

2000C HIGH SPEED TSB SYSTEM
(REV. C)

BINARY TAPES	24261-60001
	24261-60002
	24261-60003

SOURCE TAPES	24261-80001
	24261-80002
	24261-80003
	24261-80004
	24261-80005
	24261-80006
	24261-80007
	24261-80008
	24261-80009
	24261-80010
	24261-80011
	24161-80012
	24261-80013
	24261-80014
	24261-80015
	24261-80016
	24261-80017
	24261-80018
	24261-80019
	24261-80020
	24261-80021
	24261-80022
	24261-80023
	24261-80024
	24261-80025
	24261-80026
	24261-80027

PAGE 0001

0001

ASMB,A,B,L

TSB SYSTEM - 2000C(HS) VERSION C

** NO ERRORS*

```

0001          ASMB,A,B,L      TSB SYSTEM = 2000C(HS) VERSION C
0002 02002          ORG 2002B
0003*
0004* LINKAGE INFORMATION USED BY THE TSB LOADER AND THE
0005* MAG TAPE DUMP.
0006*
0007 02002 075000      DEF LIBRA      SYSTEM LIBRARY PROGRAM ORIGIN
0008 02003 072034      DEF COM6       => SYSTEM LIBRARY DISC ADDRESSES
0009 02004 000023      ABS TTY01-TTY00  LENGTH OF A TTY TABLE
0010 02005 061130      DEF TTY00+?DISC  ADDRESS OF USER DISC ADDRES
0011 02006 061132      DEF TTY00+?ID   ADDRESS OF ID-NAME
0012 02007 001571      DEF LNAME     ADDRESS OF USER-DEPENDENT ITEMS
0013 02010 177224      ABS USER-PROGB-1  LENGTH OF SWAP AREA
0014 02011 001224      DEF USER      CORE ADDRESS OF SWAP AREA
0015 02012 070342      DEF TSB       SYSTEM STARTING ADDRESS
0016 02013 114460      JSB POWIN,1    TO GO INTO LOC 4.
0017 02014 031234      DEF GMQB      MESSAGE BUFFER GETTER
0018 02015 000103      ABS $SLPL=LIBRA  NUMBER OF LIBRARY PROGRAMS

```

0020	00000		A	EQU	0	A REGISTER ADDRESS
0021	00001		B	EQU	1	B REGISTER ADDRESS
0022	00000		DEATH	EQU	0	
0023	00017		FTEL	EQU	15	FILE TABLE ENTRY LENTH
0024	00002			ORG	2	
0025	00002	102002		HLT	2	FOR SYSTEM
0026	00003	024002		JMP	*-1	PROTECTION
0027	00004	103004		HLT	4,C	CHANGED BY LOADER.
0028	00005	102005		HLT	5	PARITY ERROR.
0029	00006	107706		CLC	6,C	
0030	00007	114476	DMA	JSB	?ADIN,I	
0031	00010	114464	CH1	JSB	R14DR,I	COMMUNICATION FROM 2114
0032	00011	102011	CH2	HLT	11B	
0033	00012	114466	?SC	JSB	T35DR,I	CONSOLE LINK
0034	00013	102013		HLT	13B	
0035	00014	102014		HLT	14B	
0036	00015	102015		HLT	15B	
0037	00016	114472	CLOCK	JSB	CLKDR,I	CLOCKLINK
0038	00030			ORG	30B	
0039	00030	000000	LTEMP	BSS	16	TEMPS USED BY NONRESIDENT FUNCS.
0040	00050	000000	MOVES	BSS	1	SOURCE AND DESTINATION
0041	00051	000000	MOVED	BSS	1	FOR MOVEW ROUTINE.
0042	00052	000000	ID	BSS	1	USED FOR RESULTS OF GETID ROUTIN
0043	00053	000000	MID	BSS	1	
0044	00054	000000	T35Cp	BSS	1	T35 BUFFER PNTR FOR LIBR,PROGS.
0045	00055	000000	T35LC	BSS	1	RESULT OF T35CH ROUTINE.
0046	00056	000000	PBPTR	BSS	1	POINTER TO END OF CURRENT PROGRA
0048	00057	000000	TIMER	BSS	1	POINTS TO CLOCK OF ACTIVE USER.
0049	00060	000000	SBHED	BSS	1	
0050	00061	000000	SCHL	BSS	1	
0051	00062	000000	TTG	BSS	1	
0052	00063	000000	SCH1D	BSS	1	
0053	00064	000000	SCHP	BSS	1	
0054	00065	000000	SCNT	BSS	1	
0055	00066	000000	SCHPR	BSS	1	
0056	00067	000000	CMA	BSS	1	
0057	00070	000000	CMB	BSS	1	
0058	00071	000000	CME	BSS	1	
0059	00072	000000	WORD	BSS	1	WORD COUNT TO DISC ROUTINE.
0060	00073	000000	SVCH2	BSS	1	
0061	00074	000000	TCNT	BSS	1	
0062	00075	000000	ID_LCP	BSS	1	
0063	00076	000000	ID_LNP	BSS	1	

0065*

0066* *****

0067*

0068* BEGINNING OF EQUIPMENT TABLE

0069*

0070* THE NEXT SET OF CARDS CONSTITUTE THE RESIDENT INFO ABOUT
 0071* DISC RESIDENT TABLES. THESE CARDS MUST BE ORIGINATED AT 100B,
 0072* THEY ARE INITIALIZED BY THE VARIOUS LOADERS, AND THEIR
 0073* CONTENTS ARE WRITTEN ON DISC BY THE SLEEP ROUTINE.

0074 00100 ORG 100B

0075 00100 000000 IDEC BSS 9

0076*

0077*

0078*

0079 00111 000000 NIOT BSS 1

0080 00112 000000 ADLOC BSS 1

0081 00113 000000 ADLEN BSS 1

0082 00114 000000 NDIRT BSS 1

0083 00115 000000 DADLC BSS 8

0084 00125 000000 DADLN BSS 8

0085 00135 000000 ?IBL BSS 4

0086 00141 000000 DKTBL BSS 8

0087 00151 000000 TRAX BSS 16

0088 00171 000000 SYSID BSS 5

0089 00176 000000 MAGSC BSS 1

0090 00177 000000 NPORT BSS 1

0091 00200 000000 YEAR BSS 1

0092 00201 000000 DATIM BSS 2

0093*

0094*

0095*

0096 00203 000000 HDATE BSS 1

0097 00204 000000 SLEPT BSS 1

0098*

0099* END OF THE EQUIPMENT TABLE

0100*

0101* *****

0102*

0103 00205 000000 LDBSA BSS 1

0104 00206 000000 LSTDA BSS 1

0105 00207 000000 DATLN BSS 1

0106 00210 000000 MHAD BSS 1

0107 00211 000000 GMBBP BSS 1

0108 00212 000000 DISCA BSS 1

0109 00213 000000 DISCB BSS 1

0110 00214 000000 MBSY BSS 1

0111 00215 000000 MWORD BSS 1

0112 00216 000000 DREDP BSS 1

0113*

0114* END OF AREA THAT MUST CORRESPOND WITH THE LOADER

0115*

0116* *****

0117*

0118 00217 03125: DISCZ DEF ZDISC

0119*

ID TABLE HEADERS
 1) FIRST ID ON TRACK
 2) DRUM ADDRESS
 3) USEFUL LENGTH
 NUMBER OF ID TRACKS
 ADT DRUM ADDRESS
 ADT LENGTH IN -WORDS
 NUMBER OF DIR TRAX PER DISK
 DISC ADT DRUM ADDRESS
 DISC ADT LENGTHS IN -WORDS
 DRUM SELECT CODE TABLE
 DISC SELECT CODE / UNIT TABLE
 AVAILABLE TRACK TABLE
 SYSTEM IDENTIFICATION
 MAG TAPE SELECT CODE
 -NUMBER OF AVAILABLE PORTS
 A NUMBER FROM 0 TO 99
 REPRESENTS TIME OF YEAR, FIRST

WORD CONTAINS HOUR OF YEAR, SECOND
 IS # OF 100MS UNITS IN HR -
 36000.

LAST HIBERNATE DATE
 0 SEZ SLEPT, -1 SEZ NO

DISC BOOTSTRAP ADDRESS
 LOADER SEGMENT TABLE ADDRESS
 -LENGTH OF DISC ALLOCATION TABLE
 ADDRESS OF M. H. DISC TABLE
 => MESSAGE BUFFER GETTER
 ADDRESS OF DISC DRIVER ENTRY
 DISC DRIVER INTERRUPT ENTRY ADDR
 DISC DRIVER BUSY FLAG
 DISC REQUESTED WORD COUNT
 => DISC AUTO RESTART ROUTINE

```

0121*
0122* 2114 SEND DRIVER OPCODES
0123*
0124 00220 000000 OCR OCT 000000 OUTPUT CHARACTER
0125 00221 020000 STE OCT 020000 START TIMING ENTER
0126 00222 040000 GTC OCT 040000 GET CHARACTER
0127 00223 060000 PHO OCT 060000 PHONES TIME
0128** SPE OCT 10000 BAUD RATE INFO
0129 00224 120000 SBP OCT 120000 SAVE BUFFER POINTER
0130 00225 140000 RBP OCT 140000 RESTORE BUFFER POINTER
0131 00224 FBP EQU SBP FREE SAVED SPACE
0132 00226 160000 INI OCT 160000 INITIALIZE SYSTEM
0133 00227 160001 UIR OCT 160001 USER IS RUNNING
0134 00230 160002 UNR OCT 160002 USER NOT RUNNING
0135 00231 160003 IWT OCT 160003 INPUT WAIT
0136 00232 160004 HUU OCT 160004 HANG USER UP
0137 00233 160005 ULO OCT 160005 USER LOGGED ON
0138 00234 160006 ECO OCT 160006 ECHO=ON
0139 00235 160007 ECF OCT 160007 ECHO=OFF
0140 00236 160010 TPO OCT 160010 TAPE MODE ON
0141 00237 160011 ILI OCT 160011 ILLEGAL INPUT?
0142 00240 160012 NUC OCT 160012 NEW USER CALLED
0143 00241 160013 KAO OCT 160013 KILL ALL OUTPUT
0144 00242 160014 ALI OCT 160014 ALLOW INPUT
0145 00243 160015 OWT OCT 160015 OUTPUT WAIT
0146 00244 160016 IBF OCT 160016 IS BUFFER FULL?
0147 00245 160017 PSC OCT 160017 LINE PRINTER SELECT CODE
0148 00246 160020 LPR OCT 160020 LINE PRINTER REQUEST
0149 00247 160021 LPD OCT 160021 LINE PRINTER DISCONNECT
0150 00250 160022 LPS OCT 160022 LINE PRINTER STATUS
0151 00251 160023 BKS OCT 160023 BACKSPACE IN BUFFER
0152** CHS OCT 160024 CHAR, SIZE INFO
0153** STP OCT 160025 SUBTYPE INFO
0154** WSP OCT 160026 WHAT BAUD RATE?
0155 00252 160027 WCS OCT 160027 WHAT CHAR, SIZE?
0156 00253 160030 WTP OCT 160030 WHAT TERMINAL TYPE?
0157** TKOTK OCT 160031 TELEKLUDGE LP OUTPUT
0158 00254 160032 ABT OCT 160032 USER IS BEING ABORTED
0159*
0160* THE FOLLOWING VARIABLES ARE SYSTEM STATUS VARIABLES
0161*
0162 00255 000000 PRIST NOP LP INDICATOR
0163 00256 000000 LFLAG NOP
0164 00257 000000 MAIN NOP INDICATES USER IN CORE, 0 IF NONE
0165 00260 000000 LIB NOP INDICATES LIBRARY PROG. IN CORE
0166 00261 000000 ENORM NOP = -1 IF DRUM BUSY, 0 IF NOT
0167 00262 000000 HQDIS NOP = 0 UNLESS HEAD OF QUEUE DISCONNEC
0168 00263 000000 T35FG NOP PSEUDO=FLAG; MUST BE 10 WORDS
0169* BEFORE T35CL
0170 00264 000000 TIMEF NOP =1 WHEN CURRENT PROG IS TIMED.
0171*
0172 24000 ULEN EQU 10240 LENGTH OF USER AREA
0173 75000 LIBRA EQU 75000B SYSTEM LIBRARY PROGRAM ADDRESS
0174 00265 000000 LCHCR NOP
0175 00266 000267 READY DEF **1

```

0176	00267	005122	OCT	5122	LF-R
0177	00270	042501	ASC	2,EADY	
	00271	042131			
0178	00272	000273	MLINK	DEF **1	POINTS TO BASIC QUEUE ENTRY.
0179	00273	000273		DEF *	LINK TO HEAD OF QUEUE.
0180	00274	077777	OCT	77777	MAX. PRIORITY USED FOR Q INSERTS
0181	00274		INF	EQU MLINK+2	
0182*	TTY ENTRY FOR TTY35				
0183	00275	000000	T35CL	NOP	PSEUDO CLOCK.
0184	00276	000000	T35RS	NOP	RESTART ADDRESS
0185	00277	000000	T35ST	NOP	STATUS
0186	00300	000000	T35LK	NOP	LINK
0187	00301	000000	T35PR	NOP	PRIORITY
0188	00302	000300	T35LN	DEF T35LK	
0189	00303	171422	T35B2	ABS T35BF+T35BF	CHAR POINTER TO TTY35 BUFFER
0190	00304	171532	T35ND	ABS T35BF+T35BF+72	POINTS TO END OF BUFFER
0191	00305	074611	T35B1	DEF T35BF	POINTS TO WORD ADDRESS OF BUFFER
0192	00047		MESLN	EQU 39	LENGTH OF OPERATOR MESSAGES
0193	00352		MESBN	EQU MESLN+MESLN+MESLN+MESLN+MESLN+MESLN	
0194	00306	000000	MSQCT	OCT 0	MESSAGE COUNTER
0195	00307	056572	MSQP1	DEF MSQHD+MESBN=MESLN	
0196	00310	056267	MSQP3	DEF MSQHD	
0197	00311	056641	MSQND	DEF MSQHD+MESBN	LIMITS
0198	00312	056267	MSQBG	DEF MSQHD	OF MESSAGE QUEUE

0199*
0200** CONSTANTS AND TEMPORARIES IN ASR-35 DRIVER,

0201* 5

0202	00313	000000	T35F1	NOP	SYSTEM
0203	00314	000000	T35F2	NOP	CONSOLE
0204	00315	000000	T35F3	NOP	FLAGS

0205*
0206*
0207** GENERAL USE CONSTANTS
0208 SUP
0209*

0210	00316	177706	D72	OCT	=72
0211	00316		M72B	EQU	D72
0212	00317	177740	M32	DEC	-32
0213	00320	177746		DEC	-26
0214	00321	177747		DEC	-25,-24,-23,-22,-21,-20,-19,-18,-17,-16
0215	00333	177761		DEC	-15,-14,-13,-12,-11,-10,-9,-8,-7,-6,-5,-4
0216	00347	177775		DEC	-3,-2,-1
0217	00352	000000	.	DEC	0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
0218	00373	000021		DEC	17,18,19,20,21,22,23,24,25,26,27,28,29,30
0219	00411	000037		DEC	31,32,33,34,35,36,37,38,39,40,41,42,43,44
0220	00427	000055		DEC	45,46,47,48,49,50,51
0221	00436	000072	,58	DEC	58
0222	00436		B72	EQU	,58
0223	00437	000144	,100	DEC	100
0224	00440	000110	,72	DEC	72
0225	00441	000177	B177	OCT	177
0226	00442	000200	B200	OCT	200
0227	00443	000377	B377	OCT	377
0228	00444	000400	B400	OCT	400
0229	00445	001000	B1000	OCT	1000

0230	00446	020000	B20M	OCT	20000
0231	00447	030000	B30M	OCT	30000
0232	00222		BIT14	EQU	GTC
0233	00353		XABOR	EQU	+.1
0234	00354		XINPT	EQU	+.2
0235	00355		XOUTW	EQU	+.3
0236	00356		XSYNT	EQU	+.4
0237	00350		XDISC	EQU	.-2
0238	00347		XENTO	EQU	.-3
0239	00346		XPUN	EQU	.-4
0240				UNS	
0241	00450	037753	XEC3I	DEF	XEC3
0242	00451	040055	XEC5I	DEF	XEC5

0244*

0245*

0246** LANGUAGE PROCESSOR CONSTANTS AND ADDRESSES

0247*

0248	00452	001601	DFILT	DEF	FLSIS
0249	00453	033027	SBJTB	DEF	#FSC
0250	00454	031731	SYNTA	DEF	SYNTAX
0251	00455	033463		DEF	#SBCK
0252	00456	001130	D600	DEC	600
0253	00457	033304		DEF	#FRCR
0254	00460	060417	POWIN	DEF	POW
0255	00461	033335		DEF	#FPOP
0256	00462	025224	LWAUS	DEF	USER+ULEN
0257	00463	034131		DEF	#VROP
0258	00464	063334	R14DR	DEF	R14CM
0259	00465	033603		DEF	#ARID
0260	00466	060735	T35DR	DEF	?TT2
0261	00467	034503		DEF	#PGIN
0262	00470	053316	MCBOP	DEF	MCBOS
0263	00471	034600		DEF	#TBSR
0264	00472	070026	CLKDR	DEF	CLKIN
0265	00473	034470		DEF	#GTPF
0266	00474	053337	ANOT	DEF	NOT
0267	00475	035211		DEF	#LPCK
0268	00476	060052	?ADIN	DEF	DINT
0269	00477	034735		DEF	#RPCK
0270	00500	063307	S14SC	DEF	S14SH
0271	00500		S14LP	EQU	S14SC
0272	00501	034713		DEF	#LTR
0273	00502	000777	B777	UCT	777
0274	00503	034725		DEF	#STOP
0275	00504	175000	#LIBI	DEF	LIBRA,I
0276	00505	034210		DEF	#CRST
0277	00506	075000	#LIB#	DEF	LIBRA
0278	00507	034747		DEF	#DGCK
0279	00510	053504	AJAB	DEF	JAB
0280	00511	034761		DEF	#LTCK
0281	00512	000151	DTRAX	DEF	TRAX
0282	00513	035202		DEF	#SBPU
0283	00514	071457	SCHEM	DEF	SCHEQ
0284	00515	034771		DEF	#SYCK
0285	00516	071433	SCHIN	DEF	SCHIQ
0286	00517	043621		DEF	#FINC
0287	00520	000030	DLTEM	DEF	LTEMP
0288	00521	052716		DEF	#NMCK
0289	00522	060713	TTY35	DEF	?TT35
0290	00523	053116		DEF	#MB10
0291	00524	034307	ACCSA	DEF	ACCST
0292	00525	053264		DEF	#DB10
0293	00526	034400	ACC5A	DEF	ACC5S
0294	00527	053146		DEF	#NRML
0295	00530	025230	LULEN	DEF	LIBUS+ULEN
0296	00531	053201		DEF	#PACK
0297	00532	074435	SCHLB	DEF	SCHLQ
0298	00533	052667		DEF	#OVFL

LINKAGE FOR INPUT REQUEST.

0299	00534	074656	ABCK	DEF	ABCHK	
0300	00535	034240		DEF	#DLPR	
0301	00536	003230	L1024	DEF	LIBUS+1024	
0302	00537	034421		DEF	#FDPS	
0303	00540	072035	FUSS	DEF	COM6+1	POINTER TO DISC ADDRESS OF FUSS.
0304	00541	036732		DEF	#SSYM	
0305	00542	020000	P8192	DEC	8192	
0306	00543	037002		DEF	#ASYM	
0307	00544	001645	ERSCA	DEF	ERSEC	
0308	00545	036450		DEF	#DCMP	
0309	00546	061126	DTTY0	DEF	TTY00	
0310	00547	036574		DEF	#PNST	
0311	00550	062266	DTT32	DEF	TTY32	
0312	00551	035170		DEF	#CUSP	
0313	00552	102501	LIA1	LIA	1	
0314	00553	033607		DEF	#STRI	
0315	00554	041655	EXITA	DEF	EXIT	
0316	00555	033635		DEF	#RSTO	
0317	00556	040031	XEC1A	DEF	XEC1	
0318	00557	033647		DEF	#GTST	
0319	00560	042614	FRET	DEF	FOR10	
0320	00561	042371		DEF	#FORM	
0321	00562	001230	LIBD	DEF	LIBUS	
0322	00563	043541		DEF	#STST	
0323	00564	033360	FOPBS	DEF	QUOTE-2	
0324	00565	044010		DEF	#SBFX	
0325	00566	101230	LIBDI	DEF	LIBUS,I	
0326	00567	043420		DEF	#PSTR	
0327	00570	020040	ASCBB	ASC	1,	
0328	00571	051165		DEF	#FLOT	
0329	00572	074025	T35CH	DEF	T35CQ	
0330	00573	044657		DEF	#TRST	
0331	00574	030060	ASC00	ASC	1,00	
0332	00575	043341		DEF	#CMPR	
0333	00576	071612	OUTCH	DEF	#OUTC	
0334	00577	043322		DEF	#PCHK	
0335	00600	001364	FSCHA	DEF	FSCH	
0336	00601	042342		DEF	#FTCH	
0337	00602	001777	B1777	OCT	1777	
0338	00603	042020		DEF	#STDP	
0339	00604	000000	LOGCT	NOP		NUMBER OF ELEMENTS IN LOGGR
0340	00605	042111		DEF	#FDAT	
0341	00606	072236	LOGP1	DEF	LOGGR+63	POINTERS TO FIRST AND
0342	00607	043563		DEF	#FSCH	
0343	00610	177700	D100	OCT	-100	
0344	00611	043741		DEF	#PSHS	
0345	00612	002000	B2000	OCT	2000	
0346	00613	045165		DEF	#ARIN	
0347	00614	003000	B3000	OCT	3000	
0348	00615	043642		DEF	#BNOP	
0349	00616	010000	RPOP	OCT	10000	
0350	00617	043635		DEF	#STTP	
0351	00620	072236	LOGP2	DEF	LOGGR+63	LAST ENTRIES IN LOGGR
0352	00621	043651		DEF	#OPCK	
0353	00622	012000	LBOP	OCT	12000	

0354	00623	043703		DEF	#RSCK	
0355	00624	013000	LPOP	OCT	13000	
0356	00625	044726		DEF	#FAD	
0357	00626	072137	LOGBG	DEF	LOGGR	POINTS TO BEGINNING OF LOGGR
0358	00627	044733		DEF	#FSB	
0359	00630	072237	LOGND	DEF	LOGGR+64	POINTS TO END OF LOGGR
0360	00631	045036		DEF	#FMP	
0361	00632	022000	MULOP	OCT	22000	
0362	00633	045101		DEF	#FDV	
0363	00634	070043	DCLC1	DEF	CLC1	
0364	00635	044702		DEF	#UNPK	
0365	00636	047000	DIMOP	OCT	47000	
0366	00637	045224		DEF	#FLUN	
0367	00640	070047	DCLC2	DEF	CLC2	
0368	00641	044021		DEF	#IFIX	
0369	00642	051000	REMOP	OCT	51000	
0370	00643	050010		DEF	#ENOT	
0371	00644	001705	ERS32	DEF	ERSEC+32	
0372	00645	050026		DEF	#NMOT	
0373	00646	055000	NXTOP	OCT	55000	
0374	00647	050345		DEF	#GTDG	
0375	00650	060000	ENDOP	OCT	60000	
0376	00651	050437		DEF	#OTLN	
0377	00652	062000	DATOP	OCT	62000	
0378	00653	050417		DEF	#EDLM	
0379	00654	025063	LW97	DEF	USER+ULEN-97	
0380	00655	042347		DEF	#STPT	
0381	00656	065000	PRTOP	OCT	65000	
0382	00657	051531		DEF	#EXP	
0383	00660	070000	FILOP	OCT	70000	
0384	00661	051655		DEF	#LOG	
0385	00662	100001	ONEI	DEF	1,I	
0386	00663	051074		DEF	#CHEB	
0387	00664	077000	OPMSK	OCT	77000	
0388	00665	051147		DEF	#IENT	
0389	00666	070613	DEH	DEF	EH	
0390	00667	051172		DEF	#PWR2	
0391	00670	100003	INTFL	OCT	100003	
0392	00671	042244		DEF	#INCL	
0393	00672	100017	PDFFL	OCT	100017	
0394	00673	050475		DEF	#GTGR	
0395	00674	176550	MLIBD	ABS	-LIBUS	
0396	00675	050467		DEF	#BKSP	
0397	00676	000135	?ATBL	DEF	?TBL	
0398	00677	050451		DEF	#OTCR	
0399	00700	100777	OPDMK	OCT	100777	
0400	00701	050370		DEF	#OTIN	
0401	00702	002000	PBUFF	DEF	PROGB+1	
0402	00703	052613		DEF	#MCOT	
0403	00704	106240	D36K	ABS	30000+6000	
0404	00705	052650		DEF	#OTST	
0405	00706	174003	OFUP	OCT	174003	
0406	00707	042365		DEF	#SINI	
0407	00710	071713	SCOM1	DEF	COM1	
0408	00711	034513		DEF	#BLDI	

0409	00712	072022	SCUM5	DEF	COM5=1
0410	00713	047303		DEF	#RDIM
0411	00714	160010	M8184	DEC	=8184
0412	00715	047252		DEF	#VCHK
0413	00716	154360	MAXSN	DEC	=10000
0414	00717	045415		DEF	#SERR
0415	00720	000105	E	OCT	105
0416	00721	052676		DEF	#CHOU
0417	00722	000073	B73	OCT	73
0418	00723	045405		DEF	#MOVE
0419	00724	000074	D60	DEC	60
0420	00725	034545		DEF	#RECR
0421	00726	073000	LETOP	OCT	73000
0422	00727	034566		DEF	#FILR
0423	00730	000140	.140	OCT	140
0424	00731	042043		DEF	#VLFI
0425	00732	176000	M2000	OCT	176000
0426	00733	044057		DEF	#RQST
0427	00734	000077	B77	OCT	77
0428	00735	044355		DEF	#FILS
0429	00736	004000	B4000	OCT	4000
0430	00737	044471		DEF	#GTTY
0431	00740	125007	PDFBS	JMP	PDFTB=1,I
0432	00741	044534		DEF	#WRBU
0433	00742	045000	COMOP	OCT	45000
0434	00743	035040		DEF	#ALCO
0435	00744	016000	SCOMM	OCT	16000
0436	00745	037057		DEF	#RSTP
0437	00746	044000	IMGOP	OCT	44000
0438	00747	043530		DEF	#FENC
0439	00750	177000	M512	DEC	=512
0440	00751	056000		DEF	#MTG1
0441	00752	177667	M73	DEC	=73
0442	00753	056010		DEF	#DTL1
0443	00754	053515	PDFNS	DEF	PRDFS
0444	00755	056022		DEF	#RUND
0445	00756	134213	STBAS	DEF	SYNTB=42B,I
0446	00757	056064		DEF	#OTBL
0447	00760	001652	IHB	DEF	HB
0448	00761	056072		DEF	#OTCL
0449	00762	177400	M256	DEC	=256
0450	00763	056103		DEF	#DSCH
0451	00764	177600	M128	DEC	=128
0452	00765	056124		DEF	#MCHR
0453	00766	177640	M96	OCT	=140
0454	00767	056150		DEF	#EVEP
0455	00770	060012	DRUM	DEF	LDRUM
0456	00771	033667		DEF	#USCK
0457	00772	000100	B100	OCT	100
0458	00773	035014		DEF	#PFSH
0459	00774	053474	ATHEN	DEF	THEN
0460	00775	054006		DEF	#FRMT
0461	00776	043000	USEOP	OCT	43000
0462	00777	041027		DEF	#EPRU
0463	01000	154000	MULEN	ABS	=ULEN

0464 01001 035220 DEF #SLCK
 0465 01002 021230 L8192 DEF LIBUS+8192
 0466 01003 073270 DEF #LCDL
 0467 01004 001562 FCUCA DEF FCUC
 0468 01005 043600 DEF #FCUC
 0469 01006 042203 FDT4A DEF FDATA
 0470 01007 051751 DEF #EDAB

0471*

0472** FUNCTION EXECUTION ENTRY ADDRESSES

0473*

0474 01010 050524 PDFTB DEF ETAB
 0475 01011 050611 DEF ELIN
 0476 01012 050554 DEF ESPA
 0477 01013 051301 DEF ETAN
 0478 01014 051417 DEF EATN
 0479 01015 051527 DEF EEXP
 0480 01016 051653 DEF ELOG
 0481 01017 050661 DEF EABS
 0482 01020 052010 DEF ESQR
 0483 01021 050664 DEF EINT
 0484 01022 050744 DEF ERND
 0485 01023 051017 DEF ESGN
 0486 01024 001032 LDVSR DEF DVSR
 0487 01025 051030 DEF ETYP
 0488 01026 050700 DEF ETIM
 0489 01027 051212 DEF ESIN
 0490 01030 051210 DEF ECOS
 0491 01031 052076 DEF EBRK

'LEN' IS DONE IN A SPECIAL WAY

0493 01032 023420 DVSR DEC 10000
 0494 01033 001750 DEC 1000
 0495 01034 000144 DEC 100
 0496 01035 000012 DEC 10
 0497 01036 100000 MNEG OCT 100000
 0498 01037 000376 OCT 376
 0499 01040 040000 HALF DEC 0.5
 01041 000000

0500 00610 M64 EQU D100
 0501 00762 HIMSK EQU M256
 0502 00351 EUF EQU .-1
 0503 00350 EOR EQU .-2
 0504 01036 BIT15 EQU MNEG
 0505 00612 AN00 EQU B2000

0506*

0507* THE FOLLOWING CONSTANTS ARE MASKS FOR THE BIT-FLAG WORD
 0508* IN EACH USER'S TTY TABLE

0509*

0510	00353	TERR	EQU	.,+1	TAPE ERROR
0511	00354	CFLAG	EQU	.,+2	COMPILE MODE
0512	00356	HFLAG	EQU	.,+4	SHELLO IS RUNNING
0513	00362	TAPEF	EQU	.,+8	USER IN TAPE MODE
0514	00372	UNABT	EQU	.,+16	UNABLE TO ABORT
0515	00412	OUTWT	EQU	.,+32	OUTPUT BUFFER FULL
0516	00772	COM14	EQU	B100	COMMUNICATION FROM 2114

0517 00442 ABTRY EQU B200
 0518 00444 DFCHK EQU B400
 0519 00445 CHNFG EQU B1000
 0520 00612 ENDST EQU B2000
 0521 00736 MBUST EQU B4000
 0522 00610 PBFLG EQU RPOP
 0523 00446 CBFLG EQU B20M

ABORT ATTEMPT
 CHECK FOR DIRTY FILES
 CHAIN RUNNING
 ENDRM POSITIVE
 MBUSY POSITIVE
 ABORT CAPABILITY DISABLED
 "BREAK" COMMAND GIVEN

0524*

0525** ERROR JUMP TABLE

0526*

0527	01042	001474	SERRS	DEF	SERR
0528				REP	35
0529	01043	001474		DEF	SERR
0529	01044	001474		DEF	SERR
0529	01045	001474		DEF	SERR
0529	01046	001474		DEF	SERR
0529	01047	001474		DEF	SERR
0529	01050	001474		DEF	SERR
0529	01051	001474		DEF	SERR
0529	01052	001474		DEF	SERR
0529	01053	001474		DEF	SERR
0529	01054	001474		DEF	SERR
0529	01055	001474		DEF	SERR
0529	01056	001474		DEF	SERR
0529	01057	001474		DEF	SERR
0529	01060	001474		DEF	SERR
0529	01061	001474		DEF	SERR
0529	01062	001474		DEF	SERR
0529	01063	001474		DEF	SERR
0529	01064	001474		DEF	SERR
0529	01065	001474		DEF	SERR
0529	01066	001474		DEF	SERR
0529	01067	001474		DEF	SERR
0529	01070	001474		DEF	SERR
0529	01071	001474		DEF	SERR
0529	01072	001474		DEF	SERR
0529	01073	001474		DEF	SERR
0529	01074	001474		DEF	SERR
0529	01075	001474		DEF	SERR
0529	01076	001474		DEF	SERR
0529	01077	001474		DEF	SERR
0529	01100	001474		DEF	SERR
0529	01101	001474		DEF	SERR
0529	01102	001474		DEF	SERR
0529	01103	001474		DEF	SERR
0529	01104	001474		DEF	SERR
0529	01105	001474		DEF	SERR
0530	01106	001474	RERRS	DEF	SERR
0531				REP	49
0532	01107	001474		DEF	SERR
0532	01110	001474		DEF	SERR
0532	01111	001474		DEF	SERR
0532	01112	001474		DEF	SERR
0532	01113	001474		DEF	SERR
0532	01114	001474		DEF	SERR

0532	01115	001474	DEF	SERR
0532	01116	001474	DEF	SERR
0532	01117	001474	DEF	SERR
0532	01120	001474	DEF	SERR
0532	01121	001474	DEF	SERR
0532	01122	001474	DEF	SERR
0532	01123	001474	DEF	SERR
0532	01124	001474	DEF	SERR
0532	01125	001474	DEF	SERR
0532	01126	001474	DEF	SERR
0532	01127	001474	DEF	SERR
0532	01130	001474	DEF	SERR
0532	01131	001474	DEF	SERR
0532	01132	001474	DEF	SERR
0532	01133	001474	DEF	SERR
0532	01134	001474	DEF	SERR
0532	01135	001474	DEF	SERR
0532	01136	001474	DEF	SERR
0532	01137	001474	DEF	SERR
0532	01140	001474	DEF	SERR
0532	01141	001474	DEF	SERR
0532	01142	001474	DEF	SERR
0532	01143	001474	DEF	SERR
0532	01144	001474	DEF	SERR
0532	01145	001474	DEF	SERR
0532	01146	001474	DEF	SERR
0532	01147	001474	DEF	SERR
0532	01150	001474	DEF	SERR
0532	01151	001474	DEF	SERR
0532	01152	001474	DEF	SERR
0532	01153	001474	DEF	SERR
0532	01154	001474	DEF	SERR
0532	01155	001474	DEF	SERR
0532	01156	001474	DEF	SERR
0532	01157	001474	DEF	SERR
0532	01160	001474	DEF	SERR
0532	01161	001474	DEF	SERR
0532	01162	001474	DEF	SERR
0532	01163	001474	DEF	SERR
0532	01164	001474	DEF	SERR
0532	01165	001474	DEF	SERR
0532	01166	001474	DEF	SERR
0532	01167	001474	DEF	SERR
0533	01170	001474	FERRS	DEF SERR
0534			REP	14
0535	01171	001474	DEF	SERR
0535	01172	001474	DEF	SERR
0535	01173	001474	DEF	SERR
0535	01174	001474	DEF	SERR
0535	01175	001474	DEF	SERR
0535	01176	001474	DEF	SERR
0535	01177	001474	DEF	SERR
0535	01200	001474	DEF	SERR
0535	01201	001474	DEF	SERR
0535	01202	001474	DEF	SERR

0535	01203	001474		DEF	SERR
0535	01204	001474		DEF	SERR
0535	01205	001474		DEF	SERR
0535	01206	001474		DEF	SERR
0536	01207	001474	WERRS	DEF	SERR
0537				REP	9
0538	01210	001474		DEF	SERR
0538	01211	001474		DEF	SERR
0538	01212	001474		DEF	SERR
0538	01213	001474		DEF	SERR
0538	01214	001474		DEF	SERR
0538	01215	001474		DEF	SERR
0538	01216	001474		DEF	SERR
0538	01217	001474		DEF	SERR
0538	01220	001474		DEF	SERR

0002	01221	001224	USE	DEF	USER
0003	01222	101224	USEI	DEF	USER,I
0004	01224			ORG	1224B
0005	01224		USER	EQU	*
0006	01224	000000	AREG	NOP	
0007	01225	000000	BREG	NOP	
0008	01226	000000	EREG	NOP	
0009	01227	000000	PREG	NOP	
0010	01230		LIBUS	EQU	*
0011*					
0012**	SUBROUTINE RETURN ADDRESSES				
0013*					
0014	01230	000000	FSC	NOP	
0015	01231	124453		JMP	*=JTD,I
0016	01232	000000	SBCK	NOP	
0017	01233	124455		JMP	*=JTD,I
0018	01234	000000	FRCUR	NOP	
0019	01235	124457		JMP	*=JTD,I
0020	01236	000000	FPOP	NOP	
0021	01237	124461		JMP	*=JTD,I
0022	01240	000000	VAROP	NOP	
0023	01241	124463		JMP	*=JTD,I
0024	01242	000000	ARRID	NOP	
0025	01243	124465		JMP	*=JTD,I
0026	01244	000000	PRGIN	NOP	
0027	01245	124467		JMP	*=JTD,I
0028	01246	000000	TBSRH	NOP	
0029	01247	124471		JMP	*=JTD,I
0030	01250	000000	GETPF	NOP	
0031	01251	124473		JMP	*=JTD,I
0032	01252	000000	LPCK	NOP	
0033	01253	124475		JMP	*=JTD,I
0034	01254	000000	RPCK	NOP	
0035	01255	124477		JMP	*=JTD,I
0036	01256	000000	LTR	NOP	
0037	01257	124501		JMP	*=JTD,I
0038	01260	000000	STROP	NOP	
0039	01261	124503		JMP	*=JTD,I
0040	01262	000000	CHRST	NOP	
0041	01263	124505		JMP	*=JTD,I
0042	01264	000000	DIGCK	NOP	
0043	01265	124507		JMP	*=JTD,I
0044	01266	000000	LETCK	NOP	
0045	01267	124511		JMP	*=JTD,I
0046	01270	000000	SBPUD	NOP	
0047	01271	124513		JMP	*=JTD,I
0048	01272	000000	SYMCK	NOP	
0049	01273	124515		JMP	*=JTD,I
0050	01274	000000	FINCH	NOP	
0051	01275	124517		JMP	*=JTD,I
0052	01276	000000	NUMCK	NOP	
0053	01277	124521		JMP	*=JTD,I
0054	01300	000000	MBY10	NOP	
0055	01301	124523		JMP	*=JTD,I
0056	01302	000000	DBY10	NOP	

0057	01303	124525		JMP	*-JTD,I
0058	01304	000000	NORML	NOP	
0059	01305	124527		JMP	*-JTD,I
0060	01306	000000	.PACK	NOP	
0061	01307	124531		JMP	*-JTD,I
0062	01310	000000	OVFLW	NOP	
0063	01311	124533		JMP	*-JTD,I
0064	01312	000000	DELPR	NOP	
0065	01313	124535		JMP	*-JTD,I
0066	01314	000000	FNDPS	NOP	
0067	01315	124537		JMP	*-JTD,I
0068	01316	000000	SSYMT	NOP	
0069	01317	124541		JMP	*-JTD,I
0070	01320	000000	ASYMT	NOP	
0071	01321	124543		JMP	*-JTD,I
0072	01322	000000	DCMPL	NOP	
0073	01323	124545		JMP	*-JTD,I
0074	01324	000000	PRNST	NOP	
0075	01325	124547		JMP	*-JTD,I
0076	01326	000000	CUSP	NOP	
0077	01327	124551		JMP	*-JTD,I
0078	01330	000000	STRID	NOP	
0079	01331	124553		JMP	*-JTD,I
0080	01332	000000	RSTOP	NOP	
0081	01333	124555		JMP	*-JTD,I
0082	01334	000000	GETST	NOP	
0083	01335	124557		JMP	*-JTD,I
0084	01336	000000	FORMX	NOP	
0085	01337	124561		JMP	*-JTD,I
0086	01340	000000	SISTR	NOP	
0087	01341	124563		JMP	*-JTD,I
0088	01342	000000	SBFIX	NOP	
0089	01343	124565		JMP	*-JTD,I
0090	01344	000000	PSTR	NOP	
0091	01345	124567		JMP	*-JTD,I
0092	01346	000000	FLOAT	NOP	
0093	01347	124571		JMP	*-JTD,I
0094	01350	000000	TRSTR	NOP	
0095	01351	124573		JMP	*-JTD,I
0096	01352	000000	COMPR	NOP	
0097	01353	124575		JMP	*-JTD,I
0098	01354	000000	PCHK	NOP	
0099	01355	124577		JMP	*-JTD,I
0100	01356	000000	FETCH	NOP	
0101	01357	124601		JMP	*-JTD,I
0102	01360	000000	SETDP	NOP	
0103	01361	124603		JMP	*-JTD,I
0104	01362	000000	FDATA	NOP	
0105	01363	124605		JMP	*-JTD,I
0106	01364	000000	FSCH	NOP	
0107	01365	124607		JMP	*-JTD,I
0108	01366	000000	PSHST	NOP	
0109	01367	124611		JMP	*-JTD,I
0110	01370	000000	ARINV	NOP	
0111	01371	124613		JMP	*-JTD,I

0112	01372	000000	BINOP	NOP	
0113	01373	124615		JMP	*=JTD,I
0114	01374	000000	STTOP	NOP	
0115	01375	124617		JMP	*=JTD,I
0116	01376	000000	OPCHK	NOP	
0117	01377	124621		JMP	*=JTD,I
0118	01400	000000	RSCHK	NOP	
0119	01401	124623		JMP	*=JTD,I
0120	01402	000000	.FAD	NOP	
0121	01403	124625		JMP	*=JTD,I
0122	01404	000000	.FSB	NOP	
0123	01405	124627		JMP	*=JTD,I
0124	01406	000000	.FMP	NOP	
0125	01407	124631		JMP	*=JTD,I
0126	01410	000000	.FDV	NOP	
0127	01411	124633		JMP	*=JTD,I
0128	01412	000000	UNPAK	NOP	
0129	01413	124635		JMP	*=JTD,I
0130	01414	000000	.FLUN	NOP	
0131	01415	124637		JMP	*=JTD,I
0132	01416	000000	IFIX	NOP	
0133	01417	124641		JMP	*=JTD,I
0134	01420	000000	ENOUT	NOP	
0135	01421	124643		JMP	*=JTD,I
0136	01422	000000	NUMOT	NOP	
0137	01423	124645		JMP	*=JTD,I
0138	01424	000000	GETUG	NOP	
0139	01425	124647		JMP	*=JTD,I
0140	01426	000000	OUTLN	NOP	
0141	01427	124651		JMP	*=JTD,I
0142	01430	000000	EDELM	NOP	
0143	01431	124653		JMP	*=JTD,I
0144	01432	000000	SETPT	NOP	
0145	01433	124655		JMP	*=JTD,I
0146	01434	000000	.EXP	NOP	
0147	01435	124657		JMP	*=JTD,I
0148	01436	000000	.LOG	NOP	
0149	01437	124661		JMP	*=JTD,I
0150	01440	000000	.CHEB	NOP	
0151	01441	124663		JMP	*=JTD,I
0152	01442	000000	.IENT	NOP	
0153	01443	124665		JMP	*=JTD,I
0154	01444	000000	.PWR2	NOP	
0155	01445	124667		JMP	*=JTD,I
0156	01446	000000	INCAL	NOP	
0157	01447	124671		JMP	*=JTD,I
0158	01450	000000	GETCR	NOP	
0159	01451	124673		JMP	*=JTD,I
0160	01452	000000	BCKSP	NOP	
0161	01453	124675		JMP	*=JTD,I
0162	01454	000000	OUTCR	NOP	
0163	01455	124677		JMP	*=JTD,I
0164	01456	000000	OUTIN	NOP	
0165	01457	124701		JMP	*=JTD,I
0166	01460	000000	MCOUT	NOP	

0167	01461	124703		JMP	*-JTD,I
0168	01462	000000	OUTST	NOP	
0169	01463	124705		JMP	*-JTD,I
0170	01464	000000	SINIT	NOP	
0171	01465	124707		JMP	*-JTD,I
0172	01466	000000	BLDIN	NOP	
0173	01467	124711		JMP	*-JTD,I
0174	01470	000000	REDIM	NOP	
0175	01471	124713		JMP	*-JTD,I
0176	01472	000000	VCHK	NOP	
0177	01473	124715		JMP	*-JTD,I
0178	01474	000000	SERR	NOP	
0179	01475	124717		JMP	*-JTD,I
0180	01476	000000	CHOUF	NOP	
0181	01477	124721		JMP	*-JTD,I
0182	01500	000000	MOVER	NOP	
0183	01501	124723		JMP	*-JTD,I
0184	01502	000000	RECRF	NOP	
0185	01503	124725		JMP	*-JTD,I
0186	01504	000000	FILRF	NOP	
0187	01505	124727		JMP	*-JTD,I
0188	01506	000000	VLFIL	NOP	
0189	01507	124731		JMP	*-JTD,I
0190	01510	000000	RQSTR	NOP	
0191	01511	124733		JMP	*-JTD,I
0192	01512	000000	FILST	NOP	
0193	01513	124735		JMP	*-JTD,I
0194	01514	000000	GTTYP	NOP	
0195	01515	124737		JMP	*-JTD,I
0196	01516	000000	WRBUF	NOP	
0197	01517	124741		JMP	*-JTD,I
0198	01520	000000	ALCOM	NOP	
0199	01521	124743		JMP	*-JTD,I
0200	01522	000000	RSTPT	NOP	
0201	01523	124745		JMP	*-JTD,I
0202	01524	000000	FENCH	NOP	
0203	01525	124747		JMP	*-JTD,I
0204	01526	000000	MTG1	NOP	
0205	01527	124751		JMP	*-JTD,I
0206	01530	000000	DTL1	NOP	
0207	01531	124753		JMP	*-JTD,I
0208	01532	000000	ROUND	NOP	
0209	01533	124755		JMP	*-JTD,I
0210	01534	000000	OUTBL	NOP	
0211	01535	124757		JMP	*-JTD,I
0212	01536	000000	OUTCL	NOP	
0213	01537	124761		JMP	*-JTD,I
0214	01540	000000	USRCH	NOP	
0215	01541	124763		JMP	*-JTD,I
0216	01542	000000	MCHAR	NOP	
0217	01543	124765		JMP	*-JTD,I
0218	01544	000000	EVEXP	NOP	
0219	01545	124767		JMP	*-JTD,I
0220	01546	000000	USTCK	NOP	
0221	01547	124771		JMP	*-JTD,I

0222	01550	000000	PFSRH	NOP	
0223	01551	124773		JMP	+=JTD,I
0224	01552	000000	FRMAT	NOP	
0225	01553	124775		JMP	+=JTD,I
0226	01554	000000	EPRUS	NOP	
0227	01555	124777		JMP	+=JTD,I
0228	01556	000000	STLCK	NOP	
0229	01557	125001		JMP	+=JTD,I
0230	01560	000000	LCDLP	NOP	
0231	01561	125003		JMP	+=JTD,I
0232	01562	000000	FCUC	NOP	
0233	01563	125005		JMP	+=JTD,I
0234	01564	000000	EDABR	NOP	
0235	01565	125007		JMP	+=JTD,I
0236	00556		JTD	EQU	FSC-SBJTB+1
0237*					
0238**	GENERAL USAGE INFORMATION				
0239*					
0240	01566	000000	RNDX1	BSS	1
0241	01567	000000	RNDX2	BSS	1
0242	01570	000000	.LNUM	BSS	1
0243	01571	000000	LNAME	BSS	1
0244	01572	000000	CHRCT	BSS	1
0245	01573	000040	BLANK	OCT	40
0246	01574	000000	SBPTR	BSS	1
0247	01575	000000	SYMTB	BSS	1
0248	01576	000000	VALTB	BSS	1
0249	01577	002000	SPRUG	DEF	PROGB+1
0250	01600	000000	VLFLG	BSS	1
0251	01601	000000	FLSTS	BSS	4
0252	01605	000000	FILPT	BSS	1
0253	01606	000000	FILCT	BSS	1
0254	01607	000000	USESN	BSS	1
0255	01610	000000	NUMPT	BSS	1
0256	01611	000000	ENOUF	NOP	
0257	01612	000000	ATIM	BSS	1
0258	01613	000000	TEMP	BSS	9
0259	01624	000000	XTEMP	BSS	2
0260	01626	000000	YTEMP	BSS	2
0261	01630	000000	UTEMP	BSS	2
0262	01632	000000	X2TMP	BSS	2
0263	01634	000000	ATMP	BSS	2
0264	01636	000000	BTMP	BSS	2
0265	01640	000000	DTMP	BSS	2
0266	01642	000000	BIN01	BSS	1
0267	01643	000000	BIN02	BSS	1
0268	01644	125372		JMP	BINOP,I
0269	01645	000000	ERSEC	BSS	64
0270	01745	000000	CC	BSS	1
0271	01746	000000	CC1	BSS	1
0272	01747	000000	CC2	BSS	1
0273	01750	000000	CONTR	BSS	1
0274	01751	000000	DP	BSS	1
0275	01752	000000	DPFLG	BSS	1
0276	01753	000000	EDSTA	BSS	1

30-BIT RANDOM
INTEGER.

0277	01754	000000	EFLAG	BSS	1
0278	01755	000000	EST	BSS	1
0279	01756	000000	FFLG	BSS	1
0280	01757	000000	FSP	BSS	1
0281	01760	000000	IFSS	BSS	1
0282	01761	000000	IFSTR	BSS	1
0283	01762	000000	NCH	BSS	1
0284	01763	000000	NUM1	BSS	1
0285	01764	000000	NUM2	BSS	1
0286	01765	000000	PC1	BSS	1
0287	01766	000000	PC2	BSS	1
0288	01767	000000	SAD	BSS	1
0289	01770	000000	SBD	BSS	1
0290	01771	000000	PMASK	BSS	1
0291	01772	000000	RETCO	BSS	1
0292	01773	000000	ASINP	BSS	1
0293	01774	050000	DEFOP	OCT	50000
0294	01775	054000	FOROP	OCT	54000
0295	01776	000000	REPCT	BSS	1
0296	02000		ORG	USER+554B	
0297	01777		PROGB	EQU	*=1
0298	01036		FLGBT	EQU	MNEG
0299	01422		GFLAG	EQU	NUMOT
0300	01645		PINTG	EQU	ERSEC
0301	01266		SIGN	EQU	LETCK
0302	01316		MANT1	EQU	SSYMT
0303	01320		MANT2	EQU	ASYMT
0304	01322		EXP	EQU	DCMPL
0305	01324		EXPON	EQU	PRNST
0306	01336		FFLAG	EQU	FORMX
0307	01360		NMTMP	EQU	SETDP
0308	01362		NMPTR	EQU	FDATA
0309	01616		NUMBF	EQU	TEMP+3
0310	01356		DIGCT	EQU	FETCH
0311	01300		NT0	EQU	MBY10
0312	01310		OCTMP	EQU	OVFLW
0313	01400		LT0	EQU	RSCHK
0314	01430		LT1	EQU	EDELM
0315	01274		LT2	EQU	FINCH
0316	01432		LT3	EQU	SETPT
0317	01440		LT4	EQU	,CHEB
0318	01442		LT5	EQU	,IENT
0319	01444		LT6	EQU	,PWR2
0320	01434		LT7	EQU	,EXP
0321	01552		LT8	EQU	FRMAT
0322	01446		OT1	EQU	INCAL
0323	01452		OT3	EQU	BCKSP
0324	01470		OT4	EQU	REDIM
0325	01374		DGCNT	EQU	STTOP
0326	01512		SOURC	EQU	FILST
0327	01514		DEST	EQU	GTTYP
0328	01500		TAP0	EQU	MOVER
0329	01474		TAP1	EQU	SERR
0330	01474		MVEND	EQU	SERR
0331	01476		CU1	EQU	CHOUF

0332*

0333** SYNTAX INFORMATION TEMPORARIES

0334*

0335	01576	ERRCT	EQU	VALTB
0336	01620	SBUFA	EQU	TEMP+5
0337	01472	SYNTQ	EQU	VCHK
0338	01617	SSTAK	EQU	TEMP+4
0339	01402	MAXCR	EQU	,FAD
0340	01404	TABLE	EQU	,FSB
0341	01406	LNGTH	EQU	,FMP
0342	01410	SMBGN	EQU	,FDV
0343	01434	SLENG	EQU	,EXP
0344	01440	COUNT	EQU	,CHEB
0345	01442	TBLPT	EQU	,IENT
0346	01444	TSPTR	EQU	,PWR2
0347	01306	SBTQ	EQU	,PACK
0348	01414	ENTVR	EQU	,FLUN
0349	01414	CDFLG	EQU	,FLUN
0350	01621	PFLAG	EQU	TEMP+6

0351*

0352** COMPILE INFORMATION TEMPORARIES

0353*

0354	01234	FLINK	EQU	FRCUR
0355	01504	FILTB	EQU	FILRF
0356	01242	STEND	EQU	ARRID
0357	01230	SPTR	EQU	FSC
0358	01236	NSPTR	EQU	FPOP
0359	01240	STYPE	EQU	VAROP
0360	01613	STMP1	EQU	TEMP
0361	01614	STMP2	EQU	TEMP+1
0362	01613	VTMP1	EQU	TEMP
0363	01614	VTMP2	EQU	TEMP+1
0364	01615	VTMP3	EQU	TEMP+2
0365	01616	VTMP4	EQU	TEMP+3
0366	01617	VTMP5	EQU	TEMP+4
0367	01617	COMSN	EQU	TEMP+4
0368	01620	STPTR	EQU	TEMP+5
0369	01620	COMPT	EQU	TEMP+6
0370	01621	STCT1	EQU	TEMP+6
0371	01615	STCT2	EQU	TEMP+2
0372	01616	STCT3	EQU	TEMP+3
0373	01621	DCFLG	EQU	TEMP+6
0374	01552	INFST	EQU	FRMAT

0375*

0376** EXECUTION INFORMATION TEMPORARIES

0377*

0378	01232	FCORE	EQU	SBSCK
0379	01502	FCNTR	EQU	RECRF
0380	01240	RTRNG	EQU	VAROP
0381	01242	RTNST	EQU	ARRID
0382	01246	FORQ	EQU	TBSRH
0383	01250	FORST	EQU	GETPF
0384	01330	TMPST	EQU	STRID
0385	01332	OPDST	EQU	RSTOP
0386	01466	OPTRQ	EQU	BLDIN

0387	01334	PRGCT	EQU	GETST
0388	01262	DCCNT	EQU	CHRST
0389	01244	NXTDT	EQU	PRGIN
0390	01613	TEMP1	EQU	TEMP
0391	01252	TEMP2	EQU	LPCK
0392	01254	TEMP3	EQU	RPCK
0393	01256	TEMP4	EQU	LTR
0394	01272	TEMP5	EQU	SYMCK
0395	01260	TEMP6	EQU	STROP
0396	01500	GTMP	EQU	MOVER
0397	01430	FVT	EQU	EDELM
0398	01422	EFN0	EQU	NUMOT
0399	01424	EFN1	EQU	GETDG
0400	01426	EFN2	EQU	OUTLN
0401	01366	EFN3	EQU	PSHST
0402	01460	INITF	EQU	MCOU
0403	01422	IFCNT	EQU	NUMOT
0404	01422	RSPTR	EQU	NUMOT
0405	01500	MCNT	EQU	MOVER
0406	01354	INTMP	EQU	PCHK
0407	01552	STRLN	EQU	FRMAT
0408	01472	EOL	EQU	VCHK
0409	01460	EOPF	EQU	MCOU
0410	01574	BS1	EQU	SBPTR
0411	01350	BS2	EQU	TRSTR
0412	01352	BS3	EQU	COMPR
0413	01312	MT0	EQU	DELPR
0414	01314	MT1	EQU	FNDPS
0415	01624	MT2	EQU	XTEMP
0416	01625	MT3	EQU	XTEMP+1
0417	01340	MOP	EQU	STSTR
0418	01364	MEXIT	EQU	FSCH
0419	01634	MMT0	EQU	ATMP
0420	01635	MMT1	EQU	ATMP+1
0421	01636	MMT2	EQU	BTMP
0422	01637	MMT3	EQU	BTMP+1
0423	01640	MMT4	EQU	DTMP
0424	01641	MMT5	EQU	DTMP+1
0425	01632	MMT6	EQU	X2TMP
0426	01633	MMT7	EQU	X2TMP+1
0427	01376	MMT8	EQU	OPCHK
0428	01516	ID0	EQU	WRBUF
0429	01362	ID1	EQU	FDATA
0430	01472	RD0	EQU	VCHK
0431	01400	VT0	EQU	RSCHK
0432	01624	SCALR	EQU	XTEMP
0433	01626	MAXE	EQU	YTEMP
0434	01630	TOL	EQU	UTEMP
0435	01344	PIVEL	EQU	PSTR
0436	01440	EST1	EQU	,CHEB
0437	01442	EST2	EQU	,IENT
0438	01444	EST3	EQU	,PWR2
0439	01620	A1	EQU	TEMP+5
0440	01621	C1	EQU	TEMP+6
0441	01622	A2	EQU	TEMP+7

0442	01623	C2	EQU	TEMP+8
0443	01310	EXP2	EQU	OVFLW
0444	01402	FD0	EQU	.FAD
0445	01264	TT1	EQU	DIGCK
0446	01266	TT2	EQU	LETCK
0447	01616	TT3	EQU	TEMP+3
0448	01617	TT4	EQU	TEMP+4
0449	01646	RQ1	EQU	ERSEC+1
0450	01651	RQ2	EQU	ERSEC+4
0451	01647	RQ3	EQU	ERSEC+2
0452	01650	RQ4	EQU	ERSEC+3
0453	01652	RQ5	EQU	ERSEC+5
0454	01236	FBASE	EQU	FPOP
0455	01653	EORFL	EQU	ERSEC+6
0456	01234	FILE#	EQU	FRCUR
0457	01352	RCRD#	EQU	COMPR
0458	01516	VL0	EQU	WRBUF
0459	01654	DADRR	EQU	ERSEC+7
0460	01655	FILT	EQU	ERSEC+8
0461	01400	MPT	EQU	R3CHK
0462	01376	NQT	EQU	OPCHK
0463	01406	TNULL	EQU	.FMP
0464	01410	TPRME	EQU	.FDV
0465	01470	PS0	EQU	REDIM
0466	01464	PS1	EQU	SINIT
0467	01434	CP0	EQU	.EXP
0468	01344	CP1	EQU	PSTR
0469	01402	TRFCH	EQU	.FAD
0470	01404	TRS0	EQU	.FSB
0471	01440	RT0	EQU	.CHEB
0472	01442	RT1	EQU	.IENT
0473	01436	LBTMP	EQU	.LOG
0474	01376	CTMP	EQU	OPCHK
0475	01645	EC	EQU	ERSEC
0476	01646	FST	EQU	ERSEC+1
0477	01650	SFLG	EQU	ERSEC+3
0478	01651	EXPW	EQU	ERSEC+4
0479	01652	HB	EQU	ERSEC+5
0480	01730	HBP	EQU	ERSEC+51
0481	01731	LCH	EQU	ERSEC+52
0482	01732	NAD	EQU	ERSEC+53
0483	01733	NBD	EQU	ERSEC+54
0484	01734	NBLK	EQU	ERSEC+55
0485	01735	NHBW	EQU	ERSEC+56
0486	01740	NUMW1	EQU	ERSEC+59
0487	01741	NUMW2	EQU	ERSEC+60
0488	01742	SNFLG	EQU	ERSEC+61
0489	01743	TOTDG	EQU	ERSEC+62
0490	01744	DCTR	EQU	ERSEC+63
0491	01472	ELCNT	EQU	VCHK
0492	01552	ORDNO	EQU	FRMAT
0493	01556	ASBFP	EQU	STLCK
0494	01470	ASTYP	EQU	REDIM

46 WORD BUFFER

```

0002 30000          ORG 30000B
0003*
0004 30000 000000  DIREC BSS 560
0005 31051          DIREL EQU *-7      => LAST ENTRY
0006 31060          DIREU EQU *        => BEYOND TABLE
0007* DLOOK SEARCHES THE DIRECTORY FOR A PARTICULAR ENTRY.  THE
0008* DESIRED ENTRY IS DEFINED BY LTEMP(0:3).
0009*
0010* IF THE ENTRY IS FOUND, DLOOK RETURNS TO P+1, THE FOLLOWING VARIA-
0011* BLES ARE SET:
0012*     (LTEMP+4)=POINTER TO DIREC ENTRY.
0013*     (LTEMP+5)=MEMORY ADDRESS OF ENTRY.
0014* THE APPROPRIATE DIRECTORY TRACK IS IN CORE.
0015*
0016* IF THE ENTRY IS NOT FOUND, DLOOK RETURNS TO P+2. THE POINTERS
0017* ARE SET TO POINT AT THE LAST ENTRY LESS THAN THE GIVEN ENTRY.

0019 31060 000000  DLOOK NOP          ENTRY POINT,
0020 31061 067224          LDB DIRDL      SET LTEMP+4 TO POINT AT FIRST
0021 31062 074034  DLOK3 STB LTEMP+4  DIRECTORY TRACK,
0022 31063 160034          LDA LTEMP+4,I TEST FOR EMPTY TRACK,
0023 31064 002002          SZA
0024 31065 027071          JMP DLOK1      NOT EMPTY.
0025 31066 064034  DLOK2 LDB LTEMP+4  BUMP BACK TO
0026 31067 044343          ADB #-7        NEXT TRACK.
0027 31070 027062          JMP DLOK3
0028 31071 006004  DLOK1 INB          COMPARE FIRST TRACK ENTRY
0029 31072 060520          LDA DLTEM      TO DESIRED ENTRY.
0030 31073 017176          JSB DIRCM
0031 31074 027066          JMP DLOK2      NOT ON THIS TRACK,
0032 31075 000000          NOP          FOUND THE RIGHT TRACK.
0033 31076 160034          LDA LTEMP+4,I
0034 31077 003004          CMA,INA      SET UP INITIAL POINTER FOR
0035 31100 040562          ADA LIBD      TRACK SCAN.
0036 31101 040336          ADA #-12
0037 31102 070035          STA LTEMP+5
0038 31103 060034          LDA LTEMP+4  GET DIRECTORY
0039 31104 040360          ADA +6        DRUM ADDRESS
0040 31105 160000          LDA 0,I
0041 31106 053223          CPA DIRWD      CHECK FOR THIS TRACK IN CORE,
0042 31107 027127          JMP DLOK4      TRACK ALREADY IN CORE.
0043 31110 063223          LDA DIRWD      CHECK FOR DIR. TRACK IN CORE.
0044 31111 002003          SZA,RSS      SKIP IF 30.
0045 31112 027116          JMP DLOKB      OTHERWISE, JUST READ IN NEW TRACK
0046 31113 064562          LDB LIBD      OUTGOING CORE ADDRESS.
0047 31114 117225          JSB DRUMW,I   WRITE PREVIOUS TRACK OUT
0048 31115 027173          JMP DLOK9      GOOF: GO TRY TO SALVAGE
0049 31116          DLOKB EQU *
0050 31116 160034          LDA LTEMP+4,I GET LENGTH OF THIS DIR TRACK
0051 31117 070072          STA WORD      SET UP DRUM TRANSFER LENGTH
0052 31120 060034          LDA LTEMP+4  GET DIRECTORY
0053 31121 040360          ADA +6        DRUM ADDRESS
0054 31122 073233          STA DLO10     SAVE POINTER TO IT
0055 31123 160000          LDA 0,I
0056 31124 064566          LDB LIBDI

```

```

0057 31125 117225      JSB DRUMW,I   READ DIRECTORY
0058 31126 117227      JSB SICKW,I   CAN'T: GO GIVE UP GRACEFULLY
0059* NOW SEARCH DIRECTORY FOR DESIRED ENTRY, A BINARY SEARCH IS USED,
0060* WITH LTEMP(14:15) USED AS POINTERS TO THE FIRST AND LAST OF ALL
0061* UNTESTED ENTRIES,
0062*
0063 31127 060562      DLOK4 LDA LIBD      SET POINTER TO BEGINNING OF
0064 31130 070046      STA LTEMP+14  DIRECTORY.
0065 31131 060520      LDA DLTEM     TEST LAST ENTRY IN TRACK.
0066 31132 064035      LDB LTEMP+5
0067 31133 017176      JSB DIRCM
0068 31134 027137      JMP DLOK5     LAST ENTRY TOO BIG--START CHOP.
0069 31135 037060      ISZ DLOOK    TOO SMALL--IT'S THE ONE.
0070 31136 127060      JMP DLOOK,I   LAST ENTRY IS IT.
0071*
0072 31137 060035      DLOK5 LDA LTEMP+5  SET END POINTER.
0073 31140 070047      STA LTEMP+15
0074 31141 060046      LDA LTEMP+14  COMPUTE DIFFERENCE BETWEEN FIRST
0075 31142 003004      DLOK6 CMA,INA  AND LAST ENTRIES.
0076 31143 040047      ADA LTEMP+15
0077 31144 001100      ARS
0078 31145 006400      CLB
0079 31146 100400      DIV ,+12     DIVIDE BY TWO.
0080 31147 000366      MPY ,+12     ROUND TO A
0081 31150 100200      OF TWELVE
0082 31151 000365      ADA LTEMP+14  GET ADDRESS OF MIDDLE ENTRY.
0083 31152 040046      STA LTEMP+6   SET INTO RESULT LOCATION.
0084 31153 070035      LDB DLTEM     SETUP FOR JSB DIRCM.
0085 31154 064520      CPA LTEMP+14  TEST FOR ONLY 2 ENTRIES LEFT.
0086* 31155 050046      JMP DLOK8     THERE ARE--WE'VE GOT THE RESULT.
0087 31156 027166
0088* 31157 017176      JSB DIRCM     TEST MIDWAY ENTRY.
0089 31160 027163      JMP DLOK7     TOO SMALL--GO RESET LTEMP(14).
0090 31161 027137      JMP DLOK5     TOO BIG--GO RESET LTEMP(15).
0091* 31162 127060      JMP DLOOK,I   EQUAL--RETURN.
0092 31163 060035      DLOK7 LDA LTEMP+5  RESET LTEMP(14).
0093 31164 070046      STA LTEMP+14
0094 31165 027142      JMP DLOK6
0095*
0096 31166 050562      DLOK8 CPA LIBD     IF LTEMP(14)<>LTEMP, WE KNOW
0097 31167 017176      JSB DIRCM     IT'S LESS, SO WE SKIP TEST.
0098 31170 037060      ISZ DLOOK    LESS THAN ENTRY.
0099 31171 000000      NOP
0100 31172 127060      JMP DLOOK,I   EQUAL TO ENTRY.
0101*
0102 31173 063233      DLOK9 LDA DL010   GET POINTER TO DRUM ADDRESS
0103 31174 064072      LDB WORD     GET LENGTH OF TABLE IN CORE
0104 31175 117226      JSB SALVW,I  GO ATTEMPT TO SALVAGE TRACK

```

```

0106*
0107* DIRCM COMPARES THE 4 WORD ENTRIES POINTED TO BY A AND B.
0108* BIT 15 IS NOT USED, IT RETURNS AS FOLLOWS:
0109*     P+1; A<B
0110*     P+2; A>B
0111*     P+3 A=B
0112  31176 000000  DIRCM NOP
0113  31177 073231          STA DIRC2
0114  31200 060346          LDA  ,=4          SET COUNTER.
0115  31201 073230          STA DIRC1
0116  31202 077232          STB DIRC5
0117  31203 163232  DIRC3 LDA DIRC5,I  SUBTRACT WORD FROM B
0118  31204 001665          ELA,CLE,ERA
0119  31205 003004          CMA,INA          FROM WORD FROM A.
0120  31206 167231          LDB DIRC2,I
0121  31207 005665          ELB,CLE,ERB
0122  31210 040001          ADA 1
0123  31211 002002          SZA          TEST FOR EQUAL.
0124  31212 027220          JMP DIRC4          NOT EQUAL-GO RETURN.
0125  31213 037232          ISZ DIRC5          BUMP
0126  31214 037231          ISZ DIRC2          POINTERS.
0127  31215 037230          ISZ DIRC1          TEST FOR FINISHED.
0128  31216 027203          JMP DIRC3
0129  31217 037176          ISZ DIRCM          DOUBLE ISZ FOR EQUAL.
0130  31220 002021  DIRC4 SSA,RSS
0131  31221 037176          ISZ DIRCM          ONE ISZ IF A>B
0132  31222 127176          JMP DIRCM,I          NONE IF A<B.
0133  31223 000000  DIRWD OCT 0          TELLS WHAT DIRECTORY TRACK
0134*
0135  31224 031051  DIRDL DEF DIREL          IS IN CORE WHEN FILES IS RUNNING.
0136  31225 074231  DRUMW DEF DRUML          DRUM DRIVER LINK
0137  31226 062411  SALVW DEF SALVG
0138  31227 062613  SICKW DEF SICK
0139  31230 000000  DIRC1 BSS 1
0140  31231 000000  DIRC2 BSS 1
0141  31232 000000  DIRC5 BSS 1
0142  31233 000000  DL010 BSS 1          DRUM ADDRESS POINTER SAVE WORD
0143*

```

0145*

0146*

0147*

0148*

0149*

0150*

0151*

THIS ROUTINE IS USED TO GET A MESSAGE BUFFER FOR
 THE DISC OR DRUM DRIVER. THE LINK TO IT IS PASSED IN THE
 LINKAGE AREA, AND IS STORED ONTO THE BASE PAGE
 BEFORE THE SYSTEM IS STARTED UP.
 PRIOR TO THAT TIME, THE LOADER USES ITS OWN VERSION.

0152	31234	000000	GMQB	NOP	
0153	31235	060306		LDA MSQCT	CHECK FOR MESSAGE BUFFERS ALL
0154	31236	050357		CPA .+5	BEING USED
0155	31237	127234		JMP GMQB,I	NO SKIP SEZ NO BUFFER
0156	31240	034306		ISZ MSQCT	INCREMENT COUNT
0157	31241	060310		LDA MSQP3	LOAD CURRENT POINTER
0158	31242	064310		LDB MSQP3	ADVANCE POINTER FOR
0159	31243	044421		ADB .+MESLN	NEXT MESSAGE
0160	31244	054311		CPB MSQND	CHECK FOR END OF QUEUE
0161	31245	064312		LDB MSQBG	IF END, START OVER
0162	31246	074310		STB MSQP3	
0163	31247	037234		ISZ GMQB	ADVANCE TO BUFFER PRESENT RETURN
0164	31250	127234		JMP GMQB,I	RETURN

```

0166*           THIS ROUTINE CALLS THE REAL DISK DRIVER, AND WAITS
0167*           FOR THE TRANSFER TO BE SUCCESSFULLY COMPLETED,
0168*
0169  31251 000000 ZDISC NOP           COME HERE FOR DISC TRANSFER
0170*                                           AND WAIT FOR COMPLETION
0171  31252 114212 JSB DISCA,I       CALL NORMAL DRIVER
0172  31253 102030 HLT 30B          DRIVER BUSY
0173  31254 102031 HLT 31B          DISK NOT PRESENT
0174  31255 060214 LDA MBUSY        WAIT FOR COMPLETION
0175  31256 002020 SSA              -1 SEZ BUSY
0176  31257 027255 JMP *-2
0177  31260 002003 SZA,RSS        0 SEZ DONE WITHOUT ERRORS
0178  31261 037251 ISZ ZDISC        ADVANCE TO NO ERRORS RETURN
0179  31262 127251 JMP ZDISC,I     RETURN

```

```

0181 31701                ORG 31701B
0182 31701 000151        .105 DEC 105
0183 31702 045233        TAPEA DEF TAPER
0184 31703 045724        SER7A DEF SERR7
0185 31704 153064        LW200 ABS =10240-USER+200
0186*
0187** CLEAN UP FOR NEW PROGRAM **
0188*
0189 31705 103100        CLNUP CLF 0
0190 31706 060354        LDA CFLAG          SET
0191 31707 003000        CMA              PROGRAM
0192 31710 110257        AND MAIN,I          MODE TO
0193 31711 170257        STA MAIN,I          'UNCOMPILED'
0194 31712 102100        STF 0
0195 31713 064702        LDB PBUFF          INSURE CORRECT
0196 31714 075577        STB SPROG          START-OF--PROGRAM SETTING
0197 31715 006400        CLB              INITIALIZE
0198 31716 075575        STB SYMTB          ERROR FLAG
0199 31717 027743        JMP SYNT1
0200**
0201*** DELETE A PROGRAM STATEMENT ***
0202**
0203*
0204* THE STATEMENT REFERENCED BY THE SEQUENCE NUMBER IN
0205* (B) IS DELETED, EXIT TO EXECUTIVE.
0206*
0207 31720 060055        DELST LDA PBPTR          LOAD SEARCH TERMINATION POINTER
0208 31721 015314        JSB FNDPS          SEARCH FOR STATEMENT
0209 31722 124526        JMP ACC5A,I        NOT
0210 31723 124526        JMP ACC5A,I        FOUND
0211 31724 002400        CLA
0212 31725 006004        INB              (B),I = STATEMENT LENGTH
0213 31726 164001        LDB 1,I           LOAD LENGTH OF OLD STATEMENT
0214 31727 015312        JSB DELPR          DELETE
0215 31730 124526        JMP ACC5A,I        STATEMENT
0216*
0217* *****
0218****
0219*** CHECK SYNTAX OF STATEMENT ***
0220****
0221* *****
0222*
0223* PBPTR POINTS TO THE LAST WORD +1 OF THE PREVIOUS PROGRAM AND
0224* THUS ALSO POINTS TO THE FIRST WORD OF AVAILABLE USER SPACE,
0225* WHERE THE NEW STATEMENT WILL BE TRANSLATED. WHEN AN ERROR
0226* OCCURS UNDER 'TAPE' MODE, THE USER'S TERR BIT IN THE FIRST WORD
0227* OF HIS TTY TABLE IS SET AND HIS COPY OF ERRCT IS BUMPED. IF AN
0228* OUT-OF-STORAGE ERROR OCCURS IN 'TAPE' MODE, SYMTB IS SET TO 1
0229* AND ALL SUBSEQUENT PROGRAM MATERIAL IS REJECTED. IF UPON ENTRY
0230* THE PRIOR PROGRAM IS NULL, ALL FLAGS ARE SET TO NULL; IF THE
0231* PRIOR PROGRAM IS NOT NULL, IT IS PLACED IN 'SOURCE' MODE. SYNTAX
0232* WILL REJECT ADDITIONAL STATEMENTS IF FEWER THAN 200 WORDS OF
0233* USER SPACE ARE AVAILABLE BUT WILL ACCEPT STATEMENT DELETIONS IF
0234* IN 'KEY' MODE.
0235*

```

0236	31731	064056	SYNTAX	LDB	PBPTR	NULL
0237	31732	054702		CPB	PBUFF	PROGRAM?
0238	31733	027705		JMP	CLNUP	YES
0239	31734	060353		LDA	TERR	NO, ERROR
0240	31735	110257		AND	MAIN,I	FLAG
0241	31736	002003		SZA,	RSS	SET?
0242	31737	027743		JMP	SYNT1	NO
0243	31740	002400		CLA		YES, ERRORS
0244	31741	051576		CPA	ERRCT	IMBEDDED IN CODE?
0245	31742	127702		JMP	TAPEA,I	NO, FINISH ABORTED ERROR CLEANUP
0246	31743	015464	SYNT1	JSB	SINIT	YES, PREPARE PROGRAM
0247	31744	015322		JSB	DCMPL	FOR SYNTAX
0248	31745	006400		CLB		SET LINE NUMBER
0249	31746	174056		STB	PBPTR,I	TO ZERO
0250	31747	060056		LDA	PBPTR	SET SYNTAX POINTER TO FIRST
0251	31750	071574		STA	SBPTR	AVAILABLE WORD OF USER SPACE
0252	31751	071620		STA	SBUFA	SAVE POINTER TO SYNTAX BUFFER
0253	31752	043701		ADA	.105	AND TO
0254	31753	071617		STA	SSTAK	SYNTAX STACK
0255	31754	071472		STA	SYNT0	
0256	31755	006004		INB		DOES 'OUT OF STORAGE'
0257	31756	055575		CPB	SYMTB	ERROR EXIST?
0258	31757	127703		JMP	SER7A,I	YES
0259	31760	015450		JSB	GETCR	NO, EMPTY RECORD?
0260	31761	124526		JMP	ACC5A,I	YES
0261	31762	015452		JSB	BCKSP	NO
0262*						*
0263**			DETERMINE SEQUENCE NUMBER			**
0264*						*
0265*						
0266*			A RECORD CONSISTING ONLY OF A SEQUENCE NUMBER WILL CAUSE THE			
0267*			DELETION OF A PREVIOUSLY ACCEPTED STATEMENT REFERENCED BY THAT			
0268*			SEQUENCE NUMBER,			
0269*						
0270	31763	015466		JSB	BLDIN	RECORD
0271	31764	175574		STB	SBPTR,I	SEQUENCE
0272	31765	035574		ISZ	SBPTR	NUMBER
0273	31766	050367		CPA	.+15B	NULL STATEMENT?
0274	31767	027720		JMP	DELST	YES
0275	31770	035574		ISZ	SBPTR	NO, SKIP STATEMENT LENGTH WORD
0276	31771	171574		STA	SBPTR,I	SAVE FIRST CHARACTER
0277	31772	060056		LDA	PBPTR	ACCEPTABLE AMOUNT
0278	31773	043704		ADA	LW200	OF USER SPACE
0279	31774	002021		SSA,	RSS	REMAINING?
0280	31775	115042		JSB	SERRS,I	NO
0281*						*
0282**			DETERMINE STATEMENT TYPE			**
0283*						*
0284	31776	060361		LDA	.+7	SET MAXIMUM
0285	31777	071402		STA	MAXCR	SYMBOL LENGTH
0286	32000	063735		LDA	STTYP	STATEMENT-TYPE NAMES
0287	32001	064321		LDB	.25	(NUMBER OF STATEMENT TYPES)
0288	32002	015246		JSB	TBSRH	FIND STATEMENT TYPE
0289	32003	060726		LDA	LETOP	NO, ASSUME 'IMPLIED' LET
0290	32004	064341		LDB	.-9	DISALLOW

0291	32005	077447		STB MSFLG	MULTIPLE STORE
0292	32006	064355		LDB ,+3	SET MAXCR TO MOST
0293	32007	075402		STB MAXCR	COMMON VALUE
0294	32010	006400		CLB	TURN OFF
0295	32011	075621		STB PFLAG	'PARAMETER' MODE
0296	32012	101051		LSR 9	RIGHT JUSTIFY OPERATOR CODE
0297	32013	073453		STA SFLAG	TURN OFF STRING AND STORE MODES
0298	32014	073445		STA DFLAG	TURN ON 'SUBSCRIPT' MODE
0299	32015	040756		ADA STBAS	BRANCH TO
0300	32016	124000		JMP 0,I	SYNTAX ROUTINE
0301*					
0302***				**	
0303**			<LET STATEMENT>	SYNTAX	**
0304***				**	
0305*					
0306	32017	060726	LET0	LDA LETOP	FAKE
0307	32020	171574		STA SBPTR,I	A
0308	32021	015452		JSB BCKSP	'LET'
0309	32022	065574	LETS	LDB SBPTR	ENABLE A
0310	32023	077453		STB SFLAG	STRING VARIABLE
0311	32024	037447		ISZ MSFLG	TURN ON 'MULTIPLE STORE' MODE
0312	32025	015230		JSB FSC	ANALYZE FORMULA
0313	32026	037453		ISZ SFLAG	STRING VARIABLE FOUND?
0314	32027	026035		JMP LET1	NO
0315	32030	015272		JSB SYMCK	YES, (B) IS LEFT AT -1
0316	32031	033415		DEF ASSOP-1	DEMAND ASSIGNMENT OPERATOR
0317	32032	115045		JSB SERRS+3,I	NOT FOUND
0318	32033	015332		JSB RSTOP	RECORD A STRING OPERAND
0319	32034	026037		JMP EOST	DEMAND END OF STATEMENT
0320	32035	037453	LET1	ISZ SFLAG	DID A STORE OCCUR?
0321	32036	115045		JSB SERRS+3,I	NO
0322**				**	
0323***			CHECK FOR END OF STATEMENT	***	
0324**				**	
0325	32037	050367	EOST	CPA ,+15B	END OF STATEMENT?
0326	32040	124524		JMP ACCSA,I	YES
0327	32041	115046		JSB SERRS+4,I	NO
0328*					
0329***				**	
0330**			<DIM STATEMENT>	SYNTAX	**
0331***				**	
0332*					
0333	32042	002400	DIMS	CLA	FLAG AS DIM STATEMENT
0334*					
0335***				**	
0336**			<COM STATEMENT>	SYNTAX	**
0337***				**	
0338*					
0339	32043	071414	COMS	STA CDFLG	FLAG AS COM STATEMENT
0340	32044	077445		STB DFLAG	TURN ON 'DIM' MODE ((B)=0)
0341	32045	061574		LDA SBPTR	ENABLE STRING
0342	32046	073453		STA SFLAG	VARIABLE
0343	32047	015240		JSB VAROP	SEEK VARIABLE OPERAND
0344	32050	115047		JSB SERRS+5,I	IMPROPER SUBSCRIPT
0345	32051	026055	COMS0	JMP COMS1	ARRAY OR STRING FOUND

0346	32052	006400		CLB	SIMPLE VARIABLE
0347	32053	055414		CPB CDFLG	'DIM'?
0348	32054	115047		JSB SERRS+5,I	YES==ERROR
0349	32055	050367	COMS1	CPA .+15B	NO, CARRIAGE RETURN FOLLOWS?
0350	32056	124524		JMP ACCSA,I	YES
0351	32057	007400		CCB	NO
0352	32060	015272		JSB SYMCK	COMMA?
0353	32061	033363		DEF COMMA=1	
0354	32062	115050		JSB SERRS+6,I	NO
0355	32063	026045		JMP COMS+2	YES
0356*					
0357*** **					
0358** <DEF STATEMENT> SYNTAX **					
0359*** **					
0360*					
0361	32064	015256	DEFS	JSB LTR	FIRST TWO
0362	32065	115051		JSB SERRS+7,I	
0363	32066	001727		ALF,ALF	CHARACTERS
0364	32067	031614		IOR TEMP+1	
0365	32070	053375		CPA FN	'FN' ?
0366	32071	002001		RSS	YES
0367	32072	115051		JSB SERRS+7,I	NO
0368	32073	015256		JSB LTR	FOLLOWED BY A LETTER?
0369	32074	115051		JSB SERRS+7,I	NO
0370	32075	061614		LDA TEMP+1	YES,
0371	32076	064436		LDB .58	RECORD
0372	32077	015260		JSB STROP	FUNCTION
0373	32100	061615		LDA TEMP+2	RETRIEVE FOLLOWING CHARACTER
0374	32101	015252		JSB LPCK	DEMAND LEFT PARENTHESIS
0375	32102	031036		IOR FLGBT	SET FLAG FOR
0376	32103	171574		STA SBPTR,I	FORMAL PARAMETER
0377	32104	015249		JSB VAROP	DEMAND A SIMPLE VARIABLE
0378	32105	000000		NOP	NONE
0379	32106	115052		JSB SERRS+8,I	FOUND
0380	32107	015254		JSB RPCK	DEMAND A RIGHT PARENTHESIS
0381	32110	007400		CCB	ASSIGNMENT
0382	32111	015272		JSB SYMCK	OPERATOR
0383	32112	033415		DEF ASSOP=1	NEXT?
0384	32113	115045		JSB SERRS+3,I	NO
0385	32114	060350		LDA =2	YES,
0386	32115	041574		ADA SBPTR	ISOLATE
0387	32116	160000		LDA 0,I	AND SAVE
0388	32117	010502		AND B777	FORMAL
0389	32120	071621		STA PFLAG	PARAMETER
0390	32121	015230		JSB FSC	FETCH DEFINING FORMULA
0391	32122	015270		JSB SBPUD	RECORD END-OF-FORMULA OPERATOR
0392	32123	026037		JMP EOST	DEMAND END OF STATEMENT
0393*					
0394*** **					
0395** <IMAGE STATEMENT> SYNTAX **					
0396*** **					
0397*					
0398	32124	065574	IMAGS	LDB SBPTR	SAVE CURRENT
0399	32125	077457		STB ARYAD	BUFFER POINTER
0400	32126	006400		CLB	

0401	32127	060367	LDA	+.15B	SET DELIMETER
0402	32130	015262	JSB	CHRST	RECORD STRING CONSTANT
0403	32131	000000	NOP		
0404	32132	061614	LDA	TEMP+1	LENGTH
0405	32133	040752	ADA	M73	
0406	32134	002021	SSA,	RSS	>72?
0407	32135	115101	JSB	SERRS+31,I	YES
0408	32136	163457	LDA	ARYAD,I	NO,
0409	32137	041614	ADA	TEMP+1	RECORD
0410	32140	173457	STA	ARYAD,I	LENGTH
0411	32141	124524	JMP	ACCSA,I	
0412*					
0413***					**
0414**	<GOTO STATEMENT>	&	<GOSUB STATEMENT>	SYNTAX	**
0415***					**
0416*					
0417	32142	060224	GOTOS	LDA SBP	SAVE
0418	32143	064257		LDB MAIN	
0419	32144	006004		INB	BUFFER
0420	32145	130001		IOR 1,I	
0421	32146	114500		JSB S14SC,I	POINTER
0422	32147	003400		CCA	SET INTCK MODE TO
0423	32150	071422		STA GFLAG	'EXIT ON ERROR'
0424	32151	015244		JSB PRGIN	SEEK SEQUENCE NUMBER
0425	32152	026212		JMP GOTO3	FOUND
0426	32153	007400		CCB	NOT FOUND
0427	32154	045574	GOTO1	ADB SBPTR	BACK UP
0428	32155	075574		STB SBPTR	SYNTAX POINTER
0429	32156	161574		LDA SBPTR,I	ERASE
0430	32157	010664		AND OPMSK	'INTEGER FOLLOWS'
0431	32160	171574		STA SBPTR,I	FLAG
0432	32161	060225		LDA RBP	RESTORE
0433	32162	064257		LDB MAIN	
0434	32163	006004		INB	BUFFER
0435	32164	130001		IOR 1,I	
0436	32165	114500		JSB S14SC,I	POINTER
0437	32166	015230		JSB FSC	SEEK FORMULA
0438	32167	050367		CPA .+15B	END-OF-RECORD?
0439	32170	115053		JSB SERRS+9,I	YES
0440	32171	001727		ALF,ALF	NO, DO
0441	32172	071614		STA TEMP+1	NEXT
0442	32173	015450		JSB GETCR	TWO
0443	32174	115053		JSB SERRS+9,I	CHARACTERS
0444	32175	031614		IOR TEMP+1	FORM
0445	32176	053377		CPA OF	'OF' ?
0446	32177	002001		RSS	YES
0447	32200	115053		JSB SERRS+9,I	NO
0448	32201	060706		LDA OFOP	RECORD
0449	32202	171574		STA SBPTR,I	'OF' AND
0450	32203	015270		JSB SBPUD	ADVANCE POINTER
0451	32204	015466	GOTO2	JSB BLDIN	DEMAND A SEQUENCE NUMBER
0452	32205	175574		STB SBPTR,I	RECORD IT
0453	32206	015270		JSB SBPUD	
0454	32207	050426		CPA .+44	COMMA NEXT?
0455	32210	026204		JMP GOTO2	YES

0456	32211	026037		JMP	EOST	NO, DEMAND END OF STATEMENT
0457	32212	050367	GOTO3	CPA	+.15B	END OF STATEMENT?
0458	32213	026217		JMP	GOTO4	YES
0459	32214	071422		STA	GFLAG	NO, RE=ENABLE BAD INTEGER ERROR
0460	32215	064350		LDB	.=2	
0461	32216	026154		JMP	GOTO1	
0462	32217	060224	GOTO4	LDA	FBP	FREE
0463	32220	064257		LDB	MAIN	
0464	32221	006004		INB		SAVED
0465	32222	130001		IOR	1,I	
0466	32223	114500		JSB	S14SC,I	BUFFER SPACE
0467	32224	124524		JMP	ACCSA,I	ACCEPT STATEMENT
0468*						
0469***					**	
0470**	<IF	STATEMENT>	SYNTAX	**		
0471***				**		
0472*						
0473	32225	035574	IFS	ISZ	SBPTR	FETCH NEXT
0474	32226	015450		JSB	GETCR	CHARACTER
0475	32227	115101		JSB	SERRS+31,I	NONE FOUND
0476	32230	171574		STA	SBPTR,I	FOUND, SAVE IT
0477	32231	063451		LDA	AEND	LOOK
0478	32232	007400		CCB		FOR
0479	32233	015246		JSB	TBSRH	'END'
0480	32234	026240		JMP	IF0	NOT FOUND
0481	32235	015504		JSB	FILRF	FOUND, GET FILE REFERENCE
0482	32236	115102		JSB	SERRS+32,I	NONE FOUND
0483	32237	026265		JMP	IF1+1	FOUND
0484	32240	015452	IF0	JSB	BCKSP	RESTORE
0485	32241	007400		CCB		TO
0486	32242	045574		ADB	SBPTR	ENTRY
0487	32243	075574		STB	SBPTR	STATUS
0488	32244	077453		STB	SFLAG	ENABLE STRING VARIABLE
0489	32245	015230		JSB	FSC	SEEK DECISION FORMULA
0490	32246	037453		ISZ	SFLAG	STRING VARIABLE FOUND?
0491	32247	026265		JMP	IF1+1	NO
0492	32250	071614		STA	TEMP+1	YES, SAVE NEXT CHARACTER
0493	32251	064347		LDB	.=3	MAXCR = 3 FROM FSC
0494	32252	171574		STA	SBPTR,I	MULTICHARACTER
0495	32253	063736		LDA	MCREL	RELATIONAL
0496	32254	013246		JSB	TBSRH	OPERATOR?
0497	32255	002001		RSS		NO
0498	32256	026264		JMP	IF1	YES
0499	32257	061614		LDA	TEMP+1	RETRIEVE CHARACTER
0500	32260	064346		LDB	.=4	SINGLE CHARACTER
0501	32261	015272		JSB	SYMCK	RELATIONAL
0502	32262	033431		DEF	RELOS=1	OPERATOR?
0503	32263	115062		JSB	SERRS+16,I	NO
0504	32264	015332	IF1	JSB	RSTOP	YES, RECORD A STRING OPERAND
0505	32265	171574		STA	SBPTR,I	SAVE NEXT CHARACTER
0506	32266	035402		ISZ	MAXCR	BUMP LIMIT TO FOUR CHARACTERS
0507	32267	060774		LDA	ATHEN	LOOK
0508	32270	007400		CCB		FOR
0509	32271	015246		JSB	TBSRH	'THEN'
0510	32272	115054		JSB	SERRS+10,I	NOT FOUND

```

0511 32273 015244 JSB PRGIN DEMAND A SEQUENCE NUMBER
0512 32274 026037 JMP EOST DEMAND END OF STATEMENT
0513*
0514*** **
0515** <FOR STATEMENT> SYNTAX **
0516*** **
0517*
0518 32275 015240 FORS JSB VAROP SEEK A SIMPLE VARIABLE
0519 32276 000000 NOP NONE
0520 32277 115052 JSB SERRS+8,I FOUND
0521 32300 007400 CCB DEMAND AN
0522 32301 015272 JSB SYMCK ASSIGNMENT
0523 32302 033415 DEF ASSOP=1 OPERATOR
0524 32303 115045 JSB SERRS+3,I NOT FOUND
0525 32304 015230 JSB FSC RECORD INITIALIZATION FORMULA
0526 32305 001727 ALF,ALF DO
0527 32306 071614 STA TEMP+1 NEXT
0528 32307 015450 JSB GETCR TWO
0529 32310 115055 JSB SERRS+11,I CHARACTERS
0530 32311 031614 IOR TEMP+1 FORM
0531 32312 053376 CPA TO 'TO' ?
0532 32313 002001 RSS YES
0533 32314 115055 JSB SERRS+11,I NO
0534 32315 063740 LDA TOOP RECORD
0535 32316 171574 STA SBPTR,I 'TO'
0536 32317 015230 JSB FSC RECORD LIMIT FORMULA
0537 32320 050367 CPA .+15B END OF STATEMENT?
0538 32321 124524 JMP ACCSA,I YES
0539 32322 171574 STA SBPTR,I NO, IS NEXT
0540 32323 035402 ISZ MAXCR
0541 32324 063461 LDA ASTEP SYMBOL
0542 32325 007400 CCB
0543 32326 015246 JSB TBSRH 'STEP' ?
0544 32327 115056 JSB SERRS+12,I NO
0545 32330 015230 JSB FSC YES, RECORD STEP SIZE
0546 32331 026037 JMP EOST DEMAND END OF STATEMENT
0547*
0548*** **
0549** <NEXT STATEMENT> SYNTAX **
0550*** **
0551*
0552 32332 015240 NEXTS JSB VAROP SEEK SIMPLE VARIABLE
0553 32333 000000 NOP NOT
0554 32334 115052 JSB SERRS+8,I FOUND
0555 32335 026037 JMP EOST DEMAND END OF STATEMENT
0556*
0557*** **
0558** <RETURN STATEMENT>, <END STATEMENT>, **
0559** AND <STOP STATEMENT> SYNTAX **
0560*** **
0561*
0562 32336 035574 ENDS ISZ SBPTR RECORD NULL OPERAND
0563 32337 015450 JSB GETCR END OF STATEMENT?
0564 32340 124524 JMP ACCSA,I YES
0565 32341 115046 JSB SERRS+4,I NO

```

0566*

0567***

0568** <DATA STATEMENT> SYNTAX **

0569***

0570*

0571	32342	015270	DATAS	JSB	SBPUD	
0572	32343	002400		CLA		INITIALIZE
0573	32344	071266		STA	SIGN	SIGN
0574	32345	015450		JSB	GETCR	REQUEST A CHARACTER
0575	32346	115057		JSB	SERRS+13,I	END-OF-INPUT CONDITION
0576	32347	006404		CLB,	INB	
0577	32350	050425		CPA	.,+4J	'+' ?
0578	32351	026400		JMP	DATA4	YES
0579	32352	007400		CCB		NO
0580	32353	050427		CPA	.,+45	'=' ?
0581	32354	026400		JMP	DATA4	YES
0582	32355	015276	DATA1	JSB	NUMCK	NO, NUMBER?
0583	32356	026373		JMP	DATA3	NO
0584	32357	115060		JSB	SERRS+14,I	BAD EXPONENT
0585	32360	064347		LDB	.,-3	NUMBER,
0586	32361	045574		ADB	SBPTR	MARK
0587	32362	160001		LDA	1,I	PREVIOUS
0588	32363	031036		IOR	FLGBT	OPERATOR AS
0589	32364	170001		STA	1,I	'NUMBER FOLLOWS'
0590	32365	061614		LDA	TEMP+1	RETRIEVE FOLLOWING CHARACTER
0591	32366	007400	DATA2	CCB		COMMA
0592	32367	015272		JSB	SYMCK	
0593	32370	033363		DEF	COMMA=1	NEXT?
0594	32371	026037		JMP	EOST	NO, DEMAND END OF STATEMENT
0595	32372	026342		JMP	DATAS	YES
0596	32373	055266	DATA3	CPB	SIGN	SIGN FOUND? ((B) = 0)
0597	32374	002001		RSS		NO
0598	32375	115061		JSB	SERRS+15,I	YES
0599	32376	015334		JSB	GETST	DEMAND A STRING CONSTANT
0600	32377	026366		JMP	DATA2	
0601	32400	075266	DATA4	STB	SIGN	RECORD SIGN
0602	32401	015450		JSB	GETCR	
0603	32402	115061		JSB	SERRS+15,I	END-OF-INPUT CONDITION
0604	32403	026355		JMP	DATA1	

0605*

0606***

0607** <READ STATEMENT> SYNTAX **

0608***

0609*

0610	32404	015502	READS	JSB	RECRF	READ FROM FILE?
0611	32405	026413		JMP	READ1	NO
0612	32406	050367		CPA	.,+15B	YES, PSEUDO-RESTORE?
0613	32407	124524		JMP	ACCSA,I	YES
0614	32410	050722		CPA	B73	NO, '!' ?
0615	32411	026414		JMP	INPTS	YES
0616	32412	115050		JSB	SERRS+6,I	NO
0617	32413	015452	READ1	JSB	BCKSP	

```

0619*
0620***
0621** <INPUT STATEMENT> SYNTAX **
0622***
0623*
0624 32414 065574 INPTS LDB SBPTR ENABLE STRING
0625 32415 077453 STB SFLAG VARIABLE
0626 32416 015240 JSB VAROP SEEK VARIABLE OPERAND
0627 32417 115063 JSB SERRS+17,I NONE FOUND
0628 32420 000000 NOP
0629 32421 007400 CCB
0630 32422 015272 JSB SYMCK COMMA?
0631 32423 033363 DEF COMMA=1
0632 32424 026037 JMP EOST NO, DEMAND END OF STATEMENT
0633 32425 026414 JMP INPTS YES
0634*
0635***
0636** <PRINT STATEMENT> SYNTAX **
0637***
0638*
0639 32426 015270 PRINS JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0640 32427 015450 JSB GETCR FETCH NEXT CHARACTER
0641 32430 124524 JMP ACCSA,I NONE FOUND
0642 32431 015546 JSB USTCK CHECK FOR USING STATEMENT
0643 32432 026460 JMP PRN01 NONE FOUND
0644 32433 050367 CPA .+15B END OF STATEMENT?
0645 32434 124524 JMP ACCSA,I YES
0646 32435 007400 CCB NO,
0647 32436 015272 JSB SYMCK SEMI=COLON
0648 32437 033365 DEF SEMI=1 FOLLOWS?
0649 32440 115104 JSB SERRS+34,I NO
0650 32441 015270 PRN10 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0651 32442 015450 JSB GETCR FETCH NEXT CHARACTER
0652 32443 115050 JSB SERRS+6,I NONE FOUND
0653 32444 171574 STA SBPTR,I SAVE CHARACTER
0654 32445 015550 JSB PFSRH SEARCH FOR PRINT FUNCTION
0655 32446 026451 JMP PRN11 FOUND
0656 32447 077453 STB SFLAG ENABLE STRING VARIABLE
0657 32450 015230 JSB F9C LOOK FOR FORMULA
0658 32451 050367 PRN11 CPA .+15B CARRIAGE RETURN FOLLOWS?
0659 32452 124524 JMP ACCSA,I YES
0660 32453 007400 CCB NO,
0661 32454 015272 JSB SYMCK COMMA?
0662 32455 033363 DEF COMMA=1
0663 32456 115050 JSB SERRS+6,I NO, ERROR
0664 32457 026441 JMP PRN10 YES
0665 32460 015502 PRN01 JSB RECRF WRITE ONTO FILE?
0666 32461 026471 JMP PRIN0=1 NO
0667 32462 007400 CCB YES, SET
0668 32463 075504 STB FILRF 'FILE' FLAG
0669 32464 050367 CPA .+15B NULL WRITE?
0670 32465 124524 JMP ACCSA,I YES
0671 32466 050722 CPA B73 NO, ' ; ' ?
0672 32467 026472 JMP PRIN0 YES
0673 32470 115050 JSB SERRS+6,I NO

```

0674	32471	015452		JSB BCKSP	
0675	32472	015270	PRIN0	JSB SBPUD	ADVANCE SYNTAX BUFFER POINTER
0676	32473	015450		JSB GETCR	MORE STATEMENT?
0677	32474	026552		JMP PRIN7	NO
0678	32475	007400		CCB	YES, ENABLE
0679	32476	075621		STB PFLAG	FORMULA AND TAB
0680	32477	050414		CPA .+42B	" ?
0681	32500	002001		RSS	YES
0682	32501	026520		JMP PRIN3	NO
0683	32502	015334	PRIN1	JSB GETST	RECORD A STRING CONSTANT
0684	32503	050367		CPA .+15B	END OF STATEMENT?
0685	32504	124524		JMP ACCSA, I	YES
0686	32505	007400		CCB	NO
0687	32506	075621		STB PFLAG	
0688	32507	050414	PRIN2	CPA .+42B	" ?
0689	32510	026502		JMP PRIN1	YES
0690	32511	064350		LDB .-2	NO
0691	32512	015272		JSB SYMCK	COMMA OR
0692	32513	033363		DEF COMMA=1	SEMICOLON?
0693	32514	006401		CLB, RSS	NO
0694	32515	026472		JMP PRIN0	YES
0695	32516	175574		STB SBPTR, I	ZERO NEXT WORD
0696	32517	015270		JSB SBPUD	
0697	32520	035621	PRIN3	ISZ PFLAG	FORMULA OR TAB PERMITTED?
0698	32521	115050		JSB SERRS+6, I	NO
0699	32522	171574		STA SBPTR, I	YES
0700	32523	007400		CCB	'FILE'
0701	32524	035504		ISZ FILRF	MODE?
0702	32525	026536		JMP PRIN4	NO
0703	32526	075504		STB FILRF	YES, SET FLAG AGAIN
0704	32527	063451		LDA AEND	
0705	32530	015246		JSB TBSRH	'END' ?
0706	32531	026541		JMP PRIN5	NO
0707	32532	015270		JSB SBPUD	YES
0708	32533	015450		JSB GETCR	FETCH NEXT
0709	32534	124524		JMP ACCSA, I	CHARACTER
0710	32535	026507		JMP PRIN2	
0711	32536	015550	PRIN4	JSB PFSRH	SEARCH FOR PRINT FUNCTION
0712	32537	026547		JMP PRIN6	FOUND
0713	32540	026545		JMP PRIN8	NOT FOUND
0714	32541	015452	PRIN5	JSB BCKSP	BACKUP
0715	32542	007400		CCB	TO POINT
0716	32543	045574		ADB SBPTR	FOLLOWING
0717	32544	075574		STB SBPTR	LAST OPERATOR
0718	32545	077453	PRIN8	STB SFLAG	ENABLE STRING VARIABLE
0719	32546	015230		JSB FSC	RECORD FORMULA
0720	32547	050367	PRIN6	CPA .+15B	END OF STATEMENT?
0721	32550	124524		JMP ACCSA, I	YES
0722	32551	026507		JMP PRIN2	NO
0723	32552	035504	PRIN7	ISZ FILRF	'FILE' MODE?
0724	32553	124524		JMP ACCSA, I	NO
0725	32554	115044		JSB SERRS+2, I	YES

0726*


```

0002*
0003***
0004** <MAT STATEMENT> SYNTAX **
0005***
0006*
0007 32555 015256 MATS JSB LTR FIRST TWO
0008 32556 115064 JSB SERRS+18,I CHARACTERS
0009 32557 015266 JSB LETCK LETTERS?
0010 32560 026677 JMP MATS3 NO
0011 32561 035574 ISZ SBPTR YES,
0012 32562 001727 ALF,ALF RETRIEVE
0013 32563 031614 IOR TEMP+1 FIRST CHARACTER
0014 32564 171574 STA SBPTR,I LOOK
0015 32565 060357 LDA .+5 FOR
0016 32566 071402 STA MAXCR 'INPUT',
0017 32567 063443 LDA MATIO 'READ',
0018 32570 064347 LDB .-3 OR
0019 32571 015246 JSB TBSRH 'PRINT'
0020 32572 115064 JSB SERRS+18,I NONE FOUND
0021 32573 050656 CPA PRTQP IS IT 'PRINT'?
0022 32574 026621 JMP MATS2 YES
0023 32575 053741 CPA INPOP NO, 'INPUT' ?
0024 32576 026605 JMP MATS1-2 YES
0025 32577 015502 JSB RECRF NO, READ FROM FILE?
0026 32600 026604 JMP MATS1-3 NO
0027 32601 050722 CPA B73 YES, '!' ?
0028 32602 026605 JMP MATS1-2 YES
0029 32603 115050 JSB SERRS+6,I NO
0030 32604 015452 JSB BCKSP
0031 32605 002404 CLA,INA TURN ON
0032 32606 073445 STA DFLAG 'MATRIX SUBSCRIPT' MODE
0033 32607 015242 MATS1 JSB ARRID RECORD AN ARRAY
0034 32610 015232 JSB SBCK RECORD SUBSCRIPT
0035 32611 000000 NOP IF PRESENT
0036 32612 050367 CPA .+15B END OF STATEMENT?
0037 32613 124524 JMP ACCSA,I YES
0038 32614 007400 CCB NO, DEMAND
0039 32615 015272 JSB SYMCK COMMA
0040 32616 033363 DEF COMMA-1
0041 32617 115050 JSB SERRS+6,I NOT FOUND
0042 32620 026607 JMP MATS1
0043 32621 015270 MATS2 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0044 32622 015450 JSB GETCR FETCH NEXT CHARACTER
0045 32623 115050 JSB SERRS+6,I NONE FOUND
0046 32624 015546 JSB USTCK CHECK FOR USING STATEMENT
0047 32625 026652 JMP MAT13 NONE FOUND
0048 32626 050367 CPA .+15B CARRIAGE RETURN ?
0049 32627 124524 JMP ACCSA,I YES
0050 32630 007400 CCB SEMI-
0051 32631 015272 JSB SYMCK COLON
0052 32632 033365 DEF SEMI-1 FOLLOWS?
0053 32633 115104 JSB SERRS+34,I NO
0054 32634 015270 MAT12 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0055 32635 015450 JSB GETCR FETCH NEXT CHARACTER
0056 32636 115050 JSB SERRS+6,I NONE FOUND

```

0057	32637	171574		STA SBPTR,I	SAVE CHARACTER
0058	32640	015550		JSB PFSRH	SEARCH FOR PRINT FUNCTION
0059	32641	002001		RSS	FOUND
0060	32642	015242		JSB ARRID	RECORD AN ARRAY
0061	32643	050367		CPA .+15B	CARRIAGE RETURN FOLLOWS?
0062	32644	124524		JMP ACCSA,I	YES
0063	32645	007400		CCB	NO,
0064	32646	015272		JSB SYMCK	COMMA?
0065	32647	033363		DEF COMMA=1	
0066	32650	115050		JSB SERRS+6,I	NO, ERROR
0067	32651	026634		JMP MAT12	YES
0068	32652	015502	MAT13	JSB RECRF	WRITE ON FILE?
0069	32653	026671		JMP MAT11	NO
0070	32654	050722		CPA B73	YES, ';' ?
0071	32655	007401		CCB,RSS	YES
0072	32656	115050		JSB SERRS+6,I	NO
0073	32657	075504		STB FILRF	NOTE 'FILE' MODE
0074	32660	015242	MAT10	JSB ARRID	RECORD AN ARRAY
0075	32661	050367		CPA .+15B	END OF STATEMENT?
0076	32662	124524		JMP ACCSA,I	YES
0077	32663	064350		LDB .-2	NO, DEMAND
0078	32664	015272		JSB SYMCK	COMMA OR
0079	32665	033363		DEF COMMA=1	SEMICOLON
0080	32666	115050		JSB SERRS+6,I	NOT FOUND
0081	32667	015450		JSB GETCR	END OF STATEMENT?
0082	32670	026673		JMP ++3	YES
0083	32671	015452	MAT11	JSB BCKSP	NO
0084	32672	026660		JMP MAT10	
0085	32673	015270		JSB SBPUO	UPDATE POINTER
0086	32674	035504		ISZ FILRF	'FILE' MODE?
0087	32675	124524		JMP ACCSA,I	NO
0088	32676	115044		JSB SERRS+2,I	YES
0089	32677	065574	MATS3	LDB SBPTR	SAVE ADDRESS
0090	32700	077457		STB ARYAD	OF ARRAY OPERAND
0091	32701	061614		LDA TEMP+1	RECORD
0092	32702	171517		STA SSTAK,I	AND SAVE
0093	32703	064430		LDB .+46	THE ARRAY
0094	32704	015260		JSB STROP	IDENTIFIER
0095	32705	061615		LDA TEMP+2	RETRIEVE
0096	32706	007400		CCB	NEXT CHARACTER
0097	32707	015272		JSB SYMCK	AND TEST FOR
0098	32710	033415		DEF ASSOP=1	ASSIGNMENT OPERATOR
0099	32711	115045		JSB SERRS+3,I	NOT FOUND
0100	32712	015256		JSB LTR	LETTER NEXT?
0101	32713	026763		JMP MATS5	NO
0102	32714	015266		JSB LETCK	YES, ANOTHER LETTER?
0103	32715	026773		JMP MATS6	NO
0104	32716	035574		ISZ SBPTR	YES,
0105	32717	001727		ALF,ALF	CONCATENATE
0106	32720	031614		IOR TEMP+1	LETTERS
0107	32721	171574		STA SBPTR,I	AND
0108	32722	063442		LDA MATFN	SEARCH FOR
0109	32723	064345		LDB .-5	AN ARRAY
0110	32724	015246		JSB TBSRH	FUNCTION
0111	32725	115051		JSB SERRS+7,I	NONE FOUND

0112	32726	001727	ALF,ALF	FOUND,
0113	32727	001723	ALF,RAR	CONVERT
0114	32730	030672	IOR PDFFL	TO OPERAND
0115	32731	007400	CCB	COMBINE
0116	32732	045574	ADB SBPTR	WITH
0117	32733	130001	IOR 1,I	OPERATOR
0118	32734	170001	STA 1,I	AND RECORD
0119	32735	010502	AND B777	'INV'
0120	32736	043744	ADA D577	OR
0121	32737	002021	SSA,RSS	'TRN' ?
0122	32740	026750	JMP MATS4	YES
0123	32741	015450	JSB GETCR	NO, END OF STATEMENT?
0124	32742	124524	JMP ACCSA,I	YES
0125	32743	006404	CLB,INB	NO, TURN ON
0126	32744	077445	STB DFLAG	'MATRIX SUBSCRIPT' MODE
0127	32745	015232	JSB SB8CK	DEMAND SUBSCRIPT
0128	32746	115047	JSB SERRS+5,I	NONE FOUND
0129	32747	026037	JMP EOST	DEMAND END OF STATEMENT
0130	32750	002003	MATS4 SZA,RSS	ALLOW INVERSION
0131	32751	171617	STA SSTAK,I	INTO SELF
0132	32752	015450	JSB GETCR	DEMAND
0133	32753	115070	JSB SERRS+22,I	LEFT
0134	32754	015252	JSB LPCK	PARENTHESIS
0135	32755	015242	JSB ARRID	DEMAND ARRAY
0136	32756	015254	JSB RPCK	DEMAND RIGHT PARENTHESIS
0137	32757	065614	LDB TEMP+1	SAME SOURCE AND
0138	32760	155617	CPB SSTAK,I	DESTINATION ARRAYS?
0139	32761	115065	JSB SERRS+19,I	YES
0140	32762	026037	JMP EOST	NO, DEMAND END OF STATEMENT
0141	32763	015452	MATS5 JSB BCK9P	BACK UP AND
0142	32764	015250	JSB GETPF	DEMAND PARENTHESIZED FORMULA
0143	32765	007400	CCB	SEEK
0144	32766	015272	JSB SYMCK	
0145	32767	033423	DEF TIMES=1	'+'
0146	32770	115066	JSB SERRS+20,I	NOT FOUND
0147	32771	015242	JSB ARRID	DEMAND ARRAY
0148	32772	026037	JMP EOST	DEMAND END OF STATEMENT
0149	32773	061614	MATS6 LDA TEMP+1	RECORD
0150	32774	064430	LDB .+46	ARRAY
0151	32775	015260	JSB STROP	OPERAND
0152	32776	061615	LDA TEMP+2	END OF
0153	32777	050367	CPA .+15B	STATEMENT?
0154	33000	124524	JMP ACCSA,I	YES
0155	33001	064347	LDB .-3	NO, SEEK
0156	33002	015272	JSB SYMCK	'+', '=',
0157	33003	033417	DEF PLUS=1	OR '+'
0158	33004	115067	JSB SERRS+21,I	NOT FOUND
0159	33005	006400	CLB	SET '+' FLAG TO FALSE
0160	33006	050632	CPA MULOP	'+' ?
0161	33007	027022	JMP MATS9	YES
0162	33010	075621	MATS7 STB PFLAG	NO
0163	33011	015242	JSB ARRID	DEMAND ARRAY
0164	33012	071615	STA TEMP+2	SAVE CHARACTER
0165	33013	035621	ISZ PFLAG	'+' ?
0166	33014	027020	JMP MATS8	NO

0167	33015	061614		LDA TEMP+1	YES, DOES ARRAY
0168	33016	151617		CPA SSTAK,I	MATCH LEFT-HAND SIDE?
0169	33017	115065		JSB SERRS+19,I	YES
0170	33020	061615	MATS8	LDA TEMP+2	NO, RETRIEVE CHARACTER
0171	33021	026037		JMP EOST	DEMAND END OF STATEMENT
0172	33022	007400	MATS9	CCB	SET '*' FLAG TO TRUE
0173	33023	061614		LDA TEMP+1	DOES ARRAY
0174	33024	151617		CPA SSTAK,I	MATCH LEFT-HAND SIDE?
0175	33025	115065		JSB SERRS+19,I	
0176	33026	027010		JMP MATS7	NO

```

0178*
0179***
0180** <FORMULA> SYNTAX CHECKER **
0181***
0182*
0183*
0184* FSC ANALYZES THE INPUT STRING UNDER THE ASSUMPTION
0185* THAT A LEGITIMATE FORMULA IS THERE. EXIT TO ERROR ON
0186* UNRECOGNIZABLE OR OBVIOUSLY INCORRECT INPUT. EXIT TO
0187* (P+1) WHEN CONTINUED INPUT CANNOT BE A PART OF THE
0188* FORMULA AND THE INPUT SCANNED SO FAR FORMS A COMPLETE
0189* FORMULA IN ITSELF (I.E., ... A+B TO .., EXITS AFTER
0190* THE 'B'). ON EXIT (A) HOLDS THE FIRST CHARACTER NOT
0191* PARSED INTO THE FORMULA, (B) = 0, AND SBPTR,I = 0
0192* (END-OF-FORMULA OPERATOR). DURING THE FORMULA PARSE,
0193* SSTAK,I HOLDS THE COUNT OF UNMATCHED LEFT PARENTHESES.
0194* IF THE FIRST SYMBOL ENCOUNTERED IS A STRING VARIABLE,
0195* EXIT TO ERROR IF IT IS NOT ENABLED ELSE RECORD THE
0196* VARIABLE AND ANY FOLLOWING SUBSCRIPT AND EXIT TO (P+1)
0197* WITH THE NEXT CHARACTER IN (A), (B) = -1, AND SFLAG = -1.
0198*
0199 33027 002400 #FSC CLA SET LEFT PARENTHESIS
0200 33030 171617 STA SSTAK,I COUNT TO ZERO
0201 33031 060355 LDA .+3 SET MULTICHARACTER SEARCH
0202 33032 071402 STA MAXCR TO MAXIMUM OF 3 CHARACTERS
0203 33033 003400 FSC1 CCA ENABLE
0204 33034 073455 STA UFLAG UNARY OPERATORS
0205*
0206** LOOK FOR AN OPERAND **
0207*
0208 33035 015240 FSC2 JSB VAROP SEEK VARIABLE OPERAND
0209 33036 027142 JMP FSC7 FIRST CHARACTER NOT A LETTER
0210 33037 027242 JMP FSC13-3 SUBSCRIPTED OR STRING VARIABLE
0211 33040 015266 JSB LETCK SIMPLE VARIABLE. LETTER NEXT?
0212 33041 027245 JMP FSC13 NO
0213*
0214** DOES 'AND', 'OR', 'MAX', OR 'MIN' FOLLOW **
0215** A SIMPLE VARIABLE? **
0216*
0217 33042 064346 LDB .+4
0218 33043 171674 STA SBPTR,I SEARCH FOR
0219 33044 060470 LDA MCBOP 'AND', 'OR',
0220 33045 015246 JSB TBSRH 'MAX', AND 'MIN'
0221 33046 002001 RSS NONE FOUND
0222 33047 027137 JMP FSC6 FOUND
0223*
0224** SEE IF OPERAND IS A FUNCTION RATHER **
0225** THAN A SIMPLE VARIABLE. **
0226*
0227 33050 061615 LDA TEMP+2
0228 33051 001727 ALF,ALF WERE
0229 33052 031614 IOR TEMP+1 TWO LETTERS
0230 33053 053375 CPA FN 'FN' ?
0231 33054 027104 JMP FSC4 YES
0232 33055 171574 STA SBPTR,I NO,

```

0233	33056	060754		LDA PDFNS	PREDEFINED
0234	33057	064333		LDB ,=15	
0235	33060	015246		JSB TBSRH	
0236	33061	027202		JMP FSC11	NO
0237	33062	001727		ALF,ALF	YES,
0238	33063	001723		ALF,RAR	BUILD
0239	33064	030672		IOR PDFFL	NAME
0240	33065	071614	FSC3	STA TEMP+1	SAVE FUNCTION
0241	33066	007400		CCB	RETRIEVE
0242	33067	045574		ADB SBPTR	PREVIOUS
0243	33070	075574		STB SBPTR	OPERATOR=
0244	33071	160001		LDA 1,I	OPERAND
0245	33072	010664		AND OPMSK	REPLACE
0246	33073	031614		IOR TEMP+1	OPERAND
0247	33074	171574		STA SBPTR,I	WITH FUNCTION
0248	33075	061614		LDA TEMP+1	
0249	33076	053737		CPA LENCN	'LEN' ?
0250	33077	027114		JMP FSC0	YES
0251	33100	064341		LDB ,=9	NO, TURN OFF
0252	33101	077447		STB MSFLG	'MULTIPLE STORE' MODE
0253	33102	015250		JSB GETPF	DEMAND PARENTHSIZED
0254	33103	027245		JMP FSC13	FORMULA
0255	33104	015450	FSC4	JSB GETCR	DOES
0256	33105	115051		JSB SERRS+7,I	LETTER
0257	33106	015266		JSB LETCK	FOLLOW?
0258	33107	115051		JSB SERRS+7,I	NO
0259	33110	040610		ADA D100	YES,
0260	33111	001700		ALF	BUILD
0261	33112	040371		ADA ,+17B	FUNCTION
0262	33113	027065		JMP FSC3	NAME
0263	33114	035574	FSC0	ISZ SBPTR	MOVE TO CORRECT PROGRAM WORD
0264	33115	015450		JSB GETCR	RECORD
0265	33116	115070		JSB SERRS+22,I	LEFT
0266	33117	015252		JSB LPCK	PARENTHESIS
0267	33120	015256		JSB LTR	LETTER NEXT?
0268	33121	115072		JSB SERRS+24,I	NO
0269	33122	050416		CPA ,+44B	YES, FOLLOWED BY 'S' ?
0270	33123	002001		RSS	YES
0271	33124	115072		JSB SERRS+24,I	NO
0272	33125	061614		LDA TEMP+1	RECORD
0273	33126	064425		LDB ,+53B	STRING
0274	33127	015260		JSB STROP	VARIABLE
0275	33130	015450		JSB GETCR	RECORD
0276	33131	115071		JSB SERRS+23,I	RIGHT
0277	33132	015254		JSB RPCK	PARENTHESIS
0278	33133	027162		JMP FSC8	
0279*					*
0280**				CHECK FOR LEFT PARENTHESIS	**
0281*					*
0282	33134	060624	FSC5	LDA LPOP	RECORD
0283	33135	171574		STA SBPTR,I	A '(
0284	33136	135617		ISZ SSTAK,I	COUNT IT
0285	33137	064341	FSC6	LDB ,=9	TURN OFF
0286	33140	077447		STB MSFLG	'MULTIPLE STORE'
0287	33141	027033		JMP FSC1	MODE

0288	33142	015270	FSC7	JSB	SBPUD	UPDATE POINTER
0289	33143	050422		CPA	.,+40	'(' ?
0290	33144	027134		JMP	FSC5	YES
0291	33145	053745		CPA	B133	NO, '(' ?
0292	33146	027134		JMP	FSC5	YES
0293*						
0294**	CHECK FOR A NUMBER					**
0295*						
0296	33147	006400		CLB		SET '+'
0297	33150	075266		STB	SIGN	AS SIGN
0298	33151	015276		JSB	NUMCK	SEEK A NUMBER
0299	33152	027165		JMP	FSC9	NOT FOUND
0300	33153	115060		JSB	SERRS+14,I	BAD EXPONENT
0301	33154	065574		LDB	SBPTR	RETRIEVE
0302	33155	044347		ADB	.-3	PRECEDING
0303	33156	160001		LDA	1,I	OPERATOR
0304	33157	031036		IOR	FLGBT	SET FLAG TO SAY
0305	33160	170001		STA	1,I	NUMBER FOLLOWS
0306	33161	061614		LDA	TEMP+1	RETRIEVE CHARACTER
0307	33162	064341	FSC8	LDB	.-9	TURN OFF
0308	33163	077447		STB	MSFLG	'MULTIPLE STORE'
0309	33164	027245		JMP	FSC13	MODE
0310*						
0311**	CHECK FOR A UNARY OPERATOR					**
0312*						
0313	33165	037455	FSC9	ISZ	UFLAG	UNARY OPERATORS PERMITTED?
0314	33166	115073		JSB	SERRS+25,I	NO
0315	33167	067372		LDB	UNMNC	YES LOAD UNARY MINUS OPCODE
0316	33170	050425		CPA	.,+43	'+' ?
0317	33171	027175		JMP	++4	YES
0318	33172	050427		CPA	.,+45	NO, '- ' ?
0319	33173	027176		JMP	++3	YES
0320	33174	115073		JSB	SERRS+25,I	NO
0321	33175	067373		LDB	UNPLC	CONVERT (B) TO UNARY '+' OPCODE
0322	33176	175574		STB	SBPTR,I	RECORD UNARY OPERATOR
0323	33177	064341	FSC10	LDB	.-9	TURN OFF
0324	33200	077447		STB	MSFLG	'MULTIPLE STORE'
0325	33201	027035		JMP	FSC2	MODE
0326*						
0327**	CHECK POSSIBILITY OF 'NOT' RATHER THAN					**
0328**	A SIMPLE VARIABLE					**
0329*						
0330	33202	037455	FSC11	ISZ	UFLAG	'NOT' PERMITTED?
0331	33203	027276		JMP	FSC14-1	NO
0332	33204	161574		LDA	SBPTR,I	YES
0333	33205	001727		ALF	ALF	
0334	33206	171574		STA	SBPTR,I	
0335	33207	060474		LDA	ANUT	SEEK
0336	33210	007400		CCB		
0337	33211	015246		JSB	TBSRH	'NOT'
0338	33212	027276		JMP	FSC14-1	'NOT' NOT FOUND
0339	33213	171574		STA	SBPTR,I	FOUND
0340	33214	007400		CCB		ERASE
0341	33215	045574		ADB	SBPTR	
0342	33216	160001		LDA	1,I	SPURIOUS

0343	33217	010664	AND	OPMSK	
0344	33220	170001	STA	1,I	OPERAND
0345	33221	027177	JMP	FSC10	
0346*					*
0347**	CHECK FOR RIGHT PARENTHESIS				**
0348*					*
0349	33222	064350	FSC12	LDB	.-2
0350	33223	015272	JSB	SYMCK	OR
0351	33224	033377	DEF	RPARN=1	')' ?
0352	33225	027277	JMP	FSC14	NO
0353	33226	060616	LDA	RPOP	YES,
0354	33227	171574	STA	SBPTR,I	RECORD ')
0355	33230	060423	LDA	.-41	RETRIEVE ')
0356	33231	007400	CCB		MATCHING
0357	33232	145617	ADB	SSTAK,I	LEFT
0358	33233	006020	SSB		PARENTHESIS?
0359	33234	027277	JMP	FSC14	NO
0360	33235	175617	STB	SSTAK,I	YES
0361	33236	015270	JSB	SBPUD	UPDATE POINTER
0362	33237	015450	JSB	GETCR	FETCH NEXT
0363	33240	027277	JMP	FSC14	CHARACTER
0364	33241	027245	JMP	FSC13	
0365*					*
0366**	CHECK FOR A BINARY OPERATOR				**
0367*					*
0368	33242	007400	CCB		STRING VARIABLE
0369	33243	057453	CPB	SFLAG	JUST FOUND?
0370	33244	125230	JMP	FSC,I	YES
0371	33245	050367	FSC13	CPA	.-15B
0372	33246	027277	JMP	FSC14	NO, END OF STATEMENT?
0373	33247	073455	STA	UFLAG	YES
0374	33250	071614	STA	TEMP+1	NO, DISABLE UNARY OPERATORS
0375	33251	064343	LDB	.-7	SAVE CHARACTER
0376	33252	171574	STA	SBPTR,I	SEARCH
0377	33253	060470	LDA	MCBOP	FOR A
0378	33254	015246	JSB	TBSRH	MULTICHARACTER
0379	33255	002001	RSS		BINARY OPERATOR
0380	33256	027137	JMP	FSC6	NONE FOUND
0381	33257	061614	LDA	TEMP+1	FOUND
0382	33260	067447	LDB	MSFLG	NO, RECOVER A CHARACTER
0383	33261	015272	JSB	SYMCK	SINGLE
0384	33262	033417	DEF	PLUS=1	CHARACTER
0385	33263	027267	JMP	++4	BINARY OPERATOR?
0386	33264	053742	CPA	EXPUP	NO
0387	33265	027177	JMP	FSC10	YES, '!' ?
0388	33266	027137	JMP	FSC6	YES
0389	33267	007400	CCB		NO
0390	33270	015272	JSB	SYMCK	ASSIGNMENT
0391	33271	033415	DEF	ASSOP=1	OPERATOR?
0392	33272	027222	JMP	FSC12	NO
0393	33273	060350	LDA	.-2	YES, SET FLAG
0394	33274	073453	STA	SFLAG	TO SAY
0395	33275	027033	JMP	FSC1	STORE OCCURRED


```

0397*
0398** END OF FORMULA **
0399*
0400 33276 061615 LDA TEMP+2 RETRIEVE CHARACTER
0401 33277 006400 FSC14 CLB RECORD
0402 33300 175574 STB SBPTR,I END-OF-FORMULA
0403 33301 155617 CPB SSTAK,I ALL LEFT PARENTHESES MATCHED?
0404 33302 125230 JMP FSC,I YES
0405 33303 115071 JSB SERRS+23,I NO
0406**
0407*** SAVE LOCAL VARIABLES OF FSC ***
0408**
0409*
0410* SAVING MSFLG, UFLAG, VAROP, GETPF, AND FSC MAKES FSC A
0411* RE-ENTRANT SUBROUTINE. THEY ARE SAVED ON THE SYNTAX
0412* STACK BELOW THE ACTIVE SYNTAX BUFFER, ON ENTRY (B)
0413* CONTAINS THE NUMBER OF WORDS TO BE SAVED.
0414*
0415 33304 035617 #FRCR ISZ SSTAK SAVE PREVIOUS '(' COUNT
0416 33305 045617 ADB SSTAK SUFFICIENT
0417 33306 007000 CMB USER
0418 33307 044462 ADB LWAUS SPACE
0419 33310 006020 SSB LEFT?
0420 33311 115042 JSB SERRS,I NO
0421 33312 067447 LDB MSFLG YES, SAVE
0422 33313 175617 STB SSTAK,I 'MULTIPLE STORE'
0423 33314 035617 ISZ SSTAK FLAG
0424 33315 067455 LDB UFLAG SAVE
0425 33316 175617 STB SSTAK,I 'UNARY OPERATOR'
0426 33317 035617 ISZ SSTAK FLAG
0427 33320 065240 LDB VAROP SAVE
0428 33321 175617 STB SSTAK,I VAROP
0429 33322 035617 ISZ SSTAK RETURN ADDRESS
0430 33323 065250 LDB GETPF SAVE
0431 33324 175617 STB SSTAK,I GETPF
0432 33325 035617 ISZ SSTAK RETURN ADDRESS
0433 33326 065230 LDB FSC SAVE
0434 33327 175617 STB SSTAK,I FSC
0435 33330 035617 ISZ SSTAK RETURN ADDRESS
0436 33331 003400 CCA DISABLE
0437 33332 043453 ADA SFLAG SFLAG
0438 33333 073453 STA SFLAG VALUE
0439 33334 125234 JMP FRCUR,I
0440**
0441*** RESTORE FSC LOCAL VARIABLES ***
0442**
0443*
0444* INVERSE OF FRCUR. (A) IS SAVED BUT (B) IS NOT.
0445*
0446 33335 071614 #FPOP STA TEMP+1 SAVE (A)
0447 33336 065617 LDB SSTAK RESET
0448 33337 044344 ADB .-6 SYNTAX STACK
0449 33340 075617 STB SSTAK POINTER
0450 33341 006004 INB RESTORE
0451 33342 160001 LDA 1,I 'MULTIPLE STORE'

```

0452	33343	073447	STA MSFLG	FLAG
0453	33344	006004	INB	RESTORE
0454	33345	160001	LDA 1,I	'UNARY OPERATOR'
0455	33346	073455	STA UFLAG	FLAG
0456	33347	006004	INB	RESTORE
0457	33350	160001	LDA 1,I	VAROP
0458	33351	071240	STA VAROP	RETURN ADDRESS
0459	33352	006004	INB	
0460	33353	104200	DLD 1,I	RESTORE GETPF
	33354	100001		
0461	33355	071250	STA GETPF	RETURN ADDRESS AND
0462	33356	075230	STB FSC	FSC RETURN ADDRESS
0463	33357	037453	ISZ SFLAG	RESTORE SFLAG VALUE
0464	33360	061614	LDA TEMP+1	RESTORE (A)
0465	33361	125236	JMP FPOP,I	

0467**
 0468*** SINGLE CHARACTER AND/OR FORMULA OPERATORS ***
 0469**

0470*
 0471* BITS 15-9 OF THE OCTAL WORD ARE THE OPERATOR CODE.
 0472* BITS 3-0 ARE THE PRECEDENCE FOR FORMULA OPERATORS.
 0473* THE ASCII WORD IS USED TO RECOGNIZE THE OPERATOR ON
 0474* INPUT AND TO PROVIDE THE PRINT NAME ON OUTPUT. THE
 0475* ORDERING OF THE TABLE FACILITATES SEARCHING.

0476*				
0477	33362	001000	QUOTE OCT 1000	STRING DELIMITER
0478	33363	021040	ASC 1,"	
0479	33364	002000	COMMA OCT 2000	COMMA
0480	33365	026040	ASC 1,,	
0481	33366	003000	SEMI OCT 3000	SEMICOLON
0482	33367	035440	ASC 1,;	
0483	33370	004000	HATCH OCT 4000	HATCH SIGN
0484	33371	021440	ASC 1,#	
0485	33372	015000	UNMNC OCT 15000	
0486	33373	014000	UNPLC OCT 14000	
0487	33374	011000	RBOP OCT 11000	
0488	33375	047106	FN ASC 1,NF	
0489	33376	052117	TO ASC 1,TO	
0490	33377	047506	OF ASC 1,OF	
0491	33400	010001	RPARN OCT 10001	RIGHT PARENTHESIS
0492	33401	024440	ASC 1,)	
0493	33402	011001	OCT 11001	RIGHT BRACKET
0494	33403	056440	ASC 1,]	
0495	33404	012013	LBRAC OCT 12013	LEFT BRACKET
0496	33405	055440	ASC 1,[
0497	33406	013013	OCT 13013	LEFT PARENTHESIS
0498	33407	024040	ASC 1,(
0499	33410	014011	OCT 14011	UNARY PLUS
0500	33411	025440	ASC 1,+	
0501	33412	015011	OCT 15011	UNARY MINUS
0502	33413	026440	ASC 1,=	
0503	33414	016002	SCMMA OCT 16002	SUBSCRIPT SEPARATOR
0504	33415	026040	ASC 1,,	

0505	33416	017002	ASSOP	OCT	17002	ASSIGNMENT OPERATOR
0506	33417	036440		ASC	1,=	
0507	33420	020007	PLUS	OCT	20007	ADDITION
0508	33421	025440		ASC	1,+	
0509	33422	021007		OCT	21007	SUBTRACTION
0510	33423	026440		ASC	1,-	
0511	33424	022010	TIMES	OCT	22010	MULTIPLICATION
0512	33425	025040		ASC	1,*	
0513	33426	023010		OCT	23010	DIVISION
0514	33427	027440		ASC	1,/	
0515	33430	024012		OCT	24012	EXPONENTIATION
0516	33431	057040		ASC	1,↑	
0517	33432	025005	RELOS	OCT	25005	GREATER THAN
0518	33433	037040		ASC	1,>	
0519	33434	026005		OCT	26005	LESS THAN
0520	33435	036040		ASC	1,<	
0521	33436	027005		OCT	27005	UNEQUAL
0522	33437	021440		ASC	1,#	
0523	33440	030005		OCT	30005	EQUAL
0524	33441	036440		ASC	1,=	
0525	33442	053572	MATFN	DEF	MATFS	
0526	33443	053431	MATIO	DEF	IOSTS	
0527	33444	032004		OCT	32004	AND
0528	33445	000000	DFLAG	NOP		
0529	33446	033003		OCT	33003	OR
0530	33447	000000	MSFLG	NOP		
0531	33450	034006		OCT	34006	MINIMUM
0532	33451	053420	AEND	DEF	EOFOP	
0533	33452	035006		OCT	35006	MAXIMUM
0534	33453	000000	SFLAG	NOP		
0535	33454	036005		OCT	36005	UNEQUAL
0536	33455	000000	UFLAG	NOP		
0537	33456	037005		OCT	37005	GREATER THAN OR EQUAL
0538	33457	000000	ARYAD	NOP		
0539	33460	040005		OCT	40005	LESS THAN OR EQUAL
0540	33461	053501	ASTEP	DEF	STEP	
0541	33462	041011		OCT	41011	NOT

```

0003**
0004*** SUBSCRIPT SYNTAX ***
0005**
0006*
0007* SBSCK ASSUMES A PRIOR ARRAY OPERAND REFERENCED THROUGH
0008* THE POINTER ARYAD. ENTRY IS MADE WITH A CHARACTER IN
0009* (A); EXIT TO (P+1) IF THIS CHARACTER IS NOT '(' OR '[',
0010* OTHERWISE ANALYZE THE SUBSCRIPT WHICH MUST FOLLOW,
0011* EXITING TO (P+2). SBSCK HANDLES BOTH SINGLE AND DOUBLE
0012* SUBSCRIPTS. IF DFLAG=0 THE SUBSCRIPT IS FROM A
0013* <DIM STATEMENT> AND THE BOUNDS MUST BE POSITIVE
0014* INTEGERS. IF DFLAG=1 THE SUBSCRIPT RE-DIMENSIONS A
0015* MATRIX AND A COMMA SEPARATES THE TWO BOUNDS OF A
0016* DOUBLE SUBSCRIPT AND AN END-OF-FORMULA OPERATOR
0017* FOLLOWS THE LAST BOUND. OTHERWISE A 'SUBSCRIPT'
0018* COMMA SEPARATES THE TWO PARTS OF A DOUBLE SUBSCRIPT
0019* AND NO END-OF-FORMULA OPERATOR APPEARS. IN ALL CASES,
0020* THE ARRAY OPERAND IS MARKED AS ONE- OR TWO-DIMENSIONAL.
0021* IF THE SUBSCRIPT BELONGS TO A STRING VARIABLE IN A
0022* <DIM STATEMENT>, IT MUST HAVE ONE AND ONLY ONE BOUND
0023* CONSISTING OF A POSITIVE INTEGER NOT LARGER THAN 72.
0024* IN THIS CASE ARYAD HOLDS A DUMMY POINTER SINCE STRING
0025* VARIABLES ARE NOT MARKED WITH DIMENSIONALITY.
0026*
0027 33463 064350 #SBSCK LDB ,=2 '('
0028 33464 015272 JSB SYMCK OR
0029 33465 033403 DEF LBRAC=1 '[' ?
0030 33466 125232 JMP SBSCK,I NO, RETURN TO (P+1)
0031 33467 035232 ISZ SBSCK YES, SET RETURN TO (P+2)
0032 33470 163457 LDA ARYAD,I SET
0033 33471 040350 ADA ,=2 ARRAY TO
0034 33472 173457 STA ARYAD,I SINGLE DIMENSION
0035 33473 060622 LDA LBOP RECORD
0036 33474 171574 STA SBPTR,I '['
0037 33475 037445 ISZ DFLAG BUMP MAGIC FLAG
0038 33476 006404 CLB,INB DIM
0039 33477 057445 CPB DFLAG STATEMENT?
0040 33500 027574 JMP SBSC5 YES
0041 33501 064361 LDB ,+7 NO, SAVE FSC
0042 33502 015234 JSB FRCUR LOCAL VARIABLES
0043 33503 065232 LDB SBSCK SAVE
0044 33504 175617 STB SSTAK,I RETURN
0045 33505 035617 ISZ SSTAK ADDRESS
0046 33506 067457 LDB ARYAD SAVE ARRAY
0047 33507 175617 STB SSTAK,I REFERENCE
0048 33510 035617 ISZ SSTAK RESERVE SPACE FOR '(' COUNT
0049 33511 060341 LDA ,=9 TURN OFF 'STORE
0050 33512 073447 STA MSFLG ALLOWED' MODE
0051 33513 015230 JSB FSC DEMAND SUBSCRIPT
0052 33514 007400 CCB RESTORE
0053 33515 045617 ADB SSTAK
0054 33516 075617 STB SSTAK ARRAY
0055 33517 164001 LDB 1,I
0056 33520 077457 STB ARYAD REFERENCE
0057 33521 067445 LDB DFLAG 'MATRIX SUBSCRIPT'

```

0058	33522	054354	CPB	.,+2	MODE?	
0059	33523	027567	JMP	SBSC4	YES	
0060	33524	007400	SBSC1	CCB	NO, SEEK	
0061	33525	015272	JSB	SYMCK	'SUBSCRIPT'	
0062	33526	033413	DEF	SCMMA-1	COMMA	
0063	33527	027537	JMP	SBSC3+1	NONE FOUND	
0064	33530	137457	ISZ	ARYAD,I	SET ARRAY AS DOUBLY-SUBSCRIPTED	
0065	33531	006404	CLB,	INB	DIM	
0066	33532	057445	CPB	DFLAG	STATEMENT?	
0067	33533	027536	JMP	SBSC3	YES	
0068	33534	015230	JSB	FSC	NO, DEMAND SECOND SUBSCRIPT	
0069	33535	002001	RSS			
0070	33536	015244	SBSC3	JSB	PRGIN	DEMAND SECOND BOUND
0071	33537	007400	CCB		RESTORE	
0072	33540	047445	ADB	DFLAG	ORIGINAL	
0073	33541	077445	STB	DFLAG	DFLAG VALUE	
0074	33542	054353	CPB	.,+1	'MATRIX SUBSCRIPT' MODE?	
0075	33543	015270	JSB	SBPUD	YES	
0076	33544	064350	LDB	.-2	DEMAND	
0077	33545	015272	JSB	SYMCK	' ' OR	
0078	33546	033377	DEF	RPARN-1	' '	
0079	33547	115071	JSB	SERRS+23,I	NOT FOUND	
0080	33550	063374	LDA	RBOP	RECORD	
0081	33551	171574	STA	SBPTR,I	' '	
0082	33552	015270	JSB	SBPUD	UPDATE POINTER	
0083	33553	015450	JSB	GETCR	FETCH NEXT	
0084	33554	000000	NOP		CHARACTER	
0085	33555	006400	CLB		DIM	
0086	33556	057445	CPB	DFLAG	STATEMENT?	
0087	33557	125232	JMP	SBSCK,I	YES	
0088	33560	007400	CCB		NO,	
0089	33561	045617	ADB	SSTAK	RESTORE	
0090	33562	075617	STB	SSTAK	THE	
0091	33563	165617	LDB	SSTAK,I	RETURN	
0092	33564	075232	STB	SBSCK	ADDRESS	
0093	33565	015236	JSB	FPOP	RESTORE FSC	
0094	33566	125232	JMP	SBSCK,I	LOCAL VARIABLES	
0095	33567	007400	SBSC4	CCB		
0096	33570	015272	JSB	SYMCK	COMMA?	
0097	33571	033363	DEF	COMMA-1		
0098	33572	027537	JMP	SBSC3+1	NO	
0099	33573	027530	JMP	SBSC1+4	YES	
0100	33574	015244	SBSC5	JSB	PRGIN	DEMAND DECLARED BOUND
0101	33575	037463	ISZ	SFLAG	STRING VARIABLE?	
0102	33576	027524	JMP	SBSC1	NO	
0103	33577	044752	ADB	M73	YES, DOES BOUND	
0104	33600	006021	SSB,	RSS	EXCEED 72?	
0105	33601	115100	JSB	SERRS+30,I	YES	
0106	33602	027537	JMP	SBSC3+1	NO	

```

0108**
0109*** RECORD ARRAY IDENTIFIER ***
0110**
0111*
0112* ARRAY IDENTIFIER LEFT IN TEMP+1, ARRAY OPERAND ADDRESS
0113* PUT IN ARYAD. EXIT WITH FOLLOWING CHARACTER IN TEMP+2
0114* AND IN (A).
0115*
0116 33603 015256 #ARID JSB LTR          FETCH IDENTIFIER
0117 33604 115074          JSB SERRS+26,I  NONE FOUND
0118 33605 065242          LDB ARRID      SET
0119 33606 075339          STB STRID      EXIT
0120**
0121*** RECORD STRING IDENTIFIER ***
0122**
0123*
0124* STRING IDENTIFIER LEFT IN TEMP+1, SFLAG SET TO -1.
0125* EXIT WITH FOLLOWING CHARACTER IN (A). EXIT TO ERROR
0126* IF A STRING VARIABLE IS NOT PERMITTED IN THIS CONTEXT.
0127*
0128 33607 050416 #STRI CPA .+44B      'S' ?
0129 33610 027620          JMP STRI1      YES
0130 33611 061574          LDA SBPTR      NO, SET POINTER TO
0131 33612 073457          STA ARYAD      VARIABLE LOCATION
0132 33613 061614          LDA TEMP+1    RECORD
0133 33614 064430          LDB .+56B     ARRAY
0134 33615 015260          JSB STROP     VARIABLE
0135 33616 061615          LDA TEMP+2    RETRIEVE FOLLOWING
0136 33617 125330          JMP STRID,I   CHARACTER
0137 33620 063453 STRI1 LDA SFLAG    STRING VARIABLE
0138 33621 051574          CPA SBPTR     PERMITTED?
0139 33622 003401          CCA,RSS      YES
0140 33623 115075          JSB SERRS+27,I NO
0141 33624 073453          STA SFLAG     SET FLAG TO 'STRING OCCURRED'
0142 33625 061614          LDA TEMP+1    RECORD
0143 33626 064425          LDB .+53B     STRING
0144 33627 015260          JSB STROP     VARIABLE
0145 33630 061617          LDA SSTAK     SET POINTER TO DUMMY
0146 33631 073457          STA ARYAD     VARIABLE LOCATION
0147 33632 015450          JSB GETCR     FETCH
0148 33633 000000          NOP          NEXT
0149 33634 125330          JMP STRID,I   CHARACTER
0150**
0151*** RECORD A STRING OPERAND ***
0152**
0153*
0154* DEMAND A STRING VARIABLE OR A STRING CONSTANT. EXIT
0155* TO ERROR IF NEITHER IS FOUND, ELSE EXIT WITH THE NEXT
0156* CHARACTER IN (A).
0157*
0158 33635 061574 #RSTO LDA SBPTR     SEEK
0159 33636 073453          STA SFLAG     STRING
0160 33637 015240          JSB VAROP     OPERAND
0161 33640 027644          JMP RSTO1     1ST CHARACTER NOT A LETTER
0162 33641 037453          ISZ SFLAG    STRING VARIABLE?

```

```

0163 33642 115076      JSB SERRS+28,I  NO
0164 33643 125332      JMP RSTOP,I     YES
0165 33644 015270      RST01 JSB SBPUD  DEMAND A
0166 33645 015334      JSB GETST      STRING
0167 33646 125332      JMP RSTOP,I    CONSTANT
0168**                **
0169***  FETCH A STRING CONSTANT ***
0170**                **
0171*
0172*  EXIT TO ERROR IF (A) # " UPON ENTRY, ELSE SAVE CURRENT
0173*  BUFFER POINTER AND PACK THE INPUT STRING INTO THE BUFFER
0174*  FOLLOWING THE INITIAL BUFFER WORD. EXIT TO ERROR IF NO
0175*  CLOSING " IS FOUND. RECORD THE OPENING " ALONG WITH A
0176*  COUNT OF THE STRING CHARACTERS AND EXIT WITH THE NEXT
0177*  CHARACTER IN (A). EXIT TO ERROR IF STRING EXCEEDS
0178*  72 CHARACTERS,
0179*
0180 33647 065574      #GTST LDB SBPTR  SAVE SYNTAX
0181 33650 077457      STB ARYAD     BUFFER POINTER
0182 33651 050414      CPA ,+42B    " ?
0183 33652 006401      CLB,RSS      YES, SET (B) = 0
0184 33653 115076      JSB SERRS+28,I  NO
0185 33654 015262      JSB CHRST     RECORD STRING CONSTANT
0186 33655 115077      JSB SERRS+29,I  NO CLOSING QUOTE
0187 33656 063362      LDA QUOTE     RECORD CHARACTER COUNT
0188 33657 041614      ADA TEMP+1   ALONG WITH
0189 33660 173457      STA ARYAD,I  OPENING QUOTE
0190 33661 043743      ADA D1111    MORE THAN 72,
0191 33662 002021      SSA,RSS      CHARACTER?
0192 33663 115100      JSB SERRS+30,I  YES
0193 33664 015450      JSB GETCR    NO, FETCH
0194 33665 000000      NOP          NEXT
0195 33666 125334      JMP GETST,I  CHARACTER
0196**                **
0197***  CHECK FOR USING STATEMENT ***
0198**                **
0199*
0200*  SCAN THE INPUT STRING FOR A USING OPERATOR. IF NONE FOUND, EXIT
0201*  TO (P+1) WITH THE INPUT STRING AND SYNTAX BUFFER AS UPON ENTRY.
0202*  OTHERWISE, CHECK FOR A LEGAL OPERATOR FOLLOWING THE 'USING' AND
0203*  EXIT TO (P+2) AFTER SAVING IT IN THE SYNTAX BUFFER, WITH (A)
0204*  = THE NEXT CHARACTER.
0205 33667 171574      #USCK STA SBPTR,I  (A) = NEXT CHARACTER
0206 33670 060357      LDA ,+5      5 CHARACTERS
0207 33671 071402      STA MAXCR    ALLOWED
0208 33672 007400      CCB         LOOK
0209 33673 063734      LDA USTMA   LOOK
0210 33674 015246      JSB TBSRH   'USING'
0211 33675 027725      JMP USCK3   NOT FOUND
0212 33676 035546      ISZ USTCK
0213 33677 015256      JSB LTR     NEXT CHARACTER LETTER?
0214 33700 027712      JMP USCK1   NO
0215 33701 050416      CPA ,+44B   YES, 'S' FOLLOWS?
0216 33702 002001      RSS        YES
0217 33703 115104      JSB SERRS+34,I  NO

```

0218	33704	065574	LDB SBPTR	ENABLE STRING
0219	33705	077453	STB SFLAG	VARIABLE
0220	33706	015330	JSB STRID	STORE STRING
0221	33707	015232	JSB SBSCK	
0222	33710	000000	NOP	
0223	33711	125546	JMP USTCK,I	
0224	33712	050414	USCK1 CPA ,+42B	QUOTE?
0225	33713	027722	JMP USCK2	YES
0226	33714	015452	JSB BCKSP	SEARCH
0227	33715	007400	CCB	FOR
0228	33716	075422	STB GFLAG	STATEMENT
0229	33717	015244	JSB PRGIN	NUMBER
0230	33720	125546	JMP USTCK,I	FOUND ONE
0231	33721	115104	JSB SERRS+34,I	NOT FOUND, ERROR
0232	33722	015270	USCK2 JSB SBPUD	ADVANCE BUFFER POINTER
0233	33723	015334	JSB GETST	RECORD STRING CONSTANT
0234	33724	125546	JMP USTCK,I	
0235	33725	007400	USCK3 CCB	RESTORE
0236	33726	045574	ADB SBPTR	BUFFER
0237	33727	075574	STB SBPTR	POINTER
0238	33730	060355	LDA ,+3	RESET FOR
0239	33731	071402	STA MAXCR	3 CHARACTERS
0240	33732	015452	JSB BCKSP	RESTORE INPUT STRING
0241	33733	125546	JMP USTCK,I	

0243	33734	053346	USTMA	DEF	USTMT
0244	33735	053342	SITYP	DEF	STYPS
0245	33736	053331	MCREL	DEF	MRELS
0246	33737	100337	LENCN	OCT	100337
0247	33740	076000	TUOP	OCT	76000
0248	33741	063000	INPOP	OCT	63000
0249	33742	024000	EXPOP	OCT	24000
0250	33743	176667	D1111	OCT	-1111
0251	33744	177201	D577	OCT	-577
0252	33745	000133	B133	OCT	133

```

0254 34000                ORG 34000B
0255 34000 000133      BB133 OCT 133
0256 34001 177645      D133 OCT =133
0257 34002 032051      DCOM0 DEF COMS0
0258 34003 033453      SFLGA DEF SFLAG
0259 34004 177725      D53 OCT =53
0260 34005 177631      M103 DEC =103
0261 34006 032037      EUSTA DEF EOST
0262***                **
0263** <RESTORE STATEMENT> SYNTAX **
0264***                **
0265*
0266 34007 015450      RSTRS JSB GETCR      END OF STATEMENT?
0267 34010 026014                JMP RSTR1          YES
0268 34011 015452                JSB BCKSP          NO, DEMAND
0269 34012 015244                JSB PRGIN          SEQUENCE NUMBER
0270 34013 126006                JMP EOSTA,I        DEMAND END OF STATEMENT
0271 34014 035574      RSTR1 ISZ SBPTR      RECORD DUMMY OPERAND
0272 34015 124524                JMP ACCSA,I
0273*
0274***                **
0275** <FILES STATEMENT> SYNTAX **
0276***                **
0277*
0278 34016 002401      FILES CLA,RSS      SUPPRESS BLANKS
0279*
0280***                **
0281** <REM STATEMENT> SYNTAX **
0282***                **
0283*
0284 34017 060367      REMS LDA ,+15B      DUMMY STATEMENT TERMINATOR
0285 34020 006404                CLB,INB          SET CHARACTER FLAG TO 'LOW HALF'
0286 34021 015262                JSB CHRST        RECORD REMAINDER OF STATEMENT
0287 34022 124524                JMP ACCSA,I      AS A STRING
0288***                **
0289** <CHAIN STATEMENT> SYNTAX **
0290***                **
0291*
0292 34023 015332      CHANS JSB RSTOP      REQUEST STRING OPERAND
0293 34024 007400                CCB
0294 34025 015272                JSB SYMCK        COMMA FOLLOWS?
0295 34026 033363                DEF COMMA=1      A COMMA?
0296 34027 126006                JMP EOSTA,I      NO, DEMAND END-OF-STATEMENT
0297 34030 006400                CLB              DISALLOW
0298 34031 176003                STB SFLGA,I     STRING VARIABLES
0299 34032 015230                JSB FSC          GET A FORMULA FOR LINE NO.
0300 34033 126006                JMP EOSTA,I     DEMAND END-OF-STATEMENT
0301*
0302***                **
0303** <ENTER STATEMENT> SYNTAX **
0304***                **
0305*
0306 34034 015450      ENTRS JSB GETCR      FETCH FIRST CHARACTER
0307 34035 115105                JSB SERRS+35,I  NONE FOUND
0308 34036 035574                ISZ SBPTR

```

```

0309 34037 007400 CCB
0310 34040 015272 JSB SYMCK FIRST CHARACTER A '#'?
0311 34041 033367 DEF HATCH-1
0312 34042 026055 JMP ENTR1 NO
0313 34043 015240 JSB VAROP YES, SEEK SIMPLE VARIABLE
0314 34044 115105 JSB SERRS+35,I NONE FOUND
0315 34045 000000 NOP
0316 34046 050367 CPA +15B CR FOLLOWS?
0317 34047 026307 JMP ACCST YES, ACCEPT STATEMENT
0318 34050 007400 CCB NO
0319 34051 015272 JSB SYMCK COMMA?
0320 34052 033363 DEF COMMA-1
0321 34053 115050 JSB SERRS+6,I NO
0322 34054 026061 JMP ENTR2
0323 34055 ENTR1 EQU *
0324 34055 015452 JSB BCKSP BACKUP ONE CHARACTER
0325 34056 007400 CCB RESTORE
0326 34057 045574 ADB SBPTR BUFFER
0327 34060 075574 STB SBPTR POINTER
0328 34061 ENTR2 EQU *
0329 34061 015230 JSB FSC DEMAND A FORMULA
0330 34062 007400 CCB
0331 34063 015272 JSB SYMCK COMMA FOLLOWS?
0332 34064 033363 DEF COMMA-1
0333 34065 115050 JSB SERRS+6,I NO
0334 34066 015240 JSB VAROP DEMAND A SIMPLE VARIABLE
0335 34067 115105 JSB SERRS+35,I NONE FOUND
0336 34070 000000 NOP
0337 34071 007400 CCB
0338 34072 015272 JSB SYMCK COMMA FOLLOWS?
0339 34073 033363 DEF COMMA-1
0340 34074 115050 JSB SERRS+6,I NO
0341 34075 065574 LDB SBPTR YES, ENABLE
0342 34076 176003 STB SFLGA,I STRING VARIABLE
0343 34077 015240 JSB VAROP SEEK VARIABLE OPERAND
0344 34100 115105 JSB SERRS+35,I NONE FOUND
0345 34101 000000 NOP
0346 34102 126006 JMP EOSTA,I DEMNAD END_OF_STATEMENT
0347*
0348*** **
0349** <USING STATEMENT> SYNTAX **
0350*** **
0351*
0352 34103 115103 USINS JSB SERRS+33,I USING ILLEGAL AS FIRST WORD
0353*
0354*** **
0355** <ASSIGN STATEMENT> SYNTAX **
0356*** **
0357*
0358 34104 015332 ASNS JSB RSTOP
0359 34105 007400 CCB
0360 34106 015272 JSB SYMCK RECORD
0361 34107 033363 DEF COMMA-1 A COMMA
0362 34110 115050 JSB SERRS+6,I NOT A COMMA
0363 34111 064354 LDB +2 DISABLE

```

0364	34112	176003		STB SFLGA,I	STRING VARIABLE
0365	34113	015230		JSB FSC	RECORD FORMULA
0366	34114	007400	ASNS4	CCB	
0367	34115	015272		JSB SYMCK	RECORD
0368	34116	033363		DEF COMMA-1	A COMMA
0369	34117	115050		JSB SERRS+6,I	NOT A COMMA
0370	34120	015240		JSB VAROP	SEEK A NUMERIC OPERAND
0371	34121	115105		JSB SERRS+35,I	NONE FOUND
0372	34122	000000		NOP	
0373	34123	007400		CCB	
0374	34124	015272		JSB SYMCK	COMMA
0375	34125	033363		DEF COMMA-1	NEXT?
0376	34126	002001		RSS	
0377	34127	015332		JSB RSTOP	DEMAND A STRING OPERAND
0378	34130	126006		JMP EOSJA,I	DEMAND END-OF-STATEMENT

0380** **
 0381*** SEEK A VARIABLE OPERAND ***
 0382** **

0383*
 0384* VAROP SCANS FOR AND RECORDS A VARIABLE OPERAND, IF
 0385* THE FIRST CHARACTER IS NOT A LETTER, EXIT IS TO (P+1)
 0386* WITH THE CHARACTER IN (A). OTHERWISE A VARIABLE
 0387* OPERAND IS RECORDED AND UPON EXIT (A) CONTAINS THE
 0388* FOLLOWING CHARACTER. EXIT IS TO (P+2) AFTER FINDING
 0389* AN ARRAY OR STRING VARIABLE ALONG WITH ANY FOLLOWING
 0390* SUBSCRIPT. IF A STRING VARIABLE IS FOUND AND SFLAG =
 0391* SBPTR, SET SFLAG = -1; IF SFLAG # SBPTR, NO STRING
 0392* VARIABLE IS PERMITTED AT THIS POINT; EXIT TO ERROR.
 0393* AFTER FINDING A SIMPLE VARIABLE EXIT TO (P+3) WITH
 0394* TEMP+2 = (A) AND THE LAST CHARACTER OF THE SIMPLE
 0395* VARIABLE IN TEMP+1. IF INSIDE A <DEF STATEMENT>,
 0396* SIMPLE VARIABLES ARE COMPARED WITH THE PARAMETER AND
 0397* MATCHES ARE MARKED.

0398*
 0399 34131 015256 #VROP JSB LTR LETTER?
 0400 34132 125240 JMP VAROP,I NO, EXIT VIA (P+1)
 0401 34133 035240 ISZ VAROP YES
 0402 34134 050422 CPA .+50B '(?
 0403 34135 026155 JMP VAR04 YES
 0404 34136 052000 CPA BB133 NO, '(?
 0405 34137 026155 JMP VAR04 YES
 0406 34140 050416 CPA .+44B NO, 'S' ?
 0407 34141 026155 JMP VAR04 YES
 0408 34142 035240 ISZ VAROP NO
 0409 34143 015264 JSB DIGCK DIGIT NEXT?
 0410 34144 026165 JMP VAR01 NO
 0411 34145 061614 LDA TEMP+1 YES, LOAD LETTER,
 0412 34146 044432 ADB .+48 RESTORE DIGIT,
 0413 34147 075614 STB TEMP+1 AND RECORD
 0414 34150 015260 JSB STROP SIMPLE VARIABLE
 0415 34151 015450 JSB GETCR FETCH
 0416 34152 000000 NOP AND SAVE
 0417 34153 071615 STA TEMP+2 NEXT
 0418 34154 026171 JMP VAR02 CHARACTER
 0419 34155 015330 VAR04 JSB STRID RECORD ARRAY OR STRING VARIABLE
 0420 34156 015232 JSB SBsCK FETCH THE SUBsCRIPT
 0421 34157 002001 RSS NO SUBSCRIPT
 0422 34160 125240 JMP VAROP,I EXIT VIA (P+2)
 0423 34161 065240 LDB VAROP WAS VAROP CALLED FOR
 0424 34162 056002 CPB DCOM0 DIM OR COM SYNTAX?
 0425 34163 115047 JSB sERRs+5,I YES--ERROR
 0426 34164 125240 JMP VAROP,I NO--EXIT
 0427 34165 061614 VAR01 LDA TEMP+1 RETRIEVE LETTER,
 0428 34166 064431 LDB .+57B SET 'NO DIGIT',
 0429 34167 015260 JSB STROP AND RECORD
 0430 34170 061615 LDA TEMP+2 SIMPLE VARIABLE
 0431 34171 006400 VAR02 CLB INSIDE A
 0432 34172 055621 CPB PFLAG 'DEF' STATEMENT?
 0433 34173 125240 JMP VAROP,I NO, EXIT VIA (P+3)
 0434 34174 007400 CCB YES,

0435	34175	045574	ADB SBPTR	ISOLATE
0436	34176	160001	LDA 1,I	LATEST
0437	34177	010502	AND B777	OPERAND
0438	34200	051621	CPA PFLAG	IS IT THE PARAMETER?
0439	34201	026204	JMP **3	YES
0440	34202	061615	VAR03 LDA TEMP+2	NO, RETRIEVE CHARACTER
0441	34203	125240	JMP VAROP,I	AND EXIT VIA (P+3)
0442	34204	160001	LDA 1,I	FLAG
0443	34205	031036	IOR FLGBT	OPERAND
0444	34206	170001	STA 1,I	AS
0445	34207	026202	JMP VAR03	PARAMETER
0446**				**
0447***	PROCESS CHARACTER STRING			***
0448**				**
0449*				
0450*	UPON ENTRY (A) CONTAINS THE STRING DELIMITER AND (B)			
0451*	INDICATES WHETHER THE FIRST CHARACTER IS TO BE STORED			
0452*	IN THE LOWER HALF OF THE CURRENT BUFFER WORD ((B) = 1)			
0453*	OR THE UPPER HALF OF THE NEXT BUFFER WORD ((B) = 0),			
0454*	EXIT TO (P+1) ON EMPTYING THE INPUT STRING. EXIT TO			
0455*	(P+2) ON FINDING THE STRING DELIMITER. BLANKS ARE NOT			
0456*	STRIPPED OUT OF THE INPUT STRING IF (A) ≠ 0 UPON ENTRY. UPON			
0457*	EXIT SBPTR POINTS TO THE FIRST BUFFER WORD NOT CONTAINING PART OF			
0458*	THE STRING WHILE TEMP+1 CONTAINS A COUNT OF THE STRING			
0459*	CHARACTERS BIASED BY THE VALUE OF (B) UPON ENTRY.			
0460*				
0461	34210	075614	#CRST STB TEMP+1	SET CHARACTER FLAG AND COUNTER
0462	34211	071615	STA TEMP+2	NOTE TERMINATOR CHARACTER
0463	34212	064364	LDB .+10	IF (A) ≠ 0
0464	34213	002002	SZA	STOP BLANK
0465	34214	075573	STB BLANK	SUPPRESSION
0466	34215	015450	CHRS1 JSB GETCR	FETCH CHARACTER
0467	34216	026234	JMP CHRS3+1	NONE FOUND
0468	34217	060001	LDA B	ALLOW LOWER CASE
0469	34220	051615	CPA TEMP+2	TERMINATOR?
0470	34221	026233	JMP CHRS3	YES
0471	34222	065614	LDB TEMP+1	NO, COUNT CHARACTER
0472	34223	006014	SLB,INB	AND SELECT WORD HALF
0473	34224	026227	JMP CHRS2	LOW HALF
0474	34225	015270	JSB SBPUD	HIGH HALF, MOVE TO NEXT WORD
0475	34226	001737	ALF,SLA,ALF	POSITION CHARACTER AND SKIP
0476	34227	131574	CHRS2 IOR SBPTR,I	COMBINE WITH PREVIOUS CHARACTER
0477	34230	171574	STA SBPTR,I	
0478	34231	075614	STB TEMP+1	SAVE FLAG/COUNTER
0479	34232	026215	JMP CHRS1	
0480	34233	035262	CHRS3 ISZ CHRST	SET EXIT TO (P+2)
0481	34234	015270	JSB SBPUD	ADVANCE POINTER
0482	34235	064412	LDB .+40B	RESTORE BLANK
0483	34236	075573	STB BLANK	SUPPRESSION
0484	34237	125262	JMP CHRST,I	

0486** **
 0487*** DELETE SOME PROGRAM ***
 0488** **

0489*
 0490* THAT PART OF THE PROGRAM REFERENCED BY CORE LOCATIONS
 0491* (TEMP+1)+(A) THROUGH (TEMP+1)+(B)-1 INCLUSIVE IS
 0492* DELETED BY SLIDING UP ALL OF THE PROGRAM FROM
 0493* (TEMP+1)+(B) TO (PBPTR)-1 (I.E., THE REST OF THE
 0494* PROGRAM FOLLOWING THE 'GAP'). PBPTR IS THEN
 0495* UPDATED TO POINT TO LAST WORD +1 OF THE PROGRAM.

0496*					
0497	34240	041614	#DLPR	ADA TEMP+1	COMPUTE INITIAL
0498	34241	071615		STA TEMP+2	DESTINATION ADDRESS
0499	34242	045614		ADB TEMP+1	COMPUTE INITIAL SOURCE ADDRESS
0500	34243	054056	DELP1	CPB PBPTR	DONE?
0501	34244	026252		JMP DELP2	YES
0502	34245	160001		LDA 1,I	NO, TRANSFER
0503	34246	171615		STA TEMP+2,I	A WORD
0504	34247	035615		ISZ TEMP+2	BUMP
0505	34250	006004		INB	POINTERS
0506	34251	026243		JMP DELP1	
0507	34252	061615	DELP2	LDA TEMP+2	UPDATE
0508	34253	070056		STA PBPTR	END-OF-PROGRAM
0509	34254	125312		JMP DELPR,I	POINTER

```

0511**
0512*** STATEMENT SYNTAX ENTRY POINTS ***
0513**
0514 34255 034104 SYNTB DEF ASNS ASSIGN
0515 34256 034103 DEF USINS USING
0516 34257 032124 DEF IMAGS IMAGE
0517 34260 032043 DEF COMS COM
0518 34261 032022 DEF LETS LET
0519 34262 032042 DEF DIMS DIM
0520 34263 032064 DEF DEFS DEF
0521 34264 034017 DEF REMS REM
0522 34265 032142 DEF GOTOS GOTU
0523 34266 032225 DEF IFS IF
0524 34267 032275 DEF FORS FOR
0525 34270 032332 DEF NEXTS NEXT
0526 34271 032142 DEF GOTOS GOSUB
0527 34272 032336 DEF ENDS RETURN
0528 34273 032336 DEF ENDS END
0529 34274 032336 DEF ENDS STOP
0530 34275 032342 DEF DATAS DATA
0531 34276 032414 DEF INPTS INPUT
0532 34277 032404 DEF READS HEAD
0533 34300 032426 DEF PRINS PRINT
0534 34301 034007 DEF RSTRS RESTORE
0535 34302 032555 DEF MATS MAT
0536 34303 034016 DEF FILES FILES
0537 34304 034023 DEF CHANS CHAIN
0538 34305 034034 DEF ENTRS ENTER
0539 34306 032017 DEF LET0 'IMPLIED' LET
0540**
0541*** ACCEPT A STATEMENT ***
0542**
0543*
0544* A CORRECT STATEMENT IS ADDED TO THE PROGRAM BUFFER,
0545* IF ITS SEQUENCE NUMBER IS THE HIGHEST SO FAR, ONLY
0546* THE END-OF-PROGRAM POINTER REQUIRES CHANGE, SINCE THE
0547* STATEMENT IS TRANSLATED IMMEDIATELY BELOW THE PREVIOUS
0548* PROGRAM. OTHERWISE THE NEW STATEMENT IS INSERTED INTO
0549* THE PROGRAM IN PROPER SEQUENTIAL POSITION, IF ITS
0550* SEQUENCE NUMBER COINCIDES WITH THAT OF A PREVIOUS
0551* PROGRAM STATEMENT, IT REPLACES IT, WITH SPACE MADE OR
0552* DELETED IN THE PROGRAM AS NECESSARY. EXIT TO EXEC.
0553* IF STATEMENT LENGTH = 0 THE STATEMENT WAS REJECTED DUE TO
0554* A STORAGE OVERFLOW IN TAPE MODE. IF IN KEYBOARD MODE AND
0555* SYMTB = 4 AT LEAST ONE OVER/UNDERFLOW OCCURRED WHILE ANALYZING
0556* THE STATEMENT SO EMIT THE ERROR; OTHERWISE ECHO A LINE FEED.
0557* IF IN TAPE MODE MOVE THE START-OF-RECORD POINTER TO THE START
0558* OF THE NEXT BUFFER AND IF IT IS COMPLETED SYNTAX IT NOW, ELSE
0559* EXIT TO EXEC.
0560*
0561 34307 065620 ACCST LDB SBUFA
0562 34310 006004 INB
0563 34311 061620 LDA SBUFA COMPUTE
0564 34312 003004 CMA,INA STATEMENT
0565 34313 041574 ADA SBPTR LENGTH

```


0566	34314	002003	SZA, RSS	UNPROCESSED STATEMENT?
0567	34315	026413	JMP ACCS6	YES
0568	34316	170001	STA 1, I	NO, STORE LENGTH IN STATEMENT
0569	34317	071615	STA TEMP+2	SAVE IT
0570	34320	060056	LDA PBPTR	FIND STATEMENT'S
0571	34321	165620	LDB SBUFA, I	SEQUENTIAL
0572	34322	015314	JSB FNDRS	POSITION
0573	34323	026376	JMP ACCS4	APPEND STATEMENT TO PROGRAM
0574	34324	026350	JMP ACCS2	INSERT STATEMENT INTO PROGRAM
0575	34325	006004	INB	REPLACE PRIOR STATEMENT
0576	34326	160001	LDA 1, I	COMPARE LENGTH
0577	34327	003004	CMA, INA	OF NEW STATEMENT
0578	34330	041615	ADA TEMP+2	WITH THAT OF OLD
0579	34331	002003	SZA, RSS	EQUAL?
0580	34332	026340	JMP ACCS1	YES
0581	34333	002021	SSA, RSS	NO, LONGER?
0582	34334	026351	JMP ACCS2+1	YES
0583	34335	061615	LDA TEMP+2	NO, SHORTER
0584	34336	164001	LDB 1, I	LOAD LENGTH OF OLD STATEMENT
0585	34337	015312	JSB DELPR	DELETE EXTRA LENGTH
0586	34340	065620	ACCS1 LDB SBUFA	LOAD FIRST SOURCE ADDRESS
0587	34341	160001	LDA 1, I	TRANSFER
0588	34342	171614	STA TEMP+1, I	A WORD
0589	34343	035614	ISZ TEMP+1	ADVANCE DESTINATION
0590	34344	006004	INB	AND SOURCE ADDRESSES
0591	34345	055574	CPB SBPTR	DONE?
0592	34346	026400	JMP ACCS5	YES
0593	34347	026341	JMP ACCS1+1	NO
0594	34350	061615	ACCS2 LDA TEMP+2	LOAD SPACE REQUIREMENT
0595	34351	041620	ADA SBUFA	UPDATE POINTER
0596	34352	071620	STA SBUFA	TO NEW STATEMENT
0597	34353	041615	ADA TEMP+2	RESET
0598	34354	065574	LDB SBPTR	END OF STATEMENT
0599	34355	071574	STA SBPTR	POINTER
0600	34356	071615	STA TEMP+2	INITIALIZE DESTINATION ADDRESS
0601	34357	003000	CMA	USER
0602	34360	040462	ADA LWAUS	SPACE
0603	34361	002020	SSA	OVERFLOW?
0604	34362	115042	JSB SERRS, I	YES
0605	34363	061620	LDA SBUFA	NO, UPDATE POINTER
0606	34364	070056	STA PBPTR	TO END-OF-PROGRAM
0607	34365	055614	ACCS3 CPB TEMP+1	EVERYTHING MOVED?
0608	34366	026340	JMP ACCS1	YES
0609	34367	003400	CCA	NO, BACK UP
0610	34370	041615	ADA TEMP+2	SOURCE AND
0611	34371	071615	STA TEMP+2	DESTINATION
0612	34372	044351	ADB .-1	ADDRESSES
0613	34373	160001	LDA 1, I	TRANSFER
0614	34374	171615	STA TEMP+2, I	A WORD
0615	34375	026365	JMP ACCS3	
0616	34376	061574	ACCS4 LDA SBPTR	RESET POINTER TO
0617	34377	070056	STA PBPTR	LAST WORD+1 OF PROGRAM
0618	34400	060362	ACCS5 LDA TAPEF	TAPE
0619	34401	110257	AND MAIN, I	
0620	34402	002002	SZA	MODE?

0621	34403	026413	JMP	ACCS6	YES	
0622	34404	065575	LDB	SYMTB	NO	
0623	34405	071575	STA	SYMTB	RESET UNDER/OVERFLOW FLAG	
0624	34406	054356	CPB	.,+4	UNDER/OVERFLOW ERROR(S)?	
0625	34407	115146	JSB	RERRS+32,I	YES	
0626	34410	060364	LDA	.,+12B	NO,	
0627	34411	015454	JSB	OUTCR	OUTPUT A	
0628	34412	124514	JMP	SCHEN,I	LINE FEED	
0629	34413	064257	ACCS6	LDB	MAIN	ALLOW
0630	34414	006004	INB			
0631	34415	160001	LDA	1,I	MORE	
0632	34416	030242	IOR	ALI		
0633	34417	114500	JSB	S14SC,I	INPUT	
0634	34420	124514	JMP	SCHEN,I		
0001**					**	
0002**	FIND A STATEMENT'S SEQUENTIAL POSITION				***	
0003**					**	
0004*						
0005*	UPON ENTRY (A) POINTS TO THE LAST WORD+1 OF THE PROGRAM					
0006*	AND (B) HOLDS A SEQUENCE NUMBER. IF (B) IS LARGER THAN					
0007*	ANY SEQUENCE NUMBER IN THE PROGRAM, EXIT TO (P+1) WITH					
0008*	(B) POINTING TO THE LAST WORD+1 OF THE PROGRAM. IF (B)					
0009*	FALLS BETWEEN TWO SEQUENCE NUMBERS, EXIT TO (P+2) WITH					
0010*	(B) POINTING TO THE STATEMENT WITH A LARGER SEQUENCE					
0011*	NUMBER. IF A STATEMENT IN THE PROGRAM HAS THE SEQUENCE					
0012*	NUMBER IN (B), EXIT TO (P+3) WITH (B) POINTING TO THIS					
0013*	STATEMENT (IF IT IS AN EMBEDDED ERROR MESSAGE, STATEMENT					
0014*	TYPE = 0, DECREMENT THE ERROR COUNT). IN ALL CASES TEMP+1					
0015*	= (B) UPON EXIT.					
0016*						
0017	34421	075614	#FDPS	STB	TEMP+1	SAVE TEST SEQUENCE NUMBER
0018	34422	071616		STA	TEMP+3	SAVE TERMINATION POINTER
0019	34423	065577		LDB	SPROG	START WITH FIRST WORD OF PROGRAM
0020	34424	055616	FNDP1	CPB	TEMP+3	PROGRAM EXHAUSTED?
0021	34425	026466		JMP	FNDP3+2	YES, EXIT TO (P+1)
0022	34426	160001		LDA	1,I	NO, IS
0023	34427	003004		CMA,	INA	PROGRAM
0024	34430	041614		ADA	TEMP+1	SEQUENCE NUMBER
0025	34431	002003		SZA,	RSS	THE SAME?
0026	34432	026443		JMP	FNDP2	YES, EXIT TO (P+3)
0027	34433	002020		SSA		NO, GREATER?
0028	34434	026465		JMP	FNDP3+1	YES, EXIT TO (P+2)
0029	34435	060001		LDA	B	NO, CHECK
0030	34436	002004		INA		STATEMENT
0031	34437	160000		LDA	A,I	LENGTH AND
0032	34440	044000		ADB	A	SET (B) TO
0033	34441	015556		JSB	STLCK	POINT TO NEXT
0034	34442	026424		JMP	FNDP1	STATEMENT
0035	34443	060001	FNDP2	LDA	1	LOAD
0036	34444	040354		ADA	.,+2	STATEMENT
0037	34445	160000		LDA	0,I	ERROR
0038	34446	010664		AND	OPMSK	
0039	34447	002002		SZA		STATEMENT?
0040	34450	026464		JMP	FNDP3	NO
0041	34451	003400		CCA		YES,

```

0042 34452 041576      ADA ERRCT      DECREMENT
0043 34453 071576      STA ERRCT      ERROR COUNT
0044 34454 002002      SZA            ONLY ERROR?
0045 34455 026464      JMP FNDP3      NO
0046 34456 103100      CLF 0
0047 34457 060353      LDA TERR      YES--
0048 34460 003000      CMA            SET FLAG
0049 34461 110257      AND MAIN,I    TO SAY
0050 34462 170257      STA MAIN,I    'NO EMBEDDED ERRORS'
0051 34463 102100      STF 0
0052 34464 035314      FNDP3 ISZ FNDPS
0053 34465 035314      ISZ FNDPS
0054 34466 075614      STB TEMP+1    SAVE POINTER TO
0055 34467 125314      JMP FNDPS,I   FINAL STATEMENT SEEN
0056**
0057***  FETCH PARENTHESIZED FORMULA ***
0058**
0059*
0060*  AN END-OF-FORMULA OPERATOR FOLLOWS THE FORMULA
0061*
0062 34470 064357      #GTFP LDB ,+5    SAVE FSC
0063 34471 015234      JSB FRCUR     LOCAL VARIABLES
0064 34472 015270      JSB SBPUD     UPDATE POINTER
0065 34473 015450      JSB GETCR     RECORD
0066 34474 115070      JSB SERRS+22,I LEFT
0067 34475 015252      JSB LPCK      PARENTHESIS
0068 34476 015230      JSB FSC       DEMAND FORMULA
0069 34477 015270      JSB SBPUD     RECORD END-OF-FORMULA OPERATOR
0070 34500 015254      JSB RPCK      RECORD RIGHT PARENTHESIS
0071 34501 015236      JSB FPOP      RESTORE FSC
0072 34502 125250      JMP GETPF,I   LOCAL VARIABLES
0073**
0074***  RECORD AN INTEGER ***
0075**
0076*
0077*  PRGIN FLAGS THE PREVIOUS OPERATOR TO SAY 'INTEGER FOLLOWS',
0078*  STORE THE INTEGER AND EXIT WITH IT IN (B) AND THE FOLLOWING
0079*  CHARACTER IN (A).
0080*
0081 34503 161574      #PGIN LDA SBPTR,I  SET
0082 34504 030670      IOR INTFL     'INTEGER FOLLOWS'
0083 34505 171574      STA SBPTR,I   FLAG
0084 34506 015270      JSB SBPUD     ADVANCE POINTER
0085 34507 015466      JSB BLDIN     BUILD INTEGER
0086 34510 175574      STB SBPTR,I  RECORD INTEGER
0087 34511 015270      JSB SBPUD     ADVANCE POINTER
0088 34512 125244      JMP PRGIN,I

```

```

0090**          **
0091*** BUILD AN INTEGER ***
0092**          **
0093*
0094* MISSING OR ILLEGAL INTEGER EXITS TO (P+2) OF PRGIN IF GFLAG = -1,
0095* ELSE TO ERROR. A LEGAL INTEGER IS NON-ZERO AND LESS THAN 10000.
0096*
0097 34513 002400 #BLDI CLA INITIALIZE TO
0098 34514 071645 STA PINTG ZERO INTEGER,
0099 34515 015450 JSB GETCR
0100 34516 026535 JMP BLDI2
0101 34517 015264 JSB DIGCK DIGIT?
0102 34520 026535 JMP BLDI2 NO
0103 34521 071646 STA PINTG+1 YES, SAVE IT
0104 34522 061645 LDA PINTG MULTIPLY PREVIOUS
0105 34523 100200 MPY ,+10 INTEGER BY 10
      34524 000364
0106 34525 000040 CLE ADD IN
0107 34526 041646 ADA PINTG+1 NEW DIGIT
0108 34527 006043 SEZ,SZB,RSS OVERFLOW?
0109 34530 026514 JMP #BLDI+1 NO
0110 34531 035422 BLDI1 ISZ GFLAG YES, RETURN ON ERROR?
0111 34532 115043 JSB SERRS+1,I NO
0112 34533 035244 ISZ PRGIN YES, EXIT TO
0113 34534 125244 JMP PRGIN,I (P+2) OF PRGIN
0114 34535 065645 BLDI2 LDB PINTG ZERO
0115 34536 006103 CLE,SZB,RSS INTEGER?
0116 34537 026531 JMP BLDI1 YES
0117 34540 044716 ADB MAXSN NO, INTEGER
0118 34541 002040 SEZ TOO LARGE?
0119 34542 026531 JMP BLDI1 YES
0120 34543 065645 LDB PINTG NO
0121 34544 125466 JMP BLDIN,I
0122**          **
0123*** SEEK RECORD REFERENCE ***
0124**          **
0125*
0126* IF THE NEXT CHARACTER IS NOT '#', RESTORE SBPTR AS UPON ENTRY
0127* AND EXIT TO (P+1) WITH THE CHARACTER IN (A). OTHERWISE CHECK
0128* CHARACTER RETURNED IN (A) FROM FILRF. IF IT IS A COMMA OR A
0129* SEMICOLON RECORD IT. EXIT TO (P+2) WITH THE CHARACTER IN (A)
0130* IF IT IS A SEMICOLON. IF A COMMA, PROCESS THE FOLLOWING RECORD
0131* REFERENCE AND EXIT TO (P+2) WITH CHARACTER FOLLOWING IT IN (A)
0132* (IF A SEMICOLON, RECORD IT BEFORE EXITING).
0133*
0134 34545 015504 #RECR JSB FILRF SEEK FILE REFERENCE
0135 34546 026562 JMP RECR1 NONE FOUND
0136 34547 035502 ISZ RECRF FOUND
0137 34550 050426 CPA ,+54B COMMA?
0138 34551 002001 RSS YES
0139 34552 026556 JMP RECR0 NO
0140 34553 064612 LDB B2000 RECORD
0141 34554 175574 STB SBPTR,I COMMA
0142 34555 015230 JSB FSC PROCESS RECORD REFERENCE
0143 34556 064614 RECR0 LDB B3000

```

```

0144 34557 050722          CPA B73          SEMICOLON?
0145 34560 175574          STB SBPTR,I     YES
0146 34561 125502          JMP RECRF,I
0147 34562 007400 RECR1 CCB          RESTORE
0148 34563 045574          ADB SBPTR
0149 34564 075574          STB SBPTR          SBPTR
0150 34565 125502          JMP RECRF,I
0151**
0152*** SEEK FILE REFERENCE ***
0153**
0154*
0155* IF THE NEXT CHARACTER IS NOT A '#' RETURN TO (P+1) WITH IT IN
0156* (A). OTHERWISE RECORD THE FILE REFERENCE AND RETURN TO (P+2)
0157* WITH THE FOLLOWING CHARACTER IN (A),
0158*
0159 34566 035574 #FILR ISZ SBPTR
0160 34567 015450 JSB GETCR        NEXT
0161 34570 125504 JMP FILRF,I
0162 34571 007400 CCB             CHARACTER
0163 34572 015272 JSB SYMCK
0164 34573 033367 DEF HATCH=1     A '#' ?
0165 34574 125504 JMP FILRF,I     NO
0166 34575 015230 JSB FSC         YES, PROCESS FILE REFERENCE
0167 34576 035504 ISZ FILRF
0168 34577 125504 JMP FILRF,I
0169**
0170*** SEARCH TABLE FOR MULTICHARACTER SYMBOL ***
0171**
0172*
0173* UPON ENTRY (A) POINTS TO THE TABLE OF ACCEPTABLE
0174* SYMBOLS, (B) CONTAINS THE NUMBER OF ENTRIES IN THE
0175* TABLE (IN 2'S COMPLEMENT), MAXCR CONTAINS THE MAXIMUM
0176* ACCEPTABLE NUMBER OF CHARACTERS IN THE SYMBOL, AND
0177* SBPTR,I CONTAINS THE FIRST CHARACTER OF THE PROSPECTIVE
0178* SYMBOL IN BITS 7=0 AND EITHER 0 OR THE SECOND CHARACTER
0179* IN BITS 15=8. IF NO ACCEPTABLE SYMBOL IS FOUND, EXIT TO
0180* (P+1) WITH THE HALVES OF SBPTR,I SWAPPED AND THE INPUT
0181* STRING AS UPON ENTRY. ON SUCCESS EXIT TO (P+2) WITH
0182* THE OPERATOR CODE IN BOTH (A) AND SBPTR,I; THE NEW INPUT
0183* STRING BEGINS WITH THE CHARACTER FOLLOWING THE SYMBOL,
0184*
0185 34600 071404 #TBSR STA TABLE  SAVE TABLE ADDRESS
0186 34601 075406 STB LNTH        SAVE -(NUMBER OF ENTRIES)
0187 34602 060257 LDA MAIN        SAVE
0188 34603 002004 INA
0189 34604 160000 LDA 0,I        BUFFER
0190 34605 030224 IOR SBP
0191 34606 114500 JSB S14SC,I    POINTER
0192 34607 061574 LDA SBPTR      SAVE CURRENT
0193 34610 071410 STA SMBGN     SYNTAX BUFFER POINTER
0194 34611 002404 CLA,INA       COUNT FIRST CHARACTER
0195 34612 071434 STA SLENG     OF SYMBOL
0196 34613 161574 LDA SBPTR,I   LEFT JUSTIFY
0197 34614 001727 ALF,ALF      FIRST
0198 34615 171574 STA SBPTR,I   CHARACTER

```

0199	34616	010441	AND B177	TWO
0200	34617	002003	SZA, RSS	CHARACTERS?
0201	34620	026637	JMP TSRC4	NO
0202	34621	035434	TSRC1 ISZ SLENG	COUNT NEW CHARACTER
0203	34622	065406	LDB LNGTH	SET COUNTER
0204	34623	075440	STB COUNT	FOR TABLE ENTRIES
0205	34624	061404	LDA TABLE	SET POINTER
0206	34625	071442	TSRC2 STA TBLPT	TO NEXT ENTRY
0207	34626	161442	LDA TBLPT, I	TABLE ENTRY AND
0208	34627	010361	AND .+7	CURRENT SYMBOL
0209	34630	051434	CPA SLENG	OF SAME LENGTH?
0210	34631	026654	JMP TSRC6	YES
0211	34632	040355	TSRC3 ADA .+3	NO, UPDATE
0212	34633	001100	ARS	TABLE
0213	34634	041442	ADA TBLPT	POINTER
0214	34635	035440	ISZ COUNT	MORE ENTRIES?
0215	34636	026625	JMP TSRC2	YES
0216	34637	015450	TSRC4 JSB GETCR	NO, FETCH NEXT CHARACTER
0217	34640	026705	JMP TSR10	NONE FOUND
0218	34641	065434	LDB SLENG	SYMBOL ALREADY
0219	34642	055402	CPB MAXCR	OF MAXIMUM LENGTH?
0220	34643	026705	JMP TSR10	YES
0221	34644	006011	SLB, RSS	NO, EVEN-NUMBERED CHARACTER?
0222	34645	026651	JMP TSRC5	NO
0223	34646	131574	IQR SBPTR, I	YES, FILL LOWER HALF
0224	34647	171574	STA SBPTR, I	OF LAST WORD OF SYMBOL
0225	34650	026621	JMP TSRC1	
0226	34651	015270	TSRC5 JSB SBPU	ADVANCE SYMBOL POINTER
0227	34652	001727	ALF, ALF	STORE CHARACTER IN
0228	34653	020647	JMP **4	UPPER HALF OF WORD
0229	34654	065442	TSRC6 LDB TBLPT	SET POINTER TO
0230	34655	075444	STB TSPTR	SYMBOL IN TABLE
0231	34656	065410	LDB SMBGN	SET (B) TO
0232	34657	026663	JMP **4	INPUT SYMBOL
0233	34660	055574	TSRC7 CPB SBPTR	ALL OF SYMBOL MATCHED?
0234	34661	026671	JMP TSRC8	YES
0235	34662	006004	INB	NO, ADVANCE
0236	34663	035444	ISZ TSPTR	POINTERS
0237	34664	161444	LDA TSPTR, I	COMPARE NEXT
0238	34665	150001	CPA 1, I	WORD OF SYMBOLS
0239	34666	026660	JMP TSRC7	EQUAL
0240	34667	061434	LDA SLENG	UNEQUAL, TRY
0241	34670	026632	JMP TSRC3	NEXT TABLE SYMBOL
0242	34671	060257	TSRC8 LDA MAIN	FREE
0243	34672	002004	INA	
0244	34673	160000	LDA 0, I	SAVED
0245	34674	030224	IOR FBP	
0246	34675	114500	JSB S14SC, I	BUFFER SPACE
0247	34676	161442	LDA TBLPT, I	LOAD, ISOLATE
0248	34677	010664	AND OPMSK	AND STORE
0249	34700	171410	STA SMBGN, I	OPERATOR CODE
0250	34701	035246	ISZ TBSRH	SET EXIT TO (P+2)
0251	34702	065410	TSRC9 LDB SMBGN	CORRECT SYNTAX
0252	34703	075574	STB SBPTR	BUFFER POINTER
0253	34704	125246	JMP TBSRH, I	

```

0254 34705 060257  TSR10 LDA MAIN      RESTORE
0255 34706 002004          INA
0256 34707 160000          LDA 0,I      BUFFER
0257 34710 030225          IOR RBP
0258 34711 114500          JSB S14SC,I   POINTER
0259 34712 026702          JMP TSRC9
0260**
0261***  FETCH A LETTER  ***
0262**
0263*
0264*  EXITS TO (P+1) IF NEXT CHARACTER NOT A LETTER,
0265*  OTHERWISE STORES IT IN TEMP+1, STORES FOLLOWING
0266*  CHARACTER IN TEMP+2, AND EXITS TO (P+2) WITH
0267*  SECOND CHARACTER IN (B).
0268*
0269 34713 015450  #LTR JSB GETCR      FIRST
0270 34714 000000          NOP          CHARACTER
0271 34715 015266          JSB LETCK   A LETTER?
0272 34716 125256          JMP LTR,I   NO, EXIT WITH CHARACTER IN (A)
0273 34717 035256          ISZ LTR    YES, SET RETURN ADDRESS TO (P+2)
0274 34720 071614          STA TEMP+1  SAVE CHARACTER
0275 34721 015450          JSB GETCR   SAVE
0276 34722 000000          NOP          SECOND
0277 34723 071615          STA TEMP+2  CHARACTER
0278 34724 125256          JMP LTR,I

```

```

0280**
0281*** STORE AN OPERAND NAME ***
0282**
0283*
0284* OPERANDS ARE STORED AS 9-BIT QUANTITIES. BITS 8-4
0285* HOLD A LETTER (1-32 OCTAL FOR A-Z). BITS 3-0 INDICATE
0286* THE TYPE OF OPERAND: 0 FOR A STRING, 1 AND 2 FOR
0287* SINGLY AND DOUBLY SUBSCRIPTED VARIABLES, 3 FOR A
0288* SUBSCRIPTED VARIABLE WITH DIMENSIONALITY NOT DEFINED
0289* LOCALLY, 4 FOR A SINGLE-LETTER SIMPLE VARIABLE, 5-16
0290* OCTAL FOR A LETTER-DIGIT SINGLE VARIABLE, AND 17 OCTAL
0291* FOR A PROGRAMMER-DEFINED FUNCTION.
0292*
0293 34725 040610 #STOP ADA D100 LETTER = ASCII CODE - 100 OCTAL
0294 34726 046004 ADB D53 DIGIT = ASCII CODE = 53 OCTAL
0295 34727 001700 ALF COMPLETE
0296 34730 030001 IOR 1 OPERAND
0297 34731 131574 IOR SBPTR,I MERGE OPERATOR
0298 34732 171574 STA SBPTR,I AND OPERAND
0299 34733 015270 JSB SBPUD SET POINTER TO
0300 34734 125260 JMP STROP,I FRESH WORD
0301**
0302*** DEMAND A RIGHT PARENTHESIS ***
0303**
0304*
0305* IF (A) HOLDS ')' OR ']' RECORD A ')' AND EXIT
0306* WITH THE FOLLOWING CHARACTER IN (A), ELSE ERROR.
0307*
0308 34735 064350 #RPCK LDB .-2 ')'
0309 34736 015272 JSB SYMCK OR
0310 34737 033377 DEF RPARN=1 ']' ?
0311 34740 115071 JSB SERRS+23,I NO
0312 34741 060616 LDA RPOP YES, RECORD
0313 34742 171574 STA SBPTR,I A ')'
0314 34743 015270 JSB SBPUD RECORD A NULL OPERAND
0315 34744 015450 JSB GETCR FETCH
0316 34745 000000 NOP NEXT
0317 34746 125254 JMP RPCK,I CHARACTER
0318**
0319*** CHECK FOR A DIGIT ***
0320**
0321*
0322* ENTER WITH CHARACTER IN (A). IF NOT A DIGIT, EXIT
0323* TO (P+1) WITH CHARACTER IN (A); ELSE EXIT TO (P+2)
0324* WITH DIGIT (BINARY) IN (A) AND (B).
0325*
0326 34747 064000 #DGCK LDB 0 ASCII
0327 34750 044316 ADB D72 72B OR
0328 34751 006021 SSB,RSS GREATER?
0329 34752 125264 JMP DIGCK,I YES
0330 34753 044364 ADB .+12B NO, ASCII 57B
0331 34754 006020 SSB OR LESS?
0332 34755 125264 JMP DIGCK,I YES
0333 34756 060001 LDA 1 NO, LOAD
0334 34757 035264 ISZ DIGCK DIGIT

```



```

0335 34760 125264      JMP DIGCK,I          INTO (A)
0336**
0337*** CHECK FOR A LETTER ***
0338**
0339*
0340* ENTER WITH CHARACTER IN (A). EXIT TO (P+2) IF A
0341* LETTER, ELSE EXIT TO (P+1). (A) IS NOT CHANGED.
0342*
0343 34761 064000      #LTCK LDB 0          ASCII
0344 34762 046001      ADB D133          133B OR
0345 34763 006021      SSB,RSS          GREATER?
0346 34764 125266      JMP LETCK,I       YES
0347 34765 044404      ADB .+32B       NO, ASCII 101B
0348 34766 006021      SSB,RSS          OR GREATER?
0349 34767 035266      ISZ LETCK        YES
0350 34770 125266      JMP LETCK,I       NO
0351**
0352*** CHECK FOR SINGLE-CHARACTER OPERATORS ***
0353**
0354*
0355* ENTER WITH CHARACTER IN (A) AND NUMBER OF ACCEPTABLE
0356* OPERATORS IN (B) IN 2'S COMPLEMENT. (P+1)+2 POINTS
0357* TO THE LIST OF ACCEPTABLE OPERATORS. ON A MATCH
0358* EXIT TO (P+3) AFTER RECORDING THE OPERATOR CODE,
0359* WHICH REMAINS IN (A). ON NO MATCH EXIT TO (P+2)
0360* WITH THE CHARACTER IN (A).
0361*
0362 34771 075440      #SYCK STB COUNT    SAVE COUNT OF POSSIBLE MATCHES
0363 34772 001727      ALF,ALF          POSITION
0364 34773 030412      IOR .+32         CHARACTER
0365 34774 165272      LDB SYMCK,I      LOAD
0366 34775 035272      ISZ SYMCK        STARTING
0367 34776 044354      SYMC1 ADB .+2    TABLE ENTRY
0368 34777 150001      CPA 1,I          MATCH?
0369 35000 027006      JMP SYMC2        YES
0370 35001 035440      ISZ COUNT        NO, POSSIBILITIES LEFT?
0371 35002 026776      JMP SYMC1        YES
0372 35003 001727      ALF,ALF          NO,
0373 35004 010441      AND B177         RESTORE
0374 35005 125272      JMP SYMCK,I      CHARACTER
0375 35006 044351      SYMC2 ADB .-1    FETCH
0376 35007 160001      LDA 1,I          AND
0377 35010 010664      AND OPMSK        STORE
0378 35011 171574      STA SBPTR,I      OPERATOR
0379 35012 035272      ISZ SYMCK        CODE
0380 35013 125272      JMP SYMCK,I

```

```

0382**
0383*** SEARCH FOR PRINT FUNCTIONS ***
0384**
0385*
0386* SEARCH THE INPUT STRING FOR A 'TAB', 'LIN' OR 'SPA' FUNCTION.
0387* IF FOUND, RECORD IT AND EXIT TO (P+1). OTHERWISE RESTORE THE
0388* INPUT STRING AND SYNTAX BUFFER POINTER AND EXIT TO (P+2).
0389*
0390 35014 064347 #PFSH LDB .-3 3 POSSIBLE FUNCTIONS
0391 35015 060510 LDA ATAB SEARCH
0392 35016 015246 JSB TBSRH FOR THEM
0393 35017 027032 JMP PFSH1 NONE FOUND
0394 35020 007400 CCB BACKUP
0395 35021 045574 ADB SBPTR BUFFER
0396 35022 075574 STB SBPTR POINTER
0397 35023 001727 ALF,ALF CONSTRUCT
0398 35024 001723 ALF,RAR
0399 35025 130001 IOR B,I FUNCTION
0400 35026 030672 IOR PDFFL
0401 35027 170001 STA B,I OPERAND
0402 35030 015250 JSB GETPF FETCH PARENTHESED FORMULA
0403 35031 125550 JMP PFSRH,I
0404 35032 015452 PFSH1 JSB BCKSP BACKUP
0405 35033 007400 CCB TO POINT
0406 35034 045574 ADB SBPTR FOLLOWING
0407 35035 075574 STB SBPTR LAST OPERATOR
0408 35036 035550 ISZ PFSRH EXIT TO
0409 35037 125550 JMP PFSRH,I (P+2)

```

```

0411**
0412*** ALLOCATE COM STORAGE ***
0413**
0414*
0415* THE BEGINNING OF THE PROGRAM IS SCANNED FOR <COM STATEMENTS>, THE
0416* AMOUNT OF COM STORAGE NEEDED IS COMPUTED, A POINTER (SPROG) TO
0417* THE START OF THE PROGRAM IS CREATED AND THE PROGRAM IS SHIFTED TO
0418* HIGHER CORE TO ALLOW FOR THE COM STORAGE.
0419*
0420 35040 006400 #ALCO CLB SAY NO COMMON
0421 35041 075514 STB DEST ALLOCATED YET.
0422 35042 064702 LDB PBUFF
0423 35043 075620 STB STPTR POINTER TO FIRST STATEMENT
0424 35044 161620 ALC01 LDA STPTR,I SAVE STATEMENT
0425 35045 071570 STA ,LNUM NUMBER
0426 35046 035620 ISZ STPTR
0427 35047 145620 ADB STPTR,I
0428 35050 075236 STB NSPTR POINTER TO NEXT STATEMENT
0429 35051 035620 ISZ STPTR
0430 35052 161620 LDA STPTR,I EXTRACT
0431 35053 010664 AND OPMSK OPERATOR
0432 35054 050742 CPA COMOP COM STATEMENT?
0433 35055 027103 JMP ALC02 YES
0434 35056 061514 ALC06 LDA DEST GET TOTAL COMMON ALLOCATED
0435 35057 002003 SZA,RSS EXIT IF THERE WERE
0436 35060 125520 JMP ALC0M,I NO COM STATEMENTS
0437 35061 040702 ADA PBUFF PROGRAM BEGINNING MOVES BY
0438 35062 071577 STA SPROG AMOUNT OF COMMON ALLOCATED.
0439 35063 007400 CCB POINTER TO FIRST
0440 35064 044056 ADB PBPTR WORD TO BE MOVED
0441 35065 060001 LDA 1 POINTER TO
0442 35066 041514 ADA DEST FIRST DESTINATION
0443 35067 071514 STA DEST LOCATION
0444 35070 002004 INA RESET END OF
0445 35071 070056 STA PBPTR PROGRAM POINTER.
0446 35072 160001 ALC00 LDA 1,I MOVE A
0447 35073 171514 STA DEST,I WORD
0448 35074 054702 CPB PBUFF DONE?
0449 35075 125520 JMP ALC0M,I EXIT
0450 35076 044351 ADB .-1 NO--BUMP
0451 35077 003400 CCA
0452 35100 041514 ADA DEST POINTERS
0453 35101 071514 STA DEST
0454 35102 027072 JMP ALC00 AND LOOP
0455 35103 161620 ALC02 LDA STPTR,I EXTRACT
0456 35104 010371 AND .+17B OPERAND
0457 35105 002002 SZA STRING?
0458 35106 027117 JMP ALC03 NO
0459 35107 035620 ISZ STPTR YES--
0460 35110 035620 ISZ STPTR EXTRACT
0461 35111 161620 LDA STPTR,I LENGTH
0462 35112 002004 INA COMPUTE
0463 35113 001100 ARS STORAGE
0464 35114 002004 INA REQUIRED
0465 35115 035620 ISZ STPTR BUMP PAST RIGHT BRACKET

```

```

0466 35116 027153          JMP ALC07+1
0467 35117 040346    ALC03  ADA , -4
0468 35120 002020          SSA          SIMPLE VARIABLE?
0469 35121 027124          JMP ALC04          NO
0470 35122 002404          CLA, INA        YES-- ALLOW TWO WORDS
0471 35123 027152          JMP ALC07
0472 35124 035620    ALC04  ISZ STPTR        MUST BE ARRAY
0473 35125 035620          ISZ STPTR
0474 35126 165620          LDB STPTR, I      EXTRACT LENGTH
0475 35127 035620          ISZ STPTR
0476 35130 161620          LDA STPTR, I      GET NEXT
0477 35131 010664          AND OPMSK         OPERATOR
0478 35132 050744          CPA SCOMM        SUBSCRIPT COMMA?
0479 35133 027136          JMP *+3          YES
0480 35134 060001          LDA 1            NO
0481 35135 027145          JMP ALC05+1
0482 35136 060001          LDA 1            COMPUTE
0483 35137 035620          ISZ STPTR        ARRAY
0484 35140 100200          MPY STPTR, I     SIZE
          35141 101620
0485 35142 006002          SZB            TOO BIG?
0486 35143 127157          JMP CUS1A, I     YES
0487 35144 035620    ALC05  ISZ STPTR        BUMP PAST
0488 35145 000066          CLE, ELA
0489 35146 002061          SEZ, SSA, RSS   TOO BIG?
0490 35147 000035          SLA, ERA        NO
0491 35150 127167          JMP CUS1A, I     YES
0492 35151 040354          ADA , +2        ALLOW 4 WORDS FOR DIMENSIONS
0493 35152 001000    ALC07  ALS            DOUBLE EVERYTHING
0494 35153 041514          ADA DEST        UPDATE
0495 35154 071514          STA DEST        POINTER
0496 35155 040437          ADA , 100
0497 35156 015326          JSB CUSP        CHECK FOR STORAGE OVERFLOW
0498 35157 035620          ISZ STPTR
0499 35160 065620          LDB STPTR
0500 35161 055236          CPB NSPTR       END OF STATEMENT
0501 35162 002001          RSS            YES
0502 35163 027103          JMP ALC02        NO
0503 35164 054056          CPB PBPTR       END OF PROGRAM?
0504 35165 027056          JMP ALC06        YES
0505 35166 027044          JMP ALC01        NO
0506*
0507 35167 035176    CUS1A  DEF CUSP1
0508**
0509***  INSURE SPACE FOR NEW ENTRY ***
0510**
0511*
0512*  A CHECK IS MADE THAT THE UNUSED USER SPACE IS AT
0513*  LEAST AS LARGE AS THE NUMBER OF WORDS SPECIFIED BY
0514*  (A).  EXIT TO ERROR IF NOT SO.  (B) IS NOT CHANGED,
0515*  ON NORMAL EXIT (A) CONTAINS ITS ENTRY VALUE + (PBPTR).
0516*
0517 35170 040056    #CUSP  ADA PBPTR        AT LEAST
0518 35171 071476          STA CU1         (A) WORDS
0519 35172 003000          CMA            OF AVAILABLE

```

```

0520 35173 040452      ADA LWAUS          USER
0521 35174 002021      SSA,RSS          SPACE?
0522 35175 027200      JMP **3          YES
0523 35176 015322      CUSP1 JSB DCMPL   NO, DECOMPILE
0524 35177 115120      JSB RERRS+10,I  OUT OF STORAGE
0525 35200 061476      LDA CU1         RETURN WITH NEW
0526 35201 125326      JMP CUSP,I      VALUE OF PBPTR
0527**
0528*** ADVANCE SYNTAX BUFFER POINTER ***
0529**
0530*
0531* (A) AND (B) REMAIN AS UPON ENTRY
0532*
0533 35202 071306      #SBPU STA SBT0    SAVE (A)
0534 35203 035574      ISZ SBPTR      ADVANCE POINTER
0535 35204 061574      LDA SBPTR      BUFFER
0536 35205 051472      CPA SYNTQ      OVERFLOW?
0537 35206 115101      JSB SERRS+31,I YES
0538 35207 061306      LDA SBT0       NO, RETRIEVE (A)
0539 35210 125270      JMP SBPUD,I
0540**
0541*** DEMAND A LEFT PARENTHESIS ***
0542**
0543*
0544* INSIST CHARACTER IN (A) BE '(' OR '[', RECORD IT
0545* AS A '(',
0546*
0547 35211 064350      #LPCK LDB .-2     '('
0548 35212 015272      JSB SYMCK      OR
0549 35213 033403      DEF LBRAC-1    '[' ?
0550 35214 115070      JSB SERRS+22,I NO
0551 35215 060624      LDA LPOP       YES, RECORD
0552 35216 171574      STA SBPTR,I    A '('
0553 35217 125252      JMP LPCK,I
0554**
0555*** STATEMENT LENGTH CHECKER ***
0556**
0557*
0558* CHECK THAT (A) (THE STATEMENT LENGTH) IS BETWEEN 3 AND 106.
0559* IF NOT, EXIT TO ERROR.
0560 35220 040347      #SLCK ADA .-3
0561 35221 002020      SSA
0562 35222 115167      JSB RERRS+49,I TOO SMALL
0563 35223 042005      ADA M103
0564 35224 002020      SSA
0565 35225 125556      JMP STLCK,I    OK
0566 35226 115167      JSB RERRS+49,I TOO BIG

```

```

0002 36000          ORG 36000B
0003 36000 011610  .5000 DEC 5000
0004 36001 000364  A.10  DEF ,+10
0005 36002 037025  APTK2 DEF SYMT7
0006 36003 037016  APTK1 DEF SYMT6
0007 36004 041675  DONEA DEF EXIT3
0008 36005 075045  CSVRT DEF CSAV2
0009 36006 067000  MATOP OCT 67000
0010*
0011* *****
0012****
0013***  !COMPILE! THE PROGRAM **
0014****
0015* *****
0016*
0017*
0018* SYMTB#0 IMPLIES THE PROGRAM IS IN 'SOURCE'; ALL OPERANDS ARE IN
0019* SYMBOLIC FORM. SYMTB#0 AND SPTR#0 IMPLIES THE PROGRAM IS 'SEMI-
0020* COMPILED'; VARIABLE OPERANDS ARE POINTERS TO A SYMBOL TABLE AND
0021* STATEMENT REFERENCES ARE REPLACED BY ABSOLUTE POINTERS.
0022* SYMTB = SPTR IMPLIES THE PROGRAM IS 'COMPILED'; THE SYMBOL TABLE
0023* ENTRIES CONTAIN POINTERS TO A VALUE TABLE OR IN THE CASE OF
0024* FUNCTIONS TO THE DEFINING FORMULA, AND A TABLE IS BUILT
0025* CONTAINING INFORMATION FOR EACH FILE IN THE PROGRAM. BEFORE
0026* BUILDING THE SYMBOL TABLE, THE INTERPRETER'S PROGRAM COUNTER
0027* IS SET TO THE STATEMENT REFERENCED BY THE !RUN! COMMAND (THE
0028* LOWEST NUMBERED STATEMENT IS THE DEFAULT CHOICE).
0029*
0030 36007 064702  CMPLE LDB PBUFF          NULL
0031 36010 054056          CPB PBPTR          PROGRAM?
0032 36011 126004          JMP DONEA,I        YES
0033 36012 006404          CLB,INB           INITIALIZE
0034 36013 075334          STB PRGCT         PROGRAM COUNTER
0035 36014 015464          JSB SINIT         SIMPLE
0036 36015 015450          JSB GETCR         'RUN' ?
0037 36016 026025          JMP CMP15         YES
0038 36017 015452          JSB BCKSP         NO
0039 36020 015466          JSB BLDIN         DEMAND AN INTEGER
0040 36021 075334          STB PRGCT         SAVE STARTING STATEMENT NUMBER
0041 36022 050367          CPA ,+15B        END OF RECORD?
0042 36023 002001          RSS             YES
0043 36024 115122          JSB RERRS+12,I   NO
0044 36025 103100  CMP15 CLF 0
0045 36026 160257          LDA MAIN,I        DON'T
0046 36027 030372          IOR UNABT         ALLOW
0047 36030 170257          STA MAIN,I        ABORTS
0048 36031 102100          STF 0
0049 36032 064702          LDB PBUFF
0050 36033 055577          CPB SPROG         NO, COM STORAGE ALLOCATED?
0051 36034 015520          JSB ALCOM         NO--DO IT
0052 36035 061575          LDA SYMTB         GET SYMBOL TABLE POINTER
0053 36036 002003          SZA,RSS           IS PROGRAM COMPILED ?
0054 36037 060056          LDA PBPTR         NO, USE PBPTR
0055 36040 065334          LDB PRGCT         GET STARTING STATEMENT NUMBER
0056 36041 015314          JSB FNOPS         SEEK REFERENCED STATEMENT

```

0057	36042	126004		JMP DONEA,I	NOT WITHIN PROGRAM
0058	36043	000000		NOP	SET
0059	36044	075334		STB PRGCT	PROGRAM COUNTER
0060	36045	060257	CMP14	LDA MAIN	TELL 2114
0061	36046	002004		INA	
0062	36047	160000		LDA 0,I	THAT USER
0063	36050	030227		IOR UIR	
0064	36051	114500		JSB S14LP,I	IS RUNNING
0065	36052	061575	CMP10	LDA SYMTB	PROGRAM
0066	36053	002003		SZA,RSS	UNCOMPILED?
0067	36054	026071		JMP CMP00	YES
0068	36055	051230		CPA SPTR	NO, COMPILED?
0069	36056	002001		RSS	YES
0070	36057	026067		JMP CMP16	NO, MUST BE SEMI-COMPILED
0071	36060	065773		LDB ASINP	
0072	36061	006003		SZB,RSS	ASSIGN STATEMENT SEEN?
0073	36062	027221		JMP VALUE	NO
0074	36063	015522		JSB RSTPT	YES, FAKE SEMI-COMPILED PROGRAM
0075	36064	061575		LDA SYMTB	
0076	36065	071230		STA SPTR	
0077	36066	026434		JMP CMP18	
0078	36067		CMP16	EQU *	
0079	36067	071230		STA SPTR	
0080	36070	026423		JMP CMP17	
0081	36071	071504	CMP00	STA FILTB	
0082	36072	103100		CLF 0	
0083	36073	060354		LDA CFLAG	SET
0084	36074	064273		LDB MLINK+1	
0085	36075	044335		ADB .=?LINK	PROGRAM MODE
0086	36076	130001		IOR 1,I	
0087	36077	170001		STA 1,I	TO 'COMPILED'
0088	36100	102100		STF 0	

```

0090**
0091*** BUILD THE SYMBOL TABLE ***
0092**
0093*
0094* THE PROGRAM IS EXAMINED STATEMENT BY STATEMENT, ALL
0095* VARIABLE OPERANDS ARE REPLACED BY POINTERS (RELATIVE
0096* TO THE START OF THE SYMBOL TABLE) TO TWO WORD ENTRIES,
0097* SYMBOL TABLE ENTRIES KEEP THE SYMBOL IN THE FIRST WORD
0098* AND INFORMATION IN THE SECOND, FOR FUNCTIONS THE
0099* SECOND WORD CONTAINS A POINTER TO THE DEFINING FORMULA
0100* (0 BEFORE FINDING THE <DEF STATEMENT>), FOR SIMPLE
0101* VARIABLES THE SECOND WORD IS USED TO FORM A LINKED LIST
0102* OF UNMATCHED FOR=VARIABLES (OTHERWISE IT IS 0) WITH
0103* FLINK POINTING TO THE INNERMOST NESTED FOR=VARIABLE,
0104* IF THE SIMPLE VARIABLE APPEARS IN A <COM STATEMENT>
0105* THE SECOND WORD IS SET TO -1, FOR ARRAY AND STRING
0106* VARIABLES THE SECOND WORD IS 0 UNLESS THE VARIABLE
0107* APPEARS IN A <DIM STATEMENT>, IN WHICH CASE IT
0108* POINTS TO THE DIMENSIONS IN THE CODE, OR IT APPEARS
0109* IN A <COM STATEMENT>, IN WHICH CASE IT IS THE
0110* NEGATION OF A POINTER TO THE DIMENSIONS,
0111* PROGRAM INTEGERS ARE REPLACED BY A POINTER TO THE
0112* STATEMENT THEY REFERENCE, ON EXIT TO VALUE OR DCMLP,
0113* SPTR POINTS TO THE FIRST WORD NOT PROCESSED.
0114*
0115 36101 064056          LDB PBPTR          CREATE POINTER
0116 36102 075575          STB SYMTB           TO SYMBOL TABLE
0117*
0118* COUNT NUMBER OF STATEMENTS IN PROGRAM
0119*
0120 36103 002404          CLA,INA           INITIALIZE STATEMENT COUNTER
0121 36104 065577          LDB SPROG
0122 36105 006004          CMP01 INB           MOVE TO
0123 36106 144001          ADB 1,I           NEXT
0124 36107 044351          ADB ,=1          STATEMENT
0125 36110 054056          CPB PBPTR          DONE?
0126 36111 026114          JMP CMP02          YES
0127 36112 002004          INA           NO==BUMP COUNTER
0128 36113 026105          JMP CMP01
0129 36114 006400          CMP02 CLB          DIVIDE # OF STATEMENTS
0130 36115 100400          DIV ,+32          INTO 32 PARTS
0131 36116 000412
0131 36117 007000          CMB           SET 00-1=# OF OVERSIZE GROUPS,
0132 36120 002003          SZA,RSS          BUT IF <32 STATEMENTS USE -#
0133 36121 006004          INB
0134 36122 002004          INA           SET A TO SIZE OF LARGER GROUP
0135 36123 071621          STA STCT1        SET COUNTER
0136 36124 075615          STB STCT2
0137 36125 064544          LDB ERSCA        SET POINTER TO TABLE
0138 36126 075610          STB NUMPT

```



```

0140*
0141* BUILD A TABLE OF 64 WORDS, THE FIRST 32 CONTAIN THE SEQUENCE
0142* NUMBERS OF STATEMENTS WHICH DIVIDE THE PROGRAM INTO 32 ALMOST
0143* EQUAL PARTS, THE SECOND 32 WORDS ARE THE ABSOLUTE ADDRESSES
0144* OF THESE STATEMENTS
0145*
0146 36127 061577 LDA SPROG
0147 36130 044412 CMP03 ADB ,+32
0148 36131 170001 STA 1,I SET ABSOLUTE ADDRESS INTO TABLE
0149 36132 164000 LDB 0,I SET SEQUENCE # INTO TABLE
0150 36133 175610 STB NUMPT,I
0151 36134 035610 ISZ NUMPT BUMP POINTERS
0152 36135 035615 ISZ STCT2 TEST FOR ANY MORE
0153 36136 006401 CLB,RSS OVERSIZE GROUPS
0154 36137 007400 CCB COMPUTE SIZE OF NEXT GROUP
0155 36140 045621 ADB STCT1
0156 36141 075621 STB STCT1
0157 36142 007000 CMB
0158 36143 075616 STB STCT3
0159 36144 065610 LDB NUMPT TEST FOR DONE
0160 36145 054644 CPB ERS32
0161 36146 026155 JMP CMP04
0162 36147 035616 ISZ STCT3 COMPUTE FIRST STATEMENT
0163 36150 002005 INA,RSS IN NEXT GROUP
0164 36151 026130 JMP CMP03
0165 36152 140000 ADA 0,I
0166 36153 040351 ADA ,=-1
0167 36154 026147 JMP *-5
0168*
0169 36155 002404 CMP04 CLA,INA
0170 36156 071234 STA FLINK SET FOR QUEUE TO EMPTY
0171 36157 015324 JSB PRNST INITIALIZE
0172 36160 036405 DEF CMP11 COMPILATION
0173 36161 002041 SEZ,RSS WAS FLAG BIT SET?
0174 36162 026240 JMP CMPL3 NO
0175*
0176** PROCESS NON-VARIABLE OPERAND **
0177*
0178 36163 040346 ADA ,=4 PROGRAM
0179 36164 002021 SSA,RSS INTEGER?
0180 36165 026703 JMP PRNST NO, MUST BE A PARAMETER
0181 36166 035230 CMPL1 ISZ SPTR YES, MOVE
0182 36167 065230 LDB SPTR TO NEXT WORD
0183 36170 055236 CPB NSPTR STATEMENT FINISHED?
0184 36171 026405 JMP CMP11 YES
0185 36172 064544 LDB ERSCA BEGIN SEARCH FOR REFERENCED SIMT
0186 36173 160001 CMP05 LDA 1,I FIRST STATEMENT => SOUGHT STATE.?
0187 36174 003000 CMA
0188 36175 141230 ADA SPTR,I
0189 36176 002024 SSA,INA
0190 36177 026207 JMP CMP06 FOUND ONE
0191 36200 006004 INB
0192 36201 054644 CPB ERS32 TEST FOR DONE
0193 36202 002001 RSS
0194 36203 026173 JMP CMP05

```

0195	36204	044411	ADB	+.31	
0196	36205	061575	LDA	SYMTB	STATEMENT IS IN LAST GROUP
0197	36206	026216	JMP	CMP07	
0198	36207	044412	CMP06	ADB	.*+32
0199	36210	002003	SZA,	RSS	B.* FIRST STATEMNT IN GROUP
0200	36211	026231	JMP	CMP09	TEST FOR FOUND
0201	36212	054644	CPB	ERS32	TEST FOR NOT THERE
0202	36213	026236	JMP	CMPL2	ERROR
0203	36214	160001	LDA	1,I	SET A.* FIRST WORD BEYOND GROUP
0204	36215	044351	ADB	.-1	
0205	36216	164001	CMP07	LDB	1,I
0206	36217	071621	STA	STCT1	SAVE END TEST
0207	36220	161230	LDA	SPTR,I	GET SEQUENCE NUMBER
0208	36221	006004	CMP08	INB	BUMP STATEMENT POINTER
0209	36222	144001	ADB	1,I	
0210	36223	044351	ADB	.-1	
0211	36224	055621	CPB	STCT1	TEST FOR DONE
0212	36225	026236	JMP	CMPL2	LABEL NOT FOUND--ERROR
0213	36226	150001	CPA	1,I	TEST FOR FOUND
0214	36227	026232	JMP	CMP09+1	
0215	36230	026221	JMP	CMP08	
0216	36231	164001	CMP09	LDB	1,I
0217	36232	175230	STB	SPTR,I	FOUND--REPLACE INTEFER
0218	36233	035552	ISZ	INFST	IN 'USING' STATEMENT?
0219	36234	026166	JMP	CMPL1	NO
0220	36235	026703	JMP	PRNS2	YES
0221	36236	015322	CMPL2	JSB	DCMPL
0222	36237	115106	JSB	RERRS,I	DECOMPILE
0223*					NON-EXISTENT STATEMENT NUMBER
0224**					
0225*					
0226	36240	071513	CMPL3	STA	STMP1
0227	36241	010371	AND	+.17B	SAVE SYMBOL
0228	36242	050371	CPA	+.17B	FUNCTION?
0229	36243	026327	JMP	CMPL6	YES
0230	36244	002003	SZA,	RSS	NO, STRING VARIABLE?
0231	36245	026350	JMP	CMPL9-3	YES
0232	36246	040346	ADA	.-4	NO,
0233	36247	002020	SSA		ARRAY?
0234	36250	026353	JMP	CMPL9	YES
0235	36251	015316	JSB	SSYMT	NO, COMPILE
0236	36252	035230	ISZ	SPTR	SIMPLE VARIABLE
0237	36253	054742	CPB	COMOP	'COMI'?
0238	36254	026320	JMP	CMP41	YES
0239	36255	055775	CPB	FOROP	NO, FOR-VARIABLE OF 'FOR'?
0240	36256	026301	JMP	CMPL4	YES
0241	36257	054646	CPB	NXTOP	NO, FOR-VARIABLE OF 'NEXT' ?
0242	36260	002001	RSS		YES
0243	36261	026704	JMP	PRNS2+1	NO
0244	36262	065234	LDB	FLINK	
0245	36263	006020	SSB		MAKE
0246	36264	007004	CMB,	INB	POSITIVE
0247	36265	055614	CPB	STMP2	MATCH LATEST <FOR STATEMENT> ?
0248	36266	026271	JMP	.*+3	YES
0249	36267	015322	JSB	DCMPL	NO, DECOMPILE

0250	36270	115107	JSB RERRS+1, I	NEXT NOT PRECEDED BY PROPER FOR
0251	36271	065234	LDB FLINK	
0252	36272	161614	LDA STMP2, I	REMOVE
0253	36273	071234	STA FLINK	VARIABLE
0254	36274	006020	SSB	WAS VARIABLE IN COMMON?
0255	36275	007401	CCB, RSS	NO
0256	36276	006400	CLB	NO
0257	36277	175614	STB STMP2, I	RESET AS SIMPLE VARIABLE
0258	36300	026704	JMP PRNS2+1	
0259	36301	161614	CMPL4 LDA STMP2, I	LOAD SECOND WORD OF TABLE ENTRY
0260	36302	002002	SZA	ALREADY IN FOR-QUEUE?
0261	36303	002007	INA, SZA, RSS	COMMON VARIABLE
0262	36304	026307	JMP CMPL5	
0263	36305	015322	JSB DCMPL	DECOMPILE
0264	36306	115110	JSB RERRS+2, I	NESTED "FOR'S" WITH SAME VARIABL
0265	36307	065614	CMPL5 LDB STMP2	
0266	36310	161614	LDA STMP2, I	WAS VARIABLE
0267	36311	002020	SSA	IN COMMON?
0268	36312	007004	CMB, INB	YES
0269	36313	061234	LDA FLINK	ADD
0270	36314	171614	STA STMP2, I	TO
0271	36315	075234	STB FLINK	FOR-QUEUE
0272	36316	035240	ISZ STYPE	DESTROY STATEMENT TYPE
0273	36317	026704	JMP PRNS2+1	
0274	36320	061614	CMP41 LDA STMP2	
0275	36321	164000	LDB A, I	GET POINTER
0276	36322	006002	SZB	ALREADY IN COMMON?
0277	36323	026403	JMP CMP10+1	
0278	36324	007400	CCB	FLAG VARIABLE AS
0279	36325	174000	STB A, I	CONTAINED IN COMMON
0280	36326	026704	JMP PRNS2+1	
0281	36327	015316	CMPL6 JSB SSYM	COMPILE FUNCTION NAME
0282	36330	055774	CPB DEFOP	FUNCTION DEFINITION?
0283	36331	002001	RSS	YES
0284	36332	026703	JMP PRNS2	NO
0285	36333	165614	LDB STMP2, I	PREVIOUSLY
0286	36334	006002	SZB	DEFINED?
0287	36335	026345	JMP CMPL8	YES
0288	36336	061614	LDA STMP2	NO
0289	36337	035240	ISZ STYPE	DESTROY STATEMENT TYPE
0290	36340	065230	CMPL7 LDB SPTR	ADVANCE
0291	36341	044355	ADB .+3	PROGRAM
0292	36342	075230	STB SPTR	POINTER
0293	36343	174000	STB 0, I	SAVE
0294	36344	026704	JMP PRNS2+1	POINTER
0295	36345	035230	CMPL8 ISZ SPTR	
0296	36346	015322	JSB DCMPL	DECOMPILE
0297	36347	115111	JSB RERRS+3, I	FUNCTION DEFINED TWICE
0298	36350	015316	JSB SSYM	COMPILE STRING VARIABLE
0299	36351	035613	ISZ STMP1	SET TO 'SINGLY SUBSCRIPTED'
0300	36352	002001	RSS	PROCESS POSSIBLE DECLARATION
0301	36353	015320	CMPL9 JSB ASYM	COMPILE ARRAY VARIABLE
0302	36354	002300	CCE	SET 'COM' FLAG
0303	36355	054742	CPB COMOP	'COM'?
0304	36356	026352	JMP CMP91	YES

```

0305 36357 054636 CPB DIMOP NO, 'DIM'?
0306 36360 002101 CLE,RSS YES==SET 'DIM' FLAG
0307 36361 026703 JMP PRNS2
0308 36362 165614 CMP91 LDB STMP2,I WAS VARIABLE
0309 36363 006002 SZB PREVIOUSLY DIMENSIONED?
0310 36364 026402 JMP CMP10 YES
0311 36365 065230 LDB SPTR NO, SAVE POINTER
0312 36366 044354 ADB .+2 TO DIMENSIONS
0313 36367 002040 SEZ DIMENSIONED IN 'COM' ?
0314 36370 007004 CMB,INB YES--FLAG IT
0315 36371 175614 STB STMP2,I NO
0316 36372 065230 LDB SPTR RESTORE
0317 36373 044354 ADB .+2 POINTER
0318 36374 061613 LDA STMP1 RETRIEVE SYMBOL
0319 36375 002011 SLA,RSS ADVANCE
0320 36376 044354 ADB .+2 POINTER
0321 36377 044354 ADB .+2 PAST
0322 36400 075230 STB SPTR ONE OR TWO
0323 36401 025705 JMP PRNS2+2
0324 36402 035230 CMP10 ISZ SPTR
0325 36403 015322 JSB DCMPL DECOMPILE
0326 36404 115112 JSB RERRS+4,I VARIABLE DEFINED TWICE
0327* *
0328** PROCESS END OF STATEMENT **
0329* *
0330 36405 055575 CMP11 CPB SYMTB END OF PROGRAM?
0331 36406 002001 RSS YES
0332 36407 026607 JMP PRNS1 NO
0333 36410 075230 STB SPTR INSURE CORRECT SETTING FOR SPTR
0334 36411 061240 LDA STYPE LAST STATEMENT
0335 36412 050650 CPA ENDOP AN 'END' ?
0336 36413 025416 JMP CMP12 YES
0337 36414 015322 JSB DCMPL NO, DECOMPILE
0338 36415 115113 JSB RERRS+5,I MISSING 'END'
0339 36416 002404 CMP12 CLA,INA
0340 36417 051234 CPA FLINK ALL FORS MATCHED?
0341 36420 026423 JMP ++3 YES
0342 36421 015322 JSB DCMPL DECOMPILE
0343 36422 115114 JSB RERRS+6,I 'FOR' WITHOUT 'NEXT'
0344 36423 CMP17 EQU *
0345 36423 002400 CLA
0346 36424 071600 STA VLFLG MUST RUN VALUE,
0347 36425 064056 LDB PBPTR SET POINTER TO
0348 36426 075504 STB FILTB END OF SYMBOL TABLE,
0349 36427 060273 LDA MLINK+1 IS CSAVE
0350 36430 040351 ADA .+?STAT-?LINK
0351 36431 160000 LDA 0,I RUNNING
0352 36432 050374 CPA .+5+CSAV=COM2
0353 36433 126005 JMP CSVRT,I YES==EXIT TO IT
0354*
0355* FILCT = 5 AT THIS POINT UNLESS THE PROGRAM CONTAINS A
0356* <FILES STATEMENT>. THE CALL TO SCHLB,I LEAVES VALTB =
0357* FILTB+7*(NUMBER OF FILES REQUESTED). IF NO <FILES STATEMENT>
0358* APPEARS, VALTB = FILTB,
0359*

```

0360	36434		CMP18	EQU *	
0361	36434	061606		LDA FILCT	ANY <FILES
0362	36435	050345		CPA .-5	STATEMENTS>?
0363	36436	026445		JMP CMP13	NO
0364	36437	114532		JSB SCHLB,I	REQUEST FILE TABLE
0365	36440	072037		DEF FILIB	
0366	36441	115123		JSB RERRS+13,I	BAD FORMAT OR ILLEGAL NAME
0367	36442	115124		JSB RERRS+14,I	MISSING OR PROTECTED FILE
0368	36443	115120		JSB RERRS+10,I	OUT OF STORAGE
0369	36444	027223		JMP VALUE+2	SUCCESSFUL REQUEST
0370	36445	065504	CMP13	LDB FILTB	SET VALUE TABLE
0371	36446	075576		STB VALTB	POINTER.
0372	36447	027223		JMP VALUE+2	

```

0374**
0375*** DECOMPILE ALL OR PART OF PROGRAM ***
0376**
0377*
0378* IF CFLAG[I] = 0 PROGRAM IS IN SOURCE, EXIT IMMEDIATELY;
0379* ELSE SET CFLAG[I] = 0 AND DECOMPILE PROGRAM. SPTR POINTS
0380* INITIALLY TO LAST WORD+1 OF COMPILED PROGRAM, ABSOLUTE
0381* ADDRESSES ARE REPLACED BY THE SEQUENCE NUMBERS TO WHICH
0382* THEY POINT. VARIABLE OPERAND POINTERS ARE REPLACED BY
0383* THEIR SYMBOL. PBPTR IS SET TO LAST WORD+1 OF PROGRAM,
0384*
0385 36450 060354 #DCMP LDA CFLAG PROGRAM
0386 36451 064273 LDB MLINK+1
0387 36452 044335 ADB .-?LINK
0388 36453 110001 AND 1,I COMPILED?
0389 36454 002003 SZA,RSS
0390 36455 026553 JMP DCMP4 NO
0391 36456 103100 CLF 0 YES
0392 36457 120001 XOR 1,I SET PROGRAM MODE
0393 36460 170001 STA 1,I TO 'UNCOMPILED'
0394 36461 102100 STF 0
0395 36462 060056 LDA PBPTR NULL
0396 36463 050702 CPA PBUFF PROGRAM?
0397 36464 026551 JMP DCMP3+2 YES
0398 36465 061230 LDA SPTR SPTR=0 TO FLAG
0399 36466 002003 SZA,RSS SEMI-COMPILED?
0400 36467 061575 LDA SYMTB YES==RESET IT TO CORRECT VALUE
0401 36470 071230 STA SPTR SET TERMINATION
0402 36471 071504 STA FILTB ADDRESS
0403 36472 015324 JSB PRNST INITIALIZE
0404 36473 036607 DEF PRNS1 DECOMPILE
0405 36474 006441 CLB,SEZ,RSS WAS FLAG BIT SET?
0406 36475 026515 JMP DCMP2 NO
0407*
0408** PROCESS NON-VARIABLE OPERAND **
0409*
0410 36476 040346 ADA .-4 PROGRAM
0411 36477 002021 SSA,RSS INTEGER?
0412 36500 026703 JMP PRNS2 NO
0413 36501 035230 DCMP1 ISZ SPTR YES, MOVE TO
0414 36502 065230 LDB SPTR NEXT WORD
0415 36503 055504 CPB FILTB DONE?
0416 36504 026547 JMP DCMP3 YES
0417 36505 055236 CPB NSPTR NO, STATEMENT DONE?
0418 36506 026610 JMP PRNS1+1 YES
0419 36507 161230 LDA SPTR,I NO, REPLACE
0420 36510 160000 LDA 0,I ABSOLUTE ADDRESS
0421 36511 171230 STA SPTR,I WITH SEQUENCE NUMBER
0422 36512 035552 ISZ INFST IN <USING STATEMENT>?
0423 36513 026501 JMP DCMP1 NO
0424 36514 026703 JMP PRNS2 YES
0425*
0426** PROCESS VARIABLE OPERAND **
0427*
0428 36515 040351 DCMP2 ADA .-1 COMPUTE

```

0429	36516	101117	RRR 15	SYMBOL TABLE
0430	36517	045575	ADB SYMTB	ADDRESS
0431	36520	161230	LDA SPTR,I	EXTRACT
0432	36521	010664	AND OPMSK	OPERATOR
0433	36522	130001	IOR 1,I	REPLACE OPERATOR=
0434	36523	171230	STA SPTR,I	OPERAND PAIR IN CODE
0435	36524	065240	LDB STYPE	
0436	36525	054636	CPB DIMOP	'DIM' ?
0437	36526	026532	JMP DCMP6	YES
0438	36527	054742	CPB COMOP	NO, 'COM'?
0439	36530	002001	RSS	YES
0440	36531	026703	JMP PRNS2	NO
0441	36532	065230	DCMP6 LDB SPTR	
0442	36533	006004	INB	
0443	36534	055504	CPB FILTB	DONE?
0444	36535	026547	JMP DCMP3	YES
0445	36536	006004	INB	NO
0446	36537	010371	AND .+17B	STRING
0447	36540	040346	ADA .+4	SIMPLE
0448	36541	002021	SSA,RSS	VARIABLE?
0449	36542	026703	JMP PRNS2	YES
0450	36543	040356	ADA .+4	NO, STRING
0451	36544	002003	SZA,RSS	VARIABLE?
0452	36545	002004	INA	YES, SET TO SINGLE SUBSCRIPT MOD
0453	36546	026375	JMP CMP10=5	
0454	36547	061575	DCMP3 LDA SYMTB	SET ACTIVE USER AREA POINTER
0455	36550	070056	STA PBPTR	TO LAST WORD+1 OF PROGRAM
0456	36551	002400	CLA	ZERO
0457	36552	071575	STA SYMTB	POINTER
0458	36553	170634	DCMP4 STA DCLC1,I	BLOCK CLOCK
0459	36554	064702	LDB PBUFF	
0460	36555	055577	CPB SPROG	COMMON ALLOCATED?
0461	36556	026670	JMP DCMP5	NO
0462	36557	054056	CPB PBPTR	YES, NULL PROGRAM?
0463	36560	026670	JMP DCMP5	YES
0464	36561	075514	STB DEST	NO
0465	36562	061577	LDA SPROG	SET UP
0466	36563	075577	STB SPROG	POINTERS
0467	36564	064056	LDB PBPTR	FOR MOVE
0468	36565	015500	JSB MOVER	REMOVE COMMON AREA
0469	36566	065514	LDB DEST	RESET END-OF-
0470	36567	074056	STB PBPTR	PROGRAM POINTER
0471	36570	114534	DCMP5 JSB ABCK,I	ABORT ATTEMPT DURING COMPILE?
0472	36571	160640	LDA DCLC2,I	NO==UNBLOCK
0473	36572	170634	STA DCLC1,I	CLOCK
0474	36573	125322	JMP DCMP1,I	

```

0002**
0003*** PROCESS NEXT STATEMENT OF PROGRAM ***
0004**
0005**
0006* USED BY CMPL AND DCML TO SCAN THROUGH THE PROGRAM,
0007* A 'JSB PRNST' INITIALIZES THE SCAN: (P+1) IS A POINTER
0008* TO THE CODE FOR HANDLING THE END-OF-STATEMENT CONDITION;
0009* ,LNUM HOLDS THE SEQUENCE NUMBER OF THE STATEMENT BEING
0010* PROCESSED; SPTR POINTS TO THE WORD OF THE PROGRAM BEING
0011* PROCESSED. PRNST HANDLES <REM STATEMENT>, <DATA STATEMENT>,
0012* STRING CONSTANTS, NULL OPERANDS, NUMERICAL CONSTANTS, AND
0013* <FILES STATEMENT>. OTHER CASES EXIT TO (P+2). PRNST IS
0014* RE-ENTERED DIRECTLY, LEAVING THE INITIALIZED EXIT ADDRESSES
0015* UNCHANGED THROUGHOUT PROCESSING OF THE PROGRAM.
0016*
0017 36574 161324 #PNST LDA PRNST,I SET POINTER TO
0018 36575 071242 STA STEND END-OF-STATEMENT
0019 36576 035324 ISZ PRNST PROCESSING ROUTINE
0020 36577 060452 LDA DFILT INITIALIZE POINTER TO
0021 36600 071605 STA FILPT <FILES STATEMENT> TABLE
0022 36601 002400 CLA INITIALIZE
0023 36602 071617 STA COMSN COM FLAG
0024 36603 071607 STA USESN AND USING FLAG
0025 36604 060345 LDA ,=5 INITIALIZE <FILES
0026 36605 071606 STA FILCT STATEMENT> COUNTER
0027 36606 065577 LDB SPRQG INITIAL PROGRAM POINTER
0028 36607 075230 PRNS1 STB SPTR SET PROGRAM POINTER TO STATEMENT
0029 36610 161230 LDA SPTR,I SAVE STATEMENT
0030 36611 071570 STA ,LNUM SEQUENCE NUMBER
0031 36612 035230 ISZ SPTR COMPUTE
0032 36613 145230 ADB SPTR,I LENGTH
0033 36614 075236 STB NSPTR SAVE POINTER TO NEXT STATEMENT
0034 36615 035230 ISZ SPTR EXTRACT
0035 36616 161230 LDA SPTR,I STATEMENT
0036 36617 010664 AND OPMSK TYPE
0037 36620 071240 STA STYPE SAVE IT
0038 36621 050742 CPA COMOP 'COM' ?
0039 36622 026625 JMP ++3 YES
0040 36623 075617 STB COMSN NO--CLEAR COM FLAG.
0041 36624 026635 JMP PRNS4
0042 36625 065617 LDB COMSN NON-COM
0043 36626 006003 SZB,RSS STATEMENT SEEN?
0044 36627 026704 JMP PRNS2+1 NO
0045 36630 065230 LDB SPTR YES, RESET
0046 36631 044350 ADB ,=2 STATEMENT
0047 36632 075230 STB SPTR POINTER
0048 36633 015322 JSB DCML ERROR
0049 36634 115160 JSB RERRS+42,I 'COM' OUT OF ORDER
0050 36635 050642 PRNS4 CPA REMOP 'REM' ?
0051 36636 026705 JMP PRNS2+2 YES
0052 36637 050652 CPA DATOP NO, DATA?
0053 36640 026705 JMP PRNS2+2 YES
0054 36641 050746 CPA IMGOP NO, IMAGE?
0055 36642 026705 JMP PRNS2+2 YES
0056 36643 050660 CPA FILOP NO, <FILES STATEMENT> ?

```


0057	36644	002001	RSS	YES
0058	36645	026662	JMP PRNS5	NO
0059	36646	065230	LDB SPTR	
0060	36647	044350	ADB ,=2	
0061	36650	035606	ISZ FILCT	TOO MANY <FILES STATEMENTS>?
0062	36651	026655	JMP **4	NO
0063	36652	075230	STB SPTR	YES--RESET STATEMENT POINTER
0064	36653	015322	JSB DCMPL	
0065	36654	115150	JSB RERRS+34,I	EXTRA <FILES STATEMENT>
0066	36655	006004	INB	
0067	36656	175605	STB FILPT,I	SAVE POINTER TO <FILES STATEMENT
0068	36657	035605	ISZ FILPT	
0069	36660	065236	LDB NSPTR	SKIP OVER REST
0070	36661	026705	JMP PRNS2+2	OF STATEMENT
0071	36662	065230	PRNS5 LDB SPTR	
0072	36663	052006	CPA MATOP	'MATI' STATEMENT?
0073	36664	006005	INB,RSS	YES, BUMP TO NEXT WORD
0074	36665	026670	JMP **3	NO
0075	36666	160001	LDA B,I	EXTRACT
0076	36667	010664	AND OPMSK	OPERATOR
0077	36670	050656	CPA PRTOP	'PRINT' STATEMENT?
0078	36671	006005	INB,RSS	YES, BUMP TO NEXT WORD
0079	36672	026701	JMP PRNS6	NO
0080	36673	160001	LDA 1,I	EXTRACT
0081	36674	010664	AND OPMSK	OPERATOR
0082	36675	050776	CPA USEUP	'USING' STATEMENT?
0083	36676	003401	CCA,RSS	YES, SET (A)
0084	36677	002001	RSS	NO
0085	36700	071607	STA USESN	SET 'USING SEEN' FLAG
0086	36701	071552	PRNS6 STA INFST	SET INTEGER FOLLOWS FLAG
0087	36702	002001	RSS	
0088*				*
0089**			PROCESS NEXT WORD OF STATEMENT	**
0090*				*
0091	36703	035230	PRNS2 ISZ SPTR	MOVE TO
0092	36704	065230	LDB SPTR	NEXT WORD
0093	36705	055504	CPB FILTB	DECOMPILE FINISHED?
0094	36706	026547	JMP DCMP3	YES
0095	36707	055236	CPB NSPTR	NO, STATEMENT FINISHED?
0096	36710	125242	JMP STEND,I	YES
0097	36711	161230	LDA SPTR,I	NO, ISOLATE
0098	36712	010664	AND OPMSK	OPERATOR
0099	36713	050445	CPA B1000	" ?
0100	36714	026724	JMP PRNS3	YES
0101	36715	121230	XOR SPTR,I	NO, GET OPERAND
0102	36716	002003	SZA,RSS	NULL OPERAND?
0103	36717	026703	JMP PRNS2	YES
0104	36720	001265	RAL,CLE,ERA	NO, PUT FLAG BIT IN (E)
0105	36721	002003	SZA,RSS	NUMBER?
0106	36722	026340	JMP CMPL7	YES
0107	36723	125324	JMP PRNST,I	NO
0108	36724	121230	PRNS3 XOR SPTR,I	EXTRACT LENGTH
0109	36725	040355	ADA ,+3	COMPUTE
0110	36726	001100	ARS	POINTER
0111	36727	041230	ADA SPTR	TO CLOSING

```

0112 36730 071230      STA SPTR          QUOTE
0113 36731 026704      JMP PRNS2+1
0114**
0115*** 'COMPILE' A SYMBOL ***
0116**
0117*
0118* ENTER WITH A SYMBOLIC NAME IN STMP1 AND SEARCH THE
0119* SYMBOL TABLE FOR A MATCHING ENTRY, IF NO ENTRY IS
0120* FOUND, APPEND A NEW TWO WORD ENTRY WITH THE SYMBOL
0121* IN THE FIRST WORD AND 0 IN THE SECOND, THE SYMBOL IN
0122* THE PROGRAM IS REPLACED WITH THE ORDINAL NUMBER OF
0123* ITS SYMBOL TABLE ENTRY, EXIT WITH THE NEW PROGRAM
0124* WORD IN (A), A POINTER TO THE SECOND WORD OF THE
0125* TABLE ENTRY IN STMP2, AND THE STATEMENT TYPE IN (B).
0126*
0127 36732 060356      #SSYM LDA .+4      INSURE SPACE
0128 36733 015326      JSB CUSP          FOR NEW ENTRY
0129 36734 061613      LDA STMP1        RETRIEVE SYMBOL
0130 36735 065575      LDB SYMTB
0131 36736 054056      SYMT1 CPB PBPTR  SYMBOL TABLE EXHAUSTED?
0132 36737 026756      JMP SYMT3        YES
0133 36740 150001      CPA 1,I          NO, IS NEXT SYMBOL A MATCH?
0134 36741 026766      JMP SYMT5        YES
0135 36742 044354      ADB .+2         NO, MOVE
0136 36743 026736      JMP SYMT1        TO NEXT ENTRY
0137*
0138** HANDLE UNMATCHED ARRAY SYMBOL **
0139*
0140 36744 051613      SYMT2 CPA STMP1  "DON'T KNOW" SYMBOL?
0141 36745 002001      RSS             YES
0142 36746 026756      JMP SYMT3       NO, MAKE NORMAL TABLE ENTRY
0143 36747 034056      ISZ PBPTR      ALLOCATE SPACE
0144 36750 034056      ISZ PBPTR      FOR NEW ENTRY
0145 36751 061614      LDA STMP2      WAS A SINGLE OR DOUBLE
0146 36752 002006      INA,SZA       SUBSCRIPTED ENTRY FOUND?
0147 36753 026761      JMP SYMT4       YES, INCLUDE POINTER IN ENTRY
0148 36754 170001      STA 1,I        NO, SAVE SPACE FOR LATER ENTRY
0149 36755 044354      ADB .+2        WITH NUMBER OF DIMENSIONS
0150*
0151** CREATE A NEW TABLE ENTRY **
0152*
0153 36756 034056      SYMT3 ISZ PBPTR  ALLOCATE SPACE
0154 36757 034056      ISZ PBPTR      FOR NEW ENTRY
0155 36760 002400      CLA           INITIALIZE
0156 36761 006004      SYMT4 INB       SECOND
0157 36762 170001      STA 1,I        WORD
0158 36763 044351      ADB .-1        PUT SYMBOL
0159 36764 061613      LDA STMP1      IN FIRST
0160 36765 170001      STA 1,I        WORD
0161*
0162** 'COMPILE' PROGRAM WORD **
0163*
0164 36766 006004      SYMT5 INB       COMPUTE
0165 36767 075614      STB STMP2
0166 36770 007000      CMB           RELATIVE

```

0167	36771	045575	ADB SYMTB	
0168	36772	007004	CMB, INB	ADDRESS
0169	36773	005100	BRS	
0170	36774	161230	LDA SPTR, I	REPLACE SYMBOL
0171	36775	010664	AND OPMSK	IN PROGRAM
0172	36776	030001	IOR 1	WITH RELATIVE
0173	36777	171230	STA SPTR, I	ADDRESS
0174	37000	065240	LDB STYPE	LOAD STATEMENT TYPE
0175	37001	125316	JMP SSYMT, I	

```

0177**
0178*** PROCESS ARRAY SYMBOL ***
0179**
0180*
0181* ENTER WITH AN ARRAY NAME IN STMP1. IF A MATCHING
0182* SYMBOL TABLE ENTRY EXISTS, PROCEED AS IN SSYMT. ELSE IF
0183* THE ARRAY IS SINGLY OR DOUBLY SUBSCRIPTED (LAST FOUR
0184* BITS OF NAME ARE 0001 OR 0010): EXIT IS TO ERROR ON
0185* FINDING A CONFLICTING ENTRY; ON FINDING ONLY A "DON'T
0186* KNOW" ENTRY (LAST FOUR BITS 0011), PROCEED AS IN SSYMT,
0187* PLACING THE APPROPRIATE ENTRY IN THE TWO WORDS ABOVE
0188* THE "DON'T KNOW" ENTRY AND SETTING A POINTER TO ITS
0189* SECOND WORD INTO THE SECOND WORD OF THE "DON'T KNOW"
0190* ENTRY. IF THE SYMBOL IS AN UNMATCHED "DON'T KNOW"
0191* ARRAY NAME, APPEND A SYMBOL TABLE ENTRY; IF A SINGLY
0192* OR DOUBLY SUBSCRIPTED VERSION OF THE ARRAY HAS BEEN
0193* PREVIOUSLY FOUND, PLACE A POINTER TO THE SECOND WORD
0194* OF THE PREVIOUS ENTRY INTO THE SECOND WORD OF THE NEW
0195* "DON'T KNOW" ENTRY; OTHERWISE LEAVE TWO WORDS ABOVE
0196* THE NEW ENTRY.
0197*
0198 37002 061320 #ASYM LDA ASYMT SET RETURN
0199 37003 071316 STA SSYMT ADDRESS
0200 37004 003400 CCA SET MATCH
0201 37005 071614 STA STMP2 FLAG FALSE
0202 37006 062003 LDA APTR1 INITIALIZE
0203 37007 071320 STA ASYMT SEARCH LOOP
0204 37010 060356 LDA ,+4 INSURE SPACE
0205 37011 015326 JSB CUSP FOR NEW ENTRY
0206 37012 065575 LDB SYMTB
0207 37013 061613 LDA STMP1 RETRIEVE SYMBOL
0208 37014 030355 IOR ,+3 SET ARRAY SYMBOL
0209 37015 027030 JMP SYMT7+3 TO "DON'T KNOW"
0210 37016 040350 SYMT6 ADA ,=2 MATCH AS
0211 37017 150001 CPA 1,1 'SINGLE SUBSCRIPT'?
0212 37020 027033 JMP SYMT8 YES
0213 37021 002004 INA NO, MATCH AS
0214 37022 150001 CPA 1,1 'DOUBLE SUBSCRIPT'?
0215 37023 027033 JMP SYMT8 YES
0216 37024 002004 INA NO, MATCH AS
0217 37025 150001 SYMT7 CPA 1,1 "DON'T KNOW"?
0218 37026 027047 JMP SYMT9 YES
0219 37027 044354 ADB ,+2 NO, MORE SYMBOL
0220 37030 054056 CPB PBPTR TABLE ENTRIES?
0221 37031 026744 JMP SYMT2 NO
0222 37032 125320 JMP ASYMT,1 YES
0223 37033 051613 SYMT8 CPA STMP1 DOES ENTRY MATCH SYMBOL?
0224 37034 026766 JMP SYMT5 YES
0225 37035 030355 IOR ,+3 NO, IS SYMBOL OF
0226 37036 051613 CPA STMP1 TYPE "DON'T KNOW"?
0227 37037 027042 JMP ,+3 YES
0228 37040 015322 JSB DCMPL NO, DECOMPILE
0229 37041 115121 JSB RERRS+11,1 SUBSCRIPT CONFLICT
0230 37042 075614 STB STMP2 SAVE POINTER TO ENTRY
0231 37043 066002 LDB APTR2 CONTINUE SEARCH

```

0232	37044	075320		STB ASYMT	FOR POSSIBLE
0233	37045	065614		LDB STMP2	"DON'T KNOW"
0234	37046	027027		JMP SYMT7+2	ENTRY
0235	37047	051613	SYMT9	CPA STMP1	DOES ENTRY MATCH SYMBOL?
0236	37050	026766		JMP SYMT5	YES
0237	37051	006004		INB	NO, NEW ENTRY TO BE MADE
0238	37052	060001		LDA 1	SET POINTER TO
0239	37053	044350		ADB .+2	NEW ENTRY INTO
0240	37054	174000		STB 0,I	"DON'T KNOW" ENTRY
0241	37055	002400		CLA	MAKE NEW
0242	37056	026762		JMP SYMT4+1	ENTRY
0243**					**
0244***	RESTORE	SYMBOL	TABLE	POINTERS	***
0245**					**
0246*					
0247*	USED BY	CSAVE	TO	RESTORE	THE SYMBOL TABLE TO ITS APPEARANCE
0248*	BEFORE	VALUE	HAS	BEEN	RUN, I.E. THE POINTERS TO DIM AND COM
0249*	STATEMENTS	ARE	PLACED	IN	THE SECOND WORD OF ARRAY AND STRING
0250*	ENTRIES	IN	THE	SYMBOL	TABLE, 'DON'T KNOW' ENTRIES ARE LINKED
0251*	TO	THE	CORRESPONDING	KNOWN	ONE AND THE SECOND WORD OF DEFAULT
0252*	ENTRIES	IS	SET	TO	ZERO.
0253*					
0254	37057	065577	#RSTP	LDB SPROG	INITIALIZE PROGRAM
0255	37060	075230		STB SPTR	POINTER
0256	37061	055575		CPB SYMTB	FINISHED PROGRAM SCAN?
0257	37062	027147		JMP RSTP5	YES
0258	37063	035230		ISZ SPTR	NO--COMPUTE
0259	37064	145230		ADB SPTR,I	NEXT STATEMENT
0260	37065	075236		STB NSPTR	POINTER
0261	37066	035230		ISZ SPTR	
0262	37067	161230		LDA SPTR,I	EXTRACT
0263	37070	010664		AND OPMSK	OPERATOR
0264	37071	050742		CPA COMOP	'COM'?
0265	37072	027077		JMP RSTP1+1	YES
0266	37073	050636		CPA DIMOP	NO, 'DIM'?
0267	37074	002001		RSS	YES
0268	37075	027060		JMP #RSTP+1	NO
0269	37076	006400	RSTP1	CLB	
0270	37077	075621		STB DCFLG	SET COM-DIM FLAG
0271	37100	161230	RSTP2	LDA SPTR,I	COMPUTE
0272	37101	010700		AND OPDMK	POINTER
0273	37102	040351		ADA .-1	INTO
0274	37103	001000		ALS	SYMBOL
0275	37104	041575		ADA SYMTB	TABLE
0276	37105	071613		STA STMP1	
0277	37106	160000		LDA 0,I	EXTRACT
0278	37107	010371		AND .+17B	SYMBOL
0279	37110	040346		ADA .-4	SIMPLE
0280	37111	002020		SSA	VARIABLE?
0281	37112	027125		JMP RSTP4	NO
0282	37113	003400		CCA	YES
0283	37114	065613		LDB STMP1	FLAG
0284	37115	006004		INB	AS 'IN
0285	37116	170001		STA 1,I	COMMON'
0286	37117	065230		LDB SPTR	UPDATE

0287	37120	006004	RSTP3	INB	STATEMENT
0288	37121	075230		STB SPTR	POINTER
0289	37122	055236		CPB NSPTR	END OF STATEMENT?
0290	37123	027060		JMP #RSTP+1	YES
0291	37124	027100		JMP RSTP2	NO
0292	37125	065230	RSTP4	LDB SPTR	SET POINTER
0293	37126	044354		ADB ,+2	TO DIMENSION
0294	37127	061621		LDA DCFLG	
0295	37130	002002		SZA	'COMI'?
0296	37131	007004		CMB, INB	YES==COMPLEMENT POINTER
0297	37132	061613		LDA STMP1	STORE
0298	37133	002004		INA	IN SYMBOL
0299	37134	174000		STB 0, I	TABLE
0300	37135	065230		LDB SPTR	FINISHED
0301	37136	044356		ADB ,+4	
0302	37137	055236		CPB NSPTR	STATEMENT?
0303	37140	027060		JMP #RSTP+1	YES
0304	37141	044351		ADB ,=1	NO, TWO=
0305	37142	160001		LDA 1, I	
0306	37143	010664		AND OPMSK	DIMENSIONAL?
0307	37144	050744		CPA SCOMM	
0308	37145	044354		ADB ,+2	YES==BUMP PAST SECOND DIMENSION
0309	37146	027120		JMP RSTP3	NO
0310*					
0311*	SCAN SYMBOL TABLE FOR 'DON'T KNOW' ENTRIES AND				
0312*	DEFAULT DIMENSION ENTRIES				
0313*					
0314	37147	065575	RSTP5	LDB SYMTB	INITIALIZE TABLE POINTER
0315	37150	055504		CPB FILTB	FINISHED SYMBOL TABLE SCAN?
0316	37151	027215		JMP RSTP9	YES
0317	37152	075613		STB STMP1	NO==SAVE POINTER
0318	37153	160001		LDA 1, I	DON'T
0319	37154	010371		AND ,+17B	KNOW
0320	37155	050355		CPA ,+3	ENTRY?
0321	37156	027175		JMP RSTP7	YES
0322	37157	040347		ADA ,=3	NO, STRING
0323	37160	002021		SSA, RSS	OR ARRAY?
0324	37161	027172		JMP RSTP6	NO
0325	37162	006004		INB	YES
0326	37163	160001		LDA 1, I	DEFAULT
0327	37164	003004		CMA, INA	
0328	37165	041575		ADA SYMTB	DIMENSIONS?
0329	37166	002021		SSA, RSS	
0330	37167	027172		JMP RSTP6	NO
0331	37170	002400		CLA	YES==STORE A ZERO
0332	37171	170001		STA 1, I	IN SYMBOL TABLE
0333	37172	065613	RSTP6	LDB STMP1	BUMP TO
0334	37173	044354		ADB ,+2	NEXT SYMBOL
0335	37174	027150		JMP RSTP5+1	
0336*					
0337*	PROCESS 'DON'T KNOW' ENTRY				
0338*					
0339	37175	075614	RSTP7	STB STMP2	
0340	37176	065575		LDB SYMTB	IS THERE
0341	37177	003400		CCA	A MATCHING

0342	37200	141614	ADA	STMP2,I	TWO-DIMENSIONAL
0343	37201	150001	CPA	1,I	ENTRY?
0344	37202	027210	JMP	RSTP8	YES
0345	37203	040351	ADA	.-1	NO, MATCHING ONE-
0346	37204	150001	CPA	1,I	DIMENSIONAL ENTRY?
0347	37205	027210	JMP	RSTP8	YES
0348	37206	044354	ADB	.+2	NO-BUMP TO
0349	37207	027177	JMP	RSTP7+2	NEXT SYMBOL
0350	37210	006004	RSTP8	INB	LINK 'DON'T
0351	37211	061613	LDA	STMP1	KNOW: ENTRY
0352	37212	002004	INA		WITH MATCHING
0353	37213	174000	STB	0,I	KNOWN ONE
0354	37214	027172	JMP	RSTP6	
0355	37215	002400	RSTP9	CLA	SET STORAGE
0356	37216	071600	STA	VLFLG	UNALLOCATED FLAG
0357	37217	074056	STB	PBPTR	RESET END-OF-PROGRAM POINTER
0358	37220	125522	JMP	RSTPT,I	

```

0360**
0361*** BUILD THE VALUE TABLE ***
0362**
0363*
0364* IF NO VALUE TABLE EXISTS, ONE IS BUILT FROM THE SYMBOL
0365* TABLE AND INITIALIZED; IF IT ALREADY EXISTS, IT IS
0366* INITIALIZED. IN BUILDING THE VALUE TABLE, EACH ENTRY
0367* IN THE SYMBOL TABLE IS CHECKED: FOR FUNCTIONS THE
0368* EXISTENCE OF A DEFINING FORMULA IS CHECKED; FOR SIMPLE
0369* VARIABLES TWO WORDS ARE ALLOCATED AND SET TO 'UNDEFINED'
0370* AND A POINTER TO THEM IS PLACED IN THE SECOND WORD OF
0371* THE SYMBOL TABLE ENTRY; FOR ARRAYS FOUR WORDS ARE
0372* ALLOCATED FOR THE DECLARED AND DYNAMIC DIMENSIONS,
0373* THE DIMENSIONS ARE INITIALIZED EITHER FROM A
0374* <DIM STATEMENT> IN THE PROGRAM OR THE DEFAULT
0375* DIMENSIONS, ARRAY SPACE IS ALLOCATED AT TWO WORDS PER
0376* ARRAY ELEMENT CONTIGUOUS WITH THE DIMENSIONS, THE
0377* ELEMENTS ARE INITIALIZED TO 'UNDEFINED,' AND A
0378* POINTER TO THE FIRST ELEMENT IS PLACED IN THE SECOND
0379* WORD OF THE SYMBOL TABLE ENTRY; FOR STRINGS FOLLOW THE
0380* PATTERN FOR ARRAYS WITH ONE WORD HOLDING THE PHYSICAL
0381* DIMENSION IN BITS 15=8 AND THE DYNAMIC DIMENSION IN
0382* BITS 7=0 (DIMENSION HERE MEANS LENGTH AS NUMBER OF
0383* CHARACTERS), STRING SPACE IS ALLOCATED ONE WORD PER
0384* TWO CHARACTERS, AND THE DYNAMIC LENGTH IS INITIALIZED
0385* TO ZERO. FOR "DON'T KNOW" ARRAY ENTRIES, THE SECOND
0386* WORD OF THE SYMBOL TABLE ENTRY IS COPIED FROM THE
0387* ASSOCIATED SINGLY OR DOUBLY SUBSCRIPTED ENTRY (OR
0388* EXIT TO ERROR IF NONE EXISTS).
0389* FOR VARIABLES WHICH HAVE BEEN DECLARED IN A <COM
0390* STATEMENT>, STORAGE IS ALLOCATED IN THE COMMON AREA
0391* WHICH RESIDES AHEAD OF THE PROGRAM. FOR ARRAYS AND
0392* STRINGS, THIS AREA IS LEFT UNDISTURBED IF THE DIMENSIONS
0393* DECLARED IN THE <COM STATEMENT> MATCH THOSE FOUND IN
0394* THE COMMON AREA, AND THE DYNAMIC DIMENSIONS ARE CONSISTENT
0395* IF A VALUE TABLE ALREADY EXISTS, VARIABLES IN COMMON ARE
0396* LEFT UNTOUCHED, VALUES OF SIMPLE VARIABLES AND ARRAY
0397* ELEMENTS ARE SET TO 'UNDEFINED' AND DYNAMIC ARRAY
0398* DIMENSIONS ARE SET TO DECLARED DIMENSIONS; THE DYNAMIC
0399* LENGTHS OF STRINGS ARE SET TO ZERO. EXIT TO XEC IF
0400* PROCESSING IS SATISFACTORILY COMPLETED.
0401*
0402 37221 065232 VALUE LDB FCORE INSURE CORRECT
0403 37222 074056 STB PBPTR SETTING FOR PBPTR
0404 37223 064702 LDB PBUFF INITIALIZE
0405 37224 075620 STB COMPT COMMON POINTER
0406 37225 065575 LDB SYMTB SET (B) TO
0407 37226 002001 RSS SYMBOL TABLE
0408 37227 006004 VALU1 INB SYMBOL TABLE
0409 37230 055504 CPB FILTB EXHAUSTED?
0410 37231 027662 JMP VAL99 YES
0411 37232 160001 LDA 1,I NO, LOAD SYMBOL
0412 37233 006004 INB POINT (B) TO VALUE TABLE POINTER
0413 37234 002003 SZA,RSS NULL SYMBOL?
0414 37235 027555 JMP VAL14 YES

```


0415	37236	010371		AND .+178	NO
0416	37237	050371		CPA .+178	FUNCTION?
0417	37240	027301		JMP VALU4	YES
0418	37241	002003		SZA,RSS	NO, STRING VARIABLE?
0419	37242	027557		JMP VAL15	YES
0420	37243	040346		ADA .-4	NO,
0421	37244	002020		SSA	ARRAY?
0422	37245	027306		JMP VALU5	YES
0423*					*
0424**	INITIALIZE	SIMPLE	VARIABLE	**	**
0425*					*
0426	37246	061600		LDA VLFLG	SIMPLE VARIABLE
0427	37247	002003		SZA,RSS	STORAGE ALLOCATED?
0428	37250	027263		JMP VALU3	NO
0429	37251	160001		LDA 1,I	YES
0430	37252	003004		CMA,INA	VARIABLE
0431	37253	040001		ADA 1	IN
0432	37254	002021		SSA,RSS	COMMON?
0433	37255	027227		JMP VALU1	YES
0434	37256	160001		LDA 1,I	NO
0435	37257	071613	VALU2	STA VTMP1	SAVE POINTER TO VALUE
0436	37260	003400		CCA	SET
0437	37261	171613		STA VTMP1,I	VALUE TO
0438	37262	027227		JMP VALU1	UNDEFINED
0439	37263	160001	VALU3	LDA 1,I	VARIABLE
0440	37264	002020		SSA	IN COMMON?
0441	37265	027274		JMP VAL31	YES
0442	37266	060354		LDA .+2	NO--ALLOCATE
0443	37267	015326		JSB CUSP	STORAGE
0444	37270	070056		STA PBPTR	FOR VALUE
0445	37271	040350		ADA .-2	PUT VALUE POINTER
0446	37272	170001		STA 1,I	INTO SYMBOL TABLE
0447	37273	027257		JMP VALU2	
0448	37274	061620	VAL31	LDA COMPT	ALLOCATE STORAGE
0449	37275	170001		STA 1,I	IN COMMON
0450	37276	040354		ADA .+2	UPDATE COMMON
0451	37277	071620		STA COMPT	POINTER
0452	37300	027227		JMP VALU1	
0453*					*
0454**	CHECK	FUNCTION	**	**	**
0455*					*
0456	37301	160001	VALU4	LDA 1,I	WAS FUNCTION
0457	37302	002002		SZA	DEFINED?
0458	37303	027227		JMP VALU1	YES
0459	37304	015322		JSB DCMP	NO, DECOMPILE
0460	37305	115115		JSB RERRS+7,I	UNDEFINED FUNCTION
0001*					*
0002**	INITIALIZE	ARRAY	**	**	**
0003*					*
0004	37306	050351	VALU5	CPA .-1	IS ARRAY TYPE "DON'T KNOW" ?
0005	37307	027546		JMP VAL13	YES
0006	37310	075613		STB VTMP1	NO, SAVE POINTER TO SYMBOL TABLE
0007	37311	002004		INA	SAVE INFORMATION ON
0008	37312	071614		STA VTMP2	NUMBER OF DIMENSIONS
0009	37313	061600		LDA VLFLG	STORAGE

0010	37314	002002	SZA	ALLOCATED?
0011	37315	027400	JMP VAL12	YES
0012	37316	160001	LDA 1,I	NO
0013	37317	002020	SSA	IN COMMON?
0014	37320	027422	JMP VAL51	YES
0015	37321	165613	LDB VTMP1,I	NO, LOAD POINTER TO DIMENSIONS
0016	37322	060056	LDA PBPTR	SET POINTER TO
0017	37323	071615	STA VTMP3	DIMENSION ENTRY
0018	37324	060356	LDA .+4	ALLOCATE
0019	37325	015326	JSB CUSP	SPACE
0020	37326	070056	STA PBPTR	FOR ENTRY
0021	37327	171613	STA VTMP1,I	SYMBOL TABLE POINTER TO ARRAY
0022	37330	006003	SZB,RSS	DEFAULT DIMENSIONS?
0023	37331	027403	JMP VAL11	YES
0024	37332	160001	LDA 1,I	NO, LOAD ROW DIMENSION
0025	37333	044354	ADB .+2	BUMP POINTER
0026	37334	035614	VALU6 ISZ VTMP2	TWO DIMENSIONAL?
0027	37335	006405	CLB,INB,RSS	NO, SET COLUMN DIMENSION TO 1
0028	37336	164001	LDB 1,I	YES, LOAD COLUMN DIMENSION
0029	37337	171615	STA VTMP3,I	PUT
0030	37340	035615	ISZ VTMP3	DECLARED DIMENSIONS
0031	37341	175615	STB VTMP3,I	IN VALUE TABLE
0032	37342	035615	VALU7 ISZ VTMP3	PUT
0033	37343	171615	STA VTMP3,I	DYNAMIC DIMENSIONS
0034	37344	035615	ISZ VTMP3	IN
0035	37345	175615	STB VTMP3,I	VALUE TABLE
0036	37346	100200	MPY VTMP3,I	COMPUTE NUMBER OF ARRAY ELEMENTS
	37347	101615		
0037	37350	006003	SZB,RSS	TOO
0038	37351	002020	SSA	LARGE?
0039	37352	027401	JMP VAL10	YES
0040	37353	071616	STA VTMP4	SAVE POSITIVE
0041	37354	003004	CMA,INA	AND NEGATIVE
0042	37355	071614	STA VTMP2	COUNT
0043	37356	065615	LDB VTMP3	HAS
0044	37357	006004	INB	ARRAY BEEN
0045	37360	054056	CPB PBPTR	ALLOCATED?
0046	37361	027371	JMP VALU9	NO
0047	37362	003400	VALU8 CCA	INITIALIZE
0048	37363	170001	STA 1,I	ARRAY ELEMENT
0049	37364	044354	ADB .+2	TO 'UNDEFINED'
0050	37365	035614	ISZ VTMP2	DONE?
0051	37366	027362	JMP VALU8	NO
0052	37367	065613	LDB VTMP1	YES
0053	37370	027227	JMP VALU1	
0054	37371		VALU9 EQU *	
0055	37371	042000	ADA .5000	ARRAY
0056	37372	002020	SSA	TOO LARGE?
0057	37373	027401	JMP VAL10	YES
0058	37374	061616	LDA VTMP4	NO
0059	37375	001000	ALS	ALLOCATE
0060	37376	015326	JSB CUSP	SPACE
0061	37377	070056	STA PBPTR	FOR ARRAY
0062	37400	027362	JMP VALU8	
0063	37401	015322	VAL10 JSB DCML	DECOMPILE

0064	37402	115116		JSB RERRS+8,I	ARRAY TOO LARGE
0065	37403	060364	VAL11	LDA .+10	LOAD (A) WITH 10
0066	37404	066001		LDB A,10	LOAD (B) WITH
0067	37405	027334		JMP VALU6	ADDRESS OF 10
0068	37406	160001	VAL12	LDA 1,I	IS ARRAY
0069	37407	003004		CMA,INA	
0070	37410	040001		ADA 1	IN COMMON?
0071	37411	002021		SSA,RSS	
0072	37412	027227		JMP VALU1	YES
0073	37413	161613		LDA VTMP1,I	NO--LOAD
0074	37414	040346		ADA .-4	
0075	37415	071615		STA VTMP3	DECLARED
0076	37416	161615		LDA VTMP3,I	
0077	37417	035615		ISZ VTMP3	DIMENSIONS
0078	37420	165615		LDB VTMP3,I	
0079	37421	027342		JMP VALU7	
0080	37422	165613	VAL51	LDB VTMP1,I	SET
0081	37423	007004		CMB,INB	DIMENSION
0082	37424	075617		STB VTMP5	POINTER
0083	37425	175613		STB VTMP1,I	POSITIVE
0084	37426	061620		LDA COMPT	SET
0085	37427	071615		STA VTMP3	POINTER
0086	37430	040356		ADA .+4	IN SYMBOL
0087	37431	171613		STA VTMP1,I	TABLE
0088	37432	160001		LDA 1,I	PHYSICAL ROW DIMENSION
0089	37433	151615		CPA VTMP3,I	SAME AS DECLARED DIMENSION?
0090	37434	002001		RSS	YES
0091	37435	027504		JMP VAL52	NO
0092	37436	044354		ADB .+2	B=> SECOND DIMENSION
0093	37437	061614		LDA VTMP2	TWO
0094	37440	050350		CPA .-2	DIMENSIONAL?
0095	37441	006405		CLB,INB,RSS	NO--SET COLUMN DIMENSION TO 1
0096	37442	164001		LDB 1,I	YES--LOAD COLUMN DIMENSION
0097	37443	035615		ISZ VTMP3	PHYSICAL COLUMN DIMENSION
0098	37444	155615		CPB VTMP3,I	SAME AS DECLARED DIMENSION
0099	37445	002001		RSS	YES
0100	37446	027504		JMP VAL52	NO
0101	37447	161620		LDA COMPT,I	COMPUTE SIZE OF
0102	37450	100200		MPY VTMP3,I	ARRAY AS DECLARED
		37451			
0103	37452	006003		SZB,RSS	TOO
0104	37453	002020		SSA	LARGE?
0105	37454	027504		JMP VAL52	YES
0106	37455	071616		STA VTMP4	NO--SAVE SIZE
0107	37456	042000		ADA .5000	TOO
0108	37457	002020		SSA	LARGE?
0109	37460	027504		JMP VAL52	YES
0110	37461	035615		ISZ VTMP3	NO
0111	37462	161615		LDA VTMP3,I	COMPUTE SIZE
0112	37463	035615		ISZ VTMP3	AS SPECIFIED BY
0113	37464	100200		MPY VTMP3,I	DYNAMIC DIMENSIONS
		37465			
0114	37466	006003		SZB,RSS	TOO
0115	37467	002020		SSA	LARGE?
0116	37470	027504		JMP VAL52	YES

0117	37471	003007		CMA, INA, SZA, RSS	
0118	37472	027504		JMP VAL52	CHEESE IT! DYNAMIC DIM = 0
0119	37473	041616		ADA VTMP4	DYNAMIC SIZE
0120	37474	002020		SSA	> DECLARED SIZE
0121	37475	027504		JMP VAL52	YES
0122	37476	161613		LDA VTMP1, I	= COMPT+4
0123	37477	041616		ADA VTMP4	
0124	37500	041616		ADA VTMP4	UPDATE
0125	37501	071620		STA COMPT	COMMON POINTER
0126	37502	065613		LDB VTMP1	RESTORE (B)
0127	37503	027227		JMP VALU1	
0128	37504	065617	VAL52	LDB VTMP5	=> ROW DIMENSION
0129	37505	160001		LDA 1, I	
0130	37506	044354		ADB .+2	=> COLUMN DIMENSION
0131	37507	035614		ISZ VTMP2	TWO-DIMENSIONAL?
0132	37510	006405		CLB, INB, RSS	NO--LOAD DEFAULT DIMENSION
0133	37511	164001		LDB 1, I	PUT
0134	37512	171620		STA COMPT, I	DECLARED
0135	37513	035620		ISZ COMPT	DIMENSIONS IN
0136	37514	175620		STB COMPT, I	COMMON AREA
0137	37515	035620		ISZ COMPT	PUT
0138	37516	171620		STA COMPT, I	DYNAMIC
0139	37517	035620		ISZ COMPT	DIMENSIONS IN
0140	37520	175620		STB COMPT, I	COMMON AREA
0141	37521	100200		MPY COMPT, I	COMPUTE NUMBER OF ARRAY ELEMENTS
		37522			
0142	37523	006003		SZB, RSS	TOO
0143	37524	002020		SSA	LARGE?
0144	37525	027401		JMP VAL10	YES
0145	37526	003004		CMA, INA	NO--SAVE COMPLEMENT
0146	37527	071614		STA VTMP2	OF NUMBER OF ELEMENTS
0147	37530	003004		CMA, INA	ARRAY
0148	37531	042000		ADA .5000	TOO
0149	37532	002020		SSA	LARGE?
0150	37533	027401		JMP VAL10	YES
0151	37534	035620		ISZ COMPT	NO
0152	37535	065620		LDB COMPT	INITIALIZE
0153	37536	003400		CCA	ALL
0154	37537	170001	VAL53	STA 1, I	ELEMENTS
0155	37540	044354		ADB .+2	TO
0156	37541	035614		ISZ VTMP2	UNDEFINED
0157	37542	027537		JMP VAL53	
0158	37543	075620		STB COMPT	UPDATE COMMON POINTER
0159	37544	065613		LDB VTMP1	RESTORE (B)
0160	37545	027227		JMP VALU1	
0161	37546	061600	VAL13	LDA VLFLG	STORAGE
0162	37547	002002		SZA	ALLOCATED?
0163	37550	027227		JMP VALU1	YES
0164	37551	160001		LDA 1, I	NO, GET
0165	37552	160000		LDA 0, I	AND STORE
0166	37553	170001		STA 1, I	POINTER TO
0167	37554	027227		JMP VALU1	VALUE TABLE
0168	37555	015322	VAL14	JSB DCMPL	DECOMPILE
0169	37556	115117		JSB RERRS+9, I	NUMBER OF DIMENSIONS NOT KNOWN

```

0171*
0172** INITIALIZE STRING VARIABLE **
0173*
0174 37557 075613 VAL15 STB VTMP1 SAVE (B)
0175 37560 061600 LDA VLFLG STORAGE
0176 37561 002002 SZA ALLOCATED?
0177 37562 027612 JMP VAL17 YES
0178 37563 160001 LDA 1,I NO
0179 37564 002020 SSA IN COMMON?
0180 37565 027625 JMP VAL18 YES
0181 37566 165613 LDB VTMP1,I NO, SAVE LENGTH POINTER
0182 37567 060056 LDA PBPTR SET POINTER TO
0183 37570 071615 STA VTMP3 LENGTH ENTRY
0184 37571 002004 INA MORE
0185 37572 050462 CPA LWAUS USER SPACE?
0186 37573 115120 JSB RERRS+10,I NO
0187 37574 070056 STA PBPTR YES, SET POINTER TO STRING
0188 37575 171613 STA VTMP1,I INTO SYMBOL TABLE ENTRY
0189 37576 006003 SZB,RSS DEFAULT LENGTH?
0190 37577 002405 CLA,INA,RSS YES, SET (A) = 1
0191 37600 160001 LDA 1,I NO, LOAD DECLARED LENGTH
0192 37601 001727 ALF,ALF STORE PHYSICAL LENGTH
0193 37602 171615 STA VTMP3,I ALONG WITH ZERO
0194 37603 001727 ALF,ALF LOGICAL LENGTH
0195 37604 002004 INA ALLOCATE
0196 37605 001100 ARS SPACE
0197 37606 015326 JSB CUSP FOR
0198 37607 070056 STA PBPTR STRING
0199 37610 065613 VAL16 LDB VTMP1 RESTORE
0200 37611 027227 JMP VALU1 (B)
0201 37612 160001 VAL17 LDA 1,I
0202 37613 003004 CMA,INA STRING
0203 37614 040001 ADA 1 IN
0204 37615 002021 SSA,RSS COMMON?
0205 37616 027227 JMP VALU1 YES
0206 37617 007400 CCB NO--RESET
0207 37620 145613 ADB VTMP1,I
0208 37621 160001 LDA 1,I LOGICAL LENGTH
0209 37622 010762 AND M256
0210 37623 170001 STA 1,I TO ZERO
0211 37624 027610 JMP VAL16
0212 37625 003004 VAL18 CMA,INA SET POINTER POSITIVE
0213 37626 071615 STA VTMP3 => DIMENSION INFORMATION
0214 37627 061620 LDA COMPT SET VALUE
0215 37630 002004 INA POINTER IN
0216 37631 170001 STA 1,I SYMBOL TABLE
0217 37632 161620 LDA COMPT,I EXTRACT PHYSICAL
0218 37633 001727 ALF,ALF LENGTH FROM
0219 37634 010443 AND B377 COMMON AREA
0220 37635 151615 CPA VTMP3,I SAME AS DECLARED LENGTH?
0221 37636 002001 RSS YES
0222 37637 027650 JMP VAL20 NO
0223 37640 161620 LDA COMPT,I LOGICAL
0224 37641 010443 AND B377
0225 37642 003004 CMA,INA LENGTH <=

```

0226	37643	141615		ADA VTMP3,I	
0227	37644	002020		SSA	PHYSICAL LENGTH?
0228	37645	027650		JMP VAL20	NO
0229	37646	161615		LDA VTMP3,I	LOAD PHYSICAL LENGTH
0230	37647	027654		JMP VAL19	
0231	37650	161615	VAL20	LDA VTMP3,I	RESET PHYSICAL LENGTH TO
0232	37651	001727		ALF,ALF	DECLARED LENGTH AND
0233	37652	171620		STA COMPT,I	LOGICAL LENGTH TO ZERO
0234	37653	001727		ALF,ALF	
0235	37654	002004	VAL19	INA	UPDATE
0236	37655	001100		ARS	
0237	37656	002004		INA	COMMON
0238	37657	041620		ADA COMPT	
0239	37660	071620		STA COMPT	POINTER
0240	37661	027227		JMP VALU1	
0241	37662		VAL99	EQU *	
0242	37662	061600		LDA VLFLG	HAS STORAGE
0243	37663	002002		SZA	BEEN ALLOCATED?
0244	37664	027675		JMP VAL98	YES
0245	37665	061607		LDA USESN	NO, ANY 'PRINT
0246	37666	002003		SZA,RS8	USING' STATEMENTS?
0247	37667	027675		JMP VAL98	NO
0248	37670	060056		LDA PBPTR	YES,
0249	37671	071760		STA IFSS	ALLOCATE
0250	37672	060440		LDA .72	SPACE FOR
0251	37673	015326		JSB CUSP	FORMAT
0252	37674	070056		STA PBPTR	STACK
0253	37675		VAL98	EQU *	
0254	37675	002404		CLA,INA	SAY STORAGE
0255	37676	071600		STA VLFLG	ALLOCATED
0256	37677	060056		LDA PBPTR	POINTER TO END
0257	37700	071232		STA FCORE	OF FIXED TABLES

```

0259*
0260* *****
0261***
0262*** EXECUTE THE PROGRAM ***
0263***
0264* *****
0265*
0266*
0267* THE CORE-RESIDENT FILE BUFFERS FOLLOW THE VALUE TABLE; ONE
0268* RECORD-SIZED BLOCK OF CORE IS ALLOCATED FOR EACH FILE REQUESTED
0269* IN THE <FILES STATEMENT>. FIVE STACKS EXIST DURING EXECUTION:
0270* SINCE STACK POINTERS ARE ASSUMED TO REFERENCE THE TOPMOST
0271* ENTRY IN THEIR STACK THEY ARE INITIALLY SET ONE ENTRY BELOW
0272* THE PHYSICAL START OF THE STACK; THUS THE FIRST ENTRY ADVANCES
0273* A STACK POINTER TO THE FIRST WORD OF ITS STACK SPACE. GOSUBS
0274* QUEUE THEIR RETURN ADDRESSES IN THE RETURN STACK, WHICH HAS A
0275* FIXED LENGTH OF NINE WORDS ALLOCATED IMMEDIATELY FOLLOWING
0276* THE FILE BUFFERS. THE FOR-STACK (SIX-WORD ENTRIES) CONTAINS
0277* ALL INFORMATION PERTAINING TO ACTIVE FOR-NEXT LOOPS; INITIALLY
0278* EMPTY, ITS CORE SPACE IS ALLOCATED DYNAMICALLY AS NEEDED. THE
0279* TEMPORARY STACK HOLDS INTERMEDIATE RESULTS DURING FORMULA
0280* EVALUATION; IT IS INITIALIZED TO HOLD TEN TEMPORARIES AND
0281* EXPANDS DYNAMICALLY AS NECESSARY. THE OPERAND AND OPERATOR
0282* STACKS FOLLOW WITH THEIR ONE-WORD ENTRIES OCCUPYING ALTERNATE
0283* LOCATIONS, EXPANDING INTO FREE USER SPACE ON A DEMAND BASIS.
0284* THE TOP OF THE OPERATOR STACK, ALWAYS AT LEAST ONE WORD AHEAD
0285* OF THE OPERAND STACK, IS PBPTR SO THAT ALL ACTIVE USER SPACE
0286* IS KEPT WITHIN THE SWAP REGION. SINCE ALL STACKS EXCEPT THE
0287* RETURN STACK EXPAND DYNAMICALLY, STATIC AND DYNAMIC NESTING
0288* OF FORMULAS AND FOR-NEXT LOOPS IS FREELY PERMITTED UP TO
0289* THE EXHAUSTION OF USER SPACE,
0290*
0291**
0292*** INITIALIZE EXECUTION ***
0293**
0294*
0295* PRINT THE PROGRAM NAME. INITIALIZE FILE STATUS INFORMATION
0296* IN THE FILE TABLE AND NOTIFY USER OF ANY REQUESTED FILES
0297* WHICH ARE READ-ONLY. ALLOCATE A 64 WORD BUFFER FOR EACH FILE.
0298* ALLOCATE RUN-TIME STACKS, INITIALIZE POINTERS TO THE DATA BLOCK,
0299* AND MOVE TO A FRESH TELETYPE LINE.
0300*
0301 37701 002400 XEC CLA BLOCK
0302 37702 170634 STA DCLC1,I CLOCK
0303 37703 114534 JSB ABCK,I ABORT ATTEMPT DURING COMPILE?
0304 37704 160640 LDA DCLC2,I NO==UNBLOCK
0305 37705 170634 STA DCLC1,I CLOCK
0306 37706 160257 LDA MAIN,I
0307 37707 010445 AND CHNFG
0308 37710 071252 STA TEMP2 SAVE CHAIN FLAG
0309 37711 002003 SZA,RSS WAS THIS PROGRAM CHAINED TO?
0310 37712 027720 JMP XEC01 NO
0311 37713 103100 CLF 0 YES
0312 37714 120257 XOR MAIN,I CLEAR
0313 37715 170257 STA MAIN,I CHAIN FLAG

```

0314	37716	102100		STF 0	
0315	37717	027734		JMP XEC0	DON'T PRINT NAME
0316	37720	060364	XEC01	LDA ,+12B	ECHO
0317	37721	015454		JSB OUTCR	LINE FEED
0318	37722	061571		LDA LNAME	
0319	37723	071430		STA LT1	
0320	37724	002004		INA	NULL
0321	37725	160000		LDA 0,I	
0322	37726	002003		SZA,RSS	NAME?
0323	37727	027734		JMP XEC0	YES
0324	37730	006400		CLB	NO
0325	37731	075274		STB LT2	OUTPUT
0326	37732	060347		LDA ,=3	PROGRAM
0327	37733	015462		JSB OUTST	NAME
0328	37734	002400	XEC0	CLA	ZERO
0329	37735	071502		STA FCNTR	FILE COUNTER
0330	37736	071242		STA RTNST	AND MESSAGE FLAG
0331	37737	071611		STA ENOUF	TURN OFF OVER/UNDERFLOW
0332	37740	071773		STA ASINP	SET NO ASSIGN PROCESSED
0333	37741	066504		LDB FILTB	LOAD ADDRESS OF FILE TABLE
0334	37742	055576	XEC2	CPB VALTB	DONE?
0335	37743	027777		JMP XEC4	YES
0336	37744	035502		ISZ FCNTR	NO, COUNT FILE
0337	37745	061252		LDA TEMP2	
0338	37746	002002		SZA	WAS THIS PROGRAM CHAINED TO?
0339	37747	027753		JMP XEC3	YES
0340	37750	160001		LDA 1,I	READ
0341	37751	002020		SSA	ONLY?
0342	37752	124451		JMP XEC5I,I	YES
0343	37753	061036	XEC3	LDA BIT15	NO
0344	37754	044356		ADB ,+4	SET NULL
0345	37755	170001		STA B,I	RECORD ADDRESS
0346	37756	044347		ADB ,=3	GET RECORD
0347	37757	160001		LDA B,I	SIZE AND
0348	37760	001423		ALR,RAK	CLEAR BITS 14 AND 15
0349	37761	170001		STA B,I	AND STICK BACK IN FILE TABLE
0350	37762	044361		ADB ,+7	ALLOCATE
0351	37763	015326		JSB CUSP	BUFFER FOR
0352	37764	070056		STA PBPTR	THE FILE
0353	37765	170001		STA 1,I	SET
0354	37766	006004		INB	'RECORD FULL'
0355	37767	170001		STA 1,I	CONDITION
0356	37770	006004		INB	SET
0357	37771	002400		CLA	'NO EOF EXIT'
0358	37772	170001		STA 1,I	CONDITION
0359	37773	044356		ADB ,+4	POINT TO MASK
0360	37774	170001		STA 1,I	CLEAR PROTECT MASK
0361	37775	006004		INB	POINT TO NEXT ENTRY
0362	37776	027742		JMP XEC2	
0363	37777	061502	XEC4	LDA FCNTR	ARE THERE
0364	40000	002003		SZA,RSS	ANY FILES?
0365	40001	026007		JMP XEC9	NO
0366	40002	060444		LDA DFCHK	YES, SET
0367	40003	103100		CLF 0	POSSIBLE DIRTY
0368	40004	130257		IOR MAIN,I	FILES BIT IN

0369	40005	170257		STA MAIN,I	TTY TABLE
0370	40006	102100		STF 0	
0371	40007	061252	XEC9	LDA TEMP2	
0372	40010	002002		SZA	WAS THIS PROGRAM CHAINED TO?
0373	40011	026020		JMP XEC8	YES
0374	40012	060367		LDA ,+15B	NO, OUTPUT A
0375	40013	015454		JSB OUTCR	CARRIAGE RETURN
0376	40014	060364		LDA ,+12B	AND
0377	40015	015454		JSB OUTCR	TWO
0378	40016	060364		LDA ,+12B	LINE FEEDS
0379	40017	015454		JSB OUTCR	
0380	40020	064056	XEC8	LDB PBPTR	
0381	40021	044351		ADB ,=1	SET POINTERS TO
0382	40022	075240		STB RTRNQ	TOP AND BOTTOM
0383	40023	075242		STB RTNST	OF RETURN STACK
0384	40024	044356		ADB ,+4	SET
0385	40025	075246		STB FORQ	EXECUTION
0386	40026	015432		JSB SETPT	POINTERS
0387	40027	065577		LDB SPROG	SET POINTERS TO
0388	40030	015360		JSB SETDP	FIRST <DATA STATEMENT>
0389*				*	
0390**				EXECUTE STATEMENT	**
0391*				*	
0392*				*	
0393*				SAVE SEQUENCE NUMBER FOR POSSIBLE USE BY ERROR ROUTINE.	
0394*				ADVANCE PROGRAM COUNTER TO NEXT STATEMENT AND BRANCH TO	
0395*				CODE FOR EXECUTION OF CURRENT STATEMENT.	
0396*				*	
0397	40031	065334	XEC1	LDB PRGCT	SAVE CURRENT
0398	40032	160001		LDA 1,I	SEQUENCE
0399	40033	071570		STA ,LNUM	NUMBER
0400	40034	060001		LDA B	
0401	40035	002004		INA	CHECK
0402	40036	160000		LDA A,I	STATEMENT
0403	40037	015556		JSB STLCK	LENGTH
0404	40040	060001		LDA 1	COMPUTE
0405	40041	002004		INA	ADDRESS
0406	40042	144000		ADB 0,I	OF NEXT
0407	40043	075334		STB PRGCT	STATEMENT
0408	40044	002004		INA	SET INTRA-
0409	40045	071613		STA TEMP1	STATEMENT POINTER
0410	40046	161613		LDA TEMP1,I	COMPUTE
0411	40047	010664		AND OPMSK	BRANCH
0412	40050	001727		ALF,ALF	ADDRESS
0413	40051	001300		RAR	FOR CURRENT
0414	40052	043770		ADA XECBR	STATEMENT TYPE
0415	40053	071234		STA FILE#	SET 'NO FILE' FLAG
0416	40054	124000		JMP 0,I	BRANCH TO APPROPRIATE ROUTINE
0417*				*	
0418**				OUTPUT READ-ONLY WARNING	**
0419*				*	
0420	40055	075240	XEC5	STB RTRNQ	SAVE (B)
0421	40056	064273		LDB MLINK+1	
0422	40057	044341		ADB ,+7ID-?LINK	
0423	40060	160001		LDA 1,I	GET ID

PAGE 0105 #09 MAIN EXECUTION LOOP

0424	40061	010732	AND	M2000	IS IT
0425	40062	050612	CPA	A000	AN 'A'?
0426	40063	026107	JMP	XEC7	YES
0427	40064	035242	ISZ	RTNST	NO, FIRST TIME THROUGH?
0428	40065	115217	JSB	WERRS+8,I	YES, EMIT MESSAGE
0429	40066	003400	CCA		SET FLAG FOR
0430	40067	071242	STA	RTNST	MESSAGE SUPPRESSION
0431	40070	060415	LDA	.,+43B	OUTPUT
0432	40071	015454	JSB	OUTCR	A '#'
0433	40072	061502	LDA	FCNTR	OUTPUT
0434	40073	040340	ADA	.,-10	
0435	40074	002020	SSA		FILE #>9?
0436	40075	026103	JMP	XEC6	NO
0437	40076	060433	LDA	.,+61B	YES
0438	40077	015454	JSB	OUTCR	OUTPUT A '1'
0439	40100	061502	LDA	FCNTR	OUTPUT
0440	40101	040420	ADA	.,+46B	SECOND
0441	40102	002001	RSS		DIGIT
0442	40103	040436	XEC6	ADA .58	OUTPUT SINGLE DIGIT
0443	40104	015454	JSB	OUTCR	
0444	40105	060412	LDA	.,+40B	OUTPUT
0445	40106	015454	JSB	OUTCR	BLANK
0446	40107	065240	XEC7	LDB RTRNQ	RETRIEVE (B)
0447	40110	124450	JMP	XEC3I,I	

```

0002*
0003***
0004** EXECUTE <LET STATEMENT> **
0005*** **
0006*
0007 40111 002404 ELET CLA,INA ALLOW STRING CONSTANT
0008 40112 071472 STA EOL IN FORMULA
0009 40113 015336 JSB FORMX EVALUATE
0010 40114 026031 JMP XEC1 FORMULA
0011*
0012*** **
0013** EXECUTE <IF STATEMENT> **
0014*** **
0015*
0016 40115 035613 EIF1 ISZ TEMP1 EVALUATE
0017 40116 015506 JSB VLFIL FILE REQUEST
0018 40117 035236 ISZ FBASE TRANSFER
0019 40120 035613 ISZ TEMP1 EOF LABEL
0020 40121 165613 LDB TEMP1,I TO
0021 40122 175236 STB FBASE,I FILE TABLE
0022 40123 026031 JMP XEC1
0023 40124 104200 EIF DLD TEMP1,I EOF
    40125 101613
0024 40126 054650 CPB ENDOP
0025 40127 002020 SSA OPERATOR?
0026 40130 002405 CLA,INA,RSS NO
0027 40131 026115 JMP EIF1 YES
0028 40132 071472 STA EOL ALLOW STRING CONSTANT
0029 40133 015356 JSB FETCH EVALUATE DECISION FORMULA
0030 40134 002003 SZA,RSS RESULTANT 'TRUE' ?
0031 40135 026031 JMP XEC1 NO
0032*
0033*** **
0034** EXECUTE <GO TO STATEMENT> **
0035*** **
0036*
0037 40136 006401 EGOTO CLB,RSS SET FLAG TO 'GOTO' MODE
0038*
0039*** **
0040** EXECUTE <GOSUB STATEMENT> **
0041*** **
0042*
0043 40137 007400 EGOSB CCB SET FLAG TO
0044 40140 075500 STB GTMP 'GOSUB' MODE
0045 40141 065613 LDB TEMP1 COMPUTE SIMPLE BRANCH
0046 40142 006004 INB 'ADDRESS' ADDRESS
0047 40143 161613 LDA TEMP1,I SIMPLE
0048 40144 010700 AND OPDMK BRANCH
0049 40145 050670 CPA INTFL STATEMENT?
0050 40146 026161 JMP EGOS1 YES
0051 40147 015356 JSB FETCH NO, COMPUTE
0052 40150 015342 JSB SBFIX BRANCH INDEX
0053 40151 026031 JMP XEC1 UNSUITABLE RESULT
0054 40152 045613 ADB TEMP1 COMPUTE
0055 40153 006004 INB 'ADDRESS'

```

0056	40154	060001		LDA 1	ADDRESS
0057	40155	003000		CMA	WITHIN
0058	40156	041334		ADA PRGCT	STATEMENT
0059	40157	002020		SSA	RANGE?
0060	40160	026031		JMP XEC1	NO
0061	40161	164001	EGOS1	LDB 1,I	YES, LOAD BRANCH ADDRESS
0062	40162	035500		ISZ GTMP	<GOTO STATEMENT> ?
0063	40163	026032		JMP XEC1+1	YES
0064	40164	051334		LDA PRGCT	NO, STACK
0065	40165	035242		ISZ RTNST	RETURN
0066	40166	171242		STA RTNST,I	ADDRESS
0067	40167	061242		LDA RTNST	NESTING
0068	40170	040340		ADA ,=10	10
0069	40171	051240		CpA RTRNQ	DEEP?
0070	40172	115125		JSB RERRS+15,I	YES
0071	40173	026032		JMP XEC1+1	NO
0072*					
0073***				**	
0074**	EXECUTE	<FOR STATEMENT>	**		
0075***			**		
0076*					
0077	40174	055250	EFOR0	CPB FORST	TOP ENTRY?
0078	40175	026231		JMP EFOR5+1	YES
0079	40176	071422		STA EFN0	NO, SAVE (A)
0080	40177	075514		STB DEST	SET DESTINATION ADDRESS
0081	40200	065250		LDB FORST	COMPUTE MOVE
0082	40201	044360		ADB ,+6	TERMINATION ADDRESS
0083	40202	061514		LDA DEST	COMPUTE
0084	40203	040360		ADA ,+6	SOURCE ADDRESS
0085	40204	015500		JSB MOVER	DELETE FOR-TABLE ENTRY
0086	40205	061422		LDA EFN0	RETRIEVE (A)
0087	40206	026230		JMP EFOR5	
0088	40207	161613	EFOR	LDA TEMP1,I	EXTRACT
0089	40210	010502		AND B777	AND SAVE THE
0090	40211	071430		STA FVT	FOR-VARIABLE
0091	40212	001000		ALS	COMPUTE
0092	40213	041575		ADA SYMTB	ADDRESS
0093	40214	040351		ADA ,=1	OF ITS
0094	40215	160000		LDA 0,I	VALUE
0095	40216	065250		LDB FORST	LOAD POINTER TO FOR-STACK
0096	40217	055246	EFOR1	CPB FORQ	AT BOTTOM OF FOR-STACK?
0097	40220	026225		JMP EFOR2	YES
0098	40221	150001		CpA 1,I	NO, ENTRY FOR THIS FOR-VARIABLE?
0099	40222	026174		JMP EFOR0	YES
0100	40223	044344		ADB ,=6	NO, CHECK
0101	40224	026217		JMP EFOR1	LOWER ENTRY
0102	40225	065250	EFOR2	LDB FORST	MOVE TO SPACE
0103	40226	044360		ADB ,+6	FOR ENTRY
0104	40227	015432		JSB SETPT	RESET EXECUTION POINTERS
0105	40230	171250	EFOR5	STA FORST,I	SAVE ADDRESS OF VALUE IN ENTRY
0106	40231	015336		JSB FORMX	INITIALIZE FOR-VARIABLE
0107	40232	061250		LDA FORST	SAVE POINTERS TO
0108	40233	002004		INA	ENTRY FOR
0109	40234	071422		STA EFN0	LIMIT VALUE
0110	40235	040354		ADA ,+2	AND

0111	40236	071424		STA EFN1	STEP SIZE
0112	40237	040354		ADA .+2	SAVE ADDRESS OF
0113	40240	065334		LDB PRGCT	FOLLOWING STATEMENT
0114	40241	174000		STB 0,I	IN ENTRY
0115	40242	015356		JSB FETCH	COMPUTE AND SAVE
0116	40243	104400		DST EFN0,I	LIMIT VALUE
	40244	101422			
0117	40245	061513		LDA TEMP1	IMPLICIT
0118	40246	051334		CPA PRGCT	STEP SIZE?
0119	40247	026304		JMP EFOR6	YES
0120	40250	015356		JSB FETCH	NO, COMPUTE STEP SIZE
0121	40251	104400	EFOR3	DST EFN1,I	AND SAVE VALUE
	40252	101424			
0122	40253	006400		CLB	SET SIGN FLAG
0123	40254	002020		SSA	TO -1 FOR
0124	40255	007400		CCB	NEGATIVE STEP SIZE,
0125	40256	075426		STB EFN2	0 FOR POSITIVE STEP SIZE
0126	40257	036334		ISZ PRGCT	LOAD
0127	40260	065334		LDB PRGCT	TYPE WORD OF
0128	40261	006004	EFOR4	INB	STATEMENT FOLLOWING
0129	40262	160001		LDA 1,I	THE <FOR STATEMENT>
0130	40263	071366		STA EFN3	SAVE IT
0131	40264	044351		ADB .-1	COMPUTE POINTER
0132	40265	144001		ADB 1,I	TO ITS SUCCESSOR
0133	40266	010664		AND OPMSK	<NEXT
0134	40267	050646		CPA NXTOP	STATEMENT> ?
0135	40270	002001		RSS	YES
0136	40271	026261		JMP EFOR4	NO
0137	40272	021366		XOR EFN3	SAME
0138	40273	051430		CPA FVT	FOR-VARIABLE?
0139	40274	002001		RSS	YES
0140	40275	026261		JMP EFOR4	NO
0141	40276	044351		ADB .-1	SET PROGRAM COUNTER
0142	40277	075334		STB PRGCT	PAST <NEXT STATEMENT>
0143	40300	165250		LDB FORST,I	LOAD
0144	40301	104200		DLD 1,I	INITIAL VALUE OF
	40302	100001			
0145	40303	026346		JMP ENEX3	FOR-VARIABLE
0146	40304	061040	EFOR6	LDA HALF	LOAD
0147	40305	064354		LDB .+2	DEFAULT
0148	40306	026251		JMP EFOR3	OF 1.0
0149*					
0150***					**
0151**				EXECUTE <NEXT STATEMENT>	**
0152***					**
0153*					
0154	40307	161613	ENEXT	LDA TEMP1,I	EXTRACT
0155	40310	010502		AND B777	FOR-VARIABLE
0156	40311	001000		ALS	COMPUTE
0157	40312	041575		ADA SYMTB	ADDRESS
0158	40313	040351		ADA .-1	OF ITS
0159	40314	160000		LDA 0,I	VALUE
0160	40315	065250		LDB FORST	LOAD POINTER TO FOR-STACK
0161	40316	055246	ENEX1	CPB FORQ	BOTTOM OF STACK?
0162	40317	026031		JMP XEC1	YES, IGNORE STATEMENT

0163	40320	150001		CPA 1,I	NO, MATCHING ENTRY?
0164	40321	026324		JMP ENEX2	YES
0165	40322	044344		ADB .-6	NO,CHECK
0166	40323	026316		JMP ENEX1	LOWER ENTRY
0167	40324	071424	ENEX2	STA EFN1	SAVE FOR VARIABLE VALUE ADDRESS
0168	40325	055250		CPB FORST	TOP ENTRY OF FOR=STACK?
0169	40326	026331		JMP ++3	YES
0170	40327	015432		JSB SETPT	NO, RESET
0171	40330	065250		LDB FORST	EXECUTION POINTERS
0172	40331	006004		INB	SAVE ADDRESS
0173	40332	075422		STB EFN0	OF LIMIT VALUE
0174	40333	044354		ADB .+2	
0175	40334	060350		LDA .-2	SET SIGN FLAG TO SAY
0176	40335	071426		STA EFN2	POSITIVE STEP SIZE
0177	40336	104200		DLD 1,I	LOAD STEP SIZE
	40337	100001			
0178	40340	002020		SSA	POSITIVE?
0179	40341	035426		ISZ EFN2	NO, RESET SIGN FLAG
0180	40342	015402		JSB .FAD	ADD STEP SIZE
0181	40343	101424		DEF EFN1,I	TO VALUE OF FOR-VARIABLE
0182	40344	104400		DST EFN1,I	SAVE NEW VALUE
	40345	101424			
0183	40346	015404	ENEX3	JSB .FSB	SUBTRACT
0184	40347	101422		DEF EFN0,I	LIMIT VALUE
0185	40350	035426		ISZ EFN2	IF STEP SIZE POSITIVE,
0186	40351	001600		ELA	INVERT SIGN OF RESULT
0187	40352	002020		SSA	LIMIT VALUE EXCEEDED?
0188	40353	026300		JMP ENEX4	YES
0189	40354	061250		LDA FORST	NO, LOAD ADDRESS
0190	40355	040357		ADA .+5	OF STATEMENT
0191	40356	164000		LDB 0,I	FOLLOWING THE
0192	40357	026032		JMP XEC1+1	<FOR STATEMENT>
0193	40360	065250	ENEX4	LDB FORST	REMOVE
0194	40361	044344		ADB .-6	ENTRY FROM
0195	40362	015432		JSB SETPT	FOR=STACK
0196	40363	026031		JMP XEC1	SKIP PAST <NEXT STATEMENT>
0197*					
0198***				**	
0199**	EXECUTE	<RETURN STATEMENT>		**	
0200***				**	
0201*					
0202	40364	061242	ERTRN	LDA RTNST	RETURN STACK
0203	40365	051240		CPA RTRNG	EMPTY?
0204	40366	115126		JSB RERRS+16,I	YES
0205	40367	164000		LDB 0,I	NO, POP
0206	40370	040351		ADA .-1	RETURN ADDRESS
0207	40371	071242		STA RTNST	FROM STACK
0208	40372	026032		JMP XEC1+1	
0209*					
0210***				**	
0211**	EXECUTE	<INPUT STATEMENT>		**	
0212***				**	
0213*					
0214	40373	002400	EINPT	CLA	TURN OFF
0215	40374	071500		STA MCNT	MATRIX INPUT COUNTER

0216	40375	071460	EINP1	STA INITF	SAVE ADDRESS FLAG
0217	40376	002400		CLA	REQUEST
0218	40377	071472		STA SYNTQ	FIRST
0219	40400	015446		JSB INCAL	INPUT RECORD
0220	40401	035422	EINP2	ISZ IFCNT	COUNT INPUT QUANTITY
0221	40402	003400		CCA	MATRIX
0222	40403	051460		CPA INITF	INPUT?
0223	40404	026415		JMP EINP3	YES
0224	40405	015336		JSB FORMX	NO, EVALUATE NEXT ADDRESS
0225	40406	165332		LDB OPDST,I	IS IT A
0226	40407	006020		SSB	STRING VARIABLE?
0227	40410	026521		JMP EIN13	YES
0228	40411	061332		LDA OPDST	NO,
0229	40412	040350		ADA .-2	UNSTACK
0230	40413	071332		STA OPDST	ADDRESS
0231	40414	075574		STB SBPTR	SAVE DESTINATION ADDRESS
0232	40415	002400	EINP3	CLA	SET SIGN
0233	40416	071266		STA SIGN	TO POSITIVE
0234	40417	071354		STA INTMP	FLAG REQUEST FOR NUMBER
0235	40420	026424		JMP EINP4	
0236	40421	075266		STB SIGN	RESET SIGN TO POSITIVE
0237	40422	015446		JSB INCAL	
0238	40423	035422		ISZ IFCNT	FETCH
0239	40424	015450	EINP4	JSB GETCR	FIRST
0240	40425	026422		JMP *-3	CHARACTER
0241	40426	007400		CCB	TURN OFF
0242	40427	075474		STB SERR	OVER/UNDERFLOW FLAG
0243	40430	050427		CPA .+45	! ?
0244	40431	026506		JMP EIN11	YES
0245	40432	006404		CLB, INB	NO
0246	40433	050425		CPA .+43	! ?
0247	40434	026506		JMP EIN11	YES
0248	40435	015276	EINP5	JSB NUMCK	NO, NUMBER?
0249	40436	026471		JMP EINP7	NO
0250	40437	026475		JMP EINP8	BAD EXPONENT
0251	40440	064412	EINP6	LDB .+40B	TURN ON
0252	40441	075573		STB BLANK	BLANK SUPPRESSION
0253	40442	035500		ISZ MCNT	MATRIX COMPLETED?
0254	40443	002001		RSS	NO
0255	40444	127773		JMP MIDEN,I	YES
0256	40445	065613	EINP0	LDB TEMP1	<INPUT STATEMENT>
0257	40446	055334		CPB PRGCT	SATISFIED?
0258	40447	026512		JMP EIN12	YES
0259	40450	035474		ISZ SERR	DID OVER/UNDERFLOW OCCUR?
0260	40451	026456		JMP EINP9	YES
0261	40452	050367		CPA .+15B	NO, END OF INPUT RECORD?
0262	40453	026400		JMP EINP2-1	YES
0263	40454	050426		CPA .+54B	NO, COMMA NEXT?
0264	40455	026465		JMP EIN10	YES
0265	40456	115207	EINP9	JSB WERRS,I	NO
0266	40457	065422		LDB IFCNT	OUTPUT NEXT
0267	40460	006004		INB	ITEM
0268	40461	015456		JSB OUTIN	NUMBER
0269	40462	060367		LDA .+15B	OUTPUT
0270	40463	015454		JSB OUTCR	CARRIAGE RETURN

0271	40464	026400		JMP	EINP2-1	
0272	40465	015450	EIN10	JSB	GETCR	END OF INPUT RECORD?
0273	40466	026456		JMP	EINP9	YES
0274	40467	015452		JSB	BCKSP	NO
0275	40470	026401		JMP	EINP2	
0276	40471	050414	EINP7	CPA	+.42B	" ?
0277	40472	026475		JMP	EINP8	YES
0278	40473	055266		CPB	SIGN	NO, SIGN FOUND?
0279	40474	026424		JMP	EINP4	NO, IGNORE CHARACTER
0280	40475	115207	EINP8	JSB	WERRS,I	YES
0281	40476	065422		LDB	IFCNT	OUTPUT
0282	40477	015456		JSB	OUTIN	ITEM NUMBER
0283	40500	060367		LDA	+.15B	OUTPUT
0284	40501	015454		JSB	OUTCR	CARRIAGE RETURN
0285	40502	006400		CLB		NUMBER
0286	40503	055354		CPB	INTMP	REQUESTED?
0287	40504	026421		JMP	EINP4-3	YES
0288	40505	025535		JMP	EIN14	NO
0289	40506	075266	EIN11	STB	SIGN	SAVE SIGN
0290	40507	015450		JSB	GETCR	
0291	40510	026475		JMP	EINP8	OUT-OF-DATA ERROR
0292	40511	026435		JMP	EINP5	
0293	40512	050367	EIN12	CPA	+.15B	END OF RECORD?
0294	40513	002401		CLA	RSS	YES
0295	40514	115216		JSB	WERRS+7,I	NO
0296	40515	071572		STA	CHRCT	ZERO CHARACTER COUNT
0297	40516	060364		LDA	+.12B	OUTPUT A
0298	40517	015454		JSB	OUTCR	LINE FEED
0299	40520	026031		JMP	XEC1	
0300	40521	007000	EIN13	CMB		EXTRACT
0301	40522	160001		LDA	1,I	PHYSICAL
0302	40523	001727		ALF	ALF	LENGTH OF
0303	40524	010443		AND	B377	DESTINATION STRING
0304	40525	003000		CMA		SET IT AS END
0305	40526	141330		ADA	TMPST,I	OF UNSPECIFIED
0306	40527	071410		STA	TPRME	DESTINATION STRING
0307	40530	003400		CCA		PREPARE
0308	40531	015344		JSB	PSTR	DESTINATION STRING
0309	40532	065406		LDB	TNULL	SAVE LENGTH
0310	40533	075354		STB	INTMP	ALLOWANCE
0311	40534	026537		JMP	++3	
0312	40535	015446	EIN14	JSB	INCAL	
0313	40536	035422		ISZ	IFCNT	FETCH
0314	40537	015450		JSB	GETCR	FIRST
0315	40540	026535		JMP	+=3	CHARACTER
0316	40541	007400		CCB		TURN OFF
0317	40542	075474		STB	SERR	OVER/UNDERFLOW FLAG
0318	40543	050414		CPA	+.42B	" ?
0319	40544	002001		RSS		YES
0320	40545	015452		JSB	BCKSP	NO, STRING BEGINS HERE
0321	40546	006400	EIN17	CLB		TURN OFF
0322	40547	075573		STB	BLANK	BLANK SUPPRESSION
0323	40550	063772		LDA	FINCA	POINT TO INPUT BUFFER
0324	40551	015350		JSB	TRSTR	TRANSFER STRING
0325	40552	006400		CLB		ALL REQUESTED

0326	40553	055406	CPB	TNULL	CHARACTERS TRANSFERRED?
0327	40554	026600	JMP	EIN21	YES
0328	40555	055464	CPB	PS1	NO, TRANSFER LENGTH SPECIFIED?
0329	40556	026574	JMP	EIN20	NO
0330	40557	071354	STA	INTMP	YES, SAVE (A)
0331	40560	003400	CCA		FINISH
0332	40561	071410	STA	TPRME	
0333	40562	041406	ADA	TNULL	TRANSFER
0334	40563	071406	STA	TNULL	
0335	40564	060600	LDA	FSCHA	WITH BLANKS
0336	40565	015350	JSB	TRSTR	
0337	40566	061354	LDA	INTMP	RESTORE (A)
0338	40567	050367	EIN18	CPA ,+15B	TRANSFER ENDED BY END-OF-INPUT?
0339	40570	026440	JMP	EINP6	YES
0340	40571	015450	EIN19	JSB GETCR	NO, WAS A "
0341	40572	000000	NOP		EXIT WITH
0342	40573	026440	JMP	EINP6	NEXT CHARACTER
0343	40574	165260	EIN20	LDB TEMP6,I	SET LOGICAL
0344	40575	045406	ADB	TNULL	TO ACTUAL
0345	40576	175260	STB	TEMP6,I	STRING LENGTH
0346	40577	026567	JMP	EIN18	
0347	40600	055464	EIN21	CPB PS1	LENGTH OF TRANSFER SPECIFIED?
0348	40601	026607	JMP	EIN15	NO
0349	40602	015450	EIN16	JSB GETCR	YES
0350	40603	026440	JMP	EINP6	IMPLIED CLOSING QUOTE
0351	40604	050414	CPA	,+42B	" ?
0352	40605	026571	JMP	EIN19	YES
0353	40606	026602	JMP	EIN16	NO, LOOK FOR " OR END-OF-INPUT
0354	40607	015450	EIN15	JSB GETCR	END-OF-INPUT NEXT?
0355	40610	026440	JMP	EINP6	YES
0356	40611	050414	CPA	,+42B	NO, CLOSING " ?
0357	40612	026571	JMP	EIN19	YES
0358	40613	061354	LDA	INTMP	NO, DESTINATION STRING EXCEEDED
0359	40614	071406	STA	TNULL	RESTORE
0360	40615	061574	LDA	SBPTR	DESTINATION STRING
0361	40616	071272	STA	TEMP5	PARAMETERS
0362	40617	060412	LDA	,+40B	SET TO
0363	40620	071573	STA	BLANK	SKIP BLANKS
0364	40621	026475	JMP	EINP8	
0365*					
0366***				**	
0367**	EXECUTE	<READ STATEMENT>		**	
0368***				**	
0369*					
0370	40622	015506	EREAD	JSB VLFIL	LOOK FOR FILE REQUEST
0371	40623	026640	JMP	EREA1	FILE REQUEST FOUND
0372	40624	015336	JSB	FORMX	EVALUATE DESTINATION ADDRESS
0373	40625	161332	LDA	OPDST,I	STRING
0374	40626	002020	SSA		VARIABLE?
0375	40627	026644	JMP	EREA2	YES
0376	40630	071574	STA	SBPTR	NO, SAVE AND
0377	40631	061332	LDA	OPDST	UNSTACK
0378	40632	040350	ADA	,=2	DESTINATION
0379	40633	071332	STA	OPDST	ADDRESS
0380	40634	006404	CLB,	INB	FETCH

0381	40635	015362		JSB FDATA	NUMBER
0382	40636	104400		DST SBPTR,I	STORE NUMBER
	40637	101574			
0383	40640	061613	EREA1	LDA TEMP1	END OF
0384	40641	051334		CPA PRGCT	STATEMENT?
0385	40642	026031		JMP XEC1	YES
0386	40643	026624		JMP EREAD+2	NO
0387	40644	064354	EREA2	LDB ,+2	PREPARE
0388	40645	015362		JSB FDATA	SOURCE STRING
0389	40646	003400		CCA	PREPARE
0390	40647	015344		JSB PSTR	DESTINATION STRING
0391	40650	060600		LDA FSCHA	
0392	40651	015350		JSB TRSTR	TRANSFER STRING
0393	40652	026640		JMP EREA1	
0001*					
0002***					**
0003**	EXECUTE	<PRINT STATEMENT>			**
0004***					**
0005*					
0006	40653	002404	EPRIN	CLA,INA	FLAG AS 'PRINT'
0007	40654	015554		JSB EPRUS	CHECK FOR USING STATEMENT
0008	40655	002400		CLA	FLAG AS
0009	40656	071756		STA FFLG	NON-FORMATTED
0010	40657	015506		JSB VLFIL	VALIDATE FILE REQUEST
0011	40660	027017		JMP EPR13	
0012	40661	026671		JMP EPRI2+1	NO FILE REQUEST FOUND
0013	40662	061234	EPRI1	LDA FILE#	FILE
0014	40663	002021		SSA,RSS	MODE?
0015	40664	026670		JMP EPRI2	YES
0016	40665	002400		CLA	NO, EXECUTE COMMA
0017	40666	051472		CPA EOL	UNLESS PRECEDED BY
0018	40667	015430		JSB EDELM	A 'TAB' (EOL = 1)
0019	40670	003401	EPRI2	CCA,RSS	TURN OFF 'END-OF-LINE' FLAG
0020	40671	002400		CLA	TURN ON
0021	40672	071472		STA EOL	'END-OF-LINE' FLAG
0022	40673	161613	EPRI3	LDA TEMP1,I	EXTRACT
0023	40674	010700		AND OPDMK	NEXT OPERAND
0024	40675	002002		SZA	NULL?
0025	40676	026722		JMP EPRI5	NO, BEGINS FORMULA
0026	40677	035613		ISZ TEMP1	YES
0027	40700	065613	EPRI4	LDB TEMP1	STATEMENT
0028	40701	055334		CPB PRGCT	FINISHED?
0029	40702	027014		JMP EPR12	YES
0030	40703	161613		LDA TEMP1,I	NO, EXTRACT
0031	40704	010664		AND UPMSK	NEXT OPERATOR
0032	40705	050612		CPA B2000	COMMA?
0033	40706	026662		JMP EPRI1	YES
0034	40707	050614		CPA B3000	NO, SEMICOLON?
0035	40710	026670		JMP EPRI2	YES
0036	40711	050445		CPA B1000	NO, " ?
0037	40712	026746		JMP EPRI8	YES
0038	40713	050650		CPA ENDOP	NO, 'END' ?
0039	40714	027006		JMP EPR11	YES
0040	40715	002003		SZA,RSS	NO, NULL?
0041	40716	026673		JMP EPRI3	YES

0042	40717	003400		CCA	NO, MUST BE FORMULA
0043	40720	041613		ADA TEMP1	RESET TO PRIOR
0044	40721	071613		STA TEMP1	NULL OPERAND
0045	40722	003400	EPR15	CCA	TURN OFF
0046	40723	071472		STA EOL	'TAB' FLAG
0047	40724	015336		JSB FORMX	EVALUATE FORMULA
0048	40725	165332		LDB OPDST,I	IS IT A
0049	40726	006020		SSB	STRING VARIABLE?
0050	40727	026747		JMP EPR18+1	YES
0051	40730	015376		JSB OPCHK	NO, UNSTACK VALUE ADDRESS
0052	40731	061234		LDA FILE#	TO BE WRITTEN
0053	40732	002021		SSA,RSS	ON A FILE?
0054	40733	026742		JMP EPR17	YES
0055	40734	035472		ISZ EOL	NO, A 'TAB' ?
0056	40735	026700		JMP EPR14	YES (EOL = 1 NOW)
0057	40736	104200		DLD 1,I	NO, OUTPUT
	40737	100001			
0058	40740	015420		JSB ENOUT	A NUMBER
0059	40741	026700		JMP EPR14	
0060	40742	075574	EPR17	STB SBPTR	SAVE VALUE ADDRESS
0061	40743	064350		LDB .-2	WRITE NUMBER
0062	40744	015512		JSB FILST	ON FILE
0063	40745	026700		JMP EPR14	
0064	40746	015340	EPR18	JSB STSTR	STACK STRING CONSTANT
0065	40747	060350		LDA .-2	PREPARE
0066	40750	015344		JSB PSTR	PRINT
0067	40751	071256		STA TEMP4	STRING
0068	40752	075410		STB TPRME	
0069	40753	064347		LDB .-3	PRESET TO WRITE ON FILE
0070	40754	061234		LDA FILE#	TO BE WRITTEN
0071	40755	002021		SSA,RSS	ON A FILE?
0072	40756	026744		JMP EPR17+2	YES
0073	40757	002400		CLA	NO, TURN ON
0074	40760	071472		STA EOL	'END-OF-LINE' FLAG
0075	40761	061406		LDA TNULL	ENOUGH
0076	40762	003004		CMA,INA	SPACE
0077	40763	041572		ADA CHRCT	UN
0078	40764	043774		ADA M74	CURRENT
0079	40765	002021		SSA,RSS	LINE?
0080	40766	015426		JSB OUTLN	NO
0081	40767	027003		JMP EPR10	YES
0082	40770	015364	EPR19	JSB FSCH	FETCH
0083	40771	060412		LDA .+40B	CHARACTER
0084	40772	050370		CPA .+16B	PSUEDO LINE FEED?
0085	40773	060364		LDA .+12B	YES
0086	40774	050371		CPA .+17B	PSUEDO CARRIAGE RETURN?
0087	40775	002001		RSS	YES
0088	40776	027002		JMP EPR10-1	NO
0089	40777	060367		LDA .+15B	OUTPUT
0090	41000	015454		JSB OUTCR	CARRIAGE RETURN
0091	41001	002400		CLA	AND A NULL
0092	41002	015454		JSB OUTCR	OUTPUT CHARACTER
0093	41003	035400	EPR10	ISZ TNULL	MORE STRING?
0094	41004	026770		JMP EPR19	YES
0095	41005	026700		JMP EPR14	NO

0096	41006	071653	EPR11	STA	EORFL	FILE
0097	41007	015514		JSB	GTTYP	
0098	41010	050355		CPA	.+3	FULL?
0099	41011	026677		JMP	EPR14-1	YES
0100	41012	007400		CCB		NO, WRITE
0101	41013	026744		JMP	EPR17+2	END-OF-FILE
0102	41014	035472	EPR12	ISZ	EOL	'END-OF-LINE' FLAG SET?
0103	41015	015426		JSB	OUTLN	YES
0104	41016	026031		JMP	XEC1	NO
0105	41017	044342	EPR13	ADB	.-8	SET BUFFER
0106	41020	160001		LDA	B,I	DIR-
0107	41021	031036		IOR	BIT15	TY
0108	41022	170001		STA	B,I	BIT
0109	41023	065613		LDB	TEMP1	NULL
0110	41024	055334		CPB	PRGCT	PRINT?
0111	41025	026031		JMP	XEC1	YES
0112	41026	026670		JMP	EPR12	NO
0113*						
0114**						**
0115**					EXECUTE <PRINT USING STATEMENT>	**
0116**						**
0117*						
0118*					EXIT TO (P+1) IF NO USING OPERATOR FOUND, OTHERWISE PREPARE	
0119*					FORMAT SPECIFICATION STRING AND CALL FORMATTED OUTPUT ROUTINE.	
0120*						
0121	41027	071756	#EPRU	STA	FFLG	SAVE FORMAT FLAG
0122	41030	065613		LDB	TEMP1	
0123	41031	160001		LDA	B,I	
0124	41032	050656		CPA	PRTOP	NULL OPERAND?
0125	41033	006005		INB	RSS	YES
0126	41034	125554		JMP	EPRUS,I	NO, CAN'T BE USING STATEMENT
0127	41035	055334		CPB	PRGCT	END OF STATEMENT?
0128	41036	125554		JMP	EPRUS,I	YES
0129	41037	160001		LDA	B,I	NO, 'USING'
0130	41040	010664		AND	OPMSK	OPERATOR
0131	41041	050776		CPA	USEOP	NEXT?
0132	41042	002001		RSS		YES
0133	41043	125554		JMP	EPRUS,I	NO, EXIT
0134	41044	120001		XOR	B,I	GET OPERAND
0135	41045	075613		STB	TEMP1	SAVE POINTER
0136	41046	002021		SSA	RSS	INTEGER FOLLOWS?
0137	41047	027065		JMP	EPRU1	NO
0138	41050	006004		INB		
0139	41051	164001		LDB	B,I	GET ADDRESS OF IMAGE STATEMENT
0140	41052	044354		ADB	.-2	=> LENGTH WORD
0141	41053	160001		LDA	B,I	
0142	41054	010664		AND	OPMSK	GET OPERATOR
0143	41055	050746		CPA	IMGOP	IMAGE?
0144	41056	002001		RSS		YES
0145	41057	115154		JSB	RERRS+38,I	NO, ERROR
0146	41060	035613		ISZ	TEMP1	BUMP TO POINT
0147	41061	035613		ISZ	TEMP1	TO FIRST OPERAND
0148	41062	002400		CLA		
0149	41063	071762		STA	NCH	
0150	41064	015552		JSB	FRMAT	CALL FORMATTER

0151	41065	002003	EPRU1	SZA,RSS	NULL OPERAND?
0152	41066	027135		JMP EPRU4	YES
0153	41067	015336		JSB FORMX	NO, FETCH
0154	41070	060350		LDA .-2	STRING
0155	41071	015344		JSB PSTR	OPERAND
0156	41072	161260		LDA TEMP6,I	GET
0157	41073	010443		AND B377	LENGTH
0158	41074	002003		SZA,RSS	NULL STRING?
0159	41075	026031		JMP XEC1	YES
0160	41076	003004		CMA,INA	NO, SAVE
0161	41077	071552		STA STRLN	=LENGTH
0162	41100	065330		LDB TMPST	
0163	41101	044354		ADB .+2	
0164	41102	160001		LDA B,I	GET FIRST SUBSCRIPT
0165	41103	003004		CMA,INA	NEGATE IT
0166	41104	006004		INB	
0167	41105	134001		ISZ B,I	SECOND SUBSCRIPT EXIST?
0168	41106	027112		JMP EPRU2	YES
0169	41107	002400		CLA	NO, SET
0170	41110	071762		STA NCH	CHARACTER COUNT
0171	41111	027125		JMP EPRU3	
0172	41112	140001	EPRU2	ADA B,I	COMPUTE DIFFERENCE
0173	41113	002003		SZA,RSS	NULL STRING?
0174	41114	026031		JMP XEC1	YES
0175	41115	002020		SSA	NO, NEGATIVE?
0176	41116	115162		JSB RERRS+44,I	YES
0177	41117	071762		STA NCH	NO, SAVE DIFFERENCE
0178	41120	003400		CCA	
0179	41121	140001		ADA B,I	SECOND
0180	41122	041552		ADA STRLN	SUBSCRIPT
0181	41123	002021		SSA,RSS	VALID?
0182	41124	115162		JSB RERRS+44,I	NO
0183	41125	044351	EPRU3	ADB .-1	YES
0184	41126	160001		LDA B,I	FIRST
0185	41127	041552		ADA STRLN	SUBSCRIPT
0186	41130	002021		SSA,RSS	VALID?
0187	41131	115162		JSB RERRS+44,I	NO
0188	41132	160001		LDA B,I	YES, LOAD IT
0189	41133	065260		LDB TEMP6	=> FIRST WORD OF STRING
0190	41134	015552		JSB FRMAT	CALL FORMATTER
0191	41135	006004	EPRU4	INB	=> 1ST WORD OF STRING
0192	41136	160001		LDA B,I	UPDATE
0193	41137	010700		AND OPDMK	
0194	41140	002004		INA	INTRA-
0195	41141	001100		ARS	
0196	41142	041613		ADA TEMP1	STATEMENT
0197	41143	040354		ADA .+2	
0198	41144	071613		STA TEMP1	POINTER
0199	41145	002400		CLA	
0200	41146	071762		STA NCH	
0201	41147	015552		JSB FRMAT	CALL FORMATTER

0202*

0203***

0204** EXECUTE <RESTORE STATEMENT> **

0205*** **

```

0206*
0207 41150 161613 ERSTR LDA TEMP1,I LOAD FLAG WORD
0208 41151 035613      ISZ TEMP1 ADVANCE STATEMENT POINTER
0209 41152 065577      LDB SPROG SET (B) TO START OF PROGRAM
0210 41153 002020      SSA 'LABELLED RESTORE'
0211 41154 165613      LDB TEMP1,I YES, RESET (B) TO STATEMENT
0212 41155 015360      JSB SETUP SET DATA POINTERS
0213 41156 026031      JMP XEC1
0214*
0215***
0216** EXECUTE <ENTER STATEMENT> **
0217***
0218*
0219 41157 161613 EENTR LDA TEMP1,I => FIRST OPERATOR
0220 41160 010700      AND OPDMK
0221 41161 002002      SZA IS '#' PRESENT?
0222 41162 027214      JMP EENT3 NO
0223 41163 065613      LDB TEMP1
0224 41164 006004      INB
0225 41165 160001      LDA B,I GET NEXT OPERATOR
0226 41166 010664      AND OPMSK
0227 41167 050736      CPA B4000 '#'?
0228 41170 002001      RSS YES
0229 41171 027214      JMP EENT3 NO
0230 41172 075613      STB TEMP1
0231 41173 015336      JSB FORMX EVALUATE ADDRESS
0232 41174 165332      LDB OPDST,I
0233 41175 075574      STB SBPTR => SYMBOL
0234 41176 061332      LDA OPDST UNSTACK
0235 41177 040350      ADA *-2
0236 41200 071332      STA OPDST ADDRESS
0237 41201 064257      LDB MAIN
0238 41202 006004      INB => USERS TTY # IN TELETYPE TABLE
0239 41203 160001      LDA I,I GET TTY # AND
0240 41204 001727      ALF,ALF RIGHT JUSTIFY
0241 41205 015346      JSB FLOAT CONVERT TO FLOATING POINT
0242 41206 171574      STA SBPTR,I STORE
0243 41207 035574      ISZ SBPTR TTY
0244 41210 175574      STB SBPTR,I NUMBER
0245 41211 061613      LDA TEMP1 ENTER STATEMENT
0246 41212 051334      CPA PRGCT FINISHED?
0247 41213 026031      JMP XEC1 YES
0248 41214 015356 EENT3 JSB FETCH NO->FETCH ALLOWED TIME
0249 41215 015416      JSB IFIX CONVERT
0250 41216 000000      NOP TO
0251 41217 060001      LDA 1 SECONDS
0252 41220 010443      AND B377 MASK TO 8 BITS
0253 41221 002003      SZA,RSS IF 0, SET
0254 41222 002004      INA TO 1
0255 41223 071612      STA ATIM
0256 41224 060257      LDA MAIN DOES THIS USER
0257 41225 002004      INA HAVE THE
0258 41226 050255      CPA PRIST LINE PRINTER?
0259 41227 115220      JSB WERRS+9,I YES - RELEASE IT
0260 41230 060373      LDA +21B OUTPUT

```

0261	41231	015454	JSB	OUTCR	AN X=ON
0262	41232	060221	LDA	STE	START
0263	41233	031612	IOR	ATIM	ENTER
0264	41234	114516	JSB	SCHIN,I	TIMING
0265	41235		ENTRT	EQU *	
0266	41235	027253	JMP	EENT6	INPUT ENTERED
0267	41236	015336	JSB	FORMX	TIMEOUT OCCURED
0268	41237	165332	LDB	OPDST,I	=> RESPONSE
0269	41240	075574	STB	SBPTR	TIME
0270	41241	061332	LDA	OPDST	UNSTACK
0271	41242	040350	ADA	,-2	
0272	41243	071332	STA	OPDST	ADDRESS
0273	41244	060762	LDA	M256	SET
0274	41245	015346	JSB	FLOAT	RESPONSE
0275	41246	171574	STA	SBPTR,I	TIME
0276	41247	035574	ISZ	SBPTR	TO
0277	41250	175574	STB	SBPTR,I	=256
0278	41251	127252	JMP	**+1,I	
0279	41252	041425	DEF	EEN18	
0280	41253		EENT6	EQU *	
0281	41253	006400	CLB		DON'T SUPPRESS
0282	41254	075573	STB	BLANK	BLANKS
0283	41255	015450	JSB	GETCR	FIRST
0284	41256	000000	NOP		CHARACTER A
0285	41257	064412	LDB	,+40B	SUPPRESS
0286	41260	075573	STB	BLANK	BLANKS
0287	41261	050355	CPA	,+3	CONTROL C?
0288	41262	124554	JMP	EXITA,I	YES
0289	41263	015452	JSB	BCKSP	NO
0290	41264	015336	JSB	FORMX	EVALUATE ADDRESS
0291	41265	165332	LDB	OPDST,I	
0292	41266	075574	STB	SBPTR	=> RESPONSE TIME
0293	41267	075422	STB	RSPTR	
0294	41270	061332	LDA	OPDST	UNSTACK
0295	41271	040350	ADA	,-2	
0296	41272	071332	STA	OPDST	ADDRESS
0297	41273	064257	LDB	MAIN	
0298	41274	044371	ADB	,+7RTIM	GET RESPONSE
0299	41275	160001	LDA	1,I	TIME
0300	41276	015346	JSB	FLOAT	
0301	41277	171574	STA	SBPTR,I	STORE
0302	41300	035574	ISZ	SBPTR	IT
0303	41301	175574	STB	SBPTR,I	
0304	41302	015336	JSB	FORMX	EVALUATE ADDRESS
0305	41303	165332	LDB	OPDST,I	IS IT A
0306	41304	006020	SSB		STRING VARIABLE?
0307	41305	027341	JMP	EEN10	YES
0308	41306	061332	LDA	OPDST	NO,
0309	41307	040350	ADA	,-2	UNSTACK
0310	41310	071332	STA	OPDST	ADDRESS
0311	41311	075574	STB	SBPTR	SAVE DESTINATION ADDRESS
0312	41312	002400	CLA		SET SIGN
0313	41313	071266	STA	SIGN	TO POSITIVE
0314	41314	015450	JSB	GETCR	FETCH FIRST CHARACTER
0315	41315	027414	JMP	EEN17	NONE FOUND--ERROR

0316	41316	007400		CCH	TURN OFF
0317	41317	075611		STB ENOUF	OVER/UNDERFLOW FLAG
0318	41320	050427		CPA ,+55B	'-!?'
0319	41321	027326		JMP EENT7	YES
0320	41322	006404		CLB,INB	NO
0321	41323	050425		CPA ,+53B	'+!?'
0322	41324	002001		RSS	YES
0323	41325	027331		JMP EENT8	NO
0324	41326	075266	EENT7	STB SIGN	SET SIGN
0325	41327	015450		JSB GETCR	GET NEXT CHARACTER
0326	41330	027414		JMP EEN17	NONE FOUND
0327	41331	015276	EENT8	JSB NUMCK	NUMBER?
0328	41332	000000		NOP	NO--ERROR
0329	41333	027414		JMP EEN17	BAD EXPONENT--ERROR
0330	41334	035611		ISZ ENOUF	DID OVER/UNDERFLOW OCCUR?
0331	41335	027414		JMP EEN17	YES--ERROR
0332	41336	050367	EENT9	CPA ,+15B	NO, CARRIAGE RETURN FOLLOWS?
0333	41337	027425		JMP EEN18	YES
0334	41340	027414		JMP EEN17	NO--ERROR
0335	41341	007000	EEN10	CMB	EXTRACT
0336	41342	160001		LDA 1,I	PHYSICAL
0337	41343	001727		ALF,ALF	LENGTH OF
0338	41344	010443		AND B377	DESTINATION STRING
0339	41345	003000		CMA	SET IT AS END
0340	41346	141330		ADA TMPST,I	OF UNSPECIFIED
0341	41347	071410		STA TPRME	DESTINATION STRING
0342	41350	003400		CCA	PREPARE
0343	41351	015344		JSB PSTR	DESTINATION STRING
0344	41352	065406		LDB TNULL	SAVE LENGTH
0345	41353	075354		STB INTMP	ALLOWANCE
0346	41354	006400		CLB	TURN OFF
0347	41355	075573		STB BLANK	BLANK SUPPRESSION
0348	41356	063771		LDA FENCA	POINT TO ENTER CHAR ROUTINE
0349	41357	015350		JSB TRSTR	TRANSFER STRING
0350	41360	006400		CLB	ALL REQUESTED
0351	41361	055406		CPB TNULL	CHARACTERS TRANSFERRED?
0352	41362	027401		JMP EEN14	YES
0353	41363	055464		CPB PS1	NO, TRANSFER LENGTH SPECIFIED?
0354	41364	027375		JMP EEN13	NO
0355	41365	071354		STA INTMP	YES--SAVE (A)
0356	41366	003400		CCA	FINISH
0357	41367	071410		STA TPRME	
0358	41370	041406		ADA TNULL	TRANSFER
0359	41371	071406		STA TNULL	
0360	41372	060600		LDA FSCHA	WITH BLANKS
0361	41373	015350		JSB TRSTR	
0362	41374	027425		JMP EEN18	
0363	41375	165260	EEN13	LDB TEMP6,I	SET LOGICAL
0364	41376	045406		ADB TNULL	TO ACTUAL
0365	41377	175260		STB TEMP6,I	STRING LENGTH
0366	41400	027425		JMP EEN18	
0367	41401	055464	EEN14	CPB PS1	LENGTH OF TRANSFER SPECIFIED?
0368	41402	027406		JMP EEN16	NO
0369	41403	015450	EEN15	JSB GETCR	YES
0370	41404	027425		JMP EEN18	CARRIAGE RETURN

0371	41405	027403		JMP EEN15	LOOK FOR CARRIAGE RETURN
0372	41406	015450	EEN16	JSB GETCR	END-OF-INPUT NEXT?
0373	41407	027425		JMP EEN18	YES
0374	41410	061354		LDA INTMP	NO--DESTINATION STRING EXCEEDED
0375	41411	071406		STA TNULL	RESTORE
0376	41412	061574		LDA SBPTR	DESTINATION STRING
0377	41413	071272		STA TEMP5	PARAMETERS
0378	41414	161422	EEN17	LDA RSPTR,I	TAKE
0379	41415	035422		ISZ RSPTR	ARITHMETIC
0380	41416	165422		LDB RSPTR,I	INVERSE OF
0381	41417	015370		JSB ARINV	RESPONSE TIME
0382	41420	175422		STB RSPTR,I	STORE
0383	41421	007400		CCB	IN
0384	41422	045422		ADB RSPTR	VALUE
0385	41423	170001		STA 1,I	TABLE
0386	41424	075611		STB ENOUF	CLEAR OVER/UNDERFLOW FLAG
0387	41425	002400	EEN18	CLA	ZERO CHARACTER
0388	41426	071572		STA CHRCT	COUNTER
0389	41427	060412		LDA .+40B	RESTORE
0390	41430	071573		STA BLANK	BLANK SUPPRESSION
0391	41431	002400		CLA	OUTPUT A
0392	41432	015454		JSB OUTCR	NULL.
0393	41433	026031		JMP XEC1	

0394*

0395***

0396** EXECUTE <ASSIGN STATEMENT> **

0397*** **

0398*

0399	41434		EASN	EQU *	
0400	41434	060347		LDA .-3	
0401	41435	071442		STA LT5	
0402	41436	071773		STA ASINP	SET FLAG TO SAY ASSIGN OCCURRED
0403	41437	067767		LDB ASBFA	
0404	41440	063766		LDA DBLNK	
0405	41441		EASN0	EQU *	
0406	41441	170001		STA B,I	BLANK OUT 3 WORDS
0407	41442	006004		INB	
0408	41443	035442		ISZ LT5	
0409	41444	027441		JMP EASN0	
0410	41445	002404		CLA,INA	ALLOW STRING
0411	41446	071472		STA EOL	CONSTANT
0412	41447	015336		JSB FORMX	EVALUATE STRING
0413	41450	060350		LDA .-2	
0414	41451	015344		JSB PSTR	PREPARE STRING OPERAND
0415	41452	071256		STA TEMP4	SAVE SOURCE POINTER
0416	41453	002400		CLA	INITIALIZE TO
0417	41454	071470		STA ASTYP	LOCAL LIBRARY
0418	41455	054351		CPB .-1	NULL STRING?
0419	41456	027514		JMP EASN0	YES
0420	41457	075410		STB TPRME	SAVE STRING LENGTH
0421	41460	065256		LDB TEMP4	GET FIRST
0422	41461	004065		CLE,ERB	
0423	41462	160001		LDA B,I	CHARACTER
0424	41463	002041		SEZ,RSS	
0425	41464	001727		ALF,ALF	OF STRING

0426	41465	010443	AND B377	
0427	41466	006404	CLB, INB	SET FOR PUBLIC LIBRARY
0428	41467	050416	CPA, +44B	'S'?
0429	41470	027474	JMP EAS01	YES
0430	41471	050424	CPA, +52B	NO, '*1?
0431	41472	006005	INB, RSS	YES, SET FOR GROUP LIBRARY
0432	41473	027477	JMP EAS00	NO
0433	41474		EAS01 EQU *	
0434	41474	075470	STB ASTYP	SAVE LIBRARY TYPE
0435	41475	035256	ISZ TEMP4	BUMP SOURCE POINTER
0436	41476	035410	ISZ TPRME	BUMP LENGTH
0437	41477		EAS00 EQU *	
0438	41477	061410	LDA TPRME	
0439	41500	040361	ADA, +7	
0440	41501	002020	SSA	LENGTH > 6?
0441	41502	002400	CLA	YES, SET TO 6
0442	41503	040343	ADA, -7	NO
0443	41504	071410	STA TPRME	
0444	41505	071405	STA TNULL	
0445	41506	063767	LDA ASBFA	POINTER TO
0446	41507	071556	STA ASBFP	NAME BUFFER
0447	41510	001000	ALS	
0448	41511	071272	STA TEMP5	DESTINATION STRING POINTER
0449	41512	061004	LDA FCUCA	UPPER CASE CHARACTERS ONLY
0450	41513	015350	JSB TRSTR	MOVE NAME
0451	41514	015356	EAS02 JSB FETCH	EVALUATE NUMERIC OPERAND
0452	41515	015342	JSB SBFIX	ROUND TO INTEGER
0453	41516	064445	LDB B1000	
0454	41517	075552	STB ORDNO	SAVE SPECIFIED ORDINAL NUMBER
0455	41520	015336	JSB FORMX	LEAVE NEXT VARIABLE ON TOP OF ST
0456	41521	161332	LDA OPDST, I	SAVE ADDRESS OF USER VARIABLE
0457	41522	071635	STA ATMP+1	
0458	41523	060356	LDA, +4	DEFAULT
0459	41524	015346	JSB FLOAT	RETURN CODE
0460	41525	104400	DST ATMP+1, I	TU NON-EXISTENT FILE
	41526	101635		
0461	41527	015376	JSB OPCHK	UNSTACK VALUE ADDRESS
0462	41530	061552	LDA ORDNO	DOES
0463	41531	003000	CMA	REQUESTED
0464	41532	041502	ADA FCNTR	FILE
0465	41533	003021	CMA, SSA, RSS	EXIST?
0466	41534	026031	JMP XEC1	NO, DONE
0467	41535	006400	EASN1 CLB	
0468	41536	061552	LDA ORDNO	LOCATE
0469	41537	100200	MPY, +FTEL	CORRECT
	41540	000371		
0470	41541	041504	ADA FILTB	FCB
0471	41542	040357	ADA, +5	
0472	41543	071236	STA FBASE	DISC ADDRESS AND SAVE IT
0473	41544	040355	ADA, +3	
0474	41545	164000	LDB 0, I	GET CURRENT BUFFER ADDRESS
0475	41546	040343	ADA, -7	
0476	41547	160000	LDA 0, I	
0477	41550	001423	ALR, RAR	CLEAR BITS 15 AND 14
0478	41551	003004	CMA, INA	

0479	41552	040001	ADA	1	
0480	41553	071647	STA	RQ3	
0481	41554	015516	JSB	WRBUF	WRITE OUT RECORD
0482	41555	061236	LDA	FBASE	RESTORE
0483	41556	040345	ADA	,-5	FCB
0484	41557	071236	STA	FBASE	POINTER
0485	41560	006400	CLB		
0486	41561	174000	STB	0,I	INITIALIZE
0487	41562	040370	ADA	,+14	
0488	41563	174000	STB	0,I	INITIALIZE PROTECTMASK TO 0
0489	41564	075772	STB	RETCO	INITIALIZE RETURN CODE
0490	41565	114532	JSB	SCHLB,I	CALL IN
0491	41566	072040	DEF	ASNIB	ASSIGN OVERLAY
0492	41567	027653	JMP	EASN5	ASSIGNED FILE RECORD SIZE TOO LA
0493	41570	027651	JMP	EASN4	FILE DOESN'T EXIST
0494	41571	035772	ISZ	RETCO	'READ ONLY' = GROUP OR A000
0495	41572	035772	ISZ	RETCO	'READ ONLY' = IN USE
0496	41573	061613	EASN2 LDA	TEMP1	
0497	41574	051334	CPA	PRGCT	END OF STATEMENT ?
0498	41575	027644	JMP	EASN3	YES
0499	41576	160000	LDA	0,I	TEST FOR A COMMA
0500	41577	010664	AND	OPMSK	
0501	41600	050612	CPA	B2000	COMMA FOLLOWING?
0502	41601	002001	RSS		
0503	41602	027644	JMP	EASN3	NO
0504	41603	002404	CLA,INA		ALLOW
0505	41604	071472	STA	EOL	STRING CONSTANT
0506	41605	015336	JSB	FORMX	YES, EVALUATE STRING OPERAND
0507	41606	060350	LDA	,-2	PREPARE
0508	41607	015344	JSB	PSTR	SOURCE
0509	41610	071256	STA	TEMP4	STRING
0510	41611	075410	STB	TPRME	
0511	41612	063767	LDA	ASBFA	
0512	41613	071556	STA	ASBFP	GET CHARACTER
0513	41614	001000	ALS		POINTER TO
0514	41615	071272	STA	TEMP5	PASSWORD BUFFER
0515	41616	060347	LDA	,-3	
0516	41617	071442	STA	LT5	
0517	41620	065556	LDB	ASBFP	
0518	41621	063766	LDA	DBLNK	
0519	41622	170001	STA	1,I	FILL PASSWORD
0520	41623	006004	INB		BUFFER WITH
0521	41624	035442	ISZ	LT5	BLANKS
0522	41625	027622	JMP	*-3	
0523	41626	060343	LDA	,-7	SET LENGTH (IN CHARACTERS)
0524	41627	071400	STA	TNULL	OF PASSWORD BUFFER
0525	41630	060600	LDA	FSCHA	
0526	41631	015350	JSB	TRSTR	MOVE PASSWORD TO BUFFER
0527	41632	061556	LDA	ASBFP	
0528	41633	002004	INA		
0529	41634	104200	DLD	0,I	
	41635	100000			
0530	41636	141556	ADA	ASBFP,I	ADD WORD1 AND WORD2
0531	41637	020001	XOR	1	EXCLUSIVE OR = WORD3
0532	41640	030225	IOR	RBP	INCLUSIVE OR BITS 14 AND 15

PAGE 0123 #11 STATEMENT EXECUTION PROCESSORS

0533	41641	065236		LDB FBASE	
0534	41642	044370		AOB .+14	
0535	41643	170001		STA 1,I	STORE PROTECTMASK IN FCB
0536	41644	061772	EASN3	LDA RETCD	
0537	41645	015346		JSB FLOAT	FLOAT RETURN CODE AND
0538	41646	104400		DST ATMP+1,1	STORE IN USER VARIABLE
		41647			
0539	41650	026031		JMP XEC1	DONE
0540	41651	060355	EASN4	LDA .+3	SET RETURN CODE FOR NON-EXISTENT
0541	41652	027645		JMP EASN3+1	
0542	41653	060357	EASN5	LDA .+5	SET RETURN CODE FOR RECORD SIZE
0543	41654	027645		JMP EASN3+1	

0545*

0546***

0547** COMPLETE EXECUTION **

0548***

0549*

0550	41655	EXIT	EQU *	
0551	41655		CLF 0	
0552	41656		LDA MAIN,I	INHIBIT
0553	41657		IOR UNABT	
0554	41660		STA MAIN,I	ABORTS
0555	41661		STF 0	
0556	41662		LDA FCNTR	SET COUNTER TO
0557	41663		CMA	1'S COMPLEMENT OF
0558	41664		STA FCNTR	NUMBER OF FILES
0559	41665		INA	SAVE 2'S COMPLEMENT FOR
0560	41666		STA FRMAT	LCD'S FILE COUNT
0561	41667		LDA FCORE	LOAD FIRST BUFFER ADDRESS
0562	41670		LDB FILTB	LOAD POINTER TO
0563	41671		ADB .+6	FIRST DISC ADDRESS (LOW WORD)
0564	41672	EXIT0	ISZ FCNTR	MORE FILES?
0565	41673		JMP EXIT2	YES
0566	41674		JSB LCDLP	UPDATE LAST CHANGE DATE
0567	41675	EXIT3	CLB	OUTPUT
0568	41676		STB DCLC1,I	
0569	41677		JSB ABCK,I	
0570	41700		LDA DCLC2,I	
0571	41701		STA DCLC1,I	
0572	41702		LDA EXIT1	
0573	41703		STA LT1	COMPLETION
0574	41704		LDA MAIN,I	
0575	41705		AND HFLAG	
0576	41706		SZA	MESSAGE UNLESS
0577	41707		CCA,RSS	SHELLO PROGRAM
0578	41710		LDA .-4	
0579	41711		LDB MAIN	DOES USER
0580	41712		INB	HAVE LP?
0581	41713		CPB PRIST	
0582	41714		RSS	
0583	41715		JMP EXIT4	NO.
0584	41716		LDA EXT1A	YES,
0585	41717		STA LT1	RELEASE IT AND
0586	41720		LDA .-10	PRINT MESSAGE
0587	41721		CLB	
0588	41722		STB PRIST	
0589	41723	EXIT4	CLB	
0590	41724		STB LT2	
0591	41725		JSB OUTST	
0592	41726		LDA MAIN	TELL 2114
0593	41727		INA	
0594	41730		LDA 0,I	THAT USER IS
0595	41731		IOR UNR	
0596	41732		JSB S14LP,I	FINISHED RUNNING
0597	41733		LDA .+4	CLEAR PBFLG AND CBFLG
0598	41734		LDB MAIN	
0599	41735		JSB EDABR	BITS.

PAGE 0125 #11 STATEMENT EXECUTION PROCESSORS

0600	41736	124514		JMP	SCHEN,I	
0601	41737	041737	EXT1A	DEF	*	
0602	41740	011423		OCT	11423	
0603	41741	006412		OCT	6412	
0604	41742	046120		ASC	3,LP FRE	
	41743	020106				
	41744	051105				
0605	41745		EXT1	EQU	*	
0606	41745	042412		OCT	42412	
0607	41746	006412		OCT	6412	
0608	41747	042117		ASC	2,DONE	
	41750	047105				
0609	41751	006412		OCT	6412	
0610	41752	075236	EXIT2	STB	FBASE	WRITE
0611	41753	071547		STA	RQ3	OUT
0612	41754	015516		JSB	WRBUF	RECORD
0613	41755	065236		LDB	FBASE	GET RECORD
0614	41756	044365		ADB	.,+FTEL=4	SIZE OF NEXT FILE
0615	41757	160001		LDA	1,I	
0616	41760	001423		ALR	RAR	CLEAR BITS 14 AND 15
0617	41761	003004		CMA	INA	
0618	41762	044361		ADB	.,+7	GET END OF FILE BUFFER
0619	41763	140001		ADA	1,I	COMPUTE FILE BUFFER STARTING ADD
0620	41764	044347		ADB	.,-3	POINT B TO FIRST DISC ADDRESS
0621	41765	027672		JMP	EXIT0	
0623	41766	020040	DBLNK	OCT	20040	
0624	41767	001741	ASBFA	DEF	ERSEC+60	
0625	41770	142246	XECBR	DEF	XECTB=42B,I	
0626	41771	001524	FENCA	DEF	FENCH	
0627	41772	001274	FINCA	DEF	FINCH	
0628	41773	046174	MIOEN	DEF	MIO7	
0629	41774	177666	M74	DEC	=74	
0630	41775	041745	EXIT1	DEF	EXT1	

```

0002 42000          ORG 42000B
0003 42000 142664  ARBAS DEF FOJT=12B,I
0004 42001 177712  D66  OCT =66
0005 42002 041675  EXT3A DEF EXIT3
0006 42003 000000  ITEMP BSS 1
0007 42004 177670  M72  DEC =72
0008 42005 000111  ,73  DEC 73
0009*
0010**
0011*** EXECUTE <CHAIN STATEMENT> ***
0012**
0013*
0014 42006 114532  ECHAN JSB SCHLB,I  CALL SYSTEM TO EXECUTE DISC ROUT
0015 42007 072041          DEF CHLIB
0016 42010 115155          JSB RERRS+39,I
0017 42011 115166          JSB RERRS+48,I
0018 42012 115156          JSB RERRS+40,I
0019 42013 115157          JSB RERRS+41,I
0020 42014 115165          JSB RERRS+47,I
0021 42015 126002          JMP EXT3A,I  NULL PROGRAM OR BAD LINE NUMBER
0022 42016 126017          JMP ++1,I  GO COMPILE IT
0023 42017 036052          DEF CML0
0024**
0025*** SET POINTERS TO DATA STATEMENT ***
0026**
0027*
0028* STARTING WITH THE STATEMENT REFERENCED BY (B) UPON
0029* ENTRY, FIND THE NEXT <DATA STATEMENT> AND SET THE DATA
0030* BLOCK POINTERS APPROPRIATELY, IF NO <DATA STATEMENT>
0031* IS FOUND, SET THE POINTERS TO THE 'OUT OF DATA'
0032* CONFIGURATION AND EXIT WITH (A) = -1.
0033*
0034 42020 055575  #STDP CPB SYMTB  PROGRAM EXHAUSTED?
0035 42021 026037          JMP SETD2  YES, SET 'OUT OF DATA' CONDITION
0036 42022 044354          ADB ,+2  NO,
0037 42023 160001          LDA 1,I  STATEMENT
0038 42024 044351          ADB ,-1  OF
0039 42025 010664          AND OPMSK  TYPE
0040 42026 050652          CPA DATOP  'DATA'?
0041 42027 026033          JMP SETD1  YES
0042 42030 144001          ADB 1,I  NO, COMPUTE
0043 42031 044351          ADB ,-1  ADDRESS OF
0044 42032 026020          JMP #STDP  NEXT STATEMENT
0045 42033 160001  SETD1 LDA 1,I  LOAD STATEMENT LENGTH
0046 42034 006004          INB  SET
0047 42035 003004          CMA,INA  DATA
0048 42036 002005          INA,RSS  COUNTER
0049 42037 003400  SETD2 CCA  TO
0050 42040 071262          STA DCCNT  1-STATEMENT LENGTH
0051 42041 075244          STB NXTDT  SET POINTER ONE WORD
0052 42042 125360          JMP SETDP,I  ABOVE FIRST DATA CONSTANT
0053**
0054*** VALIDATE A FILE REQUEST ***
0055**
0056*

```

```

0057* EXIT TO (P+2) IF (TEMP1)+1 DOES NOT BEGIN A FILE REFERENCE;
0058* ELSE EVALUATE THE FILE REFERENCE AND VERIFY ITS CORRESPONDENCE
0059* WITH A REQUESTED FILE, IF A RECORD REFERENCE IS ALSO PRESENT,
0060* EVALUATE IT AND CALL FOR ITS SWAPPING INTO THE CORE BUFFER,
0061*
0062 42043 065613 #VLF1 LDB TEMP1 IS
0063 42044 006004 INB
0064 42045 055334 CPB PRGCT NEXT
0065 42046 026053 JMP VLF10
0066 42047 160001 LDA 1,I OPERATOR
0067 42050 010664 AND OPMSK
0068 42051 050736 CPA B4000 A '#' ?
0069 42052 026055 JMP VLF11 YES
0070 42053 035506 VLF10 ISZ VLFIL NO, EXIT
0071 42054 125506 JMP VLFIL,I TO (P+2)
0072 42055 007400 VLF11 CCB SET
0073 42056 161613 LDA TEMP1,I VL0 = 0
0074 42057 010664 AND OPMSK FOR
0075 42060 050656 CPA PRTOP 'PRINT',
0076 42061 006400 CLB ELSE
0077 42062 075516 STB VL0 VL0 = -1
0078 42063 035613 ISZ TEMP1 EVALUATE
0079 42064 015356 JSB FETCH FILE REFERENCE
0080 42065 015342 JSB SBFIX 15-BIT INTEGER?
0081 42066 115151 JSB RERRS+35,I NO
0082 42067 075234 STB FILE# YES, SAVE IT
0083 42070 161613 LDA TEMP1,I NEXT
0084 42071 010664 AND OPMSK OPERATOR
0085 42072 050612 CPA B2000 A COMMA?
0086 42073 026105 JMP VLF13 YES
0087 42074 007400 CCB NO, USE NULL RECORD
0088 42075 075352 VLF12 STB RCRD#
0089 42076 006020 SSB NULL RECORD?
0090 42077 064350 LDB ,=2 YES, DO NOT ADJUST FILE POINTER
0091 42100 061234 LDA FILE#
0092 42101 035516 ISZ VL0 WRITE REQUEST?
0093 42102 003000 CMA YES
0094 42103 015510 JSB RQSTR VALIDATE FILE/RECORD REQUEST
0095 42104 125506 JMP VLFIL,I
0096 42105 015356 VLF13 JSB FETCH EVALUATE RECORD REFERENCE
0097 42106 015342 JSB SBFIX 15-BIT INTEGER?
0098 42107 064274 LDB INF NO, LOAD IMPOSSIBLE RECORD
0099 42110 026075 JMP VLF12 YES
0100** **
0101*** FETCH DATA ITEM ***
0102** **
0103*
0104* UPON ENTRY (B) = 1 IF A NUMBER IS REQUESTED OR (B) = 2 IF A
0105* STRING IS REQUESTED, FDATA FILLS THE REQUEST FROM A FILE IF
0106* ONE IS REFERENCED BY THE CALLER, ELSE FROM THE DATA BLOCK.
0107* TYPE MATCH IS CHECKED, NUMBERS RETURN IN (A) AND (B); STRINGS
0108* ARE PREPARED AS SOURCE STRINGS, FDATA MOVES TO NEW FILE
0109* RECORDS OR <DATA STATEMENT>S AS NECESSARY.
0110*
0111 42111 061234 #FDAT LDA FILE# READ FROM

```


0112	42112	002021	SSA,RSS	FILE?
0113	42113	026164	JMP FDAT3	YES
0114	42114	035262	ISZ DCCNT	NO, DATA IN CURRENT STATEMENT?
0115	42115	026125	JMP FDAT1	YES
0116	42116	075272	STB TEMP5	NO, SAVE (B)
0117	42117	065244	LDB NXTDT	MOVE TO NEXT
0118	42120	015360	JSB SETDP	<DATA STATEMENT>
0119	42121	065272	LDB TEMP5	RETRIEVE (B)
0120	42122	035262	ISZ DCCNT	DATA FOUND?
0121	42123	002001	RSS	YES
0122	42124	115133	JSB RERRS+21,I	NO, OUT OF DATA
0123	42125	035262	FDAT1 ISZ DCCNT	INCREMENT COUNTER
0124	42126	161244	LDA NXTDT,I	CORRECT
0125	42127	035244	ISZ NXTDT	
0126	42130	005300	RBR	TYPE OF
0127	42131	020001	XOR 1	
0128	42132	002020	SSA	DATA?
0129	42133	115134	JSB RERRS+22,I	NO
0130	42134	006021	SSB,RSS	YES, STRING?
0131	42135	026144	JMP FDAT2	YES
0132	42136	104200	DLD NXTDT,I	NO, LOAD NUMBER
	42137	101244		
0133	42140	035244	ISZ NXTDT	UPDATE
0134	42141	035244	ISZ NXTDT	POINTER
0135	42142	035262	ISZ DCCNT	
0136	42143	125362	JMP FDATA,I	
0137	42144	161244	FDAT2 LDA NXTDT,I	LOAD STRING LENGTH
0138	42145	035244	ISZ NXTDT	SET
0139	42146	065244	LDB NXTDT	START-OF-STRING
0140	42147	005000	BLS	CHARACTER
0141	42150	075256	STB TEMP4	ADDRESS
0142	42151	010443	AND B377	SET
0143	42152	003000	CMA	TRANSFER STRING
0144	42153	071410	STA TPRME	LENGTH
0145	42154	003004	CMA,INA	UPDATE
0146	42155	001100	ARS	
0147	42156	064000	LDB 0	
0148	42157	041244	ADA NXTDT	DATA
0149	42160	071244	STA NXTDT	
0150	42161	045262	ADB DCCNT	
0151	42162	075262	STB DCCNT	POINTERS
0152	42163	125362	JMP FDATA,I	
0153	42164	061236	FDAT3 LDA FBASE	GET
0154	42165	040357	ADA ,+5	
0155	42166	160000	LDA 0,I	PROTECT
0156	42167	071771	STA PMASK	MASK
0157	42170	075272	STB TEMP5	SAVE DATA REQUEST TYPE
0158	42171	065352	LDB RCRD#	GET TYPE
0159	42172	075653	STB EORFL	OF NEXT ITEM
0160	42173	015514	JSB GTTYP	IN FILE
0161	42174	051272	CPA TEMP5	MATCHING TYPES?
0162	42175	026213	JMP FDAT5	YES
0163	42176	050356	CPA ,+4	NO, END-OF-RECORD?
0164	42177	026203	JMP FDAT4	YES
0165	42200	050355	CPA ,+3	NO, END-OF-FILE?

0166	42201	002001	RSS	YES
0167	42202	115134	JSB RERRS+22,I	NO, TYPE MISMATCH
0168	42203	035236	FDAT4 ISZ FBASE	LOAD
0169	42204	165236	LDB FBASE,I	EOF/EOR ADDRESS
0170	42205	006003	SZB,RSS	NULL?
0171	42206	115153	JSB RERRS+37,I	YES, UNPROTECTED EOF/EOR
0172	42207	075334	STB PRGCT	NO
0173	42210	065250	LDB FORST	CLEAN UP
0174	42211	015432	JSB SETPT	EXECUTION STACKS
0175	42212	124556	JMP XEC1A,I	
0176	42213	165236	FDAT5 LDB FBASE,I	LOAD DATA ADDRESS
0177	42214	002011	SLA,RSS	STRING?
0178	42215	026227	JMP FDATA	YES
0179	42216	104200	DLI 1,I	NO, LOAD NUMBER
	42217	100001		
0180	42220	021771	XOR PMASK	MASK
0181	42221	101100	SWP	
0182	42222	021771	XOR PMASK	DATA
0183	42223	101100	SWP	
0184	42224	135236	ISZ FBASE,I	ADJUST RECORD POINTER
0185	42225	135236	ISZ FBASE,I	PAST DATA
0186	42226	125362	JMP FDATA,I	
0187	42227	160001	FDAT6 LDA 1,I	LOAD STRING HEADER
0188	42230	006004	INB	SET
0189	42231	005000	BLS	SOURCE
0190	42232	075256	STB TEMP4	ADDRESS
0191	42233	005100	BRS	
0192	42234	010443	AND B377	SET
0193	42235	003000	CMA	TRANSFER
0194	42236	071410	STA TPRME	LENGTH
0195	42237	003004	CMA,INA	ADJUST
0196	42240	001100	ARS	RECORD POINTER
0197	42241	044000	ADB 0	PAST
0198	42242	175236	STB FBASE,I	STRING
0199	42243	125362	JMP FDATA,I	

```

0201**          **
0202***  REQUEST AN INPUT RECORD  ***
0203**          **
0204*
0205*  SERVICES REQUESTS FOR TELETYPE INPUT.  IF (A) = 0 EMIT A '?'
0206*  AND 'X-ON' ELSE EMIT A LINE FEED, TWO '?', AND AN 'X-ON'.
0207*
0208  42244 072003 #INCL STA ITEMP      SAVE FLAG
0209  42245 060257          LDA MAIN      DOES THIS USER
0210  42246 002004          INA              HAVE THE
0211  42247 050255          CPA PRIST        LINE PRINTER?
0212  42250 115220          JSB WERRS+9,I  YES - RELEASE IT
0213  42251 062003          LDA ITEMP      RESTORE FLAG
0214  42252 002002          SZA              INITIAL REQUEST?
0215  42253 026303          JMP INCL2      NO
0216  42254 061572          LDA CHRCT      YES
0217  42255 042004          ADA M72         LINE
0218  42256 002020          SSA              FULL?
0219  42257 026264          JMP INCL1      NO
0220  42260 060367          LDA .+15B     YES, OUTPUT
0221  42261 015454          JSB OUTCR      CARRIAGE RETURN
0222  42262 060364          LDA .+12B     AND
0223  42263 015454          JSB OUTCR      LINE FEED
0224  42264 060734          INCL1 LDA B77     OUTPUT
0225  42265 015454          JSB OUTCR      '?'
0226  42266 060373          LDA .+21B     OUTPUT
0227  42267 015454          JSB OUTCR      AN X-ON
0228  42270 002400          CLA              RESET
0229  42271 071572          STA CHRCT      OUTPUT CHARACTER COUNTER
0230  42272 071422          STA IFCNT      AND INPUT ITEM COUNTER
0231  42273 060231          LDA IWT
0232  42274 114516          JSB SCHIN,I   REQUEST INPUT RECORD
0233  42275 015450          JSB GETCR      FIRST
0234  42276 026303          JMP INCL2      CHARACTER A
0235  42277 050355          CPA .+3       'CONTROL C' ?
0236  42300 124554          JMP EXITA,I   YES, TERMINATE EXECUTION
0237  42301 015452          JSB BCKSP     NO, RETURN
0238  42302 125446          JMP INCAL,I   TO CALLER
0239  42303 060364          INCL2 LDA .+12B  OUTPUT A
0240  42304 015454          JSB OUTCR      LINE FEED
0241  42305 060734          LDA B77         AND
0242  42306 015454          JSB OUTCR      A '?'
0243  42307 026264          JMP INCL1
0244**          **
0245***  EXECUTION BRANCH TABLE ***
0246**          **
0247  42310 041434          XECTB DEF EASN  ASSIGN
0248  42311 040031          DEF XEC1      USING
0249  42312 040031          DEF XEC1      IMAGE
0250  42313 040031          DEF XEC1      COM
0251  42314 040111          DEF ELET      LET
0252  42315 040031          DEF XEC1      DIM
0253  42316 040031          DEF XEC1      DEF
0254  42317 040031          DEF XEC1      REM
0255  42320 040136          DEF EGOTO     GOTO

```

0256	42321	040124	DEF EIF	IF
0257	42322	040207	DEF EFUR	FOR
0258	42323	040307	DEF ENEXT	NEXT
0259	42324	040137	DEF EGOSB	GOSUB
0260	42325	040364	DEF ERTRN	RETURN
0261	42326	041655	DEF EXIT	END
0262	42327	041655	DEF EXIT	STOP
0263	42330	040031	DEF XEC1	DATA
0264	42331	040373	DEF EINPUT	INPUT
0265	42332	040622	DEF EREAD	READ
0266	42333	040653	DEF EPRIN	PRINT
0267	42334	041150	DEF ERSTR	RESTORE
0268	42335	046023	DEF EMAT	MAT
0269	42336	040031	DEF XEC1	FILES
0270	42337	042006	DEF ECHAN	CHAIN
0271	42340	041157	DEF EENTR	ENTER
0272	42341	040111	DEF ELET	'IMPLIED' LET
0273**			**	
0274***	FETCH FORMULA VALUE		***	
0275**			**	
0276*				
0277*	RETURN WITH THE RESULT IN (A) AND (B)			
0278*				
0279	42342	015336	#FTCH JSB FORMX	EVALUATE FORMULA
0280	42343	015376	JSB OPCHK	UNSTACK ADDRESS
0281	42344	104200	DLD 1,I	LOAD RESULT
	42345	100001		
0282	42346	125356	JMP FE7CH,I	
0283**			**	
0284***	SET EXECUTION POINTERS		***	
0285**			**	
0286*				
0287*	SETS POINTERS TO THOSE STACKS WHOSE LOCATION MAY CHANGE			
0288*	DURING EXECUTION, USUALLY DUE TO INITIATION OR COMPLETION			
0289*	OF FOR=LOOPS.			
0290*				
0291	42347	075250	#STPT STB FORST	SET TOP OF FOR=STACK
0292	42350	044356	ADB ,+4	SET POINTER TO TOP
0293	42351	075330	STB TMPST	OF TEMPORARY STACK
0294	42352	044376	ADB ,+20	SET POINTER TO TOP
0295	42353	075332	STB OPDST	OF OPERAND STACK
0296	42354	044355	ADB ,+3	SET POINTER TO BOTTOM
0297	42355	075466	STB OPTRQ	OF OPERATOR STACK
0298	42356	007000	CMB	OUT
0299	42357	044462	ADB LWAUS	OF
0300	42360	006020	SSB	STORAGE?
0301	42361	115120	JSB RERRS+10,I	YES
0302	42362	065466	LDB OPTRQ	NO, SET POINTER TO TOP
0303	42363	074056	STB PBPTR	OF OPERATOR STACK
0304	42364	125432	JMP SETPT,I	
0305**			**	
0306***	INITIALIZE FOR PROGRAM MODIFICATION		***	
0307**			**	
0308	42365	060412	#SINI LDA ,+40B	TURN ON
0309	42366	071573	STA BLANK	BLANK SUPPRESSION

0310 42367 071422
0311 42370 125464

STA GFLAG
JMP SINIT,I

TURN OFF INTEGER ERROR SUPPRESS

```

0313**          **
0314***  EVALUATE A FORMULA  ***
0315**          **
0316*
0317*  ENTER WITH TEMP1 POINTING TO THE FIRST OPERAND OF THE
0318*  FORMULA. OPERATORS AND THE ADDRESSES OF OPERANDS ARE
0319*  STACKED SEPARATELY. OPERAND ADDRESSES ARE STACKED AS
0320*  SOON AS THE OPERAND IS SCANNED. AN OPERATOR IS NOT
0321*  STACKED WHILE THE OPERATOR ON TOP OF THE STACK HAS EQUAL
0322*  OR HIGHER PRECEDENCE, INSTEAD THE LATTER IS UNSTACKED
0323*  AND EXECUTED; THUS AN OPERATOR FORCES EXECUTION OF THOSE
0324*  PREVIOUSLY STACKED, DOWN TO THE LATEST ONE STACKED WHICH
0325*  HAS A LOWER PRECEDENCE. THE OPERATOR STACK IS INITIALIZED
0326*  WITH AN END-OF-FORMULA (LOWEST PRECEDENCE) OPERATOR. THE
0327*  ACTION OF OPERATORS IS IN GENERAL TO COMBINE THE TOP TWO
0328*  OPERANDS STACKED. THE ADDRESS OF THE PARTIAL RESULT THUS
0329*  OBTAINED REPLACES THE ADDRESSES OF ITS CONSTITUENT OPERANDS
0330*  ON THE STACK (VALUES OF PARTIAL RESULTS ARE KEPT ON THE
0331*  TEMPORARY STACK). UPON EXIT TEMP1 POINTS TO THE FIRST PROGRAM
0332*  WORD WHOSE OPERATOR DOES NOT MANIPULATE THE STACK (THIS
0333*  MAY BE AN END-OF-FORMULA, 'THEN', 'OF', ETC.).
0334*
0335  42371 015366 #FORM JSB PSHST      STACK
0336  42372 006400      CLB          BEGINNING-OF-FORMULA
0337  42373 174056      STB PBPTR,I  OPERATOR
0338*          *
0339**  PROCESS NEXT OPERAND  **
0340*          *
0341  42374 161613 FORM1 LDA TEMP1,I  EXTRACT
0342  42375 035613      ISZ TEMP1     NEXT
0343  42376 010700      AND OPDMK    OPERAND
0344  42377 002003      SZA,RSS      NULL OPERAND?
0345  42400 026441      JMP FORM2   YES
0346  42401 035332      ISZ OPDST    NO, BUMP POINTER
0347  42402 035332      ISZ OPDST    TO OPERAND STACK
0348  42403 002020      SSA          VARIABLE OPERAND?
0349  42404 026517      JMP FORM6   NO
0350*          *
0351**  STACK NON-FUNCTION VARIABLE OPERAND ADDRESS  **
0352*          *
0353*
0354*  THE ADDRESSES STACKED ARE AS FOLLOWS; FOR SIMPLE VARIABLES,
0355*  A POINTER TO THE VALUE; FOR ARRAYS, THE BASE ADDRESS; FOR
0356*  STRING VARIABLES, THE NEGATION OF THE BASE ADDRESS.
0357*
0358  42405 040351      ADA ,-1      COMPUTE
0359  42406 001000      ALS          POINTERS
0360  42407 041575      ADA SYMTB   TO SYMBOL
0361  42410 064000      LDB 0          TABLE
0362  42411 006004      INB          ENTRY
0363  42412 160000      LDA 0,I     PROGRAMMER.
0364  42413 010371      AND .+17B   DEFINED
0365  42414 050371      CPA .+17B   FUNCTION?
0366  42415 026551      JMP FORM8   YES
0367  42416 164001      LDB 1,I     NO, LOAD VALUE POINTER

```

0368	42417	002002		SZA	STRING VARIABLE?
0369	42420	026440		JMP FORM2-1	NO
0370	42421	061613		LDA TEMP1	YES, END
0371	42422	051334		CPA PRGCT	OF FORMULA?
0372	42423	026430		JMP FORM0	YES
0373	42424	161613		LDA TEMP1,I	NO,
0374	42425	010664		AND OPMSK	FOLLOWED BY
0375	42426	050622		CPA LBOP	SUBSCRIPT?
0376	42427	026437		JMP FORM2-2	YES
0377	42430	075256	FORM0	STB TEMP4	NO
0378	42431	015400		JSB RSCHK	CREATE TEMPORARY
0379	42432	002400		CLA	RECORD
0380	42433	007400		CCB	
0381	42434	104400		DST TMPST,I	(0,-1)
	42435	101330			
0382	42436	065256		LDB TEMP4	RETRIEVE AND
0383	42437	007004		CMB,INB	NEGATE STRING ADDRESS
0384	42440	175332		STB OPDST,I	STACK ADDRESS
0385*				*	
0386**	PROCESS NEXT OPERATOR			**	
0387*				*	
0388	42441	061613	FORM2	LDA TEMP1	FORMULA
0389	42442	051334		CPA PRGCT	EXHAUSTED?
0390	42443	026457		JMP FORM3	YES
0391	42444	161613		LDA TEMP1,I	NO,
0392	42445	010664		AND OPMSK	EXTRACT
0393	42446	001727		ALF,ALF	NEXT
0394	42447	064000		LDB 0	OPERATOR
0395	42450	050354		CPA ,+2	STRING CONSTANT?
0396	42451	026651		JMP FOR13	YES
0397	42452	040332		ADA ,=200	NO, NON-FORMULA
0398	42453	002020		SSA	OPERATOR?
0399	42454	006400		CLB	YES
0400	42455	042001		ADA D66	NO, NON-FORMULA
0401	42456	002021		SSA,RSS	OPERATOR?
0402	42457	006400	FORM3	CLB	YES
0403	42460	002400		CLA	NO
0404	42461	006003		SZB,RSS	END-OF-FORMULA?
0405	42462	026466		JMP **4	YES
0406	42463	044564		ADB FOPBS	NO, LOAD OPERATOR
0407	42464	160001		LDA 1,I	INFORMATION WORD
0408	42465	010443		AND B377	SAVE
0409	42466	071252		STA TEMP2	PRIORITY
0410	42467	120001		XOR 1,I	SAVE
0411	42470	001100		ARS	INTERNAL
0412	42471	071254		STA TEMP3	NAME
0413*				*	
0414**	STACK PRESENT OR EXECUTE PREVIOUS OPERATOR			**	
0415*				*	
0416	42472	160056	FORM4	LDA PBPTR,I	DOES OPERATOR
0417	42473	010443		AND B377	ON TOP
0418	42474	003000		CMA	OF STACK
0419	42475	041252		ADA TEMP2	HAVE HIGHER
0420	42476	002020		SSA	PRIORITY?
0421	42477	026507		JMP FORM5	YES

0422	42500	061252	LDA TEMP2	NO
0423	42501	050365	CPA ,+13B	CORRECT
0424	42502	002404	CLA,INA	STACK PRIORITY
0425	42503	031254	IOR TEMP3	ADD NAME
0426	42504	015366	JSB PSHST	STACK
0427	42505	170056	STA PBPTR,I	OPERATOR
0428	42506	026374	JMP FORM1	
0429	42507	160056	FORM5 LDA PBPTR,I	POP
0430	42510	064350	LDB ,=2	OPERATOR
0431	42511	044056	ADB PBPTR	FROM TOP
0432	42512	074056	STB PBPTR	OF STACK
0433	42513	001727	ALF,ALF	BRANCH
0434	42514	010443	AND B377	TO
0435	42515	042000	ADA ARBAS	APPROPRIATE
0436	42516	124000	JMP 0,I	ROUTINE
0437*				*
0438**	STACK CONSTANT OR PARAMETER ADDRESS			**
0439*				*
0440*				
0441*	FOR NUMERICAL CONSTANTS STACK A POINTER TO THE VALUE			
0442*	EMBEDDED IN THE PROGRAM, FOR PARAMETERS STACK THE			
0443*	PARAMETER ADDRESS.			
0444*				
0445	42517	001666	FORM6 ELA,CLE,ERA	ERASE FLAG BIT
0446	42520	002002	SZA	CONSTANT?
0447	42521	026526	JMP FORM7	NO
0448	42522	065613	LDB TEMP1	YES,
0449	42523	035613	ISZ TEMP1	STACK
0450	42524	035613	ISZ TEMP1	ADDRESS
0451	42525	026440	JMP FORM2=1	
0452	42526	071252	FORM7 STA TEMP2	PRE-
0453	42527	010371	AND ,+17B	DEFINED
0454	42530	050371	CPA ,+17B	FUNCTION?
0455	42531	026534	JMP **3	YES
0456	42532	165466	LDB OPTRQ,I	NO, STACK
0457	42533	026440	JMP FORM2=1	PARAMETER ADDRESS
0458*				
0459*	FOR FUNCTIONS RECURSION ON FORMX EVALUATES THE PARAMETER			
0460*	AND, FOR PROGRAMMER DEFINED FUNCTIONS, THE VALUE,			
0461*	FUNCTION VALUES ARE LEFT ON THE TEMPORARY STACK AND A			
0462*	POINTER THERETO IS PLACED ON THE OPERAND STACK,			
0463*	'LEN' IS HANDLED IN A SPECIAL WAY.			
0464*				
0465*				*
0466**	EVALUATE PRE-DEFINED FUNCTION			**
0467*				*
0468	42534	021252	XOR TEMP2	IDENTIFY
0469	42535	001727	ALF,ALF	
0470	42536	001700	ALF	FUNCTION
0471	42537	050367	CPA ,+15B	'LEN' ?
0472	42540	026630	JMP FOR12	YES
0473	42541	040740	ADA PDFBS	NO, STACK
0474	42542	015366	JSB PSHST	JUMP TO
0475	42543	170056	STA PBPTR,I	ENTRY POINT
0476	42544	061336	LDA FORMX	SAVE FORMX

PAGE 0136 #12 FORMULA EVALUATION ROUTINES

0477	42545	171332	STA OPDST,I	RETURN ADDRESS
0478	42546	015336	JSB FORMX	EVALUATE ARGUMENT
0479	42547	015374	JSB SITOP	BRANCH TO
0480	42550	124056	JMP PBPTR,I	SUBROUTINE

```

0001*
0002** EVALUATE PROGRAMMER-DEFINED FUNCTION **
0003*
0004 42551 160001 FORM8 LDA 1,I LOAD ADDRESS OF FORMULA
0005 42552 015366 JSB PSHST SAVE VALUE OF
0006 42553 065330 LDB TMPST CURRENT POINTER TO
0007 42554 174056 STB PBPTR,I TEMPORARY STACK
0008 42555 015366 JSB PSHST SAVE ADDRESS OF
0009 42556 170056 STA PBPTR,I DEFINING FORMULA
0010 42557 061336 LDA FORMX SAVE FORMX
0011 42560 171332 STA OPDST,I RETURN ADDRESS
0012 42561 015336 JSB FORMX EVALUATE ARGUMENT
0013 42562 161332 LDA OPDST,I SWAP
0014 42563 165466 LDB OPTRQ,I OLD AND NEW
0015 42564 175332 STB OPDST,I ARGUMENT
0016 42565 171466 STA OPTRQ,I ADDRESSES
0017 42566 051330 CPA TMPST PROTECT PARAMETER
0018 42567 015400 JSB RSCHK ON TEMPORARY STACK
0019 42570 061613 LDA TEMP1 SWAP ADDRESSES
0020 42571 164056 LDB PBPTR,I OF CURRENT
0021 42572 075613 STB TEMP1 AND FUNCTION
0022 42573 170056 STA PBPTR,I FORMULAS
0023 42574 015336 JSB FORMX EVALUATE FUNCTION
0024 42575 165332 LDB OPDST,I POP
0025 42576 060350 LDA .-2 OPERAND
0026 42577 041332 ADA OPDST STACK,
0027 42600 071332 STA OPDST SAVING
0028 42601 161332 LDA OPDST,I RESULT ADDRESS
0029 42602 171466 STA OPTRQ,I AND ADDRESS OF
0030 42603 175332 STB OPDST,I OLD PARAMETER
0031 42604 160056 LDA PBPTR,I RESTORE
0032 42605 071613 STA TEMP1 FORMULA POINTER
0033 42606 060056 LDA PBPTR POP
0034 42607 040350 ADA .-2 OPERATOR
0035 42610 070056 STA PBPTR STACK
0036 42611 160056 LDA PBPTR,I RESTORE ORIGINAL
0037 42612 071330 STA TMPST TEMPORARY STACK POINTER
0038 42613 015374 JSB STTOP LOAD FUNCTION RESULT
0039*
0040** RECORD RESULT OF FUNCTION **
0041*
0042*
0043* PRE-DEFINED FUNCTIONS RETURN TO THIS POINT WITH THEIR
0044* RESULT IN (A) AND (B),
0045*
0046 42614 104400 FOR10 DST TMPST,I SAVE RESULT
0047 42615 101330
0047 42616 161332 LDA OPDST,I RESTORE FORMX
0048 42617 071336 STA FORMX RETURN ADDRESS
0049 42620 061330 LDA TMPST RECORD LOCATION
0050 42621 171332 STA OPDST,I OF RESULT
0051 42622 064056 LDB PBPTR POP
0052 42623 044350 ADB .-2 FUNCTION
0053 42624 074056 STB PBPTR ADDRESS
0054 42625 035613 ISZ TEMP1 OF RESULT

```

```

0055 42626 035613      ISZ TEMP1      ON TOP OF
0056 42627 026441      JMP FORM2      OPERAND STACK
0057*
0058** EVALUATE 'LEN' **
0059*
0060 42630 015400  FOR12 JSB RSCHK      CREATE SPACE ON TEMPORARY STACK
0061 42631 161613      LDA TEMP1,I    FIND
0062 42632 010700      AND OPDMK      STRING'S
0063 42633 040351      ADA ,-1        SYMBOL
0064 42634 001000      ALS           TABLE
0065 42635 041575      ADA SYMTB      ENTRY
0066 42636 002004      INA           LOAD ADDRESS
0067 42637 160000      LDA 0,I        OF STRING
0068 42640 040351      ADA ,-1        EXTRACT
0069 42641 160000      LDA 0,I        STRING
0070 42642 010443      AND B377       LENGTH
0071 42643 015346      JSB FLOAT      STACK
0072 42644 104400      DST TMPST,I    STRING LENGTH
      42645 101330
0073 42646 061330      LDA TMPST      STACK ADDRESS
0074 42647 171332      STA OPDST,I    OF RESULT
0075 42650 026625      JMP FOR12-3
0076*
0077** PROCESS STRING CONSTANT **
0078*
0079*
0080* WHEN STRING CONSTANTS ARE STACKED, AN APPROPRIATE
0081* ENTRY IS PLACED ON THE TEMPORARY STACK SO THAT ALL
0082* STRING OPERANDS HAVE THE SAME FORM: A NEGATED BASE
0083* ADDRESS ON THE OPERAND STACK AND A TWO WORD ENTRY ON
0084* THE TEMPORARY STACK CONTAINING THE START-OF-STRING
0085* AND END-OF-STRING DESIGNATORS BIASED BY -1 (DEFAULT
0086* START-OF-STRING DESIGNATORS HAVE A STACK VALUE OF 0,
0087* DEFAULT END-OF-STRING DESIGNATORS HAVE A STACK VALUE
0088* OF -1). IN THE CASE OF SUBSCRIPTED STRING VARIABLES,
0089* THE TEMPORARY IS CREATED WHEN THE ']' IS SCANNED; THE
0090* ENTRY FOR NON-SUBSCRIPTED STRING OPERANDS IS CREATED
0091* WHEN THEY ARE SCANNED.
0092*
0093 42651 002404  FOR13 CLA,INA      PRINT STATEMENT
0094 42652 051472      CPA EOL        STRING CONSTANT?
0095 42653 015340      JSB STSTR      NO, STACK STRING CONSTANT
0096 42654 026457      JMP FORM3      EXECUTE END-OF-FORMULA

```

```

0098*
0099** RECORD RESULT OF OPERATION **
0100*
0101*
0102* OPERATORS CREATING INTERMEDIATE RESULTS RETURN TO HERE.
0103*
0104 42655 035332 FOR14 ISZ OPDST STACK
0105 42656 035332 ISZ OPDST TEMPORARY
0106 42657 104400 DST TMPST,I RESULT
      42660 101330
0107 42661 061330 LDA TMPST SAVE
0108 42662 171332 STA OPDST,I ADDRESS ON
0109 42663 026472 JMP FORM4 OPERAND STACK
0110*
0111** EXIT FORMULA EVALUATOR **
0112*
0113*
0114* THIS WORD IS ACTUALLY PART OF THE FORMULA OPERATOR JUMP
0115* TABLE. THE WORDS BETWEEN IT AND FOJT CORRESPOND TO
0116* OPERATORS WHICH ARE NOT EXECUTED, SO CODE IS INSERTED HERE
0117* TO UTILIZE THIS SPACE.
0118*
0119 42664 101336 DEF FORMX,I
0120**
0121*** SET LOGICAL VALUES ***
0122**
0123 42665 002400 FALSE CLA LOAD
0124 42666 006400 CLB ZERO
0125 42667 026655 JMP FOR14
0126 42670 061040 TRUE LDA HALF LOAD
0127 42671 064354 LDB ,+2 1.0
0128 42672 026655 JMP FOR14
0129**
0130*** EXECUTE UNARY - ***
0131**
0132 42673 015374 EUMIN JSB STTOP UNSTACK AND LOAD TOP OF STACK
0133 42674 015370 JSB ARINV NEGATE IT
0134 42675 026655 JMP FOR14 STORE IT
0135**
0136*** FORMULA OPERATOR JUMP TABLE ***
0137**
0138 42676 042726 FOJT DEF ELBRC (
0139 42677 042374 DEF FORM1 (
0140 42700 042472 DEF FORM4 UNARY +
0141 42701 042673 DEF EUMIN UNARY -
0142 42702 042735 DEF ESCMA SUBSCRIPT COMMA
0143 42703 043011 DEF ESTR ASSIGNMENT OPERATOR
0144 42704 043120 DEF EFAD +
0145 42705 043123 DEF EFSB -
0146 42706 043126 DEF EFMP *
0147 42707 043131 DEF EFDV /
0148 42710 043134 DEF EPWR ↑
0149 42711 043235 DEF EGTRT >
0150 42712 043241 DEF ELSJ <
0151 42713 043257 DEF ENEQL #

```

```

0152 42714 043247      DEF EEQL      *
0153 42715 000000      NOP          UNUSED
0154 42716 043304      DEF EAND      AND
0155 42717 043312      DEF EIOR      OR
0156 42720 043272      DEF EMIN      MIN
0157 42721 043263      DEF EMAX      MAX
0158 42722 043257      DEF ENEQL     <>
0159 42723 043243      DEF EGORE     >*
0160 42724 043253      DEF ELORE     <=
0161 42725 043320      DEF ENOT      NOT
0162**
0163*** EXECUTE LEFT BRACKET ***
0164**
0165*
0166* LOAD A DEFAULT SECOND SUBSCRIPT AND ENTER THE CODE FOR
0167* A SUBSCRIPT COMMA,
0168*
0169 42726 061332  ELBRC LDA OPDST      LOAD
0170 42727 040350      ADA ,=2          =1
0171 42730 160000      LDA 0,I          FOR A
0172 42731 007400      CCB              STRING,
0173 42732 002021      SSA,RSS          0
0174 42733 006400      CLB              FOR
0175 42734 026745      JMP ESCM1        AN ARRAY
0176**
0177*** EXECUTE SUBSCRIPT COMMA ***
0178**
0179*
0180* BOTH SUBSCRIPTS ARE ROUNDED TO INTEGERS AND TESTED TO BE
0181* POSITIVE. FOR STRINGS, THE TWO INTEGERS ARE SAVED ON THE
0182* TEMPORARY STACK AS A PSEUDO-ENTRY LATER USED BY PSTR. FOR
0183* ARRAYS, THE SUBSCRIPTS ARE CHECKED AND IF WITHIN THE CURRENT
0184* BOUNDS THEY ARE COMBINED WITH THE BASE ADDRESS OF THE ARRAY.
0185* THE ARRAY ELEMENT ADDRESS THEN REPLACES THE BASE ADDRESS ON
0186* THE OPERAND STACK. UNSUITABLE SUBSCRIPTS EXIT TO THE ERROR
0187* ROUTINE.
0188*
0189 42735 015376  ESCMA JSB OPCHK      UNSTACK
0190 42736 104200      OLD 1,I          SECOND SUBSCRIPT
0191 42740 015342      JSB SBFIX        ROUND TO INTEGER
0192 42741 115127      JSB RERRS+17,I  UNSUITABLE RESULT
0193 42742 060056      LDA PBPTR        UNSTACK
0194 42743 040350      ADA ,=2          THE
0195 42744 070056      STA PBPTR        'I'
0196 42745 075256  ESCM1 STB TEMP4      SAVE RESULT
0197 42746 015374      JSB STTOP        POP FIRST SUBSCRIPT
0198 42747 015342      JSB SBFIX        ROUND TO INTEGER
0199 42750 115127      JSB RERRS+17,I  UNSUITABLE RESULT
0200 42751 175330      STB TMPST,I     STORE IN TEMPORARY STACK
0201 42752 161332      LDA OPDST,I     STRING
0202 42753 002021      SSA,RSS        VARIABLE?
0203 42754 026762      JMP ESCM2        NO, ARRAY VARIABLE
0204 42755 061330      LDA TMPST        YES,
0205 42756 002004      INA            SAVE

```

0206	42757	065256	LDB TEMP4	SECOND SUBSCRIPT IN
0207	42760	174000	STB 0,I	TEMPORARY STACK
0208	42761	026374	JMP FORM1	
0209	42762	040350	ESCM2 ADA .-2	LOAD COLUMN
0210	42763	104200	DL0 0,I	AND ROW BOUNDS
	42764	100000		
0211	42765	003004	CMA,INA	IS SPECIFIED
0212	42766	141330	ADA TMPST,I	ROW
0213	42767	002021	SSA,RSS	LEGAL?
0214	42770	115127	JSB RERRS+17,I	NO
0215	42771	075272	ST0 TEMP5	YES
0216	42772	007004	CMB,INB	IS SPECIFIED
0217	42773	045256	ADB TEMP4	COLUMN
0218	42774	006021	SSB,RSS	LEGAL?
0219	42775	115127	JSB REKRS+17,I	NO
0220	42776	161330	LDA TMPST,I	YES, COMPUTE ROW
0221	42777	100200	MPY TEMP5	DISPLACEMENT
	43000	001272		
0222	43001	041256	ADA TEMP4	ADD COLUMN DISPLACEMENT
0223	43002	001000	ALS	DOUBLE FOR CORE WORDS
0224	43003	141332	ADA OPDST,I	STORE ACTUAL
0225	43004	171332	STA OPDST,I	ELEMENT ADDRESS
0226	43005	061330	LDA TMPST	POP UNUSED
0227	43006	040350	ADA .-2	TEMPORARY
0228	43007	071330	STA TMPST	STACK
0229	43010	026374	JMP FORM1	ENTRY
0230**			**	
0231***	EXECUTE STORE		***	
0232**			**	
0233*				
0234*	IN ORDER TO ALLOW MULTIPLE ASSIGNMENT STATEMENTS, NO			
0235*	ASSIGNMENT CAN TAKE PLACE UNTIL THE RIGHT-HAND FORMULA			
0236*	IS EVALUATED; I.E. ONLY AN END-OF-FORMULA OPERATOR CAN			
0237*	FORCE AN ASSIGNMENT OPERATOR OFF OF THE STACK. ASSIGNMENTS			
0238*	MAY BE NUMERICAL TO NUMERICAL TYPE OPERAND, IN WHICH CASE			
0239*	THE ASSIGNED QUANTITY IS SAVED FOR POSSIBLE ADDITIONAL			
0240*	ASSIGNMENTS; OR STRING TO STRING OPERAND. IN THE LATTER			
0241*	CASE AN INTERMEDIATE STRING IS NECESSARY IF THE HEAD OF			
0242*	THE DESTINATION STRING LIES IN THE TAIL OF THE ACTUAL			
0243*	SOURCE STRING.			
0244*				
0245	43011	065252	ESTR LDB TEMP2	NEXT OPERATOR AN
0246	43012	006002	SZB	END-OF-FORMULA?
0247	43013	027112	JMP ESTR5	NO
0248	43014	055254	CPB TEMP3	YES, FIRST STORE OF FORMULA?
0249	43015	027030	JMP ESTR2	YES
0250	43016	161332	ESTR1 LDA OPDST,I	NO, SET
0251	43017	071260	STA TEMP6	DESTINATION ADDRESS
0252	43020	104200	DL0 TEMP3,I	TRANSFER
	43021	101254		
0253	43022	104400	DST TEMP6,I	THE NUMBER
	43023	101260		
0254	43024	061332	LDA OPDST	UNSTACK
0255	43025	040350	ADA .-2	DESTINATION
0256	43026	071332	STA OPDST	OPERAND

0257	43027	026472		JMP	FORM4	
0258	43030	161332	ESTR2	LDA	OPDST, I	STRING
0259	43031	002020		SSA		OPERANDS?
0260	43032	027036		JMP	ESTR3	YES
0261	43033	015376		JSB	OPCHK	NO, UNSTACK SOURCE
0262	43034	075254		STB	TEMP3	AND SAVE VALUE ADDRESS
0263	43035	027016		JMP	ESTR1	
0264	43036	060350	ESTR3	LDA	.-2	PREPARE
0265	43037	015344		JSB	PSTR	SOURCE
0266	43040	071256		STA	TEMP4	STRING
0267	43041	075410		STB	TPRME	
0268	43042	003400		CCA		PREPARE
0269	43043	015344		JSB	PSTR	DESTINATION STRING
0270	43044	064056		LDB	PBPTR	SAVE CORE
0271	43045	075440		STB	EST1	POINTER
0272	43046	061256		LDA	TEMP4	TRANSFER
0273	43047	003000		CMA		TO
0274	43050	041272		ADA	TEMP5	HIGHER
0275	43051	002020		SSA		CORE?
0276	43052	027105		JMP	ESTR4	NO
0277	43053	041410		ADA	TPRME	YES,
0278	43054	040354		ADA	.-2	OVERLAPPING
0279	43055	002021		SSA, RSS		TRANSFER?
0280	43056	027105		JMP	ESTR4	NO
0281	43057	061272		LDA	TEMP5	YES, SAVE
0282	43060	071442		STA	EST2	DESTINATION ADDRESS
0283	43061	006004		INB		SET DESTINATION
0284	43062	005000		BLS		ADDRESS TO START
0285	43063	075272		STB	TEMP5	OF FREE CORE
0286	43064	061406		LDA	TNULL	SAVE TRANSFER
0287	43065	071444		STA	EST3	LENGTH
0288	43066	003004		CMA, INA		ALLOCATE
0289	43067	001100		ARS		SPACE FOR
0290	43070	015326		JSB	CUSP	INTERMEDIATE
0291	43071	070056		STA	PBPTR	STRING
0292	43072	060600		LDA	FSCHA	
0293	43073	015350		JSB	TRSTR	TRANSFER STRING TO FREE CORE
0294	43074	061444		LDA	EST3	RESTORE TRANSFER
0295	43075	071406		STA	TNULL	LENGTH
0296	43076	071410		STA	TPRME	RESET ACTUAL SOURCE LENGTH
0297	43077	061440		LDA	EST1	SET SOURCE
0298	43100	002004		INA		ADDRESS TO
0299	43101	001000		ALS		INTERMEDIATE
0300	43102	071256		STA	TEMP4	STRING
0301	43103	061442		LDA	EST2	RESTORE ORIGINAL
0302	43104	071272		STA	TEMP5	DESTINATION STRING
0303	43105	060600	ESTR4	LDA	FSCHA	
0304	43106	015350		JSB	TRSTR	COMPLETE TRANSFER
0305	43107	061440		LDA	EST1	RESTORE FREE
0306	43110	070056		STA	PBPTR	CORE POINTER
0307	43111	026507		JMP	FORM5	EXECUTE END-OF-FORMULA
0308	43112	034056	ESTR5	ISZ	PBPTR	DEFER
0309	43113	034056		ISZ	PBPTR	EXECUTION
0310	43114	063117		LDA	BASSO	
0311	43115	170056		STA	PBPTR, I	

```

0312 43116 026500          JMP FORM4+6
0313*
0314 43117 007402  BASSO OCT 7402
0315**
0316*** EXECUTE +      ***
0317**
0318 43120 015372  EFAD   JSB BINOP
0319 43121 015402          JSB ,FAD
0320 43122 026655          JMP FOR14
0321**
0322*** EXECUTE -      ***
0323**
0324 43123 015372  EFSB   JSB BINOP
0325 43124 015404          JSB ,FSB
0326 43125 026655          JMP FOR14
0327**
0328*** EXECUTE *      ***
0329**
0330 43126 015372  EFMP   JSB BINOP
0331 43127 015406          JSB ,FMP
0332 43130 026655          JMP FOR14
0333**
0334*** EXECUTE /      ***
0335**
0336 43131 015372  EFDV   JSB BINOP
0337 43132 015410          JSB ,FDV
0338 43133 026655          JMP FOR14
0339**
0340*** EXECUTE ↑      ***
0341**
0342*
0343** REAL POWER      **
0344*
0345*
0346* EXIT TO ERROR IF BASE IS NEGATIVE. ELSE COMPUTE
0347* RESULT AS ET(POWER*LN(BASE)).
0348*
0349 43134 165332  EPWR  LDB OPDST,I  LOAD
0350 43135 104200          DLD 1,I          POWER
         43136 100001
0351 43137 015416          JSB IFIX        INTEGER?
0352 43140 027143          JMP ++3         NO
0353 43141 102301          SOS           YES, 16-BIT?
0354 43142 027156          JMP IPWR        YES
0355 43143 015372          JSB BINOP       NO, UNSTACK
0356 43144 002001          RSS           ARGUMENTS
0357 43145 015354          JSB PCHK        CHECK ARGUMENTS
0358 43146 002020          SSA           NEGATIVE BASE?
0359 43147 115144          JSB RERRS+30,I YES
0360 43150 065642          LDB BIN01      NO, LOAD BASE ADDRESS
0361 43151 015436          JSB ,LOG        TAKE NATUAL LOG
0362 43152 015406          JSB ,FMP        MULTIPLY
0363 43153 101643          DEF BIN02,I    BY POWER
0364 43154 015434          JSB ,EXP        EXPONENTIATE
0365 43155 026655          JMP FOR14

```



```

0366*
0367** INTEGER POWER **
0368*
0369*
0370* MULTIPLY BASE REPEATEDLY, USING POWERS-OF-TWO METHOD
0371* TO SPEED PROCESS. IF POWER IS NEGATIVE, TAKE RECIPROCAL
0372* FOR FINAL RESULT.
0373*
0374 43156 075264 IPWR STB TT1 SAVE SIGN
0375 43157 006020 SSB FORM ABSOLUTE
0376 43160 007004 CMB,INB VALUE OF POWER
0377 43161 075266 STB TT2 SAVE IT
0378 43162 015372 JSB BINOP UNSTACK
0379 43163 002001 RSS ARGUMENTS
0380 43164 015354 JSB PCHK CHECK ARGUMENTS
0381 43165 065642 LDB BIN01 STORE
0382 43166 071642 STA BIN01
0383 43167 075643 STB BIN02 BASE
0384 43170 061040 LDA HALF INITIALIZE
0385 43171 071616 STA TT3 RESULT
0386 43172 060354 LDA .+2 TO
0387 43173 071617 STA TT4 1.0
0388 43174 065266 IPWR1 LDB TT2 DIVIDE POWER
0389 43175 004031 SLB,BRS BY 2
0390 43176 027215 JMP IPWR4 ODD POWER
0391 43177 075266 STB TT2 EVEN POWER
0392 43200 006002 IPWR2 SZB ZERO?
0393 43201 027226 JMP IPWR5 NO
0394 43202 061264 LDA TT1 YES
0395 43203 002020 SSA POSITIVE POWER?
0396 43204 027210 JMP IPWR3 NO
0397 43205 061616 LDA TT3 YES, RETURN
0398 43206 065617 LDB TT4 WITH
0399 43207 026655 JMP FOR14 RESULT
0400 43210 061040 IPWR3 LDA HALF TAKE
0401 43211 064354 LDB .+2 RECIPROCAL
0402 43212 015410 JSB .FDV FOR
0403 43213 001616 DEF TT3 FINAL
0404 43214 026655 JMP FOR14 RESULT
0405 43215 075266 IPWR4 STB TT2 SAVE POWER
0406 43216 061642 LDA BIN01 LOAD
0407 43217 065643 LDB BIN02 BASE
0408 43220 015406 JSB .FMP MULTIPLY BY
0409 43221 001616 DEF TT3 RESULT SO FAR
0410 43222 071616 STA TT3 SAVE NEW
0411 43223 075617 STB TT4 PARTIAL
0412 43224 065266 LDB TT2 RESULT
0413 43225 027200 JMP IPWR2
0414 43226 061642 IPWR5 LDA BIN01 SQUARE
0415 43227 065643 LDB BIN02
0416 43230 015406 JSB .FMP BASE
0417 43231 001642 DEF BIN01
0418 43232 071642 STA BIN01 RECORD
0419 43233 075643 STB BIN02 NEW
0420 43234 027174 JMP IPWR1 BASE

```

```

0002**          **
0003*** EXECUTE > ***
0004**          **
0005 43235 015352 EGTRT JSB COMPR COMPARE OPERANDS
0006 43236 002020      SSA      < ?
0007 43237 026665      JMP FALSE YES
0008 43240 027260      JMP ENEQL+1 NO
0009**          **
0010*** EXECUTE < ***
0011**          **
0012 43241 015352 ELST JSB COMPR COMPARE OPERANDS
0013 43242 003001      CMA,RSS REVERSE COMPARISON SENSE
0014**          **
0015*** EXECUTE >= ***
0016**          **
0017 43243 015352 EGTRE JSB COMPR COMPARE OPERANDS
0018 43244 002020      SSA      < ?
0019 43245 026665      JMP FALSE YES
0020 43246 026670      JMP TRUE NO
0021**          **
0022*** EXECUTE = ***
0023**          **
0024 43247 015352 EEQL JSB COMPR COMPARE OPERANDS
0025 43250 002002      SZA      = ?
0026 43251 026665      JMP FALSE NO
0027 43252 026670      JMP TRUE YES
0028**          **
0029*** EXECUTE <= ***
0030**          **
0031 43253 015352 ELORE JSB COMPR COMPARE OPERANDS
0032 43254 002020      SSA      >= ?
0033 43255 026670      JMP TRUE NO
0034 43256 027260      JMP EEQL+1 YES
0035**          **
0036*** EXECUTE # OR <> ***
0037**          **
0038 43257 015352 ENEQL JSB COMPR COMPARE OPERANDS
0039 43260 002002      SZA      # ?
0040 43261 026670      JMP TRUE NO
0041 43262 026665      JMP FALSE YES
0042**          **
0043*** EXECUTE 'MAX' ***
0044**          **
0045 43263 015372 EMAX JSB BINOP SUBTRACT THE
0046 43264 015404      JSB ,FSB TOP TWO OPERANDS
0047 43265 002021      SSA,RSS TOP OPERAND LARGER?
0048 43266 027276      JMP ARG1 NO
0049 43267 104200 ARG2 DLD BIN02,I YES, RETRIEVE
      43270 101543      JMP FOR14 ITS VALUE
0050 43271 026655
0051**          **
0052*** EXECUTE 'MIN' ***
0053**          **
0054 43272 015372 EMIN JSB BINOP SUBTRACT THE
0055 43273 015404      JSB ,FSB TOP TWO OPERANDS

```

0056	43274	002021	SSA,RSS	TOP OPERAND LARGER?
0057	43275	027267	JMP ARG2	NO
0058	43276	035332	ARG1 ISZ OPDST	YES,
0059	43277	035332	ISZ OPDST	RETRIEVE
0060	43300	165332	LDB OPDST,I	VALUE OF
0061	43301	104200	DLD 1,I	NEXT-TO-TOP
	43302	100001		
0062	43303	026657	JMP FOR14+2	OPERAND
0063**			**	
0064***			EXECUTE 'AND'	***
0065**			**	
0066	43304	015372	EAND JSB BINOP	UNSTACK
0067	43305	002001	RSS	OPERANDS
0068	43306	002003	SZA,RSS	TOP OPERAND ZERO?
0069	43307	026665	JMP FALSE	YES
0070	43310	161643	LDA BIN02,I	NO, CHECK
0071	43311	027260	JMP ENEQL+1	NEXT-TO-TOP OPERAND
0072**			**	
0073***			EXECUTE 'OR'	***
0074**			**	
0075	43312	015372	EIOR JSB BINOP	UNSTACK
0076	43313	002001	RSS	OPERANDS
0077	43314	002002	SZA	TOP OPERAND NON-ZERO?
0078	43315	026670	JMP TRUE	YES
0079	43316	161643	LDA BIN02,I	NO, CHECK
0080	43317	027260	JMP ENEQL+1	NEXT-TO-TOP OPERAND
0081**			**	
0082***			EXECUTE 'NOT'	***
0083**			**	
0084	43320	015374	ENOT JSB STTOP	LOAD TOP OPERAND
0085	43321	027250	JMP EEQL+1	GO TO CHECK
0086**			**	
0087***			INSURE VALID POWERING	***
0088**			**	
0089.				
0090*			INSURES THAT ATB HAS ACCEPTABLE ARGUMENTS. A*B=0 IS A NON-	
0091*			RECOVERABLE ERROR. A#0 AND B<0 PRINTS A WARNING MESSAGE AND	
0092*			RETURNS THE MAXIMUM POSITIVE NUMBER AS THE RESULT.	
0093*				
0094	43322	075642	#PCHK STB BIN01	LOAD HIGH PART
0095	43323	165643	LDB BIN02,I	OF POWER
0096	43324	002002	SZA	BASE ZERO?
0097	43325	027336	JMP PCHK1	NO
0098	43326	006003	SZB,RSS	YES, POWER ZERO?
0099	43327	115143	JSB RERRS+29,I	YES
0100	43330	006021	SSB,RSS	NO, POWER POSITIVE?
0101	43331	026665	JMP FALSE	YES
0102	43332	115211	JSB WERRS+2,I	NO
0103	43333	060274	LDA INF	USE POSITIVE
0104	43334	064350	LDB ,=2	INFINITY
0105	43335	026655	JMP FOR14	FOR RESULT
0106	43336	006003	PCHK1 SZB,RSS	POWER ZERO?
0107	43337	026670	JMP TRUE	YES, TAKE RESULT AS 1,0
0108	43340	125354	JMP PCHK,I	NO

```

0110**
0111*** COMPARE TOP OPERANDS OF STACK ***
0112**
0113*
0114* ON EXIT (A) IS NEGATIVE IF THE TOP OPERAND OF THE
0115* STACK IS GREATER THAN THE NEXT-TO-TOP OPERAND,
0116* POSITIVE IF IT IS LESS, AND ZERO IF THEY ARE EQUAL.
0117*
0118 43341 161332 #CMPR LDA OPDST,I STRING
0119 43342 002020 SSA ARGUMENTS?
0120 43343 027347 JMP COMP1 YES
0121 43344 015372 JSB BINOP NO, COMPARE
0122 43345 015404 JSB ,FSB NUMERICAL
0123 43346 125352 JMP COMPR,I OPERANDS
0124 43347 060350 COMP1 LDA ,=2 PREPARE
0125 43350 015344 JSB PSTR COMPARISON
0126 43351 071256 STA TEMP4 STRING
0127 43352 075410 STB TPRME
0128 43353 061406 LDA TNULL SAVE SPECIFIED
0129 43354 071434 STA CP0 LENGTH
0130 43355 060350 LDA ,=2 PREPARE
0131 43356 015344 JSB PSTR TEST STRING
0132 43357 075344 STB CP1 SAVE ACTUAL LENGTH
0133 43360 035330 ISZ TMPST RESERVE SPACE
0134 43361 035330 ISZ TMPST FOR RESULT
0135 43362 035434 COMP2 ISZ CP0 MORE SPECIFIED STRING?
0136 43363 027366 JMP COMP3 YES
0137 43364 006400 CLB NO, LOAD A
0138 43365 027371 JMP COMP4 NULL CHARACTER
0139 43366 015364 COMP3 JSB FSCH LOAD NEXT
0140 43367 060412 LDA ,+40B COMPARISON
0141 43370 064000 LDB 0 CHARACTER
0142 43371 035406 COMP4 ISZ TNULL MORE SPECIFIED TEST STRING?
0143 43372 027402 JMP COMP6 YES
0144 43373 002400 CLA NO, LOAD NULL CHARACTER
0145 43374 007004 COMP5 CMB,INB COMPARE
0146 43375 040001 ADA 1 CHARACTERS
0147 43376 002003 SZA,RSS EXIT ON NOT EQUAL
0148 43377 006003 SZB,RSS OR BOTH NULL
0149 43400 125352 JMP COMPR,I CHARACTERS
0150 43401 027362 JMP COMP2
0151 43402 061344 COMP6 LDA CP1 MORE ACTUAL
0152 43403 002006 INA,SZA TEST STRING?
0153 43404 027407 JMP COMP7 YES
0154 43405 060412 LDA ,+40B NO, LOAD A BLANK
0155 43406 027374 JMP COMP5
0156 43407 071344 COMP7 STA CP1
0157 43410 061272 LDA TEMP5 EXTRACT
0158 43411 000065 CLE,ERA
0159 43412 160000 LDA 0,I NEXT
0160 43413 002041 SEZ,RSS
0161 43414 001727 ALF,ALF TEST
0162 43415 010443 AND B377
0163 43416 035272 ISZ TEMP5 CHARACTER
0164 43417 027374 JMP COMP5

```

```

0166**                               **
0167*** PREPARE STRING OPERAND      **
0168**                               **
0169*
0170* THE STRING ADDRESS ON TOP OF THE OPERAND STACK IS COMBINED
0171* WITH THE SUBSCRIPTS IN A PSEUDO_ENTRY ON THE TEMPORARY STACK
0172* TO FORM A STRING OPERAND. (A) = -2 UPON ENTRY FOR A SOURCE
0173* STRING; (A) = -1 FOR A DESTINATION STRING. THE ADDRESS OF
0174* THE FIRST CHARACTER OF THE STRING OPERAND IS LEFT IN TEMP5;
0175* FOR SOURCE STRINGS (A) = TEMP5 UPON EXIT. THE REQUESTED
0176* STRING LENGTH (IN CHARACTERS) IS LEFT IN TNULL; FOR SOURCE
0177* STRINGS THE ACTUAL STRING LENGTH (WHICH MAY BE LESS THAN THE
0178* REQUESTED LENGTH) IS IN (B) UPON EXIT. THE FOLLOWING
0179* CONDITIONS EXIT TO ERROR: NEGATIVE STRING LENGTH, REQUESTED
0180* DESTINATION STRING WOULD EXCEED PHYSICAL STRING BOUNDARY, OR
0181* REQUESTED DESTINATION STRING WOULD PRODUCE A STRING QUANTITY
0182* WITH TWO UNCONNECTED PARTS. THE LOGICAL LENGTH OF A
0183* DESTINATION STRING IS ADJUSTED AS NEEDED.
0184*
0185 43420 071470 #PSTR STA PS0 SAVE MODE FLAG
0186 43421 015376 JSB OPCHK UNSTACK OPERAND
0187 43422 075464 STB PS1 SET FLAG POSITIVE
0188 43423 005000 BLS SAVE ADDRESS OF FIRST
0189 43424 075272 STB TEMP5 CHARACTER OF STRING
0190 43425 005100 BRS SAVE
0191 43426 044351 ADB =1 POINTER TO
0192 43427 075260 STB TEMP6 STRING LENGTH
0193 43430 065330 LDB TMPST LOAD
0194 43431 044354 ADB +2 START_OF_STRING
0195 43432 160001 LDA 1,I DESIGNATOR
0196 43433 071400 STA MPT SAVE IT
0197 43434 041272 ADA TEMP5 RECORD CHARACTER ADDRESS
0198 43435 071272 STA TEMP5 OF START-OF-STRING
0199 43436 071574 STA SBPTR SAVE ADDRESS
0200 43437 006004 INB LOAD
0201 43440 160001 LDA 1,I END-OF-STRING DESIGNATOR
0202 43441 002005 INA,SZA SPECIFIED?
0203 43442 027455 JMP PSTR2 YES
0204 43443 003400 CCA NO
0205 43444 051470 CPA PS0 'SOURCE' MODE?
0206 43445 027451 JMP PSTR1 NO
0207 43446 161260 LDA TEMP6,I YES, LOAD STRING'S
0208 43447 010443 AND B377 LOGICAL LENGTH
0209 43450 027455 JMP PSTR2
0210 43451 071464 PSTR1 STA PS1 SET FLAG TO -1
0211 43452 061410 LDA TPRME COMPUTE
0212 43453 003000 CMA END-OF-STRING
0213 43454 041400 ADA MPT DESIGNATOR
0214 43455 071376 PSTR2 STA NQT SAVE IT
0215 43456 003000 CMA IS LENGTH
0216 43457 041400 ADA MPT OF SPECIFIED STRING
0217 43460 002021 SSA,RSS NEGATIVE?
0218 43461 115130 JSB RERRS+18,I YES
0219 43462 071406 STA TNULL
0220 43463 042005 ADA .73 >72?

```

0221	43464	002020	SSA	
0222	43465	115132	JSB RERRS+20,I	
0223	43466	161260	LDA TEMP6,I	DOES
0224	43467	010443	AND B377	START-OF-STRING
0225	43470	003000	CMA	CHARACTER
0226	43471	035470	ISZ PS0	RELATE TO
0227	43472	002004	INA	PREVIOUS
0228	43473	041400	ADA MPT	VALUE
0229	43474	002021	SSA,RSS	OF STRING?
0230	43475	027514	JMP PSTR3	NO
0231	43476	161260	LDA TEMP6,I	YES, EXTRACT
0232	43477	035470	ISZ PS0	END-OF-
0233	43500	001727	ALF,ALF	PERMITTED-STRING
0234	43501	010443	AND B377	DESIGNATOR
0235	43502	003000	CMA	COMPUTE DIFFERENCE FROM
0236	43503	041376	ADA NQT	END OF SPECIFIED STRING -1
0237	43504	006404	CLB,INB	'SOURCE'
0238	43505	055470	CPB PS0	MODE?
0239	43506	027521	JMP PSTR5	NO
0240	43507	066406	LDB TNULL	YES, SPECIFIED SOURCE STRING
0241	43510	002004	INA	CONTAINED WITHIN
0242	43511	002021	SSA,RSS	DEFINED SOURCE STRING?
0243	43512	044000	ADB 0	NO, CORRECT LENGTH
0244	43513	027517	JMP PSTR4	OF ACTUAL SOURCE STRING
0245	43514	035470	PSTR3 ISZ PS0	'SOURCE' MODE?
0246	43515	115131	JSB RERRS+19,I	NO
0247	43516	007400	CCB	YES, SET ACTUAL LENGTH TO 0
0248	43517	061272	PSTR4 LDA TEMP5	LOAD START-OF-STRING
0249	43520	125344	JMP PSTR,I	CHARACTER ADDRESS
0250	43521	002021	PSTR5 SSA,RSS	PHYSICAL STORAGE OVERFLOW?
0251	43522	115132	JSB RERRS+20,I	YES
0252	43523	035464	ISZ PS1	END-OF-STRING SPECIFIED?
0253	43524	027532	JMP PSTR7	YES
0254	43525	161260	PSTR6 LDA TEMP6,I	NO,
0255	43526	010762	AND M256	RESET
0256	43527	031376	IOR NQT	LOGICAL LENGTH
0257	43530	171260	SIA TEMP6,I	OF STRING
0258	43531	125344	JMP PSTR,I	
0259	43532	161260	PSTR7 LDA TEMP6,I	IS NEW
0260	43533	010443	AND B377	DESTINATION
0261	43534	003000	CMA	STRING
0262	43535	041376	ADA NQT	LONGER
0263	43536	002021	SSA,RSS	THAN OLD?
0264	43537	027525	JMP PSTR6	YES
0265	43540	125344	JMP PSTR,I	NO
0266**			**	
0267***	STACK STRING CONSTANT		***	
0268**			**	
0269*			*	
0270*	SEE NOTE AT FOR13 OF ROUTINE FORMX			
0271*			*	
0272	43541	035332	#STST ISZ OPDST	STACK
0273	43542	035332	ISZ OPDST	NEGATIVE
0274	43543	061613	LDA TEMP1	OF
0275	43544	003000	CMA	STRING

0276	43545	171332	STA	UPDST,I	ADDRESS
0277	43546	161613	LDA	TEMP1,I	COMPUTE
0278	43547	010443	AND	B377	STRING
0279	43550	007400	CCB		LENGTH
0280	43551	044000	ADB	0	=1
0281	43552	040355	ADA	,+3	UPDATE
0282	43553	001100	ARS		INTRA=STATEMENT
0283	43554	041613	ADA	TEMP1	POINTER
0284	43555	071613	STA	TEMP1	PAST STRING
0285	43556	015400	JSB	RSCHK	CREATE TEMPORARY
0286	43557	002400	CLA		RECORD
0287	43560	104400	DST	TMPST,I	(0,(8))
	43561	101330			
0288	43562	125340	JMP	STSTR,I	
0289**				**	
0290***	FETCH SOURCE CHARACTER			***	
0291**				**	
0292*					
0293*	CHARACTER ADDRESS IN TEMP4, SOURCE CHARACTER COUNT				
0294*	IN TPRME (IN 1'S COMPLEMENT), EXIT TO (P+1) ON NO				
0295*	MORE CHARACTERS (TPRME = -1) ELSE EXIT TO (P+2) WITH				
0296*	NEXT CHARACTER IN (A).				
0297*					
0298	43563	061410	#FSCH	LDA TPRME	MORE
0299	43564	002007		INA,SZA,RSS	CHARACTERS?
0300	43565	125364		JMP FSCH,I	NO
0301	43566	071410		STA TPRME	YES, UPDATE CHARACTER COUNT
0302	43567	061256		LDA TEMP4	LOAD CHARACTER
0303	43570	000065		CLE,ERA	ADDRESS
0304	43571	160000		LDA 0,I	EXTRACT
0305	43572	002041		SEZ,RSS	NEXT
0306	43573	001727		ALF,ALF	CHARACTER
0307	43574	010443		AND B377	
0308	43575	035256		ISZ TEMP4	UPDATE CHARACTER ADDRESS
0309	43576	035364		ISZ FSCH	
0310	43577	125364		JMP FSCH,I	
0311**				**	
0312***	FETCH SOURCE CHARACTER (UPPER CASE)			***	
0313**				**	
0314*					
0315*	SAME AS FSCH, EXCEPT LOWER CASE CHARACTERS ARE CONVERTED TO				
0316*	UPPER CASE, USED BY CHAIN AND ASSIGN STATEMENTS.				
0317*					
0318	43600	061410	#FCUC	LDA TPRME	MORE
0319	43601	002007		INA,SZA,RSS	CHARACTERS?
0320	43602	125562		JMP FCUC,I	NO
0321	43603	071410		STA TPRME	YES, UPDATE CHARACTER COUNT
0322	43604	061256		LDA TEMP4	LOAD CHARACTER
0323	43605	000065		CLE,ERA	ADDRESS
0324	43606	160000		LDA A,I	EXTRACT
0325	43607	002041		SEZ,RSS	NEXT
0326	43610	001727		ALF,ALF	CHARACTER
0327	43611	010443		AND B377	
0328	43612	040766		ADA M96	
0329	43613	002021		SSA,RSS	LOWER CASE

0330	43614	040317	ADA M32	NO
0331	43615	040730	ADA .140	YES
0332	43616	035256	ISZ TEMP4	UPDATE CHARACTER ADDRESS
0333	43617	035562	ISZ FCUC	
0334	43620	125562	JMP FCUC,I	
0335**			**	
0336***	FETCH INPUT CHARACTER		***	
0337**			**	
0338*				
0339*	EXITS NORMALLY TO (P+2) WITH NEXT INPUT CHARACTER IN (A).			
0340*	IF THE CHARACTER IS A " OR THE INPUT RECORD IS EMPTY,			
0341*	EXIT TO TRSTR,I (THE ONLY CALLER WHO CAN ENCOUNTER THIS			
0342*	CONDITION).			
0343*				
0344	43621	035274	#FINC ISZ FINCH	
0345	43622	015450	JSB GETCR	FETCH NEXT CHARACTER
0346	43623	125350	JMP TRSTR,I	NONE IN BUFFER
0347	43624	060001	LDA B	ALLOW LOWER CASE
0348	43625	050414	CPA .+42B	" ?
0349	43626	125350	JMP TRSTR,I	YES, TERMINAL EXIT
0350	43627	125274	JMP FINCH,I	NO


```

0352**
0353***  FETCH ENTER CHARACTER  ***
0354**
0355*
0356*  SAME AS FINCH EXCEPT IT DOES NOT CHECK FOR A QUOTE
0357*
0358  43630 035524 #FENC ISZ FENCH
0359  43631 015450      JSB GETCR      FETCH NEXT CHARACTER
0360  43632 125350      JMP TRSTR,I   NONE IN BUFFER
0361  43633 060001      LDA B        ALLOW LOWER CASE
0362  43634 125524      JMP FENCH,I   CHARACTER FOUND
0363**
0364***  FETCH TOP OF STACK  ***
0365**
0366*
0367*  EXIT WITH TOP OPERAND IN (A) AND (B) AFTER UNSTACKING
0368*  IT.  CREATE EMPTY SPACE ON TEMPORARY STACK FOR FUTURE
0369*  INTERMEDIATE RESULT.
0370*
0371  43635 015376 #STTP JSB OPCHK      UNSTACK OPERAND
0372  43636 015400      JSB RSCHK    CREATE SPACE FOR TEMPORARY
0373  43637 104200      DLD 1,I     LOAD TOP OPERAND
          43640 100001
0374  43641 125374      JMP STTOP,I
0375**
0376***  EXECUTE A BINARY OPERATOR  ***
0377**
0378*
0379*  ON ENTRY (P+1) CONTAINS A SUBROUTINE CALL FOR A BINARY
0380*  OPERATION.  THE TOP TWO OPERANDS ON THE STACK ARE
0381*  UNSTACKED AND VERIFIED AS NOT BEING 'UNDEFINED.'  THE
0382*  APPROPRIATE SUBROUTINE IS CALLED WITH THE TOP ARGUMENT'S
0383*  ADDRESS IN BIN02 AND THE NEXT-TO-TOP ARGUMENT'S VALUE IN
0384*  (A) AND (B).  EXIT IS TO (P+2) WITH THE RESULT IN (A)
0385*  AND (B).
0386  43642 161372 #BNOP LDA BINOP,I   SAVE
0387  43643 071642      STA BIN01    SUBROUTINE
0388  43644 035372      ISZ BINOP    CALL
0389  43645 015376      JSB OPCHK    SAVE ADDRESS OF
0390  43646 075643      STB BIN02    TOP OPERAND
0391  43647 015374      JSB STTOP    FETCH NEXT OPERAND
0392  43650 025642      JMP BIN01    EXECUTE SUBROUTINE
0393**
0394***  VERIFY LEGITIMACY OF OPERAND  ***
0395**
0396*
0397*  THE VALUE REFERENCED BY THE TOP OF THE OPERAND STACK
0398*  IS CHECKED.  EXIT TO ERROR IF VALUE IS 'UNDEFINED.'
0399*  ELSE REMOVE OPERAND ADDRESS FROM STACK AND REMOVE VALUE
0400*  FROM TOP OF TEMPORARY STACK, IF IT IS THERE.  EXIT
0401*  WITH OPERAND ADDRESS IN (B).
0402*
0403  43651 165332 #OPCK LDB OPDST,I   STRING
0404  43652 006020      SSB        OPERAND?
0405  43653 027676      JMP OPCH3=1  YES

```

0406	43654	160001	LDA 1,I	NO, HIGH PART OF
0407	43655	001222	RAL,RAL	IS
0408	43656	002004	INA	OPERAND
0409	43657	001310	RAR,SLA	NORMALIZED?
0410	43660	027670	JMP OPCH1	YES
0411	43661	051036	CPA BIT15	WAS FIRST WORD ZERO
0412	43662	006005	INB,RSS	YES
0413	43663	115135	JSB RERRS+23,I	NO==ERROR
0414	43664	160001	LDA 1,I	SECOND
0415	43665	002002	SZA	WORD ZERO?
0416	43666	115135	JSB RERRS+23,I	NO==ERROR
0417	43667	044351	ADB .-1	YES==RESTORE OPERAND ADDRESS
0418	43670	055330	OPCH1 CPB TMPST	TEMPORARY?
0419	43671	027677	JMP OPCH3	YES
0420	43672	061332	OPCH2 LDA OPDST	NO,
0421	43673	040350	ADA .-2	UNSTACK
0422	43674	071332	STA OPDST	OPERAND
0423	43675	125376	JMP OPCHK,I	ADDRESS
0424	43676	007004	CMB,INB	SET ADDRESS TRUE
0425	43677	061330	OPCH3 LDA TMPST	UNSTACK
0426	43700	040350	ADA .-2	TEMPORARY
0427	43701	071330	STA TMPST	OPERAND
0428	43702	027672	JMP OPCH2	
0429**				**
0430***	ALLOCATE AN ENTRY ON THE TEMPORARY STACK			***
0431**				**
0432*				
0433*	(B) IS UNCHANGED UPON EXIT. ON STACK OVERFLOW,			
0434*	THE OPERATOR AND OPERAND STACKS ARE MOVED TO HIGHER			
0435*	CORE TO MAKE ROOM FOR FIVE MORE TEMPORARY ENTRIES.			
0436*				
0437	43703	061330	#RSCK LDA TMPST	ADVANCE
0438	43704	040354	ADA .+2	POINTER TO
0439	43705	071330	STA TMPST	NEXT ENTRY
0440	43706	002004	INA	STACK
0441	43707	051466	CPA OPTRO	OVERFLOW?
0442	43710	002001	RSS	YES
0443	43711	125400	JMP RSCHK,I	NO
0444	43712	075440	STB RT0	SAVE (B)
0445	43713	064056	LDB PBPTR	LOAD SOURCE ADDRESS
0446	43714	060364	LDA .+10	ALLOCATE SPACE FOR
0447	43715	015326	JSB CUSP	FIVE MORE
0448	43716	070056	STA PBPTR	TEMPORARIES
0449	43717	071442	STA RT1	SAVE DESTINATION ADDRESS
0450	43720	160001	RSCH1 LDA 1,I	TRANSFER
0451	43721	171442	STA RT1,I	A WORD
0452	43722	055330	CPB TMPST	DONE?
0453	43723	027731	JMP RSCH2	YES
0454	43724	003400	CCA	NO, DECREMENT
0455	43725	041442	ADA RT1	DESTINATION
0456	43726	071442	STA RT1	AND SOURCE
0457	43727	044351	ADB .-1	ADDRESSES
0458	43730	027720	JMP RSCH1	
0459	43731	061332	RSCH2 LDA OPDST	CORRECT
0460	43732	040364	ADA .+10	

0461	43733	071332		STA OPDST	STACK
0462	43734	061466		LDA OPTR0	
0463	43735	040364		ADA .+10	POINTERS
0464	43736	071466		STA OPTR0	
0465	43737	065440		LDB RT0	RESTORE (B)
0466	43740	125400		JMP RSCHK,I	
0467**					**
0468***				PUSH DOWN OPERATOR STACK	***
0469**					**
0470*					
0471*				ALLOCATE AN ENTRY ON THE OPERATOR STACK.	(A) IS
0472*				NOT CHANGED.	
0473*					
0474	43741	064056	#PSHS	LDB PBPTR	ADVANCE
0475	43742	044354		ADB .+2	STACK POINTER
0476	43743	007000		CMB	USER
0477	43744	044462		ADB LWAUS	SPACE
0478	43745	006020		SSB	OVERFLOW?
0479	43746	115120		J9B RERRS+10,I	YES
0480	43747	034056		ISZ PBPTR	NO, ALLOCATE
0481	43750	034056		ISZ PBPTR	STORAGE
0482	43751	125366		JMP PSHST,I	

PAGE 0155 #15 EXECUTION UTILITY ROUTINES

```

0002 44000          ORG 44000B
0003 44000 140000  UNNRM OCT 140000
0004 44001 077600  SMSK  OCT 77600
0005 44002 176736  SERRA ABS =SERRS
0006 44003 177734  RERRA ABS SERRS=RERRS
0007 44004 177716  FERRA ABS RERRS=FERRS
0008 44005 177761  WERRA ABS FERRS=WERRS
0009 44006 072133  DSERR DEF DSERA
0010 44007 062613  SICKL DEF SICK
0011**
0012*** ROUND NUMBER TO INTEGER ***
0013**
0014*
0015* ENTER WITH NUMBER IN (A) AND (B). EXIT TO (P+2) IF
0016* INTEGER FORM (ROUNDED AS NEEDED) IS POSITIVE AND NOT
0017* LARGER THAN 15 BITS, ELSE EXIT TO (P+1). ON EXIT TO
0018* (P+2), (B) HOLDS THE INTEGER BIASED BY -1.
0019*
0020 44010 015416  #SBFX JSB IFIX          TRUNCATE NUMBER
0021 44011 125342          JMP SBFIX,I          NUMBER TOO LARGE
0022 44012 002002          SZA                INTEGER OVERFLOW?
0023 44013 125342          JMP SBFIX,I          YES
0024 44014 002041          SEZ,RSS           NO, ROUNDING BIT?
0025 44015 044351          ADB ,-1           NO, BIAS INTEGER BY -1
0026 44016 006021          SSB,RSS           YES, POSITIVE RESULT?
0027 44017 035342          ISZ SBFIX          YES
0028 44020 125342          JMP SBFIX,I          NO

```

```

0030**
0031*** INTEGERIZE A NUMBER ***
0032**
0033*
0034* ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B).
0035* IF EXPONENT EXCEEDS 23, NUMBER HAS INTEGER SIGNIFICANCE;
0036* EXIT TO (P+1). ALL OTHER CASES EXIT TO (P+2) WITH 32-BIT
0037* INTEGER RIGHT JUSTIFIED IN (A) AND (B). ON EXIT (O) = 0
0038* IF NUMBER IS EXACTLY REPRESENTABLE AS A 16-BIT INTEGER.
0039* IF EXPONENT IS NEGATIVE, TRUNCATE TO 0 OR -1 APPROPRIATELY
0040* AND LET (O) = 1. OTHERWISE RIGHT JUSTIFY INTEGER AND EXIT
0041* WITH LAST BIT LOST IN (E).
0042*
0043 44021 071260 #IFIX STA TEMP6 SAVE (A)
0044 44022 102101 STO SET 'NOT ONE-WORD INTEGER' MODE
0045 44023 015414 JSB .FLUN UNPACK (B)
0046 44024 002020 SSA NEGATIVE EXPONENT?
0047 44025 026050 JMP IFIX3 YES
0048 44026 040332 ADA .-16 NO, EXPONENET
0049 44027 002020 SSA <= 15?
0050 44030 103101 CLO YES
0051 44031 040342 ADA .-8 NO, EXPONENT
0052 44032 002021 SSA,RSS <= 23?
0053 44033 125416 JMP IFIX,I NO, ALL SIGNIFICANCE IS INTEGER
0054 44034 040342 ADA .-8 YES, MOVE BINARY POINT TO END OF
0055 44035 071322 STA EXP (B) AND SAVE SHIFT COUNT
0056 44036 061260 LDA TEMP6 RETRIEVE (A)
0057 44037 026044 JMP IFIX2
0058 44040 000071 IFIX1 CLE,SLA,ARS SHIFT (A) RIGHT
0059 44041 002200 CME SHIFT
0060 44042 004035 SLB,ERB (B) RIGHT
0061 44043 102101 STO LOST A 1
0062 44044 035322 IFIX2 ISZ EXP ALL SHIFTS DONE?
0063 44045 026040 JMP IFIX1 NO
0064 44046 035416 ISZ IFIX YES
0065 44047 125416 JMP IFIX,I
0066 44050 061260 IFIX3 LDA TEMP6 RETRIEVE (A)
0067 44051 002120 CLE,SSA TRUNCATE
0068 44052 003401 CCA,RSS TO
0069 44053 002401 CLA,RSS -1
0070 44054 007401 CCB,RSS OR
0071 44055 006400 CLB 0
0072 44056 026046 JMP IFIX3-2

```

```

0074**
0075*** REQUEST A RECORD ***
0076**
0077*
0078* UPON ENTRY (A) HOLDS A FILE NUMBER (POSITIVE FOR A READ
0079* REQUEST, NEGATIVE FOR A WRITE REQUEST) AND (B) SPECIFIES
0080* VALIDATION OF THE FILE'S EXISTENCE ( (B) = -2) OR THE FILE
0081* RECORD TO BE PUT IN THE FILE BUFFER ( (B) = -1 REQUESTS
0082* THE RECORD WHICH FOLLOWS THE ONE CURRENTLY IN THE BUFFER,
0083* (B) >= 0 REQUESTS RECORD (B)+1 ). EXIT TO ERROR IF THE
0084* FILE DOES NOT EXIST OR A WRITE REQUEST IS GIVEN FOR A
0085* READ-ONLY FILE. EXIT TO THE END-OF-FILE CODE IF THE
0086* REQUESTED RECORD DOES NOT EXIST. OTHERWISE, THE DIRTY
0087* BIT IS EXAMINED TO DETERMINE IF THE FILE BUFFER SHOULD
0088* BE WRITTEN BACK TO DISC.
0089* A READ REQUEST READS THE REQUESTED RECORD INTO THE BUFFER;
0090* A WRITE REQUEST MERELY INITIALIZES THE BUFFER TO 'EMPTY'.
0091* THE FILE TABLE IS UPDATED TO REFLECT THE CHANGES,
0092*
0093 44057 075651 #RQST STB RQ2 SAVE RECORD REFERENCE
0094 44060 007400 CCB GET 1'S COMPLEMENT
0095 44061 002020 SSA OF FILE NUMBER AND
0096 44062 006401 CLB,RSS SET RQ1 = -1 FOR A
0097 44063 003000 CMA READ REQUEST OR 0
0098 44064 075646 STB RQ1 FOR A WRITE REQUEST
0099 44065 041502 ADA FCNTR DOES REQUESTED
0100 44066 003021 CMA,SSA,RSS FILE EXIST?
0101 44067 115151 JSB RERRS+35,I NO
0102 44070 041502 ADA FCNTR YES
0103 44071 100200 MPY ,+FTEL SET POINTER
0104 44072 000371
0104 44073 041504 ADA FILTB TO FILE TABLE
0105 44074 071236 STA FBASE ENTRY
0106 44075 161236 LDA FBASE,I LOAD NUMBER OF RECORDS
0107 44076 002003 SZA,RSS DOES FILE EXIST?
0108 44077 115151 JSB RERRS+35,I
0109 44100 065236 LDB FBASE
0110 44101 044356 ADB ,+4
0111 44102 075236 STB FBASE
0112 44103 007500 CCB,CLE
0113 44104 002020 SSA READ-ONLY FILE?
0114 44105 055646 CPB RQ1 YES, READ REQUEST?
0115 44106 001575 ELA,CLE,SLA,ERA YES, CLEAR BIT 15 AND SKIP
0116 44107 115152 JSB RERRS+36,I NO
0117 44110 065651 LDB RQ2 FILE VALIDATION
0118 44111 054350 CPB ,-2 ONLY?
0119 44112 026351 JMP RQST9 YES
0120 44113 035651 ISZ RQ2 NO, RECORD SPECIFIED?
0121 44114 026146 JMP RQST2 YES
0122 44115 165236 LDB FBASE,I NO, GET HIGH OLD RECORD ADDRESS
0123 44116 055036 CPB BIT15 NULL RECORD?
0124 44117 026146 JMP RQST6 YES
0125 44120 035236 ISZ FBASE NO, COMPUTE
0126 44121 165236 LDB FBASE,I RECORD'S
0127 44122 035236 ISZ FBASE DISTANCE

```

0128	44123	035236	ISZ FBASE	FROM
0129	44124	007000	CMB	FIRST
0130	44125	145236	ADB FBASE, I	RECORD
0131	44126	007000	CMB	
0132	44127	003400	CCA	GET UPPER
0133	44130	041236	ADA FBASE	WORD OF
0134	44131	160000	LDA A, I	DISC ADDRESS
0135	44132	003003	CMA, SZA, RSS	FILE ON DRUM?
0136	44133	005121	BRS, BRS	YES, 4 SECTORS = 1 RECORD
0137	44134	060343	LDA .-7	GET RECORD
0138	44135	041236	ADA FBASE	COUNT BACK
0139	44136	160000	LDA A, I	INTO A
0140	44137	001665	ELA, CLE, ERA	CLEAR BIT 15
0141	44140	004010	SLB	
0142	44141	044000	ADB A	
0143	44142	005100	BRS	NEW RECORD
0144	44143	006004	INB	NUMBER
0145	44144	026151	JMP RQST7	
0146	44145	006400	RQST6 CLB	NO RECORD IN CORE
0147	44146	035236	RQST2 ISZ FBASE	ADJUST POINTER
0148	44147	035236	ISZ FBASE	TO LOW WORD
0149	44150	035236	ISZ FBASE	OF BASE ADDRESS
0150	44151	003004	RQST7 CMA, INA	DOES
0151	44152	040001	ADA 1	RECORD
0152	44153	002020	SSA	EXIST?
0153	44154	026160	JMP ++4	YES
0154	44155	035236	ISZ FBASE	NO, CORRECT FBASE
0155	44156	035236	ISZ FBASE	
0156	44157	125006	JMP FDT4A, I	FOR EOF EXIT CHECK
0157	44160	040001	ADA 1	
0158	44161	030353	IOR .+1	COMPUTE RELATIVE
0159	44162	005000	BLS	DISC
0160	44163	002020	SSA	ADDRESS
0161	44164	060001	LDA 1	OF NEW RECORD
0162	44165	007400	CCB	GET HIGH
0163	44166	045236	ADB FBASE	DISC
0164	44167	164001	LDB B, I	ADDRESS
0165	44170	007103	CMB, CLE, SZB, RSS	FILE ON DRUM?
0166	44171	001020	ALS, ALS	YES, 1 RECORD = 4 SECTORS
0167	44172	141236	ADA FBASE, I	COMPUTE LOW DISC ADDRESS
0168	44173	071651	STA RQ2	SAVE IT
0169	44174	007000	CMB	OLD HIGH ADDRESS
0170	44175	002040	SEZ	INCREMENT IF
0171	44176	006004	INB	CARRY FROM
0172	44177	075650	STB RQ4	LOW ADD
0173	44200	064344	LDB .-6	GET
0174	44201	045236	ADB FBASE	NEGATIVE
0175	44202	164001	LDB B, I	OF BUFFER
0176	44203	005423	BLR, RBR	
0177	44204	007004	CMB, INB	SIZE
0178	44205	075652	STB RQ5	SAVE IT
0179	44206	035236	ISZ FBASE	SET POINTER
0180	44207	145236	ADB FBASE, I	TO BEGINNING
0181	44210	035236	ISZ FBASE	
0182	44211	175236	STB FBASE, I	OF RECORD BUFFER

0183	44212	075647	STB RQ3	SAVE ADDRESS OF BUFFER
0184	44213	065236	LDB FBASE	MOVE TO
0185	44214	044346	ADB .-4	DISC
0186	44215	075236	STB FBASE	ADDRESSES
0187	44216	044351	ADB .-1	IS ANY
0188	44217	164001	LDB B,I	RECORD
0189	44220	055036	CPB BIT15	IN CORE?
0190	44221	026225	JMP RQS15	NO, SKIP COMPARE AND WRITE
0191	44222	151236	CPA FBASE,I	OLD AND NEW RECORDS THE SAME?
0192	44223	026267	JMP RQST3	YES
0193	44224	015516	JSB WRBUF	NO, WRITE OLD RECORD TO DISC
0194	44225		RQS15 EQU *	
0195	44225	035646	ISZ RQ1	READ REQUEST?
0196	44226	026272	JMP RQST4	NO
0197	44227	065652	LDB RQ5	GET NEGATIVE BUFFER SIZE
0198	44230	002404	CLA,INA	CHECK
0199	44231	041236	ADA FBASE	FOR
0200	44232	160000	LDA A,I	DISC
0201	44233	103100	CLF 0	
0202	44234	003002	CMA,SZA	OR
0203	44235	026247	JMP RQST8	DRUM
0204	44236	061651	LDA RQ2	DRUM:
0205	44237	074072	STB WORD	READ IN
0206	44240	065647	LDB RQ3	REQUESTED
0207	44241	045036	ADB BIT15	
0208	44242	114770	JSB DRUM,I	
0209	44243	060261	LDA ENDRM	RECORD
0210	44244	002020	SSA	
0211	44245	026243	JMP *-2	
0212	44246	026262	JMP RQS10	
0213	44247	060355	RQST8 LDA .+3	DISC: GET ADDRESS
0214	44250	040544	ADA ERSCA	OF DOUBLE WORD ADDRESS
0215	44251	074215	STB MWORD	STORE WORD COUNT
0216	44252	065647	LDB RQ3	GET CORE ADDRESS
0217	44253	045036	ADB BIT15	AND READ BIT
0218	44254	114212	JSB DISCA,I	READ
0219	44255	102030	HLT 30B	IN
0220	44256	102031	HLT 31B	REQUESTED
0221	44257	060214	LDA MBSY	RECORD
0222	44260	002020	SSA	
0223	44261	026257	JMP *-2	
0224	44262		RQS10 EQU *	
0225	44262	002003	SZA,RSS	ANY ERRORS?
0226	44263	026275	JMP RQST5	NO
0227	44264	006400	CLB	YES, CLEAR DRUM DRIVER
0228	44265	074261	STB ENDRM	BUSY WORD
0229	44266	115163	JSB RERRS+45,I	AND GO INDICATE ERROR
0230	44267	035646	RQST3 ISZ RQ1	WRITE REQUEST?
0231	44270	002001	RSS	YES
0232	44271	026342	JMP RQS14	NO, GO FINISH UP
0233	44272	064350	RQST4 LDB EOR	SCRATCH RECORD
0234	44273	175647	STB RQ3,I	WITH END-OF-RECORD MARK
0235	44274	026342	JMP RQS14	GO FINISH UP
0236	44275	065236	RQST5 LDB FBASE	GET
0237	44276	044363	ADB .+9	PROTECT

0238	44277	160001	LDA B,I	MASK
0239	44300	002003	SZA,RSS	IS IT ZERO?
0240	44301	026342	JMP RQS14	YES, SKIP MASKING
0241	44302	071771	STA PMASK	NO, SAVE MASK
0242	44303	044344	ADB .-6	ADJUST FBASE TO
0243	44304	075236	STB FBASE	BUFFER LIMIT POINTER
0244	44305	065647	LDB RQ3	
0245	44306	155236	RQS11 CPB FBASE,I	DONE ?
0246	44307	026337	JMP RQS13	YES
0247	44310	160001	LDA 1,I	NO
0248	44311	050350	CPA EOR	EOR ?
0249	44312	026337	JMP RQS13	
0250	44313	050351	CPA EOF	EOF ?
0251	44314	026337	JMP RQS13	
0252	44315	010762	AND M256	
0253	44316	050445	CPA B1000	STRING ?
0254	44317	026322	JMP ++3	
0255	44320	044354	ADB .+2	SKIP TWO WORDS
0256	44321	026306	JMP RQS11	
0257	44322	160001	LDA 1,I	YES
0258	44323	010443	AND B377	
0259	44324	040355	ADA .+3	
0260	44325	001100	ARS	
0261	44326	040001	ADA 1	
0262	44327	071634	STA ATMP	
0263	44330	006004	RQS12 INB	MASK
0264	44331	055634	CPB ATMP	
0265	44332	026306	JMP RQS11	STRING
0266	44333	160001	LDA 1,I	
0267	44334	021771	XOR PMASK	
0268	44335	170001	STA 1,I	
0269	44336	026330	JMP RQS12	
0270	44337	061236	RQS13 LDA FBASE	RESTORE
0271	44340	040347	ADA .-3	
0272	44341	071236	STA FBASE	FBASE
0273	44342		RQS14 EQU *	
0274	44342	061651	LDA RQ2	
0275	44343	171236	STA FBASE,I	NEW RECORD INTO FILE TABLE
0276	44344	061650	LDA RQ4	
0277	44345	007400	CCB	
0278	44346	045236	ADB FBASE	
0279	44347	075236	STB FBASE	
0280	44350	170001	STA B,I	
0281	44351	065236	RQST9 LDB FBASE	MOVE POINTER
0282	44352	044357	ADB .+5	TO REFERENCE
0283	44353	075236	STB FBASE	RECORD POINTER
0284	44354	125510	JMP RQSTR,I	

```

0286**
0287*** STORE ITEM IN FILE ***
0288**
0289*
0290* UPON ENTRY (B) INDICATES WHAT IS TO BE WRITTEN ON THE FILE:
0291* (B) = -1 WRITES AN END-OF-FILE MARK, (B) = -2 WRITES A TWO-
0292* WORD FLOATING POINT NUMBER, (B) = -3 WRITES A STRING. IF
0293* THE RECORD CANNOT ACCOMMODATE THE QUANTITY, A SERIAL WRITE
0294* WILL PLACE IT IN THE FOLLOWING RECORD WHILE A RECORD WRITE
0295* WILL EXIT TO THE END-OF-FILE CODE.
0296*
0297 44355 075655 #FILS STB FILT SAVE REQUEST TYPE
0298 44356 065236 LDB FBASE GET
0299 44357 044357 ADB ,+5 PROTECT
0300 44360 164001 LDB 1,I MASK
0301 44361 075771 STB PMASK
0302 44362 007400 CCB LOAD
0303 44363 045236 ADB FBASE ACTIVE AND LIMIT
0304 44364 104200 DLD 1,I RECORD POINTERS
      44365 100001
0305 44366 050001 CPA 1 RECORD FULL?
0306 44367 026457 JMP FILS1 YES
0307 44370 075654 STB DADRR NO, SAVE ACTIVE POINTER
0308 44371 035655 ISZ FILT EOF REQUEST?
0309 44372 026403 JMP FILS2 NO
0310 44373 003400 CCA YES, OVERLAY PREVIOUS
0311 44374 170001 STA 1,I EOR OR EOF WITH EOF MARK
0312 44375 065236 FILS7 LDB FBASE MAKE POINTER TO SECOND WORD OF
0313 44376 044342 ADB ,=8 FILE TABLE ENTRY.
0314 44377 160001 LDA B,I SET BUFFER
0315 44400 031036 IOR BIT15 DIRTY
0316 44401 170001 STA 1,I BIT.
0317 44402 125512 JMP FILST,I
0318 44403 035655 FILS2 ISZ FILT STRING?
0319 44404 026442 JMP FILS6 YES
0320 44405 044354 ADB ,+2 NO
0321 44406 003004 FILS3 CMA,INA COMPARE PROSPECTIVE
0322 44407 040001 ADA 1 ACTIVE POINTER WITH
0323 44410 003004 CMA,INA END-OF-RECORD POINTER
0324 44411 002020 SSA OVERFLOW?
0325 44412 026452 JMP FILS0 YES
0326 44413 175236 STB FBASE,I NO, SAVE NEW ACTIVE POINTER
0327 44414 002003 SZA,RSS RECORD EXACTLY FULL?
0328 44415 026420 JMP FILS4 YES
0329 44416 060350 LDA EOR NO, FOLLOW ENTRY SPACE
0330 44417 170001 STA 1,I WITH EOR MARK
0331 44420 035655 FILS4 ISZ FILT STRING?
0332 44421 026431 JMP FILS5 NO
0333 44422 061406 LDA TNULL YES
0334 44423 003000 CMA COMPUTE AND
0335 44424 030445 IOR B1000 STORE STRING
0336 44425 171654 STA DADRR,I HEADER WORD
0337 44426 060600 LDA FSCHA TRANSFER
0338 44427 015350 JSB TRSTR STRING
0339 44430 026375 JMP FILS7

```

0340	44431	104200	FILS5	DLD SBPTR,I	TRANSFER
	44432	101574			
0341	44433	021771		XOR PMASK	MASK
0342	44434	101100		SWP	
0343	44435	021771		XOR PMASK	DATA
0344	44436	101100		SWP	
0345	44437	104400		DST DADDR,I	NUMBER
	44440	101654			
0346	44441	026375		JMP FILS7	
0347	44442	006004	FILS6	INB	COMPUTE
0348	44443	005000		BLS	DESTINATION
0349	44444	075272		STB TEMP5	ADDRESS
0350	44445	007004		CMB,INB	COMPUTE
0351	44446	045406		ADB TNULL	RECORD
0352	44447	007004		CMB,INB	SPACE
0353	44450	005100		BRS	REQUIRED
0354	44451	026406		JMP FILS3	
0355	44452	060350	FILS0	LDA EOR	INSURE EOR MARK
0356	44453	171654		STA DADDR,I	ENDS PRESENT RECORD
0357	44454	060350		LDA ,=2	RESTORE
0358	44455	041655		ADA FILT	REQUEST
0359	44456	071655		STA FILT	TYPE
0360	44457	007400	FILS1	CCB	
0361	44460	055352		CPB RCRD#	SERIAL WRITE?
0362	44461	002001		RSS	YES
0363	44462	125005		JMP FDT4A,I	NO
0364	44463	061234		LDA FILE#	REQUEST
0365	44464	003000		CMA	RECORD
0366	44465	015510		JSB RQSTR	TO WRITE
0367	44466	026355		JMP #FILS+1	
0368**				**	
0369***	GET NEXT FILE ITEM TYPE			***	
0370**				**	
0371*				*	
0372*	THE NEXT ITEM IN THE FILE, NUMBER, STRING, END-OF-FILE, OR				
0373*	END-OF-RECORD, IS IDENTIFIED AND UPON EXIT (A) =1,2,3, OR 4				
0374*	RESPECTIVELY, EORFL = -1 WILL IGNORE END-OF-RECORD'S AND				
0375*	RETURN WITH THE FIRST OF THE OTHER ITEMS ENCOUNTERED.				
0376*				*	
0377	44467	061234	GTTY1	LDA FILE#	REQUEST
0378	44470	015510		JSB RQSTR	NEXT RECORD
0379	44471	007400	#GTTY	CCB	LOAD ACTIVE
0380	44472	045236		ADB FBASE	AND LIMIT
0381	44473	104200		DLD 1,I	RECORD POINTERS
	44474	100001			
0382	44475	050001		CPA 1	PHYSICAL END OF RECORD?
0383	44476	026512		JMP GTTY3	YES
0384	44477	160001		LDA 1,I	NO, LOAD WORD
0385	44500	006404		CLB,INB	OF RECORD
0386	44501	050350		CPA EOR	END-OF-RECORD?
0387	44502	026512		JMP GTTY3	YES
0388	44503	050351		CPA EOF	NO, END-OF-FILE?
0389	44504	026530		JMP GTTY4	YES
0390	44505	010762		AND M256	NO
0391	44506	050445		CPA B1000	STRING?

```

0392 44507 006004      INB          YES, (B) = 2
0393 44510 060001      GTTY2 LDA 1      SET (A) = (B)
0394 44511 125514      JMP GTTYP,I
0395 44512 065236      GTTY3 LDB FBASE  PHYSICAL
0396 44513 044345      ADB .-5      NULL RECORD
0397 44514 160001      LDA B,I
0398 44515 051036      CPA BIT15    IN CORE?
0399 44516 026524      JMP GTTY6    YES, SKIP COMPARE
0400 44517 044351      ADB .-1      NO, PHYSICAL
0401 44520 160001      LDA B,I      END
0402 44521 044354      ADB .+2      OF
0403 44522 150001      CPA B,I      FILE?
0404 44523 026532      JMP GTTY5    YES
0405 44524      GTTY6 EQU *
0406 44524 007400      CCB          NO
0407 44525 055653      CPB EORFL    EOR'S WANTED?
0408 44526 026467      JMP GTTY1    NO
0409 44527 064354      LDB .+2      YES, SET (B) = 4
0410 44530 044354      GTTY4 ADB .+2  (B) = (B) + 2
0411 44531 026510      JMP GTTY2
0412 44532 060355      GTTY5 LDA .+3  (A) = 3
0413 44533 125514      JMP GTTYP,I
0414**
0415*** WRITE BUFFER TO DISC ***
0416**
0417*
0418* THE BUFFER OF THAT FILE CURRENTLY REFERENCED BY FBASE IS
0419* WRITTEN TO ITS PLACE ON THE DISC, UNLESS NOTHING HAS BEEN
0420* WRITTEN INTO THE BUFFER.
0421*
0422 44534 065236      #WRBU LDB FBASE  LOAD SECOND
0423 44535 044346      ADB .-4      WORD FROM
0424 44536 160001      LDA B,I      FILE TABLE
0425 44537 001600      ELA          ENTRY (RECORD LENGTH)
0426 44540 002141      SEZ,CLE,RSS HAS BIT 15 BEEN SET?
0427 44541 125516      JMP WRBUF,I  NO
0428 44542 001500      ERA          YES, CLEAR IT
0429 44543 170001      STA B,I      STORE IT BACK
0430 44544 044355      ADB .+3      GET HIGH CURRENT
0431 44545 160001      LDA B,I      RECORD ADDRESS
0432 44546 051036      CPA BIT15    NULL RECORD?
0433 44547 125516      JMP WRBUF,I  YES, DON'T WRITE RECORD OUT
0434 44550 044364      ADB .+10     GET
0435 44551 160001      LDA B,I      PROTECT MASK
0436 44552 002003      SZA,RSS     IS IT ZERO?
0437 44553 026615      JMP WRBU7    YES, SKIP STRING MASKING
0438 44554 071771      STA PMASK    NO, SAVE MASK
0439 44555 044344      ADB .-6      ADJUST FBASE TO
0440 44556 075236      STB FBASE    BUFFER LIMIT POINTER
0441 44557 065647      LDB R03
0442 44560 155236      WRBU4 CPB FBASE,I  DONE ?
0443 44561 026611      JMP WRBU6
0444 44562 160001      LDA 1,I      NO
0445 44563 050350      CPA EOR      EOR ?
0446 44564 026611      JMP WRBU6

```

0447	44565	050351	CPA	EOF	EOF ?
0448	44566	026611	JMP	WRBU6	
0449	44567	010762	AND	M256	
0450	44570	050445	CPA	B1000	STRING ?
0451	44571	026574	JMP	*+3	
0452	44572	044354	ADB	.*+2	SKIP TWO WORDS
0453	44573	026560	JMP	WRBU4	
0454	44574	160001	LDA	1,I	YES
0455	44575	010443	AND	B377	
0456	44576	040355	ADA	.*+3	
0457	44577	001100	ARS		
0458	44600	040001	ADA	1	
0459	44601	071634	STA	ATMP	
0460	44602	006004	WRBU5	INB	
0461	44603	055634	CPB	ATMP	
0462	44604	026560	JMP	WRBU4	
0463	44605	160001	LDA	1,I	
0464	44606	021771	XOR	PMASK	
0465	44607	170001	STA	1,I	
0466	44610	026602	JMP	WRBU5	
0467	44611	065236	WRBU6	LDB	FBASE
0468	44612	044347	ADB	.*-3	
0469	44613	075236	STB	FBASE	
0470	44614	044363	ADB	.*+9	=> PMASK WORD
0471	44615	044335	WRBU7	ADB	.*-13
0472	44616	160001	LDA	B,I	=> WORDS/RECORD WORD
0473	44617	030222	IOR	BIT14	
0474	44620	170001	STA	B,I	SET FILE
0475	44621	001423	ALR,RAR		DIRTY BIT
0476	44622	003004	CMA,INA		CLEAR DIRTY BITS AND
0477	44623	044355	ADB	.*+3	GET NEG. REC. LENGTH
0478	44624	164001	LDB	B,I	GET HIGH CURRENT
0479	44625	103100	CLF	0	RECORD ADDRESS AGAIN
0480	44626	007002	CMB,SZB		DRUM OR DISC ADDRESS?
0481	44627	026640	JMP	WRBU1	DISC, GO TRANSFER
0482	44630	070072	STA	WORD	DRUM:
0483	44631	161236	LDA	FBASE,I	
0484	44632	065647	LDB	RQ3	WRITE
0485	44633	114770	JSB	DRUM,I	RECORD
0486	44634	060261	LDA	ENDRM	TO
0487	44635	002020	SSA		DRUM
0488	44636	026634	JMP	*-2	
0489	44637	026652	JMP	WRBU2	
0490	44640	070215	WRBU1	STA	MWORD
0491	44641	065647	LDB	RQ3	WRITE
0492	44642	003400	CCA		RECORD
0493	44643	041236	ADA	FBASE	
0494	44644	114212	JSB	DISCA,I	TO
0495	44645	102030	HLT	30B	
0496	44646	102031	HLT	31B	DISC
0497	44647	060214	LDA	MBUSY	
0498	44650	002020	SSA		
0499	44651	026647	JMP	*-2	
0500	44652		WRBU2	EQU	*
0501	44652	002003	SZA	RSS	ANY ERRORS?

PAGE 0165 #15 EXECUTION UTILITY ROUTINES

0502	44653	125516	JMP	WRBUF,I	
0503	44654	006400	CLB		YES, CLEAR DRUM DRIVER
0504	44655	074261	STB	ENDRM	BUSY WORD
0505	44656	115164	JSB	RERRS+46,I	AND GO INDICATE GOOF
0506**				**	
0507***				TRANSFER A STRING	***
0508**				**	
0509*					
0510*				THE NUMBER OF CHARACTERS SPECIFIED BY TNULL (IN 1'S	
0511*				COMPLEMENT) IS TRANSFERRED FROM THE SOURCE STRING TO	
0512*				A DESTINATION STRING BEGINNING WITH THE CHARACTER	
0513*				ADDRESSED BY TEMP5.	
0514*					
0515	44657	071402	#TRST	STA TRFCH	SAVE SUBROUTINE CALL
0516	44660	035406	ISZ	TNULL	MORE TRANSFER STRING?
0517	44661	002001	RSS		YES
0518	44662	125350	JMP	TRSTR,I	NO
0519	44663	115402	JSB	TRFCH,I	FETCH A SOURCE CHARACTER
0520	44664	060412	LDA	.,+400	NONE LEFT, LOAD A BLANK
0521	44665	071404	STA	TRSO	SAVE IT
0522	44666	065272	LDB	TEMP5	LOAD
0523	44667	004065	CLE	ERB	DESTINATION
0524	44670	160001	LDA	1,I	WORD
0525	44671	002041	SEZ	RSS	SAVE
0526	44672	001727	ALF	ALF	OTHER
0527	44673	010762	AND	M256	CHARACTER
0528	44674	031404	IOR	TRSO	COMBINE WITH
0529	44675	002041	SEZ	RSS	NEW CHARACTER
0530	44676	001727	ALF	ALF	AND STORE
0531	44677	170001	STA	1,I	WORD
0532	44700	035272	ISZ	TEMP5	INCREMENT DESTINATION ADDRESS
0533	44701	026660	JMP	#TRST+1	

```

0535**
0536*** UNPACK ARGUMENTS FOR ARITHMETIC OPERATIONS ***
0537**
0538 44702 071620 #UNPK STA A1 SAVE HIGH MANTISSA OF ARG 1
0539 44703 002003 SZA,RSS UNPACK
0540 44704 006104 CLE,INB SECOND
0541 44705 015414 JSB .FLUN WORD
0542 44706 075621 STB C1 SAVE LOW MANTISSA OF ARG 1
0543 44707 071322 STA EXP SAVE EXPONENT
0544 44710 161412 LDA UNPAK,I COMPUTE ADDRESS
0545 44711 035412 ISZ UNPAK OF CALLING ROUTINE
0546 44712 164000 LDB 0,I
0547 44713 134000 ISZ 0,I SET CALLING ROUTINE'S RETURN
0548 44714 164001 LDB 1,I LOAD
0549 44715 104200 DLD 1,I ARG 2
      44716 100001
0550 44717 071622 STA A2 SAVE HIGH PART OF ARG 2
0551 44720 002003 SZA,RSS UNPACK
0552 44721 006404 CLB,INB LOW
0553 44722 015414 JSB .FLUN PART
0554 44723 075623 STB C2 SAVE LOW MANTISSA OF ARG 2
0555 44724 071310 STA EXP2 SAVE EXPONENT
0556 44725 125412 JMP UNPAK,I
0557**
0558*** ADD TWO FLOATING POINT NUMBERS ***
0559**
0560 44726 015412 #FAD JSB UNPAK UNPACK THE ARGUMENTS
0561 44727 001402 DEF .FAD
0562 44730 065402 LDB .FAD MOVE
0563 44731 075404 STB .FSB RETURN ADDRESS
0564 44732 026751 JMP ADMU1 ADD THE ARGUMENTS
0565**
0566*** SUBTRACT TWO FLOATING POINT NUMBERS ***
0567**
0568 44733 015412 #FSB JSB UNPAK UNPACK THE ARGUMENTS
0569 44734 001404 DEF .FSB
0570 44735 061622 LDA A2
0571 44736 003000 CMA NEGATE SECOND ARGUMENT
0572 44737 007006 CMB,INB,SZB OVERFLOW FROM LOW MANTISSA?
0573 44740 026746 JMP .FSB1 NO
0574 44741 002025 SSA,INA,RSS YES, ORIGINAL NUMBER NEGATIVE?
0575 44742 002021 SSA,RSS YES, COMPLEMENT NEGATIVE?
0576 44743 026746 JMP .FSB1 NO
0577 44744 001300 RAR YES, SHIFT MANTISSA
0578 44745 035310 ISZ EXP2 AND CORRECT EXPONENT
0579 44746 075623 .FSB1 STB C2 SAVE
0580 44747 071622 STA A2 COMPLEMENT
0581 44750 061310 LDA EXP2
0582*
0583** ADD UNPACKED ARGUMENTS **
0584*
0585 44751 003004 ADMU1 CMA,INA EXP2 IN (A)
0586 44752 041322 ADA EXP COMPUTE EXPONENT DIFFERENCE
0587 44753 002021 SSA,RSS ARG 1 LARGER?
0588 44754 026772 JMP ADMU2 YES

```

0589	44755	061620		LDA A1	NO,
0590	44756	065622		LDB A2	
0591	44757	071622		STA A2	SWAP
0592	44760	075620		STB A1	
0593	44761	061621		LDA C1	ARGUMENTS
0594	44762	065623		LDB C2	
0595	44763	071623		STA C2	
0596	44764	075621		STB C1	
0597	44765	061322		LDA EXP	
0598	44766	065310		LDB EXP2	
0599	44767	071310		STA EXP2	
0600	44770	075322		STB EXP	
0601	44771	026751		JMP ADMU1	
0602	44772	040321	ADMU2	ADA .-25	SHIFT
0603	44773	065621		LDB C1	COUNT
0604	44774	003120		CMA,CLE,SSA	>= 25?
0605	44775	027026		JMP ADMU4	YES, IGNORE SMALLER ARGUMENT
0606	44776	040321		ADA .-25	NO, COMPUTE SHIFT COUNT IN
0607	44777	071310		STA EXP2	1'S COMPLEMENT
0608	45000	061622		LDA A2	LOAD SMALLER
0609	45001	065623		LDB C2	MANTISSA
0610	45002	035310	ADMU3	ISZ EXP2	MORE SHIFTS?
0611	45003	027031		JMP ADMU5	YES
0612	45004	045621		ADB C1	NO, ADD
0613	45005	103101		CLO	LOWER MANTISSAS
0614	45006	002040		SEZ	OVERFLOW?
0615	45007	002104		CLE,INA	YES, BUMP (A)
0616	45010	102301		SOS	OVERFLOW?
0617	45011	027016		JMP ++5	NO
0618	45012	041620		ADA A1	YES, ADD HIGH MANTISSAS
0619	45013	002021		SSA,RSS	OVERFLOW CORRECTED BY A1 < 0 ?
0620	45014	027027		JMP ADMU4+1	YES
0621	45015	027021		JMP ++4	NO, CORRECT OVERFLOW
0622	45016	041620		ADA A1	ADD HIGH MANTISSAS
0623	45017	102301		SOS	OVERFLOW?
0624	45020	027027		JMP ADMU4+1	NO
0625	45021	001500		ERA	YES, SHIFT
0626	45022	005500		ERB	DOWN AND
0627	45023	035322		ISZ EXP	BUMP
0628	45024	027027		JMP ADMU4+1	EXPONENT
0629	45025	002001		RSS	
0630	45026	061620	ADMU4	LDA A1	
0631	45027	015306		JSB .PACK	NORMALIZE AND PACK
0632	45030	125404		JMP .FSB,I	
0633	45031	000071	ADMU5	CLE,SLA,ARS	ARITHMETIC
0634	45032	002200		CME	DOUBLE
0635	45033	005540		ERB,CLE	SHIFT
0636	45034	027002		JMP ADMU3	
0001**					**
0002***	MULTIPLY TWO FLOATING POINT NUMBERS				***
0003**					**
0004	45035	040000	B40M	OCT 40000	
0005	45036	015412	#FMP	JSB UNPAK	UNPACK THE ARGUMENTS
0006	45037	001406		DEF .FMP	
0007	45040	041322		ADA Exp	ADD EXPONENTS

0008	45041	002004	INA	PLUS 1 FOR
0009	45042	071322	STA EXP	NORMALIZATION
0010	45043	005320	RBR	POSITION LOW MANTISSA OF ARG 2
0011	45044	060001	LDA 1	COMPUTE A
0012	45045	100200	MPY A1	CROSS PRODUCT
	45046	001620		
0013	45047	071623	STA C2	SAVE RESULT
0014	45050	061621	LDA C1	POSITION LOW MANTISSA
0015	45051	001300	RAR	OF ARG 1
0016	45052	075621	STB C1	SAVE REST OF PRIOR RESULT
0017	45053	100200	MPY A2	COMPUTE SECOND CROSS PRODUCT
	45054	001622		
0018	45055	045621	ADB C1	ADD
0019	45056	000040	CLE	CROSS
0020	45057	041623	ADA C2	PRODUCTS
0021	45060	002040	SEZ	CORRECT
0022	45061	006004	INB	FOR CARRY
0023	45062	075623	STB C2	SAVE RESULT
0024	45063	061620	LDA A1	COMPUTE PRODUCT OF
0025	45064	100200	MPY A2	HIGH MANTISSAS
	45065	001622		
0026	45066	000055	CLE,ERA	POSITION LOW PART OF RESULT
0027	45067	041623	ADA C2	ADD IN CROSS PRODUCTS
0028	45070	000066	CLE,ELA	POSITION RESULT
0029	45071	002041	SEZ,RSS	CARRY?
0030	45072	027076	JMP **4	NO
0031	45073	102201	SOC	YES, POSITIVE CARRY?
0032	45074	006005	INB,RSS	YES
0033	45075	044351	ADB .-1	NO
0034	45076	101100	SWP	EXCHANGE REGISTERS
0035	45077	015306	JSB .PACK	NORMALIZE
0036	45100	125406	JMP .FMP,I	AND PACK RESULT
0037**				**
0038***	DIVIDE TWO FLOATING POINT NUMBERS			***
0039**				**
0040	45101	015412	#FDV JSB UNPAK	UNPACK THE ARGUMENTS
0041	45102	001410	DEF .FDV	
0042	45103	065622	LDB A2	ZERO
0043	45104	006003	SZB,RSS	DIVISOR?
0044	45105	027161	JMP .FDV2	YES
0045	45106	065620	LDB A1	NO, ZERO
0046	45107	006003	SZB,RSS	DIVIDEND?
0047	45110	027156	JMP .FDV1	YES
0048	45111	003004	CMA,INA	NO, COMPUTE
0049	45112	002004	INA	EXPONENT
0050	45113	041322	ADA EXP	DIFFERENCE
0051	45114	071322	STA EXP	PLUS 1
0052	45115	061621	LDA C1	LOAD DIVIDEND
0053	45116	101022	ASR 2	SHIFT TO PREVENT OVERFLOW
0054	45117	100400	DIV A2	SAVE
	45120	001622		
0055	45121	071310	STA EXP2	QUOTIENT
0056	45122	005100	BRs	DIVIDE REMAINDER BY 2 TO
0057	45123	002400	CLA	PREVENT DIVISION OVERFLOW
0058	45124	100400	DIV A2	DIVIDE REMAINDER AND

0059	45125	001622		STA FD0	SAVE LOW PART OF QUOTIENT
0060	45126	071402		LDB C2	
0061	45127	065623		LSR 3	SCALE TO PREVENT OVERFLOW
0062	45130	101043		CLA	OVERFLOW
0063	45131	002400		DIV A2	COMPUTE C2/A2 = Q
	45132	100400			
	45133	001622			
0064	45134	003004		CMA,INA	COMPUTE
0065	45135	100200		MPY EXP2	=HIGH QUOTIENT*Q
	45136	001310			
0066	45137	005066		BLS,CLE,ELB	SHIFT SIGN TO (E)
0067	45140	061402		LDA FD0	LOW QUOTIENT
0068	45141	002020		SSA	NEGATIVE?
0069	45142	003401		CCA,RSS	YES, SET (A) = -1 (EXTEND
0070	45143	002400		CLA	NO, SET (A) = 0 SIGN)
0071	45144	003040		CMA,SEZ	IF (E) = 1 SUBTRACT
0072	45145	002004		INA	1 AS EXTENSION
0073	45146	003100		CMA,CLE	OF PRODUCT
0074	45147	045402		ADB FD0	ADD IN LOW QUOTIENT
0075	45150	002040		SEZ	CARRY
0076	45151	002004		INA	INTO (A)
0077	45152	004066		CLE,ELB	POSITION
0078	45153	001600		ELA	REGISTERS
0079	45154	041310		ADA EXP2	ADD HIGH QUOTIENT
0080	45155	002001		RSS	
0081	45156	002400	.FDV1	CLA	SET MANTISSA TO ZERO
0082	45157	015306		JSB .PACK	NORMALIZE AND PACK
0083	45160	125410		JMP .FDV,1	
0084	45161	115212	.FDV2	JSB WERRS+3,I	DIVIDE BY ZERO
0085	45162	061620		LDA A1	
0086	45163	015310		JSB OVFLW	RETURN INFINITY OF
0087	45164	125410		JMP .FDV,I	APPROPRIATE SIGN
0088**					**
0089***				TAKE ARITHMETIC INVERSE	***
0090**					**
0091*					
0092*				ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B),	
0093*				EXIT WITH ITS ARITHMETIC INVERSE IN (A) AND (B),	
0094*					
0095	45165	053035	#ARIN	CPA B40M	A=040000?
0096	45166	002001		RSS	
0097	45167	027172		JMP ARIN2	NO,
0098	45170	054353		CPB +1	YES, B=000001?
0099	45171	027220		JMP ARIN3	YES,
0100	45172	101100	ARIN2	SWP	NO, SWAP REGISTERS,
0101	45173	007100		CMB,CLE	COMPLEMENT HIGH PART
0102	45174	020762		XOR M256	COMPLEMENT LOW PART
0103	45175	040444		ADA B400	FINISH LOW PART
0104	45176	002041		SEZ,RSS	OVERFLOW?
0105	45177	027216		JMP ARIN1	NO
0106	45200	006004		INB	YES, INCREMENT HIGH PART
0107	45201	055036		CPB FLGBT	OVERFLOW?
0108	45202	027206		JMP ++4	YES
0109	45203	056000		CPB UNNRM	NO, NEGATIVE UNNORMALIZED?
0110	45204	002001		RSS	YES

0111	45205	027216		JMP ARIN1	NO
0112	45206	046000		AQB UNNRM	FIX HIGH MANTISSA
0113	45207	000033		SLA,RAR	POSITION EXPONENT
0114	45210	032001		IOR SMSK	FILL IN LEADING BITS IF NEGATIVE
0115	45211	006021		SSB,RSS	POSITIVE?
0116	45212	002005		INA,RSS	YES, INCREMENT EXPONENT
0117	45213	040351		ADA ,=1	NO, DECREMENT EXPONENT
0118	45214	001200		RAL	POSITION
0119	45215	010443		AND B377	EXPONENT
0120	45216	101100	ARIN1	SWP	RESTORE USUAL
0121	45217	125370		JMP ARINV,I	NUMBER ORDER
0122	45220	115215	ARIN3	JSB WERRS+6,I	OUTPUT UNDERFLOW MESSAGE.
0123	45221	002400		CLA	RETURN WITH A=0
0124	45222	006400		CLB	AND B=0.
0125	45223	125370		JMP ARINV,I	
0126**					**
0127***	UNPACK	LOW WORD OF NUMBER			***
0128**					**
0129*					
0130*	ENTER WITH	LOW WORD OF FLOATING POINT NUMBER IN (B).			
0131*	EXIT WITH	EXPONENT IN (A) AND MANTISSA IN (B).			
0132*					
0133	45224	002400	#FLUN	CLA	EXTRACT
0134	45225	101050		LSR 8	EXPONENT
0135	45226	001727		ALF,ALF	IN (A) AND
0136	45227	005727		BLF,BLF	MANTISSA IN (B)
0137	45230	000033		SLA,RAR	NEGATIVE EXPONENT?
0138	45231	032001		IOR SMSK	YES, FILL IN LEADING BITS
0139	45232	125414		JMP .FLUN,I	NO

```

0141*
0142* WHILE READING A PROGRAM IN 'TAPE' MODE, ERRONEOUS STATEMENTS
0143* ARE REPLACED WITH ERROR PSEUDO-STATEMENTS. (THESE ARE THREE
0144* WORD 'STATEMENTS': THE STATEMENT NUMBER, THE LENGTH (ALWAYS
0145* 3), AND THE ERROR NUMBER, SINCE BITS 15-9 ARE CLEAR IN WORD
0146* THREE, ERRORS HAVE A STATEMENT TYPE OF 0. ERRCT HOLDS A
0147* COUNT OF THE EMBEDDED ERRORS AND THE USER'S BIT OF TERR IS
0148* SET IF ANY EMBEDDED ERRORS EXIST. ADDITIONALLY, THE 'OUT-OF-
0149* STORAGE' ERROR SETS SYMTB = 1 TO ASSIST SYNTAX. ALL STATEMENTS
0150* WITH A SEQUENCE NUMBER OF ZERO WILL BE COLLAPSED INTO A SINGLE
0151* ERROR AND UNDER/OVERFLOWS IN NUMERICAL CONSTANTS ARE NOT
0152* REPORTED.
0153*
0154**
0155*** OUTPUT TAPE MODE ERRORS ***
0156**
0157*
0158* UPON ENTRY ALL EMBEDDED ERRORS ARE STRIPPED FROM THE PROGRAM
0159* AND STORED BELOW IT AS TWO_WORD QUANTITIES (THE LENGTH WORD
0160* IS DROPPED). FOLLOWING THIS THE ERRORS ARE PRINTED ONE BY
0161* ONE WITH LINE NUMBERS. AFTER PRINTING ALL ERRORS (OR, IF THE
0162* USER ABORTS THE ERROR PRINTING, AFTER THE USER TYPES THE NEXT
0163* LINE) EVERYTHING IS CLEANED UP AND A MESSAGE PRINTED TO SAY
0164* THE LAST RECEIVED INPUT HAS BEEN IGNORED.
0165*
0166 45233 002400 TAPER CLA FIRST
0167 45234 051576 CPA ERRCT ENTRY?
0168 45235 027347 JMP TAPES NO
0169 45236 071575 STA SYMTB YES, RESET 'OUT OF STORAGE' FLAG
0170 45237 060056 LDA PBPTR INITIALIZE
0171 45240 071230 STA SPTR
0172 45241 064702 LDB PBUFF PROGRAM
0173 45242 075514 STB DEST
0174 45243 075512 STB SOURC POINTERS
0175*
0176** STRIP OUT EMBEDDED ERRORS **
0177*
0178 45244 006004 TAPE1 INB SET (B)
0179 45245 060001 LDA 1 TO FIRST WORD
0180 45246 144001 ADB 1,I OF NEXT
0181 45247 044351 ADB ,=1 PROGRAM STATEMENT
0182 45250 002004 INA IS THE
0183 45251 160000 LDA 0,I CURRENT STATEMENT
0184 45252 010664 AND OPMSK OF TYPE
0185 45253 002002 SZA 'ERROR' ?
0186 45254 027244 JMP TAPE1 NO
0187 45255 061512 LDA SOURC YES, LOAD SOURCE ADDRESS
0188 45256 075512 STB SOURC SET SOURCE TO NEW VALUE
0189 45257 044347 ADB ,=3 JUXTAPOSED
0190 45260 050001 CPA 1 ERRORS?
0191 45261 027265 JMP TAPE2 YES, NO MOVE NEEDED
0192 45262 051514 CPA DEST NO, FIRST ERROR ENCOUNTERED?
0193 45263 027360 JMP TAPE6 YES
0194 45264 015500 JSB MOVER NO, DELETE PRIOR ERROR(S)
0195 45265 064056 TAPE2 LDB PBPTR ENOUGH

```

0196	45266	075500	STB	TAP0		
0197	45267	006004	INB		USER SPACE	
0198	45270	054462	CPB	LWAUS		
0199	45271	027363	JMP	TAPE7	TO TRANSFER	
0200	45272	006004	INB			
0201	45273	054462	CPB	LWAUS	ERROR?	
0202	45274	027363	JMP	TAPE7	NO	
0203	45275	074056	STB	PBPTR	YES, APPEND TWO WORDS	
0204	45276	164000	LDB	0,I	TRANSFER	
0205	45277	175500	STB	TAP0,I	LINE NUMBER	
0206	45300	035500	ISZ	TAP0		
0207	45301	040364	ADA	,+2	TRANSFER	
0208	45302	164000	LDB	0,I	ERROR	
0209	45303	175500	STB	TAP0,I	NUMBER	
0210	45304	065512	LDB	SOURC	RETRIEVE POINTER TO STATEMENT	
0211	45305	003400	CCA		DECREMENT	
0212	45306	041576	ADA	ERRCT	ERROR	
0213	45307	071576	STA	ERRCT	COUNTER	
0214	45310	002002	SZA		ALL ERRORS DELETED?	
0215	45311	027244	JMP	TAPE1	NO	
0216	45312	055230	CPB	SPTR	YES, PROGRAM REMAINING?	
0217	45313	027317	JMP	TAPE3	NO	
0218	45314	061512	LDA	SOURC	YES, SLIDE UP	
0219	45315	065230	LDB	SPTR	OVER LAST	
0220	45316	015500	JSB	MOVER	ERROR(S)	
0221*				*		
0222**	OUTPUT ERROR MESSAGES			**		
0223*				*		
0224	45317	063335	TAPE3	LDA	RETAD	SET
0225	45320	071474		STA	SERR	RETURN ADDRESS
0226	45321	062005		LDA	WERRA	FAKE
0227	45322	042004		ADA	FERRA	
0228	45323	003004		CMA,	INA	'WARNING ONLY'
0229	45324	071442		STA	LT5	ERROR MODE
0230	45325	007400	TAPE4	CCB		FORCE
0231	45326	075444		STB	LT6	LINE NUMBER
0232	45327	165230		LDB	SPTR,I	MAKE LINE NUMBER OF
0233	45330	075570		STB	.LNUM	CURRENT ERROR ACCESSIBLE
0234	45331	035230		ISZ	SPTR	LOAD
0235	45332	161230		LDA	SPTR,I	ERROR NUMBER
0236	45333	006400		CLB		EXIT TO
0237	45334	027450		JMP	SERR1+3	ERROR PRINTER
0238	45335	045336	RETAD	DEF	*+1	
0239	45336	062004		LDA	FERRA	RESTORE
0240	45337	003004		CMA,	INA	'WARNING
0241	45340	041442		ADA	LT5	ONLY'
0242	45341	071442		STA	LT5	MODE
0243	45342	035230		ISZ	SPTR	MORE
0244	45343	061230		LDA	SPTR	
0245	45344	050056		CPA	PBPTR	ERRORS?
0246	45345	002001		RSS		NO
0247	45346	027325		JMP	TAPE4	YES
0248	45347	061514	TAPE5	LDA	DEST	CORRECT POINTER TO
0249	45350	070056		STA	PBPTR	LAST WORD +1 OF PROGRAM
0250	45351	103100		CLF	0	

0251	45352	060353	LDA	TERR	TURN
0252	45353	003000	CMA		ERROR
0253	45354	110257	AND	MAIN,I	FLAG
0254	45355	170257	STA	MAIN,I	OFF
0255	45356	102100	STF	0	
0256	45357	115147	JSB	RERRS+33,I	EMIT PARTING SHOT
0257*					
0258	45360	075514	TAPE6	STB DEST	SET DESTINATION POINTER
0259	45361	060001	LDA	1	TO FIRST ERROR ENCOUNTERED
0260	45362	027265	JMP	TAPE2	
0261	45363	071474	TAPE7	STA TAP1	SAVE SOURCE ADDRESS
0262	45364	003004	CMA,INA		COMPUTE SIZE OF AREA
0263	45365	041514	ADA	DEST	TO BE RECLAIMED
0264	45366	071500	STA	TAP0	AND SAVE IT
0265	45367	041230	ADA	SPTR	RESET POINTER TO
0266	45370	071230	STA	SPTR	LAST WORD +1 OF PROGRAM
0267	45371	065512	LDB	SOURC	SET POINTER TO
0268	45372	045500	ADB	TAP0	NEXT STATEMENT
0269	45373	075512	STB	SOURC	TO NEW VALUE
0270	45374	061474	LDA	TAP1	RETRIEVE SOURCE ADDRESS
0271	45375	064056	LDB	PBPTR	RECLAIM
0272	45376	015500	JSB	MOVER	SPACE
0273	45377	065514	LDB	DEST	SET NEW POINTER TO
0274	45400	074056	STB	PBPTR	PROTECTED AREA
0275	45401	061512	LDA	SOURC	COMPUTE POINTER TO
0276	45402	040347	ADA	.-3	CURRENT ERROR STATEMENT
0277	45403	071514	STA	DEST	SET NEW DESTINATION POINTER
0278	45404	027266	JMP	TAPE2+1	
0279**					**
0280***					***
					MOVE BLOCK TO LOWER CORE
0281**					**
0282*					
0283*					UPON ENTRY (B) POINTS TO THE LAST WORD +1 TO BE MOVED AND
0284*					(A) POINTS TO THE FIRST WORD TO BE MOVED, DEST POINTS TO THE
0285*					FIRST WORD OF THE DESTINATION SPACE.
0286*					
0287	45405	075474	#MOVE	STB MVEND	SAVE POINTER TO LAST WORD +1
0288	45406	164000	LDB	0,I	TRANSFER
0289	45407	175514	STB	DEST,I	WORD
0290	45410	035514	ISZ	DEST	BUMP
0291	45411	002004	INA		POINTERS
0292	45412	051474	CPA	MVEND	DONE?
0293	45413	125500	JMP	MOVER,I	YES
0294	45414	027406	JMP	#MOVE+1	NO

```

0296**
0297*** OUTPUT AN ERROR MESSAGE ***
0298**
0299*
0300* ERRORS ARE IDENTIFIED, THE APPROPRIATE SECTOR OF DRUM LOADED,
0301* AND THE MESSAGE PRINTED. IF A SYNTAX ERROR AND IN 'TAPE'
0302* MODE, THE ERROR IS EMBEDDED IN THE PROGRAM AS A PSEUDO-
0303* STATEMENT AND THE ERROR FLAGS ADJUSTED AS APPROPRIATE. IF A
0304* SYNTAX ERROR AND IN 'KEY' MODE, 'ERROR' IS PRINTED AND INPUT
0305* REQUESTED. THE ERROR MESSAGE IS PRINTED IF THE REPLY IS OTHER
0306* THAN A SIMPLE CARRIAGE RETURN. IF THE LENGTH WORD OF THE ERROR
0307* MESSAGE IS POSITIVE THE CURRENT LINE NUMBER IS APPENDED,
0308*
0309 45415 003400 #SERR CCA COMPUTE
0310 45416 041474 ADA SERR
0311 45417 160000 LDA 0,I AND SAVE
0312 45420 042002 ADA SERRA
0313 45421 010502 AND B777 ERROR NUMBER
0314 45422 071432 STA LT3
0315 45423 042003 ADA RERRA
0316 45424 071442 STA LT6 SYNTAX
0317 45425 002021 SSA,RSS ERROR?
0318 45426 027445 JMP SERR1 NO
0319 45427 060362 LDA TAPEF YES, TAPE
0320 45430 110257 AND MAIN,I
0321 45431 002002 SZA MODE?
0322 45432 027701 JMP SERR6 YES
0323 45433 006400 CLB NO
0324 45434 075274 STB LT2 OUTPUT
0325 45435 063727 LDA ASCER 'ERROR'
0326 45436 071430 STA LT1 AND
0327 45437 060347 LDA .-3 WAIT
0328 45440 015462 JSB OUTST FOR
0329 45441 060231 LDA IWT
0330 45442 114516 JSB SCHIN,I INPUT.
0331 45443 015450 JSB GETCR CARRIAGE RETURN ONLY?
0332 45444 027552 JMP SERR4 YES
0333*
0334** PRINT THE MESSAGE **
0335*
0336 45445 061432 SERR1 LDA LT3 NO
0337 45446 006400 CLB
0338 45447 075444 STB LT6 LOAD
0339 45450 101105 RRR 5
0340 45451 075432 STB LT3 OCTANT
0341 45452 042006 ADA DSERR
0342 45453 164000 LDB 0,I ADDRESS
0343 45454 061432 LDA LT3 COMPUTE
0344 45455 001222 RAL,RAL
0345 45456 001200 RAL
0346 45457 010361 AND .+7 SECTOR
0347 45460 040001 ADA 1
0348 45461 064610 LDB D100
0349 45462 103100 CLF 0
0350 45463 074072 STB WORD READ

```

0351	45464	064544	LDB ERSCA	
0352	45465	045036	ADB FLGBT	SECTOR
0353	45466	114770	JSB DRUM,1	
0354	45467	060261	LDA ENDRM	
0355	45470	002020	SSA	DONE?
0356	45471	027467	JMP *-2	NO
0357	45472	002003	SZA,RSS	ANY ERRORS?
0358	45473	027477	JMP SERRB	NO
0359	45474	002400	CLA	YES, CLEAR DRUM DRIVER
0360	45475	070261	STA ENDRM	BUSY WORD
0361	45476	116007	JSB SICKL,I	AND GO DIE GRACEFULLY
0362	45477	061442	SERRB LDA LT5	
0363	45500	002021	SSA,RSS	EXECUTION ERROR?
0364	45501	027625	JMP SERRB	YES
0365	45502	002400	CLA	NO, OUTPUT
0366	45503	015454	JSB OUTCR	A NULL.
0367	45504	060343	LDA *-7	
0368	45505	071430	STA LT1	OUTPUT
0369	45506	060412	LDA ,+40B	7
0370	45507	015454	JSB OUTCR	
0371	45510	035430	ISZ LT1	
0372	45511	027506	JMP *-3	BLANKS.
0373	45512	061432	SERR2 LDA LT3	COMPUTE
0374	45513	001727	ALF,ALF	
0375	45514	010402	AND ,+30B	MESSAGE
0376	45515	001200	RAL	
0377	45516	040544	ADA ERSCA	
0378	45517	071430	STA LT1	ADDRESS
0379	45520	007400	CCB	
0380	45521	160000	LDA 0,I	
0381	45522	002020	SSA	LINE NUMBER?
0382	45523	027526	JMP **+3	NO
0383	45524	075444	STB LT6	YES, SET FLAG
0384	45525	003004	CMA,INA	
0385	45526	006400	CLB	OUTPUT
0386	45527	075274	STB LT2	ERROR
0387	45530	015462	JSB OUTST	MESSAGE
0388	45531	035444	ISZ LT6	LINE NUMBER FLAG SET?
0389	45532	027542	JMP SERR3	NO
0390	45533	063733	LDA LINEA	YES
0391	45534	071430	STA LT1	PRINT
0392	45535	006400	CLB	
0393	45536	060345	LDA *-5	" IN LINE "
0394	45537	015462	JSB OUTST	
0395	45540	065570	LDB ,LNUM	OUTPUT
0396	45541	015456	JSB OUTIN	LINE NUMBER
0397	45542	061442	SERR3 LDA LT5	'BAD
0398	45543	042004	ADA FERRA	
0399	45544	071442	STA LT5	
0400	45545	042005	ADA WERRA	INPUT
0401	45546	002003	SZA,RSS	ERROR
0402	45547	027563	JMP SERRB	YES
0403	45550	060367	LDA ,+15B	OUTPUT
0404	45551	015454	JSB OUTCR	CARRIAGE RETURN
0405	45552	060364	SERR4 LDA ,+12B	OUTPUT

0406	45553	015454		JSB OUTCR	LINE FEED
0407	45554	061442		LDA LT5	RUN
0408	45555	002020		SSA	ERROR?
0409	45556	027614		JMP SER13	YES
0410	45557	042005		ADA WERRA	NO, WARNING
0411	45560	002020		SSA	ONLY?
0412	45561	027565		JMP SERR9	NO, FORMAT ERROR
0413	45562	002400		CLA	YES
0414	45563	071572	SERR8	STA CHRCT	
0415	45564	125474		JMP SERR,I	
0416	45565	006400	SERR9	CLB	
0417	45566	061761		LDA IFSTR	CONVERT
0418	45567	101101		RRR 1	CHARACTER
0419	45570	071430		STA LT1	SAVE POINTER
0420	45571	061762		LDA NCH	SAVE
0421	45572	003004		CMA,INA	NUMBER OF
0422	45573	071762		STA NCH	CHARACTERS
0423	45574	006002		SZB	START WITH RIGHT BYTE?
0424	45575	027605		JMP SER11	YES
0425	45576		SER10	EQU *	
0426	45576	161430		LDA LT1,I	FETCH
0427	45577	001727		ALF,ALF	LEFT
0428	45600	010443		AND B377	CHAR
0429	45601	015454		JSB OUTCR	OUTPUT IT
0430	45602	035762		ISZ NCH	FINISHED ALL CHARS?
0431	45603	002001		RBS	NO
0432	45604	027613		JMP SER12	YES
0433	45605		SER11	EQU *	
0434	45605	161430		LDA LT1,I	FETCH RIGHT
0435	45606	010443		AND B377	CHARACTER
0436	45607	015454		JSB OUTCR	OUTPUT IT
0437	45610	035430		ISZ LT1	BUMP POINTER
0438	45611	035762		ISZ NCH	FINISHED ALL CHARS?
0439	45612	027576		JMP SER10	NO
0440	45613		SER12	EQU *	
0441	45613	015536		JSB OUTCL	OUTPUT CR-LF
0442	45614		SER13	EQU *	
0443	45614	103100		CLF 0	
0444	45615	160257		LDA MAIN,I	DISALLOW
0445	45616	030372		IOR UNABT	
0446	45617	170257		STA MAIN,I	ABORTS
0447	45620	102100		STF 0	
0448	45621	061502		LDA FCNTR	
0449	45622	071552		STA FRMAT	
0450	45623	015560		JSB LCDLP	UPDATE LAST CHANGE DATE
0451	45624	124514		JMP SCHEN,I	
0452*					
0453	45625	061442	SERR5	LDA LT5	
0454	45626	042004		ADA FERRA	WARNING
0455	45627	042005		ADA WERRA	ERROR?
0456	45630	002021		SSA,RSS	
0457	45631	027645		JMP SER5A	YES
0458	45632	060257		LDA MAIN	NO, DOES USER
0459	45633	002004		INA	HAVE LP?
0460	45634	050255		CPA PRIST	

0461	45635	002001	RSS		
0462	45636	027645	JMP SER5A	NO	
0463	45637	060375	LDA .+23B	YES,	
0464	45640	015454	JSB OUTCR	RELEASE IT	
0465	45641	060375	LDA .+23B		
0466	45642	015454	JSB OUTCR		
0467	45643	002400	CLA		
0468	45644	070255	STA PRIST		
0469	45645	060367	SER5A LDA .+15B	OUTPUT	
0470	45646	015454	JSB OUTCR	CARRIAGE RETURN	
0471	45647	060364	LDA .+12B	AND	
0472	45650	015454	JSB OUTCR	LINE FEED	
0473	45651	002400	CLA	BLOCK	
0474	45652	170634	STA DCLC1,I	CLOCK	
0475	45653	114534	JSB ABCK,I	CHECK FOR ABORTS	
0476	45654	160640	LDA DCLC2,I	UNBLOCK	
0477	45655	170634	STA DCLC1,I	CLOCK	
0478	45656	061442	LDA LT5	WARNING	
0479	45657	042004	ADA FERRA		
0480	45660	042005	ADA WERRA		
0481	45661	002021	SSA,RSS	ERROR?	
0482	45662	027512	JMP SERR2	YES	
0483	45663	060445	LDA CHNFG	NO	
0484	45664	003000	CMA		
0485	45665	103100	CLF 0		
0486	45666	110001	AND 1,I	CLEAR	
0487	45667	170001	STA 1,I	CHAIN FLAG	
0488	45670	102100	STF 0		
0489	45671	006004	INB		
0490	45672	160001	LDA 1,I	TELL 2114	
0491	45673	030230	IOR UNR	THAT USER IS	
0492	45674	114500	JSB S14LP,I	NO LONGER RUNNING	
0493	45675	060356	LDA .+4	CLEAR PBFLG AND CBFLG	
0494	45676	044351	ADB .-7TNUM		
0495	45677	015564	JSB EDADR	BITS,	
0496	45700	027512	JMP SERR2		
0497	45701	064056	SERR6 LDB PBPTR		
0498	45702	044354	ADB .+2	STORE	
0499	45703	061432	LDA LT3	ERROR	
0500	45704	170001	STA 1,I	NUMBER	
0501	45705	006004	INB	SET POINTER TO	
0502	45706	075574	STB SBPTR	LAST WORD +1 OF ERROR	
0503	45707	002003	SZA,RSS	'OUT OF STORAGE' ERROR?	
0504	45710	035575	ISZ SYMTB	YES	
0505	45711	103100	CLF 0	NO	
0506	45712	160257	LDA MAIN,I	FIRST	
0507	45713	030353	IOR TERR		
0508	45714	150257	CPA MAIN,I	ERROR?	
0509	45715	027721	JMP ++4	NO	
0510	45716	170257	STA MAIN,I	YES-->SET FLAG	
0511	45717	002400	CLA	CLEAR	
0512	45720	071576	STA ERRCT	ERROR COUNTER	
0513	45721	102100	STF 0		
0514	45722	035576	ISZ ERRCT	COUNT ERROR	
0515	45723	015452	JSB BCKSP	SEEK	

0516	45724	015450	SERR7	JSB	GETCR	CARRIAGE RETURN
0517	45725	124524		JMP	ACC5A,I	
0518	45726	027724		JMP	*-2	
0519*						
0520	45727	045727	ASCER	DEF	ERR=1	
0521	45730	005105	ERR	OCT	5105	
0522	45731	051122		ASC	2,RROR	
	45732	047522				
0523	45733	045733	LINEA	DEF	*	
0524	45734	020111		ASC	4, IN LINE	
	45735	047040				
	45736	046111				
	45737	047105				
0525	45740	020000		OCT	20000	

```

0002 46000                ORG 46000B
0003 46000 040512  ENDIN DEF EIN12
0004 46001 040450  MINP2 DEF EINP0+3
0005 46002 040375  MINP1 DEF EINP1
0006 46003 177713  D65  OCT =65
0007*
0008*** **
0009** EXECUTE <MAT STATEMENT> **
0010*** **
0011*
0012 46004 046323  MLP2A DEF MLOP2
0013 46005 046325  MLP3A DEF MLOP3
0014 46006 047212  MADDA DEF MADD
0015 46007 047215  MSUBA DEF MSUB
0016 46010 047227  SMULA DEF SMULT
0017 46011 047220  IONA DEF IDN
0018 46012 047232  MCPYA DEF MCPY
0019 46013 041433  TOLC DEC +1E=6
      46014 157733
0020 46015 046016  F0,0A DEF F0,0
0021 46016 000000  F0,0 DEC 0,0
      46017 000000
0022 46020 046021  F1,0A DEF F1,0
0023 46021 040000  F1,0 DEC 1,0
      46022 000002
0024*
0025 46023 161613  EMAT LDA TEMP1,I  FIRST
0026 46024 010700  AND OPDMK  OPERAND
0027 46025 002002  SZA  NULL?
0028 46026 026206  JMP EMAT1  NO
0029* *
0030** IDENTIFY MATRIX I/O **
0031* *
0032 46027 035613  ISZ TEMP1
0033 46030 003400  CCA  CHECK
0034 46031 071472  STA ELCNT  FOR
0035 46032 015554  JSB EPRUS  'MAT PRINT USING'
0036 46033 161613  LDA TEMP1,I  COMPUTE AND SAVE
0037 46034 101111  RRR 9  I/O TYPE:
0038 46035 010734  AND B77  INPUT = -2
0039 46036 042003  ADA D65  READ = -1
0040 46037 071314  STA MT1  PRINT = 0
0041 46040 002026  SSA,INA,SZA  SAVE FLAG
0042 46041 071312  STA MT0  IF 'INPUT'
0043 46042 015506  JSB VLFIL  PROCESS ANY
0044 46043 000000  NOP  FILE REQUEST
0045 46044 161613  MI01 LDA TEMP1,I  LOAD NEXT
0046 46045 010700  AND OPDMK  IDENTIFIER
0047 46046 002003  SZA,RSS  ZERO?
0048 46047 124556  JMP XEC1A,I  YES
0049* *
0050** PREPARE A MATRIX FOR I/O **
0051* *
0052 46050 001000  ALS  LOAD
0053 46051 041575  ADA SYMTB  BASE ADDRESS

```

0054	46052	040351	ADA	.-1	OF ARRAY
0055	46053	164000	LDB	0,I	
0056	46054	044350	ADB	.-2	SAVE POINTER TO
0057	46055	075574	STB	SBPTR	DYNAMIC DIMENSIONS
0058	46056	061613	LDA	TEMP1	LAST
0059	46057	002004	INA		WORD OF
0060	46060	051334	CPA	PRGCT	STATEMENT?
0061	46061	002400	CLA		YES
0062	46062	160000	LDA	0,I	NO, LOAD (A) WITH
0063	46063	010664	AND	OPMSK	FOLLOWING OPERATOR
0064	46064	065314	LDB	MT1	MAT
0065	46065	006003	SZB	RSS	PRINT?
0066	46066	026121	JMP	MI02	YES
0067	46067	050622	CPA	LBOP	NO, '!' NEXT OPERATOR?
0068	46070	015470	JSB	REDIM	YES, REDIMENSION ARRAY
0069	46071	161574	LDA	SBPTR,I	SET POINTER
0070	46072	035574	ISZ	SBPTR	TO FIRST ELEMENT
0071	46073	100200	MPY	SBPTR,I	OF ARRAY
	46074	101574			
0072	46075	035574	ISZ	SBPTR	WHILE COMPUTING
0073	46076	003004	CMA,INA		NUMBER OF
0074	46077	071500	STA	MCNT	ELEMENTS
0075	46100	003400	CCA		MAT
0076	46101	051314	CPA	MT1	READ?
0077	46102	026110	JMP	MI09	YES
0078*					
0079**	INPUT VALUES FOR MATRIX **				
0080*					
0081	46103	035312	ISZ	MT0	FIRST MATRIX TO BE INPUT?
0082	46104	002001	RSS		NO
0083	46105	126002	JMP	MINP1,I	YES
0084	46106	041312	ADA	MT0	RETRIEVE
0085	46107	126001	JMP	MINP2,I	SAVED CHARACTER
0086*					
0087**	READ VALUES FOR MATRIX **				
0088*					
0089	46110	006404	MI09	CLB,INB	FETCH
0090	46111	015362	JSB	FDATA	CONSTANT
0091	46112	104400	DST	SBPTR,I	STORE
	46113	101574			
0092	46114	035574	ISZ	SBPTR	
0093	46115	035574	ISZ	SBPTR	IT
0094	46116	035500	ISZ	MCNT	DONE?
0095	46117	026110	JMP	MI09	NO
0096	46120	026174	JMP	MI07	YES
0097*					
0098	46121	050614	MI02	CPA	B3000
0099	46122	007400	CCB		'!' FOLLOWING ARRAY?
0100	46123	075500	STB	MCNT	YES
0101	46124	065574	LDB	SBPTR	NO, TREAT AS COMMA
0102	46125	015472	JSB	VCHK	VALIDATE
0103	46126	161574	LDA	SBPTR,I	ARRAY ELEMENTS
0104	46127	035574	ISZ	SBPTR	SAVE
0105	46130	003004	CMA,INA		COUNT
0106	46131	071312	STA	MT0	OF
					ROWS

0107	46132	161574		LDA SBPTR,I	
0108	46133	035574		ISZ SBPTR	
0109	46134	065234		LDB FILE#	WRITE ON
0110	46135	006020		SSB	A FILE?
0111	46136	026151		JMP M103	NO
0112*				*	
0113**			WRITE MATRIX ON FILE	**	
0114*				*	
0115	46137	100200		MPY MT0	SET
	46140	001312			
0116	46141	071500		STA MCNT	ELEMENT COUNTER
0117	46142	064350	M104	LDB .-2	WRITE ELEMENT
0118	46143	015512		JSB FILST	TO FILE
0119	46144	035574		ISZ SBPTR	MOVE TO
0120	46145	035574		ISZ SBPTR	NEXT ELEMENT
0121	46146	035500		ISZ MCNT	MATRIX DONE?
0122	46147	026142		JMP M104	NO
0123	46150	026174		JMP M107	YES

```

0125*
0126** WRITE MATRIX ON TELETYPE **
0127*
0128 46151 003004 M103 CMA,INA SAVE
0129 46152 071625 STA MT3 COLUMN COUNT
0130 46153 071624 M108 STA MT2 SET COLUMN COUNT
0131 46154 026160 JMP M106
0132 46155 002400 M105 CLA
0133 46156 051500 CPA MCNT
0134 46157 015430 JSB EDELM
0135 46160 104200 M106 DLD SBPTR,I PRINT
      46161 101574
0136 46162 015420 JSB ENOUT ELEMENT
0137 46163 035574 ISZ SBPTR MOVE TO
0138 46164 035574 ISZ SBPTR NEXT ELEMENT
0139 46165 035624 ISZ MT2 ROW DONE?
0140 46166 026155 JMP M105 NO
0141 46167 015426 JSB OUTLN YES, DOUBLE
0142 46170 015426 JSB OUTLN SPACE
0143 46171 061625 LDA MT3
0144 46172 035312 ISZ MT0 MATRIX DONE?
0145 46173 026153 JMP M108 NO
0146*
0147** CHECK FOR MORE MATRICES **
0148*
0149 46174 035613 M107 ISZ TEMP1
0150 46175 065613 LDB TEMP1 STATEMENT
0151 46176 055334 CPB PRGCT FINISHED?
0152 46177 026202 JMP **3 YES
0153 46200 071312 STA MT0 NO, SAVE (A)
0154 46201 026044 JMP M101
0155 46202 064350 LDB *-2 MATRIX
0156 46203 055314 CPB MT1 INPUT?
0157 46204 126000 JMP ENDIN,I YES
0158 46205 124556 JMP XEC1A,I NO
0159*
0160** PREPARE MATRIX ASSIGNMENT **
0161*
0162 46206 064556 EMAT1 LDB XEC1A SET MAIN LOOP TO
0163 46207 075364 STB MEXIT STATEMENT EXIT MODE
0164 46210 001000 ALS
0165 46211 041575 ADA SYMTB COMPUTE
0166 46212 040351 ADA *-1 POINTER
0167 46213 164000 LDB 0,I TO
0168 46214 044350 ADB *-2 DESTINATION
0169 46215 075574 STB BS1 MATRIX
0170 46216 035613 ISZ TEMP1
0171 46217 161613 LDA TEMP1,I MATRIX
0172 46220 002020 SSA FUNCTION?
0173 46221 026455 JMP EMAT6 YES
0174 46222 066004 LDB MLP2A NO, SET OPERATION
0175 46223 075340 EMAT2 STB MOP JUMP TO 'REPLACE' MODE
0176 46224 035613 ISZ TEMP1
0177 46225 010700 AND OPDMK SCALAR
0178 46226 002003 SZA,RSS MULTIPLICATION?

```

0179	46227	026445	JMP EMAT5	YES
0180	46230	001000	ALS	NO
0181	46231	041575	ADA SYMTB	COMPUTE
0182	46232	040351	ADA ,=1	POINTER
0183	46233	164000	LDB 0,I	TO FIRST
0184	46234	044350	ADB ,=2	SOURCE
0185	46235	075350	STB BS2	MATRIX
0186	46236	015472	JSB VCHK	VALIDATE ITS ELEMENTS
0187	46237	061613	LDA TEMP1	END OF
0188	46240	051334	CPA PRGCT	STATEMENT?
0189	46241	026277	JMP EMAT3	YES
0190	46242	161613	LDA TEMP1,I	NO
0191	46243	010700	AND OPDMK	COMPUTE
0192	46244	001000	ALS	
0193	46245	041575	ADA SYMTB	POINTER TO
0194	46246	040351	ADA ,=1	
0195	46247	164000	LDB 0,I	SECOND
0196	46250	044350	ADB ,=2	
0197	46251	075352	STB BS3	SOURCE MATRIX
0198	46252	015472	JSB VCHK	VALIDATE ITS ELEMENTS
0199	46253	161613	LDA TEMP1,I	
0200	46254	010664	AND OPMSK	MATRIX
0201	46255	050632	CPA MULOP	MULTIPLICATION?
0202	46256	026334	JMP EMAT4	YES
0203	46257	100106	RRL 6	NO
0204*				*
0205**	SET UP MATRIX ADD, SUBTRACT, OR REPLACE			**
0206*				*
0207	46260	066006	LDB MADD	RECORD
0208	46261	002020	SSA	'MATRIX ADD'
0209	46262	066007	LDB MSUBA	OR 'MATRIX SUBTRACT'
0210	46263	075340	STB MOP	OPERATION JUMP
0211	46264	065574	LDB BS1	
0212	46265	160001	LDA 1,I	ROW
0213	46266	151352	CPA BS3,I	COMPATIBILITY?
0214	46267	006005	INB,RSS	YES
0215	46270	115121	JSB RERRS+11,I	NO
0216	46271	035352	ISZ BS3	
0217	46272	164001	LDB 1,I	COLUMN
0218	46273	155352	CPB BS3,I	COMPATIBILITY?
0219	46274	002001	RSS	YES
0220	46275	115121	JSB RERRS+11,I	NO
0221	46276	035352	ISZ BS3	
0222	46277	161350	EMAT3 LDA BS2,I	ROW
0223	46300	151574	CPA BS1,I	COMPATIBILITY?
0224	46301	002001	RSS	YES
0225	46302	115121	JSB RERRS+11,I	NO
0226	46303	035350	ISZ BS2	
0227	46304	035574	ISZ BS1	COMPUTE NUMBER
0228	46305	100200	MPY BS2,I	OF MATRIX ELEMENTS
	46306	101350		
0229	46307	165350	LDB BS2,I	COLUMN
0230	46310	155574	CPB BS1,I	COMPATIBILITY?
0231	46311	003005	CMA,INA,RSS	YES
0232	46312	115121	JSB RERRS+11,I	NO

0233 46313 071500
0234 46314 035350
0235 46315 035574

STA MCNT
ISZ BS2
ISZ BS1

SAVE 218 COMPLEMENT OF SIZE

```

0237*
0238** ASSIGN MATRIX VALUE **
0239*
0240*
0241* MOP HOLDS A POINTER TO CODE WHICH COMPUTES ONE ELEMENT OF THE
0242* DESTINATION MATRIX AND RETURNS IT IN (A) AND (B). MEXIT
0243* HOLDS THE EXIT ADDRESS SET BY THE CALLER.
0244*
0245 46316 104200 MLOOP DLD BS2,I LOAD ELEMENT OF SOURCE MATRIX
      46317 101350
0246 46320 125340 JMP MOP,I JUMP TO OPERATION
0247 46321 035352 MLOP1 ISZ BS3 MOVE TO NEXT ELEMENT
0248 46322 035352 ISZ BS3 OF SECOND SOURCE MATRIX
0249 46323 035350 MLOP2 ISZ BS2 MOVE TO NEXT ELEMENT
0250 46324 035350 ISZ BS2 OF FIRST SOURCE MATRIX
0251 46325 104400 MLOP3 DST BS1,I RECORD ELEMENT
      46326 101574
0252 46327 035574 ISZ BS1 OF DESTINATION MATRIX
0253 46330 035574 ISZ BS1 AND MOVE TO NEXT ELEMENT
0254 46331 035500 ISZ MCNT DONE?
0255 46332 026316 JMP MLOOP NO
0256 46333 125364 JMP MEXIT,I YES
0257*
0258** COMPUTE MATRIX PRODUCT **
0259*
0260 46334 161574 EMAT4 LDA BS1,I DESTINATION MATRIX
0261 46335 151350 CPA BS2,I ROW COMPATIBILITY?
0262 46336 003005 CMA,INA,RSS YES
0263 46337 115121 JSB RERRS+11,I NO
0264 46340 071634 STA MMT0 SAVE ROW COUNTER
0265 46341 035574 ISZ BS1
0266 46342 035350 ISZ BS2
0267 46343 161350 LDA BS2,I INNER PRODUCT
0268 46344 151352 CPA BS3,I COMPATIBILITY?
0269 46345 003005 CMA,INA,RSS YES
0270 46346 115121 JSB RERRS+11,I NO
0271 46347 071635 STA MMT1 SAVE INNER PRODUCT
0272 46350 071636 STA MMT2 COUNTERS
0273 46351 001000 ALS SAVE ROW
0274 46352 071632 STA MMT6 BACK UP AMOUNT
0275 46353 100200 MPY BS1,I SAVE COLUMN
      46354 101574
0276 46355 040354 ADA .+2 BACK UP
0277 46356 071633 STA MMT7 AMOUNT
0278 46357 035352 ISZ BS3
0279 46360 161574 LDA BS1,I DESTINATION MATRIX
0280 46361 151352 CPA BS3,I COLUMN COMPATIBILITY?
0281 46362 003005 CMA,INA,RSS YES
0282 46363 115121 JSB RERRS+11,I NO
0283 46364 071637 STA MMT3 SAVE COLUMN
0284 46365 071640 STA MMT4 COUNTERS
0285 46366 003004 CMA,INA SAVE COLUMN
0286 46367 001000 ALS ADVANCE
0287 46370 071641 STA MMT5 AMOUNT
0288 46371 035574 ISZ BS1 MOVE TO

```

0289	46372	035350		ISZ BS2	FIRST ELEMENT
0290	46373	035352		ISZ BS3	OF MATRICES
0291	46374	065352		LDB BS3	SAVE FIRST-ELEMENT ADDRESS
0292	46375	075376		STB MMT8	OF SECOND SOURCE MATRIX
0293	46376	104200	MPR1	DLD F0,0	INITIALIZE DESTINATION
	46377	046016			
0294	46400	104400		DST BS1,I	ELEMENT TO ZERO
	46401	101574			
0295	46402	104200	MPR2	DLD BS2,I	COMPUTE
	46403	101350			
0296	46404	035350		ISZ BS2	TERM
0297	46405	035350		ISZ BS2	OF
0298	46406	015406		JSB .FMP	INNER
0299	46407	101352		DEF BS3,I	PRODUCT
0300	46410	015402		JSB .FAD	ADD IN PREVIOUS
0301	46411	101574		DEF BS1,I	RUNNING SUM
0302	46412	104400		DST BS1,I	SAVE RUNNING SUM
	46413	101574			
0303	46414	065352		LDB BS3	ADVANCE TO
0304	46415	045641		ADB MMT5	NEXT ROW OF
0305	46416	075352		STB BS3	SECOND SOURCE MATRIX
0306	46417	035636		ISZ MMT2	INNER PRODUCT COMPLETE?
0307	46420	026402		JMP MPR2	NO
0308	46421	035574		ISZ BS1	YES, MOVE TO NEXT
0309	46422	035574		ISZ BS1	DESTINATION ELEMENT
0310	46423	065635		LDB MMT1	RESET INNER PRODUCT
0311	46424	075636		STB MMT2	TERM COUNTER
0312	46425	035640		ISZ MMT4	ROW COMPLETE?
0313	46426	026434		JMP MPR3	NO
0314	46427	065637		LDB MMT3	YES, RESET
0315	46430	075640		STB MMT4	COLUMN COUNTER
0316	46431	035634		ISZ MMT0	DONE?
0317	46432	026442		JMP MPR4	NO
0318	46433	124556		JMP XEC1A,I	YES
0319	46434	065350	MPR3	LDB BS2	BACK UP
0320	46435	045632		ADB MMT6	TO BEGINNING OF ROW OF
0321	46436	075350		STB BS2	FIRST SOURCE MATRIX
0322	46437	065352		LDB BS3	BACK UP TO BEGINNING
0323	46440	045633		ADB MMT7	OF NEXT COLUMN
0324	46441	002001		RSS	OF SECOND SOURCE MATRIX
0325	46442	065376	MPR4	LDB MMT8	BACK UP TO FIRST ELEMENT
0326	46443	075352		STB BS3	
0327	46444	026376		JMP MPR1	
0328*					
0329**	SET UP SCALAR MULTIPLICATION				**
0330*					*
0331	46445	015356	EMAT5	JSB FE1CH	COMPUTE AND
0332	46446	104400		DST SCALR	SAVE SCALAR
	46447	001624			
0333	46450	035613		ISZ TEMP1	LOAD OPERATION JUMP
0334	46451	035613		ISZ TEMP1	PROCESS
0335	46452	161613		LDA TEMP1,I	FOLLOWING
0336	46453	066010		LDB SMULA	MATRIX
0337	46454	026223		JMP EMAT2	
0338*					

0339	46455	101104	EMAT6	RRR	4	COMPUTE
0340	46456	010411		AND	.,+37B	MATRIX
0341	46457	040323		ADA	.,-27B	FUNCTION
0342	46460	071516		STA	ID0	TYPE
0343	46461	002021		SSA,	RSS	MATRIX INITIALIZATION?
0344	46462	026521		JMP	EMAT8	NO
0345*						*
0346**	SET UP MATRIX INITIALIZATION					**
0347*						*
0348	46463	065613		LDB	TEMP1	
0349	46464	006004		INB		
0350	46465	055334		CPB	PRGCT	REDIMENSIONING?
0351	46466	002001		RSS		NO
0352	46467	015470		JSB	REDIM	YES
0353	46470	161574	INVL	LDA	BS1,I	COMPUTE
0354	46471	071362		STA	ID1	NUMBER
0355	46472	035574		ISZ	BS1	OF ELEMENTS
0356	46473	100200		MPY	BS1,I	IN 2'S
	46474	101574				
0357	46475	003004		CMA,	INA	COMPLEMENT
0358	46476	071500		STA	MCNT	SAVE IT
0359	46477	035516		ISZ	ID0	'IDN' ?
0360	46500	026512		JMP	EMAT7	NO
0361	46501	161574		LDA	BS1,I	YES
0362	46502	051362		CPA	ID1	SQUARE MATRIX?
0363	46503	003001		CMA,	RSS	YES
0364	46504	115136		JSB	RERRS+24,I	NO
0365	46505	071516		STA	ID0	SET
0366	46506	003400		CCA		DIAGONAL
0367	46507	071362		STA	ID1	COUNTER
0368	46510	062011		LDA	IDNA	LOAD OPERATION JUMP
0369	46511	026515		JMP	++4	
0370	46512	062005	EMAT7	LDA	MLP3A	RECORD
0371	46513	066020		LDB	F1,0A	CORRECT CONSTANT:
0372	46514	035516		ISZ	ID0	0.0 FOR 'ZER'
0373	46515	066015		LDB	F0,0A	1.0 FOR 'CON'
0374	46516	075350		STB	BS2	0.0 FOR 'IDN'
0375	46517	071340		STA	MOP	RECORD OPERATION JUMP
0376	46520	026315		JMP	MLOOP=1	
0377*						
0378	46521	035613	EMAT8	ISZ	TEMP1	COMPUTE
0379	46522	161613		LDA	TEMP1,I	
0380	46523	010700		AND	OPDMK	POINTER
0381	46524	001800		ALS		
0382	46525	041575		ADA	SYMTB	TO
0383	46526	040351		ADA	.,-1	
0384	46527	164000		LDB	0,I	SOURCE.
0385	46530	044350		ADB	.,-2	
0386	46531	075350		STB	BS2	MATRIX
0387	46532	015472		JSB	VCHK	VALIDATE IT
0388	46533	165574		LDB	BS1,I	LOAD DESTINATION ROW DIMENSION
0389	46534	005000		BLS		SAVE COLUMN
0390	46535	075637		STB	MMT3	ADVANCE AMOUNT
0391	46536	005100		BRS		
0392	46537	035574		ISZ	BS1	

0393	46540	161574		LDA BS1,I	ARE COLUMNS OF DESTINATION
0394	46541	151350		CPA BS2,I	AND ROWS OF SOURCE EQUAL?
0395	46542	003005		CMA,INA,RSS	YES
0396	46543	115121		JSB RERRS+11,I	NO
0397	46544	071635		STA MMT1	SAVE DESTINATION MATRIX
0398	46545	071636		STA MMT2	COLUMN COUNTERS
0399	46546	035350		ISZ BS2	ARE ROWS OF DESTINATION AND
0400	46547	155350		CPB BS2,I	COLUMNS OF SOURCE EQUAL?
0401	46550	007005		CMB,INB,RSS	YES
0402	46551	115121		JSB RERRS+11,I	NO
0403	46552	075634		STB MMT0	SAVE ROW COUNTER
0404	46553	100200		MPY MMT3	SAVE COLUMN BACK UP
	46554	001637			
0405	46555	035350		ISZ BS2	
0406	46556	065516		LDB ID0	
0407	46557	006003		SZB,RSS	'TRN' ?
0408	46560	026610		JMP INV	NO
0409	46561	040354		ADA .+2	YES, SAVE COLUMN
0410	46562	071640		STA MMT4	BACK UP AMOUNT
0411	46563	035574		ISZ BS1	FOR SOURCE MATRIX
0412	46564	026572		JMP TRN	
0413	46565	065635	TRN1	LDB MMT1	RESET
0414	46566	075636		STB MMT2	COUNTER
0415	46567	065350		LDB BS2	BACK UP TO
0416	46570	045640		ADB MMT4	FIRST ELEMENT
0417	46571	075350		STB BS2	OF NEXT COLUMN
0001*					*
0002**	TRANSPOSE A MATRIX			**	
0003*				*	
0004	46572	104200	TRN	DLD BS2,I	TRANSFER
	46573	101350			
0005	46574	104400		DST BS1,I	ELEMENT
	46575	101574			
0006	46576	035574		ISZ BS1	
0007	46577	035574		ISZ BS1	
0008	46600	065350		LDB BS2	ADVANCE TO
0009	46601	045637		ADB MMT3	NEXT ELEMENT
0010	46602	075350		STB BS2	OF COLUMN
0011	46603	035636		ISZ MMT2	COLUMN TRANSFERRED?
0012	46604	026572		JMP TRN	NO
0013	46605	035634		ISZ MMT0	YES, DONE?
0014	46606	026565		JMP TRN1	NO
0015	46607	124556		JMP XEC1A,I	YES
0016*				*	
0017**	INVERT A MATRIX			**	
0018*				*	
0019	46610	064000	INV	LDB 0	SAVE 2'S COMPLEMENT
0020	46611	001100		ARS	OF NUMBER OF
0021	46612	071500		STA MCNT	ELEMENTS IN MATRIX
0022	46613	061574		LDA BS1	SAVE ADDRESS OF
0023	46614	071352		STA BS3	DESTINATION MATRIX
0024	46615	061330		LDA TMPST	SET ADDRESS
0025	46616	040354		ADA .+2	OF FREE CORE
0026	46617	071574		STA BS1	AS BASE ADDRESS
0027	46620	003004		CMA,INA	SUFFICIENT

0028	46621	040462	ADA LWAUS	FREE CORE
0029	46622	040001	ADA 1	TO COPY
0030	46623	003021	CMA,SSA,RSS	SOURCE MATRIX?
0031	46624	115120	JSB RERRS+10,I	NO
0032	46625	040462	ADA LWAUS	YES, INCLUDE IT
0033	46626	070056	STA PBPTR	IN SWAP AREA
0034	46627	006400	CLB	SET 'MAXIMUM ELEMENT'
0035	46630	075626	STB MAXE	VALUE TO
0036	46631	075627	STB MAXE+1	ZERO
0037	46632	062012	LDA MCPYA	SET UP TO
0038	46633	071340	STA MOP	COPY MATRIX,
0039	46634	062637	LDA INV1	FIND MAXIMUM (ABSOLUTE
0040	46635	071364	STA MEXIT	VALUE) ELEMENT,
0041	46636	026316	JMP MLOOP	AND RETURN
0042	46637	046640	INV1 DEF ++1	
0043	46640	104200	DLB MAXE	COMPUTE
	46641	001626		
0044	46642	015406	JSB ,FMP	RELATIVE
0045	46643	046013	DEF TOLC	TOLERANCE
0046	46644	104400	DST TOL	
	46645	001630		
0047	46646	003400	CCA	
0048	46647	071516	STA ID0	RESTORE
0049	46650	041352	ADA BS3	DESTINATION
0050	46651	071574	STA BS1	BASE ADDRESS
0051	46652	003004	CMA,INA	COMPUTE DIFFERENCE
0052	46653	041330	ADA TMPST	BETWEEN BASE ADDRESSES
0053	46654	003004	CMA,INA	OF SOURCE (COPIED)
0054	46655	071352	STA BS3	AND DESTINATION
0055	46656	062661	LDA INV2	MATRICES
0056	46657	071364	STA MEXIT	SET DESTINATION MATRIX
0057	46660	026470	JMP INV1	TO IDENTITY AND RETURN
0058	46661	046662	INV2 DEF ++1	
0059	46662	065330	LDL TMPST	SAVE
0060	46663	044354	ADB ,+2	BASE ADDRESS
0061	46664	060001	LDA 1	OF SOURCE
0062	46665	075350	STB BS2	MATRIX
0063	46666	045352	ADB BS3	SAVE BASE ADDRESS OF
0064	46667	075574	STB BS1	DESTINATION MATRIX
0065	46670	006400	CLB	SET PIVOT ELEMENT
0066	46671	075516	STB ID0	BIAS TO ZERO
0067	46672	026703	JMP INV4	
0068	46673	061516	INV3 LDA ID0	SET BIAS
0069	46674	040350	ADA , -2	FOR NEXT
0070	46675	071516	STA ID0	PIVOT ELEMENT
0071	46676	061634	LDA MMT0	INITIALIZE COUNTER TO
0072	46677	071636	STA MMT2	2'S COMPLEMENT OF COLUMNS
0073	46700	061344	LDA PIVEL	UPDATE PIVOT
0074	46701	041637	ADA MMT3	ADDRESS
0075	46702	040354	ADA ,+2	TO NEXT
0076	46703	071344	INV4 STA PIVEL	DIAGONAL ELEMENT
0077	46704	071640	STA MMT4	INITIALIZE
0078	46705	006400	CLB	PIVOT ELEMENT
0079	46706	075626	STB MAXE	AS MAXIMUM
0080	46707	075627	STB MAXE+1	IN COLUMN

0081	46710	065635		LDB MMT1	SET COUNTER TO SEARCH
0082	46711	075641		STB MMT5	REMAINDER OF COLUMN
0083	46712	071632	INV5	STA MMT6	LOAD
0084	46713	104200		DLD MMT6,I	ELEMENT
	46714	101632			
0085	46715	002020		SSA	GET
0086	46716	015370		J9B ARINV	ABSOLUTE
0087	46717	104400		DST SCALR	VALUE
	46720	001624			
0088	46721	015404		J9B ,F9B	SUBTRACT
0089	46722	001626		DEF MAXE	PREVIOUS MAXIMUM
0090	46723	002002		SZA	RESULT
0091	46724	002020		SSA	POSITIVE?
0092	46725	026734		JMP INV6	NO
0093	46726	104200		DLD SCALR	YES, RECORD
	46727	001624			
0094	46730	104400		DST MAXE	NEW MAXIMUM
	46731	001626			
0095	46732	061632		LDA MMT6	AND ITS
0096	46733	071640		STA MMT4	LOCATION
0097	46734	061632	INV6	LDA MMT6	MOVE TO NEXT
0098	46735	041637		ADA MMT3	ELEMENT OF COLUMN
0099	46736	035641		ISZ MMT5	COLUMN DONE?
0100	46737	026712		JMP INV5	NO
0101	46740	065344		LDB PIVEL	YES
0102	46741	045516		ADB ID0	SET POINTERS
0103	46742	075633		STB MMT7	TO OLD
0104	46743	045352		ADB BS3	PIVOT ROWS OF
0105	46744	075641		STB MMT5	BOTH MATRICES
0106	46745	075362		STB ID1	
0107	46746	061640		LDA MMT4	NEED TO
0108	46747	051344		CPA PIVEL	SWAP ROWS?
0109	46750	027017		JMP INV8	NO
0110	46751	041516		ADA ID0	YES, SET POINTERS
0111	46752	071376		STA MMT8	TO NEW
0112	46753	041352		ADA BS3	PIVOT ROWS OF
0113	46754	071632		STA MMT6	BOTH MATRICES
0114	46755	104200	INV7	DLD MMT5,I	SWAP
	46756	101641			
0115	46757	104400		DST SCALR	
	46760	001624			
0116	46761	104200		DLD MMT6,I	ROW
	46762	101632			
0117	46763	104400		DST MMT5,I	
	46764	101641			
0118	46765	104200		DLD SCALR	ELEMENT
	46766	001624			
0119	46767	104400		DST MMT6,I	
	46770	101632			
0120	46771	104200		DLD MMT7,I	OF
	46772	101633			
0121	46773	104400		DST SCALR	
	46774	001624			
0122	46775	104200		DLD MMT8,I	EACH
	46776	101376			

0123	46777	104400		DST MMT7,I	
	47000	101633			
0124	47001	104200		DLD SCALR	MATRIX
	47002	001624			
0125	47003	104400		DST MMT8,I	
	47004	101376			
0126	47005	035641		ISZ MMT5	BUMP
0127	47006	035641		ISZ MMT5	
0128	47007	035632		ISZ MMT6	ALL
0129	47010	035632		ISZ MMT6	
0130	47011	035633		ISZ MMT7	FOUR
0131	47012	035633		ISZ MMT7	
0132	47013	035376		ISZ MMT8	POINTERS
0133	47014	035376		ISZ MMT8	
0134	47015	035636		ISZ MMT2	ROW SWAPPED?
0135	47016	026755		JMP INV7	NO
0136	47017	104200	INV8	DLD MAXE	YES
	47020	001626			
0137	47021	015404		JSB .FSB	PIVOT ELEMENT
0138	47022	001630		DEF TOL	SMALLER THAN
0139	47023	002020		SSA	TOLERANCE?
0140	47024	115140		JSB RERRS+26,I	YES
0141	47025	104200		DLD F1.0	NO
	47026	046021			
0142	47027	015410		JSB .FDV	COMPUTE
0143	47030	101344		DEF PIVEL,I	INVERSE OF
0144	47031	104400		DST MAXE	PIVOT ELEMENT
	47032	001626			
0145	47033	061635		LDA MMT1	LAST
0146	47034	002007		INA,SZA,RSS	PIVOT?
0147	47035	027053		JMP INV10	YES
0148	47036	071641		STA MMT5	NO, PREPARE
0149	47037	061344		LDA PIVEL	TO SCALE
0150	47040	071632		STA MMT6	PIVOT ROW
0151	47041	035632	INV9	ISZ MMT6	MOVE TO NEXT
0152	47042	035632		ISZ MMT6	ELEMENT OF ROW
0153	47043	104200		DLD MMT6,I	MULTIPLY
	47044	101632			
0154	47045	015406		JSB .FMP	BY 1/PIVOT
0155	47046	001626		DEF MAXE	AND STORE
0156	47047	104400		DST MMT6,I	NEW VALUE
	47050	101632			
0157	47051	035641		ISZ MMT5	ROW DONE?
0158	47052	027041		JMP INV9	NO
0159	47053	061362	INV10	LDA ID1	YES
0160	47054	071632		STA MMT6	
0161	47055	061634		LDA MMT0	SET
0162	47056	071636		STA MMT2	
0163	47057	071641		STA MMT5	COUNTERS
0164	47060	104200	INV11	DLD MMT6,I	SCALE ELEMENTS OF
	47061	101632			
0165	47062	002003		SZA,RSS	
0166	47063	027070		JMP INV12	PIVOT ROW
0167	47064	015406		JSB .FMP	
0168	47065	001626		DEF MAXE	OF DESTINATION

0169	47066	104400		DST MMT6,I	
	47067	101632			
0170	47070	035632	INV12	ISZ MMT6	MATRIX
0171	47071	035632		ISZ MMT6	
0172	47072	035641		ISZ MMT5	ROW DONE?
0173	47073	027060		JMP INV11	NO
0174	47074	065574		LDB BS1	YES, SET POINTER TO
0175	47075	075400		STB VT0	DESTINATION ARRAY
0176	47076	061350		LDA BS2	SET POINTER
0177	47077	003004		CMA,INA	TO PIVOT COLUMN
0178	47100	041516		ADA ID0	IN FIRST ROW
0179	47101	003004		CMA,INA	OF SOURCE
0180	47102	071376	INV13	STA MMT8	MATRIX
0181	47103	051344		CPA PIVEL	PIVOT ROW?
0182	47104	027206		JMP INV19	YES
0183	47105	071633		STA MMT7	NO
0184	47106	104200		DLA MMT7,I	LOAD MULTIPLIER FOR PIVOT ROW
	47107	101633			
0185	47110	002003		SZA,RSS	ZERO?
0186	47111	027206		JMP INV19	YES
0187	47112	104400		DST SCALR	NO, SAVE MULTIPLIER
	47113	001624			
0188	47114	061635		LDA MMT1	LAST
0189	47115	002007		INA,SZA,RSS	ROW?
0190	47116	027144		JMP INV15	YES
0191	47117	071641		STA MMT5	NO, SET POINTER TO
0192	47120	061344		LDA PIVEL	PIVOT ELEMENT IN
0193	47121	071632		STA MMT6	SOURCE MATRIX
0194	47122	035632	INV14	ISZ MMT6	MOVE
0195	47123	035632		ISZ MMT6	TO
0196	47124	035633		ISZ MMT7	NEXT
0197	47125	035633		ISZ MMT7	COLUMN
0198	47126	104200		DLA SCALR	COMPUTE
	47127	001624			
0199	47130	015406		JSB ,FMP	
0200	47131	101632		DEF MMT6,I	
0201	47132	104400		DST MAXE	TRANSFORMED
	47133	001626			
0202	47134	104200		DLA MMT7,I	
	47135	101633			
0203	47136	015404		JSB ,F8B	
0204	47137	001626		DEF MAXE	ELEMENT
0205	47140	104400		DST MMT7,I	
	47141	101633			
0206	47142	035641		ISZ MMT5	ROW DONE?
0207	47143	027122		JMP INV14	NO
0208	47144	061362	INV15	LDA ID1	YES, SET POINTER TO PIVOT
0209	47145	071632		STA MMT6	ROW OF DESTINATION MATRIX
0210	47146	061634		LDA MMT0	SET
0211	47147	071640		STA MMT4	COUNTER
0212	47150	104200	INV16	DLA MMT6,I	COMPUTE
	47151	101632			
0213	47152	002003		SZA,RSS	
0214	47153	027166		JMP INV17	
0215	47154	015406		JSB ,FMP	

0216	47155	001624		DEF SCALR	TRANSFORMED
0217	47156	104400		DST MAXE	
	47157	001626			
0218	47160	104200		DLD VT0,I	
	47161	101400			
0219	47162	015404		JSB .FSB	
0220	47163	001626		DEF MAXE	ELEMENT
0221	47164	104400		DST VT0,I	
	47165	101400			
0222	47166	035400	INV17	ISZ VT0	MOVE
0223	47167	035400		ISZ VT0	TO
0224	47170	035632		ISZ MMT6	NEXT
0225	47171	035632		ISZ MMT6	COLUMN
0226	47172	035640		ISZ MMT4	ROW DONE?
0227	47173	027150		JMP INV16	NO
0228	47174	061376	INV18	LDA MMT8	YES, MOVE TO NEXT
0229	47175	041637		ADA MMT3	ROW IN SOURCE MATRIX
0230	47176	035636		ISZ MMT2	ALL ROWS TRANSFORMED?
0231	47177	027102		JMP INV13	NO
0232	47200	035635		ISZ MMT1	YES, MATRIX INVERTED?
0233	47201	026673		JMP INV3	NO
0234	47202	061330		LDA TMPST	YES
0235	47203	040401		ADA .+23	RELEASE EXTRA
0236	47204	070056		STA PBPTR	CORE
0237	47205	124556		JMP XEC1A,I	
0238	47206	061400	INV19	LDA VT0	ADVANCE TO
0239	47207	041637		ADA MMT3	NEXT ROW OF
0240	47210	071400		STA VT0	DESTINATION
0241	47211	027174		JMP INV18	MATRIX
0242*					
0243**	CODE TO COMPUTE AN ELEMENT				**
0244*					*
0245	47212	015402	MADD	JSB .FAD	ADD
0246	47213	101352		DEF BS3,I	SOURCE
0247	47214	026321		JMP MLOP1	ELEMENTS
0248*					
0249	47215	015404	MSUB	JSB .FSB	SUBTRACT
0250	47216	101352		DEF BS3,I	SOURCE
0251	47217	026321		JMP MLOP1	ELEMENTS
0252*					
0253	47220	035362	IDN	ISZ ID1	DIAGONAL ELEMENT?
0254	47221	026325		JMP MLOP3	NO
0255	47222	061516		LDA ID0	YES, RESET
0256	47223	071362		STA ID1	DIAGONAL COUNTER
0257	47224	104200		DLD F1.0	LOAD
	47225	046021			
0258	47226	026325		JMP MLOP3	1.0
0259*					
0260	47227	015406	SMULT	JSB .FMP	MULTIPLY
0261	47230	001624		DEF SCALR	SOURCE ELEMENT
0262	47231	026323		JMP MLOP2	BY SCALAR
0263*					
0264	47232	002020	MCPY	SSA	GET
0265	47233	015370		JSB ARINV	ABSOLUTE
0266	47234	104400		DST SCALR	VALUE

0267	47235	001624			
0267	47236	015404	JSB	,F9B	SUBTRACT
0268	47237	001626	DEF	MAXE	PREVIOUS
0269	47240	002002	SZA		MAXIMUM
0270	47241	002020	SSA		POSITIVE RESULT?
0271	47242	027247	JMP	MCPY1	NO
0272	47243	104200	DLD	SCALR	YES, RECORD
	47244	001624			
0273	47245	104400	DST	MAXE	NEW MAXIMUM
	47246	001626			
0274	47247	104200	MCPY1	DLD B92,I	RELOAD VALUE
	47250	101350			
0275	47251	126004	JMP	MLP2A,I	
0276**					**
0277***	CHECK	VALIDITY	OF	MATRIX	***
0278**					**
0279*					*
0280*	ENTER	WITH	(B)	POINTING	TO
0281*	COMPUTE	THE	NUMBER	OF	ELEMENTS
0282*	AND	CHECK	EACH	ONE,	EXIT
0283*	TO	ERROR	IF	ANY	ELEMENT
	HAS	VALUE	'UNDEFINED'.		
0284	47252	160001	#VCHK	LDA 1,I	LOAD ROW DIMENSION
0285	47253	006004		INB	
0286	47254	075400		STB VT0	
0287	47255	100200		Mpy VT0,I	MULTIPLY BY
	47256	101400			
0288	47257	065400	LDB	VT0	COLUMN DIMENSION
0289	47260	003000	CMA		SAVE 1'S COMPLEMENT
0290	47261	071400	STA	VT0	OF MATRIX SIZE
0291	47262	035400	VCHK1	ISZ VT0	DONE?
0292	47263	006005		INB,RSS	NO, MOVE TO NEXT ELEMENT
0293	47264	125472		JMP VCHK,I	YES
0294	47265	160001		LDA 1,I	
0295	47266	001222		RAL,RAL	IS
0296	47267	002004		INA	OPERAND
0297	47270	001310		RAR,SLA	NORMALIZED?
0298	47271	027301		JMP VCHK2	YES
0299	47272	051036		CPA BIT15	MAYBE, WAS FIRST WORD ZERO?
0300	47273	006005		INB,RSS	YES
0301	47274	115135		JSB RERRS+23,I	NO==ERROR
0302	47275	160001		LDA 1,I	SECOND
0303	47276	002002		SZA	WORD ZERO?
0304	47277	115135		JSB RERRS+23,I	NO==ERROR
0305	47300	027262		JMP VCHK1	
0306	47301	006004	VCHK2	INB	
0307	47302	027262		JMP VCHK1	

```

0309**
0310*** REDIMENSION A MATRIX ***
0311**
0312*
0313* UPON ENTRY (TEMP1)+1 POINTS TO THE REDIMENSION SUBSCRIPT IN
0314* THE PROGRAM AND SBPTR POINTS TO THE CURRENT DYNAMIC DIMENSIONS
0315* OF THE ARRAY. THE SUBSCRIPT BOUNDS ARE EVALUATED, ROUNDED,
0316* AND RECORDED. IF THE NUMBER OF ELEMENTS IS WITHIN THE
0317* PHYSICAL ARRAY ALLOWANCE, EXIT WITH TEMP1 POINTING TO THE
0318* WORD FOLLOWING THE SUBSCRIPT AND SBPTR AS UPON ENTRY, ELSE
0319* EXIT TO ERROR.
0320*
0321 47303 035613 #RDIM ISZ TEMP1 COMPUTE NEW
0322 47304 015356 JSB FETCH ROW DIMENSION
0323 47305 015342 JSB SBFIX 15 BIT INTEGER > 0?
0324 47306 115127 JSB RERRS+17,I NO
0325 47307 006004 INB YES, SAVE
0326 47310 175574 STB SBPTR,I TRUE VALUE
0327 47311 075472 STB RD0 IN ARRAY
0328 47312 035574 ISZ SBPTR ENTRY
0329 47313 165613 LDB TEMP1,I EXPLICIT NEW
0330 47314 006003 SZB,RSS COLUMN DIMENSION?
0331 47315 027321 JMP RDIM1 NO
0332 47316 015356 JSB FETCH YES,
0333 47317 015342 JSB SBFIX COMPUTE
0334 47320 115127 JSB RERRS+17,I IT
0335 47321 006004 RDIM1 INB SAVE TRUE VALUE
0336 47322 175574 STB SBPTR,I IN ARRAY ENTRY
0337 47323 061472 LDA RD0 COMPUTE
0338 47324 100200 MPY SBPTR,I NUMBER OF
0339 47325 101574
0339 47326 006003 SZB,RSS ELEMENTS
0340 47327 003025 CMA,SSA,INA,RSS SPECIFIED
0341 47330 115137 JSB RERRS+25,I TOO MANY
0342 47331 071472 STA RD0
0343 47332 065574 LDB SBPTR RESET
0344 47333 044347 ADB .-3 ARRAY POINTER
0345 47334 160001 LDA 1,I AND COMPUTE
0346 47335 006004 INB NUMBER OF
0347 47336 075574 STB SBPTR ELEMENTS
0348 47337 100200 MPY SBPTR,I AVAILABLE
0349 47340 101574
0349 47341 035574 ISZ SBPTR FOR ARRAY
0350 47342 041472 ADA RD0 SUFFICIENT
0351 47343 002020 SSA PHYSICAL SPACE?
0352 47344 115137 JSB RERRS+25,I NO
0353 47345 035613 ISZ TEMP1 YES
0354 47346 125470 JMP REDIM,I

```

```

0002 50000          ORG 500000
0003 50000 174000  HMASK OCT 174000
0004 50001 052467  LCALL DEF LIS10=1
0005 50002 001616  NMBFA DEF NUMBF
0006 50003 000112  ,74  DEC 74
0007 50004 000113  ,75  DEC 75
0008 50005 177670  MM72  DEC =72
0009 50006 177666  MM74  DEC =74
0010 50007 176030  M1000 DEC =1000
0011**              **
0012*** PRINT A NUMBER ***
0013**              **
0014*
0015* ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B), PRINT THE
0016* NUMBER AND APPEND BLANKS TO REACH THE PRINT POSITION SPECIFIED
0017* BY =EOPF ON RETURN FROM NUMOT,
0018*
0019 50010 002300  #ENOT CCE          ENABLE SIGN
0020 50011 015422          JSB NUMOT          OUTPUT NUMBER
0021 50012 026015          JMP ++3
0022 50013 060412          LDA ,+40B          OUTPUT
0023 50014 015454          JSB OUTCR          A BLANK
0024 50015 065460          LDB EOPF          FIELD
0025 50016 045572          ADB CHRCT
0026 50017 006002          SZB          FULL?
0027 50020 026013          JMP +-5          NO
0028 50021 125420          JMP ENOUT,I      YES
0029*
0030 50022 114631  MINFX DEC =0,099999959
0031 50023 116373
0031 50024 102756  MAXFX DEC =999999,5
0031 50025 002050
0032**              **
0033*** OUTPUT A NUMBER ***
0034**              **
0035*
0036* ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B) AND (E) = 1
0037* IF A SIGN IS WANTED. DETERMINE THE FORM OF THE NUMBER AND
0038* SET EOPF ACCORDINGLY. NON-INTEGERS ARE ROUNDED AFTER CONVERSION
0039* TO DECIMAL. TRAILING ZEROS ARE SUPPRESSED ON NUMBERS WITHOUT
0040* EXPONENTS (AND ON NUMBERS WITH EXPONENTS IF CALLED FROM 'LIST').
0041*
0042 50026 071616  #NMOT STA NUMBF          SAVE HIGH MANTISSA
0043 50027 002041          SEZ,RSS          SIGN?
0044 50030 026042          JMP NUM01          NO
0045 50031 002021          SSA,RSS          YES, NEGATIVE NUMBER?
0046 50032 026037          JMP ++5          NO
0047 50033 015370          JSB ARINV          YES, NEGATE NUMBER
0048 50034 071616          STA NUMBF          SAVE HIGH MANTISSA
0049 50035 060427          LDA ,+55B          LOAD '!'
0050 50036 002001          RSS
0051 50037 060412          LDA ,+40B          LOAD '!'
0052 50040 071266          STA SIGN          SAVE SIGN
0053 50041 061616          LDA NUMBF          RETRIEVE HIGH MANTISSA
0054 50042 075617  NUM01 STB NUMBF+1  SAVE LOW MANTISSA

```

0055	50043	015416		JSB IFIX	INTEGER?
0056	50044	026070		JMP NUM02	NO
0057	50045	102201		SOC	YES, 16-BIT INTEGER?
0058	50046	026070		JMP NUM02	NO
0059*				*	
0060**				**	
					OUTPUT AN INTEGER
0061*				*	
0062	50047	075616		STB NUMBF	SAVE INTEGER
0063	50050	046007		ADB M1000	
0064	50051	060360		LDA ,+6	
0065	50052	006021		SSB,RSS	3 DIGIT INTEGER?
0066	50053	040355		ADA ,+3	NO
0067	50054	041572		ADA CHRCT	COMPUTE END-OF-FIELD
0068	50055	003004		CMA,INA	SAVE
0069	50056	071460		STA EOPF	IT
0070	50057	042003		ADA ,74	ENOUGH
0071	50060	002020		SSA	ROOM?
0072	50061	015426		JSB OUTLN	NO
0073	50062	061266		LDA SIGN	YES
0074	50063	002002		SZA	SIGN?
0075	50064	015454		JSB OUTCR	YES, OUTPUT IT
0076	50065	065616		LDB NUMBF	NO
0077	50066	015456		JSB OUTIN	OUTPUT THE INTEGER
0078	50067	125422		JMP NUM02,I	
0079*				*	
0080**				**	
					OUTPUT A FLOATING POINT NUMBER
0081*				*	
0082	50070	060350	NUM02	LDA ,+2	SET 'FIXED'
0083	50071	071336		STA FFLAG	FLAG FALSE
0084	50072	104200		OLD NUMBF	LOAD NUMBER
	50073	001616			
0085	50074	015402		JSB ,FAD	IS NUMBER
0086	50075	050024		DEF MAXFX	LESS THAN
0087	50076	002021		SSA,RSS	999999.5 ?
0088	50077	026106		JMP NUM03	NO
0089	50100	104200		OLD NUMBF	YES, IS
	50101	001616			
0090	50102	015402		JSB ,FAD	NUMBER
0091	50103	050022		DEF MINFX	LESS THAN
0092	50104	002021		SSA,RSS	0.99999995 ?
0093	50105	035336		ISZ FFLAG	NO, SET 'FIXED' FLAG TRUE
0094	50106	104200	NUM03	OLD NUMBF	LOAD NUMBER
	50107	001616			
0095	50110	071316		STA MANT1	UNPACK
0096	50111	015414		JSB ,FLUN	
0097	50112	075320		STB MANT2	NUMBER
0098	50113	071322		STA EXP	
0099	50114	002400		CLA	INITIALIZE
0100	50115	071324		STA EXPON	DECIMAL EXPONENT
0101	50116	051322		CPA EXP	ZERO EXPONENT?
0102	50117	026141		JMP NUM05	YES
0103	50120	015300	NUM00	JSB MBY10	NO
0104	50121	061322		LDA EXP	MULTIPLY
0105	50122	003026		CMA,SSA,INA,SZA	NUMBER BY 10
0106	50123	026126		JMP **+3	UNTIL IT IS

0107	50124	035324	ISZ	EXPON	GREATER
0108	50125	026120	JMP	NUM00	THAN 1
0109	50126	015302	JSB	DBY10	DIVIDE BY 10
0110	50127	061324	LDA	EXPON	
0111	50130	065322	NUM04	LDB	EXP
0112	50131	007004		CMB, INB	DIVIDE
0113	50132	006021		SSB, RSS	NUMBER
0114	50133	026141	JMP	NUM05	BY 10
0115	50134	071324	STA	EXPON	UNTIL
0116	50135	015302	JSB	DBY10	IT IS
0117	50136	003400	CCA		LESS
0118	50137	041324	ADA	EXPON	THAN
0119	50140	026130	JMP	NUM04	1
0120	50141	003000	NUM05	CMA	SET EXPONENT
0121	50142	071324	STA	EXPON	TO TRUE VALUE-1
0122	50143	064344	LDB	.=6	SET DIGIT
0123	50144	075356	STB	DIGCT	COUNTER
0124	50145	066002	LDB	NMBFA	SET BUFFER
0125	50146	075362	STB	NMPTR	POINTER
0126*					
0127**	CONVERT MANTISSA TO ASCII		**		
0128*			*		
0129	50147	015424	NUM06	JSB	GETDG
0130	50150	040432	ADA	.+60B	STORE A
0131	50151	171362	STA	NMPTR, I	DECIMAL
0132	50152	035362	ISZ	NMPTR	DIGIT
0133	50153	035356	ISZ	DIGCT	SIXTH DIGIT?
0134	50154	026147	JMP	NUM06	NO
0135	50155	015424	JSB	GETDG	YES,
0136	50156	040345	ADA	.=5	NEXT DIGIT
0137	50157	002020	SSA		>= 5 ?
0138	50160	026201	JMP	NUM09+1	NO
0139*			*		
0140**	ROUND ASCII MANTISSA		**		
0141*			*		
0142	50161	065362	LDB	NMPTR	
0143	50162	044351	NUM07	ADB	.=1
0144	50163	160001	LDA	1, I	LOAD LAST
0145	50164	002004	INA		DIGIT
0146	50165	050436	CPA	.5B	INCREMENT IT
0147	50166	002001	RSS		WAS IT A 9?
0148	50167	026200	JMP	NUM09	YES
0149	50170	056002	CPB	NMBFA	NO
0150	50171	026175	JMP	NUM08	LEADING DIGIT?
0151	50172	060432	LDA	.+60B	YES
0152	50173	170001	STA	1, I	NO, OVERLAY
0153	50174	026162	JMP	NUM07	A 0
0154	50175	035324	NUM08	ISZ	EXPON
0155	50176	000000	NOP		BUMP DECIMAL
0156	50177	060433	LDA	.+61B	EXPONENT AND
0157	50200	170001	NUM09	STA	1, I
0158	50201	061324	LDA	EXPON	OVERLAY A 1
0159	50202	002021	SSA, RSS		IS NUMBER
0160	50203	026221	JMP	NM011	LESS THAN 1 ?
0161	50204	071360	STA	NMTMP	NO
					YES

0162	50205	060432		LDA	,+60B	
0163	50206	065362		LDB	NMPTR	
0164	50207	035360	NM010	ISZ	NMTMP	COUNT ZEROS
0165	50210	000000		NOP		PLUS 1
0166	50211	044351		ADB	,-1	LAST
0167	50212	150001		CPA	1,I	DIGIT 0?
0168	50213	026207		JMP	NM010	YES
0169	50214	061360		LDA	NMTMP	NO, ALL SIGNIFICANCE
0170	50215	002020		SSA		IN SIX DIGITS?
0171	50216	026221		JMP	NM011	NO
0172	50217	003400		CCA		YES, SET
0173	50220	071336		STA	FFLAG	'FIXED' FLAG TRUE
0174	50221	064366	NM011	LDB	,+12	COMPUTE
0175	50222	035336		ISZ	FFLAG	FIELD
0176	50223	044355		ADB	,+3	WIDTH
0177	50224	045572		ADB	CHRCT	SAVE
0178	50225	007004		CMB,	INB	END-OF-FIELD
0179	50226	075460		STB	EOPF	MARKER
0180	50227	046004		ADB	,75	ENOUGH
0181	50230	006020		SSB		ROOM?
0182	50231	015426		JSB	OUTLN	NO
0183	50232	061266		LDA	SIGN	YES
0184	50233	002002		SZA		SIGN?
0185	50234	015454		JSB	OUTCR	YES, OUTPUT IT
0186	50235	064343		LDB	,-7	SET OUTPUT
0187	50236	075356		STB	DIGCT	DIGIT COUNTER
0188	50237	065362		LDB	NMPTR	
0189	50240	003400		CCA		FIXED
0190	50241	051336		CPA	FFLAG	FORMAT?
0191	50242	026247		JMP	++5	NO
0192	50243	061324		LDA	EXPON	YES, SET
0193	50244	003000		CMA		INDICATOR TO
0194	50245	071360		STA	NMTMP	DECIMAL POINT
0195	50246	026261		JMP	NM016	
0196	50247	071360		STA	NMTMP	SET INDICATOR FOR DECIMAL POINT
0197	50250	062001		LDA	LCALL	CALLED
0198	50251	051422		CPA	NUMOT	FROM 'LIST' ?
0199	50252	026261		JMP	NM016	YES
0200	50253	026303		JMP	NM014	NO
0201*					*	
0202**					**	
0203*					*	
0204	50254	061356	NM012	LDA	DIGCT	AT RIGHT OF
0205	50255	002004		INA		DECIMAL
0206	50256	051360		CPA	NMTMP	POINT?
0207	50257	026265		JMP	++6	NO
0208	50260	071356		STA	DIGCT	YES, DELETE ZERO
0209	50261	044351	NM016	ADB	,-1	LAST
0210	50262	160001		LDA	1,I	DIGIT
0211	50263	050432		CPA	,+60B	0?
0212	50264	026254		JMP	NM012	YES
0213	50265	003400		CCA		NO, FIXED
0214	50266	051336		CPA	FFLAG	FORMAT?
0215	50267	026303		JMP	NM014	NO
0216	50270	061324		LDA	EXPON	YES, LEADING

0217	50271	002021	SSA, RSS	DECIMAL POINT?
0218	50272	026303	JMP NM014	NO
0219	50273	071360	STA NMTMP	YES, SET LEADING ZEROS COUNTER
0220*			*	
0221**	OUTPUT MANTISSA	**		
0222*			*	
0223	50274	060430	LDA .+56B	OUTPUT A
0224	50275	002001	RSS	DECIMAL POINT
0225	50276	060432	NM013 LDA .+60B	OUTPUT
0226	50277	015454	JSB OUTCR	A ZERO
0227	50300	035360	ISZ NMTMP	MORE LEADING ZEROS?
0228	50301	026276	JMP NM013	YES
0229	50302	035356	ISZ DIGCT	NO, COUNT DECIMAL POINT
0230	50303	066002	NM014 LDB NMBFA	SET
0231	50304	075362	STB NMPTR	DIGIT POINTER
0232	50305	026312	JMP **5	
0233	50306	035360	NM015 ISZ NMTMP	DECIMAL POINT NEXT?
0234	50307	026312	JMP **3	NO
0235	50310	060430	LDA .+56B	YES, LOAD IT
0236	50311	026314	JMP **3	
0237	50312	161362	LDA NMPTR, I	LOAD NEXT
0238	50313	035362	ISZ NMPTR	DIGIT
0239	50314	015454	JSB OUTCR	OUTPUT CHARACTER
0240	50315	035356	ISZ DIGCT	MORE DIGITS?
0241	50316	026306	JMP NM015	YES
0242	50317	035336	ISZ FFLAG	NO, EXPONENT?
0243	50320	125422	JMP NUMOT, I	NO
0244*			*	
0245**	OUTPUT THE EXPONENT	**		
0246*			*	
0247	50321	060720	LDA E	
0248	50322	015454	JSB OUTCR	OUTPUT AN 'E'
0249	50323	060427	LDA .+55B	OUTPUT
0250	50324	065324	LDB EXPON	
0251	50325	006020	SSB	AN
0252	50326	007005	CMB, INB, RSS	
0253	50327	060425	LDA .+53B	EXPONENT
0254	50330	075324	STB EXPON	
0255	50331	015454	JSB OUTCR	SIGN
0256	50332	061324	LDA EXPON	
0257	50333	006400	CLB	COMPUTE
0258	50334	100400	DIV .+10	
	50335	000364		
0259	50336	040432	ADA .+60B	EXPONENT'S
0260	50337	044432	ADB .+60B	
0261	50340	075324	STB EXPON	10'S DIGIT
0262	50341	015454	JSB OUTCR	OUTPUT IT
0263	50342	061324	LDA EXPON	OUTPUT
0264	50343	015454	JSB OUTCR	1'S DIGIT
0265	50344	125422	JMP NUMOT, I	
0266**			**	
0267***	GET DIGIT TO OUTPUT	***		
0268**			**	
0269*			*	
0270*	COMPUTE NEXT DECIMAL DIGIT AND RETURN WITH IT IN (A).			

0271*					SUBTRACT IT OUT OF THE NUMBER.	
0272*						
0273	50345	015300	#GT0G	JSB	MBY10	MULTIPLY BY 10
0274	50346	065322		LDB	EXP	GET EXPONENT IN (B)
0275	50347	007004		CMB,	INB	AS NEGATIVE
0276	50350	012000		AND	HMASK	RETAIN HIGH 5 BITS
0277	50351	001200		RAL		NORMALIZE TO BIT 15
0278	50352	006024		SSB,	INB	ROTATE INTEGER
0279	50353	026351		JMP	*=2	INTO (A)
0280	50354	010443		AND	B377	EXTRACT
0281	50355	071402		STA	FD0	DIGIT
0282	50356	065322		LDB	EXP	ROTATE
0283	50357	007004		CMB,	INB	
0284	50360	001300		RAR		BACK
0285	50361	006024		SSB,	INB	
0286	50362	026360		JMP	*=2	
0287	50363	021316		XOR	MANT1	REMOVE
0288	50364	065320		LDB	MANT2	DIGIT
0289	50365	015304		JSB	NORML	NORMALIZE REMAINDER
0290	50366	061402		LDA	FD0	LOAD (A) WITH DIGIT
0291	50367	125424		JMP	GET0G,I	

```

0293**
0294*** OUTPUT AN INTEGER ***
0295**
0296*
0297* ENTER WITH A POSITIVE INTEGER IN (B). OUTPUT IT WITHOUT
0298* LEADING ZEROS,
0299*
0300 50370 060346 #OTIN LDA ,=4 SET DIGIT
0301 50371 071374 STA DGCNT COUNTER
0302 50372 061024 LDA LDVSR SET DIVISOR
0303 50373 071446 STA OT1 ADDRESS
0304 50374 002400 CLA SUPPRESS
0305 50375 071470 STA OT4 ZEROS
0306 50376 101040 OUTI1 LSR 16 DIVIDE INTEGER BY
0307 50377 100400 DIV OT1,I CURRENT DIVISOR
      50400 101446
0308 50401 075452 STB OT3 SAVE THE REMAINDER
0309 50402 051470 CPA OT4 LEADING ZERO?
0310 50403 026407 JMP OUTI2 YES
0311 50404 040432 ADA ,+600 NO, TURN OFF
0312 50405 071470 STA OT4 ZERO SUPPRESS
0313 50406 015454 JSB OUTCR OUTPUT DIGIT
0314 50407 065452 OUTI2 LDB OT3 RETRIEVE REMAINDER
0315 50410 035446 ISZ OT1 SET FOR NEXT DIVISOR
0316 50411 035374 ISZ DGCNT ALL DIVISORS USED?
0317 50412 026376 JMP OUTI1 NO
0318 50413 060001 LDA 1 YES
0319 50414 040432 ADA ,+600 OUTPUT
0320 50415 015454 JSB OUTCR LAST DIGIT
0321 50416 125456 JMP OUTIN,I
0322**
0323*** SPACE FOR A COMMA ***
0324**
0325*
0326* MOVE TO THE NEXT FIELD OF 15 ON THE PRINT LINE OR TO THE
0327* NEXT LINE IF THE CURRENT ONE IS EXHAUSTED,
0328*
0329 50417 065572 #EDLM LDB CHRCT LOAD CURRENT CHARACTER COUNT
0330 50420 006003 SZB,RSS ZERO?
0331 50421 125430 JMP EDELM,I YES, AT START OF ZONE
0332 50422 044333 ADB ,=15 NO, SUBTRACT ZONE WIDTH
0333 50423 006021 SSB,RSS NON-NEGATIVE RESULT?
0334 50424 026420 JMP #EDLM+1 YES
0335 50425 075472 STB EOL NO, SAVE COUNT
0336 50426 060412 LDA ,+400 OUTPUT
0337 50427 015454 JSB OUTCR A BLANK
0338 50430 035472 ISZ EOL ZONE FULL?
0339 50431 026426 JMP *-3 NO
0340 50432 065572 LDB CHRCT YES,
0341 50433 046006 ADB MM74 PAST THE
0342 50434 006021 SSB,RSS END OF LINE?
0343 50435 015426 JSB OUTLN YES
0344 50436 125430 JMP EDELM,I NO

```

```

0346**
0347*** OUTPUT AN END-OF-LINE ***
0348**
0349 50437 065460 #OTLN LDB EOPF      RESET
0350 50440 045572      ADB CHRCT      END-OF-FIELD
0351 50441 075460      STB EOPF      MARKER
0352 50442 060375      LDA .+23B      OUTPUT
0353 50443 015454      JSB OUTCR      AN X-OFF
0354 50444 060367      LDA .+15B      OUTPUT A
0355 50445 015454      JSB OUTCR      CARRIAGE RETURN
0356 50446 060364      LDA .+12B      AND A
0357 50447 015454      JSB OUTCR      LINE FEED
0358 50450 125426      JMP OUTLN,I
0359**
0360*** OUTPUT A CHARACTER ***
0361**
0362*
0363* OUTPUT THE CHARACTER IN (A). NON-PRINTING CHARACTERS DO NOT
0364* COUNT AGAINST THE 72 CHARACTERS PER LINE, A CARRIAGE RETURN
0365* (CONTROL O) IN A STRING OR AN END-OF-LINE, FOR EXAMPLE)
0366* RESETS THE PRINT POSITION TO 0.
0367*
0368 50451 071310 #OTCR STA OCTMP      SAVE CHARACTER
0369 50452 050441      CPA B177      CHECK FOR
0370 50453 026457      JMP OTCRA      RUBOUT
0371 50454 010730      AND .140      NON-PRINTING
0372 50455 002002      SZA          CHARACTER?
0373 50456 035572      ISZ CHRCT      NO, COUNT IT
0374 50457          OTCRA EQU *
0375 50457 006400      CLB
0376 50460 061310      LDA OCTMP      RETRIEVE CHARACTER
0377 50461 050367      CPA .+15B      CARRIAGE RETURN?
0378 50462 075572      STB CHRCT      YES, ZERO CHARACTER COUNT
0379 50463 064273      LDB MLINK+1
0380 50464 044335      ADB .-7LINK
0381 50465 114576      JSB OUTCH,I
0382 50466 125454      JMP OUTCR,I
0383**
0384*** BACKSPACE IN BUFFER ***
0385**
0386*
0387* BACKSPACE IN BUFFER
0388*
0389 50467 060257 #BKSP LDA MAIN      TELL 2114
0390 50470 002004      INA
0391 50471 160000      LDA 0,I      TO BACKSPACE
0392 50472 030251      IOR BKS
0393 50473 114500      JSB S14LP,I      IN BUFFER
0394 50474 125452      JMP BCKSP,I

```

```

0396**
0397***  FETCH NEXT BUFFER CHARACTER ***
0398**
0399*
0400*  THE NEXT CHARACTER FROM THE INPUT BUFFER IS FETCHED. NORMAL
0401*  EXIT IS TO (P+2) WITH THE CHARACTER IN (A). BLANKS ARE SKIPPED
0402*  IF !BLANK! = 40 OCTAL, A !CARRIAGE RETURN! EXITS TO (P+1)
0403  50475 060222 #GTCR LDA GTC      LOAD OPCODE
0404  50476 064257          LDB MAIN      FOR GET CHARACTER
0405  50477 006004          INB          => TTY #
0406  50500 130001          IOR 1,I      TTY # IN BITS 12-8
0407  50501 006400          CLB          BLOCK
0408  50502 174634          STB DCLC1,I   CLOCK
0409  50503 114500          JSB S14SC,I  CALL 2114 DRIVER
0410  50504 102311          SFS CH2     WAIT FOR
0411  50505 026504          JMP *+1    RESPONSE
0412  50506 102511          LIA CH2    LOAD CHARACTER
0413  50507 164640          LDB DCLC2,I UNBLOCK
0414  50510 174634          STB DCLC1,I  CLOCK
0415  50511 051573          CPA BLANK  BLANK?
0416  50512 026475          JMP #GTCR  YES==IGNORE IT
0417  50513 050367          CPA .+15B NO, CARRIAGE RETURN?
0418  50514 125450          JMP GETCR,I YES
0419  50515 064000          LDB 0      COPY CHAR TO B
0420  50516 040766          ADA M96
0421  50517 002021          SSA,R9S   LOWER CASE
0422  50520 040317          ADA M32   MAKE INTO UPPER CASE
0423  50521 040730          ADA .140
0424  50522 035450          ISZ GETCR NO==EXIT
0425  50523 125450          JMP GETCR,I TO (P+2)

```

```

0427* *
0428** EXECUTE TAB(X) *
0429* *
0430 50524 015442 ETAB JSB .IENT INTEGERIZE ARGUMENT
0431 50525 060274 LDA INF ARG > 32767
0432 50526 006400 CLB SET FLAG TO
0433 50527 075472 STB EOL 'TAB OCCURRED'
0434 50530 065756 LDB FFLG GET FORMAT FLAG
0435 50531 006002 SZB IN FORMATTER ?
0436 50532 026537 JMP ETAB2 YES
0437 50533 066005 LDB MM72
0438 50534 044000 ADB A
0439 50535 006021 SSB,RSS
0440 50536 026551 JMP ETAB4-1 YES, GO TO NEXT LINE
0441 50537 003004 ETAB2 CMA,INA NO
0442 50540 041572 ADA CHRCT ANY BLANKS
0443 50541 002021 SSA,RSS REQUIRED?
0444 50542 026552 JMP ETAB4 NO
0445 50543 071436 STA LBTMP YES
0446 50544 060412 ETAB1 LDA ,+40B OUTPUT
0447 50545 015454 JSB OUTCR A BLANK
0448 50546 035436 ISZ LBTMP DONE?
0449 50547 026544 JMP ETAB1 NO
0450 50550 002001 RSS YES
0451 50551 015426 JSB OUTLN
0452 50552 061036 ETAB4 LDA BIT15 SO OPCHK DOESN'T BARF
0453 50553 124560 JMP FRET,I
0454* *
0455** EXECUTE SPA(X) *
0456 50554 015442 ESPA JSB .IENT INTEGERIZE ARGUMENT
0457 50555 060274 LDA INF ARG > 32767
0458 50556 006400 CLB SET FUNCTION FLAG
0459 50557 075472 STB EOL TO EXECUTED
0460 50560 002003 SZA,RSS IS IT ZERO ?
0461 50561 026607 JMP ESPA4 YES
0462 50562 002020 SSA NO, NEGATIVE?
0463 50563 026607 JMP ESPA4 YES
0464 50564 003004 CMA,INA NO
0465 50565 071776 STA REPC T OUTPUT
0466 50566 065756 LDB FFLG
0467 50567 006002 SZB
0468 50570 026577 JMP ESPA1 NO
0469 50571 040440 ADA ,72
0470 50572 065572 LDB CHRCT SPACING PAST
0471 50573 007004 CMB,INB END OF LINE ?
0472 50574 040001 ADA 1
0473 50575 002020 SSA
0474 50576 026606 JMP ESPA4-1
0475 50577 061573 ESPA1 LDA BLANK
0476 50600 015454 JSB OUTCR
0477 50601 035776 ISZ REPC T
0478 50602 026577 JMP ESPA1
0479 50603 003400 CCA RESET
0480 50604 071776 STA REPC T REPC T
0481 50605 002001 RSS

```

0482	50606	015426		JSB	OUTLN	
0483	50607	061036	ESPA4	LDA	BIT15	SO OPCHK DOESN'T BARF
0484	50610	124560		JMP	FRET,I	
0485*				*		
0486*				*		
0487**	EXECUTE	LIN(X)	*			
0488*				*		
0489	50611	015442	ELIN	JSB	.IENT	INTEGERIZE ARGUMENT
0490	50612	060444		LDA	B400	
0491	50613	006400		CLB		SET FUNCTION FLAG
0492	50614	075472		STB	EOL	TO EXECUTED
0493	50615	002021		SSA,	RSS	NO, NEGATIVE ?
0494	50616	026633		JMP	ELIN1	NO
0495	50617	040444		ADA	B400	
0496	50620	002020		SSA		
0497	50621	002400		CLA		
0498	50622	040762		ADA	M256	
0499	50623	071776		STA	REPCT	
0500	50624	060364		LDA	+.12B	
0501	50625	015454		JSB	OUTCR	REPCT LINEFEEDS
0502	50626	035776		ISZ	REPCT	
0503	50627	026624		JMP	*=3	
0504	50630	003400		CCA		
0505	50631	071776		STA	REPCT	REINITIALIZE REPCT
0506	50632	026657		JMP	ELIN2	YES
0507	50633	040762	ELIN1	ADA	M256	
0508	50634	002021		SSA,	RSS	ARGUMENT > 2 56 ?
0509	50635	002400		CLA		
0510	50636	040444		ADA	B400	
0511	50637	002002		SZA		
0512	50640	026650		JMP	ELIN3	
0513	50641	060367		LDA	+.15B	
0514	50642	015454		JSB	OUTCR	
0515	50643	002400		CLA		
0516	50644	015454		JSB	OUTCR	
0517	50645	002400		CLA		
0518	50646	071572		STA	CHRCT	
0519	50647	026657		JMP	ELIN2	YES
0520	50650	003004	ELIN3	CMA,	INA	
0521	50651	071776		STA	REPCT	OUTPUT
0522	50652	015536		JSB	OUTCL	CR=LF'S
0523	50653	035776		ISZ	REPCT	
0524	50654	026652		JMP	*=2	
0525	50655	003400		CCA		RESET
0526	50656	071776		STA	REPCT	REPCT
0527	50657	061036	ELIN2	LDA	BIT15	SO OPCHK DOESN'T BARF
0528	50660	124560		JMP	FRET,I	

```

0002* *
0003** COMPUTE ABS(X) *
0004* *
0005 50661 002020 EABS SSA ARGUMENT NEGATIVE?
0006 50662 015370 JSB ARINV YES, NEGATE IT
0007 50663 124560 JMP FRET,I NO
0008* *
0009** COMPUTE INT(X) *
0010*
0011* ENTER WITH NUMBER IN (A) AND (B). EXIT WITH FLOATING
0012* POINT FORM OF ENTIER IN (A) AND (B).
0013*
0014 50664 075436 EINT STB LBTMP SAVE (B)
0015 50665 015416 JSB IFIX TAKE ENTIER
0016 50666 026675 JMP EINT,1 ALL SIGNIFICANCE IN MANTISSA
0017 50667 075436 STB LBTMP SAVE (B)
0018 50670 064411 LDB ,+31 CORRECT FOR
0019 50671 075322 STB EXP BINARY POINT BIAS
0020 50672 065436 LDB LBTMP RETRIEVE (B)
0021 50673 015306 JSB ,PACK NORMALIZE AND PACK
0022 50674 124560 JMP FRET,I
0023 50675 061260 EINT1 LDA TEMP6 RETRIEVE
0024 50676 065436 LDB LBTMP NUMBER
0025 50677 124560 JMP FRET,I
0026* *
0027** EXECUTE TIM(X) *
0028* *
0029 50700 015416 ETIM JSB IFIX INTEGERIZE ARGUMENT
0030 50701 115161 JSB RERRS+43,I ILLEGAL ARGUMENT
0031 50702 002002 SZA
0032 50703 115161 JSB RERRS+43,I ILLEGAL ARGUMENT
0033 50704 060001 LDA 1 IS ARGUMENT
0034 50705 010355 AND ,+3 <=3 AND
0035 50706 050001 CPA 1 >=0 ?
0036 50707 002001 RSS YES
0037 50710 115161 JSB RERRS+43,I NO-ILLEGAL ARGUMENT
0038 50711 042737 ADA DTMTB BRANCH TO
0039 50712 124000 JMP 0,I APPROPRIATE ROUTINE
0040 50713 060202 ETIM0 LDA DATIM+1 # OF 100 Ms
0041 50714 040704 ADA D36K UNITS
0042 50715 006400 CLB CONVERT
0043 50716 100400 DIV D600 TO MINUTES
50717 000456
0044 50720 026735 JMP ETIM3+1
0045 50721 060201 ETIM1 LDA DATIM HOURS OF YEAR
0046 50722 006400 CLB CONVERT
0047 50723 100400 DIV ,+24 TO DAYS
50724 000402
0048 50725 060001 LDA 1 REMAINDER IS HOUR OF DAY
0049 50726 026735 JMP ETIM3+1
0050 50727 060201 ETIM2 LDA DATIM HOURS OF YEAR
0051 50730 006400 CLB CONVERT
0052 50731 100400 DIV ,+24 TO DAYS
50732 000402
0053 50733 002001 RSS

```


0054	50734	060200	ETIM3	LDA YEAR	GET YEAR
0055	50735	015346		JSB FLOAT	CONVERT TO FLOATING POINT
0056	50736	124560		JMP FRET,I	EXIT WITH RESULT IN (A) AND (B)
0057	50737	150740	DTMTB	DEF ++1,I	
0058	50740	050713		DEF ETIM0	
0059	50741	050721		DEF ETIM1	
0060	50742	050727		DEF ETIM2	
0061	50743	050734		DEF ETIM3	
0062*	*		*		
0063**	COMPUTE RND(X)	*	*		
0064*	*		*		
0065*					
0066*	THE RANDOM NUMBER FUNCTION COMPUTES A RANDOM NUMBER FROM THE				
0067*	FORMULAS:				
0068*					
0069*	X(N)=A*X(N-1)+C(MOD 2↑30)			(A=5↑11,C=2↑30*(1/2-1/SQR(12)))	
0070*	RND =X/2↑30 MIN (1-2↑-23)				
0071*					
0072	50744		ERND	EQU *	
0073	50744	002021		SSA,RSS	POSITIVE ARGUMENT?
0074	50745	026752		JMP ERND1	YES, USE PREVIOUS VALUE
0075	50746	005265		RBL,CLE,ERB	NO, MAKE A
0076	50747	001600		ELA	
0077	50750	071566		STA RNDX1	A NEW SEED
0078	50751	075567		STB RNDX2	
0079	50752		ERND1	EQU *	
0080	50752	061566		LDA RNDX1	COMPUTE FIRST
0081	50753	100200		MPY RNDA2	CROSS PRODUCT.
	50754	051014			
0082	50755	071566		STA RNDX1	SAVE (ONLY NEED LOW ORDER PART)
0083	50756	061567		LDA RNDX2	COMPUTE 2ND
0084	50757	100200		MPY RNDA1	CROSS PRODUCT.
	50760	051013			
0085	50761	041566		ADA RNDX1	ADD IN FIRST.
0086	50762	043015		ADA RNDC1	ADD IN HIGH PART OF C.
0087	50763	071566		STA RNDX1	SAVE TOTAL. (THIS IS HIGH PART).
0088	50764	002500		CLA,CLE	SET EXP=0.
0089	50765	071322		STA EXP	
0090	50766	061567		LDA RNDX2	COMPUTE LOW ORDER PRODUCT.
0091	50767	100200		MPY RNDA2	
	50770	051014			
0092	50771	043016		ADA RNDC2	ADD IN LOW PART OF C.
0093	50772	002040		SEZ	ADD ANY CARRY INTO
0094	50773	006004		INB	B.
0095	50774	001265		RAL,CLE,ERA	E←A(15),A(15)+0.
0096	50775	071567		STA RNDX2	SAVE LOW ORDER RESULT.
0097	50776	005600		ELB	SHIFT HIGH ORDER PART & ADD IN
0098	50777	045586		ADB RNDX1	PREVIOUS TOTAL.
0099	51000	005665		ELB,CLE,ERB	CLEAR BIT 15 AND STORE.
0100	51001	075566		STB RNDX1	
0101	51002	001200		RAL	SHIFT A ADJACENT TO B.
0102	51003	101100		SWP	EXCHANGE REGISTERS AND
0103	51004	015306		JSB .PACK	PACK.
0104	51005	054354		CPB .+2	TEST FOR RESULT=1.0
0105	51006	002001		RSS	

0106	51007	124560		JMP FRET,I	EXIT IF NOT,
0107	51010	060274		LDA INF	SET RESULT TO 1-2↑-23
0108	51011	064762		LDB M256	
0109	51012	124560		JMP FRET,I	
0110*					
0111*					
0112	51013	002722	RNDA1	DEC 1490	A DIV 2↑15
0113	51014	007335	RNDA2	DEC 3805	A MOD 2↑15
0114	51015	016441	RNDC1	OCT 16441	C DIV 2↑15
0115	51016	007701	RNDC2	OCT 7701	C MOD 2↑15
0116*	*		*		
0117**	COMPUTE	SGN(X)	*		
0118*	*		*		
0119*					
0120*	ENTER WITH ARGUMENT IN (A) AND (B). IF ARGUMENT IS				
0121*	NEGATIVE RETURN -1,0, IF ZERO RETURN 0, IF POSITIVE				
0122*	RETURN 1,0 .				
0123*					
0124	51017	006400	ESGN	CLB	CLEAR LOW PART OF NUMBER
0125	51020	002003		SZA,RSS	ZERO?
0126	51021	124560		JMP FRET,I	YES, RETURN 0
0127	51022	002021		SSA,RSS	POSITIVE?
0128	51023	064354		LDB ,+2	YES, LOAD EXPONENT FOR +1
0129	51024	061036		LDA FLGBT	NO, LOAD HIGH PART OF -1
0130	51025	006002		SZB	WAS ARGUMENT POSITIVE?
0131	51026	001300		RAR	YES, SET RESULT TO +1
0132	51027	124560		JMP FRET,I	NO
0133*	*		*		
0134**	COMPUTE	TYP(X)	*		
0135*	*		*		
0136*					
0137*	UPON ENTRY (A) AND (B) HOLD A FILE NUMBER IN FLOATING POINT				
0138*	FORM. FILE 0 REFERS TO THE <DATA STATEMENT>S. IF THE FILE				
0139*	NUMBER IS NEGATIVE RETURN 1,0, 2,0, 3,0, OR 4,0 IF THE NEXT				
0140*	ITEM IN THE FILE IS A NUMBER, STRING, END-OF-FILE, OR END-				
0141*	OF-RECORD RESPECTIVELY. IF THE FILE NUMBER IS POSITIVE RETURN				
0142*	WITH THE VALUE CORRESPONDING TO THE FIRST ITEM FOUND OF ONE				
0143*	OF THE FIRST THREE TYPES.				
0144*					
0145	51030	075436	ETYP	STB LBTMP	SAVE (B)
0146	51031	065234		LDB FILE#	SAVE VALUE
0147	51032	075645		STB PINTG	OF FILE#
0148	51033	002003		SZA,RSS	'DATA' FILE?
0149	51034	027064		JMP ETYP3	YES
0150	51035	007400		CCB	NO, IGNORE
0151	51036	002020		SSA	END-OF-RECORDS
0152	51037	006400		CLB	UNLESS ARGUMENT
0153	51040	075653		STB EORFL	IS NEGATIVE
0154	51041	065436		LDB LBTMP	RETRIEVE (B)
0155	51042	002020		SSA	TAKE ABSOLUTE VALUE
0156	51043	015370		JSB ARINV	OF ARGUMENT
0157	51044	015342		JSB SBFIX	15-BIT INTEGER?
0158	51045	115151		JSB RERRS+35,I	NO
0159	51046	075234		STB FILE#	YES
0160	51047	061234		LDA FILE#	VALIDATE

0161	51050	064350		LDB .+2	
0162	51051	015510		JSB RQSTR	FILE
0163	51052	015514		JSB GTTYP	GET TYPE
0164	51053	065645	ETYP1	LDB PINTG	RESTORE
0165	51054	075234		STB FILE#	FILE#
0166	51055	015346		JSB FLOAT	RETURN TYPE IN
0167	51056	124560		JMP FRET,1	FLOATING POINT FORM
0168	51057	060355	ETYP2	LDA .+3	
0169	51060	065244		LDB NXTDT	OUT-OF-DATA
0170	51061	055575		CPB SYMTB	CONDITION?
0171	51062	027053		JMP ETYP1	YES, (A) = 3
0172	51063	015360		JSB SETDP	NO, SEEK NEXT <DATA STATEMENT>
0173	51064	003400	ETYP3	CCA	MORE DATA IN
0174	51065	051262		CPA DCCNT	CURRENT STATEMENT?
0175	51066	027057		JMP ETYP2	NO
0176	51067	165244		LDB NXTDT,1	YES, LOAD TYPE WORD
0177	51070	002404		CLA,INA	SET NUMBER
0178	51071	006021		SSB,RSS	NUMBER?
0179	51072	060354		LDA .+2	NO, SET FOR STRING
0180	51073	027053		JMP ETYP1	

```

0182**
0183*** COMPUTE CHEBYSHEV(X) ***
0184**
0185 51074 015406 #CHEB JSB .FMP
0186 51075 051374 DEF K2
0187 51076 104400 DST X2TMP X2TMP = X*2
      51077 001632
0188 51100 165440 LDB .CHEB,I
0189 51101 075376 STB CTMP POINTER TO COEFFICIENT TABLE
0190 51102 104200 DLD 1,I
      51103 100001
0191 51104 104400 DST DTMP DTMP = COEFF(N)
      51105 001640
0192 51106 002400 CLA
0193 51107 071636 STA BTMP
0194 51110 071637 STA BTMP+1 B = 0
0195 51111 035376 CHEB1 ISZ CTMP N = N-1
0196 51112 035376 ISZ CTMP
0197 51113 161376 LDA CTMP,I C(N) = 0?
0198 51114 002003 SZA,RSS YES
0199 51115 027137 JMP CHEB2 NO
0200 51116 104200 DLD BTMP
      51117 001636
0201 51120 104400 DST ATMP A = B
      51121 001634
0202 51122 104200 DLD DTMP
      51123 001640
0203 51124 104400 DST BTMP B = 0
      51125 001636
0204 51126 015406 JSB .FMP
0205 51127 001632 DEF X2TMP
0206 51130 015404 JSB .FSB
0207 51131 001634 DEF ATMP
0208 51132 015402 JSB .FAD
0209 51133 101376 DEF CTMP,I
0210 51134 104400 DST DTMP D = COEFF(N)-A+B*X2
      51135 001640
0211 51136 027111 JMP CHEB1
0212 51137 104200 CHEB2 DLD DTMP
      51140 001640
0213 51141 015404 JSB .FSB
0214 51142 001634 DEF ATMP
0215 51143 015406 JSB .FMP
0216 51144 001040 DEF HALF
0217 51145 035440 ISZ .CHEB ANS = (D-A)/2
0218 51146 125440 JMP .CHEB,I

```

```

0221**
0222*** LIBRARY ENTIER ***
0223**
0224*
0225* ENTER WITH NUMBER IN (A) AND (B). IF EXPONENT > 14
0226* THEN EXIT TO (P+1), ELSE EXIT TO (P+2) WITH THE
0227* ENTIER OF THE ARGUMENT IN (A).

```

```

0228*
0229 51147 071436 #IENT STA LBTMP      SAVE (A)
0230 51150 060001      LDA 1      EXTRACT
0231 51151 010443      AND B377    EXPONENT
0232 51152 000033      SLA,RAR    NEGATIVE?
0233 51153 027157      JMP IENT1   YES
0234 51154 040333      ADA ,-15   NO, LESS THAN
0235 51155 002021      SSA,RSS    OR EQUAL TO 147
0236 51156 125442      JMP .IENT,I NO
0237 51157 035442 IENT1 ISZ .IENT YES
0238 51160 061436      LDA LBTMP  RESTORE (A)
0239 51161 015416      JSB IFIX   TAKE ENTIER
0240 51162 000000      NOP
0241 51163 060001      LDA 1      LOAD INTEGER
0242 51164 125442      JMP .IENT,I INTO (A)
0243**
0244*** FLOAT AN INTEGER ***
0245**
0246*
0247* ENTER WITH INTEGER IN (A). EXIT WITH FLOATING POINT
0248* EQUIVALENT IN (A) AND (B).
0249*
0250 51165 064371 #FLOT LDB .+15  CORRECT BIAS
0251 51166 075322      STB EXP    OF BINARY POINT
0252 51167 006400      CLB        ZERO LOW MANTISSA
0253 51170 015306      JSB .PACK  NORMALIZE AND PACK
0254 51171 125346      JMP FLOAT,I

0256**
0257*** MULTIPLY BY A POWER OF 2 ***
0258**
0259*
0260* ENTER WITH NUMBER IN (A) AND (B). AUGMENT EXPONENT
0261* BY THE VALUE POINTED TO BY (P+1) AND EXIT TO (P+2).
0262* NO CHECK ON EXPONENT UNDERFLOW OR OVERFLOW.
0263*
0264 51172 002003 #PWR2 SZA,RSS  ARGUMENT ZERO?
0265 51173 027206      JMP PWR2A  YES, RETURN 0
0266 51174 071632      STA X2TMP  NO, SAVE HIGH PART OF MANTISSA
0267 51175 015414      JSB .FLUN  UNPACK LOW PART OF NUMBER
0268 51176 075633      STB X2TMP+1 SAVE LOW MANTISSA
0269 51177 165444      LDB .PWR2,I COMPUTE NEW
0270 51200 140001      ADA 1,I    EXPONENT
0271 51201 001200      RAL        POSITION
0272 51202 010443      AND B377   AND MASK IT
0273 51203 070001      STA 1      COMPUTE NEW LOW
0274 51204 045633      ADB X2TMP+1 PART OF NUMBER
0275 51205 061632      LDA X2TMP  RETRIEVE HIGH MANTISSA
0276 51206 035444 PWR2A ISZ .PWR2
0277 51207 125444      JMP .PWR2,I
0278* *
0279** COMPUTE COS(X) *
0280* *
0281 51210 015402 ECOS JSB .FAD  COMPUTE

```

```

0282 51211 051476      DEF PIBY2      SIN(X+PI/2)
0283* *
0284** COMPUTE SIN(X) *
0285* *
0286 51212 015406      ESIN   JSB  .FMP
0287 51213 051262      DEF  TOPI
0288 51214 104400      DST  XTEMP      X = 2*X/PI
      51215 001624
0289 51216 015402      JSB  .FAD
0290 51217 051372      DEF  K1
0291 51220 015444      JSB  .PWR2
0292 51221 000350      DEF  .-2
0293 51222 015442      JSB  .IENT
0294 51223 115145      JSB  RERRS+31,I  EXPONENT EXCEEDS 14
0295 51224 015346      JSB  FLOAT
0296 51225 015406      JSB  .FMP
0297 51226 051264      DEF  MM4
0298 51227 015402      JSB  .FAD
0299 51230 001624      DEF  XTEMP
0300 51231 104400      DST  XTEMP      X = X-4*ENTIER((X+1)/4)
      51232 001624
0301 51233 015404      JSB  .FSB
0302 51234 051372      DEF  K1
0303 51235 002020      SSA  X<1?
0304 51236 027245      JMP  ESIN1      YES
0305 51237 104200      DLD  K2         NO
      51240 051374
0306 51241 015404      JSB  .FSB
0307 51242 001624      DEF  XTEMP
0308 51243 104400      DST  XTEMP      X = 2-X
      51244 001624
0309 51245 104200      ESIN1 DLD  XTEMP
      51246 001624
0310 51247 015406      JSB  .FMP
0311 51250 001624      DEF  XTEMP
0312 51251 015444      JSB  .PWR2
0313 51252 000353      DEF  .+1
0314 51253 015404      JSB  .FSB
0315 51254 051372      DEF  K1
0316 51255 015440      JSB  .CHEB
0317 51256 051266      DEF  COEF2
0318 51257 015406      JSB  .FMP
0319 51260 001624      DEF  XTEMP
0320 51261 124560      JMP  FRET,I     ANS = X+CHEBY(2*X+2 -1)
0321*
0322 51262 050574      TOPI  DEC  .636619772  2/PI
      51263 141000
0323 51264 100000      MM4   DEC  =4.
      51265 000004
0324 51266 047605      COEF2 DEC  1.18496E=6
      51267 072733
0325 51270 134143      DEC  =1.365875E=4
      51271 104751
0326 51272 045261      DEC  9.118016E=3
      51273 157365

```

```

0327 51274 133371      DEC  =.2852615692
      51275 014777
0328 51276 050656      DEC  2.5525579248
      51277 107004
0329 51300 000000      OCT  0
0330* *
0331** COMPUTE TAN(X) *
0332* *
0333 51301 015406      ETAN  JSB  .FMP
0334 51302 051370      DEF  FOPI      4/PI
0335 51303 104400      DST  XTEMP
      51304 001624
0336 51305 015402      JSB  .FAD
0337 51306 051372      DEF  K1
0338 51307 015444      JSB  .PWR2
0339 51310 000350      DEF  .-2
0340 51311 015442      JSB  .IENT
0341 51312 115145      JSB  RERRS+31,I
0342 51313 015346      JSB  FLOAT
0343 51314 015370      JSB  ARINV
0344 51315 015444      JSB  .PWR2
0345 51316 000354      DEF  .+2
0346 51317 015402      JSB  .FAD
0347 51320 001624      DEF  XTEMP
0348 51321 104400      DST  XTEMP      X = X-4*ENTIER((X+1)/4)
      51322 001624
0349 51323 015404      JSB  .FSB
0350 51324 051372      DEF  K1
0351 51325 071436      STA  LBTMP
0352 51326 002020      SSA
0353 51327 027362      JMP  ETAN2      X<1?
0354 51330 104200      DLD  K2          YES
      51331 051374          NO
0355 51332 015404      JSB  .FSB
0356 51333 001624      DEF  XTEMP
0357 51334 104400      ETAN1 DST  YTEMP      Y = 2-X
      51335 001626
0358 51336 015406      JSB  .FMP
0359 51337 001626      DEF  YTEMP
0360 51340 015406      JSB  .FMP
0361 51341 051374      DEF  K2
0362 51342 015404      JSB  .FSB
0363 51343 051372      DEF  K1
0364 51344 015440      JSB  .CHEB
0365 51345 051376      DEF  COEF0
0366 51346 015406      JSB  .FMP
0367 51347 001626      DEF  YTEMP
0368 51350 104400      DST  YTEMP      Y = Y*CHEBY(2*Y+2 -1)
      51351 001626
0369 51352 061436      LDA  LBTMP
0370 51353 002020      SSA
0371 51354 027365      JMP  ETAN3      X<1?
0372 51355 104200      DLD  K1          YES
      51356 051372          NO
0373 51357 015410      JSB  .FDV

```

```

0374 51360 001626      DEF YTEMP
0375 51361 124560      JMP FRET,I           ANS = 1/Y
0376 51362 104200      ETAN2 DLD XTEMP
      51363 001624
0377 51364 027334      JMP ETAN1           Y = X
0378 51365 104200      ETAN3 DLD YTEMP
      51366 001626
0379 51367 124560      JMP FRET,I           ANS = Y
0380*
0381 51370 050574      FOPI DEC 1,273239545
      51371 141002
0382 51372 040000      K1 DEC 1.
      51373 000002
0383 51374 040000      K2 DEC 2.
      51375 000004
0384 51376 076061      COEF0 DEC 1,4450E-8
      51377 075315
0385 51400 066034      DEC 2,013766E-7
      51401 176725
0386 51402 057035      DEC 2,804816E-6
      51403 030335
0387 51404 050755      DEC 3,906637E-5
      51405 114745
0388 51406 043523      DEC 5,4417038E-4
      51407 052355
0389 51410 076112      DEC 7,586101578E-3
      51411 065763
0390 51412 066520      DEC .10675392857
      51413 163773
0391 51414 070512      DEC 1,7701474227
      51415 014002
0392 51416 000000      OCT 0
0393* *
0394** COMPUTE ATN(X) *
0395* *
0396 51417 104400      EATN DST XTEMP
      51420 001624
0397 51421 060001      LDA 1
0398 51422 010443      AND B377
0399 51423 071436      STA LBTMP
0400 51424 002002      SZA
0401 51425 000010      SLA
      ABS(X) > 1?
0402 51426 027463      JMP EATN2          NO
0403 51427 104200      DLD K1             YES
      51430 051372
0404 51431 015410      JSB .FDV
0405 51432 001624      DEF XTEMP          U = 1/X
0406 51433 104400      EATN1 DST UTEMP
      51434 001630
0407 51435 015406      JSB .FMP
0408 51436 001630      DEF UTEMP
0409 51437 015406      JSB .FMP
0410 51440 051374      DEF K2
0411 51441 015404      JSB .FSB
0412 51442 051372      DEF K1

```


0413	51443	015440	JSB	.CHEB	
0414	51444	051502	DEF	COEF1	
0415	51445	015406	JSB	.FMP	
0416	51446	001630	DEF	UTEMP	
0417	51447	104400	DST	YTEMP	Y = U * CHEBY(2 * U ² - 1)
	51450	001626			
0418	51451	061436	LDA	LBTMP	
0419	51452	002002	SZA		
0420	51453	000010	SLA		ABS(X) > 1?
0421	51454	027466	JMP	EATN3	NO
0422	51455	061624	LDA	XTEMP	YES
0423	51456	002020	SSA		X < 0?
0424	51457	027471	JMP	EATN4	YES
0425	51460	104200	DLD	PIBY2	NO
	51461	051476			
0426	51462	027473	JMP	EATN4+2	
0427	51463	104200	EATN2	DLD	XTEMP
	51464	001624			
0428	51465	027433	JMP	EATN1	U = X
0429	51466	104200	EATN3	DLD	YTEMP
	51467	001626			
0430	51470	124560	JMP	FRET, I	ANS = Y
0431	51471	104200	EATN4	DLD	MP2
	51472	051500			
0432	51473	015404	JSB	.FSB	
0433	51474	001626	DEF	YTEMP	
0434	51475	124560	JMP	FRET, I	ANS = -PI/2 - Y
0435*					
0436	51476	062207	PIBY2	DEC	1.5707963268 PI/2
	51477	166402			
0437	51500	115570	MP2	DEC	-1.5707963268 -PI/2
	51501	011402			
0438	51502	106671	COEF1	DEC	-1.33034E-8
	51503	102315			
0439	51504	056335		DEC	8.64888E-8
	51505	156323			
0440	51506	131601		DEC	-56.99186E-8
	51507	137731			
0441	51510	040033		DEC	3.821037E-6
	51511	035737			
0442	51512	111013		DEC	-2.6215196E-5
	51513	123343			
0443	51514	060542		DEC	1.8574297E-4
	51515	000351			
0444	51516	122573		DEC	-1.381195004E-3
	51517	062757			
0445	51520	055471		DEC	.01113584206
	51521	107365			
0446	51522	111620		DEC	-.1058929245
	51523	147373			
0447	51524	070320		DEC	1.762747174
	51525	155002			
0448	51526	000000	OCT	0	
0449*	*				
0450**		COMPUTE EXP(X)	*		

PAGE 0217 #20 LIBRARY FUNCTIONS

0451*	*		*		
0452	51527	015434	EEXP	JSB .EXP	
0453	51530	124560		JMP FRET,I	
0454	51531	015406	#EXP	JSB .FMP	
0455	51532	051651		DEF L2E	
0456	51533	104400		DST XTEMP	X = ARG*LOG2(E)
	51534	001624			
0457	51535	015442		JSB .IENT	
0458	51536	027630		JMP .EXP2	
0459	51537	071436		STA LBTMP	
0460	51540	015346		JSB FLOAT	
0461	51541	104400		DST YTEMP	Y = ENTIER(X)
	51542	001626			
0462	51543	061436		LDA LBTMP	
0463	51544	043637		ADA M124	
0464	51545	002021		SSA,RSS	X >= 124?
0465	51546	027630		JMP .EXP2	YES
0466	51547	043640		ADA .244	NO
0467	51550	002020		SSA	X < =120?
0468	51551	027625		JMP .EXP1	YES
0469	51552	104200		DLD XTEMP	NO
	51553	001624			
0470	51554	015404		JSB .FSB	
0471	51555	001626		DEF YTEMP	
0472	51556	104400		DST XTEMP	X = X-ENTIER(X)
	51557	001624			
0473	51560	015406		JSB .FMP	
0474	51561	001624		DEF XTEMP	
0475	51562	104400		DST UTEMP	U = XT2
	51563	001630			
0476	51564	015402		JSB .FAD	
0477	51565	051641		DEF AAAA	
0478	51566	104400		DST YTEMP	Y = XT2+AAAA
	51567	001626			
0479	51570	104200		DLD BBBB	
	51571	051643			
0480	51572	015410		JSB .FDV	
0481	51573	001626		DEF YTEMP	
0482	51574	104400		DST YTEMP	Y = BBBB/Y
	51575	001626			
0483	51576	104200		DLD CCCC	
	51577	051645			
0484	51600	015406		JSB .FMP	
0485	51601	001630		DEF UTEMP	
0486	51602	015402		JSB .FAD	
0487	51603	051647		DEF DDDD	
0488	51604	015404		JSB .FSB	
0489	51605	001624		DEF XTEMP	
0490	51606	015404		JSB .FSB	
0491	51607	001626		DEF YTEMP	
0492	51610	104400		DST YTEMP	Y = X+DDDD+CCCC*XT2-Y
	51611	001626			
0493	51612	104200		DLD XTEMP	
	51613	001624			
0494	51614	015410		JSB .FDV	

0495	51615	001626		DEF	YTEMP	
0496	51616	015402		JSB	.FAD	
0497	51617	001040		DEF	HALF	
0498	51620	035436		ISZ	LBTMP	
0499	51621	000000		NOP		
0500	51622	015444		JSB	.PWR2	
0501	51623	001436		DEF	LBTMP	
0502	51624	125434		JMP	.EXP,I	ANS = (0.5+X/Y)*2↑ENTIER(ARG*LE)
0503	51625	002400	.EXP1	CLA		
0504	51626	006400		CLB		
0505	51627	125434		JMP	.EXP,I	ANS = 0
0506	51630	061436	.EXP2	LDA	LBTMP	LARGE ARGUMENT
0507	51631	002020		SSA		NEGATIVE?
0508	51632	027625		JMP	.EXP1	YES
0509	51633	115213		JSB	WERRS+4,I	NO
0510	51634	060274		LDA	INF	
0511	51635	064350		LDB	,-2	ANS = POSITIVE INFINITY
0512	51636	125434		JMP	.EXP,I	
0513*						
0514	51637	177604	M124	DEC	=124	
0515	51640	000364	.244	DEC	244	
0516	51641	053552	AAAA	DEC	87,417497202	
	51642	160416				
0517	51643	046477	BBBB	DEC	617,9722695	
	51644	016424				
0518	51645	043372	CCCC	DEC	.03465735903	
	51646	070371				
0519	51647	047643	DDDD	DEC	9,9545957821	
	51650	001410				
0520	51651	056125	L2E	DEC	1,4426950409	
	51652	017002				

```

0002* *
0003** COMPUTE LOG(X) *
0004* *
0005 51653 015436 ELOG JSB .LOG
0006 51654 124560 JMP FRET,I
0007 51655 002003 #LOG SZA,RSS NON=ZERO ARGUMENT?
0008 51656 027732 JMP .LOG1 NO
0009 51657 002020 SSA YES, POSITIVE ARGUMENT?
0010 51660 115141 JSB RERRS+27,I NO
0011 51661 071624 STA XTEMP YES,
0012 51662 015414 JSB .FLUN SAVE MANTISSA
0013 51663 075625 STB XTEMP+1 AND FLOATED
0014 51664 015346 JSB FLOAT EXPONENT
0015 51665 104400 DST YTEMP SEPARATELY
    51666 001626
0016 51667 104200 DLD XTEMP
    51670 001624
0017 51671 015402 JSB .FAD
0018 51672 051737 DEF R22
0019 51673 104400 DST UTEMP U = X+SQR(0.5)
    51674 001630
0020 51675 104200 DLD XTEMP
    51676 001624
0021 51677 015404 JSB .FSB
0022 51700 051737 DEF R22
0023 51701 015410 JSB .FDV
0024 51702 001630 DEF UTEMP
0025 51703 104400 DST UTEMP U = (X-SQR(0.5))/U
    51704 001630
0026 51705 015406 JSB .FMP
0027 51706 001630 DEF UTEMP
0028 51707 015404 JSB .FSB
0029 51710 051747 DEF CCC
0030 51711 104400 DST XTEMP
    51712 001624
0031 51713 104200 DLD MB
    51714 051745
0032 51715 015410 JSB .FDV
0033 51716 001624 DEF XTEMP
0034 51717 015402 JSB .FAD
0035 51720 051743 DEF AAA
0036 51721 015406 JSB .FMP
0037 51722 001630 DEF UTEMP
0038 51723 015404 JSB .FSB
0039 51724 001040 DEF HALF
0040 51725 015402 JSB .FAD
0041 51726 001626 DEF YTEMP
0042 51727 015406 JSB .FMP
0043 51730 051741 DEF LE2 ANS = LOG(2)*
0044 51731 125436 JMP .LOG,I (MANTISSA=0.5+U*(AAA+MB/X))
0045 51732 115210 .LOG1 JSB WERRS+1,I
0046 51733 061036 LDA MNEG
0047 51734 067736 LDB B776 ANS = NEGATIVE INFINITY
0048 51735 125436 JMP .LOG,I
0049*

```

PAGE 0220 #21 LIBRARY FUNCTIONS

0050	51736	000776	B776	OCT 776	
0051	51737	055202	R22	DEC .707106781	SQR(0.5)
	51740	075000			
0052	51741	054271	LE2	DEC .6931471806	LOG BASE E (2)
	51742	006000			
0053	51743	051260	AAA	DEC 1.2920070987	
	51744	037402			
0054	51745	125606	MB	DEC -2.6398577035	
	51746	044404			
0055	51747	065010	CCC	DEC 1.6567626301	
	51750	063002			

0057*
 0058*
 0059*
 0060*
 0061*
 0062*
 0063*
 0064*
 0065*
 0066*
 0067*
 0068*
 0069*
 0070
 0071
 0072
 0073
 0074
 0075
 0076
 0077
 0078
 0079
 0080
 0081
 0082
 0083
 0084
 0085
 0086*
 0087*

ENTER WITH:

(A)=1 IF PBFLG HAS TO BE SET.

(A)=2 IF PBFLG HAS TO BE CLEARED.

(A)=4 IF PBFLG AND CBFLG HAVE TO BE CLEARED.

(B)= POINTER TO ?FLAG

EXIT WITH ORIGINAL CONTENTS IN B.

```

#EDAB EQU *
CLF 0
SLA,RSS      BIT#0 SET?
JMP **4
LDA PBFLG    YES, SET PBFLG,
IOR B,I
JMP #EDB1
RAR,SLA      NO, BIT#1 SET?
LDA PBFLG    YES, CLEAR PBFLG,
LDA B30M     NO, CLEAR PBFLG AND CBFLG,
CMA
AND B,I
#EDB1 EQU *
STA B,I      STORE ?FLAG WORD BACK,
STF 0
JMP EDABR,I  EXIT,
    
```

```

0089 52000          ORG 520000
0090 52000 063146  TENTH OCT 63146
0091 52001 000063  B63   OCT 63
0092 52002 000120  B120  OCT 120      *P*
0093 52003 177716  D62   OCT -62
0094 52004 177707  M71B  OCT -71
0095 52005 000776  BB776 OCT 776
0096 52006 000106  F     OCT 106
0097 52007 000116  N     OCT 116
0098* *
0099** COMPUTE SQR(X) *
0100* *
0101 52010 002003  ESQR  SZA,RSS      X# 0?
0102 52011 124560  JMW FRET,I      YES, ANS = 0
0103 52012 002020  SSA           NO, X < 0?
0104 52013 115142  JSB RERRS+20,I YES
0105 52014 071624  STA XTEMP      NO
0106 52015 015414  JSB .FLUN
0107 52016 000031  SLA,ARS      EXPONENT ODD?
0108 52017 026055  JMP ESQR2      YES
0109 52020 040351  ADA ,-1       NO
0110 52021 071436  STA LBTMP     EXPONENT/2 -1
0111 52022 075625  STB XTEMP+1   MANTISSA SAVED
0112 52023 061624  LDA XTEMP
0113 52024 015406  JSB .FMP
0114 52025 052070  DEF SA2
0115 52026 015402  JSB .FAD
0116 52027 052074  DEF SB2       Y = SB2+SA2*X
0117 52030 104400  ESQR1 DST YTEMP
      52031 001626
0118 52032 104200  DLD XTEMP
      52033 001624
0119 52034 015410  JSB .FDV
0120 52035 001626  DEF YTEMP
0121 52036 015402  JSB .FAD
0122 52037 001626  DEF YTEMP
0123 52040 015444  JSB .PWR2
0124 52041 000351  DEF ,-1
0125 52042 104400  DST YTEMP     Y = (Y+X/Y)/2
      52043 001626
0126 52044 104200  DLD XTEMP
      52045 001624
0127 52046 015410  JSB .FDV
0128 52047 001626  DEF YTEMP
0129 52050 015402  JSB .FAD
0130 52051 001626  DEF YTEMP
0131 52052 015444  JSB .PWR2
0132 52053 001436  DEF LBTMP
0133 52054 124560  JMP FRET,I    ANS = (P+F/P)*2↑ESQR0
0134 52055 071436  ESQR2 STA LBTMP    EXPONENT/2
0135 52056 044443  ADB B377
0136 52057 075625  STB XTEMP+1  MANTISSA/2 SAVED
0137 52060 061624  LDA XTEMP
0138 52061 015406  JSB .FMP
0139 52062 052066  DEF SA1

```

```

0140 52063 015402      JSB .FAD
0141 52064 052072      DEF SB1
0142 52065 026030      JMP ESQR1      Y = SB1+SA1*X
0143*
0144 52066 070000      SA1  DEC .875
      52067 000000
0145 52070 045000      SA2  DEC .578125
      52071 000000
0146 52072 043524      SB1  DEC .27863
      52073 046377
0147 52074 066000      SB2  DEC .421875
      52075 000377

0148* *
0149** COMPUTE BRK(X) *
0150* *
0151*
0152* ENTER WITH ARGUMENT IN A AND B.
0153* IF X=0, DISABLE ABORT CAPABILITY.
0154* IF X>0, ENABLE ABORT CAPABILITY.
0155* IF X<0, DO NOT DISABLE OR ENABLE BUT JUST
0156* RETURN A VALUE.
0157*
0158* RETURN WITH:
0159*
0160* 1. 0 IF ABORT CAPABILITY WAS DISABLED PREVIOUS
0161* TO EVALUATION.
0162*
0163* 2. +1 IF ABORT CAPABILITY WAS ENABLED PREVIOUS
0164* TO EVALUATION.
0165*
0166 52076 071624      EBRK  STA XTEMP      STORE HIGH PART OF ARGUMENT.
0167 52077 160257      LDA MAIN,I      A = ?FLAG
0168 52100 010616      AND PBFLG
0169 52101 006400      CLB
0170 52102 002003      SZA,RSS      PBFLG BIT SET?
0171 52103 064354      LDB ,+2      NO. SET (B)=EXPONENT OF +1.
0172 52104 061036      LDA FLGBT      YES, SET (A)=1000000.
0173 52105 006003      SZB,RSS      WAS PBFLG SET?
0174 52106 002400      CLA      YES, SET RETURN VALUE TO 0.
0175 52107 001300      RAR      NO. SET RETURN VALUE TO +1.
0176 52110 104400      DST YTEMP      SAVE.
      52111 001626

0177*
0178 52112 064257      LDB MAIN      (B)= ? FLAG
0179 52113 061624      LDA XTEMP      RETRIEVE HIGH PART OF ARGUMENT.
0180 52114 002002      SZA      ARGUMENT=0?
0181 52115 026130      JMP EBRK1
0182 52116 002404      CLA,INA      YES, SET PBFLG TO 1(=DISABLE
0183 52117 015564      JSB EDABR      ABORT).
0184 52120 103100      CLF 0
0185 52121 044366      ADB ,+?STAT  B=> ?STAT
0186 52122 164001      LDB B,I      B= ?STAT
0187 52123 003400      CCA
0188 52124 050001      CPA B
0189 52125 126137      JMP SUSPN,I  QUIT IF ABORT REQUEST,

```



```

0190 52126 102100      STF 0
0191 52127 026134      JMP EBRK2
0192 52130      EBRK1 EQU *
0193 52130 002020      SSA
0194 52131 026134      JMP EBRK2
0195 52132 060354      LDA ,+2
0196 52133 015564      JSB EDABR
0197 52134      EBRK2 EQU *
0198 52134 104200      OLD YTEMP
      52135 001626
0199 52136 124560      JMP FRET,I
0200*
0201*
0202 52137 071651      SUSPN DEF SUSP
0203*
0204*
0205*

```

```

NO. ARGUMENT >0 OR <0?
<0. DO NOTHING.
<0 SET PBFLG TO 0(=ENABLE
ABORT).

```

RETURN WITH VALUE OF CONDITION

PREVIOUS TO EVALUATION.

```

0207* *****
0208****
0209*** LIST THE PROGRAM ***
0210****
0211* *****
0212*
0213*
0214*
0215* 'LIST' CONVERTS THE CURRENT USER PROGRAM TO A STANDARD ASCII
0216* FORMAT AND PRINTS IT ON THE TELETYPE ONE LINE PER PROGRAM
0217* STATEMENT. 'PUNCH' ADDS A LEADER AND TRAILER TO THE ASCII
0218* PROGRAM DUMP. LISTING BEGINS WITH THE FIRST PROGRAM STATEMENT
0219* UNLESS DIRECTED OTHERWISE BY THE 'LIST' OR 'PUNCH' COMMAND.
0220* LT1 IS THE PROGRAM POSITION POINTER. LT2 IS THE STATEMENT
0221* LENGTH COUNTER.
0222*
0223 52140 002404 XPNCH CLA,INA SET TO 'XPUNCH' MODE
0224 52141 026144 JMP LIST+1
0225 52142 003401 PUNCH CCA,RSS SET TO 'PUNCH' MODE
0226 52143 002400 LIST CLA SET TO 'LIST' MODE
0227 52144 071400 STA LT0 SAVE MODE
0228 52145 002400 CLA SET FOR
0229 52146 071552 STA LT8 NO PAGINATION
0230 52147 064702 LDB PBUFF NULL
0231 52150 054056 CPB PBPTR PROGRAM?
0232 52151 026574 JMP LIS16 YES
0233 52152 006404 CLB,INB NO, SET FIRST STATEMENT NUMBER
0234 52153 075432 STB LT3
0235 52154 015464 JSB SINIT PREPARE PROGRAM FOR LISTING
0236 52155 064056 LDB PBPTR
0237 52156 103100 CLF 0
0238 52157 060354 LDA CFLAG SAVE
0239 52160 110257 AND MAIN,I PROGRAM
0240 52161 071442 STA LT5 MODE
0241 52162 102100 STF 0
0242*
0243** DETERMINE FIRST STATEMENT TO BE LISTED **
0244*
0245 52163 002002 SZA SAVE POINTER TO
0246 52164 065575 LDB SYMTB LAST WORD +1
0247 52165 075444 STB LT6 OF PROGRAM
0248 52166 065036 LDB BIT15 GET LARGE SEQUENCE NUMBER
0249 52167 075434 STB LT7 SET ENDING SEQUENCE NUMBER
0250 52170 015450 JSB GETCR STARTING LINE NUMBER?
0251 52171 026233 JMP LIS00 NO
0252 52172 006400 CLB
0253 52173 050426 CPA ,+54B CHECK FOR COMMA
0254 52174 026206 JMP LIS0M FIRST STATEMENT NUMBER OMITTED.
0255 52175 052002 CPA 0120 PAGINATION?
0256 52176 026226 JMP LIS0P YES
0257 52177 015452 JSB BCKSP BACK UP FOR FIRST STATEMENT NUMB
0258 52200 015466 JSB BLDIN FETCH INTEGER
0259 52201 050367 CPA ,+15B CHECK FOR CARRIAGE RETURN
0260 52202 026234 JMP LIS0R YES, END OF COMMAND
0261 52203 050426 CPA ,+54B COMMA FOLLOWS?

```

0262	52204	002001	RSS	YES
0263	52205	115122	JSB RERRS+12,I	
0264	52206		LISCM EQU *	
0265	52206	075432	STB LT3	SAVE STARTING SEQUENCE NUMBER
0266	52207	015450	JSB GETCR	GET THE NEXT CHARACTER
0267	52210	115122	JSB RERRS+12,I	
0268	52211	052002	CPA B120	CHECK FOR P
0269	52212	026226	JMP LISCP	PAGINATION
0270	52213	015452	JSB BCKSP	BACK UP FOR SECOND STATEMENT *
0271	52214	015466	JSB BLDIN	GET INTEGER
0272	52215	007000	CMB	
0273	52216	075434	STB LT7	SAVE ENDING SEQUENCE NUMBER
0274	52217	050367	CPA .+15B	END OF RECORD?
0275	62220	026233	JMP LISCP	YES
0276	52221	015450	JSB GETCR	NO, GET NEXT CHARACTER
0277	52222	115122	JSB RERRS+12,I	
0278	52223	052002	CPA B120	PAGINATION?
0279	52224	002001	RSS	YES
0280	52225	115122	JSB RERRS+12,I	NO
0281	52226		LISCP EQU *	
0282	52226	062004	LDA M71B	SET LINE COUNTER
0283	52227	071552	STA LT8	
0284	52230	015450	JSB GETCR	TEST FOR END OF LINE
0285	52231	002001	RSS	
0286	52232	115122	JSB RERRS+12,I	
0287	52233		LISCP EQU *	
0288	52233	065432	LDB LT3	GET BACK STARTING SEQUENCE NUMBER
0289	52234		LISCR EQU *	
0290	52234	061444	LDA LT6	SEEK
0291	52235	015314	JSB FNDPS	STATEMENT
0292	52236	026574	JMP LIS16	ALL LINE NUMBERS < GIVEN INTEGER
0293	52237	000000	NOP	SAVE DESIRED
0294	52240	075432	STB LT3	STARTING POINT
0295	52241	060364	LDA .+12B	OUTPUT A
0296	52242	015454	JSB OUTCR	LINE FEED
0297*			*	
0298**	OUTPUT PROGRAM NAME	**		
0299*			*	
0300	52243	061571	LDA LNAME	
0301	52244	071430	STA LT1	
0302	52245	002004	INA	NULL
0303	52246	160000	LDA 0,I	
0304	52247	002003	SZA,RSS	NAME?
0305	52250	026257	JMP LISCU	YES
0306	52251	006400	CLB	NO
0307	52252	075274	STB LT2	OUTPUT
0308	52253	060347	LDA .-3	PROGRAM
0309	52254	015462	JSB OUTST	NAME
0310	52255	060367	LDA .+15B	OUTPUT
0311	52256	015454	JSB OUTCR	CARRIAGE RETURN
0312	52257		LISCU EQU *	
0313	52257	060364	LDA .+12B	AND
0314	52260	015454	JSB OUTCR	DOUBLE
0315	52261	060364	LDA .+12B	LINE
0316	52262	015454	JSB OUTCR	FEED

```

0317*
0318** OUTPUT LEADER IF 'PUNCH' **
0319*
0320 52263 002400 CLA 'LIST'
0321 52264 051400 CPA LT0 MODE?
0322 52265 026274 JMP LIST2=2 YES
0323 52266 060316 LDA M72B NO,
0324 52267 071356 STA DIGCT OUTPUT
0325 52270 002400 CLA FEED
0326 52271 015454 JSB OUTCR FRAMES
0327 52272 035356 ISZ DIGCT FOR
0328 52273 026270 JMP *-3 LEADER
0329 52274 065432 LDB LT3 SET POINTER TO
0330 52275 075430 STB LT1 STARTING POINT
0331*
0332** MAIN LIST LOOP **
0333*
0334 52276 065430 LIST2 LDB LT1 PROGRAM
0335 52277 055444 CPB LT6 EXHAUSTED?
0336 52300 026562 JMP LIS15 YES
0337 52301 165430 LDB LT1,I GET LINE NUMBER
0338 52302 045434 ADB LT7 CHECK FOR END OF LISTING
0339 52303 006021 SSB,RSS SKIP IF NOT DONE YET
0340 52304 026562 JMP LIS15 STOP LISTING HERE
0341*
0342 52305 035552 ISZ LT8 CHECK FOR NEW PAGE
0343 52306 026317 JMP LISPM NOT YET
0344 52307 060342 LDA *-8
0345 52310 071552 STA LT8
0346 52311 LISPF EQU *
0347 52311 060364 LDA +12B OUTPUT A
0348 52312 015454 JSB OUTCR BUNCH OF
0349 52313 035552 ISZ LT8 LINE FEEDS
0350 52314 026311 JMP LISPF
0351 52315 060316 LDA M72B RESET LINE COUNTER
0352 52316 071552 STA LT8
0353 52317 LISPM EQU *
0354*
0355 52317 165430 LDB LT1,I NO, OUTPUT
0356 52320 015456 JSB OUTIN LINE NUMBER
0357 52321 060412 LDA +40B OUTPUT
0358 52322 015454 JSB OUTCR BLANK
0359 52323 035430 ISZ LT1 CHECK
0360 52324 161430 LDA LT1,I STATEMENT
0361 52325 015556 JSB STLCK LENGTH
0362 52326 161430 LDA LT1,I LENGTH
0363 52327 003004 CMA,INA COUNTER
0364 52330 002004 INA FOR
0365 52331 071274 STA LT2 STATEMENT
0366 52332 026335 JMP LIST3
0367 52333 165430 LDB LT1,I OUTPUT
0368 52334 015456 JSB OUTIN BOUND
0369 52335 035430 LIST3 ISZ LT1 MORE OF
0370 52336 035274 ISZ LT2 STATEMENT?
0371 52337 026353 JMP LIST4 YES

```

0372	52340	002404		CLA, INA	
0373	52341	051400		CpA LT0	XPUNCH?
0374	52342	002001		RSS	YES
0375	52343	026346		JMP **3	NO
0376	52344	060375		LDA .+23B	OUTPUT
0377	52345	015454		JSB OUTCR	X=OFF
0378	52346	060367		LDA .+15B	NO,
0379	52347	015454		JSB OUTCR	OUTPUT A
0380	52350	060364		LDA .+12B	CARRIAGE RETURN
0381	52351	015454		JSB OUTCR	AND LINE FEED
0382	52352	026276		JMP LIST2	
0383*				*	
0384**	IDENTIFY OPERATOR			**	
0385*				*	
0386	52353	161430	LIST4	LDA LT1,I	EXTRACT
0387	52354	010664		AND OPMSK	OPERATOR
0388	52355	002003		SZA, RSS	NULL OPERATOR?
0389	52356	026377		JMP LIST5	YES
0390	52357	050726		CPA LETOP	NO, 'IMPLIED' LET?
0391	52360	026375		JMP LIST5-2	YES, OUTPUT A BLANK
0392	52361	001727		ALF, ALF	NO,
0393	52362	042003		ADA D62	SINGLE-CHARACTER
0394	52363	002021		SSA, RSS	OPERATOR?
0395	52364	026531		JMP LI812	NO
0396	52365	042001		ADA B63	YES,
0397	52366	040564		ADA FOPBS	EXTRACT
0398	52367	160000		LDA 0,I	ASCII
0399	52370	001727		ALF, ALF	CODE
0400	52371	010441		AND B177	
0401	52372	050414		CPA .+42B	" ?
0402	52373	026577		JMP LI914	YES
0403	52374	002001		RSS	NO
0404	52375	060412		LDA .+40B	LOAD A BLANK
0405	52376	015454		JSB OUTCR	
0406*				*	
0407**	IDENTIFY OPERAND			**	
0408*				*	
0409	52377	161430	LIST5	LDA LT1,I	EXTRACT
0410	52400	010700		AND OPDMK	OPERAND
0411	52401	071432		STA LT3	
0412	52402	002020		SSA	FLAG BIT SET?
0413	52403	026451		JMP LIST9	YES
0414	52404	006400		CLB	NO, NULL
0415	52405	055432		CPB LT3	OPERAND?
0416	52406	026335		JMP LIST3	YES
0417	52407	055442		CPB LT5	NO, 'COMPILED' ?
0418	52410	026416		JMP LIST0	NO
0419	52411	040351		ADA .-1	YES
0420	52412	001000		ALS	LOAD
0421	52413	041575		ADA SYMTB	ACTUAL
0422	52414	160000		LDA 0,I	SYMBOL
0423	52415	071432		STA LT3	SAVE SYMBOL
0424*				*	
0425**	LIST SYMBOLIC OPERAND			**	
0426*				*	

0427	52416	010672	LIST0	AND	PDFFL	ISOLATE TYPE PART
0428	52417	050371		CPA	.,+17B	FUNCTION?
0429	52420	026444		JMP	LIST0	YES
0430	52421	061432	LIST6	LDA	LT3	NO,
0431	52422	101104		RRR	4	COMPUTE
0432	52423	010411		AND	.,+37B	ASCII FOR
0433	52424	040772		ADA	B100	LETTER
0434	52425	015454		JSB	OUTCR	OUTPUT LETTER
0435	52426	061432		LDA	LT3	
0436	52427	010371		AND	.,+17B	
0437	52430	050371		CPA	.,+17B	FUNCTION?
0438	52431	026335		JMP	LIST3	YES
0439	52432	002003		SZA	,RSS	NO, STRING VARIABLE?
0440	52433	026442		JMP	LIST7	YES
0441	52434	040345		ADA	.,=5	NO
0442	52435	002020		SSA		DIGIT?
0443	52436	026335		JMP	LIST3	NO
0444	52437	040432		ADA	.,+60B	YES,
0445	52440	015454		JSB	OUTCR	OUTPUT IT
0446	52441	026335		JMP	LIST3	
0447	52442	060416	LIST7	LDA	.,+44B	LOAD ASCII 'S'
0448	52443	026440		JMP	.,=3	
0449	52444	062006	LIST8	LDA	F	OUTPUT
0450	52445	015454		JSB	OUTCR	
0451	52446	062007		LDA	N	'FN'
0452	52447	015454		JSB	OUTCR	
0453	52450	026421		JMP	LIST6	
0454*						*
0455**	LIST CONSTANT OPERAND OR PARAMETER					**
0456*						*
0457	52451	001665	LIST9	ELA	,CLE,ERA	CLEAR FLAG BIT
0458	52452	002002		SZA		CONSTANT?
0459	52453	026470		JMP	LIST10	NO
0460	52454	071572		STA	CHRCT	YES, SET
0461	52455	071266		STA	SIGN	FOR NO SIGN
0462	52456	035430		ISZ	LT1	LOAD
0463	52457	035274		ISZ	LT2	
0464	52460	104200		DLD	LT1,I	CONSTANT
	52461	101430				
0465	52462	035430		ISZ	LT1	
0466	52463	035274		ISZ	LT2	
0467	52464	002120		CLE	,SSA	NEGATIVE NUMBER?
0468	52465	002300		CCE		YES, ENABLE SIGN
0469	52466	015422		JSB	NUMOT	OUTPUT THE CONSTANT
0470	52467	026335		JMP	LIST3	
0471	52470	010371	LIST10	AND	.,+17B	ISOLATE TYPE PART
0472	52471	050355		CPA	.,+3	PROGRAM INTEGER?
0473	52472	026503		JMP	LIST11	YES
0474	52473	050371		CPA	.,+17B	NO, PRE-DEFINED FUNCTION?
0475	52474	002001		RSS		YES
0476	52475	026421		JMP	LIST6	NO, MUST BE A PARAMETER SYMBOL
0477	52476	061432		LDA	LT3	OUTPUT
0478	52477	001722		ALF	,RAL	
0479	52500	064510		LDB	ATAB	FUNCTION
0480	52501	015460		JSB	MCOUT	

					SYMBOL
0481	52502	026335		JMP LIST3	
0482	52503	035430	LIS11	ISZ LT1	
0483	52504	035274		ISZ LT2	
0484	52505	061440		LDA LT4	RESTORE OPERATOR
0485	52506	050636		CPA DIMOP	<DIM STATEMENT> ?
0486	52507	026333		JMP LIST3=2	YES
0487	52510	050742		CPA COMOP	NO, 'COMI'?
0488	52511	026333		JMP LIST3=2	YES
0489	52512	061442		LDA LT5	NO
0490	52513	165430		LDB LT1,I	LOAD PROSPECTIVE INTEGER
0491	52514	002002		SZA	PROGRAM 'COMPILED' ?
0492	52515	164001		LDB 1,I	YES
0493	52516	015456		JSB OUTIN	OUTPUT INTEGER
0494	52517	035430		ISZ LT1	MORE
0495	52520	035274		ISZ LT2	STATEMENT?
0496	52521	002001		R99	YES
0497	52522	026340		JMP LIST3+3	NO
0498	52523	061440		LDA LT4	LISTING
0499	52524	050776		CPA USEOP	'USING' ?
0500	52525	026353		JMP LIST4	YES
0501	52526	060426		LDA .+54B	EMIT
0502	52527	015454		JSB OUTCR	A COMMA
0503	52530	026512		JMP LIS11+7	
0504*					*
0505**				LIST MULTICHA	**
0506*					*
0507	52531	060412	LIS12	LDA .+40B	OUTPUT
0508	52532	015454		JSB OUTCR	A BLANK
0509	52533	161430		LDA LT1,I	OUTPUT
0510	52534	064470		LDB MCBOP	MULTICHA
0511	52535	015460		JSB MCOU	OPERATOR
0512	52536	060412		LDA .+40B	
0513	52537	065440		LDB LT4	WAS IT
0514	52540	054642		CPB REMOP	A 'REM' ?
0515	52541	026556		JMP LIS13	YES
0516	52542	054660		CPB FILOP	NO, 'FILES' ?
0517	52543	026555		JMP LIS13=1	YES
0518	52544	054746		CPB IMGOP	NO, 'IMAGE'?
0519	52545	026550		JMP LIS18	YES
0520	52546	015454		JSB OUTCR	NO, OUTPUT A BLANK
0521	52547	026377		JMP LIST5	
0522	52550	006400	LIS18	CLB	
0523	52551	061274		LDA LT2	
0524	52552	002006		INA,SZA	
0525	52553	015462		JSB OUTST	OUTPUT IMAGE STRING
0526	52554	026335		JMP LIST3	
0527	52555	015454		JSB OUTCR	OUTPUT A BLANK
0528	52556	007400	LIS13	CCB	OUTPUT
0529	52557	061274		LDA LT2	THE
0530	52560	015462		JSB OUTST	REMARK
0531	52561	026335		JMP LIST3	
0532*					*
0533**				OUTPUT TRAILER IF 'PUNCH'	**
0534*					*
0535	52562		LIS15	EQU *	

```

0536 52562 002400          CLA          'LIST'
0537 52563 051400          CPA LT0      MODE?
0538 52564 124514          JMP SCHEM,I  YES
0539 52565 060316          LDA M728    NO,
0540 52566 071356          STA DIGCT   OUTPUT
0541 52567 002400          CLA          FEED
0542 52570 015454          JSB OUTCR   FRAMES
0543 52571 035356          ISZ DIGCT   FOR
0544 52572 026567          JMP **3     TRAILER
0545 52573 124514          JMP SCHEM,I
0546*
0547 52574 060364 LIS16 LDA .+128  ECHO
0548 52575 015454          JSB OUTCR   LINE
0549 52576 124514          JMP SCHEM,I  FEED
0550*
0551** LIST A STRING CONSTANT **
0552*
0553 52577 015454 LIS14 JSB OUTCR  OUTPUT "
0554 52600 161430          LDA LT1,I   COMPUTE
0555 52601 010443          AND B377    WORDS
0556 52602 002003          SZA,RSS
0557 52603 026610          JMP LIS17
0558 52604 003004          CMA,INA     OF
0559 52605 001100          ARS         STRING
0560 52606 006400          CLB         OUTPUT
0561 52607 015462          JSB OUTST   STRING
0562 52610 060414 LIS17 LDA .+428
0563 52611 015454          JSB OUTCR   YES, OUTPUT IT
0564 52612 026335          JMP LIST3
0565**
0566*** LIST A MULTICHARACTER SYMBOL ***
0567**
0568*
0569* UPON ENTRY (A) HOLDS A WORD CONTAINING A SYMBOL CODE AND (B)
0570* HOLDS A POINTER TO THE PRINT NAME TABLE. THE SYMBOL IS FOUND
0571* IN THE TABLE AND ITS ASCII FORM OUTPUT.
0572*
0573 52613 010664 #MCOT AND OPMSK  SAVE
0574 52614 071440          STA LT4     SYMBOL
0575 52615 160001 MCOT1 LDA 1,I     DESIRED
0576 52616 010664          AND OPMSK  TABLE
0577 52617 051440          CPA LT4     ENTRY?
0578 52620 026627          JMP MCOT2   YES
0579 52621 160001          LDA 1,I     NO,
0580 52622 010361          AND .+7    COMPUTE
0581 52623 040355          ADA .+3    ADDRESS
0582 52624 001100          ARS         OF NEXT
0583 52625 044000          ADB 0      ENTRY
0584 52626 026615          JMP MCOT1
0585 52627 160001 MCOT2 LDA 1,I     COMPUTE
0586 52630 010361          AND .+7    COUNT
0587 52631 003004          CMA,INA    OF
0588 52632 001100          ARS         ASCII
0589 52633 071432          STA LT3    WORDS
0590 52634 075462          STB OUTST  SAVE ASCII SYMBOL ADDRESS

```


0591	52635	035462	MCOT3	ISZ	OUTST	MOVE TO NEXT WORD OF SYMBOL
0592	52636	161462		LDA	OUTST,I	OUTPUT
0593	52637	001727		ALF,ALF		HIGH
0594	52640	015454		JSB	OUTCR	
0595	52641	161462		LDA	OUTST,I	OUTPUT
0596	52642	010443		AND	B377	LOW CHARACTER
0597	52643	002002		SZA		IF NOT
0598	52644	015454		JSB	OUTCR	NULL
0599	52645	035432		ISZ	LT3	MORE SYMBOL?
0600	52646	026635		JMP	MCOT3	YES
0601	52647	125460		JMP	MCOUT,I	NO

0602**

0603*** LIST A STRING ***

0604**

0605*

0606* UPON ENTRY (A) HOLDS A NEGATIVE WORD COUNT OF THE STRING. IF
 0607* (B) # 0 THE STRING BEGINS WITH THE LOW HALF OF (LT1),I ; IF
 0608* (B) = 0 IT BEGINS WITH THE HIGH HALF OF THE WORD FOLLOWING
 0609* (LT1),I . A TRAILING NULL CHARACTER WILL NOT BE PRINTED.

0610*

0611	52650	071440	#OTST	STA	LT4	SAVE STRING WORD COUNT
0612	52651	006002		SZB		'REM' ?
0613	52652	026660		JMP	OTST2	YES
0614	52653	035430	OTST1	ISZ	LT1	NO, MOVE TO
0615	52654	035274		ISZ	LT2	NEXT PROGRAM WORD
0616	52655	161430		LDA	LT1,I	OUTPUT
0617	52656	001727		ALF,ALF		HIGH
0618	52657	015454		JSB	OUTCR	
0619	52660	161430	OTST2	LDA	LT1,I	OUTPUT
0620	52661	010443		AND	B377	LOW CHARACTER
0621	52662	002002		SZA		IF NOT
0622	52663	015454		JSB	OUTCR	NULL
0623	52664	035440		ISZ	LT4	MORE STRING?
0624	52665	026653		JMP	OTST1	YES
0625	52666	125462		JMP	OUTST,I	NO

```

0002** **
0003*** HANDLE OVERFLOW ***
0004** **
0005+
0006* (A) CONTAINS THE HIGH MANTISSA UPON ENTRY. (A) AND
0007* (B) CONTAIN THE LARGEST REPRESENTABLE NUMBER OF
0008* APPROPRIATE SIGN, PACKED, UPON EXIT.
0009*
0010 52667 064350 #OVFL LDB ,-2
0011 52670 002020 SSA
0012 52671 066005 LDB 88776
0013 52672 030274 IOR INF
0014 52673 002020 SSA
0015 52674 061036 LDA MNEG
0016 52675 125310 JMP OVFLW,I
0017** **
0018*** CHECK OVER/UNDERFLOWS ***
0019** **
0020+
0021* EXIT TO (P+1) IF STATUS IS NOT SYNTAX, ELSE EXIT TO (P+2),
0022* SETTING SYMTB = 4 IF IN KEYBOARD MODE, THESE ERRORS ARE NOT
0023* REPORTED IF IN TAPE MODE.
0024+
0025 52676 061571 #CHOU LDA LNAME COMPUTE
0026 52677 040362 ADA .+?STAT-?ID
0027 52700 164000 LDB 0,I STATUS
0028 52701 054356 CPB .+4 SYNTAX?
0029 52702 002001 RSS YES
0030 52703 026712 JMP CHOU1 NO
0031 52704 060362 LDA TAPEF TAPE
0032 52705 110257 AND MAIN,I
0033 52706 002003 SZA,RSS MODE?
0034 52707 075575 STB SYMTB NO
0035 52710 035476 ISZ CHOUF
0036 52711 125476 JMP CHOUF,I
0037 52712 035611 CHOU1 ISZ ENOUF ARE WE EXECUTING ENTER STATE?
0038 52713 002001 RSS NO
0039 52714 035476 ISZ CHOUF YES-->SUPPRESS ERROR
0040 52715 125476 JMP CHOUF,I
0041** **
0042*** LOOK FOR A NUMBER ***
0043** **
0044+
0045* NUMCK LOOKS FOR AN UNSIGNED NUMBER, SIGN MUST BE SET
0046* BY THE CALLER (SIGN = -1 FOR NEGATIVE, ELSE POSITIVE).
0047* (A) CONTAINS A CHARACTER UPON ENTRY; IF IT IS NEITHER
0048* A DIGIT NOR A DECIMAL POINT, EXIT IS TO (P+1) WITH
0049* (A) UNCHANGED AND (B) = 0. EXIT IS TO ERROR ON FINDING
0050* AN EXPONENT PART OF INCORRECT FORMAT. ZERO REPLACES AN
0051* UNDERFLOW; THE LARGEST REPRESENTABLE NUMBER OF THE
0052* APPROPRIATE SIGN REPLACES AN OVERFLOW. AFTER STORING A
0053* FLOATING POINT NUMBER IN M AND M+1 (WHERE 9BPTR,I = M)
0054* EXIT IS TO (P+2) WITH THE NEXT INPUT STRING CHARACTER
0055* IN (A) AND TEMP+1.
0056+

```

0057	52716	006400	#NMCK	CLB	ZERO
0058	52717	075322		STB EXP	ALL
0059	52720	075316		STB MANT1	COMPONENTS
0060	52721	075320		STB MANT2	OF THE
0061	52722	075324		STB EXPON	NUMBER
0062	52723	075614		STB TEMP+1	SET 'NUMBER FLAG' FALSE
0063	52724	007400		CCB	SET 'DECIMAL POINT'
0064	52725	075752		STB DPFLG	FLAG FALSE
0065	52726	050430	NUMC1	CPA ,+56B	DECIMAL POINT?
0066	52727	035752		ISZ DPFLG	YES
0067	52730	026734		JMP NUMC2	NO
0068	52731	002400		CLA	ZERO POST-DECIMAL
0069	52732	071324		STA EXPON	DIGIT
0070	52733	026771		JMP NUMC4+1	COUNTER
0071	52734	015264	NUMC2	JSB DIGCK	DIGIT?
0072	52735	027005		JMP NUMC7	NO
0073	52736	035324		ISZ EXPON	YES, COUNT DIGIT
0074	52737	100033		ASL 11	LEFT-JUSTIFY DIGIT
0075	52740	071615		STA TEMP+2	AND SAVE IT
0076	52741	015300		JSB MBY10	MULTIPLY PREVIOUS NUMBER BY 10
0077	52742	065322		LDB EXP	ZERO
0078	52743	006003		SZB,RSS	EXPONENT?
0079	52744	027000		JMP NUMC6	YES
0080	52745	044346		ADB ,=-4	NO,
0081	52746	007000		CMB	SAVE
0082	52747	061615		LDA TEMP+2	SHIFT
0083	52750	075615		STB TEMP+2	COUNT
0084	52751	006400		CLB	CLEAR LOWER MANTISSA
0085	52752	035615	NUMC3	ISZ TEMP+2	ALL SHIFTS DONE?
0086	52753	026775		JMP NUMC5	NO
0087	52754	000040		CLE	YES, ADD IN
0088	52755	045320		ADB MANT2	LOW PART
0089	52756	103101		CLO	OF NUMBER
0090	52757	002040		SEZ	OVERFLOW FROM (B)?
0091	52760	002004		INA	YES
0092	52761	041316		ADA MANT1	ADD IN HIGH PART OF MANTISSA
0093	52762	102301		SOS	OVERFLOW?
0094	52763	026770		JMP NUMC4	NO
0095	52764	000065		CLE,ERA	YES, CORRECT
0096	52765	005500		ERB	MANTISSA
0097	52766	035322		ISZ EXP	AND BUMP
0098	52767	000000		NOP	EXPONENT
0099	52770	015304	NUMC4	JSB NORML	NORMALIZE THE NUMBER
0100	52771	035614		ISZ TEMP+1	SET 'NUMBER FLAG' TRUE
0101	52772	015450		JSB GETCR	FETCH CHARACTER
0102	52773	027054		JMP NUM12-1	NONE FOUND
0103	52774	026726		JMP NUMC1	
0104	52775	000065	NUMC5	CLE,ERA	SHIFT
0105	52776	005500		ERB	DIGIT
0106	52777	026752		JMP NUMC3	RIGHT
0107	53000	060356	NUMC6	LDA ,+4	SET
0108	53001	071322		STA EXP	EXPONENT
0109	53002	061615		LDA TEMP+2	LOAD
0110	53003	006400		CLB	NUMBER
0111	53004	026770		JMP NUMC4	

0112	53005	006400	NUMC7	CLB	SET EXPONENT
0113	53006	075615		STB TEMP+2	SIGN TO '+'
0114	53007	055614		CPB TEMP+1	DIGIT OR DECIMAL POINT FOUND?
0115	53010	125276		JMP NUMCK,I	NO
0116	53011	050720		CPA E	'E' ?
0117	53012	002001		RSS	YES
0118	53013	027055		JMP NUM12	NO
0119	53014	015450		JSB GETCR	FETCH CHARACTER
0120	53015	027114		JMP NUM16	NONE FOUND
0121	53016	050425		CPA .+53B	'+' ?
0122	53017	027024		JMP NUMC8	YES
0123	53020	050427		CPA .+55B	NO, 'm' ?
0124	53021	003401		CCA,RSS	YES
0125	53022	027026		JMP NUMC9	NO
0126	53023	071615		STA TEMP+2	SET EXPONENT SIGN TO '-'
0127	53024	015450	NUMC8	JSB GETCR	FETCH CHARACTER
0128	53025	027114		JMP NUM16	NONE FOUND
0129	53026	015264	NUMC9	JSB DIGCK	DIGIT?
0130	53027	027114		JMP NUM16	NO
0131	53030	071614		STA TEMP+1	YES, SAVE IT
0132	53031	015450		JSB GETCR	
0133	53032	027050		JMP NUM11	
0134	53033	015264		JSB DIGCK	DIGIT?
0135	53034	027050		JMP NUM11	NO
0136	53035	061614		LDA TEMP+1	YES, MULTIPLY
0137	53036	075614		STB TEMP+1	PREVIOUS DIGIT
0138	53037	100200		MPY .+10	BY 10
	53040	000364			
0139	53041	041614		ADA TEMP+1	ADD IN NEW DIGIT
0140	53042	071614		STA TEMP+1	SAVE EXPONENT
0141	53043	015450		JSB GETCR	
0142	53044	027050		JMP NUM11	
0143	53045	015264		JSB DIGCK	THIRD DIGIT?
0144	53046	002001		RSS	NO
0145	53047	027114		JMP NUM16	YES
0146	53050	065614	NUM11	LDB TEMP+1	LOAD EXPONENT
0147	53051	035615		ISZ TEMP+2	POSITIVE?
0148	53052	007004		CMB,INB	YES, COMPLEMENT IT
0149	53053	002001		RSS	NO
0150	53054	006400		CLB	
0151	53055	071614	NUM12	STA TEMP+1	SAVE CHARACTER
0152	53056	035752		ISZ DPFLG	DECIMAL POINT FOUND?
0153	53057	045324		ADB EXPON	YES, CORRECT EXPONENT
0154	53060	006003		SZB,RSS	NO, ZERO EXPONENT?
0155	53061	027076		JMP NUM14	YES
0156	53062	006020		SSB	NO, POSITIVE EXPONENT?
0157	53063	027072		JMP NUM13	YES
0158	53064	007004		CMB,INB	NO, SET
0159	53065	075324		STB EXPON	COUNTER
0160	53066	015302		JSB DBY10	DIVIDE NUMBER BY 10
0161	53067	035324		ISZ EXPON	DONE?
0162	53070	027066		JMP *.2	NO
0163	53071	027076		JMP NUM14	YES
0164	53072	075324	NUM13	STB EXPON	SET COUNTER
0165	53073	015300		JSB MBY10	MULTIPLY NUMBER BY 10

PAGE 0236 #22 ASCII TO BINARY NUMBER CONVERSION

0166	53074	035324		ISZ EXPON	DONE?
0167	53075	027073		JMP *-2	NO
0168	53076	061316	NUM14	LDA MANT1	LOAD
0169	53077	065320		LDB MANT2	MANTISSA
0170	53100	035266		ISZ SIGN	POSITIVE?
0171	53101	027105		JMP NUM15	YES
0172	53102	003000		CMA	NO, COMPLEMENT
0173	53103	007007		CMB, INB, SZB, RSS	THE
0174	53104	002004		INA	NUMBER
0175	53105	015306	NUM15	JSB .PACK	NORMALIZE AND PACK
0176	53106	171574		STA SBPTR, I	STORE
0177	53107	015270		JSB SBPUD	NUMBER IN
0178	53110	175574		STB SBPTR, I	DESTINATION
0179	53111	015270		JSB SBPUD	ADDRESS
0180	53112	061614		LDA TEMP+1	RETRIEVE CHARACTER
0181	53113	035276		ISZ NUMCK	
0182	53114	035276	NUM16	ISZ NUMCK	
0183	53115	125276		JMP NUMCK, I	
0184**					**
0185***	MULTIPLY UNPACKED NUMBER BY 10				***
0186**					**
0187*					*
0188*	THE FLOATING POINT NUMBER IN MANT1, MANT2, AND EXP				
0189*	IS MULTIPLIED BY 10.				
0190*					*
0191	53116	061316	#MB10	LDA MANT1	LOAD HIGH MANTISSA
0192	53117	002003		SZA, RSS	ZERO NUMBER?
0193	53120	125300		JMP MBY10, I	YES
0194	53121	065322		LDB EXP	NO,
0195	53122	044355		AOB .+3	MULTIPLY
0196	53123	075322		STB EXP	BY 8
0197	53124	065320		LDB MANT2	LOAD LOW MANTISSA
0198	53125	000065		CLE, ERA	DIVIDE
0199	53126	005500		ERB	BY
0200	53127	000065		CLE, ERA	4
0201	53130	005540		ERB, CLE	
0202	53131	045320		AOB MANT2	ADD INTO
0203	53132	002040		SEZ	BOTH REGISTERS
0204	53133	002004		INA	PRODUCING
0205	53134	041316		ADA MANT1	1.25 * MANTISSA
0206	53135	002021		SSA, RSS	CORRECT
0207	53136	027143		JMP MBY01	
0208	53137	000065		CLE, ERA	ON
0209	53140	005500		ERB	
0210	53141	035322		ISZ EXP	OVERFLOW
0211	53142	000000		NOP	
0212	53143	071316	MBY01	STA MANT1	STORE
0213	53144	075320		STB MANT2	MANTISSA
0214	53145	125300		JMP MBY10, I	

```

0216**
0217*** NORMALIZE UNPACKED NUMBER ***
0218**
0219*
0220* ENTER WITH NUMBER IN (A), (B), AND EXP, EXIT WITH
0221* NORMALIZED NUMBER IN MANT1, MANT2, AND EXP (MANTISSA
0222* IS LEFT IN (A) AND (B) AS WELL).
0223*
0224 53146 071300 #NRML STA NT0 SET
0225 53147 002400 CLA LEFT-SHIFT
0226 53150 071615 STA TEMP+2 COUNTER
0227 53151 061300 LDA NT0 TO ZERO
0228 53152 002003 SZA,RSS IF NUMBER
0229 53153 006002 SZB IS ZERO,
0230 53154 027162 JMP NORM2+1 CLEAR
0231 53155 071322 STA EXP EVERYTHING
0232 53156 071316 STA MANT1 STORE
0233 53157 075320 NORM1 STB MANT2 MANTISSA
0234 53160 125304 JMP NORML,I
0235 53161 035615 NORM2 ISZ TEMP+2 COUNT A LEFT SHIFT
0236 53162 004066 CLE,ELB ROTATE (A)
0237 53163 001600 ELA AND (B) LEFT
0238 53164 002061 SEZ,SSA,RSS TWO HIGHEST BITS 0?
0239 53165 027161 JMP NORM2 YES, POSITIVE UNNORMALIZED
0240 53166 002060 SEZ,SSA NO, TWO HIGHEST BITS 1?
0241 53167 027161 JMP NORM2 YES, NEGATIVE UNNORMALIZED
0242 53170 001500 ERA NO, NORMALIZE
0243 53171 005540 ERB,CLE MANTISSA
0244 53172 071316 STA MANT1 COMPUTE
0245 53173 061615 LDA TEMP+2
0246 53174 003004 CMA,INA CORRECTED
0247 53175 041322 ADA EXP
0248 53176 071322 STA EXP EXPONENT
0249 53177 061316 LDA MANT1
0250 53200 027157 JMP NORM1
0251**
0252*** NORMALIZE AND PACK NUMBER ***
0253**
0254*
0255* NUMBER IN (A), (B), AND EXP ON ENTRY. ON EXIT (A)
0256* AND (B) CONTAIN THE NORMALIZED, ROUNDED, AND PACKED
0257* NUMBER. UNDERFLOW BECOMES A ZERO, OVERFLOW BECOMES
0258* THE LARGEST REPRESENTABLE NUMBER OF APPROPRIATE SIGN.
0259*
0260 53201 015304 #PACK JSB NORML NORMALIZE NUMBER
0261 53202 002103 CLE,SZA,RSS ZERO?
0262 53203 125306 JMP PACK,I YES
0263 53204 044441 ADB B177 NO, ROUND
0264 53205 002021 SSA,RSS POSITIVE?
0265 53206 006004 INB YES, FINISH ROUND
0266 53207 103101 CLO
0267 53210 002040 SEZ ON OVERFLOW FROM (B)
0268 53211 002104 CLE,INA CORRECT (A)
0269 53212 102301 SOS OVERFLOW? ( (A)=100000, (B)=0 )
0270 53213 001200 RAL TWO HIGH BITS

```

0271	53214	002031		SSA,SLA,RSS	BOTH 1? (IF (A) WAS 140000)
0272	53215	027220		JMP PACK1	NO
0273	53216	002300		CCE	YES
0274	53217	001130		ARS,SLA,ALS	SET (A) = 100000 AND SKIP
0275	53220	001300	PACK1	RAR	UNDOES RAL ABOVE
0276	53221	071615		STA TEMP+2	SAVE (A)
0277	53222	101050		LSR 8	DELETE 8 LOW BITS
0278	53223	005727		BLF,BLF	OF MANTISSA
0279	53224	061322		LDA EXP	DECREMENT
0280	53225	002040		SEZ	EXPONENT
0281	53226	040351		ADA ,-1	ON (E) # 0
0282	53227	102201		SOC	INCREMENT
0283	53230	002004		INA	EXPONENT ON OVERFLOW
0284	53231	040442		ADA B200	EXPONENT
0285	53232	002020		SSA	UNDERFLOW?
0286	53233	027252		JMP PACK3	YES
0287	53234	040762		ADA M256	NO, EXPONENT
0288	53235	002021		SSA,RSS	OVERFLOW?
0289	53236	027257		JMP PACK4	YES
0290	53237	040442		ADA B200	NO, RESTORE EXPONENT
0291	53240	001200		RAL	POSITION
0292	53241	010443		AND B377	EXPONENT AND
0293	53242	044000		ADB 0	ADD LOW MANTISSA
0294	53243	061615		LDA TEMP+2	RETRIEVE HIGH MANTISSA
0295	53244	051036		CPA MNEG	
0296	53245	002001		RSS	NEGATIVE
0297	53246	125306		JMP ,PACK,I	
0298	53247	055037		CPB MNEG+1	OVERFLOW?
0299	53250	027257		JMP PACK4	YES
0300	53251	125306		JMP ,PACK,I	NO
0301	53252	015476	PACK3	JSB CHOUF	CHECK STATUS
0302	53253	115215		JSB WERRS+6,I	
0303	53254	002400		CLA	ZERO RESULT
0304	53255	006400		CLB	ON UNDERFLOW
0305	53256	125306		JMP ,PACK,I	
0306	53257	015476	PACK4	JSB CHOUF	CHECK STATUS
0307	53260	115214		JSB WERRS+5,I	
0308	53261	061615		LDA TEMP+2	RETRIEVE HIGH MANTISSA
0309	53262	015310		JSB OVFLW	
0310	53263	125306		JMP ,PACK,I	
0311**					**
0312***					***
0313**					**
0314*					
0315*					
0316*					
0317	53264	061316	#DB10	LDA MANT1	RETURN
0318	53265	002003		SZA,RSS	ON
0319	53266	125302		JMP DBY10,I	ZERO
0320	53267	064350		LDB ,-2	ADD EXPONENT
0321	53270	045322		ADB EXP	OF 1/10 TO
0322	53271	075322		STB EXP	THAT OF NUMBER
0323	53272	061320		LDA MANT2	JUSTIFY
0324	53273	000065		CLE,ERA	LOWER MANTISSA
0325	53274	100200		MPY TENTH	MULTIPLY BY 1/10

	53275	052000		
0326	53276	000066	CLE,ELA	SHIFT
0327	53277	005640	ELB,CLE	BACK
0328	53300	040001	ADA 1	ADD IN EQUIVALENT OF
0329	53301	002040	SEZ	LOWER MANTISSA*
0330	53302	006104	CLE,INB	TENTH*2 [↑] (-16)
0331	53303	075320	STB MANT2	AND ROUND TO 16 BITS
0332	53304	061316	LDA MANT1	DO
0333	53305	100200	MPY TENTH	SAME TO
	53306	052000		
0334	53307	040001	ADA 1	HIGH MANTISSA
0335	53310	041320	ADA MANT2	PERFORM EFFECTIVE
0336	53311	002040	SEZ	SUM OF DOUBLE-LENGTH
0337	53312	006004	INB	PRODUCTS
0338	53313	101100	SWP	SWAP (A) AND (B)
0339	53314	015304	JSB NORML	NORMALIZE
0340	53315	125302	JMP DBY10,I	RESULT


```

0342**
0343*** PRINT NAME TABLE FOR MULTICHAACTER SYMBOLS ***
0344**
0345*
0346* BITS 15-9 OF THE 'OCT' WORD ARE THE BASIC OPERATOR
0347* CODES OF THE SYMBOLS, BITS 2-0 ARE THE LENGTH IN
0348* CHARACTERS OF THE SYMBOLS. THE ASCII VERSION (PRINT
0349* NAME) FOLLOWS.
0350*
0351*
0352** MULTICHAACTER BINARY OPERATORS **
0353*
0354 53316 032003 MCBOS OCT 32003 AND
0355 53317 040516 ASC 1,AN
0356 53320 042000 OCT 42000
0357 53321 033002 OCT 33002 OR
0358 53322 047522 ASC 1,OR
0359 53323 034003 OCT 34003 MIN
0360 53324 046511 ASC 1,MI
0361 53325 047000 OCT 47000
0362 53326 035003 OCT 35003 MAX
0363 53327 046501 ASC 1,MA
0364 53330 054000 OCT 54000
0365 53331 036002 MRELS OCT 36002 UNEQUAL
0366 53332 036076 ASC 1,<#
0367 53333 037002 OCT 37002 GREATER THAN OR EQUAL
0368 53334 037075 ASC 1,>#
0369 53335 040002 OCT 40002 LESS THAN OR EQUAL
0370 53336 036075 ASC 1,<#
0371*
0372** MULTICHAACTER UNARY OPERATOR **
0373*
0374 53337 041003 NOT OCT 41003
0375 53340 047117 ASC 1,NO
0376 53341 052000 OCT 52000
0377*
0378** STATEMENT TYPES **
0379*
0380 53342 042006 STYPS OCT 42006 ASSIGN
0381 53343 040523 ASC 3,ASSIGN
    53344 051511
    53345 043516
0382 53346 043005 USTMT OCT 43005 USING
0383 53347 052523 ASC 2,USIN
    53350 044516
0384 53351 043400 OCT 43400
0385 53352 044005 OCT 44005 IMAGE
0386 53353 044515 ASC 2,IMAG
    53354 040507
0387 53355 042400 OCT 42400
0388 53356 045003 OCT 45003 COM
0389 53357 041517 ASC 1,CO
0390 53360 046400 OCT 46400
0391 53361 046003 OCT 46003 LET
0392 53362 046105 ASC 1,LE

```

PAGE 0241 #22 PRINT NAME TABLE

0393	53363	052000	OCT	52000	
0394	53364	047003	OCT	47003	DIM
0395	53365	042111	ASC	1,DI	
0396	53366	046400	OCT	46400	
0397	53367	050003	OCT	50003	DEF
0398	53370	042100	ASC	1,DE	
0399	53371	043000	OCT	43000	
0400	53372	051003	OCT	51003	REM
0401	53373	051105	ASC	1,RE	
0402	53374	046400	OCT	46400	
0403	53375	052004	OCT	52004	GOTO
0404	53376	043517	ASC	2,GOTO	
	53377	052117			
0405	53400	053002	OCT	53002	IF
0406	53401	044506	ASC	1,IF	
0407	53402	054003	OCT	54003	FOR
0408	53403	043117	ASC	1,FO	
0409	53404	051000	OCT	51000	
0410	53405	055004	OCT	55004	NEXT
0411	53406	047105	ASC	2,NEXT	
	53407	054124			
0412	53410	056005	OCT	56005	GOSUB
0413	53411	043517	ASC	2,GOSU	
	53412	051525			
0414	53413	041000	OCT	41000	
0415	53414	057006	OCT	57006	RETURN
0416	53415	051105	ASC	3,RETURN	
	53416	052125			
	53417	051116			
0417	53420	060003	EOFOP OCT	60003	END
0418	53421	042516	ASC	1,EN	
0419	53422	042000	OCT	42000	
0420	53423	061004	OCT	61004	STOP
0421	53424	051524	ASC	2,STOP	
	53425	047520			
0422	53426	062004	OCT	62004	DATA
0423	53427	042101	ASC	2,DATA	
	53430	052101			
0424	53431	063005	IOSTS OCT	63005	INPUT
0425	53432	044516	ASC	2,INPU	
	53433	050125			
0426	53434	052000	OCT	52000	
0427	53435	064004	OCT	64004	READ
0428	53436	051105	ASC	2,READ	
	53437	040504			
0429	53440	065005	OCT	65005	PRINT
0430	53441	050122	ASC	2,PRIN	
	53442	044516			
0431	53443	052000	OCT	52000	
0432	53444	066007	OCT	66007	RESTORE
0433	53445	051105	ASC	3,RESTOR	
	53446	051524			
	53447	047522			
0434	53450	042400	OCT	42400	
0435	53451	067003	OCT	67003	MAT

0436	53452	046501		ASC 1,MA	
0437	53453	052000		OCT 52000	
0438	53454	070005		OCT 70005	FILES
0439	53455	043111		ASC 2,FILE	
	53456	046105			
0440	53457	051400		OCT 51400	
0441	53460	071005		OCT 71005	CHAIN
0442	53461	041510		ASC 2,CHAI	
	53462	040511			
0443	53463	047000		OCT 47000	
0444	53464	072005		OCT 72005	ENTER
0445	53465	042516		ASC 2,ENTE	
	53466	052105			
0446	53467	051000		OCT 51000	
0447	53470	073001		OCT 73001	'IMPLIED' LET
0448	53471	000000		OCT 0	
0449*					*
0450**	MISCELLANEOUS OPERATORS				**
0451*					*
0452	53472	074002		OCT 74002	OF
0453	53473	047506		ASC 1,OF	
0454	53474	075004	THEN	OCT 75004	
0455	53475	052110		ASC 2,THEN	
	53476	042516			
0456	53477	076002		OCT 76002	TO
0457	53500	052117		ASC 1,TO	
0458	53501	077004	STEP	OCT 77004	
0459	53502	051524		ASC 2,STEP	
	53503	042520			
0460*					*
0461**	PREDEFINED FUNCTIONS, BITS 13-9 ARE USED				**
0462**	FOR INTERNAL IDENTIFICATION				**
0463*					*
0464	53504	001003	TAB	OCT 1003	TAB
0465	53505	052101		ASC 1,TA	
0466	53506	041000		OCT 41000	
0467	53507	002003		OCT 2003	LIN
0468	53510	046111		ASC 1,LI	
0469	53511	047000		OCT 47000	
0470	53512	003003		OCT 3003	SPA
0471	53513	051520		ASC 1,SP	
0472	53514	040400		OCT 40400	
0473	53515	004003	PRDFS	OCT 4003	TAN
0474	53516	052101		ASC 1,TA	
0475	53517	047000		OCT 47000	
0476	53520	005003		OCT 5003	ATN
0477	53521	040524		ASC 1,AT	
0478	53522	047000		OCT 47000	
0479	53523	006003		OCT 6003	EXP
0480	53524	042530		ASC 1,EX	
0481	53525	050000		OCT 50000	
0482	53526	007003		OCT 7003	LUG
0483	53527	046117		ASC 1,LO	
0484	53530	043400		OCT 43400	
0485	53531	010003		OCT 10003	ABS

PAGE 0243 #22 PRINT NAME TABLE

0486	53532	040502	ASC	1,AB	
0487	53533	051400	OCT	51400	
0488	53534	011003	OCT	11003	SQR
0489	53535	051521	ASC	1,SG	
0490	53536	051000	OCT	51000	
0491	53537	012003	OCT	12003	INT
0492	53540	044516	ASC	1,IN	
0493	53541	052000	OCT	52000	
0494	53542	013003	OCT	13003	RND
0495	53543	051116	ASC	1,KN	
0496	53544	042000	OCT	42000	
0497	53545	014003	OCT	14003	SGN
0498	53546	051507	ASC	1,SG	
0499	53547	047000	OCT	47000	
0500	53550	015003	OCT	15003	LEN
0501	53551	046105	ASC	1,LE	
0502	53552	047000	OCT	47000	
0503	53553	016003	OCT	16003	TYP
0504	53554	052131	ASC	1,TY	
0505	53555	050000	OCT	50000	
0506	53556	017003	OCT	17003	TIM
0507	53557	052111	ASC	1,TI	
0508	53560	046400	OCT	46400	
0509	53561	020003	OCT	20003	SIN
0510	53562	051511	ASC	1,SI	
0511	53563	047000	OCT	47000	
0512	53564	021003	OCT	21003	COS
0513	53565	041517	ASC	1,CO	
0514	53566	051400	OCT	51400	
0515	53567	022003	OCT	22003	BRK
0516	53570	041122	ASC	1,BR	
0517	53571	045400	OCT	45400	
0518*			*		
0519**	MATRIX FUNCTIONS		**		
0520*			*		
0521	53572	024003	MATFS OCT	24003	ZER
0522	53573	055105	ASC	1,ZE	
0523	53574	051000	OCT	51000	
0524	53575	025003	OCT	25003	CON
0525	53576	041517	ASC	1,CO	
0526	53577	047000	OCT	47000	
0527	53600	026003	OCT	26003	IDN
0528	53601	044504	ASC	1,IO	
0529	53602	047000	OCT	47000	
0530	53603	027003	OCT	27003	INV
0531	53604	044516	ASC	1,IN	
0532	53605	053000	OCT	53000	
0533	53606	030003	OCT	30003	TRN
0534	53607	052122	ASC	1,IR	
0535	53610	047000	OCT	47000	

```

0002 54000          ORG 54000B
0003 54000 000130  .X   OCT 130
0004 54001 000123  S    OCT 123
0005 54002 000104  D    OCT 104
0006 54003 000101  .A   OCT 101
0007 54004 177722  M46  DEC =46
0008 54005 000111  .,73 DEC 73
0009*
0010* THE ADDRESS OF THE FIRST WORD OF THE FORMAT
0011* STRING IS IN (B) UPON ENTRY. THE FORMATTER
0012* EXTRACTS THE NUMBER OF CHARACTERS IN THE STRING
0013* AND THEN EXTRACTS THE FORMAT SPECIFICATIONS
0014* ONE BY ONE. AS EACH SPECIFICATION IS EXTRACTED,
0015* IT IS LOADED INTO A STACK, ONE CHARACTER PER
0016* WORD AND CHECKED FOR SYNTAX ERRORS. THE
0017* TYPE OF SPECIFICATION IS DETERMINED AT THIS
0018* TIME AND THE SPECIFICATION IS THEN EXECUTED
0019* FROM THE STACK.
0020*
0021 54006 075645  #FRMT STB EC      SAVE POINTER TO STRING
0022 54007 006004          INB      MAKE INTO
0023 54010 004066          CLE,ELB   CHARACTER POINTER
0024 54011 044000          ADB A     ADD IN STARTING CHARACTER
0025 54012 003004          CMA,INA  SAVE STARTING
0026 54013 071745          STA CC   CHARACTER
0027 54014 075761          STB IFSTR  SAVE IN FORMAT STRING ADDRESS
0028 54015 075751          STB DP   AND DELIMITER POINTER
0029 54016 065762          LDB NCH  MAYBE
0030 54017 006002          SZB
0031 54020 026027          JMP FM0   YES
0032 54021 161645          LDA EC,I  NO, COMPUTE #
0033 54022 010443          AND B377  OF CHARACTERS
0034 54023 041745          ADA CC   IN FORMAT
0035 54024 071762          STA NCH  STRING
0036 54025 002003          SZA,RSS  NULL STRING?
0037 54026 027674          JMP FMEND+1 YES, IGNORE IT
0038 54027 002400  FM0   CLA      INITIALIZE
0039 54030 071745          STA CC   CHARACTER COUNTER
0040 54031 071750          STA CONTR CONTROL CHARACTER
0041 54032 071645          STA EC   EXPRESSION COUNTER
0042 54033 071746          STA CC1  START OF PARENTHESIS LEVEL 1
0043 54034 071747          STA CC2  START OF PARENTHESIS LEVEL 2
0044 54035 071765          STA PC1  REPETITION COUNT FOR LEVEL 1
0045 54036 071766          STA PC2  REPETITION COUNT FOR LEVEL 2
0046 54037 071650          STA SFLG STRING FLAG
0047 54040 015540  FMT2  JSB DSRCH  DELIMITER SEARCH
0048 54041 102101          STO      IGNORE BLANKS
0049 54042 061646          LDA FST  GET THE
0050 54043 015542          JSB MCHAR FIRST CHARACTER
0051 54044 051751          CPA DP   DELIMITER FOUND ?
0052 54045 027673          JMP FMEND YES
0053 54046 050425          CPA .+53B IS CHARACTER A PLUS ?
0054 54047 026055          JMP FMT1 YES
0055 54050 050427          CPA .+55B IS IT A MINUS ?
0056 54051 026055          JMP FMT1 YES

```

PAGE 0245 #23 FORMATTED OUTPUT ROUTINE

0057	54052	050415	CPA	.,+43B	NO, IS IT A NUMBER SIGN
0058	54053	002001	RSS		YES
0059	54054	026105	JMP	FMT3	NO
0060	54055	065745	FMT1	LDB CC	END OF
0061	54056	055762	CPB	NCH	STRING ?
0062	54057	115170	JSB	FERRS,I	YES, ERROR
0063	54060	071750	STA	CONTR	SAVE CARR, CONTROL CHARACTER
0064	54061	035646	ISZ	FST	INCREMENT STRING POINTER
0065	54062	061646	LDA	FST	
0066	54063	102101	STO		IGNORE BLANKS
0067	54064	015542	JSB	MCHAR	GET NEXT CHARACTER
0068	54065	051751	CPA	DP	DELIMITER FOUND ?
0069	54066	002001	RSS		YES
0070	54067	026073	JMP	FMT01	NO, CHARACTER FOUND ?
0071	54070	103101	CLO		GET
0072	54071	061751	LDA	DP	THE
0073	54072	015542	JSB	MCHAR	DELIMITER
0074	54073	050426	FMT01	CPA ,+54B	IS IT A COMMA ?
0075	54074	002001	RSS		YES
0076	54075	115171	JSB	FERRS+1,I	NO, ERROR
0077	54076	035751	ISZ	DP	INCREMENT DELIMITER POINTER
0078	54077	035745	ISZ	CC	AND CHARACTER COUNTER
0079	54100	065745	LDB	CC	
0080	54101	055762	CPB	NCH	ALL CHARACTERS USED ?
0081	54102	115170	JSB	FERRS,I	YES, ERROR
0082	54103	061751	LDA	DP	NO
0083	54104	015540	JSB	DSRCH	FIND NEXT DELIMITING CHARACTER
0084	54105	003400	FMT3	CCA	INITIALIZE
0085	54106	071752	STA	DPFLG	FIXED FLAG
0086	54107	071754	STA	EFLAG	FLOATING FLAG
0087	54110	002004	INA		
0088	54111	071763	STA	NUM1	PRE-DECIMAL POINT D COUNTER
0089	54112	071764	STA	NUM2	POST-DECIMAL POINT D COUNTER
0090	54113	071770	STA	SBD	S BEFORE D COUNTER
0091	54114	071767	STA	SAD	S AFTER D COUNTER
0092	54115	071742	STA	SNFLG	SIGN FLAG
0093	54116	071732	STA	NAD	POST-DECIMAL ZERO COUNTER
0094	54117	071733	STA	NBD	PRE-DECIMAL POINT DIGIT COUNT
0095	54120	002004	INA		
0096	54121	071776	STA	REPCT	REPETITION COUNT
0097	54122	061760	LDA	IFSS	FORMAT STACK
0098	54123	071757	STA	FSP	POINTER
0099	54124	061646	LDA	FST	GET NON-DELIMITING
0100	54125	102101	STO		CHARACTER
0101	54126	015542	JSB	MCHAR	IGNORING BLANKS
0102	54127	051751	CPA	DP	IS IT A DELIMITER ?
0103	54130	115170	JSB	FERRS,I	YES
0104	54131	050414	FMT4	CPA ,+42B	IS IT A QUOTE ?
0105	54132	002001	RSS		YES
0106	54133	026177	JMP	FMT0	NO
0107	54134	065751	LDB	DP	
0108	54135	007004	CMB,	INB	RESET
0109	54136	045646	ADB	FST	CHARACTER
0110	54137	045745	ADB	CC	COUNTER
0111	54140	075745	STB	CC	

0112	54141	035646	FMT16	ISZ FST	INCREMENT STRING POINTER
0113	54142	061745		LDA CC	ALL
0114	54143	051762		CPA NCH	CHARACTERS USED ?
0115	54144	115172		JSB FERRS+2,I	YES, ERROR
0116	54145	035745		ISZ CC	INCREMENT CHARACTER COUNTER
0117	54146	061646		LDA FST	
0118	54147	103101		CLO	DON'T IGNORE BLANKS
0119	54150	015542		JSB MCHAR	GET NEXT CHARACTER
0120	54151	171757		STA FSP,I	LOAD CHARACTER ONTO STACK
0121	54152	035757		ISZ FSP	INCREMENT STACK POINTER
0122	54153	050414		CPA .+42B	IS IT A " ?
0123	54154	002001		RSS	YES
0124	54155	026141		JMP FMT16	NO
0125	54156	035646		ISZ FST	INCREMENT STRING POINTER
0126	54157	035745		ISZ CC	AND CHARACTER COUNTER
0127	54160	061745		LDA CC	ALL
0128	54161	051762		CPA NCH	CHARACTERS USED ?
0129	54162	026435		JMP FMT46	YES
0130	54163	061646		LDA FST	RESET
0131	54164	071751		STA DP	DELIMITER
0132	54165	015540		JSB USRCH	POINTER
0133	54166	061646		LDA FST	NEXT CHARACTER
0134	54167	051751		CPA DP	A DELIMITER ?
0135	54170	026435		JMP FMT46	YES
0136	54171	102101		STO	IGNORE BLANKS
0137	54172	015542		JSB MCHAR	FETCH A FORMAT STRING CHARACTER
0138	54173	061646		LDA FST	WOULD IT BE
0139	54174	055751		CPB DP	A DELIMITER ?
0140	54175	026435		JMP FMT46	YES
0141	54176	115171		JSB FERRS+1,I	NO, ERROR
0142	54177	052001	FMT0	CPA S	IS IT AN S ?
0143	54200	026330		JMP FMT14	YES
0144	54201	050430		CPA .+56B	IS IT A . ?
0145	54202	026316		JMP FMT9	YES
0146	54203	050720		CPA E	IS IT AN E ?
0147	54204	026325		JMP FMT13	YES
0148	54205	015264		JSB DIGCK	IS IT A DIGIT ?
0149	54206	026255		JMP FMT6	NO
0150	54207	071776		STA REPCT	YES, STORE IN REPCT
0151	54210	035646		ISZ FST	INCREMENT STRING POINTER
0152	54211	061646		LDA FST	NEXT CHARACTER
0153	54212	051751		CPA DP	A DELIMITER ?
0154	54213	115173		JSB FERRS+3,I	YES, ERROR
0155	54214	102101		STO	IGNORE BLANKS
0156	54215	015542		JSB MCHAR	GET NEXT CHARACTER
0157	54216	051751		CPA DP	IS IT A DELIMITER ?
0158	54217	115173		JSB FERRS+3,I	
0159	54220	015264		JSB DIGCK	IS IT A DIGIT ?
0160	54221	026243		JMP FMT5	NO
0161	54222	061776		LDA REPCT	YES,
0162	54223	075776		STB REPCT	MULTIPLY PREVIOUS
0163	54224	100200		MPY .+12B	DIGIT BY 10
		54225			
0164	54226	041776		ADA REPCT	ADD IN ONES DIGIT
0165	54227	071776		STA REPCT	

PAGE 0247 #23 FORMATTED OUTPUT ROUTINE

0166	54230	035646	ISZ FST	INCREMENT STRING POINTER
0167	54231	061646	LDA FST	NEXT CHARACTER
0168	54232	051751	CPA DP	A DELIMITER ?
0169	54233	115173	JSB FERRS+3,I	YES, ERROR
0170	54234	102101	STO	IGNORE BLANKS
0171	54235	015542	JSB MCHAR	GET NEXT CHARACTER
0172	54236	051751	CPA DP	IS IT A DELIMITER ?
0173	54237	115173	JSB FERRS+3,I	
0174	54240	015264	JSB DIGCK	THIRD DIGIT ?
0175	54241	002001	RSS	
0176	54242	115174	JSB FERRS+4,I	YES, ERROR
0177	54243	065776	FMT5 LDB REPCT	
0178	54244	006003	SZB,RSS	REPCT ZERO ?
0179	54245	115175	JSB FERRS+5,I	YES
0180	54246	044752	ADB M73	NO, GREATER
0181	54247	005021	SSB,RSS	THAN 72?
0182	54250	115174	JSB FERRS+4,I	YES
0183	54251	046005	ADB .,73	RESTORE REPCT
0184	54252	007004	CMB,INB	SET NUMBER FLAG
0185	54253	175757	STB FSP,I	LOAD ONTO FORMAT STACK
0186	54254	035757	ISZ FSP	INCREMENT STACK POINTER
0187	54255	052000	FMT6 CPA .X	IS NEXT CHARACTER AN X ?
0188	54256	026276	JMP FMT8	YES
0189	54257	052003	CPA .A	IS IT AN A ?
0190	54260	026321	JMP FMT10	YES
0191	54261	052002	CPA D	IS IT A D ?
0192	54262	002001	RSS	YES
0193	54263	026340	JMP FMT15	NO
0194	54264	065752	LDB DPFLG	DPFLG = -1?
0195	54265	005002	SZB	
0196	54266	026273	JMP FMT7	YES
0197	54267	065764	LDB NUM2	ADD REPCT TO
0198	54270	045776	ADB REPCT	POST-DECIMAL
0199	54271	075764	STB NUM2	DIGIT COUNTER
0200	54272	026276	JMP FMT8	
0201	54273	065763	FMT7 LDB NUM1	ADD REPCT TO
0202	54274	045776	ADB REPCT	PRE-DECIMAL
0203	54275	075763	STB NUM1	DIGIT COUNTER
0204	54276	006404	FMT8 CLB,INB	REINITIALIZE
0205	54277	075776	STB REPCT	REPCT
0206	54300	171757	STA FSP,I	LOAD CHARACTER ONTO STACK
0207	54301	035646	ISZ FST	INCREMENT STRING POINTER
0208	54302	035757	ISZ FSP	AND STACK POINTER
0209	54303	061646	LDA FST	NEXT CHARACTER
0210	54304	051751	CPA DP	A DELIMITER ?
0211	54305	026313	JMP FMT08	YES
0212	54306	102101	STO	IGNORE BLANKS
0213	54307	015542	JSB MCHAR	GET NEXT CHARACTER
0214	54310	051751	CPA DP	IS IT A DELIMITER ?
0215	54311	002001	RSS	YES
0216	54312	026177	JMP FMT0	
0217	54313	065757	FMT08 LDB FSP	
0218	54314	075755	STB EST	SET END OF STACK MARK
0219	54315	026343	JMP FMT18	
0220	54316	035752	FMT9 ISZ DPFLG	DPFLG = -1 ?

0221	54317	115176		JSB FERRS+6, I	NO
0222	54320	026300		JMP FMT8+2	YES
0223	54321	065650	FMT10	LDB SFLG	IS SFLG
0224	54322	006003		SZB, RSS	
0225	54323	035650	FMT11	ISZ SFLG	YES, INCREMENT IT
0226	54324	026276		JMP FMT8	NO
0227	54325	035754	FMT13	ISZ EFLAG	EFLAG = -1?
0228	54326	115177		JSB FERRS+7, I	NO
0229	54327	026300		JMP FMT8+2	YES
0230	54330	065763	FMT14	LDB NUM1	
0231	54331	045764		ADB NUM2	ANY D'S FOUND ?
0232	54332	006003		SZB, RSS	
0233	54333	035770		ISZ SBD	NO, INCREMENT BEFORE COUNTER
0234	54334	065770		LDB SBD	ANY S'S BEFORE A D ?
0235	54335	006003		SZB, RSS	
0236	54336	035767		ISZ SAD	NO, INCREMENT AFTER COUNTER
0237	54337	026300		JMP FMT8+2	
0238	54340	050422	FMT15	CPA, +50B	IS CHARACTER A (?
0239	54341	027433		JMP FMT95	YES
0240	54342	115200		JSB FERRS+8, I	NO, ILLEGAL CHARACTER
0241	54343	061760	FMT18	LDA IFSS	REINITIALIZE
0242	54344	071757		STA FSP	STACK POINTER
0243	54345	003400		CCA	AND
0244	54346	071776		STA REPCT	REPCT
0245	54347	041650		ADA SFLG	SFLG = 1 ?
0246	54350	002003		SZA, RSS	
0247	54351	026500		JMP FMT24	YES
0248	54352	040350		ADA, -2	SFLG = 3 ?
0249	54353	002021		SSA, RSS	
0250	54354	026502		JMP FMT25	YES
0251	54355	061763		LDA NUM1	NO, ANY
0252	54356	041764		ADA NUM2	D'S
0253	54357	002003		SZA, RSS	FOUND ?
0254	54360	026457		JMP FMT20	NO
0255	54361	015544		JSB EVEXP	EVALUATE EXPRESSION
0256	54362	027673		JMP FMEND	NONE FOUND
0257	54363	115201		JSB FERRS+9, I	STRING--ERROR
0258	54364	071316		STA MANT1	IF NUMBER
0259	54365	071740		STA NUMW1	SAVE HIGH MANTISSA
0260	54366	015414		JSB, FLUN	UNPACK NUMBER
0261	54367	071322		STA EXP	AND SAVE THE EXPONENT
0262	54370	061316		LDA MANT1	IS THE NUMBER NEGATIVE ?
0263	54371	002021		SSA, RSS	
0264	54372	026414		JMP FMT31	NO
0265	54373	060427		LDA, +55B	YES, SET SIGN TO MINUS
0266	54374	071266		STA SIGN	AND
0267	54375	007104		CMB, CLE, INB	COMPLEMENT
0268	54376	061316		LDA MANT1	
0269	54377	003000		CMA	OVERFLOW FROM
0270	54400	002041		SEZ, RSS	LOW MANTISSA ?
0271	54401	026411		JMP FMT31-3	NO
0272	54402	002004		INA	YES, OVERFLOW FROM
0273	54403	102301		SOS	HIGH MANTISSA ?
0274	54404	026411		JMP FMT31-3	NO
0275	54405	000065		CLE, ERA	YES, SHIFT RIGHT

0276	54406	005500	ERB	AND
0277	54407	035322	ISZ EXP	BUMP EXPONENT
0278	54410	000000	NOP	
0279	54411	071316	STA MANT1	
0280	54412	071740	STA NUMW1	SAVE HIGH MANTISSA
0281	54413	026416	JMP *+3	
0282	54414	060425	FMT31 LDA ,+53B	SET SIGN
0283	54415	071266	STA SIGN	TO PLUS
0284	54416	075320	STB MANT2	
0285	54417	075741	STB NUMW2	SAVE LOW MANTISSA
0286	54420	061322	LDA EXP	
0287	54421	071651	STA EXPW	AND EXPONENT
0288	54422	006404	CLB, INB	SET EXPRESSION
0289	54423	075645	STB EC	FOUND FLAG
0290	54424	060760	LDA IHB	HOLDING BUFFER
0291	54425	071730	STA HBp	POINTER
0292	54426	061754	LDA EFLAG	EFLAG
0293	54427	002003	SZA, RSS	SET ?
0294	54430	027210	JMP FMT62	YES
0295	54431	061752	LDA DPFLG	DPFLG
0296	54432	002003	SZA, RSS	SET
0297	54433	027047	JMP FMT45	YES
0298	54434	026551	JMP FMT30	NO
0299**				**
0300***	OUTPUT A LITERAL STRING			***
0301**				**
0302	54435	061760	FMT46 LDA IFSS	RESET
0303	54436	071757	STA FSP	STACK POINTER
0304	54437	161757	LDA FSP, I	TOP OF STACK
0305	54440	050414	CPA ,+42B	A " ?
0306	54441	027332	JMP FMT90	YES, DONE WITH THIS SPEC
0307	54442	050370	CPA ,+16B	IS IT A PSEUDO-LINEFEED ?
0308	54443	060364	LDA ,+12B	YES, MAKE IT A LINEFEED
0309	54444	050371	CPA ,+17B	IS IT A PSEUDO CARRIAGE RETURN ?
0310	54445	002001	RSS	YES
0311	54446	026454	JMP FMT47	NO
0312	54447	060375	LDA ,+23B	OUTPUT AN X-OFF
0313	54450	015454	JSB OUTCR	
0314	54451	060367	LDA ,+15B	OUTPUT A
0315	54452	015454	JSB OUTCR	CARRIAGE RETURN
0316	54453	002400	CLA	AND A NULL.
0317	54454		FMT47 EQU *	
0318	54454	015454	JSB OUTCR	NO, OUTPUT THE CHARACTER
0319	54455	035757	ISZ FSP	INCREMENT STACK POINTER
0320	54456	026437	JMP FMT46+2	NO
0321**				**
0322***	OUTPUT A BLANK SPECIFICATION			***
0323**				**
0324	54457	161757	FMT20 LDA FSP, I	LOAD TOP OF STACK
0325	54460	002021	SSA, RSS	IS IT A NUMBER ?
0326	54461	026465	JMP FMT21	NO
0327	54462	071776	STA REPC	YES, STORE NUMBER IN REPC
0328	54463	035757	ISZ FSP	INCREMENT STACK POINTER
0329	54464	161757	LDA FSP, I	LOAD NEW TOP OF STACK
0330	54465	052000	FMT21 CPA ,X	IS IT AN X ?

0331	54466	002001	RSS	YES
0332	54467	115200	JSB FERRS+8,I	NO, ERROR
0333	54470	015534	JSB OUTBL	
0334	54471	003400	CCA	REINITIALIZE
0335	54472	071776	STA REPCT	REPCT
0336	54473	061757	LDA FSP	END
0337	54474	051755	CPA EST	OF STACK
0338	54475	027332	JMP FMT00	YES
0339	54476	161757	LDA FSP,I	LOAD NEW TOP OF STACK
0340	54477	026457	JMP FMT20	
0341**			**	
0342***	OUTPUT A STRING		***	
0343**			**	
0344	54500		FMT24 EQU *	
0345	54500	015544	JSB EVEXP	EVALUATE NEXT EXPRESSION
0346	54501	027673	JMP FMEND	NONE FOUND
0347	54502		FMT25 EQU *	
0348	54502	006405	CLB,INB,RSS	SET THE EXPRESSION
0349	54503	115206	JSB FERRS+14,I	
0350	54504	075645	STB EC	FOUND FLAG
0351	54505	161757	LDA FSP,I	LOAD TOP OF STACK
0352	54506	002021	SSA,RSS	IS IT A NUMBER ?
0353	54507	026513	JMP FMT26	NO
0354	54510	071776	STA REPCT	YES
0355	54511	035757	ISZ FSP	INCREMENT STACK POINTER
0356	54512	161757	LDA FSP,I	LOAD NEW TOP OF STACK
0357	54513	052000	FMT26 CPA .X	IS IT AN X ?
0358	54514	002001	RSS	YES
0359	54515	026520	JMP FMT27	NO
0360	54516	015534	JSB OUTBL	
0361	54517	026543	JMP FMT28	
0362	54520	052003	FMT27 CPA .A	IS IT AN A ?
0363	54521	002001	RSS	YES
0364	54522	115201	JSB FERRS+9,I	NO, ERROR
0365	54523	035757	ISZ FSP	INCREMENT STACK POINTER
0366	54524		FMT05 EQU *	
0367	54524	015364	JSB FSCH	FETCH STRING CHARACTER
0368	54525	061573	LDA BLANK	NO, FETCH A BLANK
0369	54526	050370	CPA .+16B	IS IT A PSEUDO-LINEFEED ?
0370	54527	060364	LDA .+12B	YES, MAKE IT A LINEFEED
0371	54530	050371	CPA .+17B	IS IT A PSEUDO CARRIAGE RETURN ?
0372	54531	002001	RSS	YES
0373	54532	026540	JMP FMT29	NO
0374	54533	060375	LDA .+23B	OUTPUT AN X-OFF
0375	54534	015454	JSB OUTCR	
0376	54535	060367	LDA .+15B	OUTPUT A
0377	54536	015454	JSB OUTCR	CARRIAGE RETURN
0378	54537	002400	CLA	AND A NULL.
0379	54540		FMT29 EQU *	
0380	54540	015454	JSB OUTCR	OUTPUT CHARACTER
0381	54541	035776	ISZ REPCT	REPCT USED UP ?
0382	54542	026524	JMP FMT05	NO
0383	54543	003400	FMT28 CCA	REINITIALIZE
0384	54544	071776	STA REPCT	REPCT
0385	54545	061757	LDA FSP	END OF

0386	54546	051755	CPA	EST	STACK ?
0387	54547	027332	JMP	FMT90	
0388	54550	026502	JMP	FMT25	NO
0389**					**
0390***	PREPARE AN INTEGER FOR OUTPUT				***
0391**					**
0392	54551	002400	FMT30	CLA	INITIALIZE PRE-DECIMAL POINT
0393	54552	071324		STA EXPON	DIGIT COUNTER
0394	54553	003400		CCA	
0395	54554	041322		ADA EXP	EXPONENT ZERO OR NEGATIVE ?
0396	54555	002021		SSA, RSS	
0397	54556	026565		JMP FMT32	NO
0398	54557	060432		LDA ,+60B	YES, LOAD A
0399	54560	171730		STA HBP, I	ZERO
0400	54561	035730		ISZ HBP	INCREMENT BUFFER POINTER
0401	54562	003400		CCA	NUMBER OF BUFFER WORDS
0402	54563	071735		STA NHBW	IS ONE
0403	54564	026576		JMP FMT33	
0404	54565	015530	FMT32	JSB DTL1	
0405	54566	071324		STA EXPON	SAVE NUMBER
0406	54567	071735		STA NHBW	OF DIGITS
0407	54570	015424		JSB GETDG	GET DIGIT
0408	54571	040432		ADA ,+60B	CONVERT TO ASCII
0409	54572	171730		STA HBP, I	STORE IN HOLD BUFFER
0410	54573	035730		ISZ HBP	ALL DIGITS
0411	54574	035324		ISZ EXPON	FOUND ?
0412	54575	026570		JMP FMT32+3	NO
0413	54576	061763	FMT33	LDA NUM1	COMPUTE NUMBER OF
0414	54577	041735		ADA NHBW	LEADING BLANKS
0415	54600	060770		LDB SBD	ANY S'S
0416	54601	045767		ADB SAD	FOUND ?
0417	54602	006002		SZB	
0418	54603	026612		JMP FMT43	YES
0419	54604	065266		LDB SIGN	NO, NUMBER POSITIVE ?
0420	54605	054425		CPB ,+53B	
0421	54606	026612		JMP FMT43	YES
0422	54607	040351		ADA ,=1	NO, SAVE ROOM
0423	54610	006404		CLB, INB	FOR
0424	54611	075742		STB SNFLG	PRINTING SIGN
0425	54612	002020	FMT43	SSA	NUMBER OF BLANKS NEGATIVE ?
0426	54613	027570		JMP FMT80	YES
0427	54614	071734		STA NBLK	NO
0428	54615	015532		JSB ROUND	ROUND NUMBER IN BUFFER
0429	54616	002001		RSS	
0430	54617	027570		JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0431	54620	064760		LDB IHB	REINITIALIZE
0432	54621	075730		STB HBP	HOLD BUFFER POINTER
0433**					**
0434***	OUTPUT NUMBER FROM HOLDING BUFFER				***
0435**					**
0436	54622	161757	FMT34	LDA FSP, I	LOAD TOP OF FORMAT STACK
0437	54623	052001		CPA S	IS IT AN S ?
0438	54624	002001		RSS	YES
0439	54625	026645		JMP FMT36	NO
0440	54626	035757		ISZ FSP	INCREMENT STACK POINTER

0441	54627	061742	LDA	SNFLG	
0442	54630	002002	SZA		SNFLG = 0 ?
0443	54631	026777	JMP	FMT59	NO, IGNORE THE S
0444	54632	065770	LDB	SBD	YES, ANY S'S BEFORE A D ?
0445	54633	006002	SZB		
0446	54634	026642	JMP	FMT35	YES
0447	54635	061266	LDA	SIGN	NO, OUTPUT SIGN
0448	54636	015454	JSB	OUTCR	IMMEDIATELY
0449	54637	060354	LDA	+.2	SET SNFLG TO 2
0450	54640	071742	STA	SNFLG	
0451	54641	026777	JMP	FMT59	
0001	54642	007400	FMT35	CCB	
0002	54643	075742	STB	SNFLG	SET SNFLG TO -1
0003	54644	026622	JMP	FMT34	
0004	54645	002021	FMT36	SSA, RSS	TOP OF STACK A NUMBER ?
0005	54646	026652	JMP	FMT06	NO
0006	54647	071776	STA	REPCT	YES, STORE IN REPCT
0007	54650	035757	ISZ	FSP	INCREMENT STACK POINTER
0008	54651	161757	LDA	FSP, I	LOAD NEW TOP OF STACK
0009	54652	052000	FMT06	CPA .X	IS TOP AN X ?
0010	54653	002001	RSS		YES
0011	54654	026661	JMP	FMT37	NO
0012	54655	015534	JSB	OUTBL	
0013	54656	003400	CCA		REINITIALIZE
0014	54657	071776	STA	REPCT	REPCT
0015	54660	026777	JMP	FMT59	
0016	54661	052002	FMT37	CPA D	TOP OF STACK A D ?
0017	54662	002001	RSS		YES
0018	54663	026753	JMP	FMT57	NO
0019	54664	035757	ISZ	FSP	INCREMENT STACK POINTER
0020	54665	003400	CCA		
0021	54666	041734	ADA	NBLK	NUMBER OF BLANKS > 0 ?
0022	54667	002020	SSA		
0023	54670	026677	JMP	FMT07	NO
0024	54671	061573	LDA	BLANK	YES, OUTPUT A
0025	54672	015454	JSB	OUTCR	BLANK
0026	54673	007400	CCB		DECREMENT
0027	54674	045734	ADB	NBLK	BLANK
0028	54675	075734	STB	NBLK	COUNT
0029	54676	026746	JMP	FMT40	
0030	54677	061734	FMT07	LDA NBLK	NUMBER OF BLANKS
0031	54700	002020	SSA		LESS THAN ZERO ?
0032	54701	026713	JMP	FMT56	YES
0033	54702	003400	CCA		NO, DECREMENT
0034	54703	071734	STA	NBLK	BLANK COUNT
0035	54704	007400	CCB		
0036	54705	055742	CPB	SNFLG	SNFLG = - 1 ?
0037	54706	026717	JMP	FMT02	YES
0038	54707	045742	ADB	SNFLG	SNFLG = 1 ?
0039	54710	006003	SZB, RSS		
0040	54711	026746	JMP	FMT40	YES
0041	54712	026723	JMP	FMT58	NO
0042	54713	007400	FMT56	CCB	
0043	54714	045742	ADB	SNFLG	SNFLG = 1 ?
0044	54715	006002	SZB		

0045	54716	026723		JMP FMT58	NO
0046	54717	061266	FMT02	LDA SIGN	YES, OUTPUT
0047	54720	015454		JSB OUTCR	SIGN AND
0048	54721	060354		LDA .+2	SET SNFLG
0049	54722	071742		STA SNFLG	TO 2
0050	54723	060760	FMT58	LDA IMB	END
0051	54724	040430		ADA .+46	OF
0052	54725	051730		CPA HBP	BUFFER ?
0053	54726	026777		JMP FMT59	
0054	54727	161730		LDA HBP,I	OUTPUT A
0055	54730	015454		JSB OUTCR	DIGIT
0056	54731	035730		ISZ HBP	INCREMENT HCLD BUFFER POINTER
0057	54732	061754		LDA EFLAG	IS THIS A
0058	54733	002002		SZA	FLOATING POINT SPECIFICATION ?
0059	54734	026746		JMP FMT40	NO
0060	54735	002404		CLA,INA	YES, HAS THE DECIMAL POINT
0061	54736	051752		CPA DPFLG	BEEN FOUND YET ?
0062	54737	026746		JMP FMT40	YES
0063	54740	003400		CCA	NO, DECREMENT
0064	54741	041324		ADA EXPON	DECIMAL
0065	54742	164760		LDB IMB,I	IS THE
0066	54743	054432		CPB .+60B	NUMBER ZERO?
0067	54744	002400		CLA	YES, ZERO EXPONENT
0068	54745	071324		STA EXPON	EXPONENT
0069	54746	035776	FMT40	ISZ REpCT	REpCT = 0 ?
0070	54747	026665		JMP FMT37+4	NO
0071	54750	003400		CCA	YES, REINITIALIZE
0072	54751	071776		STA REpCT	REpCT
0073	54752	026777		JMP FMT59	
0074	54753	065752	FMT57	LDB DPFLG	FIXED POINT
0075	54754	006002		SZB	SPECIFICATION ?
0076	54755	027003		JMP FMT42	NO
0077	54756	050430		CPA .+56B	TOP OF STACK A DECIMAL POINT ?
0078	54757	002001		RSS	YES
0079	54760	027003		JMP FMT42	NO
0080	54761	035757		ISZ FSP	INCREMENT STACK POINTER
0081	54762	065742		LDB SNFLG	
0082	54763	006020		SSB	SNFLG = -1 ?
0083	54764	026770		JMP FM00	YES
0084	54765	044351		ADB .-1	NO, = 1 ?
0085	54766	006002		SZB	
0086	54767	026774		JMP FM01	NO
0087	54770	061266	FM00	LDA SIGN	YES, OUTPUT
0088	54771	015454		JSB OUTCR	SIGN
0089	54772	060354		LDA .+2	SET SNFLG
0090	54773	071742		STA SNFLG	TO 2
0091	54774	060430	FM01	LDA .+56B	OUTPUT
0092	54775	015454		JSB OUTCR	DECIMAL POINT
0093	54776	035752		ISZ DPFLG	INCREMENT FLAG TO SHOW D.P. FOUN
0094	54777	061757	FMT59	LDA FSP	END OF
0095	55000	051755		CPA EST	STACK
0096	55001	027332		JMP FMT90	YES
0097	55002	026622		JMP FMT34	NO
0098	55003	035757	FMT42	ISZ FSP	INCREMENT STACK POINTER
0099	55004	015454		JSB OUTCR	OUTPUT AN E

PAGE 0254 #24 FORMATTED OUTPUT ROUTINE

0100	55005	061757	FMT76	LDA FSP	END OF
0101	55006	051755		CPA EST	STACK ?
0102	55007	027025		JMP FMT78	YES
0103	55010	161757		LDA FSP, I	NO, TOP OF
0104	55011	002021		SSA, RSS	STACK A NUMBER ?
0105	55012	027016		JMP FM02	NO
0106	55013	035757		ISZ FSP	YES, INCREMENT STACK POINTER
0107	55014	071776		STA REPCT	STORE NUMBER
0108	55015	161757		LDA FSP, I	GET NEW TOP OF STACK
0109	55016	052000	FM02	CPA ,X	IS IT AN X ?
0110	55017	002001		RSS	YES
0111	55020	115177		JSB FERRS+7, I	NO, ERROR
0112	55021	015534		J9B OUTBL	
0113	55022	003400		CCA	RESET
0114	55023	071776		STA REPCT	REPCT
0115	55024	027005		JMP FMT76	
0116	55025	060427	FMT78	LDA ,+55B	OUTPUT
0117	55026	065324		LDB EXPON	
0118	55027	006020		SSB	AN
0119	55030	007005		CMB, INB, RSS	
0120	55031	060425		LDA ,+53B	EXPONENT
0121	55032	075324		STB EXPON	
0122	55033	015454		J9B OUTCR	SIGN
0123	55034	061324		LDA EXPON	
0124	55035	006400		CLB	COMPUTE
0125	55036	100400		DIV ,+12B	
	55037	000364			
0126	55040	040432		ADA ,+60B	EXPONENT'S
0127	55041	044432		ADB ,+60B	
0128	55042	075324		STB EXPON	10'S DIGIT
0129	55043	015454		J9B OUTCR	OUTPUT IT
0130	55044	061324		LDA EXPON	
0131	55045	015454		J8B OUTCR	OUTPUT 1'S DIGIT
0132	55046	027332		JMP FMT90	
0133**					**
0134***					***
0135**					**
0136	55047	002400	FMT45	CLA	SET PRE-DECIMAL POINT
0137	55050	071324		STA EXPON	DIGIT COUNTER
0138	55051	071732		STA NAD	ZERO COUNTER
0139	55052	051322		CPA EXP	ZERO EXPONENT ?
0140	55053	027161		JMP FMT61+3	YES
0141	55054	065322		LDB EXP	NO
0142	55055	006020		SSB	EXPONENT NEGATIVE
0143	55056	027156		JMP FMT61	YES
0144	55057	015530		J9B DTL1	
0145	55060	071324		STA EXPON	LOAD
0146	55061	071733		STA NBD	PRE-DECIMAL POINT
0147	55062	015424	FM03	J9B GETDG	DIGITS
0148	55063	040432		ADA ,+60B	
0149	55064	171730		STA HBP, I	INTO
0150	55065	035730		ISZ HBP	HOLD
0151	55066	035324		ISZ EXPON	BUFFER
0152	55067	027062		JMP FM03	
0153	55070	065764	FMT50	LDB NUM2	ANY DIS AFTER

PAGE 0255 #24 FORMATTED OUTPUT ROUTINE

0154	55071	006003	SZB, RSS	DECIMAL POINT ?
0155	55072	027126	JMP FMT51	NO
0156	55073	060760	LDA IHB	END
0157	55074	040430	ADA ,+46	OF
0158	55075	051730	CPA HBP	BUFFER ?
0159	55076	027116	JMP FM04	YES
0160	55077	065732	LDB NAD	LEADING
0161	55100	002400	CLA	ZEROS
0162	55101	006003	SZB, RSS	AFTER
0163	55102	027106	JMP ++4	DECIMAL
0164	55103	044351	ADB ,=-1	POINT
0165	55104	075732	STB NAD	
0166	55105	002001	RSS	YES
0167	55106	015424	JSB GETDG	
0168	55107	040432	ADA ,+60B	LOAD
0169	55110	171730	STA HBP, I	POST-DECIMAL POINT
0170	55111	007400	CCB	DIGITS
0171	55112	045764	ADB NUM2	INTO
0172	55113	075764	STB NUM2	HOLD
0173	55114	035730	ISZ HBP	BUFFER
0174	55115	027071	JMP FMT50+1	
0175	55116	061764	FM04 LDA NUM2	OUTPUT BLANKS
0176	55117	003004	CMA, INA	TO
0177	55120	071776	STA REPCT	FILL FIELD
0178	55121	015534	JSB OUTBL	
0179	55122	003400	CCA	REINITIALIZE
0180	55123	071776	STA REPCT	REPCT
0181	55124	041757	ADA FSP	CORRECT
0182	55125	071757	STA FSP	STACK POINTER
0183	55126	061733	FMT51 LDA NBD	COMPUT NUMBER
0184	55127	041763	ADA NUM1	OF LEADING BLANKS
0185	55130	065770	LDB SBD	ANY SIS
0186	55131	045767	ADB SAD	FOUND ?
0187	55132	006002	SZB	
0188	55133	027142	JMP FMT54	YES
0189	55134	065266	LDB SIGN	NO, NUMBER
0190	55135	054425	Cpb ,+53B	POSITIVE ?
0191	55136	027142	JMP FMT54	YES
0192	55137	040351	ADA ,=-1	NO, LEAVE ROOM FOR
0193	55140	006404	CLB, INB	SIGN TO BE PRINTED AND
0194	55141	075742	STB SNFLG	SET SNFLG TO 1
0195	55142	002020	FMT54 SSA	NUMBER OF BLANKS NEGATIVE ?
0196	55143	027570	JMP FMT80	YES
0197	55144	071734	STA NBLK	NO,
0198	55145	007400	CCB	NEXT DIGIT A
0199	55146	045732	ADB NAD	LEADING ZERO ?
0200	55147	006020	SSB	
0201	55150	015532	JSB ROUND	NO, ROUND NUMBER
0202	55151	002001	RSS	
0203	55152	027570	JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0204	55153	060760	LDA IHB	RESET HOLD
0205	55154	071730	STA HBP	BUFFER POINTER
0206	55155	026622	JMP FMT34	GO OUTPUT THE NUMBER
0207	55156	015526	FMT61 JSB MTG1	
0208	55157	061324	LDA EXPON	

0209	55160	071732		STA NAD	
0210	55161	065763		LDB NUM1	ANY D'S FOUND
0211	55162	006003		SZB, RSS	BEFORE THE DECIMAL POINT ?
0212	55163	027070		JMP FMT50	NO
0213	55164	061764		LDA NUM2	YES, ANY D'S FOUND
0214	55165	002003		SZA, RSS	AFTER THE DECIMAL POINT ?
0215	55166	027201		JMP FMT55	NO
0216	55167	054353		CPB .+1	YES, ONLY ONE OF THEM ?
0217	55170	002001		RSS	
0218	55171	027201		JMP FMT55	NO
0219	55172	061767		LDA SAD	YES, ANY S'S FOUND ?
0220	55173	041770		ADA SBD	
0221	55174	002002		SZA	
0222	55175	027201		JMP FMT55	YES
0223	55176	061266		LDA SIGN	NO, NUMBER
0224	55177	050427		CPA .+55B	NEGATIVE ?
0225	55200	027070		JMP FMT50	YES
0226	55201	060432	FMT55	LDA .+60B	NO, LOAD PRE-DECIMAL POINT
0227	55202	171730		STA HBP, I	ZERO INTO BUFFER
0228	55203	035730		ISZ HBP	
0229	55204	003400		CCA	DECREASE NUMBER OF
0230	55205	041763		ADA NUM1	D'S AVAILABLE FOR SIGN
0231	55206	071763		STA NUM1	AND BLANKS BEFORE DECIMAL PT
0232	55207	027070		JMP FMT50	
0233**					**
0234***					***
0235**					**
0236	55210	002400	FMT62	CLA	INITIALIZE DECIMAL
0237	55211	071324		STA EXPON	EXPONENT
0238	55212	051322		CPA EXP	ZERO EXPONENT ?
0239	55213	027216		JMP **3	YES
0240	55214	015526		JSB MT61	
0241	55215	015530		JSB DTL1	
0242	55216	003004		CMA, INA	SAVE DECIMAL EXPONENT
0243	55217	071324		STA EXPON	
0244	55220	061763		LDA NUM1	GET
0245	55221	041764		ADA NUM2	TOTAL NUMBER
0246	55222	071743		STA TOTDG	OF DIGITS
0247	55223	061770		LDA SBD	
0248	55224	041767		ADA SAD	ANY S'S FOUND ?
0249	55225	002002		SZA	
0250	55226	027246		JMP FMT67	YES
0251	55227	061266		LDA SIGN	NO, NUMBER
0252	55230	050425		CPA .+53B	POSITIVE ?
0253	55231	027246		JMP FMT67	YES
0254	55232	007400		CCB	NO, LEAVE ROOM
0255	55233	045763		ADB NUM1	FOR SIGN
0256	55234	006020		SSB	NONE ?
0257	55235	027570		JMP FMT80	YES
0258	55236	075763		STB NUM1	NO, DECREMENT
0259	55237	003400		CCA	TOTAL NUMBER OF D'S
0260	55240	041743		ADA TOTDG	AVAILABLE FOR SIGN
0261	55241	071743		STA TOTDG	AND BLANKS BEFORE DEC. PT.
0262	55242	002003		SZA, RSS	
0263	55243	027570		JMP FMT80	

0264	55244	006404		CLB, INB	SET SNFLG
0265	55245	075742		STB SNFLG	TO 1
0266	55246	061764	FMT67	LDA NUM2	NUM2
0267	55247	003004		CMA, INA	> 7 ?
0268	55250	064360		LDB .+6	
0269	55251	044000		ADB 0	
0270	55252	006020		SSB	
0271	55253	027273		JMP FMT70	YES
0272	55254	061743		LDA TOTDG	YES, TOTAL NUMBER OF D'S
0273	55255	040342		ADA .-100	> 7 ?
0274	55256	002020		SSA	
0275	55257	027265		JMP FMT68	NO
0276	55260	064343		LDB .-7	PREPARE TO GET
0277	55261	075744		STB DCTR	SEVEN DIGITS
0278	55262	002004		INA	NUMBER OF BLANKS
0279	55263	071734		STA NBLK	BECOMES TOTDG = 7
0280	55264	027314		JMP FMT72	
0281	55265	061743	FMT68	LDA TOTDG	PREPARE TO GET
0282	55266	003004		CMA, INA	
0283	55267	071744		STA DCTR	TOTDG DIGITS
0284	55270	006400		CLB	SET NUMBER OF BLANKS
0285	55271	075734		STB NBLK	TO ZERO
0286	55272	027314		JMP FMT72	
0287	55273	065763	FMT70	LDB NUM1	ANY D'S BEFORE
0288	55274	006002		SZB	DECIMAL POINT ?
0289	55275	040351		ADA .-1	YES, INCREMENT NUMBER OF DIGITS
0290	55276	071744		STA DCTR	PREPARE TO GET NUM2 DIGITS
0291	55277	006002		SZB	SET
0292	55300	044351		ADB .-1	BLANK
0293	55301	075734		STB NBLK	COUNT
0294	55302	061744		LDA DCTR	MORE THAN
0295	55303	040430		ADA .+46	FOURTY-SIX
0296	55304	002021		SSA, RSS	DIGITS NEEDED ?
0297	55305	027314		JMP FMT72	NO
0298	55306	071776		STA REPCT	YES, OUTPUT NECESSARY BLANKS
0299	55307	015534		JSB OUTBL	
0300	55310	041757		ADA FSP	CORRECT
0301	55311	071757		STA FSP	STACK POINTER
0302	55312	062004		LDA M46	SET DCTR
0303	55313	071744		STA DCTR	TO 46
0304	55314		FMT72	EQU *	
0305	55314	003400		CCA	REINITIALIZE
0306	55315	071776		STA REPCT	REPCT
0307	55316	015424		JSB GETDG	
0308	55317	040432		ADA .+600	CONVERT TO ASCII
0309	55320	171730		STA HBP, I	STORE IN HOLD BUFFER
0310	55321	035730		ISZ HBP	INCREMENT BUFFER POINTER
0311	55322	035744		ISZ DCTR	ALL DIGITS GOT ?
0312	55323	027314		JMP FMT72	NO
0313	55324	015532		JSB ROUND	YES, ROUND THE NUMBER IN BUFFER
0314	55325	002001		RSS	
0315	55326	027570		JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0316	55327	060760		LDA IHB	RESET
0317	55330	071730		STA HBP	BUFFER POINTER
0318	55331	026622		JMP FMT34	

```

0319**
0320*** HANDLE END OF SPECIFICATION ***
0321**
0322 55332 002400 FMT90 CLA
0323 55333 071650 STA SFLG STRING FLAG
0324 55334 061745 LDA CC ENF OF
0325 55335 051762 CPA NCH FORMAT STRING ?
0326 55336 002001 RSS YES
0327 55337 027357 JMP FMT92 NO
0328 55340 061746 FMT90 LDA CC1 YES, PARENTHESIS
0329 55341 002002 SZA BALANCED ?
0330 55342 115202 JSB FERRS+10,I NO, ERROR
0331 55343 065645 FMT91 LDB EC ANY EXPRESSIONS
0332 55344 006003 SZB,RSS USED ?
0333 55345 027673 JMP FMEND NO
0334 55346 065753 LDB EDSTA END OF
0335 55347 006003 SZB,RSS STATEMENT ?
0336 55350 027673 JMP FMEND YES
0337 55351 002400 CLA
0338 55352 071645 STA EC YES, CLEAR EC
0339 55353 071745 STA CC
0340 55354 061761 LDA IFSIR RESET
0341 55355 071751 STA DP DELIMITER POINTER
0342 55356 026040 JMP FMT12
0001 55357 061751 FMT92 LDA DP GET THE
0002 55360 103101 CLO DELIMITING CHARACTER
0003 55361 015542 JSB MCHAR NOT IGNORING BLANKS
0004 55362 050423 CPA ,+51B IS IT A RIGHT PARENTHESIS
0005 55363 027470 JMP FMT97 YES
0006 55364 071731 STA LCH NO, SAVE THE CHARACTER
0007 55365 050420 CPA ,+64B IS IT A COMMA ?
0008 55366 027373 JMP FMT93+1 YES
0009 55367 050431 CPA ,+57B IS IT A SLASH ?
0010 55370 002001 RSS YES
0011 55371 115171 JSB FERRS+1,I NO, ERROR EXIT
0012 55372 015536 FMT93 JSB OUTCL
0013 55373 035745 ISZ CC INCREMENT CHARACTER COUNTER
0014 55374 061745 LDA CC ALL CHARACTERS
0015 55375 051762 CPA NCH USED ?
0016 55376 027424 JMP FMT94 YES
0017 55377 035751 ISZ DP INCREMENT DELIMITER POINTER
0018 55400 015540 JSB DSRCH FIND NEXT DELIMITER
0019 55401 102101 STO IGNORE BLANKS
0020 55402 061646 LDA FST
0021 55403 015542 JSB MCHAR NEXT CHARACTER
0022 55404 051751 CPA DP IS IT A DELIMITER
0023 55405 002001 RSS YES
0024 55406 027415 JMP FM11 NO
0025 55407 061745 LDA CC ALL CHARACTERS
0026 55410 051762 CPA NCH USED ?
0027 55411 027424 JMP FMT94 YES
0028 55412 061751 LDA DP NO, GET DELIMITING
0029 55413 103101 CLO CHARACTER
0030 55414 015542 JSB MCHAR IGNORING BLANKS
0031 55415 050440 FM11 CPA ,+54 IS IT A COMMA

```

PAGE 0259 #25 FORMATTED OUTPUT ROUTINE

0032	55416	115170		JSB FERRS,I	YES, ERROR
0033	55417	050431		CPA .+57B	NO, A SLASH
0034	55420	027424		JMP FMT94	YES
0035	55421	050423		CPA .+51B	NO, A RIGHT PARENTHESIS ?
0036	55422	027470		JMP FMT97	YES
0037	55423	026105		JMP FMT3	
0038	55424	061731	FMT94	LDA LCH	LAST CHARACTER
0039	55425	050426		CPA .+54B	A COMMA ?
0040	55426	115170		JSB FERRS,I	
0041	55427	061745		LDA CC	NO, ALL CHARACTERS
0042	55430	051762		CPA NCH	USED ?
0043	55431	027340		JMP FMT09	YES
0044	55432	027372		JMP FMT93	NO
0045**					**
0046***				HANDLE GROUPS OF SPECIFICATIONS	***
0047**					**
0048	55433	003400	FMT95	CCA	SECOND
0049	55434	041757		ADA FSP	CHARACTER
0050	55435	051760		CPA IFSS	IN STACK ?
0051	55436	002001		RSS	
0052	55437	115203		JSB FERRS+11,I	NO, ERROR
0053	55440	061746		LDA CC1	YES, FIRST LEVEL
0054	55441	002002		SZA	OF PARENTHESIS ?
0055	55442	027454		JMP FMT96	NO
0056	55443	035646		ISZ FST	INCREMENT STRING POINTER
0057	55444	003400		CCA	FIND CHARACTER COUNT
0058	55445	041761		ADA IFSTR	UP TO AND INCLUDING
0059	55446	003000		CMA	LEFT
0060	55447	041646		ADA FST	PARENTHESIS
0061	55450	071746		STA CC1	
0062	55451	065776		LDB REPCT	STORE REPETITION
0063	55452	075765		STB PC1	COUNT
0064	55453	026105		JMP FMT3	PROCESS STRING
0065	55454	061747	FMT96	LDA CC2	SECOND LEVEL
0066	55455	002002		SZA	OF PARENTHESIS
0067	55456	115204		JSB FERRS+12,I	NO, ERROR
0068	55457	035646		ISZ FST	
0069	55460	003400		CCA	FIND CHARACTER COUNT
0070	55461	041761		ADA IFSTR	UP TO AND
0071	55462	003000		CMA	INCLUDING
0072	55463	041646		ADA FST	LEFT
0073	55464	071747		STA CC2	PARENTHESIS
0074	55465	065776		LDB REPCT	STORE REPETITION
0075	55466	075766		STB PC2	COUNT
0076	55467	026105		JMP FMT3	
0077	55470	061766	FMT97	LDA PC2	SECOND LEVEL OF
0078	55471	002003		SZA,RSS	PARENTHESIS ?
0079	55472	027530		JMP FMT98	NO
0080	55473	040351		ADA .-1	YES, REPEAT IT
0081	55474	071766		STA PC2	
0082	55475	002003		SZA,RSS	
0083	55476	027505		JMP FMT99	
0084	55477	065747		LDB CC2	RESET
0085	55500	075745		STB CC	CHARACTER COUNTER
0086	55501	045761		ADB IFSTR	

0087	55502	075751	STB DP	AND STRING POINTER
0088	55503	015540	JSB DSRCH	
0089	55504	026105	JMP FMT3	REPROCESS PARENTHESED STRING
0090	55505	002400	FMT99 CLA	CLEAR SECOND
0091	55506	071747	STA CC2	LEVEL POINTER
0092	55507	071650	STA SFLG	AND STRING FLAG
0093	55510	035745	ISZ CC	INCREMENT CHARACTER COUNTER
0094	55511	061745	LDA CC	ALL CHARACTERS
0095	55512	051762	CPA NCH	USED ?
0096	55513	115171	JSB FERRS+1,I	YES, ERROR
0097	55514	035751	ISZ DP	NO, POINT TO DELIMITER
0098	55515	015540	JSB DSRCH	FIND NEXT DELIMITER
0099	55516	102101	STO	GET NEXT
0100	55517	061646	LDA FST	NON-BLANK
0101	55520	015542	JSB MCHAR	CHARACTER
0102	55521	051751	CPA DP	IS IT A DELIMITER ?
0103	55522	002001	RSS	YES
0104	55523	027362	JMP FMT92+3	MAYBE
0105	55524	065745	LDB CC	ALL
0106	55525	055762	CPB NCH	CHARACTERS USED ?
0107	55526	115202	JSB FERRS+10,I	YES, ERROR
0108	55527	027357	JMP FMT92	NO, INVESTIGATE THE CHARACTER
0109	55530	061765	FMT98 LDA PC1	FIRST LEVEL
0110	55531	002003	SZA,RSS	OF PARENTHESIS ?
0111	55532	115205	JSB FERRS+13,I	NO, ERROR
0112	55533	040351	ADA ,=1	YES, REPEAT IT
0113	55534	071765	STA PC1	
0114	55535	002003	SZA,RSS	
0115	55536	027545	JMP FMT00	
0116	55537	065746	LDB CC1	RESET
0117	55540	075745	STB CC	CHARACTER COUNTER
0118	55541	045761	ADB IFSTR	
0119	55542	075751	STB DP	
0120	55543	015540	JSB DSRCH	
0121	55544	026105	JMP FMT3	REPROCESS PARENTHESED STRING
0122	55545	002400	FMT00 CLA	CLEAR FIRST
0123	55546	071746	STA CC1	LEVEL POINTER
0124	55547	071650	STA SFLG	AND STRING FLAG
0125	55550	035745	ISZ CC	INCREMENT CHARACTER COUNTER
0126	55551	035751	ISZ DP	POINT TO DELIMITER
0127	55552	061745	LDA CC	ALL
0128	55553	051762	CPA NCH	CHARACTERS USED ?
0129	55554	027343	JMP FMT91	YES
0130	55555	015540	JSB DSRCH	NO, FIND NEXT DELIMITER
0131	55556	102101	STO	GET NEXT
0132	55557	061646	LDA FST	NON-BLANK
0133	55560	015542	JSB MCHAR	CHARACTER
0134	55561	051751	CPA DP	IS IT A DELIMITER ?
0135	55562	002001	RSS	YES
0136	55563	027362	JMP FMT92+3	NO
0137	55564	065745	LDB CC	ALL
0138	55565	055762	CPB NCH	CHARACTERS USED ?
0139	55566	027343	JMP FMT91	YES
0140	55567	027357	JMP FMT92	NO, INVESTIGATE THE FOUND CHARAC
0141**				**

```

0142*** OUTPUT NUMBER IN DEFAULT FORMAT ***
0143** **
0144 55570 061740 FMT00 LDA NUMW1
0145 55571 071316 STA MANT1 LOAD
0146 55572 065741 LDB NUMW2
0147 55573 075320 STB MANT2 SAVED
0148 55574 061651 LDA EXPW
0149 55575 071322 STA EXP NUMBER
0150 55576 002400 CLA CLEAR
0151 55577 071324 STA EXPON DECIMAL EXPONENT
0152 55600 071754 STA EFLAG SET FLOATING POINT FLAG
0153 55601 051322 CPA EXP ZERO EXPONENT ?
0154 55602 027605 JMP **3 YES
0155 55603 015526 JSB MTG1
0156 55604 015530 JSB DTL1
0157 55605 003000 CMA
0158 55606 071324 STA EXPON
0159 55607 015536 JSB OUTCL
0160 55610 060760 LDA IHB RESET HOLD
0161 55611 071730 STA HBP BUFFER POINTER
0162 55612 060344 LDA .=6 PREPARE TO GET
0163 55613 071743 STA TOTDG SIX DIGITS
0164 55614 015424 JSB GETDG GET
0165 55615 040432 ADA .+60B
0166 55616 171730 STA HBP,I SIX
0167 55617 035730 ISZ HBP
0168 55620 035743 ISZ TOTDG DIGITS
0169 55621 027614 JMP **5
0170 55622 060354 LDA .+2 SET NBLK TO
0171 55623 071734 STA NBLK WHERE IT WONT CAUSE TROUBLE
0172 55624 015532 JSB ROUND ROUND NUMBER IN HOLD BUFFER
0173 55625 000000 NOP
0174 55626 061266 LDA SIGN OUTPUT
0175 55627 015454 JSB OUTCR SIGN
0176 55630 060760 LDA IHB INITIALIZE
0177 55631 071730 STA HBP HOLD BUFFER POINTER
0178 55632 161730 LDA HBP,I OUTPUT
0179 55633 015454 JSB OUTCR DIGIT
0180 55634 035730 ISZ HBP INCREMENT HOLD BUFFER POINTER
0181 55635 060430 LDA .+56B OUTPUT
0182 55636 015454 JSB OUTCR DECIMAL POINT
0183 55637 060345 LDA .=5 PREPARE TO OUTPUT
0184 55640 071743 STA TOTDG FIVE DIGITS
0185 55641 161730 LDA HBP,I OUTPUT
0186 55642 015454 JSB OUTCR FIVE
0187 55643 035730 ISZ HBP DIGITS
0188 55644 035743 ISZ TOTDG
0189 55645 027641 JMP **4
0190 55646 060720 LDA E OUTPUT
0191 55647 015454 JSB OUTCR AN E
0192 55650 060427 LDA .+55B
0193 55651 065324 LDB EXPON OUTPUT
0194 55652 006020 SSB
0195 55653 007005 CMB,INB,RSS EXPONENT
0196 55654 060425 LDA .+53B

```

0197	55655	075324	STB	EXPON	SIGN	
0198	55656	015454	JSB	OUTCR		
0199	55657	061324	LDA	EXPON		
0200	55660	006400	CLB		GET BOTH EXPONENT DIGITS	
0201	55661	100400	DIV	+.12B		
	55662	000364				
0202	55663	040432	ADA	+.60B	CONVERT BOTH	
0203	55664	044432	ADB	+.60B	TO ASCII	
0204	55665	075324	STB	EXPON		
0205	55666	015454	JSB	OUTCR	OUTPUT 10'S DIGIT	
0206	55667	061324	LDA	EXPON		
0207	55670	015454	JSB	OUTCR	OUTPUT 1'S DIGIT	
0208	55671	015536	JSB	OUTCL		
0209	55672	027332	JMP	FMT90		
0210	55673	061750	FMEND	LDA	CONTR	YES, CONTROL
0211	55674	002002	SZA		CHARACTER FOUND ?	
0212	55675	027700	JMP	++3	YES	
0213	55676	015536	JSB	OUTCL	NO	
0214	55677	124556	JMP	XEC1A,I		
0215	55700	050425	CPA	+.53B	IS CARRIAGE	
0216	55701	002001	RSS		CONTROL A +	
0217	55702	027714	JMP	FM10	NO	
0218	55703	060375	LDA	+.23B	YES	
0219	55704	015454	JSB	OUTCR	OUTPUT AN X-OFF	
0220	55705	060367	LDA	+.15B	AND A	
0221	55706	015454	JSB	OUTCR	CARRIAGE RETURN	
0222	55707	002400	CLA		AND A	
0223	55710	015454	JSB	OUTCR	NULL.	
0224	55711	002400	CLA			
0225	55712	071572	STA	CHRCT		
0226	55713	124556	JMP	XEC1A,I		
0227	55714	050427	FM10	CPA	+.55B	IS IT A MINUS ?
0228	55715	002001	RSS		YES	
0229	55716	124556	JMP	XEC1A,I		
0230	55717	060364	LDA	+.12B	OUTPUT A	
0231	55720	015454	JSB	OUTCR	LINEFEED	
0232	55721	124556	JMP	XEC1A,I		

```

0234 56000          ORG 560000
0235**
0236*** MAKE A NUMBER LESS THAN 1 ***
0237**
0238*
0239* MULTIPLY AN UNPACKED FLOATING POINT
0240* NUMBER IN MANT1, MANT2 AND EXP BY 10 UNTIL
0241* IT IS GREATER THAN 1. THEN DIVIDE BY 10
0242*
0243 56000 015300 #MTG1 JSB MBY10
0244 56001 061322      LDA EXP          MULTIPLY
0245 56002 003026      CMA,SSA,INA,SZA  NUMBER BY 10
0246 56003 026006      JMP ++3          UNTIL IT IS
0247 56004 035324      ISZ EXPON          GREATER
0248 56005 025527      JMP MTG1+1        THAN 1
0249 56006 015302      JSB DBY10        DIVIDE BY 10
0250 56007 125526      JMP MTG1,1
0251*
0252* DIVIDE AN UNPACKED FLOATING POINT NUMBER
0253* IN MANT1, MANT2 AND EXP BY 10 UNTIL IT IS
0254* LESS THAN 1
0255*
0256 56010 061324 #DTL1 LDA EXPON
0257 56011 065322 DTL10 LDB EXP          DIVIDE
0258 56012 007004      CMB,INB          NUMBER
0259 56013 006021      SSB,RSS          BY 10
0260 56014 125530      JMP DTL1,1        UNTIL
0261 56015 071324      STA EXPON          IT IS
0262 56016 015302      JSB DBY10        LESS
0263 56017 003400      CCA              THAN
0264 56020 041324      ADA EXPON          1
0265 56021 026011      JMP DTL10

```



```

0267**
0268*** ROUND ASCII NUMBER ***
0269**
0270*
0271* NUMBER STORED ONE ASCII DIGIT PER WORD IN
0272* HOLDING BUFFER. ROUTINE GETS NEXT DIGIT
0273* AND ROUNDS IF IT IS >= 5.
0274* IF THERE IS A CARRY TO AN EXTRA DIGIT AND NO
0275* ROOM EXISTS, EXIT IS TO (P+1). OTHERWISE RETURN
0276* TO (P+2).
0277*
0278 56022 015424 #RUND JSB GETDG GET NEXT DIGIT
0279 56023 040345 ADA .-5 IS IT >= 5 ?
0280 56024 002020 SSA
0281 56025 125532 JMP ROUND,I
0282 56026 003400 CCA DECREMENT HOLD
0283 56027 041730 ADA HBP BUFFER POINTER
0284 56030 164000 ROND1 LDB 0,I LOAD NEXT DIGIT
0285 56031 006004 INB INCREMENT IT
0286 56032 054436 CPB .50 WAS IT A 9 ?
0287 56033 026036 JMP ++3 YES
0288 56034 174000 STB 0,I NO, SAVE IT
0289 56035 125532 JMP ROUND,I AND RETURN
0290 56036 064432 LDB .+60B OVERLAY
0291 56037 174000 STB 0,I A 0
0292 56040 050760 CPA IHB LEADING DIGIT ?
0293 56041 026044 JMP ++3 YES
0294 56042 040351 ADA .-1 NO, DECREMENT POINTER
0295 56043 026030 JMP ROND1
0296 56044 064433 LDB .+61B OVERLAY A
0297 56045 174000 STB 0,I ONE
0298 56046 064432 LDB .+60B LOAD
0299 56047 175730 STB HBP,I EXTRA ZERO
0300 56050 065754 LDB EFLAG FLOATING POINT
0301 56051 006002 SZB SPECIFICATION ?
0302 56052 026056 JMP ROND2 NO
0303 56053 035324 ISZ EXPON INCREMENT EXPONENT
0304 56054 000000 NOP
0305 56055 125532 JMP ROUND,I
0306 56056 007400 ROND2 CCB IS NBLK
0307 56057 045734 ADB NBLK LESS
0308 56060 006020 SSB THAN 1 ?
0309 56061 035532 ISZ ROUND NO, RETURN TO (P+2)
0310 56062 075734 STB NBLK YES, KEEP DECREMENTED VALUE
0311 56063 125532 JMP ROUND,I

```

```

0313**          **
0314*** OUTPUT BLANKS ***
0315**          **
0316*
0317*  OUTPUTS THE NUMBER OF BLANKS SPECIFIED
0318*  BY THE NEGATIVE OF REPCT.  THE STACK POINTER
0319*  IS INCREMENTED AND REPCT HAS THE VALUE ZERO
0320*  UPON EXIT.
0321*
0322  56064 035757 #OTBL ISZ FSP          INCREMENT STACK POINTER
0323  56065 061573          LDA BLANK      OUTPUT A
0324  56066 015454          JSB OUTCR      BLANK
0325  56067 035776          ISZ REPCT      REPCT USED UP ?
0326  56070 026065          JMP *-3
0327  56071 125534          JMP OUTBL,I
0328*
0329*  OUTPUT X-OFF, CARRIAGE RETURN, LINE FEED
0330*
0331  56072          #OTCL EQU *
0332  56072 060375          LDA .+23B
0333  56073 015454          JSB OUTCR
0334  56074 060367          LDA .+15B
0335  56075 015454          JSB OUTCR
0336  56076 060364          LDA .+12B
0337  56077 015454          JSB OUTCR
0338  56100 002400          CLA
0339  56101 071572          STA CHRCT
0340  56102 125536          JMP OUTCL,I

```

0342**

0343*** SEARCH FOR A DELIMITING CHARACTER ***

0344**

0345*

0346* BEGINS SEARCH AT CHARACTER DP. WHEN A COMMA
 0347* OR SLASH IS FOUND, DP IS SET TO POINT TO THAT
 0348* CHARACTER. CHARACTERS ARE COUNTED AND IF THE
 0349* END OF THE STRING IS ENCOUNTERED BEFORE A
 0350* DELIMITER IS FOUND, A FLAG IS SET

0351*

0352	56103	061751	#DSCH	LDA DP	SET STRING POINTER TO
0353	56104	071646		STA FST	FIRST CHARACTER
0354	56105	103101		CLO	DON'T IGNORE BLANKS
0355	56106	015542	SER1	JSB MCHAR	GET STRING CHARACTER
0356	56107	050426		CPA .+54B	IS IT A COMMA ?
0357	56110	125540		JMP DSRCH,I	YES
0358	56111	050431		CPA .+57B	NO, IS IT A SLASH ?
0359	56112	125540		JMP DSRCH,I	YES
0360	56113	050423		CPA .+51B	NO, IS IT A RIGHT PARENTHESIS ?
0361	56114	125540		JMP DSRCH,I	YES
0362	56115	035751		ISZ DP	NO, INCREMENT DELIMITER POINTER
0363	56116	035745		ISZ CC	AND CHARACTER COUNTER
0364	56117	061751		LDA DP	
0365	56120	065745		LDB CC	
0366	56121	055762		CPB NCH	ALL CHARACTERS USED ?
0367	56122	125540		JMP DSRCH,I	YES
0368	56123	026106		JMP SER1	NO

0369**

0370*** MASK OUT A CHARACTER ***

0371**

0372*

0373* GET NEXT CHARACTER FROM FORMAT STRING
 0374* ADDRESS OF CHARACTER IS IN (A). CHARACTER IS
 0375* RETURNED IN (A)

0376*

0377	56124	000065	#MCHR	CLE,ERA	SHIFT ADDRESS RIGHT
0378	56125	164000		LDB 0,I	LOAD WORD FROM STRING
0379	56126	002041		SEZ,RSS	HIGH CHARACTER ?
0380	56127	005727		BLF,BLF	YES, SWITCH POSITIONS
0381	56130	060001		LDA 1	NO
0382	56131	010443		AND B377	MASK OUT LOW CHARACTER
0383	56132	102301		SOS	SHOULD BLANKS BE IGNORED ?
0384	56133	125542		JMP MCHAR,I	
0385	56134	051573		CPA BLANK	YES, IS CHARACTER A BLANK ?
0386	56135	026143		JMP MCHR1	YES
0387	56136	040766		ADA M96	NO
0388	56137	002021		SSA,RSS	LOWER CASE?
0389	56140	040317		ADA M32	YES
0390	56141	040730		ADA .140	NO
0391	56142	125542		JMP MCHAR,I	
0392	56143		MCHR1	EQU *	
0393	56143	035646		ISZ FST	INCREMENT STRING POINTER
0394	56144	061646		LDA FST	NEXT CHARACTER
0395	56145	051751		CPA DP	A DELIMITER ?
0396	56146	125542		JMP MCHAR,I	YES, RETURN

```

0397 56147 025543      JMP MCHAR+1  IGNORE THE BLANK
0398**                **
0399*** EVALUATE EXPRESSION ***
0400**                **
0401*
0402* EXTRACT THE NEXT VARIABLE TO BE OUTPUT BY THE FORMATTER, IF
0403* NONE FOUND, EXIT TO (P+1). IF A STRING IS FOUND, EXIT TO
0404* (P+2) AFTER PREPARING THE STRING FOR OUTPUT. IF A NUMERIC
0405* QUANTITY IS FOUND, EXIT TO (P+3) WITH THE NUMBER IF (A) AND (B).
0406* EDSTA IS SET TO 0 IF THIS IS THE LAST VARIABLE IN THE STATEMENT.
0407*
0408 56150      #EVEP EQU *
0409 56150 061756 LDA FFLG      MAT
0410 56151 002020 SSA          PRINT?
0411 56152 026212 JMP EVEX5      YES
0412 56153 065613 EVEX0 LDB TEMP1
0413 56154 055334 CPB PRGCT      END OF STATEMENT?
0414 56155 125544 JMP EVEXP,I    YES
0415 56156 003400 CCA          TURN OFF
0416 56157 071472 STA EOL      FUNCTION FLAG
0417 56160 015336 JSB FORMX    EVALUATE FORMULA
0418 56161 165332 LDB OPDST,I  IS IT A
0419 56162 006020 SSB          STRING VARIABLE ?
0420 56163 026177 JMP EVEX3      YES
0421 56164 015376 JSB OPCHK     NO, UNSTACK VALUE ADDRESS
0422 56165 035472 ISZ EOL      A FUNCTION ?
0423 56166 026153 JMP EVEX0
0424 56167 061613 LDA TEMP1     LAST VARIABLE?
0425 56170 051334 CPA PRGCT
0426 56171 002400 CLA          YES
0427 56172 071753 STA EDSTA    NO
0428 56173 104200 DLD 1,I     NO, LOAD NUMBER
          56174 100001
0429 56175 035544 ISZ EVEXP     RETURN TO (P+3)
0430 56176 026210 JMP EVEX4
0431 56177 060350 EVEX3 LDA #2   PREPARE
0432 56200 015344 JSB PSTR     PRINT
0433 56201 071256 STA TEMP4    STRING
0434 56202 075410 STB TPRME
0435 56203 065613 LDB TEMP1    END OF
0436 56204 055334 CPB PRGCT    STATEMENT?
0437 56205 006400 CLB          YES
0438 56206 075753 STB EDSTA    NO
0439 56207 065410 LDB TPRME
0440 56210      EVEX4 EQU *
0441 56210 035544 ISZ EVEXP     RETURN TO
0442 56211 125544 JMP EVEXP,I  (P+2)
0443 56212 035472 EVEX5 ISZ ELCNT FINISHED CURRENT MATRIX?
0444 56213 026244 JMP EVEX7    NO
0445 56214 065613 EVEX6 LDB TEMP1 YES
0446 56215 055334 CPB PRGCT    END OF STATEMENT?
0447 56216 125544 JMP EVEXP,I  YES
0448 56217 161613 LDA TEMP1,I  GET NEXT OPERAND
0449 56220 010700 AND OPDMK
0450 56221 002003 SZA,RSS     NULL

```

PAGE 0268 #25 FORMATTER UTILITY ROUTINES

0451	56222	125544		JMP EVEXP,I	YES
0452	56223	002020		SSA	NO, FUNCTION?
0453	56224	026262		JMP EVEX8	YES
0454	56225	001000		ALS	NO, LOAD
0455	56226	041575		ADA SYMTB	BASE ADDRESS
0456	56227	040351		ADA ,=1	OF ARRAY
0457	56230	164000		LDB A,I	
0458	56231	044350		ADB ,=2	SAVE POINTER TO
0459	56232	075574		STB SBPTR	DYNAMIC DIMENSIONS
0460	56233	015472		JSB VCHK	VALIDATE ARRAY ELEMENTS
0461	56234	161574		LDA SBPTR,I	SET POINTER
0462	56235	035574		ISZ SBPTR	TO FIRST ELEMENT
0463	56236	100200		MPY SBPTR,I	OF ARRAY
	56237	101574			
0464	56240	035574		ISZ SBPTR	WHILE COMPUTING
0465	56241	003004		CMA,INA	NUMBER OF
0466	56242	071472		STA ELCNT	ELEMENTS
0467	56243	035613		ISZ TEMP1	BUMP TO NEXT OPERAND
0468	56244	003400	EVEX7	CCA	LAST
0469	56245	051472		CPA ELCNT	ELEMENT?
0470	56246	002001		RSS	YES
0471	56247	026253		JMP EVEX9	NO
0472	56250	061613		LDA TEMP1	END OF
0473	56251	051334		CPA PRGCT	STATEMENT?
0474	56252	002400		CLA	YES
0475	56253		EVEX9	EQU *	
0476	56253	071753		STA EDSTA	NO
0477	56254	104200		DLB SBPTR,I	GET NUMBER
	56255	101574			
0478	56256	035574		ISZ SBPTR	BUMP TO
0479	56257	035574		ISZ SBPTR	NEXT ELEMENT
0480	56260	035544		ISZ EVEXP	
0481	56261	026210		JMP EVEX4	EXIT
0482	56262	003400	EVEX8	CCA	TURN OFF
0483	56263	071472		STA EOL	FUNCTION FLAG
0484	56264	015336		JSB FORMX	EVALUATE FUNCTION
0485	56265	015376		JSB OPCHK	REMOVE ARGUMENT FROM TEMP STACK
0486	56266	026214		JMP EVEX6	GET NEXT OPERAND
0487*					
0488*				MESSAGE BUFFER	
0489*					
0490	56267	000000	MSQHD	BSS MESBN	
0491	56641			BSS 0	

```

0002 60000          ORG 600000
0003 60000 020134  RVRSL ASC 1, \
0004 60001 160000  TBITS OCT 160000
0005 60002 120000  B120K OCT 120000
0006 60003 130000  B130K OCT 130000
0007 00226          B160K EQU INI
0008 60004 000137  BKSPC OCT 137
0009 60005 000000  TTA   BSS 1
0010 60006 000000  TTB   BSS 1
0011 60007 000000  TTE   BSS 1
0012 60010 000000  TUG   BSS 1
0013 60011 000000  TADR  BSS 1

```

0014*

0015*

0016* THE TSB DRUM DRIVER IS RESPONSIBLE FOR ALL TRANSFERS TO AND FROM
0017* THE SYSTEM DRUM(S). THE CALLING SEQUENCE TO THE DRIVER IS AS
0018* FOLLOWS:

0019* JSB DRUM,I

0020* A-REG=DRUM ADDRESS, IN THE STANDARD SYSTEM FORMAT, NAMELY:

0021* A(15:14)=DRUM NO.

0022* A(13:8) =TRACK NO.

0023* A(7) =0

0024* A(6:0) =SECTOR NO.

0025*

0026* B-REG=CORE ADDRESS (BITS 14:0) AND DIRECTION (BIT 15).

0027* B(15)=1 FOR A DRUM READ, 0 FOR A DRUM WRITE.

0028*

0029* WORD=# OF WORDS TO BE TRANSFERRED. IF WORD=0, NO TRANSFER IS
0030* DONE. IF THE TRANSFER IS A WRITE, THE ACTUAL # OF WORDS
0031* TRANSFERRED IS =64*INT(WORD/64).

0032*

0033* THE DRIVER MAINTAINS A FLAG CALLED ENDRM. IT IS SET TO -1 WHEN A
0034* TRANSFER IS INITIATED, AND CLEARED UPON SUCCESSFUL COMPLETION OF
0035* THE TRANSFER.

0036*

0037* WHEN AN ATTEMPTED TRANSFER FAILS, IT IS REPEATED 95 ADDITIONAL
0038* TIMES. IF IT CONTINUES TO FAIL, ENDRM IS SET TO 1 BEFORE THE
0039* DRIVER RETURNS TO ITS CALLER.

0040*

```

0042 60012 000000  LDRUM NOP          ENTRY POINT
0043 60013 103100          CLF 0          INTERRUPT OFF.
0044 60014 072140          STA DADDR      SAVE DRUM AND
0045 60015 076141          STB CORE       CORE ADDRESSES.
0046 60016 066012          LDB LDRUM      SET UP RETURN
0047 60017 076052          STB DINT       ADDRESS.
0048 60020 006400          CLB           TEST FOR ZERO LENGTH TRANSFER.
0049 60021 054072          CPB WORD
0050 60022 026072          JMP DEND       NO TRANSFER.
0051 60023 007400          CCB           SET DRIVER
0052 60024 074261          STB ENDRM     BUSY FLAG
0053*
0054 60025 006400  DSCST CLB
0055 60026 100042          LSL 2          GET SELECT CODE FROM DRUM TABLE

```

0056	60027	044676		ADB ?ATBL	
0057	60030	160001		LDA 1,I	
0058	60031	072146		STA DTEMP	
0059	60032	010734		AND B77	
0060	60033	040552		ADA LIA1	CONSTRUCT "LIA COMMAND CHANNEL"
0061	60034	072077		STA DRIVE	
0062	60035	072062		STA DINT1	
0063	60036	072132		STA DRMER	
0064	60037	040772		ADA B100	CONSTRUCT "OTA COMMAND CHANNEL"
0065	60040	072126		STA DINT2	
0066	60041	040734		ADA B77	CONSTRUCT "STC DATA CHANNEL"
0067	60042	072130		STA DINT3	
0068	60043	022142		XOR DCHAN	CONSTRUCT "20000B+SC" AS DMA
0069	60044	102607		OTA DMA	CONTROL WORD.
0070*					
0071	60045	060766		LDA M96	INITIALIZE FAIL COUNT
0072	60046	072143		STA DFAIL	
0073	60047	002400		CLA	
0074	60050	072147		STA DRATS	CLEAR ERROR STATUS SAVE WORD
0075	60051	026077		JMP DRIVE	GO INITIATE TRANSFER.
0076*					
0077*	INTERRUPT SECTION *				
0078*					
0079	60052	000000	DINT	NOP	
0080	60053	103100		CLF 0	INHIBIT INTERRUPT.
0081	60054	104400		DST DSAVE	SAVE A AND B REGISTERS.
	60055	060144			
0082	60056	064362		LDB .+10B	COMPUTE MASK FOR ERROR TEST.
0083	60057	062141		LDA CORE	TEST BIT 3 ONLY IF OUTPUT.
0084	60060	002020		SSA	
0085	60061	064364		LDB .+12B	TEST BITS 1 AND 3 IF INPUT
0086	60062	102500	DINT1	LIA 0	READ DRUM STATUS.
0087	60063	010001		AND 1	MASK RELEVANT BITS.
0088	60064	002002		SZA	IF ERROR BITS SET, GO TO
0089	60065	026132		JMP DRMER	DRUM RETRY
0090	60066	070261	DEND2	STA ENDRM	FLAG OPERATION COMPLETE
0091	60067	062147		LDA DRATS	GET ERROR STATUS
0092	60070	002002		SZA	RETRIES OR FAILS?
0093	60071	016150		JSB DRAIL	YES, GO INFORM OPERATOR
0094	60072	107707	DEND	CLC DMA,C	CLEAR DMA.
0095	60073	104200	DEND1	DL D DSAVE	RESTORE REGISTERS.
	60074	060144			
0096	60075	102100		STF 0	FORCE INTERRUPT ON.
0097	60076	126052		JMP DINT,I	EXIT.
0098*					
0099	60077	102500	DRIVE	LIA 0	START TRANSFER.
0100	60100	000010		SLA	TEST IF CONTRCLLER BUSY.
0101	60101	026077		JMP DRIVE	
0102	60102	001727		ALF,ALF	
0103	60103	002021		SSA,RSS	
0104	60104	026077		JMP DRIVE	
0105	60105	066141		LDB CORE	OUTPUT CORE ADDRESS
0106	60106	106703		CLC DMA=4	TO DMA.
0107	60107	106603		OTB DMA=4	
0108	60110	060072		LDA WORD	IF OUTPUT, SET WORD COUNT TO AN

0109	60111	007020		CMB,SSB	EVEN # OF SECTORS.
0110	60112	010610		AND M64	
0111	60113	102703		STC DMA=4	OUTPUT WORD
0112	60114	102603		OTA DMA=4	COUNT.
0113*					
0114	60115	062146		LDA DTEMP	GET DRUM INFO.
0115	60116	001727		ALF,ALF	A(15:14)+TRACK PREFIX.
0116	60117	005200		RBL	B(0)+DIRECTION.
0117	60120	100042		LSL 2	B(2:0)+DADDR PREFIX.
0118	60121	062140		LDA DADDR	GET DRUM ADDRESS.
0119	60122	001222		RAL,RAL	REMOVE DRUM NUMBER.
0120	60123	100046		LSL 6	EXTRACT TRACK.
0121	60124	001200		RAL	REMOVE BIT 7.
0122	60125	101051		LSR 9	GET FINAL DRUM ADDRESS.
0123	60126	102600	DINT2	OTA 0	SEND DRUM ADDRESS TO DRUM
0124	60127	103707		STC DMA,C	INITIATE DMA.
0125	60130	102700	DINT3	STC 0	INITIATE DRUM.
0126	60131	026073		JMP DEND1	
0127*					
0128	60132	102500	DRMER	LIA 0	GET STATUS
0129	60133	072147		STA DRATS	AND SAVE IT
0130	60134	036143		ISZ DFAIL	TEST FOR DEATH
0131	60135	026077		JMP DRIVE	TRY AGAIN.
0132	60136	002404		CLA,INA	
0133	60137	026066		JMP DEND2	
0134	60140		DSCED	EQU *	
0135*					
0136*					
0137	60140	000000	DADDR	BSS 1	DRUM ADDRESS
0138	60141	000000	CORE	BSS 1	CORE ADDRESS.
0139	60142	122700	DCHAN	OCT 122700	
0140	60143	000000	DFAIL	BSS 1	FAIL COUNT.
0141	60144	000000	DSAVE	BSS 2	A&B REGISTERS.
0142	60146	000000	DTEMP	BSS 1	TBL ENTRY.
0143	60147	000000	DRATS	BSS 1	ERROR STATUS SAVE WORD

0145* THIS ROUTINE INFORMS THE SYSTEM OPERATOR EACH TIME THE
 0146* DRUM DRIVER FAILS TO SUCCESSFULLY COMPLETE A REQUESTED
 0147* TRANSFER AND EACH TIME RETRIES ARE NEEDED TO COMPLETE
 0148* A REQUESTED TRANSFER. THE PRINTOUT INCLUDES THE
 0149* OPERATION, NUMBER OF SECTORS BEING TRANSFERRED, DRUM
 0150* ADDRESS, AND STATUS.

0152	60150	000000	DRAIL	NOP	ENTRY POINT
0153	60151	114211		JSB GMQBP,I	GET PUNTER TO MESSAGE QUEUE
0154	60152	126150		JMP DRAIL,I	NO ROOM: RETURN (DO NOTHING)
0155*					
0156	60153	064261		LDB ENDRM	
0157	60154	006003		SZB,RSS	RETRY OR FAILURE MESSAGE?
0158	60155	026173		JMP DRA1	RETRY
0159	60156	066414		LDB DR,66	FAILURE: SET LENGTH
0160	60157	174000		STB A,I	
0161	60160	002004		INA	
0162	60161	066413		LDB DCRLF	CARRIAGE RETURN/
0163	60162	174000		STB A,I	LINEFEED
0164	60163	002004		INA	
0165	60164	066406		LDB DRBLS	
0166	60165	174000		STB A,I	TWO BELLS
0167	60166	002004		INA	
0168	60167	072416		STA CARRD	
0169	60170	062343		LDA DRDFP	OUTPUT
0170	60171	064344		LDB ,=6	"DRUM FAILURE"
0171	60172	026201		JMP DRA2	
0172*					
0173*					
0174	60173	064436	DRA1	LDB ,58	COME HERE FOR RETRY MESSAGE
0175	60174	174000		STB A,I	
0176	60175	002004		INA	
0177	60176	072416		STA CARRD	
0178	60177	062352		LDA DRDRP	OUTPUT
0179	60200	064343		LDB ,=6	"DRUM RETRY"
0180	60201	072415	DRA2	STA CARRS	
0181	60202	016307		JSB CARRY	
0182*					
0183*					
0184*					
0185	60203	066141		LDB CORE	
0186	60204	006021		SSB,RSS	
0187	60205	026210		JMP DRA3	
0188	60206	062360		LDA DRREP	OUTPUT "READING"
0189	60207	002001		RSS	
0190	60210	062365	DRA3	LDA DRWRP	OUTPUT "WRITING"
0191	60211	072415		STA CARRS	
0192	60212	064346		LDB ,=4	
0193	60213	016307		JSB CARRY	
0194*					
0195*					
0196*					
0197	60214	060072		LDA WORD	CONVERT
0198	60215	007400		CCB	=WORDS

0199	60216	101026	ASR 6	TO
0200	60217	003004	CMA, INA	+SECTORS
0201	60220	006400	CLB	
0202	60221	100400	DIV .100	
	60222	000437		
0203	60223	042410	ADA DRAB0	
0204	60224	172416	STA CARRD, I	DIGIT 1
0205	60225	036416	ISZ CARRD	
0206	60226	060001	LDA B	
0207	60227	016317	JSB DRANM	DIGITS 2 AND 3
0208*				
0209*				
0210	60230	062372	LDA DRAP	
0211	60231	072415	STA CARRS	
0212	60232	064344	LDB .-6	
0213	60233	016307	JSB CARRY	OUTPUT "SECTORS AT"
0214*				
0215*	GET AND OUTPUT DRUM ADDRESS			
0216*				
0217	60234	062140	LDA DADDR	
0218	60235	001222	RAL, RAL	DRUM # IN LOW 2 BITS
0219	60236	010355	AND .+3	
0220	60237	001727	ALF, ALF	
0221	60240	042411	ADA DRAS0	
0222	60241	172416	STA CARRD, I	OUTPUT DRUM # - SLASH
0223	60242	036416	ISZ CARRD	
0224	60243	062140	LDA DADDR	
0225	60244	001727	ALF, ALF	ISOLATE TRACK
0226	60245	010734	AND B77	
0227	60246	016317	JSB DRANM	OUTPUT TRACK #
0228	60247	062140	LDA DADDR	
0229	60250	010441	AND B177	ISOLATE SECTOR
0230	60251	006400	CLB	
0231	60252	100400	DIV .100	
	60253	000437		
0232	60254	042412	ADA DRAS0	
0233	60255	172416	STA CARRD, I	OUTPUT SLASH - DIGIT 1
0234	60256	036416	ISZ CARRD	
0235	60257	060001	LDA B	
0236	60260	016317	JSB DRANM	OUTPUT DIGITS 2 AND 3
0237	60261	062407	LDA DRDOT	
0238	60262	172416	STA CARRD, I	PERIOD - BLANK
0239	60263	036416	ISZ CARRD	
0240*				
0241*	GET STATUS AND OUTPUT IT			
0242*				
0243	60264	062401	LDA DRSTP	
0244	60265	072415	STA CARRS	OUTPUT
0245	60266	064346	LDB .-4	
0246	60267	016307	JSB CARRY	"STATUS"
0247	60270	066147	LDB DRATS	
0248	60271	002400	CLA	
0249	60272	100104	RRL 4	
0250	60273	076415	STB CARRS	
0251	60274	016331	JSB DR8NM	DIGITS 1 AND 2

0252	60275	066415	LDB	CARRS	
0253	60276	002400	CLA		
0254	60277	100106	RRL	6	
0255	60300	016331	JSB	DR8NM	DIGITS 3 AND 4
0256	60301	062147	LDA	DRATS	
0257	60302	010734	AND	B77	
0258	60303	016331	JSB	DR8NM	DIGITS 5 AND 6
0259*					
0260	60304	062413	LDA	DCRLF	
0261	60305	172416	STA	CARRD,I	CARRIAGE RETURN / LINEFEED
0262	60306	126150	JMP	DRAIL,I	
0263*					
0264*					
0265	60307	000000	CARRY	NOP	MOVES -B WORDS FROM CARRS,I TO
0266	60310	006025	SSB,	INB,RSS	CARRD,I
0267	60311	126307	JMP	CARRY,I	
0268	60312	162415	LDA	CARRS,I	
0269	60313	172416	STA	CARRD,I	
0270	60314	036415	ISZ	CARRS	
0271	60315	036415	ISZ	CARRD	
0272	60316	026310	JMP	CARRY+1	
0273*					
0274*					
0275	60317	000000	DRANM	NOP	CONVERT A # < 100 TO ASCII
0276	60320	006400	CLB		
0277	60321	100400	DIV	.+10	
	60322	000364			
0278	60323	001727	ALF,	ALF	
0279	60324	040001	ADA	B	
0280	60325	040574	ADA	ASC00	
0281	60326	172416	STA	CARRD,I	OUTPUT 2 ASCII DIGITS
0282	60327	036416	ISZ	CARRD	
0283	60330	126317	JMP	DRANM,I	
0284*					
0285*					
0286	60331	000000	DR8NM	NOP	CONVERTS A # < 100B TO ASCII
0287	60332	006400	CLB		(TWO OCTAL DIGITS)
0288	60333	100400	DIV	.+8	
	60334	000362			
0289	60335	001727	ALF,	ALF	
0290	60336	040001	ADA	B	
0291	60337	040574	ADA	ASC00	
0292	60340	172416	STA	CARRD,I	OUTPUT 2 ASCII DIGITS
0293	60341	036416	ISZ	CARRD	
0294	60342	126331	JMP	DR8NM,I	
0295*					
0296*					
0297	60343	060344	DRDFP	DEF DRDF	
0298	60344	042122	DRDF	ASC 6,DRUM FAILURE	
	60345	052515			
	60346	020106			
	60347	040511			
	60350	046125			
	60351	051105			
0299	60352	060353	DRDRP	DEF DRDR	

0300	60353	042122	DRDR	ASC 5, DRUM RETRY
	60354	052515		
	60355	020122		
	60356	042524		
	60357	051131		
0301	60360	060361	DRREP	DEF DRRE
0302	60361	020122	DRRE	ASC 4, READING
	60362	042501		
	60363	042111		
	60364	047107		
0303	60365	060366	DRWRP	DEF DRWR
0304	60366	020127	DRWR	ASC 4, WRITING
	60367	051111		
	60370	052111		
	60371	047107		
0305	60372	060373	DRSAP	DEF DRSA
0306	60373	020123	DRSA	ASC 6, SECTORS AT
	60374	042503		
	60375	052117		
	60376	051123		
	60377	020101		
	60400	052040		
0307	60401	060402	DRSTP	DEF DRST
0308	60402	020123	DRST	ASC 4, STATUS
	60403	052101		
	60404	052125		
	60405	051440		
0309	60406	003407	DRBLS	OCT 3407
0310	60407	027040	DRDOT	ASC 1, 0
0311	60410	020060	DRAB0	ASC 1, 0
0312	60411	030057	DRAGS	ASC 1, 0/
0313	60412	027460	DRAS0	ASC 1, 0
0314	60413	006412	DCRLF	OCT 6412
0315*				
0316	60414	000102	DR, 66	DEC 66
0317*				
0318	60415	000000	CARRS	BSS 1
0319	60416	000000	CARRD	BSS 1
0320*				

0322* THE POWER FAIL/RESTART ROUTINE INSURES A LOGICAL SHUTDOWN AND
 0323* RESTART OF THE SYSTEM IN CASE OF POWER FAIL.

0325	60417	000000	POW	NOP	INTERRUPT ENTRY POINT,
0326	60420	102204		SFC 4	TEST FOR FAIL OR RESTART,
0327	60421	026474		JMP POW1	TRANSFER TO RESTART SECTION.
0328*					
0329*	POWER FAIL SECTION.				
0330*					
0331	60422	104400		DST POWI	SAVE REGISTERS TEMPORARILY.
	60423	060651			
0332	60424	005520		ERB,BLS	
0333	60425	102201		SOC	
0334	60426	006004		INB	
0335	60427	002400		CLA	IF POWFF WAS NONZERO,
0336	60430	052650		CPA POWFF	INTERRUPT WAS FROM POWER FAIL.
0337	60431	026434		JMP ++3	
0338	60432	072650		STA POWFF	
0339	60433	026472		JMP POW2	
0340*					
0341	60434	062417		LDA POW	TEST FOR INTERRUPT OUT OF
0342	60435	042670		ADA POWD1	RESTART SECTION.
0343	60436	002020		SSA	
0344	60437	026443		JMP ++4	NORMAL FAIL.
0345	60440	042671		ADA POWD2	
0346	60441	002020		SSA	
0347	60442	026472		JMP POW2	FAILED FROM RESTART SECTION.
0348*					
0349	60443	076655		STB POWEO	NORMAL FAILURE--SAVE REGISTERS.
0350	60444	104200		DLD POWI	
	60445	060651			
0351	60446	104400		DST POWAB	
	60447	060653			
0352	60450	062417		LDA POW	
0353	60451	072656		STA POWP	
0354	60452	102501		LIA 01	LOAD AND SAVE
0355	60453	072661		STA POWSW	THE SWITCH REGISTER
0356*					
0357	60454	002400		CLA	GET FLAGS FOR ALL DEVICES THAT
0358*					CAN INTERRUPT.
0359	60455	102207		SFC DMA	CHECK DMA FLAG
0360	60456	030353		IOR .+1	BIT ZERO FOR CH 7
0361*		SFC CH1			NOT INTERESTED IN STATE
0362*		IOR .+2			OF THIS CHANNEL
0363	60457	102211		SFC CH2	CHECK INTERCONNECT TWO
0364	60460	030356		IOR .+4	BIT 2 FOR CH 1:
0365	60461	102212		SFC ?SC	CHECK FLAG ON CONSOLE TTY.
0366	60462	030362		IOR .+100	BIT 3 FOR TTY
0367	60463	102216		SFC CLOCK	CHECK TIME BASE GENERATOR
0368	60464	030442		IOR 0200	BIT 7 FOR CH 16
0369	60465	072657		STA POWFL	
0370	60466	006400		CLB	
0371	60467	102200		SFC 0	IF INTERRUPT IS SET, STORE
0372	60470	066556		LDB STF0	STF 0 INTO POWND; ELSE NOP.
0373	60471	076641		STB POWND	

0374*

0375 60472 106704 POW2 CLC 4 SET FOR RESTART.
 0376 60473 102000 HLT

0378* RESTART SECTION

0380 60474 102704 POW1 STC 4 RESET FOR POWER FAIL.
 0381 60475 062661 LDA POWSW FETCH AND RESTORE
 0382 60476 102601 OTA 01 THE SWITCH REGISTER
 0383 60477 060360 LDA ,+6 INITIALIZE J AS POWER FAIL POIN-
 0384 60500 072652 STA POWJ TER AND I AS DMA POINTER,
 0385 60501 002004 INA
 0386 60502 072651 STA POWI
 0387 60503 060355 LDA ,+3 RESET CLOCK FREQUENCY.
 0388 60504 102616 OTA CLOCK
 0389 60505 062657 LDA POWFL COPY FLAGS.
 0390 60506 072660 STA POWF
 0391 60507 066001 LDB TBITS IF ASR35 FLAG WAS CLEAR, SET UP
 0392 60510 010362 AND ,+10B THE CORRECT STATE OF THE ASR35
 0393 60511 002003 SZA,RSS OTHERWISE LEAVE IT SET IN THE
 0394 60512 106612 OTB ?SC INPUT STATE.

0395*

0396* NOW TEST THE INDIVIDUAL IO FLAGS, IF A FLAG WAS CLEAR, WE PERFORM
 0397* A CLF OPERATION, IF IT WAS SET, WE TAKE STRONGER ACTION.

0398*

0399 60513 062660 POW4 LDA POWF GET WORD CONTAINING FLAGS, THE
 0400 60514 001300 RAR ONE TO BE TESTED IS IN BIT 0 AND
 0401 60515 072660 STA POWF I* ITS SELECT CODE.
 0402 60516 002020 SSA
 0403 60517 026531 JMP POW5 FLAG SET.

0404*

0405 60520 062651 LDA POWI PRODUCE CLF INSTRUCTION,
 0406 60521 042560 ADA CLF0
 0407 60522 072523 STA **1

0408 60523 000000 NOP EXECUTE CLF,
 0409 60524 062651 POW6 LDA POWI TEST FOR DONE.
 0410 60525 050370 CPA ,+16B CHECK FOR CLOCK LOCATION
 0411 60526 026567 JMP POW14 DONE.
 0412 60527 036651 ISZ POWI OTHERWISE, BUMP I AND LOOP,
 0413 60530 026513 JMP POW4

0414*

0415* FLAG WAS SET, TEST IF ROUTINE HAD ACTUALLY BEEN
 0416* ENTERED, IF SO, PERFORM A DUMMY INTERRUPT TO PRE-
 0417* VENT IT FROM BEING REENTERED.

0418*

0419 60531 066662 POW5 LDB POWTB COMPUTE LOCATION OF RETURN AD-
 0420 60532 046652 ADB POWJ DRESS OF HIGHEST PRIORITY ROU-
 0421 60533 164001 LDB 1,I TINE NOT YET TESTED.
 0422 60534 160001 LDA 1,I GET ITS RETURN ADDRESS
 0423 60535 066662 LDB POWTB
 0424 60536 046651 ADB POWI POINT TO RET.ADR. OF TEST ROUTIN
 0425 60537 003000 CMA TEST FOR INTERRUPT OUT OF THAT
 0426 60540 140001 ADA 1,I ROUTINE.
 0427 60541 002021 SSA,RSS

```

0428 60542 026524      JMP POW6      NO--INTERRUPT WAS PENDING.
0429 60543 044362    ADB10 ADB ,+10B  POINT TO END OF TEST ROUTINE.
0430 60544 140001      ADA 1,I
0431 60545 002020      SSA
0432 60546 026524      JMP POW6      NOT INTERRUPTED.
0433*
0434* PERFORM DUMMY INTERRUPT TO PREVENT AN UNWANTED ONE LATER.
0435*
0436 60547 062543      LDA ADB10    PLACE ADB10 IN INTERRUPT CELL.
0437 60550 172651      STA POWI,I
0438 60551 062651      LDA POWI
0439 60552 042700      ADA STC0    SET UP STC AND CLC.
0440 60553 072555      STA POWST
0441 60554 020736      XOR B4000   CREATE CLC.
0442 60555 102700    POWST STC 0   SET DEVICE CONTROL
0443 60556 102100    STF0  STF 0   ENABLE INTERRUPT (CAUSING ADB10&
0444 60557 072561      STA POWCL   COMPUTE ADR. OF CORRECT INT. VAL
0445 60560 103100    CLF0  CLF 0   DISABLE INTERRUPT.
0446 60561 106700    POWCL CLC 0   DISABLE DEVICE.
0447 60562 160001      LDA 1,I     GET CORRECT INTERRUPT CONTENTS.
0448 60563 172651      STA POWI,I  STORE IN INTERRUPT CELL.
0449 60564 062651      LDA POWI    UPDATE INTERRUPT CHAIN
0450 60565 072652      STA POWJ    POINTER.
0451 60566 026524      JMP POW6    GO TEST NEXT DEVICE.
0452*
0453*** HAVE DONE ALL DUMMY INTERRUPTS.
0454*** SET CONTROL ON CLOCK AND TTY.
0455*** AND RESTART INTERCONNECT.
0456*
0457 60567      POW14 EQU *
0458 60567 103710    STC CH1,C   RESTART FIRST CHANNEL
0459 60570 060073    LDA SVCH2   PUT WORD BACK OUT ON CH2
0460 60571 102611    OTA CH2
0461 60572 102111    STF CH2
0462 60573 062657    LDA POWFL   LOAD FLAG WORD
0463 60574 010356    AND ,+4     LEAVE BIT 2
0464 60575 002003    SZA,RSS    SKIP IF FLAG SET
0465 60576 103711    STC CH2,C   OTHERWISE, TELL OTHER MACHINE
0466 60577 106711    CLC CH2     WANT NO INTERRUPT
0467 60600 102716    STC CLOCK
0468 60601 102712    STC ?SC
0469 60602 062001    LDA TBITS   RE-ESTABLISH PREVIOUS
0470 60603 102612    OTA ?SC     STATE OF ASK35
0471 60604 036650    ISZ POWFF   SET IN CASE OF ANOTHER PF
0472*** IF DRUM TRANSFER WAS IN PROGRESS REPEAT TRANSFER
0473*** ELSE DO NORMAL RETURN.
0474 60605 060261    LDA ENDRM
0475 60606 002021    SSA,RSS
0476 60607 026630    JMP POW52   DRUM FREE; GO PROCESS DISCS
0477*** DRUM DRIVER WAS BUSY. TEST IF POWER FAIL
0478*** TOOK PLACE WITHIN DRUM DRIVER
0479 60610 066656    LDB POWP    GET RETURN ADDRESS.
0480 60611 046702    ADB POW28   COMPARE TO START OF DRUM DRIVER
0481 60612 006020    SSB
0482 60613 026624    JMP POW29   RETURN ADDRESS < DRIVER ?
                    YES,

```

0483	60614	046701	ADB	POW31	COMPARE TO END OF DRIVER,
0484	60615	006021	SSB,	RSS	RETURN ADDRESS > DRIVER ?
0485	60616	026624	JMP	POW29	YES.
0486	60617	016643	JSB	POW50	WAS IN DRUM DRIVER; DO DISCS 1ST
0487	60620	062140	LDA	DADDR	GET DRUM ADDRESS
0488	60621	006400	CLB		SAY NOT IN RESTART
0489	60622	076650	STB	POWFF	ROUTINE
0490	60623	026025	JMP	DSCST	JUMP DIRECTLY TO THE DRIVER
0491	60624		POW29	EQU *	
0492	60624	066141	LDB	CORE	GET CORE AND
0493	60625	062140	LDA	DADDR	DRUM ADDRESS
0494	60626	114770	JSB	DRUM,I	RECALL DRUM DRIVER
0495	60627	103100	CLF	0	
0496*					
0497	60630		POW52	EQU *	
0498	60630	016643	JSB	POW50	GO WAIT FOR DISCS
0499*					
0500	60631		POW27	EQU *	
0501	60631	002400	CLA		
0502	60632	072650	STA	POWFF	SAY NOT RESTARTING
0503**	RESTORE REGISTERS,				
0504	60633	062655	LDA	POWEO	IEI AND OVERFLOW
0505	60634	103101	CLO		
0506	60635	000036	SLA,	ELA	
0507	60636	102101	STU		
0508	60637	104200	DLI	POWAB	
	60640	060653			
0509**	RESET INTERRUPT SYSTEM TO SAME AS BEFORE FAIL.				
0510	60641	000000	POWND	NOP	OR STF 0,
0511	60642	126656	JMP	POWP,I	RETURN.
0512	60643	000000	POW50	NOP	
0513	60644	062714	LDA	POFFP	GET POINTER TO POWFF
0514	60645	066656	LDB	POWP	GET POWER FAIL LOCATION
0515	60646	114216	JSB	DREDP,I	GO DO DISC STUFF
0516	60647	126643	JMP	POW50,I	RETURN
0517	60650		POW40	EQU *	
0518*					
0519	60650	000000	POWFF	NOP	SET TO 1 DURING DISC RECALL,
0520	60651	000000	POWI	BSS 1	POINTER TO DEVICE BEING TESTED,
0521	60652	000000	POWJ	BSS 1	POINTER TO INTERRUPT CHAIN,
0522	60653	000000	POWAB	BSS 2	TEMPS TO HOLD VALUES OF A&B,
0523	60655	000000	POWEO	BSS 1	TEMP TO HOLD VALUE OF E&O,
0524	60656	000000	POWP	BSS 1	TEMP TO HOLD VALUE OF P
0525	60657	000000	POWFL	BSS 1	TEMP TO HOLD STATE OF I/O FLAGS,
0526	60660	000000	POWF	BSS 1	COPY OF POWFL,
0527	60661	000000	POWSW	BSS 1	TEMP TO HOLD SWITCH REGISTER
0528*					
0529	60662	060655	PUNTB	DEF **5	POINTER TO FOLLOWING TABLE.
0530*					
0531*	THIS TABLE POINTS TO THE ENTRY POINTS FOR				
0532*	THE INTERRUPT ROUTINES.				
0533*					
0534	60663	060656	DEF	POWP	POWER FAIL RTN,ADR.
0535	60664	060052	DEF	DINT	DISC RTN,ADR.
0536	60666	063334	DEF	R14CM	INTERCONNECT RTN ADR


```

0537 60666 063334      DEF R14CM
0538 60667 060735      DEF ?TT2      TTY RTN,ADR.
0539 60670              POX1 EQU *
0540 60670 000000      BSS 3        NO INTERRUPTS OCCUR ON THESE CHA
0541 60673 070026      DEF CLKIN    CLK RTN,ADR.

```

0542*

0543*

0544*

0545*

0546*

0547*

0548*

THIS SECTION GIVES THE LENGTH OF EACH ROUTINE
SO THAT POWER FAIL CAN DETERMINE WHETHER
THAT ROUTINES INTERRUPT HAD ACTUALLY OCCURRED
OR WAS STILL PENDING AT THE TIME OF THE POWER FAILURE.

```

0549 60674 000067      ABS DSCED=DINT+1  CODES FOR TESTING IF
0550 60675 000220      ABS R14ED=R14CM
0551 60676 000000      ABS 0          NO SUCH ROUTINE
0552 60677 000166      ABS TTYED=?TT2+1  WITHIN INTERRUPT
0553 60700              POX2 EQU *
0554 60700 000000      BSS 3        NO INTERRUPTS OCCUR ON THESE CHA
0555 60703 000030      ABS CLKED=CLKIN+1  ROUTINES.
0556*
0557 60704 114476      JSB ?ADIN,I     CORRECT CONTENTS
0558 60705 114464      JSB R14DR,I     OF INTERRUPT CELLS
0559 60706 106711      CLC CH2
0560 60707 114466      JSB T35DR,I
0561 60710 103013      HLT 13B,C
0562 60711 103014      HLT 14B,C
0563 60712 103015      HLT 15B,C
0564 60713 114472      JSB CLKDR,I
0565*
0566 60714              POX3 EQU *
0567 60670              ORG POX1      FILL UP THE HOLE
0568 60670 117304      POWD1 ABS =POW1
0569 60671 177624      POWD2 ABS POW1=POW40
0570 60672 102207      SFC7  SFC 7
0571 60700              ORG POX2      FILL UP THE HOLE
0572 60700 102700      STC0  STC 0
0573 60701 177665      POW31 ABS DSCST=DSCED
0574 60702 117763      POW28 ABS =DSCST
0575 60714              ORG POX3      BACK WHERE WE BELONG
0576 60714 060650      POWFF DEF POWFF

```

0002* THE SYSTEM CONSOLE DRIVER CONTROLS ALL TRANSMISSION OF DATA BE-
 0003* TWEEN THE SYSTEM CONSOLE (ASR=35) AND THE SYSTEM. IT HANDLES ALL
 0004* * IO FOR THE DEVICE AND PROVIDES FOR COMMUNICATION OF MESSAGES TO
 0005* THE SYSTEM, THE FOLLOWING VARIABLES ARE SIGNIFICANT:
 0006*
 0007* T35F1: =0 DURING INPUT, =1 DURING OUTPUT.
 0008* T35F2: NORMALLY 0, IT IS SET TO =1 WHEN A COMPLETE MESSAGE HAS
 0009* BEEN RECEIVED, UNTIL IT IS CLEARED BY THE SYSTEM, ALL FUR-
 0010* THER INPUT IS INHIBITED.
 0011* T35F3: NORMALLY 0, IT IS SET TO =1 WHEN A COMPLETE MESSAGE HAS
 0012* BEEN RECEIVED, UNTIL IT IS CLEARED BY THE OUTPUT
 0013* INITIALIZATION SECTION OF THIS DRIVER, LOG AND MESSAGE
 0014* ENTRIES ARE HELD OFF.
 0015* TOG: NOT USED DURING INPUT, DURING OUTPUT, BIT 0 = 0 IF NEXT
 0016* CHARACTER IS ON LEFT, 1 IF ON RIGHT.
 0017* TADR: NOT USED DURING INPUT. DURING OUTPUT, TADR(14:0) POINTS TO
 0018* THE WORD FROM WHICH THE NEXT CHARACTER WILL BE TAKEN.
 0019* BIT 15=1 FOR PUNCH & PRINT, 0 FOR PRINT ONLY.
 0020* TCNT: DURING INPUT, TCNT=# OF CHARS IN SO FAR, DURING OUTPUT,
 0021* TCNT(14:0)=# OF CHARS REMAINING TO BE OUTPUT, BIT 15=0
 0022* IF A CRLF IS TO BE APPENDED, 1 IF NOT.
 0023* TBITS: CONTAINS CURRENT CONTROL BITS.
 0024* 120000 => PRINT
 0025* 130000 => PUNCH AND PRINT
 0026* 160000 => INPUT
 0027* TTA,TTB,TTT: USED TO SAVE THE VALUES OF A,B,E REGISTERS DURING
 0028* INTERRUPTS.
 0029*
 0030* CALLING SEQUENCE:
 0031* JSB TTY35,1 A=# OF CHARS (BIT 15=0 FOR CRLF, 1 FOR NONE)
 0032* B=BUFFER ADDRESS (BIT 15=1 FOR PUNCHING)
 0033*
 0034* INPUT MESSAGES ARE STORED IN THE 72 CHARACTER BUFFER T35BF.
 0035*

 0037 60715 000200 ?TT35 NOP ENTRY POINT FOR OUTPUT.
 0038 60716 103100 CLF 0 INHIBIT INTERRUPT.
 0039 60717 070074 STA TCNT SET UP INITIAL PARAMETERS.
 0040 60720 076011 STB TADR
 0041 60721 003400 CCA SET FLAG TO SAY
 0042 60722 070313 STA T35F1 OUTPUT.
 0043 60723 062716 LDA ?TT35 COPY RETURN ADDRESS INTO THAT OF
 0044 60724 072735 STA ?TT2 INTERRUPT SECTION.
 0045 60725 002400 CLA SET TOG TO SAY LEFT HAND CHAR.
 0046 60726 072010 STA TOG
 0047 60727 070315 STA T35F3
 0048*
 0049* TEST FOR PENDING INPUT, IF THERE IS ANY, EXIT IMMEDIATELY AND LET
 0050* THE INTERRUPT TRIGGER THE FIRST OUTPUT CHARACTER.
 0051*
 0052 60730 102512 LIA 78C
 0053 60731 002021 SSA,RSS
 0054 60732 026761 JMP TT18 NONE PENDING--GO OUTPUT 1ST CHAR
 0055 60733 102100 STF 0

```

0056 60734 126715      JMP ?TT35,I
0057*
0058* INTERRUPT SECTION
0059*
0060 60735 000000      ?TT2  NOP
0061 60736 072005      STA TTA          SAVE REGISTERS.
0062 60737 076006      STB TTB
0063 60740 001500      ERA
0064 60741 072007      STA TTE
0065 60742 060313      LDA T35F1       TEST FLAG TO DETERMINE IF
0066 60743 002003      SZA,RSS         INPUT OR OUTPUT.
0067 60744 027037      JMP TT17        INPUT
0068 60745 102512      LIA ?SC         LOAD BACK LINE STATUS DURING OUT
0069 60746 064277      LDB T35ST       GET CONSOLE STATUS
0070 60747 054355      CPB XOUTW       IF OUTPUT WAIT
0071 60750 064301      LDB T35PR       USE PRIORITY
0072 60751 007004      CMB,INB
0073 60752 044435      ADB ,+XSYNT-.,+1+R08=COM2
0074 60753 006021      SSB,RSS         SKIP IF ABORT NOT ALLOWED
0075 60754 050443      CPA B377        CHECK FOR A KEY STRUCK
0076 60755 026761      JMP TT18        NO INPUT, CONTINUE ON
0077 60756 002400      CLA
0078 60757 070314      STA T35F2       CLEAR CONTINUEING OUTPUT FLAG
0079 60760 070277      STA T35ST       SET CONSOLE STATUS TO IDLE
0080*
0081 60761 060074      TT18 LDA TCNT        GET # OF CHARS LEFT.
0082 60762 001265      RAL,CLE,ERA    COPY CRLF BIT INTO E.
0083 60763 002002      SZA            ANY CHARS LEFT?
0084 60764 027014      JMP TT5        YES--GO OUTPUT NEXT ONE.
0085 60765 002040      SEZ            NO--WANT CRLF?
0086 60766 027000      JMP TT6        NO--GO RESET FOR INPUT.
0087 60767 072010      STA TOG        SET UP OUTPUT OF CRLF.
0088 60770 060355      LDA ,+3        3 CHARS WITH
0089 60771 031036      IOR BIT15     NO CRLF FOLLOWING.
0090 60772 070074      STA TCNT
0091 60773 062011      LDA TADR       KEEP PRINT/PUNCH BIT.
0092 60774 011036      AND BIT15
0093 60775 033123      IOR TTXCP
0094 60776 072011      STA TADR
0095 60777 026761      JMP TT18
0096*
0097* END OF OUTPUT--RESET FOR INPUT.
0098*
0099 61000 070074      TT6  STA TCNT        SET COUNTER TO SAY NO CHARS IN.
0100 61001 070313      STA T35F1     SET FLAG TO SAY INPUT.
0101 61002 060226      LDA B160K     GET CONTROL BITS FOR INPUT.
0102 61003 072001      STA T8BITS    SAVE.
0103 61004 102512      TT8  OTA ?SC    OUTPUT TO CONSOLE.
0104 61005 062007      TT10 LDA TTE       RESTORE REGISTERS.
0105 61006 001600      ELA
0106 61007 062005      LDA TTA
0107 61010 066006      LDB TTB
0108 61011 103712      STC ?SC,C    ENABLE DEVICE.
0109 61012 102100      STF 0         ENABLE INTERRUPT.
0110 61013 126735      JMP ?TT2,I    EXIT.

```

```

0111*
0112* OUTPUT NEXT CHARACTER
0113*
0114 61014 003400 TT5 CCA DECREMENT
0115 61015 040074 ADA TCNT COUNTER.
0116 61016 070074 STA TCNT
0117 61017 066011 LDB TADR GET POINTER TO OUTPUT BUFFER.
0118 61020 062002 LDA B120K GET BITS FOR PRINT ONLY.
0119 61021 005275 RBL,CLE,SLB,ERB TEST & CLEAR BIT 15 OF B.
0120 61022 062003 LDA B130K GET PRINT/PUNCH BITS.
0121 61023 072001 STA TBITS SAVE CONTROL BITS.
0122 61024 102612 OJA ?3C OUTPUT TO DEVICE.
0123 61025 160001 LDA 1,I GET WORD CONTAINING CHARACTER.
0124 61026 066010 LDB TOG GET LEFT/RIGHT TOGGLE.
0125 61027 004010 SLB IF RIGHT CHARACTER,
0126 61030 036011 ISZ TADR BUMP POINTER.
0127 61031 006011 SLB,RSS IF LEFT CHARACTER,
0128 61032 001727 ALF,ALF POSITION ON RIGHT.
0129 61033 036010 ISZ TUG REVERSE TOGGLE SENSE.
0130 61034 010441 TT15 AND B177 KEEP BITS 6=0 AND
0131 61035 030442 IOR B200 SET BIT 7.
0132 61036 027004 JMP TT8 GO OUTPUT CHARACTER.
0133*
0134* CHARACTER HAS BEEN INPUT.
0135*
0136 61037 060314 TT17 LDA T35F2 IGNORE CHARACTER IF T35F2 IS SET
0137 61040 102401 MIA 1 OR SWITCH 0 IS SET.
0138 61041 000010 SLA
0139 61042 027005 JMP TT10
0140 61043 102512 LIA ?3C GET CHARACTER IN A.
0141 61044 010441 AND B177
0142 61045 007400 CGB PREPARE =1 IN B.
0143 61046 050364 CPA ,+120 IGNORE LF, RUBOU1, NULL, XOFF.
0144 61047 027005 JMP TT10
0145 61050 050441 CPA B177
0146 61051 027005 JMP TT10
0147 61052 002002 SZA
0148 61053 050375 CPA ,+230
0149 61054 027005 JMP TT10
0150*
0151** TEST FOR 'CONTROL X'
0152*
0153 61055 050402 CPA ,+300
0154 61056 027112 JMP TT11
0155*
0156 61057 052004 CPA BKSPC TEST FOR "="
0157 61060 027100 JMP TT12
0158 61061 050367 CPA ,+150 TEST FOR CR.
0159 61062 074314 STB T35F2 SET COMMUNICATION FLAG.
0160 61063 050367 CPA ,+150
0161 61064 074310 STB T35F3
0162*
0163* NOW INSERT CHARACTER IN BUFFER.
0164*
0165 61065 064074 LDB TCNT GET COUNT IN B.

```

0166	61066	054440		CPB ,72	DON'T IF BUFFER IS FULL.
0167	61067	027005		JMP TT10	
0168	61070	004065		CLE,ERB	MOVE LEFT/RIGHT BIT TO E, AND
0169	61071	044305		ADB T35B1	COMPUTE ADDRESS OF DESTINATION.
0170	61072	002041		SEZ,RSS	LEFT/RIGHT TEST.
0171	61073	001737		ALF,SLA,ALF	LEFT.
0172	61074	130001		IOR 1,I	RIGHT.
0173	61075	034074		ISZ TCNT	BUMP COUNTER.
0174	61076	170001	TT16	STA 1,I	STORE IN BUFFER.
0175	61077	027005		JMP TT10	GO EXIT.
0176*					
0177*	HANDLE BACKSPACE,				
0178*					
0179	61100	064074	TT12	LDB TCNT	GET CHARACTER COUNT
0180	61101	006003		SZB,RSS	IGNORE IF NO CHARS YET.
0181	61102	027005		JMP TT10	
0182	61103	044351		ADB ,=1	GET NEW TCNT.
0183	61104	074074		STB TCNT	
0184	61105	004065		CLE,ERB	CLEAR RIGHT HALF OF NEW DESTIN-
0185	61106	044305		ADB T35B1	ATION.
0186	61107	160001		LDA 1,I	
0187	61110	010762		AND HIMSK	
0188	61111	027076		JMP TT16	
0189*					
0190**	HANDLE 'CONTROL X'				
0191*					
0192	61112	074313	TT11	STB T35F1	SET OUTPUT FLAG.
0193	61113	002400		CLA	SET TCNT FOR CRLF AFTER "\".
0194	61114	070074		STA TCNT	
0195	61115	072011		STA TADR	SET FOR NO PUNCHING.
0196	61116	062002		LDA B120K	SET FOR PRINT ONLY.
0197	61117	072001		STA TBITS	
0198	61120	102612		OTA ?9C	
0199	61121	062000		LDA RVRSL	GO OUTPUT "\"
0200	61122	027034	TTYED	JMP TT15	
0201	61123	061124	TTXCP	DEF ++1	
0202	61124	011415		OCT 011415	X-OFF CR
0203	61125	005000		OCT 005000	LF

0205 SUP
 0206* THE TELETYPE TABLES CONTAIN IN CORE INFORMATION FOR SYSTEM USERS.
 0207* EACH OF THE 32 USERS HAS 1 TABLE, CONTAINING THE FOLLOWING
 0208* ENTRIES:
 0209* (?FLAG MUST BE FIRST, AND ?CLOC THROUGH ?PLEV MUST
 0210* BE CONTIGUOUS.)

0212 00000 ?FLAG EQU 0

0214* CONTAINS ALL BIT FLAGS FOR USER

0215*
 0216* TERR = 0001 TAPE ERROR
 0217* CFLAG = 0002 COMPILE MODE
 0218* HFLAG = 0004 HELLO IS RUNNING
 0219* TAPEF = 0010 USER IN TAPE MODE
 0220* UNABT = 0020 UNABLE TO ABORT
 0221* OUTWT = 0040 OUTPUT BUFFER FULL
 0222* COM14 = 0100 2114 COMMUNICATION
 0223* ABTRY = 0200 ABORT ATTEMPT
 0224* DFCHK = 0400 DIRTY FILES CHECK
 0225* CHNFG = 1000 CHAIN RUNNING
 0226* ENDST = 2000 ENDRM POSITIVE
 0227* MBUST = 4000 MBUSY POSITIVE
 0228*

0230 00001 ?TNUM EQU ?FLAG+1

0232* TELETYPE # IN BITS 12-8.

0234 00002 ?DISC EQU ?TNUM+1

0236* DRUM ADDRESS OF THIS USERS SWAP AREA

0238 00003 ?PROG EQU ?DISC+1

0240* POINTS TO LAST USED WORD OF CORE PROGRAM.

0242 00004 ?ID EQU ?PROG+1

0244* USER ID.

0246 00005 ?NAME EQU ?ID+1

0248* 8 CHAR PROGRAM NAME

0250 00010 ?TIME EQU ?NAME+3

0252* STARTING TIME

0254 00012 ?CLOC EQU ?TIME+2

0256* USER'S TIMEOUT CLOCK.

0258 00013 ?RSTR EQU ?CLOC+1

0260* RESTART ADDRESS FOR SUSPENDED PROGRAMS.

0262 00014 ?STAT EQU ?RSTR+1

0264* USER STATUS--WHEN ON Q INDICATED PROGRAM TYPE;
0265* WHEN NOT ON Q INDICATED REASON WHY.

0267 00015 ?LINK EQU ?STAT+1

0269* POINTS TO LINK POSITION OF NEXT ENTRY ON QUEUE.

0271 00016 ?PLEV EQU ?LINK+1

0273* FOR PROGRAMS ON Q, CONTAINS PRIORITY LEVEL. FOR
0274* SUSPENDED PROGRAMS CONTAINS PROGRAM TYPE.

0276 00017 ?RTIM EQU ?PLEV+1

0278* RESPONSE TIME FOR ENTER STATEMENT

0279*

0280 00020 ?TEMP EQU ?RTIM+1

0281*

0282* TEMPORARIES FOR LIBRARY ROUTINES

PAGE 0287 #27 TELETYPE TABLES

0284	61126	000000	TTY00	OCT 0
0285	61127	000000		OCT 0
0286	61130	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0287	61146	000000		OCT 0,0,0
0288*				
0289	61151	000000	TTY01	OCT 0
0290	61152	000400		OCT 400
0291	61153	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0292	61171	000000		OCT 0,0,0
0293*				
0294	61174	000000	TTY02	OCT 0
0295	61175	001000		OCT 1000
0296	61176	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0297	61214	000000		OCT 0,0,0
0298*				
0299	61217	000000	TTY03	OCT 0
0300	61220	001400		OCT 1400
0301	61221	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0302	61237	000000		OCT 0,0,0
0303*				
0304	61242	000000	TTY04	OCT 0
0305	61243	002000		OCT 2000
0306	61244	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0307	61262	000000		OCT 0,0,0
0308*				
0309	61265	000000	TTY05	OCT 0
0310	61266	002400		OCT 2400
0311	61267	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0312	61305	000000		OCT 0,0,0
0313*				
0314	61310	000000	TTY06	OCT 0
0315	61311	003000		OCT 3000
0316	61312	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0317	61330	000000		OCT 0,0,0
0318*				
0319	61333	000000	TTY07	OCT 0
0320	61334	003400		OCT 3400
0321	61335	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0322	61353	000000		OCT 0,0,0
0323*				
0324	61356	000000	TTY08	OCT 0
0325	61357	004000		OCT 4000
0326	61360	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0327	61376	000000		OCT 0,0,0
0328*				
0329	61401	000000	TTY09	OCT 0
0330	61402	004400		OCT 4400
0331	61403	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0332	61421	000000		OCT 0,0,0
0333*				
0334	61424	000000	TTY10	OCT 0
0335	61425	005000		OCT 5000
0336	61426	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0337	61444	000000		OCT 0,0,0
0338*				

0339	61447	000000	TTY11	OCT	0
0340	61450	005400		OCT	5400
0341	61451	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0342	61467	000000		OCT	0,0,0
0343*					
0344	61472	000000	TTY12	OCT	0
0345	61473	006000		OCT	6000
0346	61474	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0347	61512	000000		OCT	0,0,0
0348*					
0349	61515	000000	TTY13	OCT	0
0350	61516	006400		OCT	6400
0351	61517	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0352	61535	000000		OCT	0,0,0
0353*					
0354	61540	000000	TTY14	OCT	0
0355	61541	007000		OCT	7000
0356	61542	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0357	61560	000000		OCT	0,0,0
0358*					
0359	61563	000000	TTY15	OCT	0
0360	61564	007400		OCT	7400
0361	61565	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0362	61603	000000		OCT	0,0,0
0363*					
0364	61606	000000	TTY16	OCT	0
0365	61607	010000		OCT	10000
0366	61610	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0367	61626	000000		OCT	0,0,0
0368*					
0369	61631	000000	TTY17	OCT	0
0370	61632	010400		OCT	10400
0371	61633	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0372	61651	000000		OCT	0,0,0
0373*					
0374	61654	000000	TTY18	OCT	0
0375	61655	011000		OCT	11000
0376	61656	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0377	61674	000000		OCT	0,0,0
0378*					
0379	61677	000000	TTY19	OCT	0
0380	61700	011400		OCT	11400
0381	61701	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0382	61717	000000		OCT	0,0,0
0383*					
0384	61722	000000	TTY20	OCT	0
0385	61723	012000		OCT	12000
0386	61724	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0387	61742	000000		OCT	0,0,0
0388*					
0389	61745	000000	TTY21	OCT	0
0390	61746	012400		OCT	12400
0391	61747	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0392	61765	000000		OCT	0,0,0
0393*					

0394	61770	000000	TTY22	OCT	0
0395	61771	013000		OCT	13000
0396	61772	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0397	62010	000000		OCT	0,0,0
0398*					
0399	62013	000000	TTY23	OCT	0
0400	62014	013400		OCT	13400
0401	62015	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0402	62033	000000		OCT	0,0,0
0403*					
0404	62036	000000	TTY24	OCT	0
0405	62037	014000		OCT	14000
0406	62040	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0407	62056	000000		OCT	0,0,0
0408*					
0409	62061	000000	TTY25	OCT	0
0410	62062	014400		OCT	14400
0411	62063	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0412	62101	000000		OCT	0,0,0
0413*					
0414	62104	000000	TTY26	OCT	0
0415	62105	015000		OCT	15000
0416	62106	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0417	62124	000000		OCT	0,0,0
0418*					
0419	62127	000000	TTY27	OCT	0
0420	62130	015400		OCT	15400
0421	62131	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0422	62147	000000		OCT	0,0,0
0423*					
0424	62152	000000	TTY28	OCT	0
0425	62153	016000		OCT	16000
0426	62154	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0427	62172	000000		OCT	0,0,0
0428*					
0429	62175	000000	TTY29	OCT	0
0430	62176	016400		OCT	16400
0431	62177	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0432	62215	000000		OCT	0,0,0
0433*					
0434	62220	000000	TTY30	OCT	0
0435	62221	017000		OCT	17000
0436	62222	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0437	62240	000000		OCT	0,0,0
0438*					
0439	62243	000000	TTY31	OCT	0
0440	62244	017400		OCT	17400
0441	62245	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0442	62263	000000		OCT	0,0,0
0443	62266		TTY32	EQU	*

0445* THE QUEUE ALWAYS CONJNS AT LEAST ONE ENTRY, A DUMMY ENTRY, IT
 0446* IS POINTED TO BY THE LAST ACTUAL ELEMENT, AND POINTS TOTHE FIRST.
 0447* WHEN THE QUEUE IS OTHERWISE EMPTY, THE DUMMY LINK POINTS TO
 0448* ITSELF.

0450* THIS ROUTINE IS CALLED WHEN A DRUM TRANSFER TO OR FROM A
 0451* USER'S SWAP TRACK HAS FAILED. THE ROUTINE SETS THE USER'S
 0452* PORT TO AN UNAVAILABLE STATUS AND CLEARS HIS FUSS TABLE.
 0453* ENTER WITH TTY TABLE ADDRESS IN B.

```

0455 62266 000000 JETPT NOP
0456 62267 076366 STB JETT1 SAVE TABLE POINTER
0457 62270 044367 ADB +?LINK
0458 62271 116365 JSB JOEQU,I TAKE HIM OFF THE QUEUE
0459 62272 066366 LDB JETT1
0460 62273 044366 ADB +?STAT => STATUS WORD
0461 62274 060346 LDA %PUN SET PORT TO
0462 62275 170001 STA B,I UNAVAILABLE
0463 62276 044342 ADB +?ID=?STAT
0464 62277 002400 CLA
0465 62300 070257 STA MAIN SAY NOBODY IN CORE
0466 62301 170001 STA B,I CLEAR ID
0467 62302 044346 ADB +?FLAG=?ID
0468 62303 170001 STA B,I CLEAR FLAGS WORD
0469 62304 060732 LDA M2000 READ IN
0470 62305 070072 STA WORD THE FUSS TABLE
0471 62306 160540 LDA FUSS,I
0472 62307 064566 LDB LIBDI
0473 62310 116524 JSB DRUMS,I
0474 62311 016613 JSB SICK IT'S STUCK ON THE DRUM; GIVE UP
0475 62312 066366 LDB JETT1 GET TABLE POINTER AGAIN
0476 62313 044353 ADB +?TNUM
0477 62314 160001 LDA B,I GET THE PORT NUMBER
0478 62315 001727 ALF,ALF
0479 62316 072366 STA JETT1 SAVE IT
0480 62317 001720 ALF,ALS TIMES 32
0481 62320 040562 ADA LIBD
0482 62321 072367 STA JETT2
0483 62322 002400 CLA ZERO OUT
0484 62323 064317 LDB M32 THIS CLOD'S PART
0485 62324 172367 STA JETT2,I OF THE FUSS
0486 62325 036367 ISZ JETT2 TABLE
0487 62326 006006 INB,SZB
0488 62327 026324 JMP +=3
0489 62330 160540 LDA FUSS,I WRITE THE FUSS
0490 62331 064562 LDB LIBD TABLE BACK TO
0491 62332 116524 JSB DRUMS,I THE DRUM
0492 62333 016613 JSB SICK DARN, IT'S STUCK IN CORE, CROAK
0493 62334 062366 LDA JETT1 GET PORT NUMBER
0494 62335 017056 JSB TCRIR AND GO INFORM VICTIM
0495*
0496* ALSO INFORM THE SYSTEM OPERATOR WHAT WE'VE DONE.
0497*
0498 62336 103100 CLF 0
0499 62337 114211 JSB GMQBP,I GO GET POINTER TO MESSAGE 0
0500 62340 026363 JMP JET2 NO ROOM, SORRY
0501 62341 072367 STA JETT2 SAVE POINTER TO AVAILABLE BUFFER
0502 62342 062366 LDA JETT1 GET PORT NUMBER
0503 62343 006400 CLB

```

0504	62344	100400		DIV ,+10	CONVERT
0505	62346	001727		ALF,ALF	IT
0506	62347	040001		ADA B	TO
0507	62350	040574		ADA ASC00	ASCII
0508	62351	072376		STA JETNO	INSERT IT INTO THE MESSAGE
0509	62352	062370		LDA JETMS	GET ADDRESS OF
0510	62353	072366		STA JETT1	STUFF TO BE MOVED
0511	62354	064332		LDB ,=16	MOVE
0512	62355	162366	JET1	LDA JETT1,I	IT
0513	62356	172367		STA JETT2,I	INTO
0514	62357	036366		ISZ JETT1	THE
0515	62360	036367		ISZ JETT2	MESSAGE
0516	62361	006006		INB,82B	QUEUE
0517	62362	026355		JMP JET1	BUFFER
0518	62363		JET2	EQU *	
0519	62363	102100		STF 0	
0520	62364	126266		JMP JETPT,I	
0521*					
0522	62365	071577	JDEQU	DEF DEQUE	
0523	62366	000000	JETT1	BSS 1	
0524	62367	000000	JETT2	BSS 1	
0525	62370	062371	JETMS	DEF **1	
0526	62371	000036		DEC 30	
0527	62372	006412		OCT 6412	CR LF
0528	62373	050117		ASC 3,PORT #	
0529	62376	000000	JETNO	BSS 1	
0530	62377	020115		ASC 9, MADE UNAVAILABLE.	
0531	62410	006412		OCT 6412	CR LF

0002* THIS ROUTINE IS CALLED WHEN A SYSTEM TRACK WITH VITAL
 0003* INFORMATION (SUCH AS A DIRECTORY OR IDT TRACK) CANNOT BE
 0004* WRITTEN BACK TO ITS ASSIGNED DRUM ADDRESS, BUT WHEN RECOVERY
 0005* MIGHT BE POSSIBLE IF THE INFORMATION CAN BE SAVED, THE TABLE
 0006* MUST BE IN CORE STARTING AT LIBUS. (A) IS THE ADDRESS OF THE
 0007* WORD IN CORE WHICH CONTAINS THE DRUM ADDRESS OF THE TRACK IN
 0008* QUESTION. (B) IS THE NEGATIVE LENGTH OF THE TABLE IN CORE.
 0009* SALVG READS THE DRUM ADT IN PIECES INTO THE UPPER 2K OF USER
 0010* AREA AND SEARCHES FOR AN ENTRY LARGE ENOUGH TO HOLD THE TABLE.
 0011* IF AN ENTRY IS FOUND, SALVG ATTEMPTS TO WRITE THE TABLE OUT TO
 0012* THE DRUM, IF IT SUCCEEDS, IT STORES THE NEW DRUM ADDRESS INTO
 0013* THE WORD POINTED TO BY (A). THE ADT IS NOT UPDATED AND THE
 0014* FORMER SYSTEM TRACK IS NOT LOCKED. IF THE ADT CANNOT BE READ,
 0015* NO DRUM SPACE IS AVAILABLE, OR THE TABLE CANNOT BE WRITTEN
 0016* OUT, THE WORD POINTED TO BY (A) IS NOT CHANGED. SALVG CALLS
 0017* CLNOT TO PRINT ANY REMAINING SYSTEM MESSAGES AND AN INDICATION
 0018* OF SALVG'S SUCCESS OR FAILURE, AND THEN HALTS. A HALT 32B SEZ
 0019* SUCCESS; ATTEMPT RECOVERY. A HALT 33B MEANS FORGET IT.

0021	62411	000000	SALVG	NOP	
0022	62412	072515		STA SALCP	SAVE CORE POINTER
0023	62413	002400		CLA	BLOCK
0024	62414	170634		STA DCLC1,I	CLOCK
0025	62415	076516		STB SALTL	SAVE TABLE LENGTH
0026	62416	060354		LDA ,+2	GET ADT LENGTH
0027	62417	040113		ADA ADLEN	LESS PSEUDO ENTRY
0028	62420	072517		STA SALWL	SAVE AS -WORDS LEFT ON DRUM
0029	62421	060112		LDA ADLOC	GET ADT DRUM ADDRESS
0030	62422	040317		ADA M32	FAKE PREVIOUS 2K ADDRESS
0031	62423	072520		STA SALDA	AND SAVE
0032	62424	062516		LDA SALTL	GET TABLE
0033	62425	007400		CCB	LENGTH AND
0034	62426	101026		ASR 6	CONVERT TO
0035	62427	072521		STA SALTS	SECTOR COUNT
0036	62430	062517	SAL1	LDA SALWL	GET -WORDS YET TO BE READ
0037	62431	002021		SSA,RSS	ARE THERE ANY?
0038	62432	026507		JMP SAL2	NO, GO TO FAILURE
0039	62433	040736		ADA B4000	YES, ADD 2K TO THE COUNT
0040	62434	002021		SSA,RSS	2K OR MORE WORDS
0041	62435	002003		SZA,RSS	LEFT TO BE READ?
0042	62436	026441		JMP SAL3	YES
0043	62437	066517		LDB SALWL	NO, GET WORD COUNT INTO B
0044	62440	002401		CLA,RSS	AND WORDS LEFT INTO A
0045	62441	066523	SAL3	LDB SAM2K	=2048 WORDS TO BE READ
0046	62442	072517		STA SALWL	STORE NEW WORDS LEFT COUNT
0047	62443	074072		STB WORD	STORE DRUM READ LENGTH
0048	62444	005100		BRS	
0049	62445	076522		STB SALEC	AND ADT-IN-CORE ENTRY COUNT
0050	62446	062520		LDA SALDA	GET PREVIOUS DRUM ADDRESS
0051	62447	040412		ADA ,+32	BUMP TO NEXT 2K CHUNK
0052	62450	072520		STA SALDA	AND SAVE IT
0053	62451	066002		LDB L8192	GET ADDRESS OF USER'S UPPER 2K
0054	62452	045036		ADB BIT15	AND READ BIT
0055	62453	116524		JSB DRUMS,I	GO READ ADT PORTION

```

0056 62454 026507      JMP SAL2      ERROR, GO TO FAILURE
0057 62455 065002      LDB LB192    GET ADDRESS OF FIRST ENTRY
0058*
0059 62456 006004      SAL4 INB     BUMP POINTER TO ENTRY LENGTH
0060 62457 160001      LDA B,I      AND GET LENGTH
0061 62460 042521      ADA SALTS    IS ENTRY LARGE ENOUGH
0062 62461 002021      SSA,RSS     TO HOLD TABLE IN CORE?
0063 62462 026467      JMP SAL5     YES GO WRITE IT OUT
0064 62463 006004      INB         NO, ARE THERE
0065 62464 036522      ISZ SALEC   MORE ENTRIES IN CORE?
0066 62465 026456      JMP SAL4     YES, CHECK NEXT
0067 62466 026430      JMP SAL1     NU, GET ANOTHER BUNCH
0068*
0069*
0070 62467 044351      SAL5 ADB ,=1 B POINTS TO DRUM ADDRESS
0071 62470 160001      LDA B,I     GET I INTO A
0072 62471 072520      STA SALDA   AND SAVE IT
0073 62472 066516      LDB SALTL  GET LENGTH OF TABLE
0074 62473 074072      STB WORD   FOR DRUM DRIVER
0075 62474 064562      LDB LIBD   GET CORE ADDRESS INTO B
0076 62475 116524      JSB DRUMS,I WRITE OUT THE SYSTEM TABLE
0077 62476 026507      JMP SAL2    ARRGH, GO TO FAILURE
0078*
0079*      WE HAVE SUCCESSFULLY FOUND A NEW HOME FOR THE TABLE
0080*
0081 62477 103100      CLF 0      DISABLE INTERRUPTS
0082 62500 062520      LDA SALDA  GET NEW DRUM ADDRESS OF TABLE
0083 62501 172515      STA SALCP,I AND UPDATE IN-CORE POINTER
0084 62502 066525      LDB SALSU  GET ADDRESS OF SUCCESS MESSAGE
0085 62503 016771      JSB CLNOT  GO PRINT MESSAGES
0086 62504 062411      LDA SALVG  A GETS CALLING ADDRESS
0087 62505 102032      HLT 32B   EXPIRE
0088 62506 026505      JMP *-1
0089*
0090 62507 103100      SAL2 CLF 0  DISABLE INTERRUPTS
0091 62510 066554      LDB SALFA  GET ADDRESS OF FAILURE MESSAGE
0092 62511 016771      JSB CLNOT  GO PRINT MESSAGES
0093 62512 062411      LDA SALVG  A GETS CALLING ADDRESS
0094 62513 102033      HLT 33B   DIE
0095 62514 026513      JMP *-1
0096*
0097 62515 000000      SALCP BSS 1 SYSTEM TABLE DRUM POINTER POINTR
0098 62516 000000      SALTTL BSS 1 NEGATIVE TABLE LENGTH
0099 62517 000000      SALWL BSS 1 REMAINING ADT WORDS ON DRUM
0100 62520 000000      SALDA BSS 1 ADT 2K CHUNK DRUM POINTER
0101 62521 000000      SALTS BSS 1 NEGATIVE SECTOR COUNT OF TABLE
0102 62522 000000      SALEC BSS 1 ADT CHUNK ENTRY COUNT (NEGATIVE)
0103*
0104 62523 174000      SAM2K DEC =2048 2K CHUNK
0105 62524 074231      DRUMS DEF DRUML POINTER TO DRUM DRIVER DRIVER
0106 62525 062526      SALSU DEF ++1
0107 62526 000051      DEC 41
0108 62527 006412      OCT 6412
0109 62530 046517      ASC 20, MOVED SYSTEM TRACK. RECOVERY POSSIBLE.
0110 62554 062555      SALFA DEF ++1

```

0111 62555 000072
0112 62556 006412
0113 62557 041501
0114 62601 047525

DEC 58
OCT 6412
ASC 18,CAN'T WRITE SYSTEM TRACK, RECOVERY
ASC 10,OUT OF THE QUESTION.

PAGE 0295 #28 SYSTEM DEATH SOFT LANDING ROUTINES

0116* THIS ROUTINE IS CALLED WHEN THE SYSTEM CANNOT CONTINUE
 0117* OPERATING BUT MAY BE ABLE TO BE RESUSCITATED.

```

0119 62613 000000 SICK NOP
0120 62614 103100 CLF 0 DISABLE INTERRUPTS
0121 62615 066622 LDB SICKM GET ADDRESS OF OPTIMISTIC MESSAG
0122 62616 016771 JSB CLNOT GO PRINT MESSAGES
0123 62617 062613 LDA SICK A GETS CALLING ADDRESS
0124 62620 102032 HLT 32B CROAK
0125 62621 026620 JMP *-1
0126*
0127 62622 062623 SICKM DEF **1
0128 62623 000073 DEC 59
0129 62624 006412 OCT 6412
0130 62625 041501 ASC 19,CAN'T ACCESS SYSTEM SEGMENT OR TABLE.
0131 62650 020122 A9C 10, RECOVERY POSSIBLE.
```

0133* THIS ROUTINE IS CALLED WHEN THE SYSTEM CANNOT CONTINUE
 0134* OPERATING AND HAS ALTERED ITS TABLES IN SUCH A WAY THAT
 0135* THEY CONTAIN CONFLICTING INFORMATION AND RESUSCITATION IS
 0136* IMPOSSIBLE.

```

0138 62662 000000 DEAD NOP
0139 62663 103100 CLF 0 DISABLE INTERRUPTS
0140 62664 066671 LDB DEADM GET ADDRESS OF PESSIMISTIC MESAG
0141 62665 016771 JSB CLNOT GO PRINT MESSAGES
0142 62666 062662 LDA DEAD A GETS CALLING ADDRESS
0143 62667 102033 HLT 33B PASS AWAY
0144 62670 026667 JMP *-1
0145*
0146 62671 062672 DEADM DEF **1
0147 62672 000063 DEC 51
0148 62673 006412 OCT 6412
0149 62674 051531 ASC 19,SYSTEM TABLES INCOMPATIBLE. RECOVERY
0150 62717 044515 ASC 6,IMPOSSIBLE.
```

0152* THIS ROUTINE IS CALLED WHEN THE SYSTEM HAS BLOWN IT WRITING
 0153* ON THE LOCKED BLOCKS TABLE OF ONE OF THE DISCS. THE SITUATION
 0154* IS SIMILAR TO THOSE WHICH CALL "DEAD", BUT SINCE LOCKED BLOCKS
 0155* TABLES ARE IMMORTAL, THE OPERATOR MUST BE INFORMED THAT ONE
 0156* HAS BEEN DAMAGED.

```

0158 62725 000000 MDEAD NOP
0159 62726 103100 CLF 0 DISABLE INTERRUPTS
0160 62727 066734 LDB MDEDM GET ADDRESS OF WARNING MESSAGE
0161 62730 016771 JSB CLNOT GO PRINT MESSAGES
0162 62731 062725 LDA MDEAD A GETS CALLING ADDRESS
0163 62732 102033 HLT 33B GIVE OUT
0164 62733 026732 JMP *-1
0165*
0166 62734 062735 MDEDM DEF **1
0167 62735 000066 DEC 54
0168 62736 006412 OCT 6412
```


0169 62737 046117
0170 62757 051105

ASC 16, LOCKED BLOCKS TABLE DESTROYED.
ASC 10, RECOVERY IMPOSSIBLE.

0172* THIS ROUTINE SENDS A SYSTEM DEATH MESSAGE TO THE USERS.
 0173* NEXT, IT COMPLETES ANY OUTPUT WHICH HAS BEEN STARTED
 0174* BY THE SYSTEM CONSOLE DRIVER. IT THEN PRINTS ANY MESSAGES
 0175* REMAINING IN THE MESSAGE BUFFER. IF IT IS ENTERED WITH (B)
 0176* NONZERO, IT WILL LAST PRINT THE ASCII STRING WHOSE LENGTH
 0177* IS POINTED TO BY (B) AND WHICH STARTS IN THE WORD FOLLOWING
 0178* THIS LENGTH.

```

0180 62771 000000 CLNOT NOP
0181 62772 002400 CLA BLOCK
0182 62773 170634 STA DCLC1,I CLOCK
0183 62774 077052 STB CLNB SAVE SPECIAL MESSAGE POINTER
0184 62775 003400 CCA INFORM USERS OF
0185 62776 017056 JSB TCRIR SYSTEM DEATH
0186 62777 103100 CLF 0
0187 63000 060313 LDA T35F1 WAS SYSTEM CONSOLE DRIVER
0188 63001 002021 SSA,RSS DOING INPUT OR OUTPUT?
0189 63002 027021 JMP CLN1 INPUT, GO CHECK FOR MESSAGES
0190 63003 102312 SFS ?SC OUTPUT, WAIT FOR CURRENT
0191 63004 027003 JMP *-1 CHARACTER TO BE OUTPUT
0192 63005 163053 LDA CLADR,I GET CHARACTER POINTER
0193 63006 000066 CLE,ELA DOUBLE FOR SYCON AND LOSE BIT 15
0194 63007 167054 LDB CLTOG,I GET LEFT=RIGHT WORD
0195 63010 004010 SLB WHERE IS NEXT CHARACTER?
0196 63011 002004 INA ON THE RIGHT: BUMP POINTER
0197 63012 073302 STA SYCBA SAVE POINTER FOR SYCON
0198 63013 064074 LDB TCNT GET REMAINING CHARACTER COUNT
0199 63014 077301 STB SYCCC AND STORE FOR SYCON
0200 63015 067055 LDB CLN1P GET RETURN ADDRESS
0201 63016 077235 STB SYCON AND STORE IN SYCON
0202 63017 163303 LDA SYBIT,I GET CURRENT OUTPUT CONTROL BITS
0203 63020 027243 JMP SYC3 JUMP INTO MIDDLE OF ROUTINE
0204*
0205* COME HERE TO CHECK FOR MORE MESSAGES IN QUEUE
0206*
0207 63021 003400 CLN1 CCA ARE THERE MESSAGES
0208 63022 040306 ADA MSQCT IN THE
0209 63023 050351 CPA *-1 QUEUE?
0210 63024 027037 JMP CLN2 NO
0211 63025 070306 STA MSQCT YES, DECREMENT THE COUNT
0212 63026 064307 LDB MSQP1 BUMP POINTER
0213 63027 044421 ADB +MESLN TO NEXT MESSAGE BUFFER
0214 63030 054311 CPB MSQND WRAP AROUND?
0215 63031 064312 LDB MSQBG YES
0216 63032 074307 STB MSQP1 SAVE NEW CURRENT MESSAGE POINTER
0217 63033 160001 LDA B,I GET CHARACTER COUNT INTO A
0218 63034 006004 INB POINTER TO FIRST WORD INTO B
0219 63035 017235 JSB SYCON GO OUTPUT IT
0220 63036 027021 JMP CLN1 CHECK FOR MORE
0221*
0222* COME HERE TO PRINT FINAL SPECIAL MESSAGE
0223*
0224 63037 067052 CLN2 LDB CLNB GET SPECIAL BUFFER POINTER
0225 63040 006003 SZB,RSS IS THERE A MESSAGE?

```

0226	63041	027045		JMP	CLN3		NO
0227	63042	160001		LDA	B,I		YES, GET CHARACTER COUNT
0228	63043	006004		INB			BUMP POINTER TO FIRST MES. WORD
0229	63044	017235		JSB	SYCON		GO OUTPUT IT
0230	63045	002400	CLN3	CLA			FINALLY,
0231	63046	017235		JSB	SYCON		OUTPUT 3
0232	63047	017235		JSB	SYCON		"AGONIZING DEATH"
0233	63050	017235		JSB	SYCON		CRLF'S AND
0234	63051	126771		JMP	CLNOT,I		RETURN
0235*							
0236*							
0237	63052	000000	CLNB	BSS	1		B REG. SAVE WORD
0238	63053	060011	CLADR	DEF	TADR		POINTER TO ?TT35'S CHAR POINTER
0239	63054	060010	CLTOG	DEF	TOG		POINTER TO ?TT35'S LEFT-RIGHT WD
0240	63055	063021	CLN1P	DEF	CLN1		RETURN ADDRESS FOR FAKE SYCON CL

0242* THIS ROUTINE IS CALLED TO INFORM ALL USERS THAT THE SYSTEM
 0243* IS GOING DOWN BECAUSE OF A HARDWARE FAILURE OR TO INFORM A
 0244* SINGLE USER THAT HIS PORT IS BEING MADE UNAVAILABLE (BECAUSE
 0245* OF A SWAP TRACK ERROR). IT MUST BE ENTERED WITH THE AFFECTED
 0246* PORT NUMBER IN A IN THE LATTER CASE OR WITH A*-1 TO INFORM
 0247* ALL USERS OF SYSTEM DEATH.

0249	63056	000000	TCRIR	NOP	
0250	63057	073226		STA TCRPT	SAVE PORT NUMBER
0251	63060	003002		CMA,SZA	IS THIS A SYSTEM DEATH?
0252	63061	027070		JMP TCR1	NO, GO SET UP FOR 1 PORT NEWS
0253	63062	073226		STA TCRPT	YES, SET FIRST PORT TO ZERO
0254	63063	064177		LDB NPORT	GET COUNT OF PORTS TO GET NEWS
0255	63064	077227		STB TCRPC	AND SET IT INTO TCRPC
0256	63065	050412		LDA ,+32	GET LENGTH OF MESSAGE (CHARS)
0257	63066	067205		LDB TCRSD	AND POINTER TO MESSAGE
0258	63067	027074		JMP TCR2	
0259*					
0260	63070	003400	TCR1	CCA	SINGLE PORT BEING ZAPPED
0261	63071	073227		STA TCRPC	SET PORT COUNT TO -1
0262	63072	060417		LDA ,+37	GET LENGTH OF MESSAGE
0263	63073	067161		LDB TCRPU	AND POINTER TO IT
0264*					
0265	63074	003000	TCR2	CMA	SAVE -MESSAGE
0266	63075	073230		STA TCRCC	LENGTH-1
0267	63076	004066		CLE,ELB	SAVE MESSAGE
0268	63077	077231		STB TCRBA	BUFFER CHARACTER POINTER
0269*					
0270	63100	060367		LDA ,+150	PRECEDE
0271	63101	017131		JSB TCROT	MESSAGE
0272	63102	060364		LDA ,+12B	WITH
0273	63103	017131		JSB TCROT	CR
0274	63104	060364		LDA ,+12B	LF
0275	63105	017131		JSB TCROT	LF
0276*					
0277	63106	037230	TCR3	ISZ TCRCC	ARE THERE MORE CHARACTERS?
0278	63107	002001		RSS	YES
0279	63110	027122		JMP TCR4	NO, GO FINISH UP
0280	63111	067231		LDB TCRBA	GET BUFFER POINTER
0281	63112	037231		ISZ TCRBA	BUMP IT
0282	63113	004065		CLE,ERB	CALCULATE WORD ADDRESS
0283	63114	160001		LDA B,I	GET 2 CHARACTERS
0284	63115	002041		SEZ,RSS	WHICH ONE?
0285	63116	001727		ALF,ALF	LEFT ONE; MOVE IT
0286	63117	010441		AND B177	ISOLATE CHARACTER
0287	63120	017131		JSB TCROT	GO SEND IT
0288	63121	027106		JMP TCR3	CHECK FOR MORE
0289*					
0290	63122	060367	TCR4	LDA ,+15B	SEND
0291	63123	017131		JSB TCROT	USER(S)
0292	63124	060364		LDA ,+12B	FINAL
0293	63125	017131		JSB TCROT	GASP
0294	63126	060364		LDA ,+12B	FORM
0295	63127	017131		JSB TCROT	FEEDS

```

0296 63130 127056          JMP TCRIR,I
0297*
0298 63131 000000   TCROT NOP          COME HERE TO OUTPUT CHAR IN A
0299 63132 073232          STA TCR02        SAVE CHARACTER
0300 63133 063227          LDA TCRPC        SAVE NUMBER
0301 63134 073233          STA TCR03        OF PORTS
0302 63135 063226          LDA TCRPT        AND FIRST
0303 63136 073234          STA TCR04        PORT
0304 63137 063234   TCR5 LDA TCR04        ASK 2114 IF
0305 63140 001727          ALF,ALF         THIS USER'S BUFFER
0306 63141 030244          IOR IBF         IS FULL
0307 63142 114500          JSB S14SC,I
0308 63143 102311          SFS CH2
0309 63144 027143          JMP *-1
0310 63145 102511          LIA CH2         GET RESPONSE
0311 63146 002002          SZA
0312 63147 027137          JMP TCR5        YES, GO ASK AGAIN
0313 63150 063234          LDA TCR04        NO, GET PORT #
0314 63151 001727          ALF,ALF
0315 63152 030220          IOR OCR         OUTPUT CODE
0316 63153 033232          IOR TCR02        AND CHARACTER
0317 63154 114500          JSB S14SC,I     GO SEND IT
0318 63155 037234          ISZ TCR04        BUMP PORT NUMBER
0319 63156 037233          ISZ TCR03        OUTPUT TO ANOTHER?
0320 63157 027137          JMP TCR5        YES
0321 63160 127131          JMP TCROT,I     NO, RETURN
0322*
0323*
0324 63161 063162   TCRPU DEF **1
0325 63162 044101          ASC 19,HARDWARE FAILURE -- PORT UNAVAILABLE.
0326 63205 063206   TCRSD DEF **1
0327 63206 044101          ASC 16,HARDWARE FAILURE -- SYSTEM DOWN.
0328*
0329 63226 000000   TCRPT BSS 1     NUMBER OF FIRST PORT TO GET NEWS
0330 63227 000000   TCRPC BSS 1     TOTAL # OF PORTS TO RECEIVE NEWS
0331 63230 000000   TCRCC BSS 1     LENGTH OF MESSAGE
0332 63231 000000   TCRBA BSS 1     MESSAGE CHARACTER POINTER
0333 63232 000000   TCR02 BSS 1     OUTPUT CHARACTER
0334 63233 000000   TCR03 BSS 1     ROUTINE
0335 63234 000000   TCR04 BSS 1     TEMPS

```

0337* UPON ENTRY (A) HOLDS THE NUMBER OF CHARACTERS TO BE OUTPUT.
 0338* BIT 15 OF A = 0 FOR X-OFF CR LF AFTER OUTPUT.
 0339* (B) POINTS TO THE FIRST WORD OF THE BUFFER TO BE OUTPUT.

0341	63235	000000	SYCON	NOP	
0342	63236	073301		STA SYCCC	SET CHARACTER COUNT
0343	63237	004066		CLE,ELB	INITIALIZE
0344	63240	077302		STB SYCBA	CHARACTER POINTER
0345	63241	060224		LDA SBP	BITS FOR "PRINT ONLY"
0346	63242	173303		STA SYBIT,I	SAVE THEM
0347	63243	102612	SYC3	OTA ?SC	SEND THEM
0348	63244	063301	SYC1	LDA SYCCC	HAVE ALL CHARACTERS
0349	63245	001265		RAL,CLE,ERA	(COPY CRLF BIT INTO E)
0350	63246	002003		SZA,RSS	BEEN OUTPUT?
0351	63247	027270		JMP SYC2	YES, GO SEE ABOUT CRLF
0352	63250	003400		CCA	NO, DECREMENT
0353	63251	043301		ADA SYCCC	
0354	63252	073301		SIA SYCCC	CHARACTER COUNT
0355	63253	067302		LDB SYCBA	COMPUTE
0356	63254	037302		ISZ SYCBA	WORD_CHARACTER
0357	63255	004065		CLE,ERB	ADDRESS
0358	63256	160001		LDA B,I	LOAD WORD
0359	63257	002041		SEZ,RSS	POSITION
0360	63260	001727		ALF,ALF	CHARACTER
0361	63261	010441		AND B177	EXTRACT CHARACTER
0362	63262	030442		IOR B200	ADD IN BIT 7
0363	63263	102612		OTA ?SC	OUTPUT IT
0364	63264	103712		STC ?SC,C	REQUEST CHARACTER TRANSFER
0365	63265	102312		SFS ?SC	WAIT FOR
0366	63266	027265		JMP *-1	COMPLETION FLAG
0367	63267	027244		JMP SYC1	GO DO NEXT CHARACTER
0368*					
0369*					
0370	63270	002040	SYC2	SEZ	WANT CRLF?
0371	63271	127235		JMP SYCON,I	NO, RETURN
0372	63272	060355		LDA .+3	YES, 3 CHARACTERS
0373	63273	031036		IOR BIT15	WITH NO CRLF
0374	63274	073301		STA SYCCC	FOLLOWING
0375	63275	067304		LDB SYCCL	ADDRESS OF
0376	63276	004066		CLE,ELB	X-OFF CR LF
0377	63277	077302		STB SYCBA	
0378	63300	027244		JMP SYC1	GO OUTPUT THESE
0379*					
0380*					
0381	63301	000000	SYCCC	BSS 1	COUNT OF CHARACTERS TO BE OUTPUT
0382	63302	000000	SYCBA	BSS 1	CURRENT CHARACTER POINTER
0383	63303	060001	SYBIT	DEF TBITS	POINTER TO CURRENT CONTROL BITS
0384	63304	063305	SYCCL	DEF *-1	
0385	63305	011415		OCT 011415	X-OFF CR
0386	63306	005000		OCT 005000	LF
0387				UNS	

```

0389*
0390* THESE ROUTINES ARE USED FOR COMMUNICATION BETWEEN THE 2114
0391* AND 2116
0392*
0393* 2116 TO 2114 SEND DRIVER
0394*
0395 63307 000000 S14SH NOP
0396 63310 103100 CLF 0
0397 63311 070073 STA SVCH2 SAVE COMMUNICATION
0398 63312 077554 STB SVBC2
0399 63313 164634 LDB DCLC1,I GET CLOCK WORD
0400 63314 005726 BLF,ELB IF IT IS A JMP, BIT 12
0401 63315 006400 CLB WILL BE SET
0402 63316 174634 STB DCLC1,I BLOCK CLOCK
0403 63317 102100 STF 0
0404 63320 102311 SFS CH2 WAIT FOR ACKNOWLEDGMENT
0405 63321 027320 JMP *-1 OF PREVIOUS TRANSMISSION
0406 63322 102611 OTA CH2 OUTPUT WORD
0407 63323 103711 STC CH2,C INTERRUPT OTHER MACHINE
0408 63324 106711 CLC CH2
0409 63325 164640 LDB DCLC2,I
0410 63326 103100 CLF 0
0411 63327 002040 SEZ UNBLOCK CLOCK UNLESS IT WAS
0412 63330 174634 STB DCLC1,I BLOCKED WHEN WE ENTERED
0413 63331 067554 LDB SVBC2
0414 63332 102100 STF 0
0415 63333 127307 JMP S14SH,I EXIT
0416*
0417* 2114 TO 2116 RECEIVE DRIVER
0418*
0419 63334 000000 R14CM NOP
0420 63335 070067 STA CMA SAVE
0421 63336 074070 STB CMB
0422 63337 001520 ERA,ALS A,B,E
0423 63340 102201 SOC
0424 63341 002004 INA AND OVERFLOW
0425 63342 070071 STA CME
0426 63343 102510 LIA CH1 LOAD REQUEST WORD
0427 63344 001723 ALF,RAR OPCODE IN BITS 2-0.
0428 63345 010361 AND,+7 MASK TO THREE BITS
0429 63346 043350 ADA CMTBL ADD ON DECODE TABLE POINTER
0430 63347 124000 JMP 0,I BRANCH TO APPROPRIATE ROUTINE
0431*
0432 63350 163351 CMTBL DEF **+1,I
0433 63351 063371 DEF HVL HAVE LINE
0434 63352 063406 DEF ABR USER'S ABORT REQUEST
0435 63353 063454 DEF BFL BUFFER FULL
0436 63354 063463 DEF BFE BUFFER EMPTY
0437 63355 063475 DEF ETO ENTER STATEMENT TIMED OUT
0438 63356 063513 DEF UHU USER HUNG UP
0439 63357 063361 DEF R14RT
0440 63360 063361 DEF R14RT

```

```

0442*
0443* ALWAYS RETURNS HERE
0444*
0445 63361 060071 R14RT LDA CME RESTORE
0446 63362 103101 CLO
0447 63363 000036 SLA,ELA A,B,E
0448 63364 102101 STO
0449 63365 060067 LDA CMA AND OVERFLOW
0450 63366 064070 LDB CMB
0451 63367 103710 STC CH1,C ACKNOWLEDGE RECEIPT
0452 63370 127334 JMP R14CM,I EXIT
0453*
0454* 2114 HAS A LINE
0455*
0456 63371 017536 HVL JSB FDTTY B=> FIRST WORD OF TTY TABLE
0457 63372 002002 SZA SKIP IF STATUS IS IDLE.
0458 63373 050354 CPA %INPT NO SKIP IF INPUT WAIT
0459 63374 002001 RSS IDLE OR WAITING FOR INPUT
0460 63375 027361 JMP R14RT IGNORE
0461 63376 160001 LDA 1,I SET 2114
0462 63377 030772 IOR COM14 COMMUNICATION
0463 63400 170001 STA 1,I BIT
0464 63401 102510 LIA CH1 STORE RESPONSE
0465 63402 010443 AND B377 TIME IN TTY
0466 63403 044371 ADB .+?RTIM TABLE (#0 IF NO
0467 63404 170001 STA 1,I ENTER TIMING)
0468 63405 027361 JMP R14RT RETURN TO 2114 DRIVER
0469*
0470* USER'S ABORT REQUEST
0471*
0472 63406 017536 ABR JSB FDTTY B=> FIRST WORD OF TTY TABLE
0473 63407 160001 LDA 1,I
0474 63410 010447 AND B30M
0475 63411 050616 CPA PBFLG CBFLG=0 AND PBFLG=1?
0476 63412 027361 JMP R14RT YES, ABORT NOT ALLOWED!
0477 63413 160001 LDA B,I NO, ABORT POSSIBLE!
0478 63414 010372 AND UNABT UNABLE TO
0479 63415 002003 SZA,RSS ABORT?
0480 63416 027423 JMP ABR1 NO
0481 63417 160001 LDA 1,I
0482 63420 030442 IOR ABTRY DELAY ABORT
0483 63421 170001 STA 1,I ATTEMPT
0484 63422 027361 JMP R14RT RETURN TO 2114 DRIVER
0485 63423 ABR1 EQU *
0486 63423 044366 ADB .+?STAT B => STATUS
0487 63424 160001 LDA 1,I A = STATUS
0488 63425 050356 CPA %SYNT CHECK FOR SYNTAX.
0489 63426 027361 JMP R14RT CAN'T ABORT OUT OF SYNTAX.
0490 63427 040337 ADA .+.-%SYNT-1-COM3+COM2
0491 63430 002020 SSA SKIP IF LIBRARY PROGRAM.
0492 63431 027444 JMP ABR2 OTHERWISE ABORT ALWAYS ALLOWED.
0493 63432 060405 LDA .+%SYNT-.+1+CAT=COM2
0494 63433 003004 CMA,INA ABORTABLE
0495 63434 140001 ADA B,I LIBRARY
0496 63435 002020 SSA PROGRAM?

```


0497	63436	027361		JMP R14RT	NO
0498	63437	160001		LDA B,I	MAYBE
0499	63440	003004		CMA,INA	
0500	63441	040414		ADA .+XSYNT=,+1+STA=COM2	
0501	63442	002020		SSA	
0502	63443	027361		JMP R14RT	NO
0503	63444		ABR2	EQU *	
0504	63444	044336		ADB .-?STAT	B => FLAGS
0505	63445	160001		LDA 1,I	SET 2114
0506	63446	030772		IOR COM14	COMMUNICATIONS
0507	63447	170001		STA 1,I	BIT
0508	63450	044366		ADB .+?STAT	SET
0509	63451	003400		CCA	STATUS TO
0510	63452	170001		STA 1,I	ABORTING
0511	63453	027361		JMP R14RT	RETRUN TO 2114 DRIVER
0512*					
0513*	BUFFER IS FULL				
0514*					
0515	63454	017536	BFL	JSB FDTTY	B => FIRST WORD OF TTY TABLE
0516	63455	050355		CPA XOUTW	IGNORE IF
0517	63456	027361		JMP R14RT	ALREADY OUTPUT WAIT
0518	63457	160001		LDA 1,I	SET
0519	63460	030412		IOR OUTWT	OUTPUT
0520	63461	170001		STA 1,I	WAIT BIT
0521	63462	027361		JMP R14RT	RETURN TO 2114 DRIVER
0522*					
0523*					
0524*	BUFFER IS EMPTY AGAIN				
0525*					
0526	63463	017536	BFE	JSB FDTTY	B => FIRST WORD OF TTY TABLE
0527	63464	050355		CPA XOUTW	CHECK FOR STATUS OUTPUT WAIT
0528	63465	003701		CCA,CCE,RSS	A ← -1, E ← 1
0529	63466	003500		CCA,CLE	A ← -1, E ← 0
0530	63467	020412		XOR OUTWT	CLEAR OUTPUT
0531	63470	110001		AND 1,I	WAIT BIT
0532	63471	002040		SEZ	IF STATUS # XOUTW, THEN DON'T
0533	63472	030772		IOR COM14	SET 2114
0534	63473	170001		STA 1,I	COMMUNICATIONS BIT
0535	63474	027361		JMP R14RT	RETURN TO 2114 DRIVER
0536*	ENTER STATEMENT TIMED OUT				
0537*					
0538	63475	017536	ETO	JSB FDTTY	B => FIRST WORD OF TTY TABLE
0539	63476	044365		ADB .+?RSTR	B => RESTART ADDRESS
0540	63477	160001		LDA 1,I	A = RESTART ADDRESS
0541	63500	053555		CPA DENRT	WAITING FOR ENTER?
0542	63501	002001		RSS	YES, SET COM BIT.
0543	63502	027361		JMP R14RT	NO, MUST BE MISTAKE.
0544	63503	044337		ADB .-?RSTR	
0545	63504	160001		LDA 1,I	SET 2114
0546	63505	030772		IOR COM14	COMMUNICATIONS
0547	63506	170001		STA 1,I	BIT
0548	63507	044366		ADB .+?STAT	SET
0549	63510	060347		LDA XENTO	STATUS TO
0550	63511	170001		STA 1,I	ENTER TIMEOUT
0551	63512	027361		JMP R14RT	RETURN TO 2114 DRIVER

```

0552*
0553* USER HUNG UP
0554*
0555 63513 017536 UHU JSB FDTTY B=> FIRST WORD OF TTY TABLE
0556 63514 044366 ADB .+?STAT
0557 63515 040337 ADA .+.-%SYNT-1-COM3+COM2
0558 63516 002020 SSA LIBRARY PROGRAM RUNNING?
0559 63517 027527 JMP UHU1 NO
0560 63520 006004 INB YES, IS THIS GUY THE
0561 63521 054273 CPB MLINK+1 HEAD OF THE QUEUE?
0562 63522 002001 RSS YES
0563 63523 027526 JMP UHU1-1 NO
0564 63524 074262 STB HQDIS SET DISCONNECT FLAG
0565 63525 027361 JMP R14RT
0566 63526 044351 ADB .+?STAT=?LINK
0567 63527 060350 UHU1 LDA %DISC SET STATUS
0568 63530 170001 STA 1,I TO DISCONNECT
0569 63531 044336 ADB .=?STAT
0570 63532 160001 LDA 1,I SET 2114
0571 63533 030772 IOR COM14 COMMUNICATIONS
0572 63534 170001 STA 1,I BIT
0573 63535 027361 JMP R14RT RETURN TO 2114 DRIVER
0574** **
0575* FIND FIRST WORD OF TTY TABLE *
0576** **
0577* EXIT WITH (B) => FIRST WORD OF TELETYPE TABLE
0578* (A) = USERS STATUS
0579*
0580 63536 000000 FDTTY NOP
0581 63537 102510 LIA CH1 LOAD REQUEST WORD
0582 63540 001727 ALF,ALF TTY# IN 4-0
0583 63541 010411 AND .+37B MASK TO 5 BITS
0584 63542 100200 MPY .+TTY01-TTY00
        63543 000375
0585 63544 064000 LDB 0 COMPUT LOC&TION
0586 63545 044546 ADB DTTY0 OF FLAG WORD
0587 63546 060001 LDA 1 A => FLAGS
0588 63547 040366 ADA .+?STAT A => STATUS
0589 63550 160000 LDA 0,I A = STATUS
0590 63551 050346 CPA %PUN CHECK FOR PORT UNAVAILABLE
0591 63552 027361 JMP R14RT IGNORE IF 80
0592 63553 127536 JMP FDTTY,I
0593 63554 R14ED EQU +
0594 63554 000000 SVBC2 BSS 1
0595 63555 041235 DENRT DEF ENTRT WHERE ENTER WAITS.
0596*
0597* ROUTINE TO CLEAR PBFLG & CBFLG BITS AND TO TELL
0598* THE OTHER MACHINE ABOUT THE ABORT.
0599*
0600 63556 000000 TRNOF NOP
0601 63557 044336 ADB .=?STAT B=> ?FLAG
0602 63560 103100 CLF 0
0603 63561 060447 LDA B30M CLEAR PBFLG & CBFLG
0604 63562 003000 CMA BITS.
0605 63563 110001 AND 0,I

```

0606 63564 170001
0607 63565 006004
0608 63566 160001
0609 63567 030254
0610 63570 114500
0611 63571 127556
0612*
0613*

STA B,I
INB
LDA B,I
IOR ABT
JSB S149C,I
JMP TRNOF,I

B=> ?TNUM
A= ?TNUM
TELL OTHER MACHINE.

0615	70000		ORG	700000
0616	70000	000140	B140	OCT 140
0617	70001	177720	M60B	OCT =60
0618	70002	177737	M41B	OCT =41
0619	70003	177645	M133B	OCT =133
0620	70004	106062	MCOM2	ABS =COM2
0621	70005	071540	M36K	ABS =30000-6000
0622	70006	047040	ASCIN	ASC 1,N
0623	70007	043106	ASCFF	ASC 1,FF
0624	70010	020100	ASCBA	ASC 1, *
0625	70011	030040	ASC0B	ASC 1,0
0626	70012	072034	DCOM6	DEF COM6
0627	70013	061126	TTYCK	ABS TTY00
0628	70014	000000	OUTM1	BSS 1
0629	70015	177776	X	OCT =2
0630	70016	000000	CTEMP	BSS 1
0631	70017	000000	SMAIN	OCT 0
0632	70020	000000	FMAIN	OCT 0
0633	70021	062266	JETPA	DEF JETPT
0634	70022	062613	SICKZ	DEF SICK
0635	70023	072021	XCOM5	DEF COM5=2
0636	70024	074563	INSEQ	DEF INSEQ
0637	70025	063556	TRNFP	DEF TRNOF

TEMPS USED BY OUTCH ROUTINE.

CURRENT SWAPR DRUM TRANSFER FLAG
 OLD TOP OF Q FLAGS POINTER

0639* THE CLOCK DRIVER IS THE CENTRAL POINT THROUGH WHICH CONTROL IS
 0640* PASSED TO THE SCHEDULER. ENTRY COMES TO THE DRIVER WHENEVER THE
 0641* CLOCK (REAL TIME SCALAR) INTERRUPTS. THIS EVENT OCCURS EVERY
 0642* 100 MS. BESIDES GIVING CONTROL TO THE SCHEDULER, THE CLOCK
 0643* DRIVER ALSO HAS THE TASK OF UPDATING THE TIME OF DAY CLOCK.
 0644* THIS CLOCK IS A TWO WORD ENTRY WHOSE VALUE IS AS FOLLOWS:
 0645* DATIM=24*DAY+HOUR
 0646* DATIM+1=600*MIN+10*SEC-36000

0648	70026	000000	CLKIN	NOP	ENTRY POINT.
0649	70027	072016		STA CTEMP	SAVE A.
0650	70030	034202		ISZ DATIM+1	BUMP 100MS COUNTER
0651	70031	026036		JMP CLC0	NO PROBLEM IF NO SKIP
0652	70032	062005		LDA M36K	RESET 100MS COUNTER.
0653	70033	070202		STA DATIM+1	
0654	70034	034201		ISZ DATIM	BUMP HR COUNTER.
0655	70035	000000		NOP	JUST IN CASE.
0656	70036	036015	CLC0	ISZ X	ENTER SCHEDULER THIS TIME?
0657	70037	026044		JMP CLC1+1	NO
0658	70040	060350		LDA .-2	YES, RESET
0659	70041	072015		STA X	RESET SKIP WORD
0660	70042	062016		LDA CTEMP	RESET A

0662* THE NEXT INSTRUCTION IS NORMALLY A JMP. WHEN THE
 0663* SCHEDULER IS RUNNING, HOWEVER, IT PREVENTS ITSELF
 0664* FROM BEING REENTERED BY INSERTING A NOP.

0666	70043	000000	CLC1	NOP	
0668	70044	062016		LDA CTEMP	RESET A
0669	70045	103116		CLF CLOCK	ALLOW ANOTHER CLOCK INTERRUPT.
0670	70046	126026		JMP CLKIN,I	RETURN.
0671	70047	026050	CLC2	JMP SCHED	USED TO INSERT IN CLC1.

0673* THE SCHEDULER SECTION OF TSB DETERMINES WHICH
 0674* PROGRAM IS TO RUN NEXT. FIRST IT CLEARS CLC1,
 0675* ALLOWING THE CLOCK TO CONTINUE INTERRUPTING.

0677	70050	071224	SCHED	STA AREG	SAVE A-REGISTER.
0678	70051	002400		CLA	INSERT NOP IN CLC1 TO PREVENT
0679	70052	072043		STA CLC1	REENTERING SCHED.
0680	70053	062026		LDA CLKIN	SAVE THE PROGRAM COUNTER
0681	70054	071227		STA PREG	ALSO.
0682	70055	103116	CLKED	CLF CLOCK	NOW LET THE CLOCK IN AGAIN.
0683	70056	075225		STB BREG	SAVE B REGISTER,
0684	70057	001520		ERA,ALS	E-REGISTER,
0685	70060	102201		SOC	AND OVERFLOW REGISTER.
0686	70061	002004		INA	
0687	70062	071226		STA EREG	
0688	70063	064273		LDB MLINK+1	GET POINTER
0689	70064	044335		ADB .-7LINK	

```

0690 70065 076020      STB FMAIN          TO FLAG WORD
0692 70066 060264      LDA TIMEF          GET TIMER FLAG.
0693 70067 002002      SZA                IF 0, THIS IS NOT A TIMED PROG.
0694 70070 134057      ISZ TIMER,I        IF NOT 0, BUMP TIMER.
0695 70071 026362      JMP SCH1           IF NOT OUT OF TIME, SKIP ROTAT-
0696*                                     ING RUN QUEUE.
0001*
0002*   AT THIS POINT WE HAVE DISCOVERED THAT THE PROGRAM THAT HAS
0003*   BEEN RUNNING HAS EXHAUSTED ITS TIME LIMIT. THE NEXT STEP IS
0004*   TO ADJUST THE QUEUE SO THAT THIS PROGRAM IS MOVED TO THE
0005*   BOTTOM. THIS IS ACCOMPLISHED BY DELETING THE PROGRAM
0006*   FROM THE QUEUE AND THEN REINSERTING IT WITH ITS NEW PRIORITY.
0007*
0008 70072 064273      LDB MLINK+1        GET THE ADDRESS OF PRIORITY
0009 70073 006004      INB                FOR THE CURRENT PROGRAM.
0010 70074 060356      LDA ,+4            SET IT TO LOW PRIORITY.
0011 70075 170001      STA 1,I
0012 70076 044351      ADB ,+?LINK-?PLEV
0013 70077 160001      LDA 1,I            GET THE LINK FROM THE CURRENT
0014 70100 070273      STA MLINK+1        PROGRAM AND STORE IT IN MLINK+1
0015 70101 116024      SCH3 JSB INQA,I     INSERT USER IN QUEUE
0016 70102 017202      JSB SWAPR          START EARLY SWAPPING
0017 70103 026362      JMP SCH1           CHECK FOR COMMUNICATION FROM 14
0018*
0019*
0020*   TEST FOR ANY TTY35 BUSINESS
0021*
0022 70104                SCHS1 EQU *           JUST FINISHED CHECKING TTYS
0023 70104 064546      LDB DTTY0          REINITIALIZE
0024 70105 076013      STB TTYCK          POINTER
0025 70106 003400      SCH5 CCA           TEST FOR DRIVER BUSY
0026 70107 050313      CPA T35F1
0027 70110 026273      JMP SCH15          DRIVER IS BUSY.
0028 70111 050315      CPA T35F3
0029 70112 026224      JMP SCH16          COMMAND ENTERED BUT NOT STARTED
0030*
0031*   WHEN T35F1=0, THE CONSOLE IS QUIET SO WE CAN DO LOGGING.
0032*
0033 70113 040306      ADA MSGCT          TEST FOR ANY ENTRIES ON MESSAGE
0034 70114 050351      CPA ,=1
0035 70115 026130      JMP SCH52          MESSAGE QUEUE EMPTY
0036*
0037*   OUTPUT AN ELEMENT OF THE MESSAGE QUEUE
0038*
0039 70116 070306      STA MSGCT          DECREMENT MESSAGE COUNTER
0040 70117 064307      LDB MSQP1          ADVANCE MESSAGE POINTER
0041 70120 044421      ADB ,+MESLN
0042 70121 054311      CPB MSGND          IF AT END OF BUFFER
0043 70122 064312      LDB MSQB6          THEN WRAP AROUND
0044 70123 074307      STB MSQP1          SET UP NEW ADDRESS
0045 70124 160001      LDA B,I            GET ADDRESS AND
0046 70125 006004      INB                LENGTH OF MESSAGE
0047 70126 114522      JSB TTY35,I        AND OUTPUT IT
0048 70127 026273      JMP SCH15

```

```

0049*
0050 70130          SCH52 EQU *
0051 70130 040604   ADA LOGCT   TEST FOR ANY ENTRIES IN LOGTABLE
0052 70131 050351   CPA  =-1
0053 70132 026224   JMP  SCH16   LOG TABLE IS EMPTY.
0054* SET UP LOG BUFFER
0055*
0056 70133 070604   STA LOGCT   DECREMENT LOG COUNTER,
0057 70134 060606   LDA LOGP1   BUMP LOG POINTER
0058 70135 002004   INA
0059 70136 050630   CPA LOGND   IF AT END,
0060 70137 060626   LDA LOGBG   WRAP AROUND.
0061 70140 070606   STA LOGP1
0062 70141 160606   LDA LOGP1,I TEST FOR LOGON
0063 70142 066006   LDB ASCIN   OR LOGOUT.
0064 70143 002020   SSA
0065 70144 066007   LDB ASCFF
0066 70145 076214   STB LOGBF+3
0067 70146 101052   LSR 10      SHIFT LOG CHAR TO LEAST 5 BITS.
0068 70147 010411   AND  =+37B  MASK OFF OTHER STUFF.
0069 70150 042010   ADA ASCBA   CONVERT TO ASCII.
0070 70151 072215   STA LOGBF+4
0071 70152 160606   LDA LOGP1,I GET ACCOUNT NUMBER AGAIN.
0072 70153 010602   AND B1777  KEEP ONLY # PART.
0073 70154 006400   CLB
0074 70155 100400   DIV  =+10   GET 1ST 2 DIGITS IN A, LAST IN B
          70156 000364
0075 70157 005727   BLF,BLF    SET UP LAST DIGIT AS
0076 70160 046011   ADB ASC0B  ASCII LEFT HALF.
0077 70161 076217   STB LOGBF+6
0078 70162 017047   JSB #LTEN  CONVERT FIRST 2 TO ASCII ALSO
0079 70163 072216   STA LOGBF+5
0080 70164 034606   ISZ LOGP1
0081 70165 160606   LDA LOGP1,I NOW GET THE TIME.
0082 70166 010411   AND  =+37B  GET TERMINAL NUMBER
0083 70167 017047   JSB #LTEN  CONVERT AND STORE IN BUFFER.
0084 70170 072223   STA LOGBF+10
0085 70171 160606   LDA LOGP1,I
0086 70172 006400   CLB
0087 70173 101025   ASR 5
0088 70174 100400   DIV 060
          70175 000724
0089 70176 174606   STB LOGP1,I SAVE SECOND HALF
0090 70177 017047   JSB #LTEN  CONVERT FIRST HALF TO ASCII.
0091 70200 072220   STA LOGBF+7
0092 70201 160606   LDA LOGP1,I
0093 70202 017047   JSB #LTEN  CONVERT 2ND HALF TO ASCII.
0094 70203 072221   STA LOGBF+8
0095 70204 060400   LDA  =+22
0096 70205 066210   LDB LOGR2  TO PRINT THE
0097 70206 114522   SCH21 JSB TTY35,I STUFF.
0098 70207 026273   JMP  SCH15
0099 70210 170211   LOGR2 DEF  +=1,I  BUFFER ADDRESS (I=>PUNCH)
0100 70211 025052   LOGBF ASC  11,**LOGOFF A123 0930 #01
          70212 046117

```

70213	043517			
70214	043106			
70215	020101			
70216	030462			
70217	031440			
70220	030071			
70221	031460			
70222	020043			
70223	030061			
0101*				
0102*	TTY35 IO COMPLETE			
0103*				
0104	70224 050314	SCH16	CPA T35F2	TEST DRIVER COMMUNICATE FLAG,
0105	70226 002001		RSS	
0106	70226 026273		JMP SCH15	
0107	70227 060277		LDA T35ST	GET CONSOLE STATUS.
0108	70230 064301		LDB T35PR	
0109	70231 050355		CPA XOUTW	IF OUTPUT WAIT,
0110	70232 026256		JMP SCH23	GO SET HIM UP.
0111	70233 002002		SZA	IF NOT IDLE WEVE ALREADY
0112	70234 026273		JMP SCH15	QUEUED HIM.
0113*	TTY35 INPUT COMMAND			
0114*				
0115	70235 060303		LDA T35B2	POINTER TO FIRST CHARACTER
0116	70236 070060		STA SBHED	OF CONSOLE BUFFER.
0117	70237 060304		LDA T35ND	POINTER TO END OF
0118	70240 070061		STA SCHL	CONSOLE BUFFER.
0119	70241 060412		LDA ,+40B	INITIALIZE COMMAND
0120	70242 070064		STA SCHP	HOLDER.
0121	70243 017113		JSB SCOM	GET COMMAND.
0122	70244 026264		JMP SCH17	BLANK LINE
0123	70245 026266		JMP SCH18	ERROR
0124	70246 026266		JMP SCH18	ERROR
0125*				
0126*	SET UP QUEUE ENTRY FOR CONSOLE.			
0127*				
0128	70247 060060		LDA SBHED	SET POINTER FOR
0129	70250 070054		STA T35CP	T35CR.
0130	70251 060412		LDA ,+40B	SET UP LA2T CHAR
0131	70252 070055		STA T35LC	AS BLANK
0132*				
0133	70253 060506		LDA #LIB#	SET RESTART ADDRESS.
0134	70254 070276		STA T35RS	
0135	70255 046263		ADB SCH19	SET PROGRAM STATUS
0136	70256 074277	SCH23	STB T35ST	TYPE.
0137	70257 060354		LDA ,+2	SET PRIORITY.
0138	70260 070301		STA T35PR	
0139	70261 064302		LDB T35LN	GO INSERT IN QUEUE
0140	70262 026101		JMP SCH3	
0141	70263 106067	SCH19	ABS =COM2+%SYNT=,+1	
0142	70264 060662	SCH17	LDA ONEI	OUTPUT LINE FEED
0143	70265 002001		RSS	
0144	70266 060356	SCH18	LDA ,+4	OUTPUT ERROR MESSAGR
0145	70267 006400		CLB	
0146	70270 074314		STB T35F2	

0147 70271 064666 LDB DEH
 0148 70272 026206 JMP SCH21

0150*

0151*

0152 70273 017202 SCH15 JSB SWAPR

0153*

0154*

0155*

CHECK FOR ANYTHING TO DO. IF NOT
 SWAPR WILL GO TO SCH1 AGAIN,
 IT WILL RETURN HERE IF THERE IS
 AN EXECUTABLE PROGRAM IN CORE.

0157*

0158*

0159*

0160*

THE PROGRAM TO RUN IS AT THE HEAD OF THE QUEUE, AND SWAPR HAS
 GUARANTEED THAT IT IS IN CORE. THE FOLLOWING SECTION OF CODE
 SETS IT UP TO RUN, AND ALSO SETS UP THE CLOCK DRIVER SO THAT
 FUTURE INTERRUPTS WILL GO BACK INTO THE SCHEDULER.

0162	70274	103100	CLF 0	INHIBIT INTERRUPT.
0163	70275	062047	LDA CLC2	RESTORE A <JMP SCHED> IN THE
0164	70276	072043	STA CLC1	CLOCK INTERRUPT ROUTINE.
0165	70277	060273	LDA MLINK+1	
0166	70300	002004	INA	GET PRIORITY OF PROGRAM.
0167	70301	164000	LDB 0,I	
0168	70302	054354	CPB .+2	IF PRIORITY IS 2, CHANGE IT TO
0169	70303	006400	CLB	ZERO SO IT DOESNT GET INTERRUPTED
0170	70304	174000	STB 0,I	
0171	70305	040347	ADA .+7RSTR-?PLEV	GET RESTART ADDRESS
0172	70306	164000	LDB 0,I	IF NOT 0, PUT IT IN PREG
0173	70307	006002	SZB	TO START UP PROPERLY.
0174	70310	075227	STB PREG	
0175	70311	006400	CLB	PUT 0 INTO TABLE IN ANY CASE
0176	70312	174000	STB 0,I	
0177	70313	074264	STB TIMEF	SET TO SAY NO TIMING.
0178	70314	002004	INA	GET PROGRAM STATUS.
0179	70315	164000	LDB 0,I	
0180	70316	040350	ADA .+7CLOC-?STAT	SET TIMER POINTER.
0181	70317	070057	STA TIMER	
0182	70320	054357	CPB XSYNT+1	IF STATUS IS RUN, SET
0183	70321	034264	ISZ TIMEF	TIMEFLAG FOR CLOCKING.
0184	70322	040340	ADA .-7CLOC	SAVE FLAGS
0185	70323	064000	LDB A	POINTER
0186	70324	160001	LDA B,I	RESTORE
0187	70325	010612	AND ENDST	DRUM
0188	70326	070261	STA ENDRM	AND
0189	70327	160001	LDA B,I	DISC
0190	70330	010736	AND MBUST	BUSY
0191	70331	070214	STA MBUSY	FLAGS
0192	70332	061226	LDA EREG	RESTORE E
0193	70333	103101	CLO	AND OVERFLOW
0194	70334	000036	SLA,ELA	REGISTERS.
0195	70335	102101	STO	
0196	70336	061224	LDA AREG	RESTORE A AND
0197	70337	065225	LDB BREG	B REG.
0198	70340	102100	STF 0	ENABLE INTERRUPT AND

```

0199 70341 125227      JMP PREG,I          TRANSFER TO PROGRAM,
0200* START OF SYSTEM *
0201 70342 060355 TSB LDA .+3          START CLOCK COUNTING IN
0202 70343 102616      OTA CLOCK          100 MS UNITS.
0203 70344 103716      STC CLOCK,C       START CLOCK
0204 70345 106711      CLC CH2
0205 70346 106712      CLC ?3C
0206 70347 060177      LOA NPORT
0207 70350 003000      CMA              A ← NUMBER OF LEGAL PORTS - 1
0208 70351 001727      ALF,ALF
0209 70352 030226      IOR INI          PLUG IN INITIALIZATION CODE.
0210 70353 114500      JSB S14SC,I     WE'RE STARTING
0211 70354 102311      SFS CH2         WAIT FOR 2114
0212 70355 026354      JMP *-1         TO FINISH
0213 70356 103710      STC CH1,C
0214 70357 060360      LDA .+6         START SYSTEM
0215 70360 064266      LDB READY       TELETYPE BY OUTPUTTING
0216 70361 114522      JSB TTY35,I     READY MESSAGE,

```

```

0217*
0218* THIS SECTION IS THE BEGINNING OF THE MAIN PART OF THE SCHEDU-
0219* LER. CONTROL ALWAYS COMES HERE TO EXAMINE THE TTQ UNTIL IT'S
0220* EXHAUSTED, OR WHEN THERE IS NOTHING TO DO. SWAPR ALWAYS COMES
0221* TO THIS POINT WHEN THE QUEUE IS EMPTY OR THE FIRST PROGRAM ON
0222* THE QUEUE IS ABSENT.
0223* THIS SECTION ACTUALLY PROCESSES A TTQ ENTRY. THERE ARE SEVERAL
0224* KINDS OF ENTRIES WHICH MAY BE CLASSIFIED AS FOLLOWS:
0225*
0226* 1) ABORT - THIS IS INDICATED BY THE TELETYPE STATUS BEING
0227* -1. THE ACTION TAKEN IS TO STOP THE PROGRAM (IF IT IS
0228* IN THE QUEUE), AND TO INITIATE THE ABORT MESSAGE.
0229*
0230* 2) OUTPUT TERMINATE - THIS IS INDICATED BY THE STATUS BEING
0231* %OUTW. THE TTQ ENTRY REALLY MEANS THAT THE OUTPUT BUFFER
0232* IS ALMOST EMPTY. THE PROGRAM IS PLACED BACK ON THE QUEUE
0233* ACCORDING TO ITS PRIORITY.
0234*
0235* 3) INPUT - THIS IS INDICATED BY STATUS BEING %INPT. IT INDI-
0236* CATES THAT A USER PROGRAM OR SYSTEM PROGRAM THAT HAS
0237* REQUESTED INPUT HAS GOTTEN IT. THE PROGRAM IS PLACED IN
0238* THE QUEUE.
0239*
0240* 4) COMMAND - WHEN STATUS IS %IDLE, EITHER A COMMAND OR
0241* A SYNTAX STATEMENT HAS BEEN ENTERED. THESE CAN BE DISTIN-
0242* GUISHED BY THE FIRST NON BLANK INPUT CHARACTER, WHICH IS
0243* A DIGIT ONLY IF SYNTAX HAS BEEN ENTERED.
0244*
0245* 5) DISCONNECT - THIS IS INDICATED BY STATUS BEING %DISC.
0246* THE ACTION TAKEN IS TO CALL THE BYE ROUTINE
0247*
0248* 6) ENTER TIMEOUT - THIS IS INDICATED BY THE STATUS BEING
0249* %ENTO. THE RESTART ADDRESS IS BUMPED AND THE PROGRAM IS
0250* PLACED ON THE QUEUE.
0251*

```

```

0252 70362 102100 SCH1 STP 0
0253 70363 066013      LDB TTYCK

```

```

0254 70364 054550 CPB DTT32 HAVE ALL TELETYPES BEEN CHECKED?
0255 70365 026104 JMP SCHS1 YES
0256 70366 160001 LDA 1,I LOAD STATUS FOR THIS USER
0257 70367 044375 ADB ,+TTY01-TTY00 GENERATE ADDRESS FOR NEXT
0258 70370 076013 STB TTYCK USER
0259 70371 010772 AND COM14 COMMUNICATION FROM 2114?
0260 70372 002003 SZA,RSS SKIP IF 90
0261 70373 026362 JMP SCH1 NO= CHECK NEXT ONE
0262 70374 044327 ADB ,+TTY00-TTY01 MOVE ADDRESS BACK TO THIS U
0263 70375 103100 CLF 0
0264 70376 120001 XOR 1,I CLEAR
0265 70377 170001 STA 1,I COM14 BIT
0266 70400 074062 STB TTQ SAVE TABLE ADDRESS
0267 70401 044356 ADB ,+?ID STORE ID
0268 70402 074063 STB SCHID ADDRESS
0269 70403 044362 ADB ,+?STAT=?ID
0270 70404 160001 LDA 1,I A=STATUS
0271 70405 040346 ADA ,=4 MAKE SURE
0272 70406 002021 SSA,RSS STATUS<4
0273 70407 026362 JMP SCH1 IGNORE OTHERWISE
0274 70410 042412 ADA ++2 BRANCH TO SECTION
0275 70411 124000 JMP 0,I TO HANDLE REQUEST
0276 70412 070422 DEF ++8
0277 70413 026531 JMP SCH4 ENTER TIMEOUT
0278 70414 026514 JMP SCH8 DISCONNECT
0279 70415 026433 JMP SCH7 ABORT
0280 70416 026535 JMP SCH6 COMMAND
0281 70417 026106 JMP SCH5 ABORTING
0282 70420 000000 NOP INPUT

```

```

0283*
0284* CODE TO HANDLE INPUT OR OUTPUT,

```

```

0285*
0286 70421 044354 ADB ,+?PLEV=?STAT
0287 70422 160001 SCH51 LDA 1,I GET ACTUAL STATUS
0288 70423 044350 ADB ,+?STAT=?PLEV
0289 70424 170001 STA 1,I SET ACTUAL STATUS
0290 70425 102100 STF 0
0291 70426 044354 ADB ,+?PLEV=?STAT
0292 70427 002400 CLA SET PRIORITY TO 0
0293 70430 170001 STA 1,I
0294 70431 044351 ADB ,+?LINK=?PLEV
0295 70432 026101 JMP SCH3 GO INSERT USER IN QUEUE

```

```

0296*
0297* CODE TO HANDLE ABORT

```

```

0298*
0299 70433 102100 SCH7 STF 0
0300 70434 006004 INB B=>LINK
0301 70435 017577 JSB DEQUE REMOVE USER FROM QUEUE.
0302 70436 064062 LDB TTQ
0303 70437 060412 LDA OUTWT CLEAR
0304 70440 003000 CMA OUTPUT
0305 70441 103100 CLF 0
0306 70442 110001 AND 1,I WAIT
0307 70443 170001 STA 1,I BIT
0308 70444 006004 INB

```

```

0309 70445 160001 LDA B,I GET TTY NUMBER
0310 70446 030241 IOR KAO
0311 70447 114500 JSB S149C,I KILL OUTPUT
0312 70450 044351 ADB ,=1
0313 70451 060444 LDA DFCHK
0314 70452 110001 AND 1,I
0315 70453 002003 SZL,RSS NEED TO UPDATE CHANGE DATE?
0316 70454 026475 JMP SCH75 NO
0317 70455 060372 LDA UNABT YES
0318 70456 130001 IOR B,I DISALLOW
0319 70457 170001 STA B,I ABORTS
0320 70460 102100 STF 0
0321 70461 044370 ADB ,+?PLEV
0322 70462 002400 CLA
0323 70463 170001 STA B,I SET PRIORITY TO 0
0324 70464 044350 ADB ,+?STAT=?PLEV
0325 70465 060363 LDA ,+XSYNT=,+1+UCDAB=COM2
0326 70466 170001 STA B,I SET STATUS TO LAST CHANGE DATE
0327 70467 044351 ADB ,+?RSTR=?STAT
0328 70470 042023 ADA XCOM5 FIND POSITION IN TABLE
0329 70471 160000 LDA A,I GET RESTART ADDRESS
0330 70472 170001 STA B,I SAVE IT
0331 70473 044354 ADB ,+?LINK=?RSTR
0332 70474 026101 JMP SCH3 GO INSERT IN QUEUE
0333 70475 SCH75 EQU *
0334 70475 044356 ADB ,+?STAT SET STATUS
0335 70476 170001 STA 1,I
0336 70477 116025 JSB TRNFP,I CLEAR PBFLG & CBFLG BITS
0337* AND TELL OTHER MACHINE,
0338 70500 054255 CPB PRIST USER HAVE LP?
0339 70501 017057 JSB SCLPR YES,
0340 70502 064062 LDB TTQ NO, PRINT ABORT
0341 70503 060342 LDA ,=8 MESSAGE
0342 70504 017075 JSB TYPE
0343 70505 006412 OCT 6412 CRLF
0344 70506 051524 ASC 2,STOP
0345 70510 006412 OCT 6412 CRLF
0346 70511 064062 SCH78 LDB TTQ SCRATCH IF SHELL0 IS RUNNING
0347 70512 017700 JSB HTEST
0348 70513 026362 JMP SCH1
0349*
0350* CODE TO SET UP FORCED DISCONNECT.
0351*
0352 70514 006004 SCH8 INB B => LINK WORD
0353 70515 017577 JSB DEQUE REMOVE FROM QUEUE
0354 70516 064062 LDB TTQ CLEAR
0355 70517 060372 LDA UNABT
0356 70520 030442 IOR ABTRY ABORT
0357 70521 030444 IOR DFCHK
0358 70522 003000 CMA
0359 70523 110001 AND 1,I FLAGS
0360 70524 170001 STA 1,I
0361 70525 102100 STF 0
0362 70526 060001 LDA 1

```

```

0363 70527 040365      ADA ,+?RSTR
0364 70530 026755      JMP SCH61      GO SET UP STARTING INFO.
0365*
0366* CODE TO HANDLE ENTER TIMEOUT
0367*
0368 70531 044351  SCH4  ADB ,+?RSTR-?STAT
0369 70532 134001      ISZ 1,I      BUMP RESTART ADDRESS
0370 70533 044355      ADB ,+?PLEV-?RSTR
0371 70534 026422      JMP SCH51      GO RESTORE STATUS
0372*
0373*
0374* CODE TO HANDLE COMMANDS.
0375*
0376 70535 102100  SCH6  STF 0
0377 70536 002400      CLA          FLAG BUFFER HEAD TO
0378 70537 070060      STA SBMED   SAY BUFFER IN 2114
0379 70540 070064      STA SCHP    INITIALIZE TO HOLD CHARACTERS
0380 70541 017113      JSB SCOM    INTERPRET COMMAND
0381 70542 026564      JMP SCH30   EMPTY LINE.
0382 70543 026546      JMP SCH9    FIRST CHARACTER A DIGIT
0383 70544 026605      JMP EHERR   INVALID COMMAND.
0384 70545 026617      JMP SCH11   COMMAND IS OK.
0385*
0386* THE FIRST CHARACTER IS A DIGIT. THIS MEANS THE LINE IS SYNTAX AND
0387* WE HAVE TO QUEUE IT AS SUCH.
0388*
0389 70546 064062  SCH9  LDB TTQ
0390 70547 044370      ADB ,+?PLEV  B=> PRIORITY
0391 70550 002400      CLA          SET PRIORITY TO 0
0392 70551 150063      CPA SCHID,I  IF NO ID, GO LOG IN.
0393 70552 026623      JMP SCH25
0394 70553 170001      STA 1,I
0395 70554 044347      ADB ,+?RSTR-?PLEV  SET UP STARTING ADDRESS
0396 70555 060454      LDA SYNTA   FOR SYNTAX
0397 70556 170001      STA 1,I
0398 70557 044353      ADB ,+?STAT-?RSTR
0399 70560 060356      LDA %SYNT   SET STATUS TO
0400 70561 170001      STA 1,I     SYNTAX.
0401 70562 006004      INB        GO INSERT IN QUEUE.
0402 70563 026101      JMP SCH3
0403*
0404 70564 064062  SCH30 LDB TTQ      TEST FOR TAPE MODE IF NULL LINE.
0405 70565 060362      LDA TAPEF
0406 70566 110001      AND 1,I
0407 70567 002003      SZA,RSS
0408 70570 026601      JMP SCH20   NO TAPE--GO EMIT LINE FEED.
0409 70571 006004      INB        B=> TTY # IN BITS 12-8
0410 70572 160001      LDA 1,I     SPACE
0411 70573 030222      IOR GTC     PAST
0412 70574 114500      JSB S14SC,I  CARRIAGE RETURN
0413 70575 160001      LDA 1,I     INFORM 2114
0414 70576 030242      IOR ALI     THAT MORE INPUT
0415 70577 114500      JSB S14SC,I  IS ALLOWABLE
0416 70600 026362      JMP SCH1
0417*

```

```

0418 70601 060364 SCH20 LDA ,+128 OUTPUT A LINE FEED.
0419 70602 064062 LDB TTQ
0420 70603 114576 JSB OUTCH,I
0421 70604 026362 JMP SCH1
0422*
0423* COME HERE WHEN ANY ILLEGAL INPUT IS FOUND,
0424*
0425 70605 064062 EHERR LDB TTQ
0426 70606 006004 INB
0427 70607 054255 CPB PRIST IF USER HAS LP,
0428 70610 017057 JSB SCLPR RELEASE IT
0429 70611 060344 LDA ,=6
0430 70612 017075 JSB TYPE
0431 70613 005077 EH OCT 5077,37477,6412 (???)
70614 037477
70615 006412
0432 70616 026362 JMP SCH1
0433*
0434* COME HERE WHEN A LEGITIMATE COMMAND IS FOUND
0435*
0436 70617 160063 SCH11 LDA SCHID,I PROCESS COMMAND ONLY IF
0437 70620 002003 SZA,RSS ID#0 OR
0438 70621 056636 CPB HI HELLO COMMAND.
0439 70622 026640 JMP SCH22
0440 70623 060332 SCH25 LDA ,=16 PRINT LOG IN MESSAGE
0441 70624 017075 JSB TYPE
0442 70625 005120 OCT 5120 LF=P
0443 70626 046105 ASC 6,LEASE LOG IN
70627 040523
70630 042440
70631 046117
70632 043440
70633 044516
0444 70634 006412 OCT 6412
0445 70635 026362 JMP SCH1
0446 70636 071737 HI DEF HELLO
0447 70637 071723 DTAPR DEF CTAPR
0448 70640 064062 SCH22 LDB TTQ
0449 70641 160001 LDA 1,I TAPE
0450 70642 010362 AND TAPEF
0451 70643 002003 SZA,RSS MODE?
0452 70644 026665 JMP SCH24 NO
0453 70645 006004 INB
0454 70646 160001 LDA 1,I YES==CHECK
0455 70647 030237 IOR ILI FOR ADDITIONAL
0456 70650 114500 JSB S14SC,I INPUT
0457 70651 102311 SFS CH2 WAIT FOR
0458 70652 026651 JMP *=1 ACKNOWLEDGMENT
0459 70653 102511 LIA CH2
0460 70654 002002 SZA ILLEGAL INPUT?
0461 70655 026605 JMP EHERR YES
0462 70656 103100 CLF 0 NO
0463 70657 044351 ADB ,=1
0464 70660 060362 LDA TAPEF CLEAR
0465 70661 003000 CMA TAPE

```

0466	70662	110001	AND 1,I	FLAG
0467	70663	170001	STA 1,I	
0468	70664	102100	STF 0	
0469	70665	160064	SCH24 LDA SCHP,I	TEST FOR HELLO,BYE, OR SCRATCH
0470	70666	053737	CPA HELLO	OK TO PROCEED IF ANY
0471	70667	026703	JMP SCH27	OF THESE.
0472	70670	053713	CPA SCR	
0473	70671	026703	JMP SCH27	
0474	70672	053740	CPA BYE	
0475	70673	026703	JMP SCH27	
0476	70674	160001	LDA 1,I	TEST FOR ANY TAPE ERRORS.
0477	70675	010353	AND TERR	
0478	70676	002003	SZA,RSS	
0479	70677	026707	JMP SCH26	NO TAPE ERRORS--CONTINUE.
0480*				
0481	70700	062637	LDA DTAPR	OTHERWISE, SET UP FOR EXECU-
0482	70701	070064	STA SCHP	TION OF TAPE ERROR
0483	70702	026707	JMP SCH26	PRINTOUT ROUTINE.
0484*				
0485	70703	060353	SCH27 LDA TERR	IF HELLO, BYE OR SCRATCH,
0486	70704	003000	CMA	CLEAR TAPE
0487	70705	110001	AND 1,I	ERROR BIT
0488	70706	170001	STA 1,I	AND PROCEED
0489	70707	044357	SCH26 ADB .+?NAME	
0490	70710	160001	LDA 1,I	TEST FOR
0491	70711	002021	SSA,RSS	RUN=ONLY PROGRAM.
0492	70712	026726	JMP SCH28	NOT RUN=ONLY.
0493	70713	160064	LDA SCHP,I	IF RUN=ONLY, DON'T
0494	70714	053732	CPA SAVE	ALLOW THESE
0495	70715	026735	JMP SCH29	COMMANDS.
0496	70716	053733	CPA CSAV	
0497	70717	026735	JMP SCH29	
0498	70720	053717	CPA LIS	
0499	70721	026735	JMP SCH29	
0500	70722	053720	CPA PUN	
0501	70723	026735	JMP SCH29	
0502	70724	053721	CPA XPUN	
0503	70725	026735	JMP SCH29	
0504*				
0505	70726	064064	SCH28 LDB SCHP	
0506	70727	046004	ADB MCOM2	TEST FOR TYPE I COMMAND.
0507	70730	006021	SSB,RSS	
0508	70731	026745	JMP SCH12	NOT TYPE I.
0509	70732	046734	ADB *+2	GET STARTING ADDRESS FOR COMMAND
0510	70733	124001	JMP 1,I	PROCESSOR AND GO THERE.
0511	70734	172026	DEF COM5=COM1+COM2,I	
0512	70735	060340	SCH29 LDA .-10	
0513	70736	017075	JSB TYPE	
0514	70737	005122	OCT 5122	LF=R
0515	70740	052516	ASC 3,UN ONL	
	70741	020117		
	70742	047114		
0516	70743	054415	OCT 54415	Y=CR
0517	70744	026601	JMP SCH20	
0518*				

0519* TYPE II AND III COMMANDS

0520*

```

0521 70745 044357 SCH12 ADB %SYNT+1 DETERMINE PROGRAM STATUS.
0522 70746 060062 LDA TTQ
0523 70747 040366 ADA ,+?STAT
0524 70750 174000 STB 0,I
0525 70751 040351 ADA ,+?RSTR=?STAT A=>RESTART ADDRESS
0526 70752 044337 ADB ,+,%SYNT+COM2=COM3-1 TYPE II OR III ??
0527 70753 006020 SSB
0528 70754 026766 JMP SCH13 TYPE II COMMAND
0529 70755 064506 SCH61 LDB #LIB# TYPE III COMMANDS HAVE A STAN-
0530 70756 174000 STB 0,I DARD STARTING ADDRESS AND
0531 70757 064354 LDB ,+2 PRIORITY 2.
0532 70760 040355 SCH14 ADA ,+?PLEV=?RSTR
0533 70761 174000 STB 0,I
0534 70762 007400 CCB GET LINK POINTER IN B AND GO
0535 70763 044000 ADB 0 TO INSERT INTO QUEUE.
0536 70764 026101 JMP SCH3
0537 70765 072034 DEF COM3+COM5=COM1
0538 70766 046765 SCH13 ADB *-1 GET STARTING ADDRESS FOR TYPE
0539 70767 164001 LDB 1,I II COMMANDS.
0540 70770 174000 STB 0,I
0541 70771 006404 CLB,INB GO SET PRIORITY TO 1
0542 70772 026760 JMP SCH14

```

0543*

0544* "SCRATCH" COMMAND

0545*

```

0546 70773 064062 #SCR LDB TTQ B=>TTY TABLE.
0547 70774 016776 JSB SCRAT PERFORM SCRATCH FUNCTION.
0548 70775 026601 JMP SCH20 TERMINATE.
0549*
0550 70776 000000 SCRAT NOP SCRATCH A PROGRAM (B=>USERS TTY)
0551 70777 060702 LDA PBUFF IF MAIN=B, SET PBPTR.
0552 71000 054257 CPB MAIN
0553 71001 070056 STA PBPTR
0554 71002 044355 ADB ,+?PROG B=>PROGEND
0555 71003 170001 STA 1,I RESET TABLE(PROG)
0556 71004 044354 ADB ,+?NAME=?PROG CLEAR
0557 71005 160001 LDA 1,I READ-ONLY BIT.
0558 71006 001665 ELA,CLE,ERA BIT.
0559 71007 170001 STA 1,I
0560 71010 126776 JMP SCRAT,I

```

0001*

0002* "TAPE" COMMAND

0003*

```

0004 71011 103100 #TAP CLF 0
0005 71012 064062 LDB TTQ B => ?FLAG
0006 71013 006004 INB B=> ?TNUM
0007 71014 160001 LDA B,I A= ?TNUM
0008 71015 030253 IOR WTP ASK WHAT TYPE.
0009 71016 114500 JSB S14SC,I
0010 71017 103100 CLF 0
0011 71020 102311 SFS CH2
0012 71021 027020 JMP *-1
0013 71022 102511 LIA CH2

```


0014	71023	002003		SZA, RSS	
0015	71024	027035		JMP #TAP1	TYPE #1, OK
0016	71025	060340		LDA ,=10	
0017	71026	017075		JSB TYPE	
0018	71027	005111		OCT 5111	LF, I
0019	71030	046114		ASC 3, LLEGAL	
	71031	042507			
	71032	040514			
0020	71033	006412		OCT 6412	CR, LF
0021	71034	026362		JMP SCH1	PRINT MESSAGE & TERMINATE.
0022	71035	064062	#TAP1	LDB TTQ	B => FLAG WORD
0023	71036	160001		LDA 1, I	
0024	71037	030362		IOR TAPEF	SET TAPE BIT
0025	71040	170001		STA 1, I	
0026	71041	102100		STF 0	
0027	71042	006004		INB	
0028	71043	160001		LDA 1, I	TELL
0029	71044	030236		IOR TPO	
0030	71045	114500		JSB S14SC, I	2114
0031	71046	026601		JMP SCH20	TERMINATE.
0032*					
0033*					
0034	71047	000000	#LTEN	NOP	CONVERT A # FROM 0-99 TO ASCII.
0035	71050	006400		CLB	GET FIRST DIGIT IN A,
0036	71051	100400		DIV ,+10	SECOND IN B.
	71052	000364			
0037	71053	001727		ALF, ALF	POSITION FIRST ON LEFT,
0038	71054	040001		ADA 1	ADD IN SECOND,
0039	71055	040574		ADA ASC00	ADD IN ASCII BITS.
0040	71056	127047		JMP #LTEN, I	RETURN.
0041*					
0042**	RELEASE LINE PRINTER				
0043*					
0044	71057	000000	SCLPR	NOP	
0045	71060	002400		CLA	
0046	71061	070255		STA PRIST	REMOVE USER FROM LP
0047	71062	060336		LDA ,=12	OUTPUT MESSAGE
0048	71063	017075		JSB TYPE	
0049	71064	011423		OCT 11423	X=OFF, X=OFF
0050	71065	005114		OCT 5114	LF, L
0051	71066	050040		ASC 3, P FREE	
	71067	043122			
	71070	042505			
0052	71071	006412		OCT 6412	CR, LF
0053	71072	060247		LDA LPD	TELL I/O PROCESSOR TO
0054	71073	114500		JSB S14SC, I	REMOVE USER FROM LP
0055	71074	127057		JMP SCLPR, I	
0056*					
0057*	TYPE SENDS AN ENTIRE STRING TO A TELETYPE. IT IS CALLED AS FOLLOWS				
0058*	A=#OF CHARS--MUST END ON RIGHT HALF OF WORD				
0059*	JSB TYPE				
0060*	<CHAR STRING>				
0061*	RETURN				

0063	71075	000060	TYPE	NOP	
0064	71076	073112		STA TYPET	SAVE COUNTER
0065	71077	163075	TYPEL	LDA TYPE,I	GET WORD CONTAINING CHAR.
0066	71100	067112		LDB TYPET	GET COUNT IN B.
0067	71101	006011		SLB,RSS	IF COUNT IS EVEN, TAKE HIGH
0068	71102	001727		ALF,ALF	CHAR;
0069	71103	004010		SLB	IF COUNT IS ODD,
0070	71104	037075		ISZ TYPE	BUMP TYPE.
0071	71105	064062		LDB TTQ	OUTPUT CHAR TO TELETYPE.
0072	71106	114676		JSB OUTCH,I	
0073	71107	037112		ISZ TYPET	ANY MORE?
0074	71110	027077		JMP TYPEL	YES.
0075	71111	127075		JMP TYPE,I	NO.
0076	71112	000000		TYPET NOP	
0077*	SCOM SCANS A COMMAND INPUT BUFFER TO DETERMINE WHAT				
0078*	THE COMMAND IS. THE CALLING SEQUENCE TO SCOM IS:				
0079*					
0080*	JSB SCOM				
0081*	<RETURN IF BLANK LINE>				
0082*	<RETURN IF FIRST CHARACTER A DIGIT>				
0083*	<RETURN IF NO LEGAL COMMAND>				
0084*	<RETURN IF COMMAND FOUND--B=COMMAND ADDRESS>				
0085*					
0086*	SCOM ASSUMES THAT BEFORE IT IS CALLED, SBMED AND				
0087*	SCHL ARE INITIALIZED AS REQUIRED BY SCHAR,, AND				
0088*	SCHP=0 FOR NORMAL USERS AND OCT40 FOR CONSOLE.				
0090	71113	000000	SCOM	NOP	ENTRY POINT.
0091	71114	064347		LDB ,=3	INITIALIZE CHAR, COUNT TO -3
0092	71115	074065		STB SCNT	
0093	71116	017527		JSB SCHAR	GET A CHARACTER.
0094	71117	127113		JMP SCOM,I	NOT THERE--BLANK LINE.
0095	71120	037113		ISZ SCOM	BUMP SCOM TO POINT AT DIGIT RET.
0096	71121	042001		ADA M60B	TEST FOR FIRST CHAR A DIGIT.
0097	71122	002020		SSA	AUTOMATIC FAILURE IF
0098	71123	037113		ISZ SCOM	< ASC0
0099	71124	040340		ADA ,=-10	
0100	71125	002021		SSA,RSS	IF <=ASC9, RETURN TO P+2 IF A
0101	71126	027140		JMP SCOME	DIGIT, P+3 IF NOT
0102	71127	064064		LDB SCHP	
0103	71130	006002		SZB	CONSOLE?
0104	71131	127113		JMP SCOM,I	YES
0105	71132	064062		LDB TTQ	NO
0106	71133	006004		INB	
0107	71134	160001		LDA 1,1	TELL 2114
0108	71135	030251		IOR BKS	
0109	71136	114500		JSB S14SC,I	TO BACKSPACE
0110	71137	127113		JMP SCOM,I	
0111	71140	037113	SCOME	ISZ SCOM	
0112	71141	042002		ADA M41B	TEST FOR LETTER.
0113	71142	002021	SCOMB	SSA,RSS	
0114	71143	127113		JMP SCOM,I	NOT A LETTER.
0115	71144	040404		ADA ,+32B	
0116	71145	002020		SSA	
0117	71146	127113		JMP SCOM,I	NOT A LETTER.

```

0118 71147 030064 IOR SCHP
0119 71150 034065 ISZ SCNT TEST FOR 3 LETTERS IN.
0120 71151 001732 ALF,SLA,RAL NO--ROTATE FOR NEXT ONE.
0121 71152 027160 JMP SCOMA YES--GO TO SEARCH TABLE.
0122 71153 070064 STA SCHP
0123 71154 017527 JSB SCHAR GET NEXT CHARACTER
0124 71155 127113 JMP SCOM,I FAIL.
0125 71156 042003 ADA M133B
0126 71157 027142 JMP SCOMB
0127* SEARCH COMMAND TABLE *
0128 71160 064710 SCOMA LDB SCOM1 B=>TABLE
0129 71161 002020 SSA
0130 71162 044425 ADB ,+COM4-COM1
0131 71163 150001 SCOMD CPA 1,I
0132 71164 027171 JMP SCOMC COMMAND FOUND
0133 71165 054712 CPB SCOM5
0134 71166 127113 JMP SCOM,I ILLEGAL COMMAND
0135 71167 006004 INB
0136 71170 027163 JMP SCOMD
0137 71171 037113 SCOMC ISZ SCOM RETURN O.K.
0138 71172 074064 STB SCHP SAVE ADDRESS OF COMMAND.
0139 71173 017527 JSB SCHAR SCAN
0140 71174 027200 JMP ++4 FOR CR
0141 71175 050427 CPA ,+55B OR DASH.
0142 71176 002001 RSS
0143 71177 027173 JMP +-4
0144 71200 064064 LDB SCHP
0145 71201 127113 JMP SCOM,I
0146*
0147* THE SWAPR ROUTINE IS CALLED FROM VARIOUS POINTS IN THE SCHEDULER
0148* IN ORDER TO DETERMINE IF A PROGRAM IS READY TO RUN. IT IS ALSO
0149* CALLED WHENEVER THE QUEUE IS UPDATED. THE FUNCTION OF SWAPR IS TO
0150* DETERMINE IF THERE IS A PROGRAM ON THE QUEUE, AND IF SO, IS THE
0151* PROGRAM AT THE HEAD OF THE QUEUE READY TO RUN. IF SAID PROGRAM IS
0152* NOT READY, SWAPR INITIATES THE NECESSARY DRUM TRANSFERS. SWAPR IN-
0153* DICATES WHETHER A PROGRAM CAN BE RUN OR NOT AS FOLLOWS:
0154*
0155* READY : NORMAL RETURN
0156* NOT READY: TRANSFER TO SCH1

0158 71202 000000 SWAPR NOP
0159 71203 060261 LDA ENDRM TEST FOR DRUM
0160 71204 030214 IOR MBUSY OR DISC BUSY
0161 71205 002020 SSA
0162 71206 026362 JMP SCH1 WAIT FOR TRANSFER COMPLETION
0163 71207 066017 LDB SMAIN
0164 71210 006002 SZB WAS SWAPR DOING A TRANSFER?
0165 71211 027262 JMP SWAP5 YES, GO CHECK SUCCESS
0166 71212 066020 LDB FMAIN NO, HAVE WE SAVED
0167 71213 006003 SZB,RSS DRIVER FLAGS FOR THIS USER?
0168 71214 027237 JMP SWAP7 YES, DON'T SAVE CURRENT ONES
0169 71215 002400 CLA NO,
0170 71216 064261 LDB ENDRM SAVE
0171 71217 006002 SZB DRUM

```

0172	71220	060612	LDA	ENDST	AND
0173	71221	064214	LDB	MBUSY	DISC
0174	71222	006002	SZB		"NOT
0175	71223	030736	IOR	MBUST	BUSY"
0176	71224	064000	LDB	A	FLAGS
0177	71225	060612	LDA	ENDST	IN
0178	71226	030736	IOR	MBUST	THIS
0179	71227	003000	CMA		USER'S
0180	71230	103100	CLF	0	FLAGS
0181	71231	112020	AND	FMAIN,I	WORD
0182	71232	030001	IOR	0	
0183	71233	172020	STA	FMAIN,I	
0184	71234	102100	STF	0	
0185	71235	006400	CLB		SAY DRIVER
0186	71236	076020	STB	FMAIN	FLAGS SAVED
0187	71237	064273	SWAP7	LDB MLINK+1	GET FIRST QUEUE ENTRY
0188	71240	054272	CPB	MLINK	TEST FOR QUEUE EMPTY.
0189	71241	026362	JMP	SCH1	EMPTY--NOTHING TO DO,
0190	71242	060604	LDA	LOGCT	IF CONSOLE AND THERE
0191	71243	030313	IOR	T35F1	IS CURRENT OR
0192	71244	054302	CPB	T35LN	IMMINENT OUTPUT TO
0193	71245	002003	SZA	RSS	ASR,
0194	71246	027273	JMP	SWAP4	
0195	71247	060277	LDA	T35ST	GET THE STATUS
0196	71250	003004	CMA	INA	
0197	71251	040435	ADA	.*XSUNT-.+1+ROS-COM2	
0198	71252	002020	SSA		CHECK TO SEE IF THIS IS
0199	71253	027273	JMP	SWAP4	A ROUTINE THAT CAN'T BE DEQUED
0200	71254	017577	JSB	DEQUE	SUSPEND UNTIL ITS DONE.
0201	71255	060277	LDA	T35ST	
0202	71256	070301	STA	T35PR	
0203	71257	060355	LDA	XOUTW	
0204	71260	070277	STA	T35ST	
0205	71261	027203	JMP	SWAPR+1	
0206*					
0207	71262	002400	SWAP5	CLA	CLEAR "SWAPR INVOKED
0208	71263	072017	STA	SMAIN	TRANSFER" FLAG
0209	71264	050261	CPA	ENDRM	WAS DRUM TRANSFER SUCCESSFUL?
0210	71265	027237	JMP	SWAP7	YES, CONTINUE
0211	71266	070261	STA	ENDRM	NO, CLEAR ENDRM FOR KICKS
0212	71267	006020	SSB		WERE WE SWAPPING A USER?
0213	71270	116022	JSB	SICKZ,I	NO, GO FOLD CON GRACIA
0214	71271	116021	JSB	JETPA,I	YES GO GET RID OF HIM OR HER
0215	71272	026362	JMP	SCH1	
0216	71273		SWAP4	EQU *	
0217	71273	044351	ADB	.-1	B=>STATUS OF FIRST ENTRY.
0218	71274	160001	LUA	1,I	A=STATUS
0219	71275	050350	CPA	.-2	TEST FOR SPECIAL DISCONNECT.
0220	71276	060401	LDA	XSYNT+1+BYE-COM2	
0221	71277	040337	ADA	.-5+COM2-COM3	TEST FOR TYPE II OR III.
0222	71300	002021	SSA	RSS	
0223	71301	027374	JMP	SWAP3	PROGRAM IS OF TYPE III.
0224	71302	044336	ADB	.-7STAT	TEST FOR PROGRAM IN CORE.
0225	71303	054257	CPB	MAIN	
0226	71304	127202	JMP	SWAPR,I	PROGRAM PRESENT.

0227	71305	060257	LDA	MAIN	FIND OUT WHAT PROGRAM IS.
0228	71306	002002	SZA		IS ANY PROGRAM PRESENT?
0229	71307	027325	JMP	SWAP1	YES.
0230	71310	074257	STB	MAIN	SET MAIN TO NEW PROGRAM.
0231*					
0232*	INITIATE DRUM TO CORE TRANSFER				
0233*					
0234	71311	076017	STB	SMAIN	SAVE TABLE OF USER IN QUESTION
0235	71312	044355	ADB	+.?PROG	B=>PROGRAM END LOCATION,
0236	71313	160001	LDA	1,I	COMPUTE NUMBER OF
0237	71314	070056	STA	PBPTR	
0238	71315	003000	CMA		WORDS IN PROGRAM.
0239	71316	041221	ADA	USE	
0240	71317	070072	STA	WORD	STORE -LENGTH INTO WORD.
0241	71320	044351	ADB	+.?DISC-?PROG	
0242	71321	160001	LDA	1,I	A=DISC ADDRESS
0243	71322	065222	LDB	USEI	B=CORE ADDRESS
0244	71323	114770	JSB	DRUM,I	INITIATE DRUM TRANSFER
0245	71324	026362	JMP	SCH1	RETURN BUSY.
0247*					
0248*	INITIATE CORE TO DRUM TRANSFER				
0249*					
0251	71325	070001	SWAP1	STA 1	B=>TABLE OF USER TO BE WRITTEN.
0252	71326	002400	SWAP2	CLA	SET MAIN TO SAY NO USER IN
0253	71327	076017	STB	SMAIN	SAVE TABLE OF USER IN QUESTION
0254	71330	070257	STA	MAIN	CORE.
0255	71331	044355	ADB	+.?PROG	B=>PROG,END LOCATION,
0256	71332	060056	LDA	PBPTR	
0257	71333	170001	STA	1,I	
0258	71334	003000	CMA		
0259	71335	041221	ADA	USE	
0260	71336	070072	STA	WORD	STORE -LENGTH INTO WORD.
0261	71337	044351	ADB	+.?DISC-?PROG	B => DRUM ADDRESS
0262	71340	160001	LDA	B,I	GET USER DRUM ADDRESS
0263	71341	010317	AND	M32	DELETE SECTOR PART
0264	71342	170001	STA	1,I	
0265	71343	001222	RAL	RAL	GET DRUM TABLE ADDRESS
0266	71344	010355	AND	+.3	ADDRESS
0267	71345	040676	ADA	?ATBL	
0268	71346	077112	STB	TYPET	SAVE DRUM ADDRESS LOCATION
0269	71347	160000	LDA	A,I	A=SELECT CODE FOR DRUM
0270	71350	010734	AND	B77	LEAVE THE SELECT CODE
0271	71351	040552	ADA	LIA1	SET UP LIA.
0272	71352	073353	STA	**+1	READ THE DRUM STATUS
0273	71353	102500	LIA	0	
0274	71354	001727	ALF	ALF	GET CURRENT SECTOR.
0275	71355	040354	ADA	+.2	GET POTENTIAL DEST. SECTOR.
0276	71356	010411	AND	+.37B	
0277	71357	064000	LDB	A	
0278	71360	005700	BLF		GET NUMBER OF WORDS THAT WOULD
0279	71361	005222	RBL	RBL	BE SKIPPED AT TRACK BEGINNING
0280	71362	045000	ADB	MULEN	B ← - NUMBER OF WORDS LEFT
0281	71363	007004	CMB	INB	NOW POSITIVE COUNT

0282	71364	044072	ADB WORD	TEST TO SEE IF THERE IS ENOUGH,
0283	71365	143112	ADA TYPET,I	COMPUTE NEW DRUM ADDRESS
0284	71366	006020	SSB	IF END OF TRACK NOT LONG ENOUGH,
0285	71367	163112	LDA TYPET,I	WRITE TO BEGINNING.
0286	71370	173112	STA TYPET,I	STORE NEW DRUM ADDR IN TABLE
0287	71371	065221	LDB USE	B*CORE ADDRESS.
0288	71372	114770	JSB DRUM,I	INITIATE DRUM TRANSFER
0289	71373	026362	JMP SCH1	AND RETURN BUSY.

0291*

0292* TYPE III PROGRAMS

0293*

0295	71374		SWAP3 EQU *	
0296	71374	160001	LDA B,I	GET STATUS
0297	71375	050421	CPA ,+XSYNT-,+1+OPE=COM2	
0298	71376	002401	CLA,RSS	SET PRIORITY TO 0 IF OPEN
0299	71377	027403	JMP SWAP6	
0300	71400	044354	ADB ,+?PLEV=?STAT	
0301	71401	170001	STA B,I	
0302	71402	044350	ADB ,+?STAT=?PLEV	
0303	71403		SWAP6 EQU *	
0304	71403	044351	ADB ,+?RSTR=?STAT	B => RESTART ADDRESS
0305	71404	160001	LDA B,I	
0306	71405	050506	CPA #LIB#	IF THIS A FRESH CALL,
0307	71406	070265	STA LCHCR	ZAP THE LCHCR FLAG
0308	71407	044353	ADB ,+?STAT=?RSTR	
0309	71410	160001	LDA B,I	
0310	71411	050350	CPA ,=2	
0311	71412	060401	LDA XSYNT+1+BYE=COM2	
0312	71413	040337	ADA ,=5+COM2=COM3	
0313	71414	064257	LDB MAIN	TEST FOR MAIN PROGRAM IN CORE
0314	71415	006002	SZB	
0315	71416	027326	JMP SWAP2	GO TO WRITE OUT MAIN PROGRAM.
0316	71417	042012	ADA DCOM6	A=> DRUM ADDRESS FOR LIB. PROGR.
0317	71420	050260	CPA LIB	IS IT IN CORE?
0318	71421	127202	JMP SWAPR,I	YES==RETURN PRESENT.
0319	71422	070260	STA LIB	IF NOT, INITIATE READ IN.
0320	71423	064750	LDB M512	LENGTH OF PROGRAM = 512
0321	71424	074072	STB WORD	
0322	71425	007400	CCB	SMAIN = -1 SEZ
0323	71426	076017	STB SMAIN	READING LIBRARY PROGRAM
0324	71427	064504	LDB #LIBI	
0325	71430	160000	LDA 0,I	
0326	71431	114770	JSB DRUM,I	INITIATE DRUM TRANSFER
0327	71432	026362	JMP SCH1	

0328*

0329* ENTRY POINT FOR INPUT REQUEST

0330*

0331	71433	000000	SCHI0 NOP	
0332	71434	103100	CLF 0	INTERRUPT INHIBIT.
0333	71435	064273	LDB MLINK+1	
0334	71436	044336	ADB ,+?TNUM=?LINK	
0335	71437	130001	IUR 1,I	TELL 2114
0336	71440	114500	JSB S149C,I	ABOUT INPUT WAIT

0337	71441	103100	CLF	0	
0338	71442	044364	ADB	.,+?RSTR-?TNUM	
0339	71443	063433	LDA	SCHIQ	
0340	71444	170001	STA	1,I	
0341	71445	006004	INB		GET PROGRAM TYPE
0342	71446	160001	LDA	1,I	
0343	71447	002020	SSA		QUIT IF ABORT REQUEST.
0344	71450	027651	JMP	SUSP	
0345	71451	044354	ADB	.,+?PLEV-?STAT	
0346	71452	170001	STA	1,I	SET INTO PLEV.
0347	71453	044350	ADB	.,+?STAT-?PLEV	
0348	71454	060354	LDA	XINPT	CHANGE STATUS TO
0349	71455	170001	STA	1,I	INPUT WAIT.
0350	71456	027651	JMP	SUSP	GO REMOVE FROM QUEUE.
0351*					
0352*	ENT RY	POINT	FOR	TERMINATION	
0353*					
0354	71457	103100	SCHQ0	CLF	0
0355	71460	060262	LDA	HQDIS	DID THIS GUY TRY TO
0356	71461	002003	SZA	,RSS	DISCONNECT?
0357	71462	027476	JMP	SCHQ1	NO
0358	71463	002400	CLA		YES
0359	71464	070262	STA	HQDIS	RESET DISCONNECT FLAG
0360	71465	064273	LDB	MLINK+1	
0361	71466	044335	ADB	.,-?LINK	
0362	71467	160001	LDA	1,I	SET
0363	71470	030772	IOR	COM14	COMMUNICATIONS
0364	71471	170001	STA	1,I	BIT
0365	71472	044366	ADB	.,+?STAT	
0366	71473	060350	LDA	XDISC	SET STATUS
0367	71474	170001	STA	1,I	TO DISCONNECT
0368	71475	027651	JMP	SUSP	
0369	71476	060273	SCHQ1	LDA	MLINK+1
0370	71477	040336	ADA	.,+?TNUM-?LINK	DOES THIS
0371	71500	050255	CPA	PRIST	USER HAVE
0372	71501	002001	RSS		THE LINE
0373	71502	027512	JMP	SCHQ3	PRINTER?
0374	71503	060256	LDA	LFLAG	NO
0375	71504	002002	SZA		YES - IS THE LPR
0376	71505	027510	JMP	SCHQ2	COMMAND FLAG SET?
0377	71506	072043	STA	CLC1	YES
0378	71507	017057	JSB	SCLPR	NO, BLOCK CLOCK
0379	71510	002400	SCHQ2	CLA	REMOVE USER FROM LP
0380	71511	070256	STA	LFLAG	CLEAR
0381	71512	064273	SCHQ3	LDB	FLAG
0382	71513	054302	CPB	T35LN	SCRATCH IF
0383	71514	027520	JMP	++4	
0384	71515	044335	ADB	.,-?LINK	THIS IS
0385	71516	017700	JSB	HTEST	SHELLO.
0386	71517	064273	LDB	MLINK+1	CHANGE
0387	71520	044351	ADB	.,+?STAT-?LINK	STATUS
0388	71521	160001	LDA	1,I	
0389	71522	050351	CPA	.,-1	QUIT IF ABORT REQUEST.
0390	71523	027651	JMP	SUSP	
0391	71524	002400	CLA		TO IDLE

```

0392 71525 170001      STA 1,I
0393 71526 027651      JMP SUSP
0394* SCHAR FETCHES THE NEXT CHARACTER FROM A BUFFER. BUFFER
0395* POINTERS FOR SCHAR ARE INITIALIZED AS FOLLOWS;
0396*      SBHED=> FIRST CHARACTER IF TTY35; #0 OTHERWISE
0397*      SCHL,I=> END OF TTY35 BUFFER
0398*
0399* SCHAR CALLING SEQUENCE:
0400*
0401*      JSB SCHAR
0402*      RETURN HERE IF CR
0403*      RETURN HERE IF ANY OTHER CHARACTER

0405 71527 000000      SCHAR NOP
0406 71530 064060      LDB SBHED      GET POINTER,
0407 71531 006003      SZB,RSS      TTY35?
0408 71532 027551      JMP SCHR1     NO
0409 71533 004065      CLE,ERB      YES=>POSITION AS WORD POINTER
0410 71534 160001      LDA 1,I      GET WORD CONTAINING CHARACTER,
0411 71535 005610      ELB,SLB     REPOSITION POINTER AND TEST
0412 71536 002001      RSS        FOR UPPER OR LOWER,
0413 71537 001727      ALF,ALF
0414 71540 010443      AND B377    MASK OUT CHARACTER,
0415 71541 050367      CPA .+15B   RETURN IMMEDIATELY IF CR
0416 71542 127527      JMP SCHAR,I  BUMP CHARACTER POINTER,
0417 71543 006004      INB        SKIP BLANKS
0418 71544 074060      STB SBHED
0419 71545 050412      CPA .+40B
0420 71546 027531      JMP SCHAR+2
0421 71547 037527      ISZ SCHAR
0422 71550 127527      JMP SCHAR,I
0423 71551 064062      SCHR1 LDB TTQ      FETCH
0424 71552 006004      INB
0425 71553 160001      LDA 1,I     CHARACTER
0426 71554 030222      IOR GTC
0427 71555 114520      JSB S14SC,I FROM 2114
0428 71556 102311      SFS CH2    WAIT FOR RESPONSE
0429 71557 027556      JMP +=1
0430 71560 102511      LIA CH2
0431 71561 050412      CPA .+40B   BLANK?
0432 71562 027553      JMP SCHR1+2 YES=>IGNORE IT
0433 71563 050367      CPA .+15B   NO, CARRIAGE RETURN?
0434 71564 027573      JMP SCHR2   YES
0435 71565 040766      ADA M96    CHECK FOR CODES
0436 71566 002021      SSA,RSS    GREATER THAN 140.
0437 71567 040317      ADA M32    CODE IS LOWER CASE, MAKE UPPER,
0438 71570 042000      ADA B140   RESTORE ASCII CODES,
0439 71571 037527      ISZ SCHAR  NO=>EXIT
0440 71572 127527      JMP SCHAR,I TO (P+2)
0441 71573          SCHR2 EQU +
0442 71573 160001      LDA 1,I     B=>TTY #
0443 71574 030251      IOR BKS    TELL 2114
0444 71575 114500      JSB S14SC,I TO BACKSPACE
0445 71576 127527      JMP SCHAR,I
0446*

```


0447* DEQUE REMOVES A USER FROM THE QUEUE. IT IS CALLED WITH THE USER'S
 0448* LINK ADDRESS IN B.

0449*

0450	71577	000000	DEQUE	NOP	
0451	71600	060272		LDA MLINK	GET POINTER TO FIRST ENTRY.
0452	71601	154000	DEQ1	CPB 0,I	TEST FOR ENTRY FOUND.
0453	71602	027607		JMP DEQ2	
0454	71603	160000		LDA 0,I	LINK TO NEXT ENTRY.
0455	71604	050272		CPA MLINK	TEST FOR END OF QUEUE.
0456	71605	127577		JMP DEQUE,I	NOT ON QUEUE--RETURN.
0457	71606	027601		JMP DEQ1	LOOP.
0458	71607	164001	DEQ2	LDB 1,I	LINK AROUND THIS USER.
0459	71610	174000		STB 0,I	
0460	71611	127577		JMP DEQUE,I	

PAGE 0329 #30 OUTPUT CHARACTER ROUTINE

0462* THE OUTCH ROUTINE OUTPUTS A CHARACTER TO A USER'S
 0463* BUFFER IN THE 2114. THE CALLING SEQUENCE IS:
 0464*
 0465* JSB OUTCH,I A=CHARACTER TO BE OUTPUT
 0466* B=TTY TABLE ADDRESS,
 0467*
 0468* OUTCH FIRST CHECKS TO MAKE SURE THAT THE 2114 CAN ACCEPT
 0469* CHARACTERS. IF NOT, THE USER IS PLACED IN OUTPUT WAIT STATUS
 0470* AND A TRANSFER IS MADE INTO THE SYSTEM TO DELETE THE USER
 0471* FROM THE QUEUE
 0472*

```

0474 71612 000000 #OUTC NOP
0475 71613 103100 CLF 0
0476 71614 010443 AND B377 MASK AND
0477 71615 072014 STA OUTM1 SAVE CHARACTER
0478 71616 160001 LDA 1,I CAN 2114
0479 71617 010412 AND OUTWT TAKE THIS
0480 71620 002002 SZA CHARACTER?
0481 71621 027630 JMP OUTC1 NO
0482 71622 006004 INB YES
0483 71623 160001 LDA 1,I BUILD OUTPUT WORD
0484 71624 032014 IOR OUTM1 WITH USER'S TTY #,
0485 71625 030220 IUR OCR CHARACTER AND OP CODE.
0486 71626 114500 JSB S14LP,I CALL 2114 DRIVER
0487 71627 127612 JMP #OUTC,I
0488*
0489* TAKE CARE OF FULL BUFFER IN 2114
0490*
0491 71630 044366 OUTC1 ADB .+?STAT
0492 71631 160001 LDA 1,I
0493 71632 002020 SSA IF ABORTED GO DIRECTLY
0494 71633 027651 JMP SUSP TO SUSPEND.
0495 71634 044354 ADB .+?PLEV=?STAT MOVE STATUS TO
0496 71635 170001 STA 1,I PLEV AND SET
0497 71636 044350 ADB .+?STAT=?PLEV STATUS TO
0498 71637 060355 LDA %OUTW OUTWAIT.
0499 71640 170001 STA 1,I
0500 71641 003400 CCA SET RETURN ADDRESS TO
0501 71642 043612 ADA #OUTC RECALL OUTC
0502 71643 044351 ADB .+?RSTR=?STAT
0503 71644 170001 STA 1,I
0504 71645 062014 LDA OUTM1
0505 71646 071224 STA AREG
0506 71647 044337 ADB .=?RSTR
0507 71650 075225 STB BREG
0508 71651 160273 SUSP LDA MLINK+1,I
0509 71652 070273 STA MLINK+1
0510 71653 002400 CLA LOCK
0511 71654 072043 STA CLC1 CLOCK
0512 71655 026362 JMP SCH1 JUMP TO SCHEDULER
0513*
0514 71656 000000 SCH00 NOP OUTPUT SUSPEND REQUEST ENTRY.
    
```

PAGE 0330 #30 OUTPUT CHARACTER ROUTINE

```

0515 71657 103100      CLF 0          TURN OFF INTERRUPT.
0516 71660 063656      LDA SCH0Q      SET UP RETURN ADDRESS.
0517 71661 002004      INA
0518 71662              SCH0Q EQU *
0519 71662 073612      STA #OUTC
0520 71663 064273      LDB MLINK+1
0521 71664 044335      ADB .-?LINK
0522 71665 160001      LDA 1,I
0523 71666 030412      IOR OUTWT     SET OUTPUT WAIT BIT
0524 71667 170001      STA 1,I
0525 71670 006004      INB
0526 71671 160001      LDA 1,I      PUT USER
0527 71672 030243      IOR OWT
0528 71673 114500      JSB S14LP,I  IN OUTPUT WAIT
0529 71674 103100      CLF 0        NO INTERRUPTS DURING SUSPEND
0530 71675 064273      LDB MLINK+1  FOOL OUTCR INTO DOING THE WORK.
0531 71676 044351      ADB .+?STAT-?LINK
0532 71677 027631      JMP OUTC1+1
0533* HTEST SCRATCHES A PROGRAM IF THE ASSOCIATED HFLAG BIT IS SET.
0534* B POINTS TO THE USER'S TTY ADDRESS.
0535*
0536 71700 000000      HTEST NOP
0537 71701 160001      LDA 1,I
0538 71702 010356      AND HFLAG    GET HFLAG BIT.
0539 71703 002003      SZA,RSS
0540 71704 127700      JMP HTEST,I  RETURN IF HFLAG BIT =0.
0541 71705 103100      CLF 0
0542 71706 120001      XOR 1,I
0543 71707 170001      STA 1,I     CLEAR HFLAG BIT
0544 71710 102100      STF 0
0545 71711 016776      JSB SCRAT
0546 71712 127700      JMP HTEST,I RETURN.

```

0001* COMMAND TABLE -- THIS TABLE CONSISTS OF 2 PARTS. PART 1 CONTAINS
 0002* THE ENCODED SYMBOLIC COMMANDS. THESE ARE CODED AS 3 BYTES, EACH
 0003* BYTE BEING OF LENGTH 5 BITS AND OF VALUE 101(OCTAL) LESS THAN THE
 0004* OCTAL VALUE OF THE CHARACTER. THE THREE BYTES ARE IN BIT POSI-
 0005* TIONS 14-10, 9-5, AND 4-0, RESPECTIVELY. BIT 15 IS SET TO 1 FOR
 0006* COMMANDS THAT ARE LEGAL FOR THE SYSTEM CONSOLE.

0007*
 0008* PART 1 IS ITSELF DIVIDED INTO 3 SECTIONS. COMMANDS IN SECTION 1
 0009* ARE THOSE COMMANDS WHICH ARE HANDLED IMMEDIATELY BY THE EXECUTIVE
 0010* WITHOUT ANY DRUM ACCESS. THOSE IN SECTION 2 ARE COMPILER COMMANDS
 0011* WHICH ARE RESIDENT BUT WHICH REQUIRE THE PROGRAM TO BE LOADED
 0012* FROM DRUM. COMMANDS IN SECTION 3 ARE SYSTEM COMMANDS WHICH ARE
 0013* DRUM RESIDENT. ALL SYSTEM COMMANDS ARE OF THIS TYPE AND
 0014* MUST BE LOCATED AFTER COM4.

0015*
 0016* PART 2 OF THE COMMAND TABLE CONTAINS THE CORE STARTING ADDRESSES
 0017* FOR THOSE COMMANDS IN SECTIONS 1 AND 2, AND THE DRUM ADDRESSES OF
 0018* THOSE IN SECTION 3.

0019*
 0020* PART I

0021*
 0022* SECTION I

0023*
 0024 71713 044121 COM1 OCT 44121 SCRATCH
 0025 71713 SCR EQU COM1
 0026 71714 046017 OCT 46017 TAPE
 0027 71715 024230 OCT 24230 KEY

0028*
 0029* SECTION II

0030*
 0031 71716 043215 COM2 OCT 43215 RUN
 0032 71717 026422 LIS OCT 26422 LIST
 0033 71720 037215 PUN OCT 37215 PUNCH
 0034 71721 056764 XPUN OCT 056764 XPUNCH
 0035 71722 177777 UCDA8 OCT -1 FOR ABORT UPDATE CHANGE DATE
 0036 71723 177777 CTAPR OCT -1 USED FOR TAPE ERROR PRINTOUT,

0037*
 0038* SECTION III

0039*
 0040 71724 177777 COM3 OCT -1 FOR LENGTH SECTION
 0041 71725 177777 OCT -1 FOR TWO HALVES
 0042 71726 177777 OCT -1 OF FUSS TABLE
 0043 71727 177777 COMFL OCT -1 FOR FILES
 0044 71730 177777 ASGNA OCT -1 ASSIGN
 0045 71731 177777 COMCH OCT -1 FOR CHAIN
 0046 71732 044025 SAVE OCT 44025 SAVE
 0047 71733 005100 CSAV OCT 5100 CSAVE
 0048 71734 177777 SAVO OCT -1 FOR SAVE OVERLAY
 0049 71735 014223 OCT 14223 GET
 0050 71736 000757 OCT 757 APPEND
 0051 71737 016213 HELLO OCT 16213 HELLO
 0052 71740 003404 BYE OCT 3404 BYE
 0053 71741 024413 OCT 24413 KILL
 0054 71742 042215 OCT 42215 RENUMBER
 0055 71743 032014 OCT 32014 NAME

PAGE 0332 #31 COMMAND TABLE

0056	71744	004023	CAT	OCT	004023	CATALOG
0057	71745	026401		OCT	26401	LIBRARY
0058	71746	015056		OCT	15056	GROUP
0059	71747	006421		OCT	6421	DIRECTORY - USER CONSOLE
0060	71750	044150		OCT	44150	SDIRECTORY - USER CONSOLE
0061	71751	042217		OCT	42217	REPORT - USER CONSOLE
0062	71752	045140		OCT	45140	STATUS - USER CONSOLE
0063	71753	177777	STA	OCT	=1	FOR STATUS OVERLAY - USER CONSOL
0064	71754	006213		OCT	6213	DELETE
0065	71755	046414		OCT	46414	TIME
0066	71756	037056		OCT	37056	PROTECT
0067	71757	050657		OCT	50657	UNPROTECT
0068	71760	034744	OPE	OCT	34744	OPEN
0069	71761	026215		OCT	26215	LENGTH
0070	71762	010107		OCT	10107	ECHO
0071	71763	030222		OCT	030222	MESSAGE
0072	71764	026761		OCT	26761	LPRINTER
0073	71765	036721		OCT	36721	PORT-USER CONSOLE
0074	71766		COM4	EQU	*	
0075	71766	142217		OCT	142217	REPORT - SYSTEM CONSOLE
0076	71767	106421		OCT	106421	DIRECTORY - SYSTEM CONSOLE
0077	71770	144150		OCT	144150	SDIRECTORY - SYSTEM CONSOLE
0078	71771	145140		OCT	145140,-1	STATUS - SYSTEM CONSOLE
	71772	177777				
0079	71773	136721		OCT	136721	PORT-SYSTEM CONSOLE
0080	71774	142722	ROS	OCT	142722	ROSTER
0081	71775	100655		OCT	100655	ANNOUNCE
0082	71776	142222		OCT	142222	RESET
0083	71777	104340		OCT	104340	CHANGE
0084	72000	144544		OCT	144544	SLEEP
0085	72001	116401		OCT	116401	HIBERNATE
0086	72002	132226		OCT	132226	NEWID
0087	72003	124413		OCT	124413	KILLID
0088	72004	150653		OCT	150653	UNLOCK
0089	72005	126702		OCT	126702	LOCK
0090	72006	131215		OCT	131215	MUNLOCK
0091	72007	130556		OCT	130556,-1	MLOCK
	72010	177777				
0092	72011	104717		OCT	104717	COPY
0093	72012	102222		OCT	102222	BESTOW
0094	72013	144015		OCT	144015	SANCTIFY
0095	72014	106222		OCT	106222	DESECRATE
0096	72015	137221		OCT	137221	PURGE
0097	72016	130006		OCT	130006	MAGTAPE
0098	72017	136356		OCT	136356	PHO
0099	72020	137050		OCT	137050	PRINTER
0100	72021	144744		OCT	144744	SPEED
0101	72022	103044		OCT	103044	BREAK
0102*						
0103*	PART II -- STARTING ADDRESSES					
0104*						
0105	72023	070773	COM5	DEF	#SCR	
0106	72024	071011		DEF	#TAP	
0107	72025	070601		DEF	SCH20	KEY
0108*						

0109	72026	036007		DEF	CMPL	
0110	72027	052143		DEF	LIST	
0111	72030	052142		DEF	PUNCH	
0112	72031	052140		DEF	XPUNCH	
0113	72032	073473		DEF	ABUCD	
0114	72033	045233		DEF	TAPER	
0115*						
0116*						DRUM ADDRESSES -- TO BE FILLED BY THE LOADER.
0117*						
0118	72034	000000	COM6	BSS	COM5=COM3	
0119	72037		FILIB	EQU	COM6=COM3+COMFL	FILES DRUM ADDRESS
0120	72041		CHLIB	EQU	COM6=COM3+COMCH	CHAIN DRUM ADDRESS
0121	72040		ASNIB	EQU	COM6+ASGNA=COM3	
0122	72133	000000	DSERA	BSS	4	DRUM ADDRESSES FOR ERROR MESS.
0123	72137		COMTE	EQU	*	
0124	72137	000000	LOGGR	BSS	64	HOLDS INFO FOR LOGGING

0126*

0127* ROUTINE TO FIND THE ADT THAT THE DISK ADDRESS
 0128* CONTAINED IN KILD SHOULD GO INTO,
 0129* LTEMPS CALLED KILD AND KILDF ARE USED

0130*

```

0131 72237 000000 FADT NOP
0132 72240 060341 LDA ,=9 SET COUNT FOR NUMBER OF ADTS
0133 72241 070044 STA KILD
0134 72242 060210 LDA MHAD A => DISK TABLES
0135 72243 040432 ADA ,+48 POINT TO LAST ENTRY
0136 72244 FADBC EQU *
0137 72244 070045 STA KILDF A => DISK TABLE ENTRY
0138 72245 104200 DLD KILDF,I AB = FIRST ADDRESS ON THIS DISK
      72246 100045
0139 72247 000065 CLE,ERA CONVERT TO BLOCKS
0140 72250 005500 ERB
0141 72251 016600 JSB FADDB
0142 72252 002021 SSA,RSS SKIP IF LOWER DISK
0143 72253 026262 JMP FADBF RESULT POSITIVE, FOUND THE DISK
0144 72254 060045 LDA KILDF
0145 72255 040344 ADA ,=6 MOVE TO PRECEEDING ENTRY
0146 72256 034044 ISZ KILD
0147 72257 026244 JMP FADBC GO TRY NEXT DISK
0148 72260 102031 FADBN HLT 31B BETTER FIND DISK
0149 72261 026260 JMP +=1
0150 72262 FADBF EQU *
0151 72262 060044 LDA KILD GENERATE THE NUMBER OF
0152 72263 003000 CMA THE DISK ADT TO GET
0153 72264 050362 CPA ,+8 IF EIGHT, THEN ADDRESS WAS BAD
0154 72265 026260 JMP FADBN
0155 72266 042273 ADA KILPC
0156 72267 070044 STA KILD => DRUM ADDRESS WORD
0157 72270 040362 ADA ,+DADLN-DADLC
0158 72271 070045 STA KILDF => DRUM LENGTH WORD
0159 72272 126237 JMP FADT,I RETURN
0160 72273 000115 KILPC DEF DADLC

```

0161*

0162*

0163* ROUTINE RESTORES DRUM SPACE TO THE DRUM ADT.

0164* ROUTINE ASSUMES:

0165* KILD = DRUM ADDRESS

0166* KILDF = DRUM AREA LENGTH

0167* ROUTINE USES:

0168* KILP

0169*

```

0170 72274 000000 RSFS NOP
0171 72275 064562 LDB LIBD
0172 72276 060044 KIL13 LDA KILD FIND THE FIRST ADT ENTRY >
0173 72277 003104 CMA,CLE,INA RELEASED SPACE,
0174 72300 140001 ADA 1,I
0175 72301 002040 SEZ
0176 72302 026305 JMP KIL12 FOUND ONE.
0177 72303 044354 ADB ,+2
0178 72304 026276 JMP KIL13
0179*

```

0180	72305	074034	KIL12	STB KILP	SAVE POINTER TO IT.
0181	72306	054562		CPB LIBD	FIRST ENTRY ON TRACK?
0182	72307	026316		JMP RSFAE	YES, NO PREVIOUS ENTRY,
0183	72310	044350		ADB ,-2	TEST FOR PREVIOUS ENTRY ADJACENT
0184	72311	160001		LDA 1,I	TO NEW ONE.
0185	72312	006004		INB	
0186	72313	140001		ADA 1,I	
0187	72314	050044		CPA KILD	
0188	72315	026355		JMP KIL14	IT IS--GO COMBINE AREAS.
0189*					
0190	72316		RSFAE	EQW *	
0191	72316	060044		LDA KILD	TEST FOR NEXT ENTRY ADJACENT TO
0192	72317	040045		ADA KILDF	NEW ONE
0193	72320	150034		CPA KILP,I	
0194	72321	026346		JMP KIL15	IT IS--GO COMBINE AREAS.
0195*					
0196*	THE NEW ENTRY IS ADJACENT TO NEITHER THE PRECEDING NOR THE FOLLOW-				
0197*	ING ENTRIES, WE HAVE TO CREATE ROOM FOR IT BY SLIDING DOWN THE				
0198*	ADT.				
0199*					
0200*					
0201	72322	064072		LDB WORD	IF NO ROOM TO EXPAND ADT, WE
0202	72323	057554		CPB M8192	HAVE TO LOSE THE SPACE
0203	72324	126274		JMP RSFS,I	
0204	72325	007000		CMB	SET UP SOURCE FOR THE MOVE.
0205	72326	044562		ADB LIBD	
0206	72327	074050		STB MOVES	
0207	72330	044354		ADB ,+2	SET UP DESTINATION.
0208	72331	074051		STB MOVED	
0209	72332	007004		CMB,INB	COMPUTE LENGTH.
0210	72333	006004		INB	
0211	72334	044034		ADB KILP	
0212	72335	117536		JSB MOVFB,I	MOVE IT
0213	72336	060044		LDA KILD	INSERT NEW
0214	72337	064045		LDB KILDF	ENTRY
0215	72340	104400		DST KILP,I	
	72341	100034			
0216*					
0217	72342	060113		LDA ADLEN	ADJUST ADLEN.
0218	72343	040350		ADA ,-2	
0219	72344	070113		STA ADLEN	
0220	72345	126274		JMP RSFS,I	DONE
0221*					
0222*	COME HERE WHEN THE NEW AREA IS ADJACENT TO THE FOLLOWING ONE, BUT				
0223*	NOT TO THE PRECEDING ONE.				
0224*					
0225	72346	104200	KIL15	DLD KILP,I	GET FOLLOWING ENTRY.
	72347	100034			
0226	72350	044045		ADB KILDF	COMBINE LENGTHS
0227	72351	060044		LDA KILD	USE NEW DISC ADDRESS.
0228	72352	104400		DST KILP,I	REPLACE.
	72353	100034			
0229	72354	126274		JMP RSFS,I	DONE


```

0231*
0232* COME HERE WHEN THE NEW AREA IS ADJACENT TO THE PRECEDING AREA.
0233*
0234 72355 160001 KIL14 LDA 1,I      ADD LENGTH OF OLD AREA TO
0235 72356 040045      ADA KILDF      LENGTH OF NEW ONE
0236 72357 170001      STA 1,I
0237 72360 060044      LDA KILD      NOW TEST TO SEE IF THE COMBINED
0238 72361 040045      ADA KILDF      AREA IS ADJACENT TO THE NEXT
0239 72362 150034      CPA KILP,I
0240 72363 026365      JMP KIL17      IT IS--GO COMBINE THEM.
0241*
0242 72364 126274      JMP RSFS,I
0243*
0244* NEW AREA WAS ADJACENT TO 2 OTHERS, COMBINE THEM ALL.
0245*
0246 72365 034034 KIL17 ISZ KILP      COMBINE
0247 72366 160001      LDA 1,I      THE
0248 72367 140034      ADA KILP,I   LENGTHS.
0249 72370 170001      STA 1,I
0250 72371 006004      INB          COLLAPSE ADT.
0251 72372 074051      STB MOVED    SET UP MOVE DESTINATION.
0252 72373 044354      ADB .+2
0253 72374 074050      STB MOVES    SET UP SOURCE
0254 72375 044674      ADB MLIBD    COMPUTE # OF WORDS
0255 72376 044072      ADB WORD     TO MOVE.
0256 72377 117537      JSB MOVFW,I
0257*
0258 72400 034113      ISZ ADLEN    REDUCE SIZE OF ADT BY
0259 72401 034113      ISZ ADLEN    TWO.
0260 72402 126274      JMP RSFS,I   RETURN

```

```

0262*
0263*   ROUTINE TO ADD A BLOCK OF SPACE BACK INTO THE DISK ADT
0264*   WHICH IS IN CORE.
0265*   ROUTINE ASSUMES:
0266*       KILDI  = TWO WORD DISK ADDRESS
0267*       KILN   = DISK LENGTH
0268*       KILD    => DRUM ADDRESS OF ADT
0269*       KILCF  => DRUM LENGTH OF ADT
0270*   ROUTINE USES:
0271*       KILC
0272*       KILP
0273*       KILPD
0274*   ROUTINE RETURNS WITH LENGTH AND WORD BOTH UPDATED,
0275*   BUT THE TRACK IS NOT WRITTEN OUT.
0276*   SKIP RETURN IS NORMAL. NO SKIP IF THE TRACK WAS
0277*   NOT MODIFIED ( TRACK TOO LONG TO ADD )
0278*
0279  72403 000000  RADT  NOP
0280  72404 060043          LDA KILN      GET LENGTH
0281  72405 002003          SZA,RSS      CHECK LENGTH
0282  72406 126403          JMP RADT,I   DON'T WASTE TIME ON ZERO LENGTH
0283  72407 060072          LDA WORD      GET THE ADT LENGTH
0284  72410 003004          CMA,INA      MAKE POSITIVE
0285  72411 040562          ADA LIBD
0286  72412 070042          STA KILC    => END OF ADT
0287  72413 064562          LDB LIBD    => BEGINNING OF ADT
0288  72414          KILCD EQU *
0289  72414 074034          STB KILP    B => CURRENT ENTRY
0290  72415 054042          CPB KILC    CHECK FOR END OF TABLE
0291  72416 026520          JMP KILCG    INSERT ENTRY AT END
0292  72417 104200          DLD KILP,I   GET DISK ADDRESS FOR THIS ENTRY
          72420 100034
0293  72421 016600          JSB FADDB   SUBTRACT FROM ADDRESS BEING RETU
0294  72422 002020          SSA      SKIP IF NOT FAR ENOUGH
0295  72423 026427          JMP KILCF   FOUND NEXT ENTRY GREATER
0296  72424 064034          LDB KILP   GET ADT POINTER AND
0297  72425 044355          ADB .+3   ADVANCE TO THE NEXT ENTRY
0298  72426 026414          JMP KILCD
0299*
0300  72427          KILCF EQU *
0301*
0302*   CHECK TO SEE IF THE NEW ENTRY
0303*   IS ADJACENT TO THE FOLLOWING ENTRY
0304*
0305  72427 104200          DLD KILDI   GET CURRENT DISK ADDRESS
          72430 000046
0306  72431 000040          CLE
0307  72432 044043          ADB KILN   ADD TO B THE LENGTH
0308  72433 002040          SEZ      CHECK FOR OVERFLOW
0309  72434 002004          INA
0310  72435 150034          CPA KILP,I CHECK FOR MATCH
0311  72436 002405          CLA,INA,RSS FIRST WORDS ARE EQUAL
0312  72437 026520          JMP KILCG  NO MATCH
0313  72440 040034          ADA KILP   A => SECOND WORD OF ENTRY
0314  72441 154000          CPB A,I    CHECK FOR MATCH

```

0315	72442	002001	RSS	YES, WE CAN COMBINE THE TWO ENTH
0316	72443	026520	JMP KILCG	CAN'T BE COMBINED WITH NEXT ENTR
0317*				
0318*	COMBINE THIS ENTRY WITH THE NEXT ENTRY			
0319*				
0320	72444	104200	DLR KILDI	GET THIS DISK ADDRESS
	72445	000046		
0321	72446	104400	DST KILP,I	REPLACE THE NEXT ENTRY
	72447	100034		
0322	72450	064034	LDB KILP	
0323	72451	044354	ADB .+2	B => LENGTH OF ENTRY
0324	72452	060043	LDA KILN	A * LENGTH
0325	72453	140001	ADA B,I	INCREASE THE LENGTH TO INCLUDE
0326	72454	170001	STA B,I	BOTH OLD AND NEW DISK AREAS
0327*				
0328*	CHECK TO SEE IF PREVIOUS ENTRY IS ADJACENT			
0329*	I.E. DID THE NEW ENTRY BRIDGE THE GAP			
0330*	BETWEEN TWO OTHERS?			
0331*				
0332	72455	060034	LDA KILP	A => THIS ENTRY
0333	72456	050562	CPA LIBD	CHECK FOR NO PREVIOUS ENTRY
0334	72457	026576	JMP KILCP	NO PREVIOUS ENTRY, WE'RE DONE
0335	72460	040351	ADA .-1	A => LENGTH OF PREVIOUS ENTRY
0336	72461	070035	STA KILPD	
0337	72462	040350	ADA .-2	A => PREVIOUS ENTRY DISK ADDRESS
0338	72463	104200	DLR A,I	
	72464	100000		
0339	72465	000040	CLE	
0340	72466	144035	ADB KILPD,I	ADD PREVIOUS LENGTH TO
0341	72467	002040	SEZ	PREVIOUS ADDRESS
0342	72470	002004	INA	
0343	72471	150034	CPA KILP,I	FIRST WORD MATCH
0344	72472	002405	CLA,INA,RSS	
0345	72473	026576	JMP KILCP	ENTRIES ARE NOT ADJACENT, ADD DO
0346	72474	040034	ADA KILP	A => SECOND DISK ADDRESS WORD
0347	72475	154000	CPB A,I	CHECK SECOND WORD FOR MATCH
0348	72476	002005	INA,RSS	=> LENGTH OF FOLLOWING ENTRY
0349	72477	026576	JMP KILCP	ADD IS DONE CUZ NO MATCH
0350*				
0351*	NOW COMBINE ENTRIES			
0352*				
0353	72500	164000	LDB A,I	B * LENGTH OF SECOND ENTRY
0354	72501	040347	ADA .-3	=> LENGTH OF PREVIOUS
0355	72502	144000	ADB A,I	SUM OF LENGTHS
0356	72503	174000	STB A,I	UPDATE LENGTHS
0357	72504	064034	LDB KILP	NOW SET UP FOR MOVE
0358	72505	074051	STB MOVED	CURRENT ENTRY IS TO BE REMOVED
0359	72506	044355	ADB .+3	
0360	72507	074050	STB MOVES	
0361	72510	044674	ADB MLI0D	FIND LENGTH OF MOVE
0362	72511	044072	ADB WORD	
0363	72512	117537	JSB MOVFW,I	MOVE TABLE DOWN
0364	72513	160045	LDA KILDF,I	A * TABLE LENGTH
0365	72514	040355	ADA .+3	SHORTEN ADT
0366	72515	170045	STA KILDF,I	

```

0367 72516 070072          STA WORD
0368 72517 026576          JMP KILCP          DONE WITH UPDATE, WRITE OUT
0369*
0370*          SEE IF THE ENTRY WILL COMBINE WITH THE PREVIOUS ENTRY
0371*
0372 72520          KILCG EQU *
0373 72520 060034          LDA KILP          A => CURRENT ENTRY
0374 72521 050562          CPA LIBD          CHECK FOR BEGINNING OF TABLE
0375 72522 026546          JMP KILCN          NO PRECEEDING ENTRY TO COMBINE W
0376 72523 040351          ADA ,=1          A => LENGTH OF PRECEEDING ENTRY
0377 72524 070042          STA KILC          SAVE POINTER
0378 72525 040350          ADA ,=2          A => PREVIOUS DISK ADDRESS
0379 72526 104200          OLD A,I
          72527 100000
0380 72530 000040          CLE
0381 72531 144042          ADB KILC,I          ADD PREVIOUS LENGTH TO
0382 72532 002040          SEZ          PREVIOUS DISK ADDRESS
0383 72533 002004          INA
0384 72534 050046          CPA KILDI          DOES FIRST WORD MATCH
0385 72535 002001          RSS
0386 72536 026546          JMP KILCN          DOESN'T COMBINE
0387 72537 054047          CPB KILDI+1        DO SECOND WORDS MATCH
0388 72540 002001          RSS          YES, ENTRIES CAN COMBINE
0389 72541 026546          JMP KILCN          DOESN'T COMBINE ANYWHERE
0390 72542 060043          LDA KILN          GET LENGTH
0391 72543 140042          ADA KILC,I          UPDATE ENTRY
0392 72544 170042          STA KILC,I
0393 72545 026576          JMP KILCP          ADD IS ALL DONE
0394*
0395*          ENTRY IS NOT ADJACENT TO , OR BRIDGING BETWEEN
0396*          TWO ENTRIES THAT ARE IN THE TABLE. . . MOVE
0397*          TABLE IF POSSIBLE AND INSERT
0398*
0399 72546          KILCN EQU *
0400 72546 064072          LDB WORD          IF THERE IS NO ROOM TO
0401 72547 057552          CPB M8190          EXPAND THE ADT,
0402 72550 126403          JMP RADT,I          WE HAVE TO LOOSE THE SPACE
0403 72551 007000          CMB
0404 72552 044562          ADB LIBD
0405 72553 074050          STB MOVES          SET UP FOR THE MOVE
0406 72554 044355          ADB ,+3
0407 72555 074051          STB MOVED
0408 72556 007004          CMB,INB
0409 72557 044354          ADB ,+2
0410 72560 044034          ADB KILP
0411 72561 117536          JSB MOVFB,I          MOVE TABLE UP TO MAKE ROOM
0412 72562 104200          OLD KILDI          GET DISK ADDRESS
          72563 000046
0413 72564 104400          DST KILP,I          SET INTO TABLE
          72565 100034
0414 72566 064034          LDB KILP
0415 72567 044354          ADB ,+2          B => NEW ENTRIES LENGTH
0416 72570 060043          LDA KILN          A = LENGTH
0417 72571 170001          STA B,I          SET NEW ENTRIES LENGTH
0418 72572 160045          LDA KILDF,I          GET TABLE LENGTH

```

0419	72573	040347	ADA	.*3	INCREASE BY THREE WORDS
0420	72574	170045	STA	KILDF,I	
0421	72575	070072	STA	WORD	
0422	72576		KILCP	EQU *	
0423	72576	036403	ISZ	RADT	SKIP RETURN IS NORMAL
0424	72577	126403	JMP	RADT,I	RETURN
0425*					
0426	72600	000000	FADDB	NOP	
0427	72601	007104		CMB,CLE,INB	
0428	72602	003040		CMA,SEZ	
0429	72603	002004		INA	
0430	72604	000040		CLE	
0431	72605	044047	ADB	KILDI+1	ADD LOWER WORDS
0432	72606	002040		SEZ	
0433	72607	002004		INA	
0434	72610	040046	ADA	KILDI	ADD UPPER WORDS
0435	72611	126600	JMP	FADDB,I	

```

0437*
0438* THIS ROUTINE SCANS A TABLE AND PUTS DISK SPACE BACK
0439* INTO THE DISK ADTS.
0440* THE FORMAT OF THE TABLE IS:
0441* LIBUS+8192/ (ID)
0442* / LENGTH
0443* / TWO WORD DISK ADDRESS
0444* .
0445* .
0446* .
0447* LOCTC CONTAINS THE NEGATIVE NUMBER OF ENTRIES
0448*
0449* THE ROUTINE RETURNS ALL SPACE ON ONE ADT BEFORE WRITING
0450* IT BACK. THE DISK ADDRESS OF EACH ENTRY IS ZEROED AS THE
0451* SPACE IS RETURNED.
0452*
0453*
0454 72612 000000 TBDAD NOP
0455 72613 TBDBB EQU *
0456 72613 060030 LDA LOCTC GET THE ENTRY COUNT
0457 72614 073562 STA TBDT1 AND SAVE IN A TEMP
0458 72615 002003 SZA,RSS CHECK FOR NULL TABLE
0459 72616 126612 JMP TBDAD,I RETURN IF SO
0460 72617 065002 LDB L8192 LOAD TABLE BASE
0461 72620 006004 INB => DISK LENGTH OF FIRST ENTRY
0462 72621 TBDBA EQU *
0463 72621 160001 LDA B,I GET THE LENGTH
0464 72622 070043 STA KILN AND SAVE FOR THE RADT ROUTINE
0465 72623 006004 INB => DISK ADDRESS
0466 72624 077563 STB TBDT2 SAVE THE POINTER
0467 72625 104200 DLD TBDT2,I GET THE DISK ADDRESS
72626 173563
0468 72627 002003 SZA,RSS SKIP IF FIRST HALF NON-ZERO
0469 72630 006002 SZB SKIP IF ENTRY ALL ZERO
0470 72631 002001 RSS NON-ZERO ENTRY, IT MUST BE RETURNED
0471 72632 026721 JMP TBDBU THIS ONE IS NULL
0472 72633 104400 DST KILDI SAVE THE DISK ADDRESS FOR RADT
72634 000046
0473 72635 002400 CLA
0474 72636 006400 CLB
0475 72637 104400 DST TBDT2,I PREVENT SECOND RETURN OF SPACE
72640 173563
0476 72641 016237 JSB FADT FIND THE CORRECT ADT TRACK
0477 72642 160045 LDA KILDF,I GET THE ACTS LENGTH
0478 72643 070072 STA WORD
0479 72644 060044 LDA KILD GET THE POINTER TO THE DRUM ADDR
0480 72645 073564 STA TBDT3 AND SAVE
0481 72646 160044 LDA KILD,I GET THE DRUM ADDRESS
0482 72647 002003 SZA,RSS SKIP IF TRACK EXISTS
0483 72650 026721 JMP TBDBU NO ADT, FORGET ENTRY
0484 72651 064566 LDB LIBDI
0485 72652 117534 JSB DRUMP,I READ IN THE TRACK
0486 72653 026716 JMP TBDBY
0487 72654 016403 JSB RADT PUT THE SPACE BACK
0488 72655 000000 NOP

```

0489	72656	TBDBC EQU *	
0490	72656 037562	ISZ TBDT1	CHECK COUNTER
0491	72657 026665	JMP TBDBE	MORE ENTRIES
0492	72660 163564	LDA TBDT3,I	GET THE DRUM ADDRESS
0493	72661 064562	LDB LIBD	
0494	72662 117534	JSB DRUMP,I	WRITE THE DISK ADT BACK
0495	72663 026716	JMP TBDBY	
0496	72664 026613	JMP TBDBB	SCAN TABLE UNTIL EMPTY
0497	72665	TBDBE EQU *	
0498	72665 067563	LDB TBDT2	
0499	72666 044355	ADB ,+3	=> NEXT DISK LENGTH
0500	72667 160001	LDA B,I	GET LENGTH
0501	72670 070043	STA KILN	AND SAVE FOR RADT
0502	72671 006004	INB	=> DISK ADDRESS
0503	72672 077563	STB TBDT2	SAVE UPDATED POINTER
0504	72673 104200	DLB TBDT2,I	GET THE DISK ADDRESS
	72674 173563		
0505	72675 002003	SZA,RSS	CHECK IT FOR ZERO
0506	72676 006002	SZB	
0507	72677 002001	RSS	REAL ADDRESS, RETURN SPACE
0508	72700 026656	JMP TBDBC	GO TRY NEXT ENTRY
0509	72701 104400	DST KILDI	SAVE DISK ADDRESS FOR RADT
	72702 000046		
0510	72703 016237	JSB FADT	FIND WHICH TRACK THIS SPACE BELO
0511	72704 060044	LDA KILD	GET POINTER TO DRUM ADDRESS
0512	72705 053564	CPA TBDT3	COMPARE WITH SAVED VERSION
0513	72706 002401	CLA,RSS	OKAY, SAME TRACK
0514	72707 026656	JMP TBDBC	NOT ON THIS ADT - DEFER
0515	72710 006400	CLB	
0516	72711 104400	DST TBDT2,I	PREVENT DOUBLE RETURNS
	72712 173563		
0517	72713 016403	JSB RADT	PUT THE SPACE BACK
0518	72714 000000	NOP	
0519	72715 026656	JMP TBDBC	TRY FOR ANOTHER ENTRY
0520*			
0521	72716	TBDBY EQU *	
0522	72716 002400	CLA	
0523	72717 170044	STA KILD,I	SET ADDRESS AND LENGTH
0524	72720 170045	STA KILDF,I	TO NULL
0525*			
0526	72721	TBDBU EQU *	
0527	72721 037562	ISZ TBDT1	CHECK THE COUNTER
0528	72722 002001	RSS	ENTRIES STILL EXIST
0529	72723 126612	JMP TBDAD,I	ALL ENTRIES ARE ZERO
0530	72724 067563	LDB TBDT2	GET THE TABLE POINTER
0531	72725 044355	ADB ,+3	=> NEXT DISK LENGTH
0532	72726 026621	JMP TBDBA	BACK TO TRY THIS ONE
0001*			

```

0003*   THE TBIDT ROUTINE IS USED TO UPDATE THE CORE TABLE
0004*   BUILT BY ROUTINES SUCH AS KILLID, PURGE, MLOCK, ETC.
0005*   IT UPDATES EACH IDT TRACK AND REWRITES IT TO THE DRUM,
0006*
0007*
0008 72727 000000 TBIDT NOP
0009 72730 060030 LDA LOCTC GET COUNT OF ENTRIES
0010 72731 002003 SZR,RSS SKIP IF WORK TO DO
0011 72732 126727 JMP TBIDT,I NO TABLE, EXIT
0012 72733 001020 ALS,ALS MAKE INTO NEGATIVE WORD COUNT
0013 72734 003004 CMA,INA
0014 72735 041002 ADA L8192 ADD TABLE BASE
0015 72736 040346 ADA .-4 *-> LAST ENTRY
0016 72737 073562 STA TBIDT1 SAVE POINTER
0017 72740 LOCFB EQU *
0018 72740 163562 LDA TBIDT1,I GET THE NEXT ID FROM THE TABLE
0019 72741 070052 STA ID
0020 72742 117535 JSB GTILP,I FIND WHAT TRACK IT'S ON
0021 72743 160076 LDA IDLNP,I READ IN IDT
0022 72744 070072 STA WORD
0023 72745 160075 LDA IDLCP,I
0024 72746 064566 LDB LIBVI
0025 72747 117534 JSB DRUMP,I
0026 72750 117546 JSB DEADA,I
0027 72751 164076 LDB IDLNP,I SET B TO POINT TO END OF IDT TRA
0028 72752 007004 CMB,INB
0029 72753 044562 ADB LIBD
0030 72754 LOCF1 EQU *
0031 72754 163562 LDA TBIDT1,I GET ID OF FIRST ENTRY
0032 72755 LOCFG EQU *
0033 72755 054562 Cpb LIBD
0034 72756 027006 JMP LOCFR
0035 72757 044342 ADB .-8 SEARCH FOR IT IN IDT.
0036 72760 150001 CPA 1,I
0037 72761 002001 RSS FOUND.
0038 72762 026755 JMP LOCFG
0039 72763 037562 ISZ TBIDT1 *-> LENGTH OF THIS PATCH
0040 72764 044361 ADB .+7 POINT TO SECTORS USED,
0041 72765 163562 LDA TBIDT1,I SUBTRACT
0042 72766 003004 CMA,INA THE
0043 72767 140001 ADA B,I LENGTH
0044 72770 170001 STA B,I OFF
0045 72771 006004 INB SET B TO NEXT HIGHER ENTRY
0046 72772 063562 LDA TBIDT1
0047 72773 040345 ADA .-5 *-> PREVIOUS ENTRY
0048 72774 073562 STA TBIDT1 SET POINTER TO PATCH TABLE
0049 72775 040356 ADA .+4
0050 72776 051002 CPA L8192 BACK TO BEGINNING?
0051 72777 002001 RSS
0052 73000 026754 JMP LOCF1 LOOP.
0053*
0054 73001 160075 LDA IDLCP,I
0055 73002 064562 LDB LIBD WRITE BACK IDT.
0056 73003 117534 JSB DRUMP,I
0057 73004 117546 JSB DEADA,I

```



```

0050 73005 126727      JMP T010T,I      RETURN
0059*
0060 73006           LKCFR EQU *
0061 73006 160075     LDA IDLCP,I      REWRITE THE CURRENT TRACK
0062 73007 064562     LDB LIBD
0063 73010 117534     JSB DRUMP,I
0064 73011 117546     JSB DEADA,I
0065 73012 026740     JMP LKCFB        AND READ THE NEXT
0066 73013           MLKFL EQU *
0067 73013 060403     LDA ,+25
0068 73014 067016     LDB **2
0069 73015 127555     JMP LEN2A,I
0070 73016 073017     DEF **1
0071 73017 005114     OCT 5114
0072 73020 047503     ASC 12,LOCKED BLOCKS TABLE FULL
      73021 045505
      73022 042040
      73023 041114
      73024 047503
      73025 045523
      73026 020124
      73027 040502
      73030 046105
      73031 020106
      73032 052514
      73033 046040
0073 73034 005104     ODERL OCT 5104      LF D
0074 73035 044523     ASC 14,ISC/DRUM ERROR; CAN'T DO IT
      73036 041457
      73037 042122
      73040 052515
      73041 020105
      73042 051122
      73043 047522
      73044 035440
      73045 041501
      73046 047047
      73047 052040
      73050 042117
      73051 020111
      73052 052040

```

```

0076*
0077* HDBUF SETS UP THE HEADING FOR DIRECTORY, SDIRECTORY, STATUS AND
0078* REPORT ON THE SYSTEM CONSOLE. THE HEADING CONSISTS OF THE SYSTEM
0079* ID, DATE AND TIME.
0080*
0081 73053 000000 HDBUF NOP
0082 73054 060305 LDA T35B1 INITIALIZE ITY
0083 73055 070041 STA LTEMP+9 BUFFER POINTER
0084 73056 063557 LDA LFSPA LF=SPACE
0085 73057 170041 STA LTEMP+9,I
0086 73060 063560 LDA SPSP TWO SPACES
0087 73061 034041 ISZ LTEMP+9
0088 73062 170041 STA LTEMP+9,I
0089 73063 060305 LDA T35B1 MOVE
0090 73064 040354 ADA .+2
0091 73065 070051 STA MOVED SYSTEM
0092 73066 063551 LDA DSYID
0093 73067 070050 STA MOVES ID TO
0094 73070 064345 LDB .+5
0095 73071 117537 JSB MOVFW,I BUFFER
0096 73072 063560 LDA SPSP TWO SPACES
0097 73073 064041 LDB LTEMP+9
0098 73074 044360 ADB .+6
0099 73075 170001 STA B,I
0100 73076 044354 ADB .+2
0101 73077 074041 STB LTEMP+9
0102 73100 060201 LDA DATIM GET HOUR OF YEAR
0103 73101 006400 CLB CONVERT
0104 73102 100400 DIV .+24 TO DAY
0105 73103 000402
0105 73104 074042 STB LTEMP+10 SAVE HOUR REMAINDER
0106 73105 006400 CLB GET LAST
0107 73106 100400 DIV .+10 DIGIT
0108 73107 000364
0108 73110 005727 BLF,BLF
0109 73111 047561 ADB ZERSL MERGE IN SLASH
0110 73112 174041 STB LTEMP+9,I
0111 73113 017146 JSB TDNUM FIRST TWO DIGITS OF DAY
0112 73114 007400 CCB
0113 73115 044041 ADB LTEMP+9
0114 73116 170001 STA B,I
0115 73117 044354 ADB .+2
0116 73120 074041 STB LTEMP+9
0117 73121 060200 LDA YEAR YEAR OF CENTURY
0118 73122 017146 JSB TDNUM
0119 73123 170041 STA LTEMP+9,I
0120 73124 063560 LDA SPSP TWO SPACES
0121 73125 034041 ISZ LTEMP+9
0122 73126 170041 STA LTEMP+9,I
0123 73127 060042 LDA LTEMP+10 HOUR OF DAY
0124 73130 017146 JSB TDNUM
0125 73131 034041 ISZ LTEMP+9
0126 73132 170041 STA LTEMP+9,I
0127 73133 060202 LDA DATIM+1 CONVERT
0128 73134 040704 ADA D36K 100 MS

```

0129	73135	006400	CLB	UNITS TO
0130	73136	100400	DIV D600	MINUTES
	73137	000456		
0131	73140	017146	JSB TDNUM	OF HOUR
0132	73141	034041	ISZ LTEMP+9	
0133	73142	170041	STA LTEMP+9,I	
0134	73143	060406	LDA ,+28	28 CHARS IN HEADING
0135	73144	064305	LDB T35B1	
0136	73145	127053	JMP HDBUF,I	
0137*				
0138*	CONVERT A NUMBER <100 TO ASCII			
0139*				
0140	73146	000000	TDNUM NOP	
0141	73147	006400	CLB	
0142	73150	100400	DIV ,+10	
	73151	000364		
0143	73152	001727	ALF,ALF	FIRST DIGIT
0144	73153	040001	ADA B	SECOND DIGIT
0145	73154	040574	ADA ASC00	ASCII OFFSET
0146	73155	127146	JMP TDNUM,I	
0147*				
0148*	UHDBF PRINTS THE HEADING FOR DIRECTORY, SDIRECTORY, STATUS AND			
0149*	REPORT ON THE USER TERMINAL. THE HEADING CONSISTS OF THE SYSTEM			
0150*	ID, DATE AND TIME.			
0151*				
0152	73156	000000	UHDBF NOP	
0153	73157	060364	LDA ,+12B	LF
0154	73160	117556	JSB LOUTA,I	
0155	73161	060412	LDA ,+40B	BLANK
0156	73162	117556	JSB LOUTA,I	
0157	73163	060412	LDA ,+40B	BLANK
0158	73164	117556	JSB LOUTA,I	
0159	73165	060412	LDA ,+40B	BLANK
0160	73166	117556	JSB LOUTA,I	
0161	73167	063551	LDA DSYID	
0162	73170	070040	STA LTEMP+8	=> SYSTEM ID
0163	73171	060345	LDA ,=5	
0164	73172	070041	STA LTEMP+9	5 WORDS
0165	73173		UHDB1 EQU +	
0166	73173	160040	LDA LTEMP+8,I	OUTPUT
0167	73174	001727	ALF,ALF	
0168	73175	010443	AND B377	
0169	73176	117556	JSB LOUTA,I	SYSTEM
0170	73177	160040	LDA LTEMP+8,I	
0171	73200	010443	AND B377	
0172	73201	117556	JSB LOUTA,I	ID
0173	73202	034040	ISZ LTEMP+8	
0174	73203	034041	ISZ LTEMP+9	
0175	73204	027173	JMP UHDB1	
0176	73205	060412	LDA ,+40B	BLANK
0177	73206	117556	JSB LOUTA,I	
0178	73207	060412	LDA ,+40B	BLANK
0179	73210	117556	JSB LOUTA,I	
0180	73211	060201	LDA DATIM	GET HOUR OF YEAR
0181	73212	006400	CLB	

0182	73213	100400	DIV	+.24	CONVERT TO DAY
	73214	000402			
0183	73215	074041	STB	LTEMP+9	SAVE HOUR REMAINDER
0184	73216	006400	CLB		
0185	73217	100400	DIV	+.10	1ST 2 DIGITS IN A, LAST IN B
	73220	000364			
0186	73221	074040	STB	LTEMP+8	
0187	73222	017255	JSB	UTDNM	OUTPUT 1ST 2
0188	73223	060040	LDA	LTEMP+8	
0189	73224	040432	ADA	+.60B	
0190	73225	117556	JSB	LOUTA,I	OUTPUT LAST ONE
0191	73226	060431	LDA	+.57B	'/'
0192	73227	117556	JSB	LOUTA,I	
0193	73230	060200	LDA	YEAR	GET YEAR
0194	73231	017255	JSB	UTDNM	AND OUTPUT
0195	73232	060412	LDA	+.40B	BLANK
0196	73233	117556	JSB	LOUTA,I	
0197	73234	060412	LDA	+.40B	BLANK
0198	73235	117556	JSB	LOUTA,I	
0199	73236	060041	LDA	LTEMP+9	HOUR OF DAY
0200	73237	017255	JSB	UTDNM	
0201	73240	060202	LDA	DATIM+1	CONVERT
0202	73241	040704	ADA	D36K	100MS
0203	73242	006400	CLB		UNITS TO
0204	73243	100400	DIV	D600	MINUTES
	73244	000456			
0205	73245	017255	JSB	UTDNM	OF HOUR
0206	73246	060375	LDA	+.23B	X-OFF
0207	73247	117556	JSB	LOUTA,I	
0208	73250	060367	LDA	+.15B	CR
0209	73251	117556	JSB	LOUTA,I	
0210	73252	060364	LDA	+.12B	LF
0211	73253	117556	JSB	LOUTA,I	
0212	73254	127156	JMP	UHDBF,I	
0213*					
0214*	CONVERT A #<100 TO ASCII AND OUTPUT IT				
0215*					
0216	73255	000000	UTDNM	NOP	
0217	73256	006400	CLB		
0218	73257	100400	DIV	+.10	
	73260	000364			
0219	73261	074043	STB	LTEMP+11	
0220	73262	040432	ADA	+.60B	
0221	73263	117556	JSB	LOUTA,I	
0222	73264	060043	LDA	LTEMP+11	
0223	73265	040432	ADA	+.60B	
0224	73266	117556	JSB	LOUTA,I	
0225	73267	127255	JMP	UTDNM,I	

0227*

0228*

UPDATE LAST CHANGED DATES IF NECESSARY

0229*

```

0230 73270      #LCDL EQU *
0231 73270 064273 LDB MLINK+1    IS THERE
0232 73271 044335 ADB ,=?LINK   A NEED TO
0233 73272 160001 LDA B,I        CHECK FILES
0234 73273 010444 AND DFCHK      FOR POSSIBLE
0235 73274 002003 SZL,RSS        LCD UPDATE
0236 73275 027345 JMP EXIT7
0237 73276 044370 ADB ,=?PLEV
0238 73277 002400 CLA
0239 73300 103100 CLF 0
0240 73301 170001 STA B,I        SET PRIORITY TO 0
0241 73302 070264 STA TIMEF      NO TIMING
0242 73303 044350 ADB ,=?STAT=?PLEV
0243 73304 060356 LDA %SYNT      SET STATUS TO SYNTAX SO
0244 73305 170001 STA B,I        WE WON'T GET SWAPPED
0245 73306 044341 ADB ,=?PROG=?STAT
0246 73307 060056 LDA PBPTR      BOUND INTO
0247 73310 170001 STA B,I        ITTY TABLE
0248 73311 003000 CMA            CALCULATE LENGTH
0249 73312 041221 ADA USE        FOR WRITE
0250 73313 070072 STA WORD       TO DRUM+M
0251 73314 044351 ADB ,=?DISC=?PROG FORCE BACK
0252 73315 160001 LDA B,I        TO SWAP
0253 73316 010317 AND M32        AREA
0254 73317 170001 STA B,I        ORIGIN
0255 73320 065221 LDB USE        OUTPUT USER
0256 73321 117534 JSB DRUMP,I    TO DRUM
0257 73322 127540 JMP RDPJP,I    BLEW IT, GO ZAP USER
0258 73323 061552 LDA FRMAT      GET FILE COUNT (-)
0259 73324 064273 LDB MLINK+1    GET POINTER
0260 73325 044341 ADB ,=?ID=?LINK TO ID WORD
0261 73326 017353 JSB LCD        GO UPDATE LAST CHANGED DATES
0262 73327 027345 JMP EXIT7      CORE INTACT, EXIT
0263 73330 002400 CLA            BLOCK
0264 73331 170634 STA DCLC1,I    CLOCK
0265 73332 064273 LDB MLINK+1    RESTORE
0266 73333 044340 ADB ,=?PROG=?LINK
0267 73334 160001 LDA B,I
0268 73335 003000 CMA
0269 73336 041221 ADA USE
0270 73337 070072 STA WORD       USER
0271 73340 044351 ADB ,=?DISC=?PROG
0272 73341 160001 LDA B,I
0273 73342 065222 LDB USEI
0274 73343 117534 JSB DRUMP,I    AREA
0275 73344 127540 JMP RDPJP,I    BLEW IT, GO ZAP USER
0276 73345      EXIT7 EQU *
0277 73345 002400 CLA            BLOCK
0278 73346 170634 STA DCLC1,I    CLOCK
0279 73347 114534 JSB ABCK,I     CHECK FOR ABORTS
0280 73350 160640 LDA DCLC2,I    UNBLOCK
0281 73351 170634 STA DCLC1,I    CLUCK

```

```

0282 73352 125560          JMP LCDLP,I
0283+
0284+      THIS ROUTINE ASSUMES THAT THE USER'S SNAP AREA IS IN CORE,
0285+      THAT THE B REGISTER POINTS TO HIS ID WORD IN THE TELETYPE
0286+      TABLE, AND THAT A CONTAINS THE NEGATIVE OF THE NUMBER OF FILES
0287+
0288+
0289 73353 000000      LCD   NOP          ENTRY POINT
0290 73354 073565      STA LCDFC      SAVE FILE COUNT
0291 73355 077566      STB LCDID      AND ID POINTER
0292 73356 002021      SSA,RSS       MAKE SURE THERE REALLY ARE
0293 73357 027436      JMP LCD9       SOME FILES
0294 73360 002400      CLA          INITIALIZE DIRTY
0295 73361 073567      STA DFCNT     FILE COUNT TO ZERO
0296 73362 063542      LDA DFNAM     GET ADDRESS FOR FIRST
0297 73363 070051      STA MOVED     DIRTY FILE'S NAME
0298 73364 065504      LDB FILTB     GET START OF FILE TABLE
0299 73365 006004      INB          BUMP POINTER TO WORD 1
0300 73366 077870      STB LCD8B     OF ENTRY AND SAVE
0301+
0302 73367 160001      LCD1  LDA B,I      GET DIRTY FILE BIT
0303 73370 010222      AND BIT14     HAS THIS FILE
0304 73371 002002      SZA          BEEN CHANGED?
0305 73372 027446      JMP LCD2      YES
0306 73373 044371      LCD3  ADB .+FTEL NO, POINT TO NEXT ENTRY
0307 73374 037565      ISZ LCDFC     ARE THERE MORE FILES?
0308 73375 027367      JMP LCD1      YES, CHECK NEXT ONE
0309 73376 063567      LDA DFCNT     NO, WERE
0310 73377 002003      SZA,RSS      ANY DIRTY?
0311 73400 027436      JMP LCD9      NO, RETURN
0312+
0313 73401 037353      ISZ LCD       YES, BUMP RETURN (CORE IS DIFF)
0314 73402 003004      CMA,INA      SAVE NEGATIVE OF
0315 73403 073567      STA DFCNT     DIRTY FILE COUNT
0316 73404 067542      LDB DFNAM     GET ADDRESS OF FIRST
0317 73405 077570      STB LCD8B     DIRTY FILE'S NAME
0318 73406 163566      LDA LCDID,I   STICK ID IN LTEMP
0319 73407 070030      STA LTEMP     FOR DLOOK
0320 73410 160001      LCD6  LDA B,I      MOVE DIRTY
0321 73411 070031      STA LTEMP+1   FILE'S
0322 73412 006004      INB          NAME
0323 73413 104200      DLD B,I      INTO
0324 73415 104400      DST LTEMP+2   LTEMPS
0325 73416 000032
0325 73417 117543      JSB DLOKA,I   GO HUNT FOR DIRECTORY ENTRY
0326 73420 027456      JMP LCD5      FOUND IT
0327 73421 067570      LCD7  LDB LCD8B     BUMP
0328 73422 044355      ADB .+3      POINTER TO
0329 73423 077570      STB LCD8B     NEXT NAME
0330 73424 037567      ISZ DFCNT     MORE DIRTY FILES?
0331 73425 027410      JMP LCD6      YES, PROCESS NEXT ONE
0332+
0333 73426 163545      LDA DIRWA,I   NO, WRITE DIRECTORY TO DRUM
0334 73427 002003      SZA,RSS      IF ANY IS IN CORE

```

```

0335 73430 027436      JMP LCD9      ELSE, RETURN
0336 73431 006400      CLB          TELL DLOOK
0337 73432 177545      STB DIRWA,I  THERE ISNIT
0338 73433 064562      LDB LIBD
0339 73434 117534      JSB DRUMP,I
0340 73435 127544      JMP DLK9A,I  GOOF, ATTEMPT SALVAGE
0341 73436 067566      LCD9 LDB LCDID  CLEAR
0342 73437 044346      ADB .-7ID   CHECK
0343 73440 060444      LDA DFCHK   FOR
0344 73441 103100      CLF 0      DIRTY
0345 73442 120001      XOR B,I    FILES
0346 73443 170001      STA B,I    BIT
0347 73444 102100      STF 0
0348 73445 127353      JMP LCD,I   RETURN
0349*
0350*      MOVE NAME OF DIRTY FILE TO SAFE PLACE
0351*
0352 73446 037567      LCD2 ISZ DFCNT  BUMP DIRTY FILE COUNT
0353 73447 077570      STB LCDBS   SAVE POINTER TO FILE TABLE ENTRY
0354 73450 044364      ADB .+10    GET POINTER TO FILE NAME
0355 73451 074050      STB MOVE8   AND SET IN MOVEW'S SOURCE ADR
0356 73452 064347      LDB .-3     MOVE THE 3
0357 73453 117537      JSB MOVFW,I NAME WORDS
0358 73454 067570      LDB LCDBS   GET ENTRY POINTER BACK
0359 73455 027373      JMP LCD3    RETURN TO SCAN OF FILE TABLE
0360*
0361*      PROCESS A FOUND DIRECTORY ENTRY
0362*
0363 73456 060034      LCD5 LDA LTEMP+4  TELL DLOOK
0364 73457 040360      ADA .+6     WHICH DIRECTORY
0365 73460 160000      LDA A,I    TRACK IS
0366 73461 173545      STA DIRWA,I IN CORE
0367 73462 064055      LDB LTEMP+5 GET
0368 73463 044354      ADB .+2     WORD
0369 73464 160001      LDA B,I    2
0370 73465 002021      SSA,RSS   IS THE ENTRY A FILE?
0371 73466 027421      JMP LCD7   NO, GO PROCESS NEXT NAME
0372 73467 044356      ADB .+4     YES, UPDATE LAST
0373 73470 060201      LDA DATIM  CHANGED DATE IN
0374 73471 170001      STA B,I    DIRECTORY ENTRY
0375 73472 027421      JMP LCD7   GO PROCESS NEXT NAME
0376*
0377*      THIS ROUTINE SETS UP THINGS TO UPDATE THE LAST CHANGE DATE
0378*      WHEN A USER HAS ABORTED
0379*
0380 73473      ABUCD EQU *
0381 73473 064257      LDB MAIN
0382 73474 044355      ADB .+7PROG
0383 73475 060056      LDA PBPTR  SET BOUND
0384 73476 170001      STA B,I    IN TTY TABLE
0385 73477 003000      CMA
0386 73500 041221      ADA USE
0387 73501 070072      STA WORD   NUMBER OF WORDS TO TRANSFER
0388 73502 044351      ADB .+7DISC-7PROG
0389 73503 160001      LDA B,I    GET SNAP TRACK ADDRESS

```

0390	73504	010317	AND	M32	
0391	73505	170001	STA	B,I	
0392	73506	065221	LDB	USE	
0393	73507	117534	JSB	DRUMP,I	WRITE USER TO SWAP TRACK
0394	73510	127540	JMP	RDpJp,I	
0395	73511	061502	LDA	FCNTR	
0396	73512	003004	CMA,	INA	*# OF FILES
0397	73513	064257	LDB	MAIN	
0398	73514	044356	ADB	,+?ID	*-> ID WORD IN TTY TABLE
0399	73515	017353	JSB	LCD	UPDATE LAST CHANGE DATE
0400	73516	000000	NOP		
0401	73517	103100	CLF	0	
0402	73520	064257	LDB	MAIN	
0403	73521	074062	STB	TTQ	FOR SCHEDULER
0404	73522	060372	LDA	UNABT	
0405	73523	030442	IOR	ABTRY	
0406	73524	003000	CMA		
0407	73525	110001	AND	B,I	
0408	73526	170001	STA	B,I	CLEAR ABORT FLAGS
0409	73527	002400	CLA		
0410	73530	070257	STA	MAIN	USER NO LONGER IN CPRE
0411	73531	170634	STA	DCLC1,I	BLOCK CLOCK
0412	73532	044366	ADB	,+?STAT	*-> STATUS WORD
0413	73533	127541	JMP	DSCH7,I	ENTER ABORT CODE IN SCHEDULER
0414*					
0415*					
0416	73534	074231	DRUMP	DEF DRUML	
0417	73535	074370	GTILP	DEF GTIL	
0418	73536	074243	MOVFB	DEF MOVEB	
0419	73537	074257	MOVFW	DEF MOVEW	
0420	73540	074071	RDpJp	DEF RDPRJ	
0421	73541	070433	DSCH7	DEF SCH7	
0422	73542	025130	DFNAM	DEF LIBUS+10176	DIRTY FILE NAMES BUFFER
0423	73543	031060	DLOKA	DEF DLOOK	
0424	73544	031173	DLK9A	DEF DLOK9	
0425	73545	031223	DIRWA	DEF DIRWD	
0426	73546	062662	DEADA	DEF DEAD	
0427	73547	062613	SICKA	DEF SICK	
0428	73550	062411	SALVA	DEF SALVG	
0429	73551	000171	DSYID	DEF SYSID	
0430	73552	160002	M8190	DEC -8190	
0431	73553	177744	HM20	DEC -28	
0432	73554	160000	M8192	DEC -8192	
0433*					
0434	73555	074271	LEN2A	DEF LEND+2	
0435	73556	074132	LOUTA	DEF LOUT	
0436	73557	005040	LFSPA	OCT 5040	
0437	73560	020040	SPSP	ASC 1,	
0438	73561	030057	ZERSL	ASC 1,0/	
0439*					
0440	73562	000000	TBDT1	BSS 1	
0441	73563	000000	TBDT2	BSS 1	
0442	73564	000000	TBDT3	BSS 1	
0443	73565	000000	LCDFC	BSS 1	COUNT OF FILES TO BE CHECKED
0444	73566	000000	LCDID	BSS 1	POINTER TO USER ID

0445	73567	000000	DFCNT	BSS	1
0446	73570	000000	LCDBS	BSS	1
0447	73571	000000	FLBF	BSS	131
0448	73774			BSS	0

COUNT OF CHANGED (DIRTY) FILES
POINTER FOR LCD'S SEARCHES

0450*
 0451*
 0452*
 0453*
 0454*
 0455*

THE FOLLOWING ROUTINE WILL PROVIDE A CORE
 DUMP ON THE CONSOLE TELETYPE.

ENTER HERE FOR A TSB DUMP

0456	77000		ORG 77000B	
0457	77000	103100	CLF 0	
0458	77001	103110	CLF CH1	CLEAR RETURN CHAN. FROM OTHER MA
0459	77002	063231	LDA LPSTK	GET LP STATUS COMMAND
0460	77003	102611	OTA CH2	OUTPUT IT TO OTHER MACHINE.
0461	77004	103711	STC CH2,C	INTERRUPT OTHER MACHINE
0462	77005	102311	SFS CH2	WAIT FOR ACCEPT AND RETURN
0463	77006	027005	JMP *-1	OF STATUS FROM OTHER MACHINE
0464	77007	102511	LIA CH2	GET STATUS WORD
0465	77010	013233	AND B37TK	MASK SELECT CODE OF LP
0466	77011	073234	STA TKLP	SAVE SEL. CODE (OR 0)
0467	77012	002002	SZA	LP UP & READY?
0468	77013	027016	JMP **3	YES.
0469	77014	063227	LDA TB130	PRINT AND PUNCH
0470	77015	102612	OTA 79C	OUTPUT TO TELEPRINTER KLUDGE BOA
0471	77016	017116	JSB TKCRL	PUT OUT LEADING CR LF
0472	77017	002400	CLA	
0473	77020	067224	LDB TP21H	END BLOCK
0474	77021	000000	NOP	
0475	77022	017067	JSB TK	

0476*
 0477*
 0478*

THIS CODE DUMPS IMPORTANT SYSTEM LOCATIONS

0479	77023	063236	LDA TKTBL	INITIALIZE
0480	77024	073235	STA TKTBP	PNTR.
0481	77025	163235	TKDLP LDA TKTBP,I	GET TBL ENTRY
0482	77026	002021	SSA,RSS	SINGLE WORD?
0483	77027	027035	JMP TK1WD	YES.
0484	77030	037235	ISZ TKTBP	BUMP PNTR.
0485	77031	167235	LDB TKTBP,I	GET ENDING PNTR.
0486	77032	003004	CMA,INA	MAKE STARTING ADDRESS POSITIVE
0487	77033	017067	JSB TK	OUTPUT STRING
0488	77034	027047	JMP TKDLN	
0489	77035	002003	TK1WD SZA,RSS	END OF TABLE?
0490	77036	027051	JMP TKDON	YES.
0491	77037	064000	LDB A	COPY TO B
0492	77040	017155	JSB TKWO	PRINT ADDRESS
0493	77041	063221	LDA TP40	A ← BLANK
0494	77042	017124	JSB TKCO	AND PRINT IT
0495	77043	167235	LDB TKTBP,I	GET ADDR. AGAIN
0496	77044	164001	LDB B,I	B = MEM CONTENT
0497	77045	017155	JSB TKWO	PRINT CONTENT
0498	77046	017116	JSB TKCRL	AGAIN FEED CARRIAGE
0499	77047	037235	TKDLN ISZ TKTBP	
0500	77050	027025	JMP TKDLP	
0501	77051	102000	TKDON HLT	
0502	77052	027051	JMP *-1	

0503*
 0504*

STARTING POINT FOR DUMPING OF

```

0505*  SELECTED LOCATIONS.
0506*  ENTER WITH A= STARTING ADDRESS AND
0507*  B= ENDING ADDRESS.
0508*
0509  77053 073206      STA TK1      SAVE STARTING ADDRESS.
0510  77054 077207      STB TK2      SAVE ENDING ADDRESS.
0511  77055 063234      LDA TKLP     CHECK FOR LP SEL, CODE
0512  77056 002002      SZA          READY?
0513  77057 027062      JMP ++3     YES.
0514  77060 063227      LDA TB130   PRINT AND PUNCH
0515  77061 102612      OTA ?SC    OUTPUT TO TTY KLUDGE BOARD.
0516  77062 017116      JSB TKCRL   PUT OUT LEADING CR LF
0517  77063 063206      LDA TK1     GET STARTING AND
0518  77064 067207      LDB TK2     ENDING ADDRESS.
0519  77065 017067      JSB TK      DUMP.
0520  77066 027051      JMP TKDON   STOP.
0521*
0522*
0523  77067 000000      TK  NOP
0524  77070 013214      AND TMB
0525  77071 073206      STA TK1
0526  77072 007000      CMB
0527  77073 077207      STB TK2
0528  77074              TKA EQU *
0529  77074 063214      LDA TMB
0530  77075 073210      STA TK3
0531  77076 067206      LDB TK1
0532  77077 017155      JSB TKWO
0533  77100              TKB EQU *
0534  77100 063221      LDA TP40   A ← BLANK
0535  77101 017124      JSB TKCO   PUT IT OUT.
0536  77102 167206      LDB TK1,I  LOAD DATA WORD
0537  77103 017155      JSB TKWO   OUT IT GOES.
0538  77104 037206      ISZ TK1    COUNT UP ADDRESS.
0539  77105 037210      ISZ TK3    COUNT DOWN COUNT WITHIN LINE
0540  77106 027100      JMP TKB
0541  77107 017116      JSB TKCRL  CONTINUE WITH THIS LINE
0542  77110 063206      LDA TK1    OUTPUT CR AND LF
0543  77111 043207      ADA TK2    LOAD CURRENT ADDRESS
0544  77112 002020      SSA        CHECK FOR DONE
0545  77113 027074      JMP TKA    SKIP IF DONE WITH DUMP
0546  77114 017116      JSB TKCRL  OTHERWISE, START LINE
0547  77115 127067      JMP TK,I
0548*
0549  77116 000000      TKCRL NOP
0550  77117 063220      LDA TP15   CR
0551  77120 017124      JSB TKCO
0552  77121 063217      LDA TP12   LF
0553  77122 017124      JSB TKCO
0554  77123 127116      JMP TKCRL,I RETURN
0555*
0556  77124 000000      TKCO NOP
0557  77125 073213      STA TK6
0558  77126 077212      STB TK5
0559  77127 106501      LIB 01
ROUTINE TO PUT OUT CHARACTERS
SAVE OUTPUT CHR.
SAVE THE B REGISTER

```

0560	77130	005665	ELB,CLE,ERB	
0561	77131	164001	LDB 1,I	DISPLAY MEMORY LOCATION
0562	77132	013223	AND TP377	MASK DOWN TO SIZE
0563	77133	063234	LDA TKLP	CHECK FOR LP SEL. CODE
0564	77134	002002	SZA	READY?
0565	77135	027144	JMP TKCOL	YES,
0566	77136	063213	LDA TK6	NO, GET CHR.
0567	77137	102312	SFS ?SC	WAIT FOR TELEKLUDGE.
0568	77140	027137	JMP *-1	AND WAIT SOME MORE.
0569	77141	102612	OTA ?SC	OUTPUT THE CHARACTER.
0570	77142	103712	STC ?SC,C	START THE MONSTER.
0571	77143	027153	JMP TKCRN	
0572	77144		TKCOL EQU *	
0573	77144	063213	LDA TK6	GET OUTPUT CHR.
0574	77145	001722	ALF,RAL	POSITION CHARACTER
0575	77146	033232	IOR TKOTK	COMPOSE TKC COMMAND
0576	77147	102311	SFS CH2	LAST COMM. ACCEPTED?
0577	77150	027147	JMP *-1	NOT YET, WAIT.
0578	77151	102611	OTA CH2	GIVE TKO TO OTHER MACHINE.
0579	77152	103711	STC CH2,C	INTERRUPT OTHER MACHINE.
0580	77153		TKCRN EQU *	
0581	77153	067212	LDB TK5	
0582	77154	127124	JMP TKCO,I	
0583*				
0584	77155	000000	TKWO NOP	ROUTINE TO OUTPUT AN ENTIRE WORD
0585	77156	063222	LDA TP60	LOAD CODE FOR ZERO
0586	77157	005210	RBL,SLB	TEST SIGN BIT
0587	77160	002004	INA	ONE IF SET.
0588	77161	017124	JSB TKCO	
0589	77162	063215	LDA TM5	FIVE MORE DIGITS.
0590	77163	073211	STA TK4	
0591	77164		TKWB EQU *	
0592	77164	063216	LDA TP6	BITS FOR ASCII
0593	77165	100103	RRL 3	NEXT OCTAL DIGIT TO A
0594	77166	017124	JSB TKCO	OUT GOES THE MEAN OL' CHARACTER
0595	77167	037211	ISZ TK4	CHECK FOR COMPLETION OF WORD.
0596	77170	027164	JMP TKWB	ANOTHER 100,000,000 NS SHOT
0597	77171	127155	JMP TKWO,I	RETURN
0598*				
0599*				
0600*				TO SET UP DMA FOR TRANSFER UP OF 2114 PROGRAM
0601*				THE 2116 PROGRAM MUST BE RUN FIRST
0602*				
0603	77172	106703	CLC DMA=4	SET UP FOR ADDRESS
0604	77173	063225	LDA TBT15	INPUT STARTING AT ZERO
0605	77174	102603	OTA DMA=4	ADDRESS OUT
0606	77175	063230	LDA TB160	LOAD WORD COUNT ALLOWED
0607	77176	102703	STC DMA=4	SET UP TO LOAD WORD COUNT
0608	77177	102603	OTA DMA=4	OUTPUT WORD COUNT
0609	77200	063226	LDA TB12C	LOAD DMA CONTROL WORD
0610	77201	102607	OTA DMA	OUT TO DMA
0611	77202	103711	STC CH2,C	START CHANNEL
0612	77203	103707	STC DMA,C	START DMA
0613	77204	102000	HLT	
0614	77205	027204	JMP *-1	

0615*

0616*

0617	77206	000000	TK1	BSS	1
0618	77207	000000	TK2	BSS	1
0619	77210	000000	TK3	BSS	1
0620	77211	000000	TK4	BSS	1
0621	77212	000000	TK5	BSS	1
0622	77213	000000	TK6	BSS	1
0623	77214	177770	TM8	DEC	-8
0624	77215	177773	TM5	DEC	-5
0625	77216	000006	TP6	DEC	6
0626	77217	000012	TP12	OCT	12
0627	77220	000015	TP15	OCT	15
0628	77221	000040	TP40	OCT	40
0629	77222	000060	TP60	OCT	60
0630	77223	000377	TP377	OCT	377
0631	77224	002100	TP21H	OCT	2100
0632	77225	100000	TBT15	OCT	100000
0633	77226	120011	TB12C	ABS	120000B+CH2
0634	77227	130000	TB130	OCT	130000
0635	77230	160000	TB160	OCT	160000
0636	77231	160022	LPSTK	OCT	160022
0637	77232	160031	TK0TK	OCT	160031
0638	77233	000037	B37TK	OCT	37

0639*

0640	77234	000000	TKLP	OCT	0
0641	77235	000000	TKTBP	BSS	1
0642	77236	077237	TKTBL	DEF	++1
0644	77237	152650	ABS	-LIBUS-10176	
0645	77240	025274	DEF	LIBUS+10276	

0646*

0647* LOADER ENTRY POINTS

0648*

0649	77241	026000	OCT	26000	MDISC
0650	77242	026156	OCT	26156	TBSCH
0651	77243	026175	OCT	26175	
0652	77244	026217	OCT	26217	MDINT
0653	77245	026236	OCT	26236	
0654	77246	026260	OCT	26260	RECON
0655	77247	026321	OCT	26321	
0656	77250	026512	OCT	26512	SEEK
0657	77251	026557	OCT	26557	
0658	77252	026526	OCT	26526	DCOUT
0659	77253	026572	OCT	26572	
0660	77254	026532	OCT	26532	CCOUT
0661	77255	026576	OCT	26576	
0662	77256	026540	OCT	26540	WAITD
0663	77257	026604	OCT	26604	
0664	77260	026551	OCT	26551	MSTAT
0665	77261	026615	OCT	26615	
0666	77262	026561	OCT	26561	DMAGO
0667	77263	026625	OCT	26625	
0668	77264	151143	OCT	151143	-ABSSEC (26635)
0669	77265	026662	OCT	26662	TATUS

0670	77266	151076	OCT	151076	
0671	77267	026731	OCT	26731	
0672	77270	027250	OCT	27250	DREDY
0673	77271	027317	OCT	27317	
0674	77272	150416	OCT	150416	-DREA (27362)
0675	77273	027374	OCT	27374	DREBS
0676	77274	150347	OCT	150347	
0677	77275	027443	OCT	27443	
0678*					
0679	77276	150000	ABS	=DIREC	
0680	77277	031060	DEF	DLOOK	
0681*					
0682	77300	031251	DEF	ZDISC	
0683	77301	060012	DEF	LDRUM	
0684	77302	060052	DEF	DINT	
0685*					
0686	77303	117640	ABS	=DADDR	
0687	77304	060150	DEF	DRAIL	
0688*					
0689	77305	060417	DEF	POW	
0690*					
0691	77306	117130	ABS	=POWFF	
0692	77307	060661	DEF	POWSW	
0693*					
0694	77310	060715	DEF	?TT35	
0695	77311	060735	DEF	?TT2	
0696*					
0697	77312	116652	ABS	=TTY00	
0698	77313	062266	DEF	TTY32	
0699*					
0700	77314	062266	DEF	JETPT	
0701	77315	062411	DEF	SALVG	
0702*					
0703	77316	115263	ABS	=SALCP	
0704	77317	062522	DEF	SALEC	
0705*					
0706	77320	062613	DEF	SICK	
0707	77321	062662	DEF	DEAD	
0708	77322	062725	DEF	MDEAD	
0709	77323	063307	DEF	S14SH	
0710	77324	063334	DEF	R14CM	
0711	77325	070014	DEF	OUTM1	
0712	77326	070016	DEF	CTEMP	
0713	77327	070017	DEF	SMAIN	
0714	77330	070020	DEF	FMAIN	
0715	77331	070026	DEF	CLKIN	
0716	77332	070043	DEF	CLC1	
0717	77333	071075	DEF	TYPE	
0718	77334	071113	DEF	SCOM	
0719	77335	071202	DEF	SWAPR	
0720	77336	071527	DEF	SCHAR	
0721	77337	071577	DEF	DEQUE	
0722	77340	071612	DEF	#OUTC	
0723	77341	071656	DEF	SCHOQ	
0724	77342	071700	DEF	HTEST	

0725*			
0726	77343	105744	ABS -COM6
0727	77344	072237	DEF FADT
0728*			
0729	77345	072274	DEF RSFS
0730	77346	072403	DEF RADT
0731	77347	072612	DEF TBDAD
0732	77350	072727	DEF TBIUT
0733	77351	073053	DEF HDBUF
0734	77352	073353	DEF LCD
0735*			
0736	77353	104216	ABS -TBDT1
0737	77354	073775	DEF FILBF+132
0738*			
0739	77355	074001	DEF STAV1
0740	77356	074002	DEF STAV2
0741	77357	074003	DEF STAV3
0742	77360	074025	DEF T35CQ
0743	77361	074047	DEF RDPRG
0744	77362	074107	DEF RDIDT
0745	77363	074132	DEF LOUT
0746	77364	074137	DEF LTYPR
0747	77365	074156	DEF LTYPE
0748	77366	074164	DEF LCHAR
0749	77367	074231	DEF DRUML
0750	77370	074243	DEF MOVEB
0751	77371	074257	DEF MOVEW
0752	77372	074315	DEF GETID
0753	77373	074370	DEF GTIL
0754	77374	074435	DEF SCHLQ
0755	77375	074563	DEF INSEQ
0756*			
0757	77376	103167	ABS -T35BF
0758	77377	074655	DEF CRLF
0759*			
0760	77400	074656	DEF ABCHK
0761	77401	074710	DEF SEMIC
0762*			
0763	77402	103000	ABS -LIBRA
0764	77403	076000	DEF LIBRA+10000
0765*			
0766	77404	000000	OCT 0
0767*			
0768*			
0769*			

0002	74000		ORG 74000B	
0003	74000	177645	M133, OCT	=133
0004	74001	000000	STAV1 BSS	1
0005	74002	000000	STAV2 BSS	1
0006	74003	000000	STAV3 BSS	1
0007	74004	074655	?ABP2 DEF	CRLF
0008	74005	031060	DLOKP DEF	DLOOK
0009	74006	031223	DIRWP DEF	DIRWD
0010	74007	072237	FADTP DEF	FADT
0011	74010	000115	RKCYP DEF	DADLC
0012*				
0013	74011	072403	RADTP DEF	RADT
0014	74012	072274	RSFSP DEF	RSFS
0015	74013	072612	TBDAP DEF	TBDAD
0016	74014	062266	JETPP DEF	JETPT
0017	74015	062613	SICKP DEF	SICK
0018	74016	062411	SALVP DEF	SALVG
0019	74017	062662	DEADP DEF	DEAD
0020	74020	062725	MDEDP DEF	MDEAD
0021	74021	073053	HDBFA DEF	HDBUF
0022	74022	073156	UHDBA DEF	UHDBF
0023	74023	071656	SCHOU DEF	SCHOU
0024	74024	073013	MLFLA DEF	MLKFL
0025*				
0026*	T35CQ IS USED BY LIBRARY PROGRAMS TO SCAN THE TTY35 INPUT BUFFER,			
0027*	EACH TIME IT IS CALLED, IT FETCHES THE NEXT CHARACTER, BUT SKIPS			
0028*	BLANKS, THE CHARACTER IS LEFT IN T35LC, AND IN A, WHEN A RETURN IS			
0029*	ENCOUNTERED, T35CQ RETURNS TO P+1; OTHERWISE TO P+2. IT IS INITI-			
0030*	ALIZED BY THE MONITOR BEFORE THE LIBRARY ROUTINE IS CALLED.			
0031*				
0032	74025	000000	T35CQ NOP	ENTRY POINT.
0033	74026	060055	LDA T35LC	GET LAST CHARACTER.
0034	74027	050367	CPA .+15B	IF CR,
0035	74030	126025	JMP T35CQ, I	RETURN IMMEDIATELY.
0036	74031		T35C0 EQU *	
0037	74031	064054	LDB T35CP	GET CHARACTER POINTER IN B+
0038	74032	004065	CLE, ERB	ADJUST.
0039	74033	160001	LDA 1, I	FETCH
0040	74034	002041	SEZ, RSS	CHAR.
0041	74035	001727	ALF, ALF	
0042	74036	010441	AND B177	
0043	74037	070055	STA T35LC	SAVE IT.
0044	74040	034054	ISZ T35CP	BUMP POINTER.
0045	74041	050367	CPA .+15B	IF CR.
0046	74042	126025	JMP T35CQ, I	RETURN IMMEDIATELY.
0047	74043	050412	CPA .+40B	IF BLANK,
0048	74044		T35C1 EQU *	
0049	74044	026031	JMP T35C0	
0050	74045	036025	ISZ T35CQ	OTHERWISE
0051	74046	126025	JMP T35CQ, I	RETURN NORMAL.
0052*				
0053*	RDPRG READS THE CURRENT USER INTO CORE.			
0054*				
0055	74047	000000	RDPRG NOP	
0056	74050	064273	LDB MLINK+1	GET PROGRAM BOUND POINTER.


```

0057 74051 044340      ADB .+?PROG=?LINK
0058 74052 160001      LDA 1,I              GET PROGRAM BOUND
0059 74053 070056      STA PBPTH
0060 74054 003000      CMA                  COMPUTE LENGTH.
0061 74055 041221      ADA USE
0062 74056 070072      STA WORD
0063 74057 044351      ADB .+?DISC=?PROG
0064 74060 160001      LDA B,I              GET DRUM ADDRESS
0065 74061 006400      CLB                  BLOCK
0066 74062 174634      STB DCLC1,I         SCHEDULER.
0067 74063 065222      LDB USE1             PERFORM
0068 74064 016231      JSB DRUML           TRANSFER
0069 74065 026071      JMP RDPRJ
0070 74066 160640      LDA DCLC2,I         UNBLOCK SCHEDULER.
0071 74067 170634      STA DCLC1,I
0072 74070 126047      JMP RDPRG,I         RETURN

```

```

0073*
0074 74071              RDPRJ EQU *
0075 74071 064273      LDB MLINK+1
0076 74072 044335      ADB .=?LINK
0077 74073 116014      JSB JETPP,I         GO JETTISON PORT
0078 74074 126075      JMP ++1,I
0079 74075 070362      DEF SCH1

```

0080*
0081* DATE COMPUTES A WORD CONTAINING THE YEAR IN ITS 7 HIGH ORDER BITS
0082* AND THE DAY IN ITS 9 LOW ORDER BITS,
0083*

```

0084 74076 000000      DATE NOP
0085 74077 060201      LDA DATIM           GET HOUR OF YEAR.
0086 74100 006400      CLB                  DIVIDE BY 24 TO
0087 74101 100400      DIV .+24            GET THE DAY.
0088 74103 100047      LSL 7                POSITION ON LEFT.
0089 74104 064200      LDB YEAR             POSITION THE YEAR
0090 74105 101047      LSR 7
0091 74106 126076      JMP DATE,I

```

0092*
0093* RDIDT READS A BLOCK OF THE IDT INTO CORE.
0094* IT THEN SEARCHES THE IDT FOR THE ID OF THE CURRENT USER AND
0095* RETURNS WITH B POINTING TO IT.
0096*

```

0097 74107 000000      RDIDT NOP
0098 74110 060273      LDA MLINK+1         GET USER ID
0099 74111 040341      ADA .+?ID=?LINK
0100 74112 160000      LDA 0,I
0101 74113 070052      STA ID              SAVE IN ID
0102 74114 016370      JSB GTIL            FIND WHICH ID TRACK
0103 74115 160076      LDA IDLNP,I         GET LENGTH OF CHOSEN TRACK
0104 74116 070072      STA WORD            SET DRUM DRIVER WORD COUNT
0105 74117 160075      LDA IDLCP,I         GET DRUM ADDRESS
0106 74120 064566      LDB LIBDI
0107 74121 016231      JSB DRUML
0108 74122 116017      JSB DEADP,I         BAD NEWS
0109*
0110 74123 064562      LDB LIBD            SEARCH IDT.

```

0111	74124	060052	LDA ID	GET THIS USERS ID BACK
0112	74125	002002	SZA	RETURN IF NOT LOGGED ON
0113	74126	150001	CPA 1,I	SEARCH FOR ENTRY.
0114	74127	126107	JMP RDIDT,I	RETURN
0115	74130	044362	ADB .+8	
0116	74131	026126	JMP *-3	
0117*				
0118	74132	000000	LOUT NOP	OUTPUT CHAR. IN A TO USERS TELETYPE.
0119	74133	064273	LDB MLINK+1	
0120	74134	044335	ADB .-?LINK	
0121	74135	114576	JSB OUTCH,I	
0122	74136	126132	JMP LOUT,I	
0123*				
0124	74137	000000	LTYPR NOP	OUTPUT -A CHARS TO USER'S TTY;
0125	74140	072076	STA LTYPR	B POINTS TO BUFFER.
0126	74141	076107	STB LTYPR	
0127	74142	162107	LTYPR3 LDA LTYPR,I	GET FIRST
0128	74143	001727	ALF,ALF	CHARACTER OF WORD
0129	74144	016132	JSB LOUT	OUT.
0130	74145	036076	ISZ LTYPR	ANY MORE?
0131	74146	002001	RSS	YES
0132	74147	126137	JMP LTYPR,I	NO.
0133	74150	162107	LDA LTYPR,I	SEND 2ND
0134	74151	016132	JSB LOUT	CHAR.
0135	74152	036107	ISZ LTYPR	BUMP POINTER.
0136	74153	036076	ISZ LTYPR	ANY MORE?
0137	74154	026142	JMP LTYPR3	YES
0138	74155	126137	JMP LTYPR,I	
0139	74156	000000	LTYPE NOP	SAME AS LTYPR BUT WITH CRLF.
0140	74157	016137	JSB LTYPR	
0141	74160	060350	LDA .-2	
0142	74161	066004	LDB ?ABP2	
0143	74162	016137	JSB LTYPR	
0144	74163	126156	JMP LTYPE,I	
0145	74076		LTYPR1 EQU DATE	
0146	74107		LTYPR2 EQU RDIDT	
0147*				
0148	74164	000000	LCHAR NOP	GET NEXT INPUT CHAR.--SKIP RETURN
0149	74165	060265	LDA LCHCR	GET CARRIAGE RETURN FLAG
0150	74166	050367	CPA .+15B	PREVIOUS RETURN?
0151	74167	126164	JMP LCHAR,I	YES
0152	74170	064273	LCHR1 LDB MLINK+1	
0153	74171	044336	ADB .+?TNUM-?LINK	
0154	74172	160001	LDA 1,I	FETCH
0155	74173	030222	IOR GTC	CHARACTER
0156	74174	114500	JSB S14SC,I	FROM 2114
0157	74175	102311	SFS CH2	WAIT FOR
0158	74176	026175	JMP *-1	RESPONSE
0159	74177	102511	LIA CH2	
0160	74200	070265	STA LCHCR	SET CARRIAGE RETURN FLAG
0161	74201	050412	CPA .+40B	BLANK?
0162	74202	026170	LCHR2 JMP LCHR1	YES, IGNORE IT
0163	74203	050367	CPA .+15B	NO, CARRIAGE RETURN
0164	74204	126164	JMP LCHAR,I	YES--EXIT
0165	74205	040766	ADA M96	

0166	74206	002021	SSA,RSS	LOWER CASE?
0167	74207	040317	ADA M32	YES, CONVERT
0168	74210	040730	ADA ,140	NO
0169	74211	036164	ISZ LCHAR	NO==EXIT
0170	74212	126164	JMP LCHAR,I	TO (P+2)
0171	74213	000000	T35SP NOP	OUTPUT TO TT35 AND WAIT,
0172	74214	114522	JSB TTY35,I	FIRST OUTPUT.
0173	74215	103100	CLF 0	
0174	74216	062213	LDA T35SP	MOVE RETURN ADDRESS
0175	74217	070276	STA T35RS	INTO TABLE.
0176	74220	060277	LDA T35ST	MOVE STATUS INTO PRIORITY
0177	74221	070301	STA T35PR	
0178	74222	060355	LDA XOUTW	SET STATUS TO OUTWAIT.
0179	74223	070277	STA T35ST	
0180	74224	126225	JMP SUSPP,I	GO HANG
0181	74225	071651	SUSPP DEF SUSP	
0182	74226	060364	LLEND LDA ,+12B	
0183	74227	016132	JSB LOUT	
0184	74230	124514	JMP SCHEN,I	
0185*				
0186	74231	000000	DRUML NOP	
0187	74232	114770	JSB DRUM,I	
0188	74233	006400	CLB	
0189	74234	060261	LDA ENDRM	GET BUSY FLAG
0190	74235	002020	SSA	DONE?
0191	74236	026234	JMP +=2	
0192	74237	002003	SZA,RSS	YES, TRANSFER SUCCESSFUL?
0193	74240	036231	ISZ DRUML	YES, SKIP RETURN
0194	74241	074261	STB ENDRM	CLEAR BUSY FLAG REGARDLESS
0195	74242	126231	JMP DRUML,I	
0196*				
0197	74243	000000	MOVEB NOP	MOVE BACKWARD =B WORDS FROM
0198	74244	006025	SSB,INB,RSS	MOVES TO MOVED.
0199	74245	126243	JMP MOVEB,I	
0200	74246	160050	LDA MOVES,I	
0201	74247	170051	STA MOVED,I	
0202	74250	003400	CCA	UPDATE POINTERS.
0203	74251	040051	ADA MOVED	
0204	74252	070051	STA MOVED	
0205	74253	003400	CCA	
0206	74254	040050	ADA MOVES	
0207	74255	070050	STA MOVES	
0208	74256	026244	JMP MOVEB+1	
0209*				
0210	74257	000000	MOVEW NOP	MOVES =B WORDS FROM MOVES,I TO
0211	74260	006025	SSB,INB,RSS	MOVED,I
0212	74261	126257	JMP MOVEW,I	
0213	74262	160050	LDA MOVES,I	GET A WORD
0214	74263	170051	STA MOVED,I	STORE IT.
0215	74264	034050	ISZ MOVES	BUMP
0216	74265	034051	ISZ MOVED	POINTERS.
0217	74266	026260	JMP MOVEW+1	NO.
0218*				
0219*	LEND OUTPUTS A LINE FEED ON THE SYSTEM TELETYPE			
0220*	AND THEN TERMINATES THE PROGRAM.			

```

0221 74267 060662 LEND LDA ONEI OUTPUT THE
0222 74270 064666 LDB DEH LINE FEED.
0223 74271 114522 JSB TTY35,I
0224 74272 002400 LENDR CLA
0225 74273 070314 STA T35F2
0226 74274 124514 JMP SCHEM,I
0227*
0228* LFRER PRINTS AN ILLEGAL FORMAT MESSAGE ON THE SYSTEM
0229* TELETYPE AND THEN TERMINATES THE PROGRAM.
0230 74275 060371 LFRER LDA ,+15
0231 74276 066300 LDB LFRDF
0232 74277 026271 JMP LEND+2
0233 74300 074301 LFRDF DEF ++1
0234 74301 005111 OCT 5111
0235 74302 046114 ASC 7,LLEGAL FORMAT
74303 042507
74304 040514
74305 020106
74306 047522
74307 046501
74310 052040
0236 74311 DDERK EQU *
0237 74311 060407 LDA ,+29
0238 74312 066314 LDB ++2
0239 74313 026271 JMP LEND+2
0240 74314 073034 DEF DDERL
0241*
0242* GETID SCANS THE INPUT BUFFER FOR AN ID NUMBER. IF NOT FOUND, IT
0243* OUTPUTS A MESSAGE AND TERMINATES.
0244* IF FOUND, THE RESULT IS PLACED IN ID, *RESULT
0245* IN MID. IF THE FOLLOWING CHARACTER IS A CR, GETID SKIPS ON THE
0246* WAY BACK. IN ANY CASE, THE NEXT CHARACTER IS IN A.
0247* GETID USES LTEMP+12,13,14,15.
0248*
0249 00044 GETCH EQU LTEMP+12
0250 00045 GETI1 EQU LTEMP+13
0251 00046 GETI2 EQU LTEMP+14
0252 00047 GETI3 EQU LTEMP+15
0253 74315 000000 GETID NOP
0254 74316 060273 LDA MLINK+1 DETERMINE WHICH SCANNER TO USE
0255 74317 066434 LDB DLCHR USE LCHAR IF USER TELETYPE,
0256 74320 050302 CPA T35LN T35CH IF SYSTEM.
0257 74321 064572 LDB T35CH
0258 74322 074044 STB GETCH
0259 74323 114044 JSB GETCH,I SCAN INPUT BUFFER FOR FIRST
0260 74324 026425 JMP GTFER CHARACTER.
0261 74325 042000 ADA M133. TEST FOR LETTER
0262 74326 002021 SSA,RSS
0263 74327 026425 JMP GTFER
0264 74330 040404 ADA ,+32B
0265 74331 002024 SSA,INA
0266 74332 026425 JMP GTFER
0267 74333 100032 ASL 10
0268 74334 070045 STA GETI1 SAVE FOR LATER.
0269 74335 060347 LDA ,=3 SET DIGIT

```

0270	74336	070046	STA	GETI2	COUNTER.
0271	74337	006400	CLB		SET NUMBER
0272	74340	074047	GETI4	STB GETI3	TO 0.
0273	74341	114044	JSB	GETCH,I	GET NEXT CHAR.
0274	74342	026425	JMP	GTFER	FAIL.
0275	74343	040316	ADA	M72B	TEST FOR DIGIT
0276	74344	002021	SSA,	RSS	
0277	74345	026425	JMP	GTFER	FAIL.
0278	74346	040364	ADA	.,+10	
0279	74347	002020	SSA		
0280	74350	026425	JMP	GTFER	FAIL.
0281	74351	064047	LDB	GETI3	GET PARTIAL VALUE.
0282	74352	005222	RBL,	RBL	MULTIPLY BY 10.
0283	74353	044047	ADB	GETI3	
0284	74354	005200	RBL		
0285	74355	044000	ADB	0	ADD IN NEW DIGIT.
0286	74356	034046	ISZ	GETI2	TEST FOR DCNE.
0287	74357	026340	JMP	GETI4	
0288	74360	044045	ADB	GETI1	MERGE IN LETTER.
0289	74361	074052	STB	ID	
0290	74362	007004	CMB,	INB	
0291	74363	074053	STB	MID	
0292	74364	016370	JSB	GTIL	FIND ID TRACK
0293	74365	114044	JSB	GETCH,I	GET NEXT CHARACTER.
0294	74366	036315	ISZ	GETID	SKIP RETURN IF CR.
0295	74367	126316	JMP	GETID,I	
0296*					
0297*					
0298*					
0299*					
0300*					
0301	74370	000000	GTIL	NOP	
0302	74371	066424	LDB	IDECL	=> LAST ENTRY
0303	74372		G TSA	EQU *	
0304	74372	074075	STB	IDLCP	SAVE IN TEMP
0305	74373	006004	INB		=> DRUM ADDRESS
0306	74374	160001	LDA	B,I	
0307	74375	002003	SZA,	RSS	
0308	74376	026411	JMP	G TSB	NO ENTRIES ON TRACK
0309	74377	006004	INB		=> TRACK LENGTH
0310	74400	160001	LDA	B,I	GET THE LENGTH
0311	74401	002003	SZA,	RSS	SKIP THIS ONE IF
0312	74402	026411	JMP	G TSB	THE TRACK IS ZERO LENGTH
0313	74403	044350	ADB	.-2	
0314	74404	160001	LDA	B,I	A = FIRST ID ON THIS TRACK
0315	74405	003004	CMA,	INA	
0316	74406	040052	ADA	ID	> OR < ?
0317	74407	002021	SSA,	RSS	
0318	74410	026416	JMP	G TSC	FOUND THE TRACK
0319	74411		G TSB	EQU *	
0320	74411	064075	LDB	IDLCP	
0321	74412	056423	CPB	IDECH	CHECK FOR DONE
0322	74413	026416	JMP	G TSC	DONE, MUST BE ON FIRST TRACK
0323	74414	044347	ADB	.-3	MOVE TO PREVIOUS ENTRY
0324	74415	026372	JMP	G TSA	

```

0325 74416          GTSC EQU *
0326 74416 000004    INB          B => DRUM ADDRESS
0327 74417 074075    STB IDLCP    SET POINTER TO DRUM ADDRESS
0328 74420 006004    INB          => TRACK LENGTH
0329 74421 074076    STB IDLNP    SET POINTER TO LENGTH
0330 74422 126370    JMP GTIL,I   RETURN
0331 74423 000100    IDECM DEF IDEC
0332 74424 000106    IDECL DEF IDEC+6
0333*
0334 74425 060044    GTFER LDA GETCH    IF SYSTEM TELETYPE, PRINT
0335 74426 050572    CPA T35CH        ERROR MESSAGE THERE.
0336 74427 026275    JMP LFRER
0337 74430 060333    ILFER LDA .-15   OTHERWISE PRINT IT ON
0338 74431 066300    LDB LFRDF        USER TELETYPE.
0339 74432 016156    LIBER JSB LTYPE
0340 74433 124514    JMP SCHEN,I     TERMINATE.
0341 74434 074164    DLCHR DEF LCHAR
0342* THIS ROUTINE IS CALLED BY THE COMPILER WHEN IT WANTS TO EXECUTE
0343* A DRUM ROUTINE. THE DRUM ROUTINE IS ALWAYS EXECUTED WITH A PRIORI-
0344* TY OF 0, AS ALL DRUM ROUTINES ARE. THE CALLING SEQUENCE IS
0345* JSB SCHLB,I
0346* DEF <DRUM ADDRESS OF ROUTINE>
0347* <PARAMETERS IF DESIRED>
0348* <RETURN>
0349*
0350 74435 000000    SCHLQ NOP
0351 74436 103100    CLF 0
0352 74437 064273    LDB MLINK+1
0353 74440 044335    ADB .-?LINK
0354 74441 160001    LDA 1,I         SUSPEND
0355 74442 010772    AND COM14       IF HE
0356 74443 002002    SZA             TRIED TO
0357 74444 126225    JMP LLEND=1,I   ABORT
0358 74445 160001    LDA 1,I         SET UNABLE
0359 74446 030372    IOR UNABT      TO ABORT
0360 74447 170001    STA 1,I        BIT
0361 74450 044370    ADB .+?PLEV
0362 74451 002400    CLA
0363 74452 070264    STA TIMEF       NO TIMING.
0364 74453 170001    STA 1,I        SET PRIORITY TO 0
0365 74454 044350    ADB .+?STAT-?PLEV SET STATUS TO SYNTAX
0366 74455 060356    LDA XSYNT      SO SCHEDULER DOESN'T KNOW
0367 74456 170001    STA 1,I        WHAT WE'RE DOING.
0368 74457 044341    ADB .+?PROG-?STAT
0369 74460 060056    LDA PBPTR      SET PBPTR IN TABLE.
0370 74461 170001    STA 1,I
0371 74462 003000    CMA            SET UP DRUM
0372 74463 041221    ADA USE        PARAMETERS.
0373 74464 070072    STA WORD
0374 74465 044351    ADB .+?DISC=?PROG
0375 74466 160001    LDA 1,I
0376 74467 010317    AND M32        FORCE BACK TO SWAP AREA ORIGIN
0377 74470 170001    STA 1,I
0378 74471 065221    LDB USE        OUTPUT USER TO
0379 74472 016231    JSB DRUML      DRUM

```

```

0380 74473 026071      JMP RDPRJ      BLEW IT, GO DUMP USER
0381 74474 162435      LDA SCHLQ,I    GET DRUM ADDRESS.
0382 74475 036435      ISZ SCHLQ
0383 74476 050260      CPA LIB       IF IN CORE, TRANSFER DIRECT.
0384 74477 027000      JMP LIBRA
0385 74500 070260      STA LIB       SET LIB.
0386 74501 160000      LDA 0,I
0387 74502 064750      LDB M512     SET UP DRUM TRANSFER
0388 74503 074072      STB WORD
0389 74504 064504      LDB #LIBI
0390 74505 016231      JSB DRUML
0391 74506 116015      JSB SICKP,I  READ NO GOOD, GO EXPIRE
0392 74507 027000      JMP LIBRA
0393*
0394* PROGRAM ALWAYS RETURNS HERE.
0395*
0396 74510 103100      SCHBL CLF 0
0397 74511 064273      LDB MLINK+1
0398 74512 044351      ADB .+?STAT=?LINK
0399 74513 134001      ISZ 1,I      TRUE STATUS IS RUN
0400 74514 034264      ISZ TIMEF    SET FLAG FOR TIMING
0401 74515 044350      ADB .+?CLOC=?STAT
0402 74516 134001      ISZ 1,I      TIMED OUT?
0403 74517 026537      JMP SCHB1    NO
0404 74520 044356      ADB .+?PLEV=?CLOC
0405 74521 060356      LDA .+4     SET PRIORITY TO 4
0406 74522 170001      STA B,I
0407 74523 044347      ADB .+?RSTR=?PLEV
0408 74524 062435      LDA SCHLQ
0409 74525 170001      STA B,I     SET RESTART ADDRESS
0410 74526 002400      CLA
0411 74527 170634      STA DCLC1,I BLOCK CLOCK
0412 74530 102100      STF 0
0413 74531 064273      LDB MLINK+1 REMOVE
0414 74532 160001      LDA B,I     USER FROM
0415 74533 070273      STA MLINK+1 QUEUE
0416 74534 016563      JSB INSEQ   INSERT AGAIN AT END
0417 74535 126536      JMP ++1,I   RETURN TO SCHEDULER
0418 74536 070362      DEF SCH1
0419 74537              SCHB1 EQU *
0420 74537 102100      STF 0
0421 74540 126435      JMP SCHLQ,I RETURN TO LANGUAGE PROCESSOR
0422 74541 074542      HELK DEF ++1
0423 74542 005111      OCT 5111
0424 74543 046114      ASC 7,LLEGAL ACCESS
      74544 042507
      74545 040514
      74546 020101
      74547 041503
      74550 042523
      74551 051440
0425 74552 074553      HELH DEF ++1
0426 74553 005116      OCT 5116
0427 74554 047440      ASC 6,0 TIME LEFT
      74555 052111

```

```

74556 046505
74557 020114
74560 042506
74561 052040
0428 74562 000000 STABF BSS 1 USED BY STATUS
0429*
0430* THIS SUBROUTINE INSERTS A USER INTO THE QUEUE IN ORDER OF HIS
0431* PRIORITY. WHEN WE ARRIVE HERE, THE B REGISTER POINTS TO THE LINK
0432* WORD FOR THE USER.
0433*
0434 74563 000000 INSEQ NOP
0435 74564 074061 STB SCHL SAVE LINK ADDRESS IN SCHL
0436 74565 006004 INB B=>USERS PRIORITY
0437 74566 160001 LDA 1,I A=PRIORITY
0438 74567 003000 CMA STORE -1=PRIORITY
0439 74570 070066 STA SCHPR IN SCHPR.
0440 74571 064272 LDB MLINK B=>PHONY USER.
0441 74572 074064 SCH2 STB SCHP SAVE IN SCHP.
0442 74573 164001 LDB 1,I B POINTS TO NEXT USER.
0443 74574 060001 LDA 1 GET PRIORITY OF
0444 74575 002004 INA THAT USER IN
0445 74576 160000 LDA 0,I A.
0446 74577 040066 ADA SCHPR COMPARE WITH PRIORITY
0447 74600 002020 SSA OF USER BEING INSERTED.
0448 74601 026572 JMP SCH2 IF >= GO TO LINK TO NEXT ENTRY.
0449 74602 174061 STB SCHL,I SET NEW ENTRY TO POINT TO HIM.
0450 74603 060061 LDA SCHL
0451 74604 170064 STA SCHP,I SET PREVIOUS ENTRY => NEW ENTRY.
0452 74605 040347 ADA .+?CLOC=?LINK SET NEW USERS CLOCK TO -10.
0453 74606 064340 LDB .-10
0454 74607 174000 STB 0,I
0455 74610 126563 JMP INSEQ,I
0456 74611 000000 T35BF BSS 36 BUFFER FOR INPUT AND REPLIES.
0457 74655 006412 CRLF OCT 6412 MUST FOLLOW T35BF
0458*
0459* TEST FOR ABORT ATTEMPT WHEN THEY WEREN'T ALLOWED. IF SO, LET
0460* THE SCHEDULER KNOW TO ABORT HIM
0461 74656 000000 ABCHK NOP
0462 74657 064273 LDB MLINK+1 CLEAR
0463 74660 044335 ADB .-?LINK
0464 74661 060372 LDA UNABT UNABLE TO
0465 74662 003000 CMA
0466 74663 103100 CLF 0 ABORT
0467 74664 110001 AND 1,I
0468 74665 170001 STA 1,I FLAG
0469 74666 102100 STF 0
0470 74667 010442 AND ABTRY
0471 74670 002003 SZA,RSS ABORT ATTEMPTED?
0472 74671 126656 JMP ABCHK,I NO
0473 74672 103100 CLF 0 YES
0474 74673 030445 IOR CHNFG
0475 74674 003000 CMA CLEAR ABORT
0476 74675 110001 AND 1,I TRY FLAG
0477 74676 030772 IOR COM14 SET COM14 BIT
0478 74677 170001 STA 1,I TO SIGNAL SCHEDULER

```


0479	74700	002400	CLA	BLOCK
0480	74701	170634	STA DCLC1,I	CLOCK
0481	74702	044366	ADB .+?STAT	
0482	74703	003400	CCA	SET STATUS
0483	74704	170001	STA 1,I	TO ABORTING
0484	74705	102100	STF 0	
0485	74706	126707	JMP ++1,I	RETURN THRU
0486	74707	070362	DEF SCH1	SCHEDULER
0487*				
0488*	CHECK IF THE PROGRAM WHICH HAS JUST BEEN LOADED FROM THE USER			
0489*	LIBRARY IS SEMI-COMPILED, AND SET THE NECESSARY COMPILER			
0490*	VARIABLES. LIBSC, LIBSP, AND LIBPB ARE PASSED TO THIS ROUTINE			
0491*	FROM THE LIBRARY ROUTINE WHICH CALLS IT (CHAIN, GET, OR HELLO)			
0492*				
0493	74710	000000	SEMIC NOP	
0494	74711	103100	CLF 0	
0495	74712	060040	LDA LIBSC	
0496	74713	002020	SSA	SEMI-COMPILED?
0497	74714	026727	JMP SEMI1	YES
0498	74715	002400	CLA	NO-CLEAR OUT-OF-
0499	74716	071575	STA SYMTB	STORAGE FLAG
0500	74717	060045	LDA LIBPB	SET LENGTH
0501	74720	070056	STA PBPTR	POINTER
0502	74721	064273	LDB MLINK+1	SET
0503	74722	044335	ADB .-?LINK	UNCOMPILED
0504	74723	060354	LDA CFLAG	BIT
0505	74724	003000	CMA	
0506	74725	110001	AND 1,I	
0507	74726	026761	JMP SEMI3	
0508	74727	060045	SEMI1 LDA LIBPB	SET
0509	74730	040343	ADA .-7	LENGTH
0510	74731	070056	STA PBPTR	POINTER
0511	74732	071504	STA FILTB	
0512	74733	164000	LDB 0,I	SET END-OF-
0513	74734	075575	STB SYMTB	PROGRAM POINTER
0514	74735	002004	INA	SET <FILES
0515	74736	164000	LDB 0,I	STATEMENT>
0516	74737	075606	STB FILCT	COUNTER
0517	74740	064452	LDB DFILT	POINTER TO
0518	74741	075605	STB FILPT	<FILES STATEMENTS>
0519	74742	064346	LDB .-4	4 <FILES
0520	74743	075230	STB SPTR	STATEMENTS> POSSIBLE
0521	74744	002004	SEMI2 INA	STORE
0522	74745	164000	LDB 0,I	POINTER
0523	74746	175605	STB FILPT,I	TO <FILES
0524	74747	035605	ISZ FILPT	STATEMENT>
0525	74750	035230	ISZ SPTR	ALL 4 DONE?
0526	74751	026744	JMP SEMI2	NO
0527	74752	002004	INA	SAVE
0528	74753	164000	LDB 0,I	'USING
0529	74754	075607	STB USESN	'SEEN' FLAG
0530	74755	064273	LDB MLINK+1	SET
0531	74756	044335	ADB .-?LINK	COMPILED
0532	74757	160001	LDA 1,I	BIT
0533	74760	030354	IOR CFLAG	

0534	74761	170001	SEMI3	STA	1,I	SET
0535	74762	074257		STB	MAIN	MAIN
0536	74763	064041		LDB	LIBSP	SET START-OF-
0537	74764	075577		STB	SPROG	PROGRAM POINTER
0538	74765	102100		STF	0	
0539	74766	126710		JMP	SEMIC,I	
0540	74767	000000	PORS1	BSS	1	USED BY "PORT"
0541	74770	000000	PORS2	BSS	1	COMMAND WHILE
0542	74771	000000	PORTL	BSS	1	SUSPENDED,
0543	74772	100000	SPE	OCT	100000	BAUD RATE INFO
0544	74773	160024	CHS	OCT	160024	CHAR, SIZE INFO
0545	74774	160025	STP	OCT	160025	SUBTYPE INFO
0546	74775	160026	WSP	OCT	160026	WHAT BAUD RATE?
0547	00045		LIBPB	EQU	LTEMP+13	END OF PROGRAM POINTER (PBPIR) .
0548	00040		LIBSC	EQU	LTEMP+8	SEMI-COMPILED FLAG
0549	00041		LIBSP	EQU	LTEMP+9	START OF PROGRAM POINTER

0002* THIS TABLE IS USED BY THE TSB PAPER TAPE LOADER, THE SLEEP
 0003* ROUTINE, AND THE MAG TAPE LOADER. IT CONTAINS THE LENGTHS OF
 0004* ALL THE REMAINING LIBRARY ROUTINES, AND ENABLES THE LOADER TO
 0005* ALLOCATE THE MINIMUM NUMBER OF DISC SECTORS FOR EACH OF THEM.
 0006* THE TABLE IS WRITTEN ON THE DISC AS THE FIRST LIBRARY ROUTINE.

0008	75000	ORG LIBRA	
0009	75000	177675	ABS LIBRA-SSLPL
0010	75001	177000	DEC -512
0011	75002	177000	DEC -512
0012	75003	177174	ABS LIBRA-SFLB
0013	75004	177257	ABS LIBRA-SASN
0014	75005	177346	ABS LIBRA-SCHN
0015	75006	177000	ABS LIBRA-SSAV
0016	75007	177000	ABS LIBRA-SSAV
0017	75010	177005	ABS LIBRA-SSSAV
0018	75011	177372	ABS LIBRA-SGET
0019	75012	177244	ABS LIBRA-SAPP
0020	75013	177237	ABS LIBRA-SHEL
0021	75014	177516	ABS LIBRA-SBYE
0022	75015	177440	ABS LIBRA-SKIL
0023	75016	177172	ABS LIBRA-SREN
0024	75017	177645	ABS LIBRA-SNAM
0025	75020	177420	ABS LIBRA-SCAT
0026	75021	177420	ABS LIBRA-SCAT
0027	75022	177420	ABS LIBRA-SCAT
0028	75023	177262	ABS LIBRA-SDIRS
0029	75024	177262	ABS LIBRA-SDIRS
0030	75025	177423	ABS LIBRA-SREPS
0031	75026	177000	ABS LIBRA-SSTAS
0032	75027	177000	ABS LIBRA-SSTAS
0033	75030	177650	ABS LIBRA-SDEL
0034	75031	177644	ABS LIBRA-STIM
0035	75032	177650	ABS LIBRA-SPRO
0036	75033	177650	ABS LIBRA-SPRO
0037	75034	177000	ABS LIBRA-SOPE
0038	75035	177717	ABS LIBRA-SLEN
0039	75036	177737	ABS LIBRA-SECH
0040	75037	177655	ABS LIBRA-SMES
0041	75040	177720	ABS LIBRA-SLPR
0042	75041	177354	ABS LIBRA-SPORS
0043	75042	177441	ABS LIBRA-SREP
0044	75043	177345	ABS LIBRA-SDIR
0045	75044	177345	ABS LIBRA-SDIR
0046	75045	177000	ABS LIBRA-SSTA
0047	75046	177000	ABS LIBRA-SSTA
0048	75047	177404	ABS LIBRA-SPOR
0049	75050	177663	ABS LIBRA-SROS
0050	75051	177606	ABS LIBRA-SANN
0051	75052	177606	ABS LIBRA-SRES
0052	75053	177603	ABS LIBRA-SCHA
0053	75054	177344	ABS LIBRA-SSLE
0054	75055	177344	ABS LIBRA-SSLE
0055	75056	177147	ABS LIBRA-SNEW
0056	75057	177225	ABS LIBRA-SKID

TWO HALVES OF
FUSS TABLE

SAVE OVERLAY,

GROUP

MESSAGE

HIBERNATE

0057 75060 177464
0058 75061 177035
0059 75062 177203
0060 75063 177000
0061 75064 177036
0062 75065 177000
0063 75066 177000
0064 75067 177375
0065 75070 177455
0066 75071 177314
0067 75072 177730
0068 75073 177747
0069 75074 177716
0070 75075 177425
0071 75076 177677
0072
0073 75077 177000
0073 75100 177000
0073 75101 177000
0073 75102 177000
0074 75103

ABS LIBRA-SUNL
ABS LIBRA-SLOC
ABS LIBRA-SMUN
ABS LIBRA-SMLO
ABS LIBRA-SSMLO
ABS LIBRA-SCOP
ABS LIBRA-SBES
ABS LIBRA-SSAN
ABS LIBRA-SDES
ABS LIBRA-SPUR
ABS LIBRA-SMAG
ABS LIBRA-SPHO
ABS LIBRA-SPRI
ABS LIBRA-SSPE
ABS LIBRA-SBRE

SANCTIFY

REP 4
DEC -512
DEC -512
DEC -512
DEC -512

SSLPL EQU *

0076* THE FUSS TABLE CONTAINS A 32 WORD ENTRY FOR EACH PORT. THESE
 0077* WORDS ARE THE DISC ADDRESSES OF THE FILES HE IS CURRENTLY USING.
 0078* A ZERO INDICATES NO FILE. THE TABLE IS READ OUT TO THE DISC
 0079* IN TWO HALVES, AND THEY ARE ASSUMED TO BE ON CONTIGUOUS
 0080* SECTORS. (THIS IS GUARANTEED IF FUSS IS ONE OF THE FIRST
 0081* LIBRARY ROUTINES.
 0082*

0083	75000		ORG LIBRA
0084			SUP
0085			REP 32
0086	75000	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75020	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75040	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75060	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75100	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75120	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75140	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75160	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75200	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75220	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75240	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75260	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75300	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75320	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75340	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75360	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75400	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75420	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75440	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75460	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75500	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75520	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75540	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75560	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75600	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75620	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75640	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75660	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75700	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75720	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75740	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0086	75760	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

0087*			
0088	75000		ORG LIBRA
0089			REP 32
0090	75000	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75020	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75040	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75060	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75100	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75120	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75140	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75160	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75200	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0090	75220	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

0093* THE FILES ROUTINE IS USED BY THE BASIC COMPILER TO PROCESS FILES
 0094* STATEMENTS DURING PHASE II. THE PURPOSE OF THE ROUTINE IS TO PRO-
 0095* VIDE THE CUMPIER WITH INFORMATION ABOUT THE REQUESTED FILES. THIS
 0096* INFORMATION CONSISTS OF THE FILE'S DISC ADDRESS AND DRUM
 0097* ADDRESS (IF ANY), ITS LENGTH, AND ITS RECORD SIZE.
 0098* THE COMPILER PASSES PARAMETERS TO THE FILES ROUTINE AS FOLLOWS:

0099*
 0100* FILCT=# OF FILES STATEMENTS
 0101* FILTB=>BEGINNING OF TABLE AREA FOR FILE INFO.
 0102* SCHLB,I=>FIRST POSSIBLE RETURN ADDRESS.
 0103*

0104* THE CALLING SEQUENCE TO THE FILES ROUTINE IS AS FOLLOWS:

0105*
 0106* JSB SCHLB,I
 0107* DEF FILIB
 0108* <ERROR EXIT FOR BAD FORMAT IN FILES STATEMENT>
 0109* <ERROR EXIT IF A FILE IS UNACCESSIBLE>
 0110* <ERROR EXIT IF PROGRAM OVERFLOW>
 0111* <NORMAL EXIT>

0113	75000		ORG LIBRA	
0114*				
0115	75000	063602	LDA FILBP	GET POINTER TO FILE BUFFER
0116	75001	070036	STA FLBUF	SAVE BUFFER POINTER.
0117	75002	070037	STA FLBFP	
0118	75003	060331	LDA .-17	SET COUNTER FOR MAXIMUM NUMBER
0119	75004	070040	STA FLBC1	OF FILES ALLOWED.
0120	75005	061606	LDA FILCT	GET COUNT = 5 OF FILES STATEMENT
0121	75006	040357	ADA .+5	GET COUNT
0122	75007	003004	CMA,INA	GET NEGATIVE
0123	75010	070046	STA FLBFC	SAVE COUNT
0124	75011	060452	LDA DFILT	GET POINTER TO FILES
0125	75012	070047	STA FLBFF	STATEMENT TABLE
0126	75013		FLBA EQU *	
0127	75013	164047	LDB FLBFF,1	GET POINTER TO FILES STATEMENTS
0128	75014	003400	CCA	SET POINTER TO
0129	75015	140001	ADA 1,1	LAST CHAR + 1 OF
0130	75016	040001	ADA 1	FILES STATEMENT.
0131	75017	001200	RAL	
0132	75020	070042	STA FLBP	
0133	75021	006004	INB	INITIALIZE POINTER TO
0134	75022	005000	BLS	
0135	75023	074043	STB FLBCP	FILES STATEMENT.
0136*				
0137	75024	060347	FLB1 LDA .+3	SET FILC2 TO SAY 3 WORDS
0138	75025	070041	STA FLBC2	ALLOWED.
0139	75026	002400	CLA	
0140	75027	070031	STA FLBCM	CLEAR COMMA FLAG.
0141	75030	070030	STA FLBS	
0142	75031	017550	JSB FLBCH	GET FIRST CHAR.
0143	75032	050416	CPA .+44B	TEST FOR DOLLAR SIGN.
0144	75033	027055	JMP FLB2	
0145	75034	050424	CPA .+52B	TEST FOR SNOWFLAKE
0146	75035	027061	JMP FLB22	

0147	75036	050412	FLB5	CPA ,+40B	BETTER NOT BE A BLANK,
0148	75037	027177		JMP FLB8+1	FAIL IF IT IS,
0149	75040		FLB25	EQU *	
0150	75040	040030		ADA FLB5	* OR \$ FLAG FIRST CHARACTER
0151	75041	001727	FLB3	ALF, ALF	POSITION ON LEFT
0152	75042	170036		STA FLBUF, I	AND STORE IN BUFFER,
0153	75043	017550		JSB FLBCH	GET RIGHT CHARACTER
0154	75044	130036		IOR FLBUF, I	AND PACK IN.
0155	75045	170036		STA FLBUF, I	
0156	75046	034036		ISZ FLBUF	BUMP BUFFER POINTER,
0157	75047	017550		JSB FLBCH	GET NEXT CHARACTER,
0158	75050	034041		ISZ FLBC2	TEST FOR END OF FILE NAME,
0159	75051	027041		JMP FLB3	
0160*					
0161	75052	050412		CPA ,+40B	IF END OF FILE NAME, CHAR MUST
0162	75053	027100		JMP FLB4	BE A BLANK.
0163	75054	027177		JMP FLB8+1	FAIL IF NOT,
0164*					
0165	75055	060442	FLB2	LDA B200	IF 1ST CHAR IS \$, SET FILS TO
0166	75056	070030		STA FLB\$	INDICATE LIBRARY FILE.
0167	75057	017550		JSB FLBCH	GET NEXT CHAR.
0168	75060	027036		JMP FLB5	
0169	75061	061036	FLB22	LDA BIT15	IF FIRST CHAR IS *, SET FILS TO
0170	75062	070030		STA FLB\$	INDICATE GROUP LIBRARY FILE
0171	75063	017550		JSB FLBCH	GET NEXT CHARACTER
0172	75064	050412		CPA ,+40B	IS IT BLANK?
0173	75065	002401		CLA, RSS	YES, * IS PLACE HOLDER
0174	75066	027040		JMP FLB25	NO, CONTINUE PROCESSING NAME
0175	75067	064343		LDB ,=7	CLEAR BUFFER
0176	75070	170036		STA FLBUF, I	SINCE NO
0177	75071	034036		ISZ FLBUF	FILE NOW
0178	75072	006006		INB, SZB	
0179	75073	027070		JMP *-3	
0180	75074	064444		LDB B400	RESERVE 256 WORDS
0181	75075	174036		STB FLBUF, I	IN CORE FOR FUTURE FILE
0182	75076	002004		INA	
0183	75077	027101		JMP FLB26	
0184*					
0185	75100	060357	FLB4	LDA ,+5	LEAVE ROOM FOR STORAGE
0186	75101		FLB26	EQU *	
0187	75101	040036		ADA FLBUF	OF FILE INFORMATION
0188	75102	070036		STA FLBUF	FROM THE DIRECTORY
0189	75103	034040		ISZ FLBC1	TEST FOR TOO MANY FILES.
0190	75104	002001		RSS	
0191	75105	027177		JMP FLB8+1	
0192	75106	060031		LDA FLBCM	TEST FOR ANY MORE REQUESTED.
0193	75107	002002		SZA	
0194	75110	027024		JMP FLB1	YES IF COMMA WAS SEEN,
0195	75111	034047		ISZ FLBFF	COUNT UP POINTER INTO TABLE
0196	75112	034046		ISZ FLBFC	CHECK COUNTER
0197	75113	027013		JMP FLBA	PROCESS ANOTHER FILES STATEMENT.
0198*					
0199	75114	060040		LDA FLBC1	SET FILC1 TO EQUAL
0200	75115	040373		ADA ,+17	=# OF FILES REQUESTED
0201	75116	003004		CMA, INA	

0202	75117	070040	STA	FLBC1	
0203	75120	070041	STA	FLBC2	
0204*					
0205	75121	036435	ISZ	SCHLQ	BUMP RETURN ADDRESS SINCE WE'VE
0206	75122	060037	LDA	FLBFP	NOW CHECKED FOR TYPE I ERRORS,
0207	75123	070036	STA	FLBUF	SET POINTER TO BUFFER AGAIN.
0208*					
0209	75124	060273	LDA	M LINK+1	GET USER ID AND SAVE IT.
0210	75125	040341	ADA	,+?ID=?LINK	
0211	75126	160000	LDA	0,I	
0212	75127	070044	STA	FLBID	
0213*					
0214	75130	164036	FLB6	LDB FLBUF,I	GET FIRST WORD OF FILE NAME.
0215	75131	006003	SZB	,RSS	IS THIS A PLACE HOLDER
0216	75132	027143	JMP	FLB27	YES, SKIP DIRECTORY LOOKUP
0217	75133	060044	LDA	FLBID	
0218	75134	006020	SSB		IF BIT 15 OF FIRST WORD IS SET,
0219	75135	060612	LDA	A000	PERFORM SEARCH USING A000.
0220	75136	005727	BLF	,BLF	IF BIT 7 OF
0221	75137	006020	SSB		FIRST WORD IS SET
0222	75140	027147	JMP	FLB24	SET UP FOR GROUP LIB SEARCH
0223	75141	005727	BLF	,BLF	ELSE RESTORE FIRST WORD
0224	75142	027165	JMP	FLB23	
0225*					
0226	75143		FLB27	EQU *	
0227	75143	064036	LDB	FLBUF	BUMP POINTER
0228	75144	044362	ADB	,+8	TO NEXT TEMP
0229	75145	074036	STB	FLBUF	BUFFER ENTRY
0230	75146	027262	JMP	FLB28	
0231*					
0232	75147	005665	FLB24	ELB,CLE,ERB	CLEAR BIT 7
0233	75150	005727	BLF	,BLF	AND
0234	75151	174036	STB	FLBUF,I	RESTORE TO TABLE
0235	75152	010602	AND	B1777	ISOLATE NUMERICAL PART OF ID
0236	75153	006400	CLB		
0237	75154	100400	DIV	.100	GET
	75155	000437			
0238	75156	100200	MPY	.100	
	75157	000437			
0239	75160	064000	LDB	A	LIBRARIAN
0240	75161	060732	LDA	M2000	
0241	75162	010044	AND	FLBID	USER
0242	75163	030001	IOR	B	NUMBER
0243	75164	164036	LDB	FLBUF,I	RESTORE FIRST WORD OF FILE NAME
0244	75165	104400	FLB23	DST LTEMP	
	75166	000030			
0245	75167	034036	ISZ	FLBUF	GET NEXT 2 WORDS ALSO.
0246	75170	104200	OLD	FLBUF,I	
	75171	100036			
0247	75172	104400	DST	LTEMP+2	
	75173	000032			
0248*					
0249	75174	116005	JSB	DLOKP,I	SEARCH FOR FILE
0250	75175	027203	JMP	FLB7	FOUND IT.
0251*					

0252	75176	016047	FLB8	JSB RDPRG	IF NOT FOUND, RETURN TO
0253	75177	002400		CLA	
0254	75200	172006		STA DIRWP,I	NO DIRECTORY BLOCK IN CORE NOW
0255	75201	015322		JSB DCMPL	
0256	75202	026510		JMP SCHBL	
0257*					
0258	75203		FLB7	EQU *	
0259	75203	060034		LDA LTEMP+4	LOAD POINTER TO DIREC ENTRY,
0260	75204	040360		ADA ,+6	POINTER TO DRUM ADDRESS
0261	75205	160000		LDA A,I	LOAD CURRENT DRUM ADDRESS
0262	75206	172006		STA DIRWP,I	SET DIRWD FOR DLOOK
0263	75207	064035		LDB LTEMP+5	TEST TO SEE
0264	75210	044354		ADB ,+2	IF THIS IS
0265	75211	160001		LDA 1,I	REALLY A
0266	75212	002021		SSA,RSS	FILE.
0267	75213	027176		JMP FLB8	FAIL IF NOT.
0268	75214	044351		ADB , -1	TEST FOR PROTECTED.
0269	75215	160001		LDA 1,I	
0270	75216	002021		SSA,RSS	
0271	75217	027224		JMP FLB9	NOT PROTECTED.
0272	75220	060030		LDA LTEMP	IF PRO., TEST FOR FILE OWNER
0273	75221	050044		CPA FLBID	
0274	75222	003777		CCA,SEZ,CC,SSA,SLA,INA,SZA,RSS JRW	
0275	75223	027176		JMP FLB8	PROTECTED FILE ACCESS--FAIL.
0276*					
0277	75224	034036	FLB9	ISZ FLBUF	
0278	75225	034036		ISZ FLBUF	
0279	75226	044360		ADB ,+6	GET DRUM
0280	75227	160001		LDA B,I	ADDRESS AND INSERT
0281	75230	170036		STA FLBUF,I	IN BUFFER ENTRY WORD 4
0282	75231	006004		INB	BUMP DIRECT, POINTER TO DISC ADD
0283	75232	034036		ISZ FLBUF	BUMP BUFF POINTER TO WORD 5
0284	75233	104200		DLD B,I	GET DISC ADDRESS AND
	75234	100001			
0285	75235	104400		DST FLBUF,1	PUT IT IN THE BUFFER
	75236	100036			
0286	75237	064035		LDB LTEMP+5	GET DIRECTORY ENTRY POINTER
0287	75240	044365		ADB ,+11	ADJUST TO FILE LENGTH WORD
0288	75241	034036		ISZ FLBUF	BUMP BUFFER POINTER
0289	75242	034036		ISZ FLBUF	TO LENGTH SLOT
0290	75243	060044		LDA FLBID	TEST FOR USER REFERENCE
0291	75244	050030		CPA LTEMP	TO PUBLIC OR GROUP FILE
0292	75245	002401		CLA,RSS	NO,CLEAR BIT 15
0293	75246	061036		LDA BIT15	YES, SET BIT 15
0294	75247	130001		IOR B,I	OR IN FILE LENGTH
0295	75250	170036		STA FLBUF,I	STORE IT IN BUFFER
0296	75251	034036		ISZ FLBUF	BUMP POINTER TO RECORD SIZE SLOT
0297	75252	044343		ADB , -7	SAME FOR DIRECTORY POINTER
0298	75253	160001		LDA B,I	TRANSFER RECORD SIZE
0299	75254	170036		STA FLBUF,I	TO BUFFER
0300	75255	034036		ISZ FLBUF	BUMP POINTER TO NEXT ENTRY
0301	75256	016076		JSB DATE	GET DATE AND SET
0302	75257	064035		LOB LTEMP+5	INTO PURGE (LAST
0303	75260	044357		ADB ,+5	REFERENCED)
0304	75261	170001		SIA B,I	DATE.

```

0305*
0306 75262          FLB28 EQU *
0307 75262 034040   ISZ FLBC1      TEST FOR ANY MORE FILES.
0308 75263 027130   JMP FLB6
0309*
0310* WE HAVE FOUND ALL THE FILES, WE NOW HAVE TO UPDATE THE FUSS TABLE.
0311* FIRST CHECK TO SEE IF THE PROGRAM HAS ROOM ENOUGH FOR THE TABLE.
0312*
0313 75264 162006   LDA DIRWP,I    WRITE DIRECTORY TO DRUM
0314 75265 002003   SZA,RSS       IF ANY IS IN CORE
0315 75266 027272   JMP FLB29
0316 75267 064562   LDB LIBD      OUTGOING CORE ADDRESS.
0317 75270 016231   JSB DRUML
0318 75271 127603   JMP DLK9P,I   CAN'T, GO ATTEMPT SALVAGE
0319 75272          FLB29 EQU *
0320 75272 036435   ISZ SCHLQ     BUMP TO NEXT ERROR EXIT,
0321 75273 060041   LDA FLBC2     GET # OF FILES.
0322 75274 070040   STA FLBC1
0323 75275 003004   CMA,INA
0324 75276 100200   MPY ,+FTEL   COMPUTE NEW VALUE OF PBPTR
          75277 000371
0325 75300 040056   ADA PBPTR
0326 75301 003000   CMA
0327 75302 040462   ADA LWAUS    TEST FOR OVERFLOW.
0328 75303 002020   SSA
0329 75304 027176   JMP FLB8     FAIL--PROGRAM TOO LARGE.
0330*
0331 75305 036435   ISZ SCHLQ     BUMP TO NORMAL RETURN ADDRESS.
0332 75306 060732   LDA M2000    INPUT FUSS TABLE
0333 75307 070072   STA WORD
0334 75310 160540   LDA FUSS,I
0335 75311 064566   LDB LIBDI
0336 75312 016231   JSB DRUML
0337 75313 116015   JSB SICKP,I  IT'S STUCK ON THE DRUM
0338*
0339 75314 060273   LDA MLINK+1  DETERMINE USER #.
0340 75315 040336   ADA ,+?TNUM=?LINK
0341 75316 160000   LDA 0,I     USER # IN BITS 12-8
0342 75317 001727   ALF,ALF    RIGHT JUSTIFY USER #
0343 75320 001722   ALF,RAL    MULTIPLY USER # BY 32 AND
0344 75321 040562   ADA LIBD    ADD LIBD TO POINT AT USER'S
0345 75322 070045   STA FLBFS   SECTION OF FUSS.
0346 75323 070030   STA LTEMP
0347 75324 064317   LDB M32     ZERO OUT USER'S SECTION
0348 75325 002400   CLA
0349 75326 170030   STA LTEMP,I
0350 75327 034030   ISZ LTEMP
0351 75330 006006   INB,SZB
0352 75331 027326   JMP *-3
0353*
0354* NOW CHECK TO SEE IF ANY OF THE REQUESTED FILES ARE BEING USED BY
0355* ANOTHER USER. IF THEY ARE, WE ALLOW ONLY FILE READS BUT NO WRITES.
0356* IF THE USER IS AN 'A', WE SKIP THE TEST.
0357*
0358 75332 060044   LDA FLBID

```

0359	75333	010732		AND M2000	
0360	75334	050612		CPA A000	
0361	75335	027403		JMP FLB10	
0362*					
0363	75336	060037		LDA FLBFP	SET BUFFER POINTER.
0364	75337		FLB11	EQU *	
0365	75337	070036		STA FLBUF	ADDRESS.
0366*					
0367	75340	164036		LDB FLBUF,I	GET FIRST WORD OF NAME
0368	75341	006003		SZB,RSS	PLACE HOLDER?
0369	75342	027366		JMP FLB30	YES
0370	75343	040356		ADA ,+4	NO, BUMP POINTER TO
0371	75344	070036		STA FLBUF	DISC ADDRESS
0372*					
0373	75345	064562		LDB LIBD	PUT ADDRESS OF FUSS
0374	75346	077604		STB FUSCH	INTO FUSS SEARCH POINTER
0375	75347	104200		DLB FLBUF,I	GET DISC ADDRESS
		75350			
0376	75351	153604	FLB14	CPA FUSCH,I	UPPER WORDS EQUAL?
0377	75352	027362		JMP FLB18	YES, GO COMPARE LOWER
0378	75353	037604		ISZ FUSCH	NO, BUMP
0379	75354	037604	FLB19	ISZ FUSCH	FUSS POINTER
0380	75355	060536		LDA L1024	GET FUSS END ADDRESS
0381	75356	053604		CPA FUSCH	HAVE WE EXHAUSTED FUSS?
0382	75357	027376		JMP FLB13	YES, GO CHECK NEXT FILE
0383	75360	160036		LDA FLBUF,I	NO, RESTORE UPPER ADDRESS WORD
0384	75361	027351		JMP FLB14	AND GO COMPARE AGAIN
0385	75362	037604	FLB18	ISZ FUSCH	BUMP TO LOW ADDRESS WORD
0386	75363	157604		CPB FUSCH,I	IS LOW ADDRESS ALSO EQUAL?
0387	75364	027370		JMP FLB12	YES, GO FLAG READ ONLY
0388	75365	027354		JMP FLB19	NO, GO CHECK NEXT FILE
0389*					
0390	75366		FLB30	EQU *	
0391	75366	060360		LDA ,+6	
0392	75367	027377		JMP FLB13+1	
0393*					
0394	75370	034036	FLB12	ISZ FLBUF	BUMP BUFFER POINTER
0395	75371	034036		ISZ FLBUF	TO LENGTH WORD
0396	75372	160036		LDA FLBUF,I	SET DISC LENGTH TO SAY
0397	75373	031036		IOR BIT15	READ ONLY.
0398	75374	170036		STA FLBUF,I	
0399*					
0400	75375	002401		CLA,RSS	
0401	75376	060354	FLB13	LDA ,+2	
0402	75377	040354		ADA ,+2	ADJUST BUFFER POINTER
0403	75400	040036		ADA FLBUF	TO NEXT FILE NAME
0404	75401	034040		ISZ FLBC1	TEST FOR ANY MORE
0405	75402	027337		JMP FLB11	
0406*					
0407*	NOW UPDATE FUSS BY PLACING THE DISC ADDRESSES JUST REQUESTED				
0408*	INTO THE USER'S FUSS AREA,				
0409*					
0410	75403	060041	FLB10	LDA FLBC2	SET COUNTER.
0411	75404	070040		STA FLBC1	
0412	75405	060037		LDA FLBFP	GET POINTER TO FIRST ONE.

0413	75406	FLB15 EQU *	
0414	75406	040360	ADA .+6 GET FILE LENGTH
0415	75407	164000	LDB 0,I
0416	75410	040350	ADA .-2 A POINTS TO HIGH DISC ADDRESS
0417	75411	006021	SSB,RSS IF NOT READ ONLY,
0418	75412	006401	CLB,RSS LEAVE BIT 15 0.
0419	75413	065036	LDB BIT15 ELSE SET IT.
0420	75414	144000	ADB 0,I
0421	75415	174045	STB FLBFS,I AND PUT INTO TABLE.
0422	75416	034045	ISZ FLBFS BUMP
0423	75417	002004	INA POINTERS AND
0424	75420	164000	LDB A,I STORE LOW
0425	75421	174045	STB FLBFS,I DISC ADDRESS
0426	75422	034045	ISZ FLBFS REBUMP
0427	75423	040355	ADA .+3 POINTERS
0428	75424	034040	ISZ FLBC1 TEST FOR DONE.
0429	75425	027400	JMP FLB15
0430*			
0431	75426	160540	LDA FUSS,I WRITE FUSS TABLE BACK TO
0432	75427	064562	LDB LIHD DRUM
0433	75430	016231	JSB DRUML
0434	75431	116015	JSB SICKP,I IT'S STUCK IN CORE
0435*			
0436	75432	016047	JSB RDPRG READ IN USER'S PROGRAM AGAIN.
0437	75433	061504	LDA FILTB
0438	75434	071576	STA VALTB
0439	75435	064037	LDB FLBFP GET BUFFER POINTER
0440	75436		FLB16 EQU *
0441	75436	044360	ADB .+6 BUMP TO LENGTH WORD
0442	75437	104200	DLD B,I GET LENGTH WORD AND RECORD SIZE
	75440	100001	
0443	75441	104400	DST VALTB,I STORE THEM IN FILE TABLE
	75442	101576	
0444	75443	035576	ISZ VALTB BUMP FILE
0445	75444	035576	ISZ VALTB TABLE POINTER
0446	75445	001665	ELA,CLE,ERA REMOVE BIT 15 FROM LENGTH
0447	75446	040350	ADA .-2 COMPUTE RELATIVE
0448	75447	002016	SLA,INA,SZA ADDRESS OF LAST
0449	75450	040351	ADA .-1 LOGICAL RECORD
0450	75451	007400	CCB SET FIRST DISC ADDRESS WORD
0451	75452	175576	STB VALTB,I TO ALL ONES
0452	75453	064355	LDB .+3 GET
0453	75454	044037	ADB FLBFP DRUM
0454	75455	164001	LDB B,I ADDRESS
0455	75456	006003	SZB,RSS IS FILE SANCTIFIED?
0456	75457	027474	JMP FLB20 NO, FILL DOUBLE WORDS
0457	75460	035576	ISZ VALTB YES, BUMP FILE TABLE POINTER
0458	75461	001020	ALS,ALS 1 RECORD = 4 SECTORS
0459	75462	040001	ADA B COMPUTE DRUM ADDRESS
0460*			
0461	75463	171576	STA VALTB,I OF LAST LOGICAL RECORD
0462	75464	060355	LDA .+3 INSERT INTO FILE TABLE
0463	75465	041576	ADA VALTB
0464	75466	071576	STA VALTB INSERT "SANCTIFIED" FLAG
0465	75467	003400	CCA INTO HIGH WORD OF

0466	75470	171576	STA VALTB,I	BASE ADDRESS
0467	75471	035576	ISZ VALTB	INSERT BASE DRUM ADDRESS
0468	75472	175576	STB VALTB,I	INTO LOW WORD
0469	75473	027521	JMP FLB21	GO PREPARE FOR NEXT FILE
0470	75474	064037	FLB20 LDB FLBFP	NOT SANCTIFIED; GET ADDRESS
0471	75475	044356	ADB .+4	OF HIGH DISC ADDRESS
0472	75476	077604	STB FUSCH	AND SAVE IT
0473	75477	006004	INB	GET POINTER TO LOW DISC ADD WD.
0474	75500	000040	CLE	
0475	75501	140001	ADA B,I	ADD RELATIVE LAST RECORD ADDRESS
0476	75502	067604	LDB FUSCH	B GETS HIGH DISC
0477	75503	164001	LDB B,I	ADDRESS WORD
0478	75504	002040	SEZ	IF LOW ADD OVERFLEW,
0479	75505	006004	INB	ADD 1 TO HIGH PART
0480	75506	101100	SWP	STORE BOTH WORDS
0481	75507	104400	DST VALTB,I	OF DISC ADDRESS
	75510	101576		
0482	75511	060356	LDA .+4	
0483	75512	041576	ADA VALTB	
0484	75513	071576	STA VALTB	
0485	75514	104200	DL0 FUSCH,I	BASE DISC ADDRESS
	75515	175604		
0486	75516	104400	DST VALTB,I	INTO FILE TABLE
	75517	101576		
0487	75520	035576	ISZ VALTB	ADJUST POINTER
0488	75521	061576	FLB21 LDA VALTB	BUMP POINTERS.
0489	75522	040356	ADA .+4	
0490	75523	071576	STA VALTB	
0491	75524	164037	LDB FLBFP,I	MOVE
0492	75525	175576	STB VALTB,I	
0493	75526	034037	ISZ FLBFP	FILE
0494	75527	035576	ISZ VALTB	
0495	75530	104200	DL0 FLBFP,I	NAME
	75531	100037		
0496	75532	104400	DST VALTB,I	
	75533	101576		
0497	75534	061576	LDA VALTB	INTO
0498	75535	040355	ADA .+FTEL-12	
0499	75536	071576	STA VALTB	TABLE
0500	75537	064037	LDB FLBFP	
0501	75540	044361	ADB .+7	
0502	75541	074037	STB FLBFP	
0503	75542	034041	ISZ FLBC2	TEST FOR ANY MORE.
0504	75543	027436	JMP FLB16	
0505	75544	070056	STA PBPTR	ADVANCE PBPTR TO
0506*				FIRST UNUSED WORD
0507*				
0508	75545	002400	CLA	
0509	75546	172006	STA DIRWP,I	NO DIRECTORY BLOCK IN CORE NOW
0510	75547	026510	JMP SCHBL	
0511*				
0512*	FLBCH GETS THE NEXT CHARACTER OUT OF THE FILES			
0513*	STATEMENT. IF FLBCM=1, IT ASSUMES A COMMA HAS BEEN			
0514*	SEEN AND RETURNS A BLANK. OTHERWISE IF THE CHARAC-			
0515*	TER IS A COMMA, IT SETS FLBCM AND RETURNS A BLANK.			

0516* IT ALSO RETURNS BLANKS AT THE END OF THE CODE.

0517*

0518	75550	000000	FLBCH	NOP	
0519	75551	060412		LDA ,+40B	RETURN BLANK IF
0520	75552	064031		LDB FLBCM	FLBCM IS SET.
0521	75553	006002		SZB	
0522	75554	127550		JMP FLBCH,I	
0523	75555	064043		LDB FLBCP	GET CHAR. POINTER.
0524	75556	006004		INB	OTHERWISE BUMP
0525	75557	054042		CPB FLBP	IF END OF STATEMENT,
0526	75560	127550		JMP FLBCH,I	RETURN A BLANK.
0527	75561	074043		STB FLBCP	POINTER.
0528	75562	004065		CLE,ERB	GET NEXT CHAR.
0529	75563	160001		LDA 1,I	
0530	75564	002041		SEZ,RSS	
0531	75565	001727		ALF,ALF	ROTATE IF NECESSARY.
0532	75566	010441		AND B177	MASK.
0533	75567	002003		SZA,RSS	SKIP 0'S.
0534	75570	027551		JMP FLBCH+1	
0535	75571	040766		ADA M96	
0536	75572	002021		SSA,RSS	LOWER CASE?
0537	75573	040317		ADA M32	YES, MAKE INTO UPPER CASE
0538	75574	040730		ADA .140	NO
0539	75575	050426		CPA ,+54B	TEST FOR COMMA.
0540	75576	002001		RSS	
0541	75577	127550		JMP FLBCH,I	NOT A COMMA.
0542	75600	034031		ISZ FLBCM	IF COMMA, SET FLAG AND GO
0543	75601	027551		JMP FLBCH+1	RETURN A BLANK.

0544*

0545	00030		FLBS	EQU	LTEMP
0546	00031		FLBCM	EQU	LTEMP+1
0547	00036		FLBUF	EQU	LTEMP+6
0548	00037		FLBFP	EQU	LTEMP+7
0549	00040		FLBC1	EQU	LTEMP+8
0550	00041		FLBC2	EQU	LTEMP+9
0551	00042		FLBP	EQU	LTEMP+10
0552	00043		FLBCP	EQU	LTEMP+11
0553	00044		FLBID	EQU	LTEMP+12
0554	00045		FLBFS	EQU	LTEMP+13
0555	00046		FLBFC	EQU	LTEMP+14
0556	00047		FLBFF	EQU	LTEMP+15
0557	75602	073571	FILBP	DEF	FILBF
0558	75603	031173	DLK9P	DEF	DLOK9
0559	75604		SFLB	EQU	*
0560	75604	000000	FUSCH	BSS	1

FUSS TABLE SEARCH POINTER

0003* THE ASSIGN ROUTINE IS USED BY THE BASIC STATEMENT EXECUTION PROCES
 0004* (PHASE III) TO PROCESS AN ASSIGN STATEMENT. THE PURPOSE OF THE ROU
 0005* TINE IS TO REPLACE THE INFORMATION CURRENTLY IN THE FILE CONTROL
 0006* BLOCK REFERENCED BY A SPECIFIED ORDINAL NUMBER WITH INFORMATION AB
 0007* THE NEW FILE BEING ASSIGNED TO THAT ORDINAL NUMBER, INPUT PARAMETE
 0008* TO THE ASSIGN ROUTINE ARE AS FOLLOWS:

0009*

0010* ASBFP: > TO BUFFER CONTAINING FILE NAME
 0011* ASNID: 0= USER LIBRARY, 1= SYSTEM LIBRARY, 2= GROUP LIBRARY
 0012* ORDNO: SPECIFIED ORDINAL NUMBER
 0013* FILTB: => FILE TABLE
 0014*

0015* THE CALLING SEQUENCE TO THE ASSIGN ROUTINE IS AS FOLLOWS:

0016*

0017* JSB SCHLB,I
 0018* DEF ASNIB
 0019* <EXIT FOR NON-EXISTENT FILE>
 0020* <EXIT FOR 'READ-ONLY' (GROUP OR SYSTEM LIB.) FILE>
 0021* <EXIT FOR 'READ-ONLY' (IN USE) FILE>
 0022* <NORMAL EXIT>

0023	75000		ORG LIBRA	
0024	75000	060273	LDA MLINK+1	GET USER ID AND STORE
0025	75001	040341	ADA .+?ID=?LINK	
0026	75002	160000	LDA 0,I	
0027	75003	070041	STA ASNID	
0028*				
0029	75004	013500	AND HI6	LOSE NUMERICS
0030	75005	070030	STA LTEMP	SAVE
0031	75006	060041	LDA ASNID	GET THE ID BACK
0032	75007	020030	XOR LTEMP	LOSE THE TOP
0033	75010	006400	CLB	SET UP FOR DIVISION
0034	75011	100400	DIV .100	PRODUCE GROUP
	75012	000437		
0035	75013	100200	MPY .100	LIBRARY ID
	75014	000437		
0036	75015	030030	IOR LTEMP	AND SAVE
0037	75016	070030	STA LTEMP	IN LTEMP
0038	75017	063512	LDA ASBFP	INITIALIZE INFORMATION
0039	75020	073510	STA ASBUF	BUFFER POINTER
0040*				
0041	75021	064041	ASN1 LDB ASNID	GET USER ID
0042	75022	061470	LDA ASTYP	GET LIBRARY INDICATOR
0043	75023	050353	CPA .+1	SYSTEM LIBRARY?
0044	75024	064612	LDB A000	YES
0045	75025	050354	CPA .+2	GROUP LIBRARY?
0046	75026	064030	LDB LTEMP	YES
0047	75027	177510	STB ASBUF,I	STORE CORRECT ID IN BUFFER
0048*				
0049	75030	061552	ASN2 LDA ORDNO	SAVE SPECIFIED
0050	75031	070037	STA ASORD	ORDINAL NUMBER
0051	75032	100200	MPY .+FTEL	SAVE POINTER
	75033	000371		
0052	75034	041504	ADA FILTB	TO FILE TABLE
0053	75035	070036	STA ASFCB	ENTRY
0054	75036	002004	INA	

0055	75037	164000	LDB 0,I	
0056	75040	004066	CLE,ELB	
0057	75041	004066	CLE,ELB	
0058	75042	005323	RBR,RBR	
0059	75043	077507	STB ASSAV	SAVE OLD RECORD SIZE
0060	75044	002041	SEZ,RSS	DID WRITE OCCUR ON OLD FILE?
0061	75045	027112	JMP ASN21	NO
0062	75046	064041	LDB ASNID	YES, SET UP
0063	75047	074030	STB LTEMP	LTEMP(0:3)
0064	75050	040364	ADA .+10	WITH OLD
0065	75051	164000	LDB 0,I	FILE NAME
0066	75052	074031	STB LTEMP+1	
0067	75053	002004	INA	
0068	75054	104200	DLD 0,I	
	75055	100000		
0069	75056	104400	DST LTEMP+2	
	75057	000032		
0070	75060	061556	LDA ASBFP	SAVE
0071	75061	164000	LDB 0,I	NEW FILENAME
0072	75062	074042	STB LTEMP+10	BEFORE SWAP
0073	75063	002004	INA	OCCURS
0074	75064	104200	DLD 0,I	
	75065	100000		
0075	75066	104400	DST LTEMP+11	
	75067	000043		
0076	75070	116005	JSB DLOKP,I	FIND DIRECTORY ENTRY FOR OLD FIL
0077	75071	002001	RSS	
0078	75072	027103	JMP ASN20	NOT FOUND
0079	75073	060034	LDA LTEMP+4	SAVE CURRENT
0080	75074	040360	ADA .+6	DIRECTORY
0081	75075	160000	LDA A,I	TRACK
0082	75076	172006	STA DIRWP,I	FOR DLOOK
0083	75077	060201	LDA DATIM	GET HOUR OF YEAR
0084	75100	064035	LDB LTEMP+5	AND UPDATE
0085	75101	044360	ADB .+6	'LAST CHANGE'
0086	75102	170001	STA 1,I	LOCATION
0087	75103	060042	ASN20 LDA LTEMP+10	GET
0088	75104	070031	STA LTEMP+1	
0089	75105	104200	DLD LTEMP+11	NEW
	75106	000043		
0090	75107	104400	DST LTEMP+2	
	75110	000032		
0091	75111	027122	JMP ASN22	
0092	75112	065556	ASN21 LDB ASBFP	
0093	75113	160001	LDA 1,I	FILE NAME
0094	75114	070031	STA LTEMP+1	
0095	75115	006004	INB	IN
0096	75116	104200	DLD 1,I	
	75117	100001		
0097	75120	104400	DST LTEMP+2	LTEMP(1:3)
	75121	000032		
0098	75122	163510	ASN22 LDA ASBUF,I	SET APPROPRIATE
0099	75123	070030	STA LTEMP	ID IN LTEMP
0100*				
0101	75124	116005	JSB DLOKP,I	SEARCH FOR FILE

0102	75125	006401	CLB,RSS	IF FOUND, CLEAR B
0103	75126	007400	CCB	IF NOT, B GETS =1
0104	75127	060034	LDA LTEMP+4	GET CURRENT
0105	75130	040360	ADA .+6	
0106	75131	160000	LDA A,I	DIRECTORY TRACK
0107	75132	152006	CPA DIRWP,I	SAME AS OTHER ONE?
0108	75133	027136	JMP ASN23	YES (SO NONE HAS BEEN WRITTEN)
0109	75134	002400	CLA	NO, SO UPDATED ONE HAS
0110	75135	172006	STA DIRWP,I	BEEN WRITTEN OUT
0111	75136	006003	ASN23 SZB,RSS	IF ENTRY WAS FOUND
0112	75137	027153	JMP ASN4	GO CHECK IT OUT
0113	75140	036435	ASN24 ISZ SCHLQ	
0114	75141	162006	ASN3 LDA DIRWP,I	IS THERE A CHANGED
0115	75142	002003	SZA,RSS	DIRECTORY TRACK IN CORE?
0116	75143	027161	JMP ASN26	NO
0117	75144	006400	CLB	YES, TELL DLOOK
0118	75145	176006	STB DIRWP,I	THERE ISN'T
0119	75146	064562	LDB LIBD	AND WRITE
0120	75147	016231	JSB DRUML	IT OUT
0121	75150	127504	JMP DLK9Q,I	BLEW IT, GO TRY TO SALVAGE
0122	75151	016247	ASN26 JSB RDPRG	
0123	75152	027476	JMP ASN14	
0124	75153	064035	ASN4 LDB LTEMP+5	IS THE
0125	75154	044354	ADB .+2	ENTRY WE
0126	75155	160001	LDA B,I	FOUND
0127	75156	002021	SSA,RSS	A FILE?
0128	75157	027140	JMP ASN24	NO, FAIL
0129	75160	044351	ADB .-1	YES, IS
0130	75161	160001	LDA B,I	IT PERCHANCE
0131	75162	002021	SSA,RSS	PROTECTED?
0132	75163	027171	JMP ASN25	NO, CONTINUE
0133	75164	044351	ADB .-1	YES, IS ITS
0134	75165	160001	LDA B,I	OWNER TRYING TO
0135	75166	050041	CPA ASNID	ACCESS IT?
0136	75167	006005	INB,RSS	YES
0137	75170	027140	JMP ASN24	NO, FAIL
0138	75171	044355	ASN25 ADB .+3	GET LOGICAL
0139	75172	160001	LDA B,I	RECORD SIZE
0140	75173	173510	STA ASBUF,I	AND SAVE IT
0141	75174	003004	CMA,INA	IS IT LARGER
0142	75175	043507	ADA ASSAV	THAN THE ALLOCATED
0143	75176	002020	SSA	BUFFER?
0144	75177	027141	JMP ASN3	YES, FAIL
0145	75200	036435	ISZ SCHLQ	NO
0146	75201	037510	ISZ ASBUF	
0147	75202	044355	ASN5 ADB .+3	PUT FILE'S DRUM ADDRESS
0148	75203	160001	LDA 1,I	IN BUFFER
0149	75204	173510	STA ASBUF,I	
0150	75205	006004	INB	
0151	75206	037510	ISZ ASBUF	
0152	75207	160001	LDA 1,I	PUT
0153	75210	173510	STA ASBUF,I	DISC
0154	75211	006004	INB	ADDRESS
0155	75212	037510	ISZ ASBUF	IN
0156	75213	160001	LDA 1,I	BUFFER

0157	75214	173510		STA ASBUF,I	
0158	75215	044354		ADB .+2	
0159	75216	037510		ISZ ASBUF	
0160	75217	164001		LDB 1,I	
0161	75220	060041		LDA ASNID	TEST FOR USER REFERENCE
0162	75221	050030		CPA LTEMP	TO PUBLIC FILE
0163	75222	002001		RSS	
0164	75223	045036		ADB BIT15	SET BIT 15 OF LENGTH IF IT IS
0165	75224	177510		STB ASBUF,I	STORE LENGTH IN BUFFER
0166	75225	016076		JSB DATE	GET DATE AND SET IN
0167	75226	064035		LDB LTEMP+5	PURGE LOCATION
0168	75227	044357		ADB .+5	
0169	75230	170001		STA 1,I	
0170	75231	002400		CLA	TELL DLOOK THAT NO DIRECTORY
0171	75232	172006		STA DIRWP,I	TRACK IS IN CORE AND
0172	75233	060034		LDA LTEMP+4	WRITE IT BACK
0173	75234	040360		ADA .+6	
0174	75235	160000		LDA 0,I	
0175	75236	064562		LDB LIBD	
0176	75237	016231		JSB DRUML	
0177	75240	127504		JMP DLK90,I	BLEW IT, TRY TO SALVAGE
0178*					
0179	75241	036435	ASN50	ISZ SCHLQ	FILE EXISTS--BUMP RETURN ADDRESS
0180	75242	060732		LDA M2000	INPUT FUSS TABLE
0181	75243	070072		STA WORD	
0182	75244	160540		LDA FUSS,I	
0183	75245	064566		LDB LIBDI	
0184	75246	016231		JSB DRUML	
0185	75247	116015		JSB SICKP,I	IT'S STUCK ON THE DRUM
0186*					
0187	75250	060273		LDA MLINK+1	DETERMINE USER #
0188	75251	043503		ADA ASN5P	
0189	75252	006400		CLB	
0190	75253	100400		DIV .+TTY01-TTY00	
	75254	000375			
0191	75255	001722		ALF,RAL	MULTIPLY USER# BY 32 AND
0192	75256	040562		ADA LIBD	ADD LIBD TO POINT TO USER'S
0193	75257	073505		STA ASUFS	
0194	75260	064037		LDB ASORD	SECTION OF FUSS
0195	75261	005000		BLS	
0196	75262	040001		ADA 1	SET POINTER TO FUSS
0197	75263	070040		STA ASNFS	ENTRY FOR THE
0198	75264	002400		CLA	SPECIFIED ORDINAL NO.
0199	75265	006400		CLB	
0200	75266	104400		DST ASNFS,I	ZERO OUT OLD FILE INFORMATION
	75267	100040			
0201*					
0202	75270	002400		CLA	SAY ENTRY NOT YET
0203	75271	073511		STA ASNIF	FOUND IN FUSS TABLE
0204*					
0205	75272	064562	ASN6	LDB LIBD	
0206	75273	063510		LDA ASBUF	
0207	75274	040350		ADA .-2	
0208	75275	160000		LDA 0,I	GET FIRST WORD OF DISC ADDRESS
0209	75276	057505	ASN7	CPB ASUFS	SKIP OVER

0210	75277	044412		ADB .+32	USERS OWN FUSS
0211	75300	054536		CPB L1024	ALL FUSS CHECKED?
0212	75301	027326		JMP ASN11	YES, NOT THERE
0213	75302	150001		CPA 1,I	TEST FOR THERE
0214	75303	027306		JMP ASN9	IT IS
0215	75304	044354		ADB .+2	BUMP FUSS POINTER
0216	75305	027276		JMP ASN7	LOOK AT NEXT ENTRY
0217*					
0218	75306	063510	ASN9	LDA ASBUF	
0219	75307	040351		ADA .-1	GET 2ND WORD OF ADDRESS
0220	75310	160000		LDA 0,I	
0221	75311	006004		INB	BUMP FUSS TO 2ND WORD
0222	75312	150001		CPA 1,I	ARE THEY EQUAL?
0223	75313	027316		JMP ASN10	YES
0224	75314	006004		INB	MOVE TO NEXT FUSS ENTRY
0225	75315	027273		JMP ASN6+1	RETURN TO CHECKING FUSS
0226*					
0227	75316		ASN10	EQU *	
0228	75316	077511		STB ASNIF	SET TO SAY "IN FUSS"
0229	75317	060041		LDA ASNID	IS THIS
0230	75320	010732		AND M2000	AN "A"
0231	75321	050612		CPA A000	USER?
0232	75322	027326		JMP ASN11	YES
0233	75323	163510		LDA ASBUF,I	SET DISC LENGTH TO SAY
0234	75324	031036		IOR BIT15	READ ONLY
0235	75325	173510		STA ASBUF,I	
0236*					
0237	75326	063510	ASN11	LDA ASBUF	
0238	75327	040350		ADA .-2	
0239	75330	160000		LDA 0,I	GET HIGH DISC ADDRESS
0240	75331	167510		LDB ASBUF,I	GET LENGTH
0241	75332	006021		SSB,RSS	IF READ ONLY,
0242	75333	027341		JMP ASN30	
0243	75334	031036		IOR BIT15	SET BIT 15 OF HIGH ADDRESS, AND
0244	75335	064041		LDB ASNID	SKIP 1 OR BOTH RETURN INCREM
0245	75336	054030		CPB LTEMP	DEPENDING ON REASON FOR
0246	75337	027344		JMP ASN31	
0247	75340	027345		JMP ASN32	
0248	75341		ASN30	EQU *	
0249	75341	067511		LDB ASNIF	READ=WRITE? WAS IT
0250	75342	006003		SZB,RSS	IN FUSS?
0251	75343	036435		ISZ SCHLQ	NO, BUMP TWICE
0252	75344		ASN31	EQU *	
0253	75344	036435		ISZ SCHLQ	
0254	75345		ASN32	EQU *	
0255	75345	067510		LDB ASBUF	
0256	75346	044351		ADB .-1	
0257	75347	164001		LDB 1,I	GET LOW ADDRESS IN B
0258	75350	104400		DST ASNFS,I	STORE NEW FUSS INFORMATION
		75351			
0259*					
0260	75352	160540		LDA FUSS,I	WRITE FUSS BACK TO DISC
0261	75353	064562		LDB LIBD	
0262	75354	016231		JSB DRUML	
0263	75355	116015		JSB SICKP,I	IT'S STUCK IN CORE

0264*				
0265	75356	016047	JSB RDRPG	READ USER'S PROGRAM BACK IN
0266	75357	067510	LDB ASBUF	
0267	75360	160001	LDA 1,1	GET LENGTH WORD
0268	75361	170036	STA ASFCB,I	AND STORE IT
0269	75362	034036	ISZ ASFCB	
0270	75363	044346	ADB .-4	
0271	75364	164001	LDB 1,1	GET NEW RECORD SIZE
0272	75365	174036	STB ASFCB,I	AND STORE IT
0273	75366	034036	ISZ ASFCB	
0274	75367	001665	ELA,CLE,ERA	REMOVE BIT 15 FROM LENGTH
0275	75370	040350	ADA .-2	COMPUTE RELATIVE
0276	75371	002016	SLA,INA,SZA	ADDRESS OF LAST
0277	75372	040351	ADA .-1	LOGICAL RECORD
0278	75373	007400	CCB	SET FIRST DISC ADDRESS WORD
0279	75374	174036	STB ASFCB,I	TO ALL ONES
0280	75375	067510	LDB ASBUF	GET
0281	75376	044347	ADB .-3	DRUM
0282	75377	164001	LDB 1,1	ADDRESS
0283	75400	006003	SZB,RSS	IS FILE SANCTIFIED?
0284	75401	027416	JMP ASN12	NO, FILL DOUBLE WORDS
0285	75402	034036	ISZ ASFCB	YES, BUMP FILE TABLE POINTER
0286	75403	001020	ALS,ALS	1 RECORD = 4 SECTORS
0287	75404	040001	ADA 1	COMPUTE DRUM ADDRESS OF LAST LOG
0288	75405	170036	STA ASFCB,I	RECORD AND STORE IN FILE TABLE
0289	75406	060036	LDA ASFCB	
0290	75407	040355	ADA .+3	
0291	75410	070036	STA ASFCB	INSERT ,SANCTIFIED, FLAG
0292	75411	003400	CCA	INTO HIGH WORD OF
0293	75412	170036	STA ASFCB,I	BASE ADDRESS
0294	75413	034036	ISZ ASFCB	INSERT BASE DRUM ADDRESS
0295	75414	174036	STB ASFCB,I	INTO LOW WORD
0296	75415	027442	JMP ASN13	
0297	75416	067510	ASN12 LDB ASBUF	NOT SANCTIFIED; GET ADDRESS
0298	75417	044350	ADB .-2	OF HIGH DISC ADDRESS
0299	75420	077506	STB ASSCH	AND SAVE IT
0300	75421	006004	INB	GET POINTER TO LOW DISC ADDRESS
0301	75422	000040	CLE	
0302	75423	140001	ADA 1,1	ADD RELATIVE LAST RECORD ADDRESS
0303	75424	167506	LDB ASSCH,I	B GETS HIGH DISC ADDRESS WORD
0304	75425	002040	SEZ	IF LOW ADDRESS OVERFLOWS,
0305	75426	006004	INB	ADD 1 TO HIGH PART
0306	75427	101100	SWP	STORE BOTH WORDS OF
0307	75430	104400	DST ASFCB,I	DISC ADDRESS
	75431	100036		
0308	75432	060036	LDA ASFCB	
0309	75433	040356	ADA .+4	
0310	75434	070036	STA ASFCB	
0311	75435	104200	OLD ASSCH,I	STORE BASE DISC ADDRESS
	75436	175506		
0312	75437	104400	DST ASFCB,I	INTO FILE TABLE
	75440	100036		
0313	75441	034036	ISZ ASFCB	ADJUST POINTER
0314	75442	060036	ASN13 LDA ASFCB	SET
0315	75443	040347	ADA .-3	'NULL RECORD'

0316	75444	065036	LDB	BIT15	CONDITION
0317	75445	174000	STB	0,I	
0318	75446	063510	LDA	ASBUF	
0319	75447	040346	ADA	,=4	
0320	75450	067507	LDB	ASSAV	
0321	75451	007004	CMB,	INB	COMPUTE DIFFERENCE BETWEEN
0322	75452	144000	ADB	0,I	OLD AND NEW BUFFER SIZES
0323	75453	034036	ISZ	ASFCB	
0324	75454	160036	LDA	ASFCB,I	
0325	75455	040001	ADA	1	ADJUST BUFFER
0326	75456	170036	STA	ASFCB,I	ADDRESS
0327	75457	034036	ISZ	ASFCB	
0328	75460	170036	STA	ASFCB,I	SET 'RECORD FULL' CONDITION
0329	75461	034036	ISZ	ASFCB	
0330	75462	002400	CLA		SET 'NO EOF EXIT'
0331	75463	170036	STA	ASFCB,I	CONDITION
0332	75464	034036	ISZ	ASFCB	
0333	75465	061556	LDA	ASBFP	MOVE
0334	75466	164000	LDB	0,I	FILE NAME
0335	75467	174036	STB	ASFCB,I	TO
0336	75470	002004	INA		FILE TABLE
0337	75471	034036	ISZ	ASFCB	
0338	75472	104200	DL0	0,I	
	75473	100000			
0339	75474	104400	DST	ASFCB,I	
	75475	100036			
0340*					
0341	75476		ASN14	EQU *	
0342	75476	016656	JSB	ABCHK	
0343	75477	026510	JMP	SCHBL	ALL DONE
0344	75500	176000	HI6	OCT 176000	
0345	75501	177400	HI8	OCT 177400	
0346	75502	177000	ASN28	DEC =512	
0347	75503	116635	ASN5P	ABS =TTY00=?LINK	
0348	00036		ASFCB	EQU LTEMP+6	
0349	00037		ASORD	EQU LTEMP+7	
0350	00040		ASNFS	EQU LTEMP+8	
0351	00041		ASNID	EQU LTEMP+9	
0352	75504	031173	DLK90	DEF DLOK9	
0353	75505	000000	ASUFS	BSS 1	
0354	75506	000000	ASSCH	BSS 1	
0355	75507	000000	ASSAV	BSS 1	
0356	75510	000000	ASBUF	BSS 1	
0357	75511	000000	ASNIF	BSS 1	CLEAR UNLESS FILE IN FUSS
0358	75512	075513	ASFBF	DEF ++1	
0359	75513	000000		BSS 6	
0360	75521		SASN	EQU *	

```

0362* THE CHAIN ROUTINE IS USED BY THE BASIC COMPILER TO PROCESS A CHAIN
0363* STATEMENT DURING PHASE III. THE PURPOSE OF THIS ROUTINE IS TO
0364* CHECK FOR THE REQUESTED PROGRAM ON THE USER'S PRIVATE LIBRARY OR
0365* ON THE PUBLIC LIBRARY (IF THE NAME IS PRECEDED BY A DOLLAR SIGN)
0366* OR ON THE GROUP LIBRARY (IF THE NAME IS PRECEDED BY A SNOWFLAKE).
0367* IF THE PROGRAM IS FOUND IT IS LOADED AND COMPILATION IS BEGUN.
0368 75000                ORG LIBRA
0369 75000 061502        LDA FCNTR          SET COUNTER TO
0370 75001 003000        CMA                    1'S COMPLEMENT OF
0371 75002 071502        STA FCNTR          NUMBER OF FILES
0372 75003 002004        INA                    PUT 2'S COMPLEMENT INTO
0373 75004 070034        STA CHNP          SAFE KEEPING FOR LCD
0374 75005 061232        LDA FCORE          LOAD FIRST BUFFER ADDRESS
0375 75006 065504        LDB FILTB          LOAD POINTER TO
0376 75007 044357        ADB ,+5            FIRST DISC ADDRESS (LOW WORD)
0377 75010 035502        CHN01 ISZ FCNTR      MORE FILES?
0378 75011 002001        RSS                    YES
0379 75012 027027        JMP CHAN0          NO--FINISHED DUMPING BUFFERS
0380 75013 075236        STB FBASE          WRITE
0381 75014 071647        STA RQ3            OUT
0382 75015 015516        JSB WRBUF          RECORD
0383 75016 065236        LDB FBASE
0384 75017 044365        ADB ,+FTEL-4
0385 75020 160001        LDA 1,I
0386 75021 001423        ALR,RAR
0387 75022 003004        CMA,INA
0388 75023 044361        ADB ,+7
0389 75024 140001        ADA 1,I
0390 75025 044347        ADB ,=3
0391 75026 027010        JMP CHN01
0392 75027 064273        CHAN0 LDB MLINK+1
0393 75030 044341        ADB ,+?ID=?LINK
0394 75031 074036        STB CHNI          => USER ID
0395 75032 044346        ADB ,=?ID        CAN THERE BE
0396 75033 160001        LDA B,I          FILES WHOSE
0397 75034 010444        AND DFCHK        LCD'S NEED
0398 75035 002003        SZA,RSS          UPDATING?
0399 75036 027044        JMP CHN17        NO
0400 75037 060034        LDA CHNP          GET NEGATIVE FILE COUNT
0401 75040 044356        ADB ,+?ID        AND ID POINTER
0402 75041 117431        JSB LCDP,I       GP UPDATE LCD'S
0403 75042 002001        RSS                    CORE NOT CHANGED (OVERWRITTEN)
0404 75043 016047        JSB RDRPG        RESTORE USER AREA
0405 75044 160036        CHN17 LDA CHNI,I     GET USER'S ID
0406 75045 070030        STA LTEMP        STORE IN LTEMP
0407 75046 060347        LDA ,=3
0408 75047 070034        STA CHNP
0409 75050 063425        LDA TWOSP
0410 75051 064520        LDB DLTEM
0411 75052                CHN00 EQU *
0412 75052 006004        INB                    INITIALIZE
0413 75053 170001        STA B,I            NAME TO
0414 75054 034034        ISZ CHNP          BLANKS
0415 75055 027052        JMP CHN00
0416 75056 002404        CLA,INA          ALLOW STRING

```

0417	75057	071472	STA EOL	CONSTANT
0418	75060	015336	JSB FORMX	EVALUATE STRING
0419	75061	060350	LDA ,=2	PREPARE
0420	75062	015344	JSB PSTR	STRING
0421	75063	071256	STA TEMP4	SAVE SOURCE POINTER
0422	75064	054351	CPB ,=1	NULL STRING?
0423	75065	027137	JMP CHAN4	YES
0424	75066	075410	STB TPRME	SAVE LENGTH
0425	75067	065256	LDB TEMP4	EXTRACT
0426	75070	004065	CLE,ERB	
0427	75071	160001	LDA B,I	FIRST
0428	75072	002041	SEZ,RSS	
0429	75073	001727	ALF,ALF	CHARACTER
0430	75074	010443	AND B377	
0431	75075	050416	CPA ,+44B	IS'?
0432	75076	027116	JMP CHAN2	YES
0433	75077	050424	CPA ,+52B	NO, 1+1?
0434	75100	002001	RSS	YES
0435	75101	027122	JMP CHAN3	NO
0436	75102	060030	LDA LTEMP	GET USER'S ID
0437	75103	010602	AND B1777	CONVERT
0438	75104	006400	CLB	IT
0439	75105	100400	DIV .100	TO
	75106	000437		
0440	75107	100200	MPY .100	ID
	75110	000437		
0441	75111	064000	LDB A	OF
0442	75112	060732	LDA M2000	GROUP
0443	75113	010030	AND LTEMP	LIBRARIAN
0444	75114	030001	IOR B	AND
0445	75115	002001	RSS	
0446	75116		CHAN2 EQU *	
0447	75116	060612	LDA A000	SET UP FOR PUBLIC LIBRARY
0448	75117	070030	STA LTEMP	SAVE ID
0449	75120	035256	ISZ TEMP4	BUMP SOURCE POINTER
0450	75121	035410	ISZ TPRME	BUMP LENGTH
0451	75122		CHAN3 EQU *	
0452	75122	061410	LDA TPRME	
0453	75123	040361	ADA ,+7	
0454	75124	002020	SSA	LENGTH > 6?
0455	75125	002400	CLA	YES, SET TO 6
0456	75126	040343	ADA ,=7	NO
0457	75127	071410	STA TPRME	
0458	75130	071406	STA TNULL	
0459	75131	060520	LDA DLTEM	
0460	75132	002004	INA	
0461	75133	001000	ALS	
0462	75134	071272	STA TEMP5	DESTINATION POINTER
0463	75135	061004	LDA FCUCA	UPPER CASE ONLY
0464	75136	015350	JSB TRSTR	TRANSFER STRING
0465	75137		CHAN4 EQU *	
0466	75137	007400	CCB	SET FLAG FOR NO LINE NUMBER
0467	75140	061613	LDA TEMP1	
0468	75141	051334	CPA PRGCT	END OF STATEMENT?
0469	75142	027147	JMP CHAN5	YES

0470	75143	015356	JSB	FETCH	NO, GET LINE NUMBER
0471	75144	015342	JSB	SBFIX	ROUND TO INTEGER
0472	75145	065032	LDB	DV8RS	ILLEGAL LINE NUMBER
0473	75146	006004	INB		READJUST
0474	75147		CHAN5	EQU *	
0475	75147	077426	STB	PKCNT	SAVE THE LINE NUMBER
0476	75150	061577	LDA	SPROG	
0477	75151	073427	STA	INWRD	
0478	75152	116005	JSB	DLOKP, I	SEARCH DIRECTORY FOR PROGRAM
0479	75153	002001	RSS		
0480	75154	027421	JMP	CHAN7	PROGRAM NOT FOUND
0481	75155	064035	LDB	CHNPD	CHECK ILL-STORED
0482	75156	044356	ADB	+.4	PROGRAM FLAG
0483	75157	160001	LDA	B, I	
0484	75160	002021	SSA, RSS		UNSUCCESSFULLY STORED?
0485	75161	027166	JMP	CHN14	NO, CONTINUE
0486	75162	160036	LDA	CHN1, I	GET USER'S ID
0487	75163	050030	CPA	LTEMP	DOES HE OWN THE PROGRAM?
0488	75164	036435	ISZ	SCHLQ	YES, BUMP TO ILL-STORED MESSAGE
0489	75165	027421	JMP	CHAN7	NO, PRINT NONEXISTENT PROGRAM
0490	75166	036435	CHN14	ISZ SCHLQ	PAST SECOND ERROR
0491	75167	036435	ISZ	SCHLQ	AND ERROR 2.5
0492	75170	044350	ADB	.-2	
0493	75171	160001	LDA	1, I	
0494	75172	002020	SSA		
0495	75173	027421	JMP	CHAN7	ENTRY IS A FILE
0496	75174	036435	ISZ	SCHLQ	PAST THIRD ERROR
0497*					
0498*	IF ENTRY IS ON DISC, START SEEK				
0499*					
0500	75175	044357	ADB	+.5	GET DRUM
0501	75176	160001	LDA	B, I	ADDRESS
0502	75177	002002	SZA		PROGRAM ON DRUM?
0503	75200	027207	JMP	CHN10	YES, DON'T BOTHER SEEKING
0504	75201	070215	STA	MWORD	STORE 0 WORD COUNT
0505	75202	060001	LDA	B	DISC ADDRESS ADDRESS
0506	75203	002004	INA		TO A REG
0507	75204	114212	JSB	DISCA, I	INITIATE SEEK
0508	75205	102030	HLT	30B	DRIVER BUSY
0509	75206	102031	HLT	31B	BLOCK OUT OF RANGE
0510*					
0511*	FOUND CORRECT ENTRY. FIRST CHECK TO SEE IF IT FITS				
0512*					
0513	75207	044344	CHN10	ADB .-6	=> FIRST WORD OF NAME
0514	75210	160001	LDA	B, I	MOVE PROTECTED BIT
0515	75211	070031	STA	LTEMP+1	TO SAFE PLACE
0516	75212	044354	ADB	+.2	=> THIRD WORD OF NAME
0517	75213	160001	LDA	1, I	SAVE SEMI-
0518	75214	070040	STA	LIBSC	COMPILED FLAG
0519	75215	006004	INB		
0520	75216	160001	LDA	1, I	SAVE START-OF-
0521	75217	001665	ELA, CLE, ERA		
0522	75220	070041	STA	LIBSP	PROGRAM POINTER
0523	75221	044361	ADB	+.7	GET PROGRAM LENGTH
0524	75222	160001	LDA	1, I	

0525	75223	070042	STA CHNLN	
0526	75224	003004	CMA, INA	COMPUTE FIRST
0527	75225	040041	ADA LIBSP	UNUSED WORD
0528	75226	070045	STA LIBPB	
0529	75227	003004	CMA, INA	COMPUTE NEGATIVE
0530	75230	064040	LDB LIBSC	
0531	75231	006021	SSB, RSS	SEMI-COMPILED?
0532	75232	027237	JMP CHN18	NO
0533	75233	040462	ADA LWAUS	
0534	75234	002021	SSA, RSS	
0535	75235	027246	JMP CHN11	OK
0536	75236	027242	JMP CHN19	TOO BIG
0537	75237		CHN18 EQU *	
0538	75237	040654	ADA LW97	TOTAL LENGTH
0539	75240	002021	SSA, RSS	COMPARE WITH MAX ALLOWED
0540	75241	027246	JMP CHN11	
0541	75242		CHN19 EQU *	
0542	75242	060214	LDA MBUSY	MAKE SURE
0543	75243	002020	SSA	DISC DRIVER
0544	75244	027242	JMP *-2	IS THROUGH
0545	75245	027421	JMP CHAN7	PROGRAM TOO LARGE
0546	75246		CHN11 EQU *	
0547	75246	036435	ISZ SCHLQ	PAST FOURTH ERROR
0548	75247	016076	JSB DATE	SET NEW DATE
0549	75250	064035	LDB CHNPD	INTO
0550	75251	044357	ADB .+5	DIRECTORY
0551	75252	170001	STA 1, I	
0552	75253	044354	ADB .+2	SET PROGRAM
0553	75254	160001	LDA B, I	DRUM ADDRESS
0554	75255	070044	STA CHND	
0555	75256	006004	INB	ALSO
0556	75257	104200	DLD B, I	DISC
	75260	100001		
0557	75261	104400	DST CHNDI	ADDRESS
	75262	000046		
0558	75263	160034	LDA CHNP, 1	WRITE DIRECTORY
0559	75264	070072	STA WORD	BACK TO
0560	75265	060034	LDA CHNP	DISC
0561	75266	040360	ADA .+6	
0562	75267	160000	LDA 0, I	
0563	75270	064562	LDB LIBD	
0564	75271	016231	JSB DRUML	
0565	75272	027415	JMP CHN16	CAN'T, GO SET UP FOR SALVAGE
0566	75273	064273	LDB MLINK+1	SET TO NULL PROGRAM
0567	75274	044340	ADB .+?PROG=?LINK	
0568	75275	160001	LOA B, I	SAVE CURRENT
0569	75276	070037	STA CHNC	PROGRAM BOUND
0570	75277	063427	LDA INWRD	
0571	75300	170001	STA 1, I	
0572	75301	016047	JSB RDPRG	READ IN FIXED AREA
0573	75302	064042	LDB CHNLN	
0574	75303	060044	LDA CHND	GET DRUM ADDRESS
0575	75304	002002	SZA	PROGRAM ON DRUM?
0576	75305	027327	JMP CHN12	YES, GO GET IT
0577	75306	074215	STB MWORD	NO!

0578	75307	064041	LDB LIBSP	
0579	75310	045036	ADB BIT15	READ
0580	75311	063424	LDA CHNDP	PROGRAM
0581	75312	114212	JSB DISCA, I	
0582	75313	027312	JMP *-1	
0583	75314	102031	HLT 31B	FROM
0584	75315	060214	LDA MBSY	
0585	75316	002020	SSA	
0586	75317	027315	JMP *-2	
0587	75320	002003	SZA, RSS	DISC
0588	75321	027334	JMP CHN13	
0589	75322	064273	CHN15 LDB MLINK+1	
0590	75323	044340	ADB ,+7PROG-7LINK	
0591	75324	060037	LDA CHNC	
0592	75325	170001	STA B, I	
0593	75326	027421	JMP CHAN7	
0594	75327	074072	CHN12 STB WORD	
0595	75330	064041	LDB LIBSP	=> START OF PROGRAM
0596	75331	045036	ADB BIT15	
0597	75332	016231	JSB DRUML	READ PROGRAM FROM DRUM
0598	75333	027322	JMP CHN15	
0599	75334	160036	CHN13 LDA CHNI, I	GET USER'S ID
0600	75335	034036	ISZ CHNI	TO FIRST WORD OF NAME
0601	75336	064031	LDB LTEMP+1	GET FIRST WORD
0602	75337	050030	CPA LTEMP	IF PROGRAM OWNER CLEAR
0603	75340	005665	ELB, CLE, ERB	RUN-ONLY BIT
0604	75341	174036	STB CHNI, I	STORE FIRST WORD OF NAME
0605	75342	034036	ISZ CHNI	BUMP POINTER TO NEXT WORD
0606	75343	104200	DLD LTEMP+2	GET LAST 2 WORDS OF NAME
	75344	000032		
0607	75345	104400	DST CHNI, I	STORE IN TABLE
	75346	100036		
0608	75347	036435	ISZ SCHLO	
0609	75350	016710	JSB SEMIC	
0610	75351	016655	JSB ABCHK	ABORT ATTEMPT?
0611*				
0612*	SET TO RUN			
0613*				
0614	75352	103100	CLF 0	
0615	75353	064257	LDB MAIN	
0616	75354	160001	LDA 1, I	DON'T ALLOW
0617	75355	030372	IOR UNABT	ABORTS
0618	75356	030445	IOR CHNFG	
0619	75357	170001	STA 1, I	DURING COMPILE
0620	75360	102100	STF 0	
0621	75361	065577	LDB SPROG	NULL
0622	75362	054055	CPB PBPTR	PROGRAM?
0623	75363	027404	JMP CHAN9	YES
0624	75364	061575	LDA SYMTB	
0625	75365	002003	SZA, RSS	UNCOMPILED?
0626	75366	060056	LDA PBPTR	YES, USE PBPTR
0627	75367	067426	LDB PKCNT	LINE NUMBER
0628	75370	006020	SSB	SPECIFIED?
0629	75371	027376	JMP CHAN6	NO
0630	75372	015314	JSB FNDPS	FIND REFERENCED STATEMENT

0631	75373	027404		JMP CHAN9	BAD LINE NUMBER
0632	75374	000000		NOP	
0633	75375	002001		RSS	
0634	75376		CHAN6	EQU *	
0635	75376	065577		LDB SPROG	DEFAULT LINE NUMBER
0636	75377	075334		STB PRGCT	SAVE FIRST STATEMENT
0637	75400	036435		ISZ SCHLQ	
0638	75401		CHAN8	EQU *	
0639	75401	060412		LDA .+40B	
0640	75402	071573		STA BLANK	
0641	75403	026510		JMP SCHBL	
0642	75404	016656	CHAN9	JSB ABCHK	
0643	75405	060445		LDA CHNFG	
0644	75406	003000		CMA	
0645	75407	064257		LDB MAIN	
0646	75410	103100		CLF 0	
0647	75411	110001		AND B,I	CLEAR CHAIN FLAG
0648	75412	170001		STA B,I	
0649	75413	102100		STF 0	
0650	75414	027401		JMP CHAN8	
0651	75415	164034	CHN16	LDB CHNP,I	
0652	75416	060034		LDA CHNP	
0653	75417	040360		ADA .+6	
0654	75420	116016		JSB SALVP,I	
0655	75421	016047	CHAN7	JSB RDPRG	READ BACK USER PROGRAM
0656	75422	016656		JSB ABCHK	ABORT ATTEMPT?
0657	75423	026510		JMP SCHBL	NO
0658	75424	000046	CHNDP	DEF CHNDI	
0659	75425	020040	TWOSP	ASC 1,	
0660	75426	000000	PKCNT	BSS 1	
0661	75427	000000	INWRD	BSS 1	
0662	75430	000000	INCHR	BSS 1	
0663	75431	073353	LCDP	DEF LCD	
0664	00034		CHNP	EQU LTEMP+4	
0665	00035		CHNPD	EQU LTEMP+5	
0666	00036		CHNI	EQU LTEMP+6	
0667	00037		CHNC	EQU LTEMP+7	
0668	00042		CHNLN	EQU LTEMP+10	
0669	00044		CHND	EQU LTEMP+12	
0670	00046		CHNDI	EQU LTEMP+14	
0671*		LTEMP+15		IS USED HERE ALSO	
0672	75432		SCHN	EQU *	

0002* THE SAVE COMMAND IS USED TO SAVE PROGRAMS IN THE USER LIBRARY.
 0003* THE PROCEDURE IS AS FOLLOWS:
 0004* 1) CHECK THAT PROGRAM IS LISTABLE (OR ID=A000), HAS A NAME,
 0005* AND ISN'T NULL,
 0006* 2) DECOMPILE,
 0007* 3) CHECK FOR IDT OR ADT OVERFLOW,
 0008* 4) CHECK FOR DUPLICATEDLY NAMED PROGRAM,
 0009* 5) UPDATE DIRECTORY,
 0010* 6) UPDATE IDT AND ADT,
 0011* 7) MOVE PROGRAM TO LIBRARY AREA,
 0012*
 0013* STEP 5 IS WRITTEN AS AN OVERLAY, WHICH IS CALLED WHENEVER THE PAR-
 0014* TICULAR DIRECTORY TRACK NEEDED IS ALREADY FULL, ITS JOB IS TO GAR-
 0015* BAGE COLLECT THE DIRECTORY TRACKS.

```

0017 75000          ORG LIBRA

0019 75000 064273   LDB MLINK+1   B=>LINK WORD.
0020 75001 044341   ADB .+?ID=?LINK  ID LOCN.
0021 75002 074050   STB MOVES
0022 75003 044351   ADB .+?PROG=?ID
0023 75004 074042   STB SAVP
0024 75005 044351   ADB .+?DISC=?PROG
0025 75006 074043   STB SAVD
0026 75007 104200   DLD MOVES,I     A=ID,B=1ST WORD OF NAME.
          75010 100050
0027 75011 006002   SZB             TEST FOR NO PROGRAM NAME
0028 75012 054570   CPB A9CBB
0029 75013 027557   JMP SAV3
0030 75014 164042   LDB SAVP,I     TEST FOR NULL PROGRAM.
0031 75015 060337   LDA .-11
0032 75016 054702   CPB PBUFF
0033 75017 027560   JMP SAV4
0034*
0035 75020 016047   JSB RDPRG     READ PROGRAM TO CORE.
0036 75021 064042   LDB SAVP     TEST FOR COMPILED.
0037 75022 044347   ADB .+?FLAG=?PROG
0038 75023 160001   LDA I,I
0039 75024 010354   AND CFLAG
0040 75025 002003   SAV0 SZA,RSS
0041 75026 027044   JMP SAV5     NOT COMPILED.
0042 75027 027043   JMP SAV5=1   ROOM FOR CSAVE CODE
0043 75030 000000   BSS 11
0044*
0045 75043 015322   JSB DCMPL     DECOMPILE IT.
0046 75044 065577   SAV5 LDB SPROG   COMMON
0047 75045 054702   CPB PBUFF     ALLOCATED?
0048 75046 015520   JSB ALCOM     NO->DO IT
0049 75047 064056   LDB PBPTR     RESET PROGRAM BOUND
0050 75050 174042   STB SAVP,I   INTO TABLE
0051 75051 007004   CMB,INB      COMPUTE #
0052 75052 045221   ADB USE      OF WORDS
0053 75053 074072   STB WORD
0054 75054 160043   LDA SAVD,I   GET DRUM ADDRESS
    
```

0055	75055	010317		AND M32	SET BACK TO SWAP
0056	75056	170043		STA SAVD,I	TRACK ORIGIN
0057	75057	065221		LDB USE	WRITE OUT
0058	75060	016231		JSB DRUML	TO DRUM
0059	75061	026071		JMP RDPRJ	GO DUMP THIS ILL-FATED USER
0060	75062	027106	SAV50	JMP SAV51	
0061	75063	000000		BSS 19	ROOM FOR CSAVE CODE
0062	75106	164042	SAV51	LDB SAVP,I	COMPUTE
0063	75107	007004		CMB,INB	PROGRAM
0064	75110	045577		ADB SPROG	LENGTH
0065	75111	074040		STB SAVWD	SAVE IN
0066	75112	101030		ASR 8	NEGATIVE WORDS AND
0067	75113	007004		CMB,INB	POSITIVE
0068	75114	076025		STB SAVLN	BLOCKS
0069	75115	065577		LDB SPROG	SAVE START-OF-
0070	75116	074042		STB SAVP	PROGRAM POINTER
0071*					
0072	75117	016107		JSB RDIDT	READ IN AN ID TRACK
0073	75120	044361		ADB .+7	GET DISC USED TO DATE.
0074	75121	160001		LDA 1,I	
0075	75122	042025		ADA SAVLN	GET TOTAL AMOUNT TO
0076	75123	003004		CMA,INA	USED AS A NEGATIVE QUANTITY
0077	75124	044351		ADB .-1	
0078	75125	000040		CLE	
0079	75126	140001		ADA 1,I	COMPARE WITH ALLOTMENT.
0080	75127	002040		SEZ	
0081	75130	027147		JMP SAV6	OK.
0082	75131	067134		LDB ++3	
0083	75132	060327	SAV9	LDA .-19	
0084	75133	026432		JMP LIBER	
0085	75134	075135		DEF ++1	
0086	75135	005114		OCT 5114	LF=L
0087	75136	044502		ASC 9,IBRARY	SPACE FULL
	75137	051101			
	75140	051131			
	75141	020123			
	75142	050101			
	75143	041505			
	75144	020106			
	75145	052514			
	75146	046040			
0088*					
0089*	SEARCH ADT FOR SPACE TO PUT THE PROGRAM.				
0090*					
0091	75147		SAV6	EQU *	
0092	75147	060342		LDA .-8	SET COUNT OF POSSIBLE DISK ADTS
0093	75150	070044		STA SAVDF	
0094	75151		SAVBA	EQU *	
0095	75151	062010		LDA RKCYP	GET CYCLIC POINTER
0096	75152	002004		INA	AND ADVANCE
0097	75153	053601		CPA EALNA	IT TO THE
0098	75154	063600		LDA EALCA	NEXT ENTRY
0099	75155	072010		STA RKCYP	IN THE TABLE
0100	75156	040362		ADA .+DADLN-DADLC	=> LENGTH WORD
0101	75157	070043		STA SAVD	

0102	75160	160043	LDA SAVD,I	IS THIS DISK AVAILABLE
0103	75161	002003	SZA,RSS	ZERO SEZ NO ADT TABLE
0104	75162	027207	JMP SAVBF	SO WE ADVANCE TO NEXT DISK
0105	75163	070072	STA WORD	OTHERWISE, SAVE LENGTH
0106	75164	162010	LDA RKCYP,I	GET DRUM ADDRESS OF ADT
0107	75165	064566	LDB LIBDI	
0108	75166	016231	JSB DRUML	READ IT IN
0109	75167	027207	JMP SAVBF	DRUM ERROR; IGNORE TRACK FOR NOW
0110	75170	007400	CCB	COMPUTE THE
0111	75171	160043	LDA SAVD,I	ENTRY
0112	75172	100400	DIV ,+3	COUNT
	75173	000355		
0113	75174	070041	STA SAVC	AND SAVE
0114	75175	064562	LDB LIBD	=> FIRST ENTRY
0115	75176	044354	ADB ,+2	=> LENGTH WORD
0116	75177		SAVBD EQU *	
0117	75177	160001	LDA B,I	TEST THIS ENTRY FOR BIG ENOUGH
0118	75200	003100	CMA,CLE	
0119	75201	042025	ADA SAVLN	
0120	75202	002041	SEZ,RSS	SKIP IF TOO SHORT
0121	75203	027244	JMP SAV7	GUTCHA
0122	75204	044355	ADB ,+3	ADVANCE TO NEXT ENTRY
0123	75205	034041	ISZ SAVC	DECREMENT ENTRY COUNT
0124	75206	027177	JMP SAVBD	PROCESS NEXT ENTRY
0125	75207		SAVBF EQU *	PROCESS NEXT TRACK
0126	75207	034044	ISZ SAVDF	TRIED ALL DISKS FOR ROOM?
0127	75210	027151	JMP SAVBA	NO, TRY THE NEXT ONE
0128*				
0129	75211		SAV23 EQU *	
0130	75211	060332	LDA ,=16	
0131	75212	067214	LDB ,+2	PRINT "SYSTEM OVERLOAD"
0132	75213	026432	JMP LIBER	
0133	75214	075215	DEF ,+1	
0134	75215	005123	OCT 5123	LF=S
0135	75216	054523	ASC 7,YSTEM OVERLOAD	
	75217	052105		
	75220	046440		
	75221	047526		
	75222	042522		
	75223	046117		
	75224	040504		
0136*				
0137	75225	060214	SAV12 LDA MBUSY	MAKE SURE
0138	75226	002020	SSA	DISC IS
0139	75227	027225	JMP ,=2	IDLE
0140	75230	060332	LDA ,=16	
0141	75231	067233	LDB ,+2	PRINT "DUPLICATE ENTRY"
0142	75232	026432	JMP LIBER	
0143	75233	075234	DEF ,+1	
0144	75234	005104	OCT 5104	LF=D
0145	75235	052520	ASC 7,UPPLICATE ENTRY	
	75236	046111		
	75237	041501		
	75240	052105		
	75241	020105		

	75242	047124			
	75243	051131			
0146*					
0147	75244		SAV7	EQU *	
0148	75244	062025		LDA SAVLN	SAVE
0149	75245	003004		CMA, INA	NEGATIVE NUMBER OF
0150	75246	140001		ADA B, I	SECTORS LEFT
0151	75247	070044		STA SAVDF	
0152	75250	044350		ADB .-2	SAVE LOCATION OF
0153	75251	074041		STB SAVC	DISK ADT ENTRY
0154	75252	104200		DLB B, I	GET DISK ADDRESS
	75253	100001			
0155	75254	104400		DST SAVDS	AND SAVE
	75255	000036			
0156	75256	006400		CLB	START SEEK
0157	75257	074215		STB MWORD	TO CORRECT
0158	75260	063603		LDA SAVDP	DISC (WITH A "C")
0159	75261	114212		JSB DISCA, I	ADDRESS
0160	75262	102030		HLT 30B	DRIVER BUSY: HALT
0161	75263	102031		HLT 31B	DISC NOT PRESENT: HALT
0162*					
0163	75264	002400		CLA	SET DRUM
0164	75265	070045		STA SAVDU	DRUM ADDRESS
0165	75266	060520		LDA DLTEM	MOVE ID/NAME ENTRY TO
0166	75267	070051		STA MOVED	LTEMP(0:3).
0167	75270	064346		LDB .-4	
0168	75271	016257		JSB MOVEW	
0169	75272	027275	SAV10	JMP SAV11	ROOM FOR CSAVE CODE
0170	75273	000000		BSS 2	
0171*					
0172	75275		SAV11	EQU *	
0173	75275	116005		JSB DLOKP, I	SEARCH FOR ENTRY
0174	75276	027225		JMP SAV12	ENTRY FOUND--ILLEGAL.
0175*					
0176	75277	164034		LDB SAV1, I	IF TRACK IS FULL, GO DO
0177	75300	054714		CPB M8184	OVERLAY SECTION.
0178	75301	027573		JMP SAV98	
0179*					
0180	75302	007000		CMB	SET UP SOURCE FOR
0181	75303	044562		ADB LIBD	MOVE.
0182	75304	074050		STB MOVES	
0183	75305	044366		ADB .+12	SET UP DESTINATION
0184	75306	074051		STB MOVED	
0185	75307	007000		CMB	COMPUTE LENGTH.
0186	75310	044402		ADB .+24	
0187	75311	044035		ADB SAVS	
0188	75312	016243		JSB MOVEB	
0189*					
0190	75313	060520		LDA DLTEM	MOVE 5 WORDS IN FOR
0191	75314	070050		STA MOVES	NEW ENTRY.
0192	75315	060035		LDA SAVS	
0193	75316	040366		ADA .+12	
0194	75317	070051		STA MOVED	
0195	75320	064346		LDB .-4	
0196	75321	016257		JSB MOVEW	

0197	75322	060042	LDA SAVP	STORE START-OF-
0198	75323	170051	STA MOVED, I	PROGRAM POINTER
0199	75324	016076	JSB DATE	STORE DATE IN ALSO,
0200	75325	034051	ISZ MOVED	
0201	75326	170051	STA MOVED, I	LAST REFERENCE DATE
0202	75327	034051	ISZ MOVED	
0203	75330	060201	LDA DATIM	GET HOUR OF YEAR
0204	75331	170051	STA MOVED, I	LAST CHANGE DATE
0205	75332	034051	ISZ MOVED	
0206	75333	002400	CLA	
0207	75334	170051	STA MOVED, I	CLEAR DRUM ADDRESS (WORD 7)
0208	75335	034051	ISZ MOVED	
0209	75336	104200	DLD SAVDS	GET DISK ADDRESS FOR
	75337	000036		
0210	75340	104400	DST MOVED, I	WORDS 8 AND 9
	75341	100051		
0211	75342	064051	LDB MOVED	
0212	75343	044355	ADB .+3	=> WORD 11
0213	75344	060040	LDA SAVWD	GET THE LENGTH WORD FOR
0214	75345	170001	STA B, I	WORD 11
0215*				
0216	75346	160034	LDA SAVI, I	ADJUST
0217	75347	040336	ADA .-12	DIRECTORY
0218	75350	170034	STA SAVI, I	LENGTH.
0219	75351	070072	STA WORD	
0220	75352	060034	LDA SAVI	WRITE DIRECTORY BACK OUT.
0221	75353	002004	INA	
0222	75354	070051	STA MOVED	
0223	75355	040357	ADA .+5	
0224	75356	160000	LDA 0, I	
0225	75357	064562	LDB LIBD	
0226	75360	074050	STB MOVES	
0227	75361	016231	JSB DRUML	WRITE OUT
0228	75362	116017	JSB DEADP, I	ERROR, FORGET IT
0229*				
0230	75363	064346	LDB .-4	RESET DIREC.
0231	75364	016257	JSB MOVEW	
0232*				
0233	75365		SAV21 EQU *	
0234	75365	016107	JSB RDIDT	READ IN THE IDT
0235	75366	044361	ADB .+7	
0236	75367	062025	LDA SAVLN	ADJUST AMOUNT
0237	75370	140001	ADA B, I	OF DISK SPACE USED
0238	75371	170001	STA 1, I	
0239*				
0240	75372	160076	LDA IDLCP, I	GET DRUM ADDRESS
0241	75373	064562	LDB LIBD	TO WRITE IDT BACK
0242	75374	016231	JSB DRUML	TO THE DRUM
0243	75375	116017	JSB DEADP, I	ERROR, FORGET IT
0244*				
0245*				
0246	75376	160043	LDA SAVD, I	FETCH THE LENGTH OF THE
0247	75377	070072	STA WORD	ADT TRACK
0248	75400	162010	LDA RKCYP, I	GET THE DRUM ADDRESS
0249	75401	064566	LDB LIBDI	AND READ IN THE

0250	75402	016231		JSB DRUML	
0251	75403	027425		JMP SAV30	ADT TRACK AGAIN CAN'T, MAKE IT DISAPPEAR
0252*					
0253	75404	064044		LDB SAVDF	
0254	75405	006002		SZB	ADT ENTRY COMPLETELY USED? NO, SHORTEN IT
0255	75406	027431		JMP SAVCF	
0256*					
0257	75407	064041		LDB SAVC	YES, REMOVE IT
0258	75410	074051		STB MOVED	
0259	75411	044355		ADB .+3	SET UP POINTERS FOR MOVE
0260	75412	074050		STB MOVES	
0261	75413	044674		ADB MLIBD	CALCULATE THE NEEDED WORD COUNT
0262	75414	044072		ADB WORD	
0263	75415	016257		JSB MOVEW	
0264*					
0265	75416	060355		LDA .+3	SHORTEN THE APPROPRIATE COUNTS
0266	75417	164043		LDB SAVD,I	
0267	75420	044000		ADB A	SHORTEN THE TABLE ENTRY
0268	75421	174043		STB SAVD,I	
0269	75422	040072		ADA WORD	AND THE DRUM DRIVER COUNT
0270	75423	070072		STA WORD	
0271	75424	027445		JMP SAVCG	
0272	75425	002400	SAV30	CLA	
0273	75426	170043		STA SAVD,I	ZERO LENGTH
0274	75427	172010		STA RKCP,I	ZERO ADDRESS
0275	75430	027451		JMP SAV31	
0276*					
0277	75431		SAVCF	EQU *	
0278	75431	104200		DLD SAVC,I	MOVE UP THE DISK ADDRESS
	75432	100041			
0279	75433	000040		CLE	
0280	75434	046025		ADB SAVLN	BY SAVLN BLOCKS
0281	75435	002040		SEZ	CHECK FOR OVERFLOW
0282	75436	002004		INA	
0283	75437	104400		DST SAVC,I	
	75440	100041			
0284	75441	064041		LDB SAVC	AND UPDATE THE COUNT
0285	75442	044354		ADB .+2	> LENGTH WORD
0286	75443	060044		LDA SAVDF	GET SAVED LENGTH
0287	75444	170001		STA B,I	AND PLUG IN
0288*					
0289	75445		SAVCG	EQU *	
0290	75445	162010		LDA RKCP,I	GET DRUM ADDRESS
0291	75446	064562		LDB LIBD	AND WRITE THE DISK ADT
0292	75447	016231		JSB DRUML	BACK TO THE DRUM
0293	75450	027425		JMP SAV30	CAN'T, MAKE IT DISAPPEAR
0294*					
0295	75451	016047	SAV31	JSB ROPRG	READ USER PROGRAM AGAIN
0296	75452	060040		LDA SAVWD	WRITE IT OUT.
0297	75453	070215		STA MWORD	TO LIBRARY
0298	75454	027477	SAV24	JMP SAV25	ROOM FOR CSAVE CODE
0299	75455	000000		BSS 10	
0300*					
0301	75477		SAV25	EQU *	
0302	75477	063603		LDA SAVDP	

0303 75500 064042
 0304 75501 114212
 0305 75502 027501
 0306 75503 102031
 0307 75504 060214
 0308 75505 002020
 0309 75506 027504
 0310 75507 002003
 0311 75510 026226
 0312*
 0313 75511 116005
 0314 75512 002001
 0315 75513 102032
 0316 75514 064035
 0317 75515 044356
 0318 75516 160001
 0319 75517 031036
 0320 75520 170001
 0321 75521 060034
 0322 75522 040360
 0323 75523 160000
 0324 75524 064562
 0325 75525 016231
 0326 75526 027553
 0327 75527 063605
 0328 75530 067532
 0329 75531 026432
 0330 75532 075533
 0331 75533 005125
 0332 75534 047123
 75535 052503
 75536 041505
 75537 051523
 75540 043125
 75541 046073
 75542 020113
 75543 044514
 75544 046040
 75545 040516
 75546 042040
 75547 051105
 75550 050105
 75551 040524
 75552 027040
 0333 75553 060034
 0334 75554 040360
 0335 75555 064072
 0336 75556 116016
 0337 75557 060332
 0338 75560 067562
 0339 75561 026432
 0340 75562 075563
 0341 75563 005116
 0342 75564 047440
 75565 050122

LDB SAVP
 JSB DISCA,I WRITE TO DISK
 JMP *-1 TRY AGAIN IF BUSY
 HLT 318 DISC NOT PRESENT; HALT
 LDA MBUSY WAIT FOR
 SSA TRANSFER TO
 JMP *-2 COMPLETE
 SZA,RSS TRANSFER SUCCESSFUL?
 JMP LLEND

 JSB DLOKP,I NO, GO GET DIRECTORY ENTRY AGAIN
 RSS FOUND IT
 HLT DEATH+32B NOT FOUND: TROUBLE
 LDB LTEMP+5 GET POINTER TO ENTRY
 ADB .+4 => END OF COMMON POINTER
 LDA B,I SET BIT 15 TO
 IOR BIT15 INDICATE BADLY SAVED
 STA B,I PROGRAM
 LDA LTEMP+4 WRITE OUT
 ADA .+6 DIRECTORY
 LDA A,I TRACK
 LDB LIBD
 JSB DRUML
 JMP SAV32 BLEW IT, TRY TO SALVAGE
 LDA SM31
 LDB **2
 JMP LIBER PRINT FAILURE
 DEF **1
 OCT 5125 LF=U
 ASC 15,NSUCCESSFUL; KILL AND REPEAT.

 SAV32 LDA LTEMP+4 GET POINTER TO
 ADA .+6 DRUM ADDRESS
 LDB WORD GET TRACK LENGTH
 JSB SALVP,I GO GRAB A NEW TRACK
 SAV3 LDA *-16
 SAV4 LDB **2
 JMP LIBER
 DEF **1
 OCT 5116 LF=N
 ASC 7,0 PROGRAM NAME

```

75566 047507
75567 051101
75570 046440
75571 047101
75572 046505
0343 75573 SAV98 EQU *
0344 75573 063604 LDA SM507 SET UP
0345 75574 070072 STA WORD OVERLAY.
0346 75575 163602 LDA SAVOV,I
0347 75576 064504 LDB #LIBI
0348 75577 027773 JMP SAV99
0349 75600 000115 EALCA DEF DADLC
0350 75601 000125 EALNA DEF DADLN
0351 75602 072044 SAVOV DEF SAVO+COM6=COM3
0352 75603 000036 SAVDP DEF SAVDS => DISK ADDRESS
0353 75604 177005 SM507 DEC =507
0354 75605 177741 SM31 DEC =31
0355*
0356 00034 SAVI EQU LTEMP+4
0357 00035 SAVS EQU LTEMP+5
0358 00036 SAVDS EQU LTEMP+6 6 & 7 ARE THE DISK ADDRESS
0359 00040 SAVWD EQU LTEMP+8 LENGTH IN WORDS OF PROGRAM
0360 00041 SAVC EQU LTEMP+9
0361 00042 SAVP EQU LTEMP+10
0362 00043 SAVD EQU LTEMP+11
0363 00044 SAVDF EQU LTEMP+12
0364 00045 SAVDU EQU LTEMP+13
0365 74025 SAVLN EQU T35CQ
0366*
0367*
0368 75773 ORG LIBRA+507
0369 75773 SAV99 EQU *
0370 75773 016231 JSB DRUML CALL IN OVERLAY
0371 75774 116015 JSB SICKP,I BLEW IT, GO HOME QUIETLY
0372 75775 027000 JMP LIBRA
0373 75776 027365 JMP SAV21 NORMAL RETURN
0374 75777 027211 JMP SAV23 ERROR RETURN
0375 76000 $$AV EQU *

```

0377* THE CSAVE COMMAND IS USED TO SAVE PROGRAMS IN THE USER LIBRARY
 0378* IN SEMI-COMPILED FORM. CSAVE BORROWS CODE FROM SAVE AND MUST
 0379* FOLLOW IT.

```

0380*
0381 75000          ORG LIBRA
0382 75000 064273   LDB MLINK+1
0383*
0384 75025          ORG SAV0
0385 75025 002002   SZA          COMPILED?
0386 75026 027042   JMP CSAV1     YES
0387 75027 065577   LDB SPROG    NO, COMMON
0388 75030 054702   CPB PBUFF   ALLOCATED?
0389 75031 015520   JSB ALCOM   NO=DO IT
0390 75032 065577   LDB SPROG   SET PROGRAM
0391 75033 075334   STB PRGCT   COUNTER
0392 75034 060412   LDA ,+40B   TURN ON
0393 75035 071573   STA BLANK   BLANK SUPPRESSION
0394 75036 002400   CLA        CLEAR OUT-OF
0395 75037 071575   STA SYMTB   STORAGE FLAG
0396 75040 127041   JMP ++1,I   GO COMPILE IT
0397 75041 036071   DEF CMP00
0398 75042 061230   CSAV1 LDA SPTR
0399 75043 002002   SZA
0400 75044 015522   JSB RSTPT   SEMI-COMPILED?
0401 75045 002400   CSAV2 CLA   RESTORE SYMBOL TABLE POINTERS
0402 75046 071230   STA SPTR   FLAG AS
0403 75047 065504   LDB FILTB   SEMI-COMPILED
0404*
0405 75062          ORG SAV50
0406 75062 065504   LDB FILTB
0407 75063 044361   ADB ,+7
0408 75064 007004   CMB,INB
0409 75065 044462   ADB LWAUS
0410 75066 006021   SSB,RSS    TOO BIG?
0411 75067 027105   JMP CSAV4   NO
0412 75070 060330   LDA ,=18   YES
0413 75071 067073   LDB ++2
0414 75072 026432   JMP LIBER
0415 75073 075074   DEF ++1
0416 75074 005120   OCT 5120   LF=P
0417 75075 051117   ASC 8,ROGRAM TOO LARGE
      75076 043522
      75077 040515
      75100 020124
      75101 047517
      75102 020114
      75103 040522
      75104 043505
0418 75105          CSAV4 EQU +
0419 75105 065504   LDB FILTB
0420 75106 044361   ADB ,+7
0421*
0422 75272          ORG SAV10
0423 75272 060033   LDA LTEMP+3 FLAG NAME
0424 75273 031036   IOR BIT15   TO INDICATE

```

0425	75274	070033	STA	LTEMP+3	SEMI-COMPILED
0426*					
0427	75454		ORG	SAV24	
0428	75454	061504	LDA	FILTB	=> FIRST WORD AFTER SYMBOL TABLE
0429	75455	065575	LDB	SYMTB	SAVE END-OF
0430	75456	174000	STB	0,I	PROGRAM POINTER
0431	75457	002004	INA		
0432	75460	065606	LDB	FILCT	SAVE # OF
0433	75461	174000	STB	0,I	<FILES STATEMENTS>
0434	75462	064452	LDB	DFILT	SAVE
0435	75463	075605	STB	FILPT	
0436	75464	064346	LDB	=4	
0437	75465	075230	STB	SPTR	POINTERS
0438	75466	002004	CSAV3	INA	
0439	75467	165605	LDB	FILPT,I	
0440	75470	174000	STB	0,I	TO <FILES
0441	75471	035605	ISZ	FILPT	
0442	75472	035230	ISZ	SPTR	
0443	75473	027466	JMP	CSAV3	STATEMENTS>
0444	75474	002004	INA		SAVE
0445	75475	065607	LDB	USE3N	'USING
0446	75476	174000	STB	0,I	'SEEN' FLAG

```

0002* THE SAVE OVERLAY ROUTINE IS CALLED BY THE SAVE AND OPEN ROUTINES
0003* * WHENEVER THEY WANT TO MAKE A DIRECTORY ENTRY ON A TRACK THAT IS
0004* ALREADY FULL. THE FOLLOWING LOCATIONS MUST BE APPROPRIATELY SET:
0005*     LTEMP(0:3)=1ST 4 WORDS OF ENTRY.
0006*     LTEMP(4:5)=SAME AS LEFT BY DLODIC
0007*     LTEMP(6:7)=DISC ADDRESS
0008*     LTEMP(13)=DRUM ADDRESS
0009*     LTEMP(8)=WORD COUNT
0010*     LTEMP(10)=START OF PROGRAM POINTER OR RECORD SIZE
0011 75000          ORG LIBRA
0012*
0013 75000 063651      LDA SDIR0          GET FIRST DIRECTORY TRACK PTR
0014*
0015* COMPUTE TOTAL # OF WORDS IN DIRECTORIES.
0016*
0017 75001 040360      ADA .+6           => DIRECTORY DRUM ADDRESS
0018 75002 164000      SUP1 LDB 0,I       GET IT IN B,
0019 75003 040344      ADA .-6
0020 75004 006003      SZB,RSS          TEST FOR NONEXIST ENT DIRECTORY.
0021 75005 027020      JMP SUP2
0022 75006 164000      LDB 0,I       GET DIRECTORY LENGTH.
0023 75007 006103      CLE,SZB,RSS     LENGTH ZERO?
0024 75010 027017      JMP SUP2-1     YES
0025 75011 047657      ADB SUPS       ADD TO
0026 75012 077657      STB SUPS       TOTAL.
0027 75013 067656      LDB SUPS-1
0028 75014 002041      SEZ,RSS          INCREMENTING DOUBLE WORD QUANTIT
0029 75015 044351      ADB .-1
0030 75016 077656      STB SUPS-1
0031 75017 037661      ISZ SUPB       BUMP DIRECTORY TRACK COUNTER.
0032 75020          SUP2 EQU *
0033 75020 053652      CPA SDIRL     LAST DIRECTORY TRACK?
0034 75021 027024      JMP ++3      YES
0035 75022 040367      ADA .+13     NO==GO TO NEXT ONE.
0036 75023 027002      JMP SUP1
0037*
0038 75024 063657      LDA SUPS       GET TOTAL # OF DIRECTORY WORDS.
0039 75025 067655      LOB SUPS-1
0040 75026 100400      DIV .+12     GET ENTRY COUNT IN A
0041 75030 007400      CCB
0042 75031 100400      DIV SUPB     COUNT < 65535
0043 75033 053644      CPA M682     COMPUTE # IN EACH DIRECTORY.
0044 75034 006003      SZB,RSS     TEST FOR FULL UP.
0045 75035 053645      CPA M683
0046 75036 027634      JMP SUP3
0047 75037 040351      ADA .-1
0048 75040 073657      STA SUPS     INCREASE # OF ENTRIES/TRACK BY 1
0049 75041 044351      ADB .-1     AND SAVE IN S.
0050 75042 077661      STB SUPB     LET B COUNT HOW MANY WILL HAVE
0051*                                     THIS LARGER SIZE.
0052 75043 067651      LDB SDIR0     GET POINTER TO FIRST TRACK AGAIN
0053 75044 044360      ADB .+6     POINT TO ITS DISC ADDRESS.
0054 75045 160001      SUP4 LDA 1,I

```

0055	75046	002003		SZA, RSS	IF 0 DON'T GIVE IT ANYTHING,
0056	75047	027060		JMP SUP5	
0057	75050	037661		ISZ SUPB	TEST FOR ANY MORE BIG TRACKS,
0058	75051	002001		RSS	YES--DON'T SWITCH,
0059	75052	037657		ISZ SUPS	SWITCH TO SMALLER SIZE
0060	75053	063657		LDA SUPS	GET # OF ENTRIES ON TRACK,
0061	75054	001020		ALS, ALS	CONVERT
0062	75055	073656		STA SUPS-1	* 4
0063	75056	001000		ALS	TO WORDS,
0064	75057	043656		ADA SUPS-1	* 12
0065	75060	173662	SUP5	STA SUPP, I	STORE IN TABLE,
0066	75061	044344		ADB ,=6	TEST FOR DONE,
0067	75062	057652		CPB SDIRL	
0068	75063	027067		JMP SUP6	
0069	75064	044367		ADB ,+13	BUMP TO NEXT TRACK,
0070	75065	037562		ISZ SUPP	BUMP TABLE POINTER ALSO,
0071	75066	027045		JMP SUP4	
0072*	TABLE NN NOW CONTAINS THE NEW LENGTHS OF THE 4 DI-				
0073*	RECTORY TRACKS,				
0074*					
0075	75067	063641	SUP6	LDA DEFNN	SET UP POINTER
0076	75070	073662		STA SUPP	TO NN AGAIN,
0077*					
0078*	SQUEEZE ALL THE DIRECTORY ENTRIES ONTO THE LASTMOST OF THE				
0079*	AVAILABLE TRACKS,				
0080*					
0081	75071	063652		LDA SDIRL	=> 1ST TRACK
0082	75072	073664		STA SUPK1	FOR READ
0083	75073	040360		ADA ,+6	
0084	75074		SUP20	EQU *	
0085	75074	164000		LDB A, I	GET ADDRESS
0086	75075	006002		SZB	ZERO?
0087	75076	027101		JMP SUP21	NO
0088	75077	040343		ADA ,=7	YES
0089	75100	027074		JMP SUP20	
0090	75101		SUP21	EQU *	
0091	75101	040344		ADA ,=6	=> 1ST TRACK
0092	75102	073666		STA SUPL1	FOR WRITE
0093	75103	002400		CLA	# OF WORDS
0094	75104	073665		STA SUPK2	IN BUFFER
0095*					
0096	75105	063564		LDA SUPK1	
0097	75106		SUP22	EQU *	
0098	75106	164000		LDB A, I	GET LENGTH FOR READ
0099	75107	006003		SZB, RSS	ZERO?
0100	75110	027237		JMP SUP27	YES
0101	75111	047665		ADB SUPK2	NO, ADD IN # OF WORDS IN BUFFER
0102	75112	047647		ADB \$8184	
0103	75113	006020		SSB	>8184?
0104	75114	027146		JMP SUP23	YES
0105	75115	164000		LDB A, I	NO, SET
0106	75116	074072		STB WORD	LENGTH
0107	75117	047665		ADB SUPK2	UPDATE # OF
0108	75120	077665		STB SUPK2	WORDS IN CORE
0109	75121	044530		ADB LULEN	

0110	75122	045036	ADB BIT15	CORE ADDRESS
0111	75123	040360	ADA .+6	
0112	75124	160000	LDA A,I	DRUM ADDRESS
0113	75125	016231	JSB DRUML	
0114	75126	116017	JSB DEADP,I	
0115*				
0116	75127	063665	LDA SUPK2	
0117	75130	050714	CPA M8184	EXACTLY 8104 WORDS?
0118	75131	002001	RSS	YES
0119	75132	027237	JMP SUP27	NO
0120	75133	070072	STA WORD	
0121	75134	067666	LDB SUPL1	SET LENGTH
0122	75135	170001	STA B,I	IN DIREC
0123	75136	044360	ADB .+6	
0124	75137	160001	LDA B,I	DRUM ADDRESS
0125	75140	067650	LDB X2056	CORE ADDRESS
0126	75141	016231	JSB DRUML	
0127	75142	116017	JSB DEADP,I	
0128	75143	006400	CLB	BUFFER NOW EMPTY
0129	75144	077665	STB SUPK2	
0130	75145	027226	JMP SUP24	
0131*				
0132	75146		SUP23 EQU *	
0133	75146	007004	CMB,INB	
0134	75147	005121	BRS,BRS	COMPUTE
0135	75150	005121	BRS,BRS	# OF
0136	75151	005121	BRS,BRS	EXTRA
0137	75152	077671	STB SUPES	SECTORS
0138	75153	005700	BLF	# OF
0139	75154	005222	RBL,RBL	EXTRA
0140	75155	077670	STB SUPEX	WORDS
0141	75156	144000	ADB A,I	# OF WORDS
0142	75157	074072	STB WORD	TO READ
0143	75160	047665	ADB SUPK2	
0144	75161	044530	ADB LULEN	
0145	75162	074050	STB MOVES	
0146	75163	045036	ADB BIT15	CORE ADDRESS
0147	75164	040360	ADA .+6	
0148	75165	160000	LDA A,I	DRUM ADDRESS
0149	75166	043671	ADA SUPES	
0150	75167	016231	JSB DRUML	
0151	75170	116017	JSB DEADP,I	
0152*				
0153	75171	060714	LDA M8184	# OF WORDS
0154	75172	070072	STA WORD	TO WRITE
0155	75173	067666	LDB SUPL1	
0156	75174	170001	STA B,I	SAVE IN DIREC
0157	75175	044360	ADB .+6	
0158	75176	160001	LDA B,I	DRUM ADDRESS
0159	75177	067650	LDB X2056	CORE ADDRESS
0160	75200	016231	JSB DRUML	
0161	75201	116017	JSB DEADP,I	
0162*				
0163	75202	067650	LDB X2056	# OF
0164	75203	007004	CMB,INB	EXTRA

0165	75204	044050	ADB MOVES	WORDS
0166	75205	077665	STB SUPK2	TO MOVE
0167	75206	060530	LDA LULEN	
0168	75207	040001	ADA B	
0169	75210	070051	STA MOVED	DESTINATION POINTER
0170	75211	016257	JSB MOVEW	MUVE THEM
0171*				
0172	75212	067670	LDB SUPEX	# OF WORDS
0173	75213	007004	CMB, INB	TO READ FROM
0174	75214	074072	STB WORD	PARTIAL TRACK
0175	75215	047665	ADB SUPK2	
0176	75216	077665	STB SUPK2	# OF WORDS IN BUFFER
0177	75217	044530	ADB LULEN	
0178	75220	045036	ADB BIT15	CORE ADDRESS
0179	75221	063664	LDA SUPK1	
0180	75222	040360	ADA .+6	
0181	75223	160000	LDA A, I	DRUM ADDRESS
0182	75224	016231	JSB DRUML	
0183	75225	116017	JSB DEADP, I	
0184*				
0185	75226		SUP24 EQU *	
0186	75226	003400	CCA	BUMP TO NEXT
0187	75227	043666	ADA SUPL1	TRACK TO WRITE
0188	75230		SUP25 EQU *	
0189	75230	164000	LDB A, I	GET ADDRESS
0190	75231	006002	SZB	ZERO?
0191	75232	027235	JMP SUP26	NO
0192	75233	040343	ADA .-7	YES, MOVE TO NEXT ONE
0193	75234	027230	JMP SUP25	
0194	75235		SUP26 EQU *	
0195	75235	040344	ADA .-6	BUMP TO LENGTH WORD
0196	75236	073666	STA SUPL1	SAVE POINTER
0197*				
0198	75237		SUP27 EQU *	
0199	75237	063664	LDA SUPK1	=> CURRENT READ TRACK
0200	75240	053651	CPA SDIR0	LAST ONE
0201	75241	027245	JMP SUP28	YES
0202	75242	040343	ADA .-7	NO, BUMP TO NEXT ONE
0203	75243	073664	STA SUPK1	
0204	75244	027106	JMP SUP22	
0205	75245		SUP28 EQU *	
0206*				
0207	75245	063665	LDA SUPK2	# OF WORDS IN BUFFER
0208	75246	002003	SZA, RSS	ZERO?
0209	75247	027266	JMP SUP30	YES
0210	75250	070072	STA WORD	NO, MUST WRITE OUT BUFFER
0211	75251	067666	LDB SUPL1	SET LENGTH
0212	75252	170001	STA B, I	IN DIREC
0213	75253	044360	ADB .+6	
0214	75254	160001	LDA B, I	DRUM ADDRESS
0215	75255	064072	LDB WORD	
0216	75256	044530	ADB LULEN	CORE ADDRESS
0217	75257	016231	JSB DRUML	
0218	75260	116017	JSB DEADP, I	
0219*				

```

0220 75261 063666          LDA SUPL1
0221 75262                SUP29 EQU *
0222 75262 053651          CPA SDIR0      LAST WRITE TRACK?
0223 75263 027277          JMP SUP31      YES, DONE
0224 75264 040343          ADA ,=7          NO, BUMP TO NEXT ONE
0225 75265 002001          RSS
0226 75266                SUP30 EQU *
0227 75266 063666          LDA SUPL1
0228 75267 040360          ADA ,+6
0229 75270 164000          LDB A,I        GET ADDRESS
0230 75271 040344          ADA ,=6
0231 75272 006003          SZB,RSS       ZERO?
0232 75273 027262          JMP SUP29      YES
0233 75274 006400          CLB           NO, SET
0234 75275 174000          STB A,I        LENGTH =0
0235 75276 027262          JMP SUP29
0236*
0237* THE MAIN PART OF THE ALGORITHM CONSISTS OF TWO SECTIONS. IN THE
0238* FIRST SECTION WE READ AS POSSIBLE INTO THE SWAP AREA. IN THE 2ND
0239* SECTION WE WRITE OUT AS MUCH AS POSSIBLE. THE ENTIRE PROCEDURE IS
0240* THEN REPEATED UNTIL WE ARE FINISHED. THE FOLLOWING MEANINGS ARE
0241* ASSOCIATED WITH THESE VARIABLES:
0242*
0243* SUPK1=>DIREC ENTRY FOR TRACK BEING READ.
0244* SUPL1=>DIREC ENTRY FOR TRACK BEING WRITTEN.
0245* SUPK2=# OF WORDS READ SO FAR FROM K1.
0246* SUPL2=# OF WORDS WRITTEN SO FAR ON L1.
0247* SUP  =# OF WORDS IN CORE.
0248* SUPP => =# OF WORDS TO BE WRITTEN ON L1.
0249*
0250 75277                SUP31 EQU *
0251 75277 002400          CLA           INITIALIZE
0252 75300 073665          STA SUPK2      LENGTH
0253 75301 073667          STA SUPL2      WORDS
0254 75302 063651          LDA SDIR0      INITIALIZE
0255 75303 073664          STA SUPK1      DIREC
0256 75304 073666          STA SUPL1      POINTERS
0257*
0258 75305 063667          SUP7  LDA SUPL2      IS # OF WORDS WRITTEN SO FAR ON
0259 75306 003004          CMA,INA      L1=# OF WORDS TO BE WRITTEN?
0260 75307 153662          CPA SUPP,I
0261 75310 027502          JMP SUP10      YES--GO ADVANCE L19
0262*
0263 75311 063660          SUP8  LDA SUP           IS THE SWAP AREA FULL
0264 75312 043655          ADA STLE
0265 75313 002021          SRA,RSS
0266 75314 027513          JMP SUP11      YES--GO TO WRITE SECTION.
0267 75315 070072          STA WORD      NO--SAVE =# OF COREWORDS AVAIL.
0268 75316 067664          LDB SUPK1      HAVE WE READ ALL OF THE TRACKS?
0269 75317 057653          CPB SDIRU
0270 75320 027513          JMP SUP11      YES--GO TO WRITE SECTION.
0271 75321 163664          LDA SUPK1,I   A=# OF WORDS ON THIS TRACK.
0272 75322 043665          ADA SUPK2      A=# NOT READ YET.
0273 75323 002002          SZA          ENTIRE TRACK READ?
0274 75324 027331          JMP SUP9        NO.

```

0275	75325	044361	ADB ,+7	YES==BUMP K1 TO NEXT TRACK.
0276	75326	077664	STB SUPK1	
0277	75327	073665	STA SUPK2	SET # OF WORDS READ TO 0.
0278	75330	027311	JMP SUP8	TEST THIS TRACK.
0279*				
0280	75331	070001	SUP9 STA 1	B=# OF WORDS NOT YET READ ON K1
0281	75332	007004	CMB,INB	MAKE POSITIVE.
0282	75333	044072	ADB WORD	IS # OF WORDS ON TRACK > # OF
0283	75334	006020	SSB	WORDS WE HAVE ROOM FOR?
0284	75335	027341	JMP ++4	NO==READ IN ENTIRE TRACK.
0285	75336	060072	LDA WORD	GET=# WE HAVE ROOM FOR.
0286	75337	040734	ADA B77	REDUCE TO NEXT SMALLER
0287	75340	010610	AND M64	SECTOR SIZE.
0288	75341	002003	SZA,RSS	IF WE CAN'T READ IN ANY, GO TO
0289	75342	027513	JMP SUP11	WRITE SECTION.
0290*				
0291	75343	070072	STA WORD	SET WORD = # OF WORDS TO READ.
0292	75344	063665	LDA SUPK2	GET # OF WORDS READ SO FAR.
0293	75345	006400	CLB	DIVIDE BY 64 TO GET
0294	75346	101026	ASR 6	SECTOR ADDRESS.
0295	75347	067664	LDB SUPK1	GET DIRECTORY
0296	75350	044360	ADB ,+6	TRACK ADDRESS.
0297	75351	140001	ADA 1,I	
0298	75352	064566	LDB LIBDI	COMPUTE CORE LOCATION
0299	75353	047660	ADB SUP	TO READ INTO.
0300	75354	016231	JSB DRUML	READ IT IN
0301	75355	116017	JSB DEADP,I	DRUM ERROR, FORGET IT
0302*				
0303	75356	064072	LDB WORD	UPDATE # OF WORDS
0304	75357	007004	CMB,INB	IN CORE.
0305	75360	047660	ADB SUP	
0306	75361	077660	STB SUP	
0307	75362	064072	LDB WORD	UPDATE # OF WORDS
0308	75363	007004	CMB,INB	READ FROM K1.
0309	75364	047665	ADB SUPK2	
0310	75365	077665	STB SUPK2	
0311*				
0312	75366	063563	LDA SUPTG	HAVE WE INSERTED THE NEW ENTRY
0313	75367	002002	SZA	YET?
0314	75370	027311	JMP SUP8	YES==GO TRY TO READ MORE.
0315	75371	063667	LDA SUPL2	GET THE AMOUNT ALREADY WRITTEN
0316	75372	006400	CLB	ON THIS TRACK
0317	75373	100400	DIV ,+12	FIND EXCESS OVER EVEN ENTRY
	75374	000366		
0318	75375	060001	LDA B	
0319	75376	007004	CMB,INB	
0320	75377	077670	STB SUPEX	
0321	75400	043660	ADA SUP	GET THE COUNT
0322	75401	006400	CLB	OF WORDS IN CORE
0323	75402	100400	DIV ,+12	CONVERT TO ENTRY COUNT
	75403	000366		
0324	75404	100200	MPY ,+12	AND BACK TO WORD COUNT
	75405	000366		
0325	75406	040562	ADA LIBD	SO THAT WE LOOK AT
0326	75407	043670	ADA SUPEX	AN EVEN BOUNDARY

0327	75410	006003	SZB,RSS	
0328	75411	040336	ADA .-12	
0329	75412	073670	STA SUPEX	
0330	75413	064520	LDB DLTEM	=> ID/NAME OF NEW ENTRY
0331	75414	117654	JSB DIRCS,I	GO COMPARE
0332	75415	027311	JMP SUP8	DOESN'T GO ON THIS TRACK
0333	75416		SUP32 EQU *	
0334	75416	067670	LDB SUPEX	GOES ON THIS
0335	75417	077671	STB SUPES	TRACK, SO
0336	75420	044336	ADB .-12	SEARCH BACKWARDS
0337	75421	077670	STB SUPEX	TO FIND
0338	75422	044674	ADB MLIBD	
0339	75423	006020	SSB	NO SKIP IF SEARCH DONE
0340	75424	027431	JMP SUP33	
0341	75425	067670	LDB SUPEX	
0342	75426	060520	LDA DLTEM	OUT WHERE
0343	75427	117654	JSB DIRCS,I	COMPARE THIS ENTRY
0344	75430	027416	JMP SUP32	NOT THIS ONE
0345*				
0346	75431		SUP33 EQU *	
0347	75431	037663	ISZ SUPTG	SET TOGGLE TO SAY WE'VE INSERTED
0348	75432	060562	LDA LIBD	COMPUTE DESTINATION
0349	75433	043660	ADA SUP	OF WORDS TO BE
0350	75434	064000	LDB A	MOVED
0351	75435	040365	ADA .+11	
0352	75436	070051	STA MOVED	COMPUTE SOURCE
0353	75437	040336	ADA .-12	
0354	75440	070050	STA MOVES	
0355	75441	007004	CMB,INB	
0356	75442	047671	ADB SUPES	CALL REVERSE MOVER.
0357	75443	016243	JSB MOVEB	
0358*				
0359	75444	063671	LDA SUPES	=> HOLE
0360	75445	070051	STA MOVED	
0361	75446	060520	LDA DLTEM	SET SOURCE AT LTEMP.
0362	75447	070050	STA MOVES	
0363	75450	064346	LDB .-4	MOVE IN FIRST 4
0364	75451	016257	JSB MOVEW	WORDS.
0365	75452	060042	LDA SAVP	STORE START-OF-
0366	75453	170051	STA MOVED,I	PROGRAM POINTER
0367	75454	034051	ISZ MOVED	
0368	75455	016076	JSB DATE	INSERT DATE IN WORD 5
0369	75456	170051	STA MOVED,I	
0370	75457	034051	ISZ MOVED	AND
0371	75460	060201	LDA DATIM	GET HOUR OF YEAR FOR
0372	75461	170051	STA MOVED,I	WORD 6
0373	75462	034051	ISZ MOVED	
0374	75463	060045	LDA SAVDU	SET DRUM
0375	75464	170051	STA MOVED,I	ADDRESS
0376	75465	034051	ISZ MOVED	
0377	75466	104200	DLD SAVDS	GET THE DISK ADDRESS AND SET IT
	75467	000036		
0378	75470	104400	DST MOVED,I	INTO WORDS 8 AND 9
	75471	100051		
0379	75472	064051	LDB MOVED	

0380	75473	044355		ADB ,+3	➤ WORD 11
0381	75474	060040		LDA SAVWD	GET LENGTH
0382	75475	170001		STA B,I	AND STORE AWAY
0383	75476	063660		LDA SUP	UPDATE THE COUNT OF WORDS
0384	75477	040366		ADA ,+12	IN CORE BY TWELVE
0385	75500	073660		STA SUP	
0386	75501	027311		JMP SUP8	

0387*

0388* COME HERE WHEN CURRENT OUTPUT TRACK HAS BEEN FILLED.

0389*

0390	75502	063666	SUP10	LDA SUPL1	TEST FOR LAST TRACK.
0391	75503	053652		CPA SDIRL	
0392	75504	027621		JMP SUP16	ALL DONE--GO CLEAN UP DIREC.
0393	75505	040361		ADA ,+7	BUMP TO NEXT TRACK.
0394	75506	073666		STA SUPL1	
0395	75507	002400		CLA	SET # OF WORDS WRITTEN SO FAR
0396	75510	073667		STA SUPL2	TO 0.
0397	75511	037662		ISZ SUPP	BUMP POINTER TO WORDS TO BE
0398	75512	027305		JMP SUP7	WRITTEN.

0400* THE NEXT SECTION IS THE OUTPUT SECTION. WE ONLY COME TO THIS SEC-
 0401* TION WHEN WE HAVE DETERMINED THAT NO MORE CAN BE READ. IN THIS
 0402* PART WE WRITE OUT AS MUCH AS POSSIBLE UNTIL WE HAVE EXHAUSTED ALL
 0403* WE HAVE IN CORE OR WE REACH THE POINT WHEN FURTHER OUTPUT WOULD
 0404* DESTROY INFORMATION NOT YET READ. IN THIS SECTION, THE VARIABLE
 0405* SUPS = # OF WORDS THAT HAVE BEEN OUTPUT FROM THE CURRENT CORE
 0406* LOAD.

0408	75513	002400	SUP11	CLA	SET # OF WORDS OUTPUT SO FAR TO
0409	75514	073657	SUP15	STA SUPS	ZERO.
0410	75515	063667		LDA SUPL2	SET WORD = # OF WORDS LEFT
0411	75516	143662		ADA SUPP,I	TO BE WRITTEN ON L1.
0412	75517	067666		LDB SUPL1	TEST FOR WRITING ON A TRACK NOT
0413	75520	057664		CPB SUPK1	COMPLETELY READ.
0414	75521	027535		JMP SUP12	WE ARE.
0415	75522	067657	SUP13	LDB SUPS	SET B=# OF WORDS LEFT IN CORE.
0416	75523	007004		CMB,INB	
0417	75524	047660		ADB SUP	SAVE IN B.
0418	75525	077661		STB SUPB	COMPARE WITH # WE WANT TO WRITE.
0419	75526	044000		ADB 0	
0420	75527	006021		SSB,RSS	
0421	75530	027544		JMP SUP14	HAVE ENOUGH, -# IS IN A.
0422	75531	063661		LDA SUPB	ONLY WRITE WHAT WE HAVE.
0423	75532	010610		AND M64	USE ONLY FULL SECTOR'S WORTH
0424	75533	003004		CMA,INA	MAKE NEGATIVE.
0425	75534	027544		JMP SUP14	
0426	75535	067667	SUP12	LDB SUPL2	IF WRITING ON UNREAD TRACK, MAKE
0427	75536	007004		CMB,INB	SURE WE DON'T GO INTO UNREAD
0428	75537	047665		ADB SUPK2	AREA.
0429	75540	044000		ADB 0	
0430	75541	007025		CMB,SSB,INB,RSS	
0431	75542	040001		ADA 1	CHANGE A TO AVOID OVERLAY.

```

0432 75543 027522      JMP SUP13
0433*
0434* A NOW CONTAINS # OF WORDS WE'RE GOING TO WRITE.
0435*
0436 75544 070072      SUP14 STA WORD      IF NO WORDS TO BE
0437 75545 002003      SZA,RSS      WRITTEN GO TO SLIDE CORE FOR
0438 75546 027604      JMP SUP17      NEW INPUT.
0439 75547 003004      CMA,INA
0440 75550 073661      STA SUPB
0441 75551 063667      LDA SUPL2      TEST FOR FIRST WRITE ON THIS
0442 75552 002002      SZA          TRACK.
0443 75553 027565      JMP SUP18
0444*
0445 75554 063666      LDA SUPL1      IF FIRST WRITE,
0446 75555 002004      INA
0447 75556 070051      STA MOVED      ADJUST DIREC TO TELL
0448 75557 060562      LDA LIBD      NEW FIRST ENTRY ON THAT
0449 75560 043657      ADA SUPS      TRACK.
0450 75561 070050      STA MOVES
0451 75562 064346      LDB ,=4
0452 75563 016257      JSB MOVEW
0453 75564 002400      CLA
0454*
0455 75565 006400      SUP18 CLB      CONVERT WORDS TO SECTOR
0456 75566 101026      ASR 6          ADDRESS.
0457 75567 067666      LDB SUPL1      ADD IN TRACK ADDRESS.
0458 75570 044360      ADB ,+6
0459 75571 140001      ADA 1,I
0460 75572 064562      LDB LIBD      COMPUTE CORE
0461 75573 047657      ADB SUPS      ADDRESS.
0462 75574 016231      JSB DRUML      OUTPUT TO DRUM
0463 75575 116017      JSB DEADP,I   DRUM ERROR, NO CHANCE FOR RECOVER
0464 75576 063661      LDA SUPB      ADJUST # OF WORDS OUTPUT TO
0465 75577 043667      ADA SUPL2      TRACK.
0466 75600 073667      STA SUPL2
0467 75601 063661      LDA SUPB      ADJUST # OF CORE WORDS WRITTEN
0468 75602 043657      ADA SUPS      OUT SO FAR.
0469 75603 027514      JMP SUP15      LOOP FOR ANY MORE WRITING.
0470*
0471* COME HERE WHEN WE CAN'T WRITE ANYMORE.
0472*
0473 75604 053657      SUP17 CPA SUPS      IF NOTHING WRITTEN AT ALL, GO TO
0474 75605 027305      JMP SUP7      TRY AND READ AGAIN.
0475 75606 067657      LDB SUPS      ADJUST # OF WORDS IN CORE.
0476 75607 007004      CMB,INB
0477 75610 047660      ADB SUP
0478 75611 077660      STB SUP
0479 75612 007004      CMB,INB      MAKE NEGATIVE FOR CORE MOVE.
0480 75613 060562      LDA LIBD      SET DESTINATION AND SOURCE.
0481 75614 070051      STA MOVED
0482 75615 043657      ADA SUPS
0483 75616 070050      STA MOVES
0484 75617 016257      JSB MOVEW
0485 75620 027305      JMP SUP7
0486*

```

```

0487* ALL TRACKS WRITTEN BACK, NOW UPDATE WORD COUNTS IN
0488* DIREC.
0489*
0490 75621 SUP16 EQU *
0491 75621 063642 LDA M80 SET COUNT
0492 75622 073660 STA SUP OF DIRECTORY TRAX
0493 75623 067651 LDB SDIR0 => FIRST DIREC ENTRY
0494 75624 SUPLL EQU *
0495 75624 163641 LDA DEFNN,I COPY NEW LENGTH WORDS INTO
0496 75625 170001 STA B,I THE DIREC TABLE ENTRIES
0497 75626 037641 ISZ DEFNN WIPE OUT "CONSTANT"
0498 75627 044361 ADB ,+7 ADVANCE DIREC POINTER
0499 75630 037660 ISZ SUP
0500 75631 027624 JMP SUPLL
0501 75632 063646 LDA SUPR1 SET UP RETURN ADDRESS,
0502 75633 073772 STA SUPR
0503 75634 SUP3 EQU *
0504 75634 063643 LDA SM504 SET WORD COUNT
0505 75635 070072 STA WORD
0506 75636 160260 LDA LIB,I GET DISC ADDRESS,
0507 75637 064504 LDB #LIBI
0508 75640 027770 JMP SUPRR
0509 75641 073571 DEFNN DEF FILBF
0510 75642 177660 M80 DEC =80
0511 75643 177010 SM504 DEC =504
0512 75644 176526 M682 DEC =682
0513 75645 176525 M683 DEC =683
0514 75646 027776 SUPR1 JMP LIBR+510 JUMP FOR NORMAL RETURN
0515 75647 017770 S8184 DEC 8184
0516 75650 000240 X2056 DEF LIBUS+ULEN=8184
0517 75651 030000 SDIR0 DEF DIREC
0518 75652 031051 SDIRL DEF DIREL
0519 75653 031060 SDIRU DEF DIREU
0520 75654 031176 DIRCS DEF DIRCM
0521 75655 154024 STLE ABS =ULEN+20
0522 75656 177777 OCT =1
0523 75657 177764 SUPS DEC =12
0524 75660 000000 SUP OCT 0
0525 75661 000000 SUPB OCT 0
0526 75662 073571 SUPP DEF FILBF
0527 75663 000000 SUPTG OCT 0
0528 75664 000000 SUPK1 BSS 1
0529 75665 000000 SUPK2 BSS 1
0530 75666 000000 SUPL1 BSS 1
0531 75667 000000 SUPL2 BSS 1
0532 75670 000000 SUPEX BSS 1
0533 75671 000000 SUPES BSS 1
0534 75770 ORG LIBR+504
0535 75770 SUPRR EQU *
0536 75770 016233 JSB DRUML OVERLAY WITH ORIGINAL ROUTINE
0537 75771 116017 JSB DEADP,I CAN'T GET IT BACK, ARRGH!
0538 75772 027777 SUPR JMP LIBR+511 SET FOR ERROR ROUTINE
0539 75773 $$$AV EQU *

```


0002* THE GET ROUTINE IS RESPONSIBLE FOR LOADING A PROGRAM FROM THE
 0003* USER LIBRARY. IT CAN BE USED TO LOAD FROM EITHER THE USER'S
 0004* PRIVATE LIBRARY, THE GROUP LIBRARY, OR THE PUBLIC LIBRARY.
 0005* IF THE PROGRAM IS TO BE FROM THE USER'S GROUP LIBRARY, THE
 0006* PROGRAM NAME SHOULD BE PRECEDED BY A SNOMFLAKE (*). IF IT IS TO
 0007* BE FROM THE PUBLIC LIBRARY, THE PROGRAM NAME SHOULD BE PRECEDED
 0008* BY A DOLLAR SIGN (\$).

```

0010 75000          ORG LIBRA

0012 75000 060273   LDA MLINK+1   GET USER'S ID.
0013 75001 040341   ADA ,+?ID=?LINK
0014 75002 070036   STA GETI
0015 75003 160000   LDA 0,I
0016 75004 070030   STA LTEMP      STORE IN LTEMP.
0017 75005 060520   LDA DLTEM      SET UP POINTER FOR NAME.
0018 75006 002004   INA
0019 75007 070034   STA GETP
0020 75010 060347   LDA ,=3        SET UP COUNTER.
0021 75011 070037   STA GETC
0022 75012 016164   JSB LCHAR      GET FIRST INPUT CHAR.
0023 75013 027035   JMP GET1       ERROR IF NONE.
0024 75014 050416   CPA ,+44B     IF $ GO TO SET UP FOR
0025 75015 027050   JMP GET2       SEARCHING PUBLIC LIBRARY.
0026 75016 050424   CPA ,+52B     IF * GO TO SET UP FOR
0027 75017 027055   JMP GET14      SEARCHING GROUP LIBRARY
0028 75020 001727   GET3 ALF,ALF   SAVE CHARACTER IN TABLE.
0029 75021 170034   STA GETP,I
0030 75022 016164   JSB LCHAR      GET RIGHT CHARACTER.
0031 75023 060412   LDA ,+40B     IF END CHANGE TO BLANK.
0032 75024 130034   IOR GETP,I
0033 75025 170034   STA GETP,I
0034 75026 034034   ISZ GETP      BUMP POINTER.
0035 75027 016164   JSB LCHAR      GET NEXT CHARACTER.
0036 75030 060412   LDA ,+40B
0037 75031 034037   ISZ GETC      DO WE WANT IT?
0038 75032 027020   JMP GET3      YES.
0039 75033 050412   CPA ,+40B     NO--A SHOULD NOW BE BLANK.
0040 75034 027074   JMP GET4

0041*
0042 75035 060335   GET1 LDA ,=13
0043 75036 067040   LDB ++2
0044 75037 026432   JMP LIBER
0045 75040 075041   DEF ++1
0046 75041 005111   OCT 5111
0047 75042 047126   ASC 6,NVALID NAME
    75043 040514
    75044 044504
    75045 020116
    75046 040515
    75047 042440

0048*
0049 75050 060612   GET2 LDA A000   SET UP FOR PUBLIC LIBRARY SEARCH
0050 75051 070030   STA LTEMP
0051 75052 016164   JSB LCHAR      GET FIRST CHAR OF NAME.

```

0052	75053	027035	JMP GET1	FAIL IF NONE.
0053	75054	027020	JMP GET3	
0054	75055	060030	GET14 LDA LTEMP	GET USER'S ID
0055	75056	010602	AND B1777	ISOLATE NUMERICAL PART
0056	75057	006400	CLB	
0057	75060	100400	DIV .100	DIVIDE BY 100 AND
	75061	000437		
0058	75062	100200	MPY .100	MULTIPLY BACK, DROPPING REMAIN
	75063	000437		
0059	75064	064000	LDB A	SAVE RESULTING MULTIPLE OF 100
0060	75065	060732	LDA M2000	GET UPPER 6 BITS MASK
0061	75066	010030	AND LTEMP	GET ALPHABETIC PART OF ID
0062	75067	030001	IOR B	MERGE NEW NUMERICAL PART
0063	75070	070030	STA LTEMP	STORE LIBRARIAN ID
0064	75071	016164	JSB LCHAR	GET FIRST CHAR OF NAME
0065	75072	027035	JMP GET1	FAIL IF NONE
0066	75073	027020	JMP GET3	ELSE, CONTINUE
0067*				
0068	75074	016047	GET4 JSB RDRPG	
0069	75075	061577	LDA SPROG	SAVE END-OF-
0070	75076	070043	STA GETS	COMMON POINTER
0071	75077	116005	JSB DLOKP,I	SEARCH DIRECTORY FOR PROGRAM
0072	75100	027133	JMP GET18	
0073*				
0074	75101	060332	GET19 LDA .-16	
0075	75102	067104	LDB ++2	
0076	75103	026432	JMP LIBER	
0077	75104	075105	DEF ++1	
0078	75105	005116	OCT 5116	
0079	75106	047440	ASC 7,0	SUCH PROGRAM
	75107	051525		
	75110	041510		
	75111	020120		
	75112	051117		
	75113	043522		
	75114	040515		
0080	75115	060327	GET22 LDA .-19	
0081	75116	067120	LDB ++2	
0082	75117	026432	JMP LIBER	
0083	75120	075121	DEF ++1	
0084	75121	005111	OCT 5111	
0085	75122	046114	ASC 9,LL	STORED PROGRAM
	75123	026523		
	75124	052117		
	75125	051105		
	75126	042040		
	75127	050122		
	75130	047507		
	75131	051101		
	75132	046440		
0086	75133	064035	GET18 LDB GETPD	CHECK ILL-STORED
0087	75134	044356	ADB .+4	PROGRAM FLAG
0088	75135	160001	LDA B,I	
0089	75136	002021	SSA,RSS	UNSUCCESSFULLY STORED?
0090	75137	027144	JMP GET9	NO, CONTINUE

0091	75140	160036	LDA GET1,I	YES, GET USER'S ID
0092	75141	050030	CPA LTEMP	DOES HE (OR SHE) OWN THE PROG?
0093	75142	027115	JMP GET22	YES, PRINT ILL-STORED PROGRAM
0094	75143	027101	JMP GET19	NO, PRINT NO SUCH PROGRAM
0095	75144	044350	GET9 ADB ,+2	TEST FOR FILE
0096	75145	160001	LDA 1,I	
0097	75146	002021	SSA,RSS	
0098	75147	027164	JMP GET10	
0099*				
0100	75150	060332	LDA ,+16	
0101	75151	067153	LDB ,+2	
0102	75152	026432	JMP LIBER	
0103	75153	075154	DEF ,+1	
0104	75154	005105	OCT 5105	LF=E
0105	75155	047124	ASC 7,NTRY IS A FILE	
	75156	051131		
	75157	020111		
	75160	051440		
	75161	040440		
	75162	043111		
	75163	046105		
0106*				
0107*	IF PROGRAM IS ON DISC, START SEEK.			
0108*				
0109	75164	044357	GET10 ADB ,+5	DRUM ADDRESS WORD
0110	75165	160001	LDA B,I	GET DRUM ADDRESS
0111	75166	002002	SZA	IS PROGRAM ON DRUM?
0112	75167	027176	JMP GET16	YES, DON'T BOTHER SEEKING
0113	75170	070215	STA MWORD	ZERO WORD COUNT
0114	75171	060001	LDA B	A REG GETS POINTER
0115	75172	002004	INA	TO DISC ADDRESS
0116	75173	114212	J9B DISCA,I	GO INITIATE SEEK ON DISC
0117	75174	102030	HLT 30B	DRIVER BUSY: HALT
0118	75175	102031	HLT 31B	RECORD OUT OF RANGE: HALT
0119*				
0120*	FOUND CORRECT ENTRY, FIRST CHECK TO SEE IF IT FITS			
0121*				
0122	75176	044344	GET15 ADB ,+6	=> FIRST WORD OF NAME
0123	75177	160001	LDA B,I	MOVE WITH PROTECTED FLAG
0124	75200	070031	STA LTEMP+1	TO SAFE PLACE
0125	75201	044354	ADB ,+2	=> THIRD WORD OF NAME
0126	75202	160001	LDA 1,I	SAVE SEMI-
0127	75203	070040	STA LIBSC	COMPILED FLAG
0128	75204	006004	INB	RETRIEVE START-
0129	75205	160001	LDA 1,I	OF-PROGRAM
0130	75206	001665	ELA,CLE,ERA	
0131	75207	070041	STA LIBSP	POINTER
0132	75210	044361	ADB ,+7	GET PROGRAM
0133	75211	160001	LDA 1,I	LENGTH.
0134	75212	070042	STA GETLN	
0135	75213	003004	CMA,INA	COMPUTE FIRST
0136	75214	040041	ADA LIBSP	UNUSED WORD
0137	75215	070045	STA LIBPB	
0138	75216	003004	CMA,INA	COMPUTE NEGATIVE
0139	75217	064040	LDB LIBSC	

0140	75220	006021	SSB,RSS	SEMI-COMPILED?
0141	75221	027226	JMP GET25	NO
0142	75222	040462	ADA LWAUS	
0143	75223	002021	SSA,RSS	TOO BIG?
0144	75224	027251	JMP GET13	NO
0145	75225	027231	JMP GET26	YES
0146	75226		GET25 EQU *	
0147	75226	040654	ADA LW97	TOTAL LENGTH
0148	75227	002021	SSA,RSS	COMPARE WITH MAX ALLOWED.
0149	75230	027251	JMP GET13	OK
0150	75231		GET26 EQU *	
0151	75231	060214	LDA MBUSY	MAKE SURE
0152	75232	002020	SSA	DISC DRIVER
0153	75233	027231	JMP *-2	IS FINISHED
0154	75234	060330	LDA .-18	
0155	75235	067237	LDB ++2	
0156	75236	026432	JMP LIBER	
0157	75237	075240	DEF ++1	
0158	75240	005120	UCT 5120	LF-P
0159	75241	051117	ASC 8,ROGRAM	TOO LARGE
	75242	043522		
	75243	040515		
	75244	020124		
	75245	047517		
	75246	020114		
	75247	040522		
	75250	043505		
0160*				
0161	75251	016076	GET13 JSB DATE	SET NEW DATE
0162	75252	064035	LDB GETPD	INTO
0163	75253	044357	ADB .+5	DIRECTORY.
0164	75254	170001	STA 1,I	
0165	75255	044354	ADB .+2	GET PROGRAM
0166	75256	160001	LDA B,I	DRUM ADDRESS
0167	75257	070044	STA GETD	
0168	75260	006004	INB	ALSO SAVE
0169	75261	104200	OLD B,I	DISC
	75262	100001		
0170	75263	104400	DST GETDI	ADDRESS
	75264	000046		
0171*				
0172	75265	160034	LDA GETP,I	WRITE DIRECTORY
0173	75266	070072	STA WORD	BACK TO
0174	75267	060034	LDA GETP	DRUM
0175	75270	040360	ADA .+6	
0176	75271	160000	LDA 0,I	
0177	75272	064562	LDB LIBD	
0178	75273	016231	JSB DRUML	
0179	75274	027357	JMP GET21	BLEW IT, TRY TO SALVAGE
0180*				
0181*				
0182	75275	064273	LDB MLINK+1	SET TO NULL PROGRAM
0183	75276	044340	ADB .+7PROG-?LINK	
0184	75277	160001	LDA B,I	SAVE PROGRAM
0185	75300	070037	STA GETC	LENGTH

0186 75301 060043
 0187 75302 170001
 0188 75303 016047
 0189 75304 064042
 0190 75305 060044
 0191 75306 002002
 0192 75307 027363
 0193 75310 074215
 0194 75311 064041
 0195 75312 045036
 0196 75313 063405
 0197 75314 114212
 0198 75315 027314
 0199 75316 102031
 0200 75317 060214
 0201 75320 002020
 0202 75321 027317
 0203 75322 002003
 0204 75323 027370
 0205 75324 064273
 0206 75325 044335
 0207 75326 074257
 0208 75327 044355
 0209 75330 060037
 0210 75331 170001
 0211 75332 016047
 0212 75333 060317
 0213 75334 067336
 0214 75335 026432
 0215 75336 075337
 0216 75337 005125
 0217 75340 047101
 75341 041114
 75342 042440
 75343 052117
 75344 020122
 75345 042524
 75346 051111
 75347 042526
 75350 042440
 75351 043122
 75352 047515
 75353 020114
 75354 044502
 75355 051101
 75356 051131
 0218 75357 060034
 0219 75360 040360
 0220 75361 164034
 0221 75362 116016
 0222 75363 074072
 0223 75364 064041
 0224 75365 045036
 0225 75366 016231
 0226 75367 027324

LDA GETS
 STA 1,I
 JSB RDPRG
 LDB GETLN
 LDA GETD
 SZA
 JMP GET16
 STB MWORD
 LDB LIBSP
 ADB BIT15
 LDA GETDP
 JSB DISCA,I
 JMP *-1
 HLT 31B
 LDA MBUSY
 SSA
 JMP **2
 SZA,RSS
 JMP GET17
 GET20 LDB MLINK+1
 ADB .-?LINK
 STB MAIN
 ADB .+?PROG
 LDA GETC
 STA B,I
 JSB RDPRG
 LDA M32
 LDB **2
 JMP LIBER
 DEF **1
 OCT 5125
 ASC 15,NABLE TO RETRIEVE FROM LIBRARY
 GET21 LDA GETP
 ADA ,+6
 LDB GETP,I
 JSB SALVP,I
 GET16 STB WORD
 LDB LIBSP
 ADB BIT15
 JSB DRUML
 JMP GET20

READ IN CURRENT USER PROGRAM.
 GET WORD COUNT
 GET DRUM ADDRESS
 FILE ON DISC OR DRUM?
 DRUM, GO GET FROM DRUM
 DISC, STORE WORD COUNT
 GET START OF PROGRAM POINTER
 AND READ BIT
 GET PTR TO DISK ADDRESS
 GO DO READ FROM DISC
 DISC DRIVER IS CALLED
 DIRECTLY HERE BECAUSE IT
 IS PROBABLY STILL BUSY
 DOING THE ADVANCE SEEK
 AND SO A
 JMP *-1 IS PUT IN THE
 "DRIVER BUSY" RETURN LOC

LF=U
 STORE WORD COUNT FOR DRUM
 GET START OF PROGRAM POINTER

0227	75370	160036	GET17	LDA GETI,I	GET USER'S ID
0228	75371	034036		ISZ GETI	FIRST WORD OF NAME.
0229	75372	064031		LDB LTEMP+1	GET IT
0230	75373	050030		CPA LTEMP	IF PROGRAM OWNER CLEAR
0231	75374	005665		ELB,CLE,ERB	RUN-ONLY BIT.
0232	75375	174036		STB GETI,I	STORE FIRST WORD OF NAME.
0233	75376	034036		ISZ GETI	BUMP POINTER TO NEXT WORD.
0234	75377	104200		DLB LTEMP+2	GET LAST 2 WORDS OF NAME.
	75400	000032			
0235	75401	104400		DST GETI,I	STORE IN TABLE.
	75402	100036			
0236	75403	016710		JSB SEMIC	
0237	75404	026226		JMP LLEND	TERMINATE.
0238	75405	000046	GETDP	DEF GETDI	=> DISK ADDRESS
0239*					
0240	00034		GETP	EQU LTEMP+4	
0241	00035		GETPD	EQU LTEMP+5	
0242	00036		GETI	EQU LTEMP+6	
0243	00037		GETC	EQU LTEMP+7	
0244	00042		GETLN	EQU LTEMP+10	
0245	00043		GETS	EQU LTEMP+11	
0246	00044		GETD	EQU LTEMP+12	
0247	00046		GETDI	EQU LTEMP+14	
0248*	LTEMP+15		IS	USED HERE ALSO	
0249	75406		SGET	EQU *	

0251* THE APPEND COMMAND ALLOWS A USER TO APPEND A LIBRARY PROGRAM ON TO
 0252* THE END OF HIS CURRENT PROGRAM, THE FIRST STATEMENT OF THE NEW
 0253* PROGRAM MUST HAVE A SEQUENCE NUMBER GREATER THAN THAT OF THE LAST
 0254* STATEMENT OF THE ORIGINAL PROGRAM, IF THE NEW SECTION IS PROTECTED
 0255* THE ENTIRE PROGRAM WILL BE PROTECTED. SEMI-COMPILED PROGRAMS AND
 0256* PROGRAMS WITH COMMON MAY NOT BE APPENDED
 0257*
 0258* THE CODE FOR APPEND MUST FOLLOW THE CODE FOR "GET".

0260 75000 ORG LIBRA THE CODE IS IDENTICAL TO "GET"
 0261 75000 060273 LDA MLINK+1 UP TO LOCATION GET15
 0262 75176 ORG GET15

0263*
 0264 75176 044346 ADB ,=4 => THIRD WORD OF NAME
 0265 75177 160001 LDA 1,I
 0266 75200 002021 SSA,RSS SEMI-COMPILED?
 0267 75201 027224 JMP APP01 NO
 0268 75202 060214 LDA MBUSY YES, MAKE SURE
 0269 75203 002020 SSA DISC DRIVER
 0270 75204 027202 JMP *-2 IS FINISHED
 0271 75205 060324 LDA ,=22
 0272 75206 067210 LOB **2
 0273 75207 026432 JMP LIBER
 0274 75210 075211 DEF **1
 0275 75211 005123 OCT 5123 LF=S
 0276 75212 042515 ASC 10,EMI-COMPILED PROGRAM
 75213 044455
 75214 041517
 75215 046520
 75216 044514
 75217 042504
 75220 020120
 75221 051117
 75222 043522
 75223 040515

0277*
 0278 75224 006004 APP01 INB
 0279 75225 160001 LDA 1,I
 0280 75226 050702 CPA PBUFF COMMON AREA?
 0281 75227 027253 JMP APP02 NO
 0282 75230 060214 LDA MBUSY MAKE SURE
 0283 75231 002020 SSA DISC DRIVER
 0284 75232 027230 JMP *-2 IS FINISHED
 0285 75233 060323 LDA ,=23
 0286 75234 067236 LOB **2
 0287 75235 026432 JMP LIBER
 0288 75236 075237 DEF **1
 0289 75237 005116 OCT 5116 LF=N
 0290 75240 047440 ASC 11,0 COMMON AREA ALLOWED
 75241 041517
 75242 046515
 75243 047516
 75244 020101
 75245 051105
 75246 040440

	75247	040514			
	75250	046117			
	75251	053505			
	75252	042040			
0291	75253	016076	APP02 JSB DATE	SET DATE OF LAST REFERENCE	
0292	75254	064035	LDB GETPD	INTO DIRECTORY ENTRY,	
0293	75255	044357	ADB .+5		
0294	75256	170001	STA 1,I		
0295	75257	044346	ADB .-4	SAVE LIST BIT,	
0296	75260	160001	LDA 1,I		
0297	75261	070036	STA APPLS		
0298	75262	044360	ADB .+6	GET PROGRAM DRUM ADDRESS	
0299	75263	160001	LDA B,I		
0300	75264	070044	STA GETD	SAVE IT	
0301	75265	006004	INB	SAVE ALSO	
0302	75266	104200	DLB B,I	DISC	
	75267	100001			
0303	75270	104400	DST GETDI	ADDRESS	
	75271	000046			
0304	75272	064035	LDB GETPD	AND	
0305	75273	044365	ADB .+11		
0306	75274	160001	LDA B,I	PROGRAM	
0307	75275	070042	STA GETLN	LENGTH	
0308*					
0309	75276	160034	LDA GETP,I	WRITE DIRECTORY	
0310	75277	070072	STA WORD	BACK TO DRUM	
0311	75300	060034	LDA GETP		
0312	75301	040360	ADA .+6		
0313	75302	160000	LDA 0,I		
0314	75303	064562	LDB LIBD		
0315	75304	016231	JSB DRUML		
0316	75305	027343	JMP APP10	DRUM ERROR, GO TRY TO SALVAGE	
0317*					
0318	75306	016047	JSB RDPRG	READ IN USER'S PROGRAM AND	
0319	75307	015322	JSB DCMPL	DECOMPILE IT,	
0320*					
0321	75310	060042	LDA GETLN	TEST FOR PROGRAM TOO	
0322	75311	003004	CMA,INA	LARGE,	
0323	75312	040056	ADA PBPTR	LAST WORD+1 OF COMBINED PROGS,	
0324	75313	070045	STA LIBPB		
0325	75314	003004	CMA,INA	COMPUTE NEGATIVE	
0326	75315	040654	ADA LW97	TOTAL LENGTH	
0327	75316	002021	SSA,RSS	COMPARE WITH MAX ALLOWED,	
0328	75317	027347	JMP APP1	O.K.	
0329	75320	060214	LDA MBUSY	MAKE SURE	
0330	75321	002020	SSA	DISC DRIVER	
0331	75322	027320	JMP *-2	IS IDLE	
0332	75323	060273	LDA MLINK+1	SET MAIN TO SAY PROGRAM IN	
0333	75324	040335	ADA .-7LINK	CORE,	
0334	75325	070257	STA MAIN		
0335	75326	060330	LDA .-18		
0336	75327	067331	LDB **2		
0337	75330	026432	JMP LIBER		
0338	75331	075332	DEF **1		
0339	75332	005120	OCT 5120	LF=P	

0340	75333	051117		ASC 8,ROGRAM TOO LARGE
	75334	043522		
	75335	040515		
	75336	020124		
	75337	047517		
	75340	020114		
	75341	040522		
	75342	043505		
0341	75343	060034	APP10	LDA GETP
0342	75344	040360		ADA ,+6
0343	75345	164034		LDB GETP,I
0344	75346	116016		JSB SALVP,I
0345*				
0346	75347	064042	APP1	LDB GETLN
0347	75350	060044		LDA GETD
0348	75351	002002		SZA
0349	75352	027364		JMP APP7
0350	75353	074215		STB MWORD
0351	75354	070261		STA ENDRM
0352	75355	064056		LDB PBPTR
0353	75356	045036		ADB BIT15
0354	75357	063533		LDA APPDP
0355	75360	114212		JSB DISCA,I
0356	75361	027360		JMP *-1
0357	75362	102031		HLT 31B
0358	75363	027372		JMP APP8
0359	75364	074072	APP7	STB WORD
0360	75365	006400		CLB
0361	75366	074214		STB MBUSY
0362	75367	064056		LDB PBPTR
0363	75370	045036		ADB BIT15
0364	75371	114770		JSB DRUM,I
0365*				
0366*	SCAN ORIGINAL PROGRAM TO DETERMINE LAST SEQUENCE NUMBER.			
0367*				
0368	75372	061577	APP8	LDA SPROG
0369	75373	002004		INA
0370	75374	064056		LDB PBPTR
0371	75375	006004		INB
0372	75376	050001		CPA 1
0373	75377	027422		JMP APP2
0374	75400	003004		CMA,INA
0375	75401	040001		ADA B
0376	75402	002021		SSA,RSS
0377	75403	027407		JMP APP5=2
0378	75404	060056		LDA PBPTR
0379	75405	071577		STA SPROG
0380	75406	027422		JMP APP2
0381*				
0382	75407	061577		LDA SPROG
0383	75410	002004		INA
0384	75411	070037	APP5	STA APPS
0385	75412	140000		ADA 0,I
0386	75413	050001		CPA 1
0387	75414	002001		RSS

GET LENGTH OF PROGRAM TO BE APPD
 GET DRUM ADDRESS
 DISC OR DRUM ADDRESS?
 DRUM, GO DO DRUM READ
 DISC, STORE WORD COUNT
 FAKE "DRUM SUCCESSFUL"
 INITIATE

DISK
 READ
 WAIT UNTIL DRIVER FREE

STORE WORD COUNT FOR DRUM
 FAKE
 "DISC SUCCESSFUL"

INITIATE DRUM READ

SET A TO POINT AT LENGTH OF
 FIRST STATEMENT.
 SET B TO POINT AT LENGTH OF
 FIRST NEW PROGRAM.
 IF EQUAL, PROGRAM IS NULL, SO
 IT'S OK.

IS SPROG>PBPTR?
 NO
 YES, RESET SPROG

RESTORE
 (A)
 SAVE LOCN OF THIS STATE, LENGTH,
 LINK TO NEXT ONE.
 IF SAVE AS B, APPS=>LAST STATE.

0388	75415	027411	JMP APP5	OTHERWISE, LOOP.
0389*				
0390	75416	003400	CCA	GET SEQUENCE # OF LAST STATE-
0391	75417	040037	ADA APP5	MENT.
0392	75420	160000	LDA 0,I	MAKE NEGATIVE AND SUBTRACT
0393	75421	003001	CMA,RSS	ONE.
0394	75422	003400	CCA	SET TO -1 (SEQNO#0) IF NO PROG.
0395*				
0396	75423	064261	LDB ENDRM	WAIT FOR DRUM TO TERMINATE OK
0397	75424	006020	SSB	
0398	75425	027423	JMP *-2	
0399	75426	006002	SZB	
0400	75427	027463	JMP APP9	
0401	75430	064214	LDB MBUSY	WAIT FOR DISC
0402	75431	006020	SSB	TO
0403	75432	027430	JMP *-2	TERMINATE
0404	75433	006002	SZB	WITHOUT
0405	75434	027463	JMP APP9	
0406*				
0407	75435	140056	ADA PBPTR,I	CHECK THAT FIRST SEQUENCE # IS
0408	75436	002021	SSA,RSS	GREATER THAN LAST ONE OF OLD
0409	75437	027514	JMP APP3	PROGRAM.
0410*				
0411	75440	060273	LDA MLINK+1	SET MAIN TO SAY PROGRAM IN
0412	75441	040335	ADA ,-7LINK	CORE.
0413	75442	070257	STA MAIN	
0414	75443	060322	LDA ,-24	ERROR.
0415	75444	067446	LDB ++2	
0416	75445	026432	JMP LIBER	
0417	75446	075447	DEF ++1	
0418	75447	005123	OCT 5123	LF=S
0419	75450	042521	ASC 11,EQUENCE	NUMBER OVERLAP
	75451	052506		
	75452	047103		
	75453	042440		
	75454	047125		
	75455	046502		
	75456	042522		
	75457	020117		
	75460	053105		
	75461	051114		
	75462	040520		
0420*				
0421	75463	006400	APP9 CLB	CLEAR DRUM DRIVER
0422	75464	074261	STB ENDRM	BUSY FLAG
0423	75465	060273	LDA MLINK+1	
0424	75466	040335	ADA ,-7LINK	
0425	75467	070257	STA MAIN	
0426	75470	060317	LDA M32	
0427	75471	067473	LDB ++2	
0428	75472	026432	JMP LIBER	
0429	75473	075474	DEF ++1	
0430	75474	005125	OCT 5125	LF=U
0431	75475	047101	ASC 15,NABLE	TO RETRIEVE FROM LIBRARY
	75476	041114		

75477 042440
 75500 052117
 75501 020122
 75502 042524
 75503 051111
 75504 042526
 75505 042440
 75506 043122
 75507 047515
 75510 020114
 75511 044502
 75512 051101
 75513 051131

0432*

0433	75514	060045	APP3	LDA	LIBPB	SET NEW VALUE OF
0434	75515	070056		STA	PBPTR	PBPTR.
0435	75516	064273		LDB	MLINK+1	GET USER ID.
0436	75517	044341		ADB	,+?ID=?LINK	
0437	75520	160001		LDA	1,I	
0438	75521	006004		INB		SET POINTER TO NAME.
0439	75522	050030		CPA	LTEMP	TEST FOR SPECIAL
0440	75523	027530		JMP	APP6	USER.
0441	75524	060036		LDA	APPLS	IF NOT, GET LIST BIT
0442	75525	011036		AND	BIT15	AND MERGE INTO NAME.
0443	75526	130001		IOR	1,I	
0444	75527	170001		STA	1,I	
0445	75530	044345	APP6	ADB	,?NAME	SET MAIN.
0446	75531	074257		STB	MAIN	
0447	75532	026226		JMP	LLEND	TERMINATE.
0448	75533	000046	APPDP	DEF	GETDI	

0449*

0450	00036	APPLS	EQU	LTEMP+6
0451	00037	APPS	EQU	LTEMP+7
0452	75534	SAPP	EQU	*

0002* THE HELLO COMMAND IS USED TO LOG A USER ON TO THE SYSTEM. IT
 0003* PERFORMS THE FOLLOWING FUNCTIONS:
 0004* 1) IF A USER IS ALREADY ON, HE IS LOGGED OFF.
 0005* 2) READ USER ID AND PASSWORD, AND ENTER INTO TTY TABLE,

0007	75000	ORG LIBRA	
0008	75000 060273	LDA MLINK+1	GET HELID TM# ADA ,)*ID-=LI
0009	75001 070037	STA HELTP	STARTING TIME,
0010	75002 043527	ADA HELST	COMPUTE PORT NUMBER,
0011	75003 006400	CLB	
0012	75004 100400	DIV .+TTY01=TTY00	
	75005 000375		
0013	75006 070031	STA HELPT	SAVE IT.
0014	75007 154036	CPB HELID,I	TEST FOR USER IN CORE.
0015	75010 027042	JMP HEL7	GO INPUT IDT.
0016*			
0017	75011 060732	LDA M2000	INPUT FUSS TABLE
0018	75012 070072	STA WORD	
0019	75013 160540	LDA FUSS,I	
0020	75014 064566	LDB LIBDI	
0021	75015 016231	JSB DRUML	
0022	75016 116015	JSB SICKP,I	IT'S STUCK ON THE DRUM
0023*			
0024	75017 060031	LDA HELPT	COMPUTE LOCATION OF USER'S
0025	75020 001720	ALF,ALS	
0026	75021 040562	ADA LIBD	
0027	75022 070030	STA LTEMP	
0028*			
0029	75023 002400	CLA	ZERO OUT HIS SECTION,
0030	75024 064317	LDB M32	
0031	75025 170030	STA LTEMP,I	
0032	75026 034030	ISZ LTEMP	
0033	75027 006006	INB, SZB	
0034	75030 027025	JMP +=3	
0035*			
0036	75031 160540	LDA FUSS,I	WRITE BACK TO
0037	75032 064562	LDB LIBD	DISC,
0038	75033 016231	JSB DRUML	
0039	75034 116015	JSB SICKP,I	IT'S STUCK IN CORE
0040*			
0041	75035 064273	LDB MLINK+1	
0042	75036 044336	ADB .+?TNUM=?LINK	
0043	75037 160001	LDA 1,I	TELL 2114 THAT
0044	75040 030240	IUR NUC	NEW USER CALLED
0045	75041 114500	JSB S14SC,I	
0046*			
0047	75042	HEL7 EQU *	
0048	75042 160036	LDA HELID,I	GET CURRENT ID.
0049	75043 002003	SZA, RSS	IF 0, NO LOGOFF IS NECESSARY.
0050	75044 027124	JMP HEL1	
0051*			
0052*			
0053	75045 060273	LDA MLINK+1	DOES THIS
0054	75046 040336	ADA .+?TNUM=?LINK	USER HAVE

0055	75047	050255	CPA PRIST	THE LINE
0056	75050	002001	RSS	PRINTER?
0057	75051	027056	JMP HEL7A	NO
0058	75052	060247	LDA LPD	YES = GET OPCODE
0059	75053	114500	JSB S14SC,I	TELL I/O PROCESSOR
0060	75054	002400	CLA	REMOVE
0061	75055	070255	STA PRIST	USER
0062	75056	104200	HEL7A DLD HELTP,I	GET STARTING TIME.
	75057	100037		
0063	75060	003004	CMA,INA	MAKE BOTH PARTS NEGATIVE.
0064	75061	007004	CMB,INB	
0065	75062	104400	DST HELTM	SAVE.
	75063	000040		
0066	75064	104200	DLD DATIM	GET CURRENT TIME.
	75065	000201		
0067	75066	040040	ADA HELTM	COMPUTE DIFFERENCES:A=#OF HRS,
0068	75067	000040	CLE	B=# OF 100 MS UNITS,
0069	75070	044041	ADB HELTM+1	E INDICATES SIGN OF B.
0070	75071	074041	STB HELTM+1	SAVE UNITS.
0071	75072	100200	MPY D60	CHANGE HRS TO MINS.
	75073	000724		
0072	75074	070040	STA HELTM	
0073	75075	060041	LDA HELTM+1	GET UNIT COUNT. IF E=0
0074	75076	002041	SEZ,RSS	THEN COUNT AS NEGATIVE.
0075	75077	007400	CCB	
0076	75100	100400	DIV D600	CHANGE TO MINUTES.
	75101	000456		
0077	75102	040040	ADA HELTM	ADD PREVIOUS COMPUTATION +1
0078	75103	070040	STA HELTM	
0079*				
0080	75104	160036	LDA HELID,I	SET UP LOGOFF
0081	75105	031036	IOR BIT15	ENTRY.
0082	75106	017470	JSB HELOG	
0083*				
0084	75107	016107	JSB RDIDT	READ IN PROPER TRACK OF IDT
0085*				
0086	75110	044357	ADB .+5	COMPUTE NEW TOTAL TIME.
0087	75111	000040	CLE	
0088	75112	160001	LDA 1,I	
0089	75113	040040	ADA HELTM	
0090	75114	002040	SEZ	IF OVERFLOW, USE MAXIMUM.
0091	75115	003400	CCA	
0092	75116	170001	STA 1,I	
0093*				
0094	75117	160075	LDA IDLCP,I	GET DRUM ADDRESS
0095	75120	064562	LDB LIBD	AND CORE OUTPUT ADDRESS
0096	75121	016231	JSB DRUML	REWRITE TO DRUM
0097	75122	027261	JMP HEL10	DRUM ERROR, TRY TO SALVAGE
0098*				
0099	75123	170036	STA HELID,I	REMOVE USER'S ID FROM TABLE.
0100*				
0101*	CONVERT ID			
0102*				
0103	75124	016315	HEL1 JSB GETID	TRANSLATE ID.
0104	75125	002001	RSS	

0105	75126	026425		JMP GTFER	ERROR--NO COMMA
0106	75127	050426		CPA ,+54B	
0107	75130	002001		RSS	
0108	75131	026425		JMP GTFER	ERROR--NO COMMA.
0109*					
0110	75132	160076		LDA IDLNP,I	GET ID TABLE LENGTH
0111	75133	070072		STA WORD	SAVE FOR DRUM DRIVER
0112	75134	160075		LDA IDLCP,I	GET DRUM ADDRESS
0113	75135	064566		LDB LIBDI	AND CORE INPUT ADDRESS
0114	75136	016231		JSB DRUML	AND READ IN THE PROPER TRACK
0115	75137	116015		JSB SICKP,I	DRUM ERROR, DIE GRACEFULLY
0116	75140	064072		LDB WORD	SEARCH IDT FOR
0117	75141	007004		CMB,INB	NEW USER'S ID.
0118	75142	044562		ADB LIBD	
0119	75143	060052		LDA ID	
0120	75144	054562	HEL2	CPB LIBD	
0121	75145	027256		JMP HELF	NOT THERE.
0122	75146	044342		ADB ,=8	
0123	75147	150001		CPA 1,I	
0124	75150	002001		RSS	FOUND
0125	75151	027144		JMP HEL2	
0126*					
0127	75152	060347		LDA ,=3	CHECK PASSWORD.
0128	75153	070042		STA HELC	
0129	75154	074043		STB HELP	
0130	75155	034043	HEL3	ISZ HELP	BUMP TO NEXT PASSWORD ENTRY.
0131	75156	067536		LDB HFLG	
0132	75157	006002		SZB	COMMA ENCOUNTERED PREVIOUSLY?
0133	75160	027170		JMP HEL3C	YES.
0134	75161	016164		JSB LCHAR	NO, GET 1ST CHAR.
0135	75162	027170		JMP HEL3C	CR.
0136	75163	006404		CLB,INB	NO CR.
0137	75164	050426		CPA ,+54B	COMMA?
0138	75165	002001		RSS	
0139	75166	027171		JMP HEL3G	NO.
0140	75167	077536		STB HFLG	YES. SET FLAG.
0141	75170		HEL3C	EQU *	
0142	75170	002400		CLA	
0143	75171		HEL3G	EQU *	
0144	75171	001727		ALF,ALF	FIRST CHAR, ON LEFT.
0145	75172	070044		STA HELGT	
0146	75173	067536		LDB HFLG	
0147	75174	006002		SZB	COMMA ENCOUNTERED PREVIOUSLY?
0148	75175	027205		JMP HEL3D	YES.
0149	75176	016164		JSB LCHAR	NO, GET 2ND CHAR.
0150	75177	027205		JMP HEL3D	CR.
0151	75200	006404		CLB,INB	NO CR.
0152	75201	050426		CPA ,+54B	COMMA?
0153	75202	002001		RSS	
0154	75203	027206		JMP HEL3H	NO.
0155	75204	077536		STB HFLG	YES. SET FLAG.
0156	75205		HEL3D	EQU *	
0157	75205	002400		CLA	
0158	75206		HEL3H	EQU *	
0159	75206	040044		ADA HELGT	

0160	75207	150043	CPA	HELP,I	COMPARE,
0161	75210	002001	RSS		
0162	75211	027256	JMP	HELP	DOES NOT COMPARE,
0163	75212	034042	ISZ	HELC	COMPARES, BUMP CHAR, COUNTER,
0164	75213	027155	JMP	HEL3	GET NEXT CHAR,
0165*					
0166	75214	067536	LDB	HFLG	
0167	75215	006002	SZB		COMMA ENCOUNTERED PREVIOUSLY?
0168	75216	027224	JMP	HEL3F	YES,
0169	75217	016164	JSB	LCHAR	NO, GET NEXT CHAR,
0170	75220	027264	JMP	HEL3A	CR, SUBTYPE #11
0171	75221	050425	CPA	,+54B	NO CR, COMMA?
0172	75222	002001	RSS		
0173	75223	026425	JMP	GTFER	NO, ERROR!
0174	75224		HEL3F	EQU *	
0175	75224	016164	JSB	LCHAR	GET NEXT CHAR,
0176	75225	026425	JMP	GTFER	CR, ERROR!
0177	75226		HEL3I	EQU *	
0178	75226	040316	ADA	M72B	NO CR, DIGIT?
0179	75227	002021	SSA,	RSS	
0180	75230	026425	JMP	GTFER	NO, ERROR!
0181	75231	040364	ADA	,+10	MAY BE,
0182	75232	002020	SSA		
0183	75233	026425	JMP	GTFER	NON-DIGIT!
0184	75234	073540	STA	HTEMP	DIGIT! SAVE,
0185	75235	063537	LDA	HTYPE	UPDATE TYPE VARIABLE,
0186	75236	100200	MPY	,+10	
	75237	000364			
0187	75240	043540	ADA	HTEMP	
0188	75241	073537	STA	HTYPE	
0189	75242	016164	JSB	LCHAR	GET NEXT CHAR,
0190	75243	002001	RSS		
0191	75244	027226	JMP	HEL3I	NO CR,
0192	75245	063537	LDA	HTYPE	CR, TYPE>6?
0193	75246	040343	ADA	,=7	
0194	75247	002021	SSA,	RSS	
0195	75250	026425	JMP	GTFER	YES, ERROR!
0196	75251	040360	ADA	,+6	NO, RESTORE TO(ORIG,INPUT-1),
0197	75252	002020	SSA		WAS 0 INPUT?
0198	75253	026425	JMP	GTFER	YES, ERROR!
0199	75254	001722	ALF,	RAL	NO, ROTATE INTO POSITION,
0200	75255	027265	JMP	HEL3B	
0201	75256	060332	HELP	LDA ,=16	PRINT ILLEGAL ACCESS MESSAGE,
0202	75257	066541	LDB	MELK	
0203	75260	026432	JMP	LIBER	
0204	75261	060075	HEL10	LDA IDLCP	
0205	75262	064072	LDB	WORD	
0206	75263	116016	JSB	SALVP,I	
0207*					
0208*	PASSWORD OK,				
0209*					
0210	75264		HEL3A	EQU *	
0211	75264	002400	CLA		SUBTYPE#11
0212	75265		HEL3B	EQU *	
0213	75265	032774	IOR	STP	MERPE OPCODE,

0214	75266	064273		LDB MLINK+1	
0215	75267	044336		ADB ,+?TNUM=?LINK	
0216	75270	130001		IOR B,I	MERGE PORT NR.
0217	75271	114500		JSB S14SC,I	TELL 2114 TO SET UP DELAYS.
0218*					
0219	75272	034043		ISZ HELP	COMPUTE
0220	75273	104200		DLI HELP,I	ALLOWED TIME=TIME TO DATE.
	75274	100043			
0221	75275	003104		CMA,CLE,INA	
0222	75276	040001		ADA 1	
0223	75277	002040		SEZ	
0224	75300	027346		JMP HELG	NO TIME LEFT.
0225*					
0226	75301	064273		LDB MLINK+1	
0227	75302	044336		ADB ,=?LINK	B=> ?FLAG
0228	75303	060446		LDA CBFLG	CLEAR
0229	75304	003000		CMA	CBFLG
0230	75305	110001		AND B,I	
0231	75306	170001		STA B,I	BIT.
0232	75307	006004		INB	B=> ?TNUM
0233	75310	160001		LDA 1,I	TELL 2114
0234	75311	030233		IOR ULO	THAT USER
0235	75312	114500		JSB S14SC,I	LOGGED ON
0236	75313	060052		LDA ID	MAKE LOG ENTRY.
0237	75314	017470		JSB HELOG	
0238	75315	104200		DLI DATIM	SET STARTING TIME AND ID
	75316	000201			
0239	75317	104400		DST HELTP,I	INTO TABLE.
	75320	100037			
0240	75321	060052		LDA ID	INSERT NEW ID AND CLEAR
0241	75322	006400		CLB	NAME.
0242	75323	104400		DST HELID,I	
	75324	100036			
0243	75325	060702		LDA PBUFF	ALSO SCRATCH
0244	75326	064273		LDB MLINK+1	
0245	75327	044340		ADB ,+?PROC=?LINK	
0246	75330	170001		STA 1,I	
0247	75331	104200		DLI Z999	MOVE SETUP FOR HELLO
	75332	075532			
0248	75333	104400		DST LTEMP	PROGRAM INTO LTEMP(0:3)
	75334	000030			
0249	75335	104200		DLI HELM+1	
	75336	075534			
0250	75337	104400		DST LTEMP+2	
	75340	000032			
0251*					
0252	75341	116005		JSB DLOKP,I	SEARCH FOR PROGRAM IN LIBRARY
0253	75342	027351		JMP HEL6	FOUND IT.
0254*					
0255*					
0256	75343	060344	HEL4	LDA ,=6	OUTPUT READY MESSAGE
0257	75344	064266		LDB READY	
0258	75345	026432		JMP LIBER	
0259	75346	060334	HEL6	LDA ,=14	
0260	75347	066552		LDB HELH	


```

0261 75350 026432      JMP LIBER
0262*
0263*
0264*
0265*      SET UP USER TO RUN HELLO PROGRAM,
0266*
0267 75351 064035      HEL6  LDB LTEMP+5
0268 75352 044356      ADB .+4      IS HELLO PROGRAM
0269 75353 160001      LDA B,I      ILL-STORED?
0270 75354 002020      SSA
0271 75355 027343      JMP HEL4     YES
0272 75356 044356      ADB .-2     NO, TEST FOR FILE
0273 75357 160001      LDA 1,I
0274 75360 002020      SSA
0275 75361 027343      JMP HEL4
0276*
0277 75362 006004      INB        => THIRD WORD OF NAME
0278 75363 160001      LDA 1,I    SAVE SEMI-
0279 75364 070040      STA LIBSC  COMPILED FLAG
0280 75365 006004      INB
0281 75366 160001      LDA 1,I    SAVE START-OF-
0282 75367 001665      EIA,CLE,ERA
0283 75370 070041      STA LIBSP  PROGRAM POINTER
0284 75371 044355      ADB .+3    GET PROGRAM DRUM ADDRESS
0285 75372 160001      LDA B,I
0286 75373 070043      STA HELP  SAVE DRUM ADDRESS
0287 75374 006004      INB        SAVE ALSO
0288 75375 104200      DLD B,I    PROGRAM
0289 75377 104400      DST HELDI  DISC ADDRESS
0290 75400 000046
0290 75401 064035      LDB LTEMP+5  GET
0291 75402 044365      ADB .+11    PROGRAM
0292 75403 164001      LDB B,I     LENGTH
0293 75404 074042      STB HELC   STORE LENGTH,
0294 75405 007004      CMB,INB   COMPUTE FIRST
0295 75406 044041      ADB LIBSP  UNUSED WORD
0296 75407 074045      STB LIBPB
0297 75410 007004      CMB,INB   TEST FOR OVERFLOW,
0298 75411 060040      LDA LIBSC
0299 75412 002021      SSA,RSS   SEMI-COMPILED?
0300 75413 027420      JMP HEL12  NO
0301 75414 044462      ADB LW97
0302 75415 006021      SSB,RSS
0303 75416 027423      JMP HEL13  OK
0304 75417 027343      JMP HEL4   TOO BIG
0305 75420      HEL12 EQU *
0306 75420 044654      ADB LW97
0307 75421 006020      SSB
0308 75422 027343      JMP HEL4
0309*
0310*
0311 75423      HEL13 EQU *
0312 75423 016047      JSB RDPRG  READ IN FIXED AREA,
0313 75424 064042      LDB HELC  GET HELLO PROGRAM LENGTH

```

0314	75425	060043	LDA	HELP	AND DRUM ADDRESS
0315	75426	002002	SZA		PROGRAM ON DRUM?
0316	75427	027437	JMP	HEL8	YES, GO GET IT
0317	75430	074215	STB	MWORD	NO, STORE WORD COUNT FOR DISC
0318	75431	064041	LDB	LIBSP	GET START OF PROGRAM POINTER
0319	75432	045036	ADB	BIT15	AND READ BIT
0320	75433	063531	LDA	HELDP	GET POINTER TO DISK ADDRESS
0321	75434	114217	JSB	DISCZ, I	
0322	75435	027343	JMP	HEL4	DISK ERROR
0323	75436	027444	JMP	HEL9	
0324	75437	074072	HEL8	STB	WORD
0325	75440	064041	LDB	LIBSP	STORE WORD COUNT FOR DRUM
0326	75441	045036	ADB	BIT15	GET START OF PROGRAM POINTER
0327	75442	016231	JSB	DRUML	
0328	75443	027343	JMP	HEL4	DRUM ERROR, GO OUTPUT "READY"
0329	75444	016710	HEL9	JSB	SEMIC
0330	75445	103100	CLF	0	PLAY SAFE.
0331	75446	064273	LDB	MLINK+1	
0332	75447	044335	ADB	.-?LINK	
0333	75450	160001	LDA	1, I	SET
0334	75451	030356	IOR	HFLAG	HELLO
0335	75452	170001	STA	1, I	FLAG
0336	75453	044366	ADB	.-?STAT	
0337	75454	060357	LDA	XSYNT+1	SET STATUS TO RUN.
0338	75455	170001	STA	1, I	
0339	75456	034264	ISZ	TIMEF	SET FLAG FOR TIMING.
0340	75457	065577	LDB	SPROG	
0341	75460	054056	CPB	PBPTR	NULL PROGRAM
0342	75461	127530	JMP	HELRT, I	YES
0343	75462	075334	STB	PRGCT	
0344	75463	060412	LDA	.-+40B	
0345	75464	071573	STA	BLANK	
0346	75465	102100	STF	0	INTERRUPT BACK ON.
0347	75466	127467	JMP	*+1, I	
0348	75467	036045	DEF	CMP14	
0349*					
0350	75470	000000	HELOG	NOP	MAKE ENTRY IN LOG TABLE.
0351	75471	064604	LDB	LOGCT	WAIT UNTIL
0352	75472	050412	CPB	.-+32	THERE'S ROOM
0353	75473	027471	JMP	*-2	
0354	75474	064620	LDB	LOGP2	SET POINTER TO NEXT LOC.
0355	75475	006004	INB		IN LOG QUEUE.
0356	75476	054630	CPB	LOGND	
0357	75477	064626	LDB	LOGBG	
0358	75500	103100	CLF	0	INHIBIT INTERRUPT.
0359	75501	074620	STB	LOGP2	
0360	75502	170620	STA	LOGP2, I	ENTER ID.
0361	75503	060201	LDA	DATIM	GET DAY COUNT.
0362	75504	006400	CLB		GET HOURS OF TODAY.
0363	75505	100400	DIV	.-+24	
	75506	000402			
0364	75507	060001	LDA	1	
0365	75510	100200	MPY	D60	CONVERT TO MINS.
	75511	000724			
0366	75512	070044	STA	HELGT	SAVE.

0367	75513	060202	LDA DATIM+1	GET UNIT COUNTER,
0368	75514	040704	ADA D36K	ADJUST,
0369	75515	100400	DIV D600	GET IN MINUTES,
	75516	000456		
0370	75517	040044	ADA HELGT	
0371	75520	034620	ISZ LOGP2	PUT IN QUEUE,
0372	75521	001722	ALF,RAL	
0373	75522	030031	IOR HELPT	MERGE IN PORT NUMBER
0374	75523	170620	STA LOGP2,I	
0375	75524	034604	ISZ LOGCT	BUMP COUNT
0376	75525	102100	STF 0	INTERRUPT BACK ON,
0377	75526	127470	JMP HELOG,I	RETURN,
0378	75527	116642	HELST ABS =TTY00=?TIME	
0379	75530	041675	HELRT DEF EXIT3	
0380	75531	000046	HELDP DEF HELDI	=> DISK ADDRESS
0381	75532	065747	Z999 OCT 65747	USER NUMBER Z999
0382	75533	044105	HELM ASC 3,HELLO	
	75534	046114		
	75535	047440		
0383	75536	000000	HFLG OCT 0	
0384	75537	000000	HTYPE OCT 0	
0385	75540	000000	HTEMP BSS 1	
0386	00031		HELPT EQU LTEMP+1	
0387	00036		HELID EQU LTEMP+6	
0388	00037		HELTP EQU LTEMP+7	
0389	00040		HELTM EQU LTEMP+8	
0390	00042		HELC EQU LTEMP+10	
0391	00043		HELP EQU LTEMP+11	
0392	00044		HELGT EQU LTEMP+12	
0393	00046		HELDI EQU LTEMP+14	
0394*	LTEMP+15		IS USED HERE ALSO	
0395	75541		SHEL EQU *	

0397* THE BYE COMMAND IS USED TO LOG A USER OFF, BYE MUST PERFORM THE
 0398* FOLLOWING FUNCTIONS:
 0399* 1) DETERMINE AMOUNT OF CONSOLE TIME USED
 0400* 2) UPDATE USER'S CLOCK IN ID=TABLE
 0401* 3) SET FLAG FOR SYSTEM TO UNHOOK,
 0402* 4) OUTPUT TERMINATION MESSAGE

```

0404 75000          ORG LIBRA
0405 75000 060273   LDA MLINK+1      DOES THIS
0406 75001 040336   ADA ,+?TNUM=?LINK  USER HAVE
0407 75002 050255   CPA PRIST          THE LINE
0408 75003 002001   RSS              PRINTER?
0409 75004 027011   JMP BYE2          NO
0410 75005 060247   LDA LPD          YES=GET OPCODE
0411 75006 114500   JSB S14SC,I     TELL I/O PROCESSOR
0412 75007 002400   CLA            REMOVE
0413 75010 070255   STA PRIST       USER
0414 75011 064273   BYE2  LDB MLINK+1
0415 75012 044335   ADB ,+?FLAG=?LINK  B => FLAG WORD
0416 75013 060412   LDA OUTWT       REMOVE
0417 75014 003000   CMA            OUTWT BIT
0418 75015 110001   AND 1,I        FROM
0419 75016 170001   STA 1,I        STATUS.
0420 75017 044356   ADB ,+?ID=?FLAG
0421 75020 160001   LDA 1,I        GET ID
0422 75021 002003   SZA,RSS        IF ID=0, USER NEVER
0423 75022 027207   JMP BYBY       LOGGED ON, SO EXIT
0424 75023 074030   STB BYEID      SAVE POINTER TO ID
0425 75024 060732   LDA M2000      INPUT FUSS TABLE
0426 75025 070072   STA WORD
0427 75026 160540   LDA FUSS,I
0428 75027 064566   LDB LIBDI
0429 75030 016231   JSB DRUML
0430 75031 116015   JSB SICKP,I    IT'S STUCK ON THE DRUM
0431*
0432 75032 060273   LDA MLINK+1    COMPUTE USER'S PORT NO.
0433 75033 043261   ADA BYESP
0434 75034 006400   CLB
0435 75035 100400   DIV ,+TTY01=TTY00
      75036 000375
0436 75037 070034   STA BYEPT
0437*
0438 75040 001720   ALF,ALS        COMPUTE LOCATION OF USER'S FUSS
0439 75041 040562   ADA LIBD
0440 75042 070031   STA LTEMP+1
0441 75043 060317   LDA M32        CLEAR USER'S FUSS
0442 75044 174031   STB LTEMP+1,I
0443 75045 034031   ISZ LTEMP+1
0444 75046 002006   INA,SZA
0445 75047 027044   JMP +=3
0446*
0447 75050 160540   LDA FUSS,I     WRITE FUSS
0448 75051 064562   LDB LIBD       BACK TO DRUM
0449 75052 016231   JSB DRUML

```

0450	75053	116015	JSB SICKP,I	IT'S STUCK IN CORE
0451*				
0452*				
0453	75054	060273	LDA MLINK+1	
0454	75055	040345	ADA .+?TIME=?LINK	SET POINTER TO START TIME.
0455	75056	104200	DLD 0,I	GET STARTING TIME.
	75057	100000		
0456	75060	003004	CMA,INA	SET BOTH PARTS NEGATIVE.
0457	75061	007004	CMB,INB	
0458	75062	104400	DST BYETM	SAVE
	75063	000031		
0459	75064	104200	DLD DATIM	NOW GET CURRENT TIME
	75065	000201		
0460	75066	040031	ADA BYETM	COMPUTE DIFFERENCES: A=# OF HRS,
0461	75067	000040	CLE	B=# OF 100 MS UNITS,
0462	75070	044032	A0B BYETM+1	E INDICATES SIGN OF B.
0463	75071	074032	STB BYETM+1	SAVE UNITS.
0464	75072	100200	MPY D60	CHANGE HRS TO MINS.
	75073	000724		
0465	75074	070031	STA BYETM	
0466	75075	060032	LDA BYETM+1	GET UNIT COUNT. IF E=0
0467	75076	002041	SEZ,RSS	THEN COUNT AS NEGATIVE.
0468	75077	007400	CQB	
0469	75100	100400	DIV D600	CHANGE TO MINUTES.
	75101	000456		
0470	75102	040031	ADA BYETM	ADD PREVIOUS COMPUTATION PLUS
0471	75103	070031	STA BYETM	
0472*				
0473	75104	060604	LDA LOGCT	CHECK FOR ROOM IN LOG TABLE
0474	75105	050412	CPA .+32	
0475	75106	027104	JMP +=2	
0476	75107	060620	LDA LOGP2	SET LOGP2 TO NEXT LOCATION IN
0477	75110	002004	INA	LOG TABLE.
0478	75111	050630	CPA LOGND	
0479	75112	060626	LDA LOG8G	
0480	75113	070620	STA LOGP2	
0481	75114	160030	LDA BYEID,I	PLACE ID IN LOG TABLE AND
0482	75115	031036	IOR BIT15	SAY LOGOFF.
0483	75116	170620	STA LOGP2,I	
0484	75117	034620	ISZ LOGP2	
0485	75120	104200	DLD DATIM	COMPUTE TIME OF DAY.
	75121	000201		
0486	75122	074032	STB BYETM+1	SAVE UNIT COUNTER.
0487	75123	006400	CLB	GET # OF HRS IN B BY MOD'ING
0488	75124	100400	DIV .+24	OFF THE DAY COUNT.
	75125	000402		
0489	75126	060001	LDA 1	
0490	75127	100200	MPY D60	CONVERT TO MINS.
	75130	000724		
0491	75131	070033	STA BYET	SAVE THAT.
0492	75132	060032	LDA BYETM+1	GET UNIT COUNTER.
0493	75133	040704	ADA D36K	ADJUST
0494	75134	100400	DIV D600	GET MINUTES.
	75135	000456		
0495	75136	040033	ADA BYET	PACK TOGETHER AND PUT IN LOG

0496	75137	001722	ALF,RAL	
0497	75140	030034	IOR BYEPT	
0498	75141	170620	STA LOGP2,I	TABLE,
0499	75142	034604	ISZ LOGCT	BUMP COUNTER,
0500*				
0501	75143	016107	JSB RDIDT	READ IDT TRACK FOR THIS USER'S I
0502*				
0503	75144	044357	ADB .+5	COMPUTE NEW TOTAL TIME,
0504	75145	000040	CLE	
0505	75146	160001	LDA 1,I	
0506	75147	040031	ADA BYETM	
0507	75150	002040	SEZ	IF OVERFLOW, USE MAXIMUM,
0508	75151	003400	CCA	
0509	75152	170001	STA 1,I	
0510*				
0511	75153	160075	LDA IDLCP,I	GET DRUM ADDRESS
0512	75154	064562	LDB LIBD	
0513	75155	016231	JSB DRUML	AND WRITE OUT MODIFIED TRACK
0514	75156	027240	JMP BYE1	BLEW IT, TRY TO SALVAGE
0515*				
0516	75157	002400	CLA	REMOVE USER'S ID
0517	75160	170030	STA BYEID,I	FROM TABLE
0518*				
0519	75161	060364	LDA .+12B	
0520	75162	016132	JSB LOUT	
0521*				
0522	75163	060031	LDA BYETM	
0523	75164	006400	CLB	OUTPUT # OF MINUTES,
0524	75165	100400	DIV .100	
	75166	000437		
0525	75167	074033	STB BYET	
0526	75170	040432	ADA .+60B	HUNDREDS
0527	75171	016132	JSB LOUT	
0528	75172	060033	LDA BYET	
0529	75173	006400	CLB	
0530	75174	100400	DIV .+10	
	75175	000364		
0531	75176	074033	STB BYET	
0532	75177	040432	ADA .+60B	TENS
0533	75200	016132	JSB LOUT	
0534	75201	060033	LDA BYET	
0535	75202	040432	ADA .+60B	UNITS,
0536	75203	016132	JSB LOUT	
0537*				
0538	75204	060321	LDA .-25	OUTPUT THE REST OF
0539	75205	067243	LDB BYEM	THE MESSAGE,
0540	75206	016156	JSB LTYPE	
0541	75207		EQU *	
0542	75207	064273	LDB MLINK+1	
0543	75210	044336	ADB .+?TNUM-?LINK	
0544	75211	160001	LDA 1,I	
0545	75212	030253	IOR WTP	ASK FOR TERMINAL TYPE.
0546	75213	114500	JSB S14SC,I	
0547	75214	102311	SFS CH2	
0548	75215	027214	JMP *-1	

BYBY

0549	75216	102511	LIA	CH2	GET TYPE,
0550	75217	002002	SZA		WHICH?
0551	75220	027224	JMP	BYE3	
0552	75221	160001	LDA	1,I	TYPE#1. TURN ECHO ON.
0553	75222	030234	IOR	ECO	
0554	75223	027226	JMP	BYE4	
0555	75224		BYE3	EQU *	
0556	75224	160001	LDA	1,I	TYPE #2. TURN ECHO OFF.
0557	75225	030235	IOR	ECF	
0558	75226		BYE4	EQU *	
0559	75226	114500	JSB	S14SC,I	
0560	75227	160001	LDA	1,I	DISCONNECT
0561	75230	030232	IOR	HUU	
0562	75231	114500	JSB	S14SC,I	USER
0563	75232	044351	ADB	.-?TNUM	B=> ?FLAG
0564	75233	060447	LDA	B30M	CLEAR CBFLG AND
0565	75234	003000	CMA		
0566	75235	110001	AND	B,I	
0567	75236	170001	STA	B,I	PBFLG BITS.
0568	75237	026226	JMP	LLEND	
0569	75240	060075	BYE1	LDA IDLCP	
0570	75241	064072	LDB	WORD	
0571	75242	116016	JSB	SALVP,I	
0572	00030		BYE1D	EQU LTEMP	
0573	00031		BYETM	EQU LTEMP+1	
0574	00033		BYET	EQU LTEMP+3	
0575	00034		BYEPT	EQU LTEMP+4	
0576	75243	075244	BYEM	DEF ++1	
0577	75244	020115	ASC	13, MINUTES OF TERMINAL TIME.	
	75245	044516			
	75246	052524			
	75247	042523			
	75250	020117			
	75251	043040			
	75252	052105			
	75253	051115			
	75254	044516			
	75255	040514			
	75256	020124			
	75257	044515			
	75260	042456			
0578	75261	116635	BYESP	ABS -TTY00-?LINK	
0579	75262		\$BYE	EQU *	

0581* THE KILL ROUTINE IS USED TO DELETE A PROGRAM FROM THE USER
 0582* LIBRARY, THE PROCESS IS AS FOLLOWS:
 0583* 1) CHECK FORMAT AND DETERMINE PROGRAM NAME,
 0584* 2) SEARCH DIRECTORY FOR ENTRY,
 0585* 3) OBTAIN LOCATION AND LENGTH,
 0586* 4) COLLAPSE DIRECTORY,
 0587* 5) UPDATE ADT AND IDT.

```

0589 75000          ORG LIBRA

0591 75000 003400   CCA          SET FLAG TO SAY WE HAVE TO CHECK
0592 75001 070036   STA KILTS        FOR BUSY FILE.
0593 75002 060273   LDA MLINK+1     GET USER'S ID.
0594 75003 040341   ADA ,+?ID=?LINK
0595 75004 160000   LDA 0,I
0596 75005 070030   STA LTEMP      STORE IN LTEMP.
0597 75006 060520   LDA DLTEM      SET UP POINTER FOR
0598 75007 002004   INA           NAME.
0599 75010 070034   STA KILP
0600 75011 060347   LDA ,=3        SET UP COUNTER.
0601 75012 070042   STA KILC
0602 75013 016164   KIL1 JSB LCHAR     GET LEFT CHAR.
0603 75014 060412   LDA ,+40B      BLANK IF NONE.
0604 75015 001727   ALF,ALF
0605 75016 170034   STA KILP,I
0606 75017 016164   JSB LCHAR      GET RIGHT CHAR.
0607 75020 060412   LDA ,+40B
0608 75021 130034   IOR KILP,I
0609 75022 170034   STA KILP,I
0610 75023 034034   ISZ KILP       BUMP POINTER.
0611 75024 034042   ISZ KILC       ANY MORE?
0612 75025 027013   JMP KIL1       YES.
0613 75026 060031   LDA LTEMP+1
0614 75027 050570   CPA ASCBB
0615 75030 027033   JMP KIL2       NO CHARS==ERROR.
0616 75031 016164   JSB LCHAR      TEST FOR TOO MANY.
0617 75032 027046   JMP KIL3       O.K.
0618*
0619 75033 067036   KIL2 LDB ,+3
0620 75034 060335   LDA ,=13
0621 75035 026432   JMP LIBER
0622 75036 075037   DEF ,+1
0623 75037 005111   OCT 5111
0624 75040 046114   ASC 6,LLEGAL NAME
      75041 042507
      75042 040514
      75043 020116
      75044 040515
      75045 042440

0625*
0626 75046          KIL3 EQU *
0627 75046 116005   JSB DLKP,I     SEARCH DIRECTORY FOR PROGRAM
0628 75047 027063   JMP KIL10      FOUND.
0629*
0630 75050 060334   LDA ,=14

```



```

0631 75051 067053      LDB **2
0632 75052 026432      JMP LIBER
0633 75053 075054      DEF **1
0634 75054 005116      OCT 5116
0635 75055 047440      ASC 6,0 SUCH ENTRY
      75056 051525
      75057 041510
      75060 020105
      75061 047124
      75062 051131
    
```

0636*
0637* FOUND ENTRY, NOW REMOVE IT.

```

0638*
0639 75063 064035      KIL10 LDB KILPD      GET LOCATION OF DISC ADDRESS.
0640 75064 074051      STB MOVED
0641 75065 044361      ADB ,+7           B => DRUM ADDRESS
0642 75066 160001      LDA B,I           A = DRUM ADDRESS
0643 75067 070044      STA KILD         SAVE THEM.
0644 75070 006004      INB              B => DISK ADDRESS
0645 75071 104200      DLD B,I          AB = DISK ADDRESS
      75072 100001
0646 75073 104400      DST KILDI        SAVE DISK ADDRESS
      75074 000046
0647 75075 064035      LDB KILPD        B => DIR ENTRY
0648 75076 044365      ADB ,+11         B => LENGTH
0649 75077 160001      LDA B,I          A = LENGTH OF FILE
0650 75100 064000      LDB A
0651 75101 005222      RBL,RBL
0652 75102 074045      STB KILDF        SET DRUM SECTOR COUNT
0653 75103 002021      SSA,RSS          SKIP IF LENGTH IN WORDS (NEGATIV
0654 75104 027113      JMP KIL11        LENGTH IS POSITIVE BLOCK COUNT
0655 75105 007400      CCB
0656 75106 101026      ASR 6            / 64 TO GET DRUM SECTOR COUNT
0657 75107 003004      CMA,INA         MAKE INTO POSITIVE COUNT
0658 75110 070045      STA KILDF
0659 75111 040355      ADA ,+3
0660 75112 001121      ARS,ARS
0661 75113              KIL11 EQU *
0662 75113 070043      STA KILN        SAVE LENGTH
0663*
0664 75114 034036      ISZ KILTS        TEST FOR OK TO KILL.
0665 75115 027211      JMP KIL18        O.K.
0666 75116 064035      LDB KILPD        TEST FOR FILE.
0667 75117 044354      ADB ,+2
0668 75120 160001      LDA 1,I
0669 75121 002021      SSA,RSS
0670 75122 027211      JMP KIL18        NOT A FILE.
0671*
0672 75123 060732      LDA M2000        INPUT FUSS TABLE
0673 75124 070072      STA WORD
0674 75125 070042      STA KILC        SAVE IN KILC ALSO.
0675 75126 160540      LDA FUSS,I
0676 75127 064566      LDB LIBDI
0677 75130 016231      JSB DRUML
0678 75131 116015      JSB SICKP,I     IT'S STUCK ON THE DRUM
    
```

```

0679*
0680 75132 060273 LDA MLINK+1 COMPUTE USER'S
0681 75133 040336 ADA ,+?TNUM=?LINK
0682 75134 160000 LDA A,I USER # IN BITS 12 - 8
0683 75135 001727 ALF,ALF RIGHT JUSTIFY USER NUMBER
0684 75136 001722 ALF,RAL COMPUTE LOCATION OF
0685 75137 040562 ADA LIBD USER'S FUSS,
0686 75140 070045 STA KILDF ZERO OUT USER'S FUSS,
0687 75141 060317 LDA M32
0688 75142 174045 STB KILDF,I
0689 75143 034045 ISZ KILDF
0690 75144 002006 INA,SZA
0691 75145 027142 JMP *-3
0692*
0693* SEARCH FUSS TABLE TO SEE IF FILE IS BEING USED
0694*
0695 75146 064562 LDB LIBD B => BEGINNING OF TABLE
0696 75147 074042 STB KILC
0697 75150 104200 DLD KILDI GET DISK ADDRESS TO AB
75151 000046
0698 75152 KILAD EQU *
0699 75152 150042 CPA KILC,I ARE THE UPPER WORDS EQUAL?
0700 75153 027166 JMP KILAF YES, CHECK LOWER WORDS
0701 75154 031036 IOR BIT15 PLUG IN WRITE PROTECT BIT AND
0702 75155 150042 CPA KILC,I CHECK FOR THAT EQUAL
0703 75156 027166 JMP KILAF EQUAL, CHECK LOWER WORD
0704 75157 034042 ISZ KILC
0705 75160 KILAE EQU *
0706 75160 034042 ISZ KILC ADVANCE POINTER TO NEXT ENTRY
0707 75161 060536 LDA L1024 GET ENDING ADDRESS AND
0708 75162 050042 CPA KILC SEE IF WE ARE THERE YET
0709 75163 027172 JMP KILAJ NOT IN FUSS TABLE
0710 75164 060046 LDA KILDI MUST SEARCH ON, RESTORE UPPER WO
0711 75165 027152 JMP KILAD
0712*
0713 75166 KILAF EQU *
0714 75166 034042 ISZ KILC ADVANCE TO SECOND WORD
0715 75167 154042 CPB KILC,I CHECK LOWER WORD
0716 75170 027177 JMP KIL19 CAN'T KILL - - FILE IS IN USE
0717 75171 027160 JMP KILAE GO TRY NEXT ENTRY
0718 75172 KILAJ EQU *
0719*
0720 75172 160540 LDA FUSS,I WRITE BACK FUSS TABLE,
0721 75173 064562 LDB LIBD
0722 75174 016231 JSB DRUML
0723 75175 116015 JSB SICKP,I NOW IT'S STUCK IN CORE
0724 75176 027046 JMP KIL3 GO GET DIRECTORY AGAIN,
0725*
0726 75177 060336 KIL19 LDA *-12
0727 75200 067202 LDB **2
0728 75201 026432 JMP LIBER
0729 75202 075203 DEF **1
0730 75203 005106 OCT 5106 LF=F
0731 75204 044514 ASC 5,ILE IN USE
75205 042440

```

75206 044516
 75207 020125
 75210 051505

0732*				
0733	75211	064035	KIL18 LDB KILPD	SET UP PARAMETERS FOR MOVE.
0734	75212	044366	ADB .+12	
0735	75213	074050	STB MOVES	
0736	75214	144034	ADB KILP,I	
0737	75215	044674	ADB MLIBD	
0738	75216	016257	JSB MOVEW	
0739*				
0740	75217	160034	LDA KILP,I	REDUCE DIRECTORY LENGTH BY 8.
0741	75220	040366	ADA .+12	
0742	75221	170034	STA KILP,I	
0743	75222	070072	STA WORD	WRITE DIRECTORY BACK OUT.
0744	75223	060034	LDA KILP	
0745	75224	002004	INA	
0746	75225	070051	STA MOVED	
0747	75226	040357	ADA .+5	
0748	75227	073337	STA KILRD	
0749	75230	160000	LDA 0,I	
0750	75231	064562	LDB LIBD	
0751	75232	074050	STB MOVES	
0752	75233	016231	JSB DRUML	
0753	75234	027326	JMP KILRC	
0754*				
0755	75235	060034	LDA KILP	ADJUST WORDS 1-4 OF DIREC.
0756	75236	002004	INA	
0757	75237	070051	STA MOVED	
0758	75240	064346	LDB .-4	
0759	75241	016257	JSB MOVEW	
0760*				
0761	75242	016107	JSB RDIOT	READ IN IDT
0762	75243	060043	LDA KILN	GET PROGRAM LENGTH.
0763	75244	003004	CMA,INA	
0764	75245	044361	ADB .+7	ADJUST IDT
0765	75246	140001	ADA B,I	
0766	75247	170001	STA 1,I	
0767	75250	060075	LDA IDLCP	
0768	75251	073337	STA KILRD	
0769	75252	160075	LDA IDLCP,I	RESTORE UPDATED
0770	75253	064562	LDB LIBD	IDT TO
0771	75254	016231	JSB DRUML	THE DRUM
0772	75255	027326	JMP KILRC	
0773*				
0774	75256	060044	LDA KILD	CHECK DRUM ADDRESS
0775	75257	002003	SZA,RSS	TO SEE IF FILE IS SANCTIFIED
0776	75260	027276	JMP KILB	NO, DONE
0777*				
0778*	RESTORE SPACE USED BY SANCTIFIED			
0779*	FILE TO THE DRUM ADT			
0780*				
0781	75261	060113	LDA ADLEN	GET AD TRACK LENGTH WORD
0782	75262	070072	STA WORD	SET DRUM DRIVER WORD COUNT
0783	75263	060112	LDA ADLOC	GET AD TRACK DRUM ADDRESS

0784	75264	064566	LDB LIBOI	
0785	75265	016231	JSB DRUML	READ TRACK IN
0786	75266	027276	JMP KILB	
0787	75267	116012	JSB RSFSP, I	PUT DRUM SPACE BACK
0788	75270	060113	LDA ADLEN	WRITE THE ADT
0789	75271	070072	STA WORD	
0790	75272	060112	LDA ADLOC	TO THE DRUM
0791	75273	064562	LDB LIBD	
0792	75274	016231	JSB DRUML	
0793	75275	116015	JSB SICKP, I	
0794*				
0795*				NOW RESTORE THE DISK SPACE TO THE APPROPRIATE
0796*				DISK ADT
0797*				
0798	75276		KILB EQU *	
0799	75276	116007	JSB FADTP, I	FIND THE CORRECT DISK
0800*				
0801	75277	160045	LDA KILDF, I	GET LENGTH OF DISK ADT
0802	75300	070072	STA WORD	SET FOR DRUM DRIVER
0803	75301	160044	LDA KILD, I	A = DRUM ADDRESS OF DISK ADT
0804	75302	002003	SZA, RSS	CHECK EXISTANCE
0805	75303	026226	JMP LLEND	NO SUCH ADT - - QUIT
0806	75304	064566	LDB LIBDI	GET CORE ADDRESS AND INPUT BIT
0807	75305	016231	JSB DRUML	READ THE DISK ADT IN
0808	75306	027315	JMP KILCS	CAN'T, FORGET ABOUT RETURNING IT
0809	75307	116011	JSB RADTP, I	PUT SPACE FOR THIS ENTRY BACK
0810	75310	027315	JMP KILCS	SKIP REWRITE
0811	75311	160044	LDA KILD, I	A* DRUM ADDRESS
0812	75312	064562	LDB LIBD	
0813	75313	016231	JSB DRUML	WRITE OUT UPDATED ADT
0814	75314	027333	JMP KILD M	CAN'T, MAKE IT DISAPPEAR
0815	75315		KILCS EQU *	
0816*				
0817	75315	060036	LDA KILTS	DID WE JUST KILL A
0818	75316	002003	SZA, RSS	FILE?
0819	75317	026226	JMP LLEND	NO.
0820	75320	016047	JSB RDPRG	IF WE DID, WE HAVE TO DECOMPILE
0821	75321	015322	JSB DCMP L	THE GUY TO MAKE SURE HE DOESN'T
0822	75322	060273	LDA MLINK+1	USE IT.
0823	75323	040335	ADA , -7LINK	LEAVE USER IN CORE.
0824	75324	070257	STA MAIN	
0825	75325	026226	JMP LLEND	TERMINATE.
0826	75326	064346	KILRC LDB , -4	
0827	75327	016257	JSB MOVEW	RESET DIREC
0828	75330	064072	LDB WORD	
0829	75331	063337	LDA KILRD	
0830	75332	116016	JSB SALVP, I	
0831	75333	002400	KILD M CLA	
0832	75334	170044	STA KILD, I	ZERO DRUM ADDRESS
0833	75335	170045	STA KILDF, I	ZERO LENGTH
0834	75336	027315	JMP KILCS	
0835	75337	000000	KILRD BSS 1	
0836	00034		KILP EQU LTEMP+4	
0837	00035		KILPD EQU LTEMP+5	
0838	00036		KILTS EQU LTEMP+6	

```
0839 00042      KILC EQU LTEMP+10
0840 00043      KILN EQU LTEMP+11
0841 00044      KILD EQU LTEMP+12
0842 00045      KILDF EQU LTEMP+13
0843 00046      KILDI EQU LTEMP+14
0844* LTEMP+15 IS USED HERE ALSO
0845 75340      SKIL EQU *
```

0002* THE RENUMBER ROUTINE IS CALLED BY A USER TO ASSIGN NEW
 0003* SEQUENCE NUMBERS TO ALL OR A PART OF A PROGRAM. THE FORMAT OF
 0004* THE COMMAND IS:
 0005* REN=M,N,P,Q
 0006* M IS THE NEW INITIAL SEQUENCE NUMBER
 0007* N IS THE NEW INCREMENT
 0008* P IS THE FIRST STATEMENT TO BE RENUMBERED
 0009* Q IS THE LAST STATEMENT TO BE RENUMBERED.
 0010* DEFAULT VALUES ARE ASSIGNED AS FOLLOWS:
 0011* M=10, N=10, P=FIRST STATEMENT, Q=LAST STATEMENT
 0012*

```

0014 75000          ORG LIBRA
0015 75000 060273   LDA MLINK+1
0016 75001 040340   ADA .+?PROG-?LINK
0017 75002 164000   LDB 0,I
0018 75003 054702   CPB PBUFF          NULL PROGRAM?
0019 75004 026226   JMP LLEND          YES
0020 75005 016047   JSB RDPRG          READ IN USER PROGRAM.
0021 75006 064273   LDB MLINK+1        COMPUTE
0022 75007 044335   ADB .-?LINK
0023 75010 060354   LDA CFLAG          PROGRAM
0024 75011 110001   AND 1,I
0025 75012 064056   LDB PBPTR          STATE AND
0026 75013 070033   STA RENC
0027 75014 002002   SZA                END OF PROGRAM
0028 75015 065575   LDB SYMTB
0029 75016 074040   STB RENEN          POINTER
    
```

0030*
 0031* SET UP INITIAL SEQUENCE NUMBER AND INCREMENT
 0032*

```

0033 75017 061577   LDA SPROG
0034 75020 070037   STA RENBA          INITIALIZE
0035 75021 074045   STB RENLA
0036 75022 060364   LDA .+10           DEFAULT
0037 75023 070031   STA RENM
0038 75024 070032   STA RENN           VALUES
0039 75025 017417   JSB RENUM          PARAMETER?
0040 75026 027134   JMP REN1           NO
0041 75027 074031   STB RENM           YES, RECORD IT
0042 75030 050367   CPA .+15B          END OF RECORD?
0043 75031 027134   JMP REN1           YES
0044 75032 050426   CPA .+54B          NO, COMMA?
0045 75033 017417   JSB RENUM          DEMAND SECOND
0046 75034 027454   JMP RENF1          NONE FOUND
0047 75035 074032   STB RENN           RECORD IT
0048 75036 050367   CPA .+15B          END OF RECORD?
0049 75037 027134   JMP REN1           YES
0050 75040 050426   CPA .+54B          NO, COMMA?
0051 75041 017417   JSB RENUM          YES, DEMAND THIRD
0052 75042 027454   JMP RENF1          NOT FOUND
0053 75043 074037   STB RENBA          RECORD IT
0054 75044 050367   CPA .+15B          END OF RECORD?
0055 75045 027075   JMP REN22          YES
    
```

0056	75046	050426	CPA	+.54B	NO, COMMA?
0057	75047	017417	JSB	RENUM	DEMAND FOURTH
0058	75050	027454	JMP	RENF1	NONE FOUND
0059	75051	074045	STB	RENLA	RECORD IT
0060	75052	050367	CPA	+.15B	END OF RECORD?
0061	75053	002001	RSS		
0062	75054	027454	JMP	RENF1	NO, ERROR
0063*					
0064*	FIND THE LAST SEQUENCE NUMBER LESS THAN				
0065*	OR EQUAL TO RENLA, AND SET RENLA TO POINT TO IT				
0066*					
0067	75055	065577	LDB	SPROG	START WITH FIRST PROGRAM WORD
0068	75056	074030	STB	RENLA	
0069	75057		REN20	EQU *	
0070	75057	054040	CPB	RENEB	PROGRAM EXHAUSTED?
0071	75060	027073	JMP	REN21	YES
0072	75061	160001	LDA	B, I	CURRENT SEQUENCE
0073	75062	003004	CMA,	INA	NUMBER GREATER
0074	75063	040045	ADA	RENLA	THAN RENLA?
0075	75064	002020	SSA		
0076	75065	027073	JMP	REN21	YES
0077	75066	074030	STB	RENLA	NO, SAVE POINTER TO STATEMENT
0078	75067	060001	LDA	B	
0079	75070	002004	INA		SET (B) TO
0080	75071	144000	ADB	A, I	NEXT PROGRAM
0081	75072	027057	JMP	REN20	STATEMENT
0082	75073		REN21	EQU *	
0083	75073	064030	LDB	RENLA	
0084	75074	074045	STB	RENLA	
0085*					
0086*	FIND THE FIRST SEQUENCE NUMBER GREATER THAN				
0087*	OR EQUAL TO RENBA, AND SET RENBA TO POINT TO IT				
0088*					
0089	75075		REN22	EQU *	
0090	75075	060037	LDA	RENBA	
0091	75076	003004	CMA,	INA	
0092	75077	070037	STA	RENBA	
0093	75100	065577	LDB	SPROG	START WITH FIRST WORD OF PROGRAM
0094	75101	074030	STB	RENLA	
0095	75102		REN23	EQU *	
0096	75102	054040	CPB	RENEB	PROGRAM EXHAUSTED?
0097	75103	027115	JMP	REN24	YES
0098	75104	160001	LDA	B, I	CURRENT SEQUENCE
0099	75105	040037	ADA	RENBA	NUMBER GREATER THAN
0100	75106	002021	SSA,	RSS	OR EQUAL TO RENBA?
0101	75107	027115	JMP	REN24	YES
0102	75110	060001	LDA	B	NO,
0103	75111	002004	INA		SET (B)
0104	75112	074030	STB	RENLA	TO NEXT
0105	75113	144000	ADB	A, I	PROGRAM
0106	75114	027102	JMP	REN23	STATEMENT
0107	75115		REN24	EQU *	
0108	75115	054040	CPB	RENEB	SEQ NBR BEYOND PROGRAM?
0109	75116	027366	JMP	REN13	YES, SO FINISHED
0110	75117	074037	STB	RENBA	

0111	75120	055577	CPB	SPROG	1ST STATEMENT
0112	75121	027127	JMP	REN29	YES
0113*					
0114*	TEST FOR SEQUENCE NUMBER OVERLAP AT RENBA				
0115*					
0116	75122	060031	LDA	RENM	LOAD NEW BA SEQ NBR
0117	75123	003004	CMA,	INA	GET OLD
0118	75124	140030	ADA	RENLI, I	SEQUENCE NUMBER
0119	75125	002021	SSA,	RSS	OVERLAP?
0120	75126	027372	JMP	RENF2	YES
0121	75127		REN29	EQU *	
0122	75127	060037	LDA	RENBA	RENLA
0123	75130	003004	CMA,	INA	GREATER
0124	75131	040045	ADA	RENLA	THAN OR
0125	75132	002020	SSA		EQUAL TO RENBA?
0126	75133	027454	JMP	RENF1	NO, FAIL
0127*					
0128*	GET NUMBER OF STATEMENTS IN PROGRAM				
0129*					
0130	75134		REN1	EQU *	
0131	75134	002400	CLA		INITIALIZE
0132	75135	070041	STA	RENNS	COUNTER
0133	75136	065577	LDB	SPROG	
0134	75137		REN27	EQU *	
0135	75137	054040	CPB	RENEN	DONE?
0136	75140	027146	JMP	REN2	YES
0137	75141	060001	LDA	B	ADVANCE
0138	75142	002004	INA		TO
0139	75143	144000	ADB	A, I	NEXT
0140	75144	034041	ISZ	RENNS	STATEMENT
0141	75145	027137	JMP	REN27	
0142*					
0143*	GET THE NUMBER OF STATEMENTS FROM RENBA TO RENLA				
0144*					
0145	75146		REN2	EQU *	
0146	75146	002400	CLA		INITIALIZE
0147	75147	070030	STA	RENLI	STATEMENT COUNTER
0148	75150	064037	LDB	RENBA	STARTING STATEMENT
0149	75151		REN25	EQU *	
0150	75151	054045	CPB	RENLA	PROGRAM EXHAUSTED?
0151	75152	027160	JMP	REN26	YES
0152	75153	060001	LDA	B	NO
0153	75154	002004	INA		SET (B)
0154	75155	144000	ADB	A, I	TO NEXT
0155	75156	034030	ISZ	RENLI	PROGRAM
0156	75157	027151	JMP	REN25	STATEMENT
0157*					
0158*	TEST FOR SEQUENCE NUMBER OVERLAP AT RENLA				
0159*					
0160	75160		REN26	EQU *	
0161	75160	060030	LDA	RENLI	COMPUTE
0162	75161	064045	LDB	RENLA	NEW
0163	75162	054040	CPB	RENEN	HIGHEST
0164	75163	040351	ADA	,-1	SEQUENCE
0165	75164	100200	MPY	RENN	NUMBER

0166	75165	000032			
0166	75166	002021		SSA, RSS	
0167	75167	006002		SZB	
0168	75170	027372		JMP RENF2	OVERFLOW
0169	75171	040031		ADA RENM	
0170	75172	070030		STA RENL	SAVE IT
0171	75173	040716		ADA MAXSN	IN
0172	75174	002021		SSA, RSS	LEGAL RANGE?
0173	75175	027372		JMP RENF2	NO
0174	75176	060045		LDA RENLA	YES
0175	75177	050040		CPA RENEN	
0176	75200	027213		JMP REN3	
0177	75201	064000		LDB A	MOVE
0178	75202	006004		INB	PTR TO
0179	75203	140001		ADA B, I	NEXT STATEMENT
0180	75204	050040		CPA RENEN	BEYOND PROGRAM?
0181	75205	027213		JMP REN3	YES, DON'T BOTHER ABOUT OVERLAP
0182	75206	164000		LDB A, I	GET FOLLOWING
0183	75207	007004		CMB, INB	OLD SEQ NBR
0184	75210	044030		ADB RENL	TEST FOR OVERLAP
0185	75211	006021		SSB, RSS	
0186	75212	027372		JMP RENF2	FAIL
0187	75213	064033	REN3	LDB RENC	PROGRAM
0188	75214	006002		SZB	COMPILED?
0189	75215	027332		JMP REN9	YES
0190*					
0191	75216	060041		LDA RENNS	GET # OF STATEMENTS IN PROGRAM,
0192	75217	100400		DIV ,+32	DIVIDE INTO 32 PARTS,
	75220	000412			
0193	75221	007000		CMB	SET B=-1-#OF OVERSIZE GROUPS,
0194	75222	002003		SZA, RSS	BUT IF <32 STATEMENTS USE =#.
0195	75223	006004		INB	
0196	75224	002004		INA	SET A TO SIZE OF LARGER GROUP,
0197	75225	070042		STA RENC1	SET COUNTER,
0198	75226	074043		STB RENC2	
0199	75227	064544		LDB ERSCA	SET INITIAL POINTER TO ERSEC,
0200	75230	074046		STB RENS N	
0201*					
0202*	NOW BUILD A TABLE IN ERSEC HAVING THE FOLLOWING STRUCTURE;				
0203*	ERSEC(0:31) ARE SEQUENCE NOS. OF STATEMENTS WHICH DIVIDE				
0204*	THE PROGRAM INTO 32 ALMOST EQUAL PARTS. ERSEC(32:63) ARE THE ABSO-				
0205*	LUTE ADDRESSES OF THESE STATEMENTS, ERSEC(0) IS THE SEQ.NO. OF THE				
0206*	FIRST STATEMENTS.				
0207*					
0208	75231	061577		LDA SPROG	
0209	75232	044412	REN15	ADB ,+32	
0210	75233	170001		STA 1, I	SET ABSOLUTE ADDRESS INTO TABLE.
0211	75234	164000		LDB 0, I	SET SEQUENCE # INTO TABLE.
0212	75235	174046		STB RENS N, I	
0213	75236	034046		ISZ RENS N	BUMP POINTERS,
0214*					
0215	75237	034043		ISZ RENC2	TEST FOR ANY MORE OVERSIZE
0216	75240	006401		CLB, RSS	GROUPS,
0217	75241	007400		CCB	COMPUTE SIZE OF NEXT GROUP.
0218	75242	044042		ADB RENC1	

0219	75243	074042		STB RENC1	
0220	75244	007000		CMB	
0221	75245	074044		STB RENC3	
0222*					
0223	75246	064046		LDB RENS9	TEST FOR DONE.
0224	75247	054644		CPB ERS32	
0225	75250	027257		JMP REN14	
0226*					
0227	75251	034044		ISZ RENC3	COMPUTE 1ST STATEMENT IN
0228	75252	002005		INA, RSS	NEXT GROUP.
0229	75253	027232		JMP REN15	
0230	75254	140000		ADA 0, I	
0231	75255	040351		ADA -1	
0232	75256	027251		JMP *-5	
0233*					
0234*	SCAN THROUGH PROGRAM FOR SEQUENCE NUMBER REFERENCES.				
0235*	FOR EACH ONE, DETERMINE ABSOLUTE ADDRESS OF THE LABEL				
0236*	AND REPLACE IT WITH THAT ADDRESS. IF LABEL IS NONEXISTENT,				
0237*	PLACE THE NEGATIVE LABEL IN TO INDICATE THIS FACT.				
0238*					
0239	75257	061577	REN14	LDA SPROG	INITIALIZE POINTERS
0240	75260	070035		STA RENQ	FOR RENS9.
0241	75261	040351		ADA -1	
0242	75262	070034		STA RENP	
0243*					
0244	75263	017467	REN4	JSB RENS9	GET NEXT STATEMENT REFERENCE.
0245	75264	027332		JMP REN9	NONE LEFT.
0246*					
0247	75265	064544		LDB ERSCA	
0248	75266	160001	REN7	LDA 1, I	FIRST STATEMENT >= SOUGHT STATE.?
0249	75267	003000		CMA	
0250	75270	140034		ADA RENP, I	
0251	75271	002024		SSA, INA	
0252	75272	027302		JMP REN5	FOUND ONE.
0253	75273	006004		INB	
0254	75274	054644		CPB ERS32	TEST FOR DONE.
0255	75275	002001		RSS	
0256	75276	027266		JMP REN7	
0257*					
0258	75277	044411		ADB +31	
0259	75300	060056		LDA PBPTR	STATEMENT IS IN LAST GROUP.
0260	75301	027311		JMP REN6	
0261	75302	044412	REN5	ADB +32	B=>FIRST STATEMENT IN GROUP.
0262	75303	002003		SZA, RSS	TEST FOR FOUND.
0263	75304	027324		JMP REN18	
0264	75305	054644		CPB ERS32	TEST FOR NOT THERE.
0265	75306	027326		JMP REN17	
0266	75307	160001		LDA 1, I	SET A=>FIRST WORD BEYOND GROUP.
0267	75310	044351		ADB -1	AT FIRST WORD BEYOND GROUP.
0268	75311	164001	REN6	LDB 1, I	
0269	75312	070042		STA RENC1	SAVE END TEST.
0270	75313	160034		LDA RENP, I	GET SEQUENCE NUMBER.
0271	75314	006004	REN16	INB	BUMP STATEMENT POINTER.
0272	75315	144001		ADB 1, I	
0273	75316	044351		ADB -1	

```

0274 75317 054042          CPB RENC1      TEST FOR DONE.
0275 75320 027326          JMP REN17
0276 75321 150001          CPA 1,I      TEST FOR FOUND.
0277 75322 027330          JMP REN8
0278 75323 027314          JMP REN16
0279*
0280 75324 164001  REN18  LDB 1,I
0281 75325 027330          JMP *+3
0282 75326 164034  REN17  LDB RENP,I      SET BIT15 FOR
0283 75327 045036          ADB BIT15    UNDEFINED LABELS.
0284 75330 174034  REN8   STB RENP,I
0285 75331 027263          JMP REN4
0286*
0287* NOW CHANGE ALL LABELS TO THEIR NEW VALUES.
0288*
0289 75332          REN9   EQU *
0290 75332 060037          LDA RENBA
0291 75333 064031          LDB RENM
0292 75334          REN10  EQU *
0293 75334 050045          CPA RENLA    DONE?
0294 75335 027344          JMP REN28    YES
0295 75336 174000          STB A,I      NO, RECORD NEW SEQUENCE NUMBER
0296 75337 044032          ADB RENN     INCREMENT TO NEXT LINE NUMBER
0297 75340 002004          INA         MOVE
0298 75341 140000          ADA A,I     TO
0299 75342 040351          ADA ,-1     NEXT
0300 75343 027334          JMP REN10    STATEMENT
0301 75344          REN28  EQU *
0302 75344 050040          CPA RENEN
0303 75345 002001          RSS
0304 75346 174000          STB A,I     RECORD LAST SEQ NBR
0305*
0306* SCAN REFERENCES AGAIN, IF ABSOLUTE ADDRESS IS THERE,
0307* REPLACE BY NEW LABEL, OTHERWISE REPLACE BY OLD LABEL.
0308*
0309 75347 060033  REN11  LDA RENC      IS PROGRAM
0310 75350 002002          SZA         COMPILED?
0311 75351 027366          JMP REN13    YES
0312 75352 061577          LDA SPROG
0313 75353 070035          STA RENQ
0314 75354 040351          ADA ,-1
0315 75355 070034          STA RENP    SEEK EMBEDDED
0316 75356 017467  REN12  JSB RENSK    STATEMENT REFERENCES
0317 75357 027366          JMP REN13    NONE LEFT
0318 75360 160034          LDA RENP,I  IF REFERENCE IS
0319 75361 001275          RAL,CLE,SLA,ERA  NEGATIVE, CLEAR BIT 15,
0320 75362 002001          RSS        OTHERWISE, REPLACE IT,
0321 75363 160000          LDA 0,I    WITH THE NEW
0322 75364 170034          STA RENP,I  LINE NUMBER
0323 75365 027356          JMP REN12
0324 75366 060273  REN13  LDA MLINK+1  SET FLAG TO SAY
0325 75367 040335          ADA ,-?LINK 'USER PROGRAM TO CORE'
0326 75370 070257          STA MAIN
0327 75371 026226          JMP LLEND
0328 75372          RENF2  EQU *

```

0329	75372	063604	LDA	LENT	
0330	75373	067375	LDB	RENO	
0331	75374	026432	JMP	LIBER	
0332	75375	075376	RENO	DEF	**1
0333	75376	005123	OCT	5123	LF=8
0334	75377	042521	ASC	16,	EQUENCE NUMBER OVERFLOW/OVERLAP
	75400	052505			
	75401	047103			
	75402	042440			
	75403	047125			
	75404	046502			
	75405	042522			
	75406	020117			
	75407	053105			
	75410	051106			
	75411	046117			
	75412	053457			
	75413	047526			
	75414	042522			
	75415	046101			
	75416	050040			

0335*

0336* RENUM SCANS INPUT BUFFER FOR A NUMBER. IF IT FINDS NOTHING
 0337* IT RETURNS WITHOUT SKIPPING. IF IT FINDS A LEGAL LABEL
 0338* (1-9999) IT RETURNS WITH IT IN B AND THE NEXT CHARACTER IN A,
 0339* AND SKIPS ON THE WAY BACK. IF IT FINDS AN ERROR IT GOES TO RENF.

0340*

0341	75417	000000	RENUM	NOP	
0342	75420	002400		CLA	INITIALIZE INTEGER
0343	75421	070030		STA	RENL
0344	75422	016164		JSB	LCHAR
0345	75423	127417		JMP	RENUM, I
0346	75424	040316	RENU1	ADA	M72B
0347	75425	002021		SSA, RSS	YES, IS IT
0348	75426	027447		JMP	RENU2
0349	75427	040364		ADA	.+10
0350	75430	002020		SSA	> ASCII 57 ?
0351	75431	027447		JMP	RENU2
0352	75432	064030		LDB	RENL
0353	75433	047605		ADB	.1000
0354	75434	006021		SSB, RSS	< 1000 ?
0355	75435	027454		JMP	RENF1
0356	75436	064030		LDB	RENL
0357	75437	005222		RBL, RBL	MULTIPLY
0358	75440	044030		ADB	RENL
0359	75441	005200		RBL	10
0360	75442	040001		ADA	1
0361	75443	070030		STA	RENL
0362	75444	016164		JSB	LCHAR
0363	75445	027450		JMP	++3
0364	75446	027424		JMP	RENU1
0365	75447	040432	RENU2	ADA	.+60B
0366	75450	064030		LDB	RENL
0367	75451	037417		ISZ	RENUM
0368	75452	006002		SZB	NON-ZERO INTEGER?

0369	75453	127417		JMP RENUM,I	YES
0370	75454	060334	RENF1	LDA ,=14	
0371	75455	067457		LDB **2	
0372	75456	026432		JMP LIBER	
0373	75457	075460		DEF **1	
0374	75460	005102		OCT 5102	LF=B
0375	75461	040504		ASC 6,AD	PARAMETER
	75462	020120			
	75463	040522			
	75464	040515			
	75465	042524			
	75466	042522			
0376	75467	000000	RENSK	NOP	
0377	75470	034034		ISZ RENP	INCREMENT POINTER
0378	75471	064035		LDB RENQ	
0379	75472	034036		ISZ RENR	<USING STATEMENT>?
0380	75473	002001		RSS	NO
0381	75474	027502		JMP RENS2	YES
0382	75475	054034		CPB RENP	STATEMENT FINISHED?
0383	75476	027502		JMP RENS2	YES
0384	75477	037467	RENS1	ISZ RENSK	NO, RETURN WITH RENP
0385	75500	127467		JMP RENSK,I	SET TO NEXT REFERENCE
0386	75501	074035		STB RENQ	UPDATE TO NEXT STATEMENT
0387	75502	054056	RENS2	CPB PBPTR	PROGRAM EXHAUSTED?
0388	75503	127467		JMP RENSK,I	YES
0389	75504	002400		CLA	CLEAR USING
0390	75505	070036		STA RENR	FLAG
0391	75506	034035		ISZ RENQ	
0392	75507	064035		LDB RENQ	
0393	75510	034035		ISZ RENQ	EXTRACT
0394	75511	160035		LDA RENQ,I	STATEMENT
0395	75512	010664		AND OPMSK	TYPE
0396	75513	144001		ADB 1,I	SET (B) TO
0397	75514	044351		ADB ,=1	NEXT STATEMENT
0398	75515	053576		CPA RESOP	<RESTORE STATEMENT> ?
0399	75516	027573		JMP RENS5	YES
0400	75517	053577		CPA GOTOP	NO, <GOTO STATEMENT> ?
0401	75520	027560		JMP RENS3	YES
0402	75521	053600		CPA GOSOP	NO, <GOSUB STATEMENT> ?
0403	75522	027560		JMP RENS3	YES
0404	75523	053601		CPA IFOP	NO, <IF STATEMENT>?
0405	75524	027557		JMP RENS3-1	YES
0406	75525	053602		CPA MTOPR	NO, <MAT STATEMENT>?
0407	75526	002001		RSS	YES
0408	75527	027533		JMP RENS6	NO
0409	75530	034035		ISZ RENQ	
0410	75531	160035		LDA RENQ,I	GET NEXT
0411	75532	010664		AND OPMSK	OPERATOR
0412	75533		RENS6	EQU *	
0413	75533	050656		CPA PRTOP	<PRINT STATEMENT>?
0414	75534	002001		RSS	YES
0415	75535	027501		JMP RENS2-1	NO
0416	75536	034035		ISZ RENQ	
0417	75537	160035		LDA RENQ,I	GET NEXT
0418	75540	010664		AND OPMSK	OPERATOR

0419	75541	050776	CPA	USEOP	<USING STATEMENT?	
0420	75542	002001	RSS		YES	
0421	75543	027501	JMP	RENS2-1	NO	
0422	75544	120035	XOR	RENG,I	GET OPERAND	
0423	75545	050670	CPA	INTFL	INTEGER FOLLOWS?	
0424	75546	002001	RSS		YES	
0425	75547	027501	JMP	RENS2-1	NO	
0426	75550	003400	CCA		SET USING	
0427	75551	070036	STA	RENK	FLAG	
0428	75552	060035	LDA	RENG	SET	
0429	75553	002004	INA		REFERENCE	
0430	75554	070034	STA	RENP	POINTER	
0431	75555	074035	STB	RENG	SET POINTER TO NEXT STATEMENT	
0432	75556	027477	JMP	RENS1		
0433	75557	063603	LDA	THNOP	LOAD !THEN!	
0434	75560	030670	RENS3	IOR	INTFL	CREATE REFERENCE HEADER
0435	75561	074035	STB	RENG	SET POINTER TO NEXT STATEMENT	
0436	75562	044351	ADB	.-1	SET POINTER TO	
0437	75563	074034	RENS4	STB	RENP	PROSPECTIVE REFERENCE
0438	75564	044351	ADB	.-1	PRECEDED BY	
0439	75565	150001	CPA	1,I	REFERENCE HEADER?	
0440	75566	027477	JMP	RENS1	YES	
0441	75567	060706	LDA	OFOP	NO, LOAD HEADER FOR	
0442	75570	150001	CPA	1,I		
0443	75571	027477	JMP	RENS1		
0444	75572	027563	JMP	RENS4	REFERENCE LIST	
0445	75573	150035	RENS5	CPA	RENG,I	ANY REFERENCE?
0446	75574	027501	JMP	RENS2-1	NO	
0447	75575	027560	JMP	RENS3	YES	
0448	00030		RENK	EQU	LTEMP	
0449	00031		RENM	EQU	LTEMP+1	
0450	00032		RENN	EQU	LTEMP+2	
0451	00033		RENC	EQU	LTEMP+3	
0452	00034		RENP	EQU	LTEMP+4	
0453	00035		RENG	EQU	LTEMP+5	
0454	00036		RENK	EQU	LTEMP+6	
0455	00037		RENBA	EQU	LTEMP+7	
0456	00040		RENEN	EQU	LTEMP+8	
0457	00041		RENNS	EQU	LTEMP+9	
0458	00042		RENC1	EQU	LTEMP+10	
0459	00043		RENC2	EQU	LTEMP+11	
0460	00044		RENC3	EQU	LTEMP+12	
0461	00045		RENLA	EQU	LTEMP+13	
0462	00046		RENSN	EQU	LTEMP+14	
0463	75576	066000	RESOP	OCT	66000	
0464	75577	052000	GUTOP	OCT	52000	
0465	75600	056000	GOSOP	OCT	56000	
0466	75601	053000	IFOP	OCT	53000	
0467	75602	067000	MTOPR	OCT	67000	
0468	75603	075000	THNOP	OCT	75000	
0469	75604	177737	LENT	DEC	=33	
0470	75605	176030	.1000	DEC	=1000	
0471	75606		SREN	EQU	*	

0473* THE NAME ROUTINE ALLOWS A USER TO ASSIGN HIS PROGRAM A NAME.

```

0475 75000          ORG LIBRA

0477 75000 060273   LDA MLINK+1   SET POINTER TO NAME,
0478 75001 040342   ADA .+?NAME=?LINK
0479 75002 070030   STA LTEMP
0480 75003 070033   STA LTEMP+3   SAVE NAME POINTER IN LTEMP+3.
0481 75004 160000   LDA 0,I       SAVE RUN-ONLY BIT IN LTEMP+4.
0482 75005 011036   AND BIT15
0483 75006 070034   STA LTEMP+4
0484 75007 060347   LDA .-3      SET COUNTER,
0485 75010 070031   STA LTEMP+1
0486 75011 002400   CLA         SET FLAG TO SAY
0487 75012 070032   STA LTEMP+2   FIRST CHARACTER
0488 75013 017055   NAME1 JSB NAMER   GET A CHAR,
0489 75014 001727   ALF,ALF
0490 75015 170030   STA LTEMP,I
0491 75016 017055   JSB NAMER   GET 2ND CHAR.
0492 75017 130030   IOR LTEMP,I
0493 75020 170030   STA LTEMP,I
0494 75021 034030   ISZ LTEMP   BUMP NAME POINTER,
0495 75022 034031   ISZ LTEMP+1 TEST FOR DONE.
0496 75023 027013   JMP NAME1
0497 75024 160033   LDA LTEMP+3,I GET FIRST WORD OF NAME
0498 75025 030034   IOR LTEMP+4 MERGE IN RUN-ONLY BIT,
0499 75026 170033   STA LTEMP+3,I
0500 75027 017055   JSB NAMER   TEST FOR ONLY 5 CHARS.
0501 75030 050412   CPA .+40B
0502 75031 026226   JMP LLEND

0503*
0504 75032 063054   LDA NAM27
0505 75033 067035   LDB ++2
0506 75034 026432   JMP LIBER
0507 75035 075036   DEF ++1
0508 75036 005117   OCT 5117    LF=0
0509 75037 047114   ASC 13,NLY 6 CHARACTERS ACCEPTED
75040 054440
75041 033040
75042 041510
75043 040522
75044 040503
75045 052105
75046 051123
75047 020101
75050 041503
75051 042520
75052 052105
75053 042040
0510 75054 177745   NAM27 DEC =27
0511*
0512 75055 000000   NAMER NOP    GETS NEXT NAME CHARACTER.
0513 75056 016164   JSB LCHAR
0514 75057 060412   LDA .+40B    USE BLANK IF END OF LINE.
0515 75060 070001   STA 1       HOLD IN B.

```

0516	75061	010730	AND	.140	TEST FOR CONTROL CHAR.
0517	75062	002002	SZA		
0518	75063	050730	CPA	.140	
0519	75064	027056	JMP	NAMER+1	SKIP CONTROL CHARS.
0520	75065	060001	LDA	1	GET IN A AGAIN.
0521	75066	064032	LDB	LTEMP+2	GET 1ST CHAR FLAG.
0522	75067	034032	ISZ	LTEMP+2	
0523	75070	050416	CPA	+.44B	IF S
0524	75071	002001	RSS		
0525	75072	050424	CPA	+.52B	OR IF *
0526	75073	006002	SZB		AND FIRST CHARACTER
0527	75074	027115	JMP	NAME2	
0528*					
0529	75075	060322	LDA	.=24	PRINT ERROR
0530	75076	067100	LDB	++2	
0531	75077	026432	JMP	LIBER	
0532	75100	075101	DEF	++1	
0533	75101	005111	OCT	5111	LF=I
0534	75102	046114	ASC	11,LLEGAL	FIRST CHARACTER
	75103	042507			
	75104	040514			
	75105	020106			
	75106	044522			
	75107	051524			
	75110	020103			
	75111	044101			
	75112	051101			
	75113	041524			
	75114	042522			
0535	75115	050426	NAME2 CPA	+.54B	IS CHARACTER A COMMA?
0536	75116	002001	RSS		
0537	75117	127055	JMP	NAMER,I	NO. RETURN CHARACTER.
0538	75120	060347	LDA	.=3	YES. BLANK
0539	75121	070030	STA	LTEMP	
0540	75122	064273	LDB	MLINK+1	OUT
0541	75123	044342	ADB	+.?NAME=?LINK	
0542	75124	063132	LDA	NAMBL	ILLEGAL
0543	75125	170001	NAMFL STA	B,I	
0544	75126	006004	INB		
0545	75127	034030	ISZ	LTEMP	
0546	75130	027125	JMP	NAMFL	NAME.
0547	75131	026430	JMP	ILFER	OUTPUT ERROR MESSAGE.
0548*					
0549	75132	020040	NAMBL ASC	1,	
0550	75133		\$NAM EQU	*	


```

0002* CATALOG PRINTS A LIST OF USER PROGRAMS AND FILES ON THE USER
0003* TELETYPE. IT PRINTS THESE, 4 PER LINE, ALONG WITH THEIR LENGTHS
0004* AND AN INDICATION OF FILES, CSAVED PROGRAMS, PROTECTED ENTRIES,
0005* AND SANCTIFIED ENTRIES. LIBRARY MUST FOLLOW CATALOG IN SEQUENCE.
0006*
0007 75000          ORG LIBRA
0008*
0009 75000 002400    CLA          FIRST TIME IN, SET LTEMP(1:3)=0.
0010 75001 070031    STA LTEMP+1 WE WILL HAVE TO LOCATE THE FIRST
0011 75002 070032    STA LTEMP+2 DIRECTORY ENTRY FOLLOWING
0012 75003 070033    STA LTEMP+3 LTEMP(0:3).
0013 75004 060364    LDA ,+12B   LF
0014 75005 016132    JSB LOUT
0015 75006 060346    LDA ,=4
0016 75007 070036    STA CATJ
0017 75010          CAT00 EQU *
0018 75010 060341    LDA ,=9
0019 75011 070037    STA CATN
0020 75012 063346    LDA CATTP
0021 75013 070044    STA CATS
0022 75014          CAT01 EQU *
0023 75014 160044    LDA CATS,I
0024 75015 001727    ALF,ALF
0025 75016 010443    AND B377
0026 75017 016132    JSB LOUT          OUTPUT LEFT CHARACTER
0027 75020 160044    LDA CATS,I
0028 75021 010443    AND B377
0029 75022 016132    JSB LOUT          OUTPUT RIGHT CHARACTER
0030 75023 034044    ISZ CATS          BUMP TO NEXT HEADING WORD
0031 75024 034037    ISZ CATN
0032 75025 027014    JMP CAT01
0033 75026 034036    ISZ CATJ
0034 75027 027010    JMP CAT00
0035 75030 060367    LDA ,+16B        CR
0036 75031 016132    JSB LOUT
0037*
0038 75032 060273    CAT1 LDA MLINK+1   SET USER ID INTO LTEMP.
0039 75033 040341    ADA ,+7ID-7LINK
0040 75034 160000    LDA 0,I
0041 75035 027047    JMP CAT2
0042 75036 000000    BSS 9            SPACE FOR ID CALCS IN GROUP
0043 75047 070030    CAT2 STA LTEMP        RENDEZVOUS WITH "LIBRARY".
0044*
0045 75050 060346    LDA ,=4
0046 75051 070037    STA CATN        SET N TO COUNT # OF NAMES ON
0047 75052 002400    CLA            THIS LINE.
0048 75053 070036    STA CATJ        SET J=0 TO INDICATE THAT NO
0049 75054 060364    LDA ,+12B      DIRECTORY TRACK HAS BEEN EXAMED
0050 75055 016132    JSB LOUT        EMIT A LINE FEED.
0051*
0052 75056 116005    JSB DLOKP,I    FIND LAST ENTRY <= LAST ONE
0053 75057 000000    NOP            OUTPUT.
0054 75060 160034    LDA CATI,I     COMPUTE LAST ADDRESS
0055 75061 003004    CMA,INA        IN TRACK.
0056 75062 040562    ADA LIBD

```

0057	75063	070041		STA CATQ	
0058*					
0059	75064	060035	CAT22	LDA CATP	SET P TO NEXT
0060	75065	040366		ADA ,+12	ENTRY
0061	75066	070035	CAT10	STA CATP	
0062	75067	050041		CPA CATQ	IF P=Q, WERE DONE WITH THIS
0063	75070	027275		JMP CAT11	TRACK--GO LOOK AT NEXT ONE
0064	75071	160035		LDA CATP,I	TEST FOR ENTRY BELONGING TO THIS
0065	75072	050030		CPA LTEMP	USER--IF NOT, WE'RE DONE.
0066	75073	027077		JMP CAT12	
0067*					
0068	75074	060367	CAT13	LDA ,+15B	EMIT CRLF
0069	75075	016132		JSB LOUT	
0070	75076	026226		JMP LLEND	
0071*					
0072	75077	027104	CAT12	JMP CAT23	
0073	75100	000000		NOP	THIS SPACE IS RESERVED
0074	75101	000000		NOP	FOR THE ILL-STORED
0075	75102	000000		NOP	PROGRAM CHECK IN
0076	75103	000000		NOP	LIBRARY AND GROUP.
0077	75104	060347	CAT23	LDA ,=3	SET UP COUNTER FOR
0078	75105	070042		STA CATC	PRINTING NAME.
0079	75106	034035	CAT15	ISZ CATP	BUMP P TO NEXT WORD.
0080	75107	160035		LDA CATP,I	
0081	75110	001727		ALF,ALF	GET LEFT CHAR.
0082	75111	016132		JSB LOUT	PRINT IT.
0083	75112	160035		LDA CATP,I	OUTPUT IT
0084	75113	016132		JSB LOUT	
0085	75114	034042		ISZ CATC	TEST FOR 6 CHARS OUT.
0086	75115	027106		JMP CAT15	
0087	75116	060412		LDA ,+40B	OUTPUT A BLANK.
0088	75117	016132		JSB LOUT	
0089	75120	160035		LDA CATP,I	GET THIRD WORD OF NAME
0090	75121	002021		SSA,RSS	SEMI-COMPILED?
0091	75122	027125		JMP CAT20	NO
0092	75123	063342		LDA ASCC	YES, OUTPUT A "C"
0093	75124	027135		JMP CAT21	
0094	75125	007400	CAT20	CCB	
0095	75126	044035		ADB CATP	
0096	75127	160001		LDA B,I	GET SECOND WORD OF NAME
0097	75130	002021		SSA,RSS	FILE?
0098	75131	027134		JMP ++3	NO
0099	75132	063343		LDA ASCF	YES, OUTPUT "F"
0100	75133	002001		RSS	
0101	75134	060412		LDA ,+40B	NEITHER, OUTPUT " "
0102	75135	016132	CAT21	JSB LOUT	
0103	75136	064035		LDB CATP	POINTER TO
0104	75137	044350		ADB ,=2	FIRST WORD OF NAME
0105	75140	160001		LDA B,I	GET IT
0106	75141	002021		SSA,RSS	PROTECTED?
0107	75142	027145		JMP ++3	NO
0108	75143	063344		LDA ASCP	YES, OUTPUT "P"
0109	75144	002001		RSS	
0110	75145	060412		LDA ,+40B	
0111	75146	016132		JSB LOUT	

0112	75147	064035	LDB CATP	POINTER TO
0113	75150	044356	ADB .+4	DRUM ADDRESS
0114	75151	160001	LDA B,I	GET IT
0115	75152	002003	SZA,RSS	SANCTIFIED?
0116	75153	027156	JMP **3	NO
0117	75154	063345	LDA ASCS	YES, OUTPUT "S"
0118	75155	002001	RSS	
0119	75156	060412	LDA .+40B	OUTPUT " "
0120	75157	016132	JSB LOUT	
0121	75160	060035	LDA CATP	BUMP TO PROGRAM LENGTH
0122	75161	040362	ADA .+8	
0123	75162	070035	STA CATP	
0124	75163	002400	CLA	INITIALIZE
0125	75164	070045	STA CATZS	ZERO SUPPRESS FLAG
0126*				
0127	75165	160035	LDA CATP,I	GET LENGTH
0128	75166	002020	SSA	MAKE POSITIVE IF NECESSARY
0129	75167	003004	CMA,INA	
0130	75170	006400	CLB	
0131	75171	100400	DIV DVSRs	DIVIDE IT BY 10000
		75172	001032	
0132	75173	017256	JSB CAT24	OUTPUT THE FIRST CHARACTER
0133	75174	100400	DIV DVSRs+1	DIV BY 1000.
		75175	001033	
0134	75176	017256	JSB CAT24	OUTPUT THE SECOND DIGIT
0135	75177	100400	DIV DVSRs+2	DIV BY 100
		75200	001034	
0136	75201	017256	JSB CAT24	OUTPUT THE THIRD DIGIT
0137	75202	100400	DIV .+10	
		75203	000364	
0138	75204	017256	JSB CAT24	OUTPUT THE FOURTH DIGIT
0139	75205	040574	ADA ASC00	
0140	75206	016132	JSB LOUT	
0141	75207	060412	LDA .+40B	OUTPUT A BLANK
0142	75210	016132	JSB LOUT	
0143	75211	060412	LDA .+40B	AND ANOTHER
0144	75212	016132	JSB LOUT	
0145	75213	060412	LDA .+40B	AND ANOTHER
0146	75214	016132	JSB LOUT	
0147*				
0148	75215	034035	ISZ CATP	BUMP POINTER TO NEXT ENTRY.
0149	75216	060035	LDA CATP	
0150	75217	034037	ISZ CATN	END OF LINE?
0151	75220	027066	JMP CAT10	NO.
0152	75221	040337	ADA .-11	** FIRST WORD OF LAST NAME
0153	75222	064273	LDB MLINK+1	
0154	75223	044355	ADB .+7TEMP=?LINK	
0155	75224	074036	STB CATJ	POINTER FOR STORING NAME
0156	75225	064347	LDB .-3	
0157	75226	074037	STB CATN	
0158	75227		CAT30 EQU *	
0159	75227	164000	LDB A,I	SAVE A WORD
0160	75230	174036	STB CATJ,I	OF THE NAME
0161	75231	034036	ISZ CATJ	
0162	75232	002004	INA	

0163	75233	034037	ISZ CATN	
0164	75234	027227	JMP CAT30	
0165*				
0166	75235	060367	LDA .+15B	OUTPUT CR.
0167	75236	016132	JSB LOUT	
0168	75237	116023	JSB SCHOU,I	OUTPUT WAIT.
0169*				
0170*	READ THE LAST ENTRY OUT OF THE TTY			
0171*	TABLE AND PUT IT INTO LTEMP[1:3]			
0172*				
0173	75240	060520	LDA DLTEM	PUT
0174	75241	002004	INA	
0175	75242	064347	LDB .-3	
0176	75243	074037	STB CATN	
0177	75244	064273	LDB MLINK+1	
0178	75245	044355	ADB .+7TEMP-?LINK	
0179	75246	074036	STB CATJ	
0180	75247		CAT29 EQU *	
0181	75247	164036	LDB CATJ,I	RESTORE A WORD
0182	75250	174000	STB A,I	OF THE NAME
0183	75251	002004	INA	
0184	75252	034036	ISZ CATJ	
0185	75253	034037	ISZ CATN	
0186	75254	027247	JMP CAT29	
0187	75255	027032	JMP CAT1	GO TO START.
0188	75256	000000	CAT24 NOP	
0189	75257	074043	STB CATLN	SAVE REMAINDER
0190	75260	002002	SZA	IS DIGIT ZERO?
0191	75261	027267	JMP CAT27	NO, GO PRINT IT
0192	75262	064045	LDB CATZ8	YES
0193	75263	006002	SZB	IS IT A LEADING ZERO?
0194	75264	027270	JMP CAT25	NO, GO PRINT IT
0195	75265	060412	LDA .+40B	YES, SUPPRESS IT AND
0196	75266	027271	JMP CAT26	PRINT " "
0197	75267	070045	CAT27 STA CATZ8	NONZERO THE SUPPRESS FLAG
0198	75270	040574	CAT25 ADA ASC00	CONSTRUCT THE CHARACTER
0199	75271	016132	CAT26 JSB LOUT	PUT OUT CHARACTER
0200	75272	060043	LDA CATLN	GET REMAINDER
0201	75273	006400	CLB	PREPARE FOR DIVIDE
0202	75274	127256	JMP CAT24,I	RETURN
0203*				
0204	75275	060034	CAT11 LDA CATI	TEST FOR USER DIRECTORY CONTIN-
0205	75276	040361	ADA .+7	UED ON NEXT DIRECTORY TRACK.
0206	75277	070034	STA CATI	
0207	75300	164000	LDB 0,I	
0208	75301	006003	SZB,RSS	
0209	75302	027276	JMP CAT11+1	NEXT TRACK EMPTY. THERE, RUN.
0210	75303	074072	STB WORD	
0211	75304	007004	CMB,INB	
0212	75305	044562	ADB LIBD	
0213	75306	074041	STB CATQ	
0214	75307	002004	INA	DOES NEXT TRACK BEGIN WITH
0215	75310	164000	LDB 0,I	THIS USER?
0216	75311	054030	CPB LTEMP	
0217	75312	002001	RSS	YES

0218	75313	027074	JMP	CAT13	NO--QUIT,
0219*					
0220	75314	040357	ADA	.*5	GET DIRECTORY DRUM ADDRESS
0221	75315	160000	LDA	0,I	
0222	75316	064566	LDB	LIBDI	
0223	75317	016231	JSB	DRUML	READ DIRECTORY
0224	75320	027323	JMP	CAT28	ARRGH, GO INFORM GUY (OR GAL)
0225	75321	060562	LDA	LIBD	
0226	75322	027066	JMP	CAT10	
0227	75323	060324	CAT28 LDA	.-22	
0228	75324	067326	LDB	++2	
0229	75325	026432	JMP	LIBER	
0230	75326	075327	DEF	++1	
0231	75327	006412	OCT	6412	
0232	75330	041501	ASC	10,CANIT	READ DIRECTORY
	75331	047047			
	75332	052040			
	75333	051105			
	75334	040504			
	75335	020104			
	75336	044522			
	75337	042503			
	75340	052117			
	75341	051131			
0233	00034		CATI	EQU	LTEMP+4
0234	00035		CATP	EQU	LTEMP+5
0235	00036		CATJ	EQU	LTEMP+6
0236	00037		CATN	EQU	LTEMP+7
0237	00041		CATQ	EQU	LTEMP+9
0238	00042		CATC	EQU	LTEMP+10
0239	00043		CATLN	EQU	LTEMP+11
0240	00044		CATS	EQU	LTEMP+12
0241	00045		CATZS	EQU	LTEMP+13
0242	75342	000103	ASCC	OCT	103
0243	75343	000106	ASCF	OCT	106
0244	75344	000120	ASCP	OCT	120
0245	75345	000123	ASCS	OCT	123
0246	75346	075347	CATTP	DEF	CATIT
0247	75347	020116	CATIT	ASC	9, NAME LENGTH
	75350	040515			
	75351	042440			
	75352	020040			
	75353	020114			
	75354	042516			
	75355	043524			
	75356	044040			
	75357	020040			
0248	75360		SCAT	EQU	*

0250* LIBRARY IS IDENTICAL TO CATALOG EXCEPT THAT IT USES A000
0251* AS ID RATHER THAN THE USER ID, AND PROGRAMS WITH EMBEDDED
0252* ERROR MESSAGES ARE NOT LISTED, IT MUST BE LOADED IMMEDIATELY
0253* AFTER CATALOG, GROUP MUST FOLLOW LIBRARY IN SEQUENCE,

0255	75000	ORG LIBRA	
0256	75000 002400	CLA	
0257	75032	ORG CAT1	
0258	75032 060612	LDA A000	
0259	75033 027047	JMP CAT2	
0260	75077	ORG CAT12	
0261	75077 060035	LDA CATP	CHECK FOR
0262	75100 040356	ADA .+4	ILL*STORED
0263	75101 160000	LDA A,I	PROGRAMS
0264	75102 002020	SSA	
0265	75103 027064	JMP CAT22	DON'T LIST THEM

0267* GROUP IS IDENTICAL TO LIBRARY EXCEPT THAT IT USES THE
 0268* GROUP LIBRARIAN'S ID INSTEAD OF A000. IT MUST BE LOADED
 0269* IMMEDIATELY AFTER LIBRARY.

0271	75000		ORG LIBRA	
0272	75000	002400	CLA	
0273	75032		ORG CAT1	
0274	75032	064273	LDB MLINK+1	GET USER ID
0275	75033	044341	ADB .+?ID=?LINK	
0276	75034	160001	LDA B,I	
0277	75035	010732	AND M2000	ISOLATE AND
0278	75036	070030	STA LTEMP	SAVE ALPHABETIC PART
0279	75037	160001	LDA B,I	
0280	75040	010602	AND B1777	ISOLATE NUMERICAL PART
0281	75041	006400	CLB	
0282	75042	100400	DIV .100	GET RID OF
	75043	000437		
0283	75044	100200	MPY .100	TENS AND ONES
	75045	000437		
0284	75046	030030	IOR LTEMP	MERGE IN LETTER

0286* THE DIRECTORY COMMAND IS AVAILABLE TO USER A000. IT CAUSES THE
 0287* CONTENTS OF THE DISC DIRECTORY TO BE PRINTED ON THE USER'S CONSOLE
 0288* IN THE FOLLOWING FORMAT:

0289*
 0290* <ID> <NAME> <PURGE DATE> <FLAGS> <LENGTH> <DISC ADR> <DRUM ADR>
 0291*

0292* THE PURGE DATE IS PRINTED AS A 3-DIGIT INTEGER INDICATING THE DAY
 0293* OF THE YEAR AND A 2-DIGIT INTEGER INDICATING THE YEAR. THE DRUM
 0294* ADDRESS CONSISTS OF 3 INTEGERS INDICATING DRUM, TRACK, AND SECTOR.
 0295* THE DISC ADDRESS IS A LOGICAL BLOCK NUMBER. THE LENGTH IS IN WORDS
 0296* FOR PROGRAMS, RECORDS FOR FILES. THESE ARE ALL PRINTED IN DECIMAL.
 0297* TYPING DIR=ID WILL START THE LISTING WITH THAT ID.

0298*

```

0299 75000          ORG LIBRA
0300 75000 064273   LDB MLINK+1
0301 75001 044341   ADB .+?ID=?LINK
0302 75002 160001   LDA B,I           GET USER'S ID
0303 75003 050612   CPA A000          A000?
0304 75004 027023   JMP UDIR1        YES
0305 75005 060327   LDA .-19        NO, NOT ALLOWED
0306 75006 067010   LDB ++2
0307 75007 026432   JMP LIBER
0308 75010 075011   DEF ++1
0309 75011 005120   OCT 5120
0310 75012 051111   ASC 9,RIVILEGED COMMAND
      75013 053111
      75014 046105
      75015 043505
      75016 042040
      75017 041517
      75020 046515
      75021 040516
      75022 042040
0311 75023          UDIR1 EQU *
0312 75023 002404   CLA,INA          INITIALIZE IS IN CASE
0313 75024 070052   STA ID           NONE IS SPECIFIED
0314 75025 016164   JSB LCHAR        GET A CHAR
0315 75026 027036   JMP UDIR2        CR = START A BEGINNING OF DIR
0316 75027 064273   LDB MLINK+1
0317 75030 044336   ADB .+?TNUM=?LINK
0318 75031 160001   LDA 1,I          BACKSPACE
0319 75032 030251   IOR BKS          BUFFER
0320 75033 114500   JSB S14SC,I      POINTER
0321 75034 016315   JSB GETID        GET THE ID
0322 75035 026430   JMP ILFER        CR MUST FOLLOW
0323 75036          UDIR2 EQU *
0324 75036 003400   CCA
0325 75037 040052   ADA ID
0326 75040 064273   LDB MLINK+1
0327 75041 044354   ADB .+?RTIM=?LINK
0328 75042 170001   STA B,I          SAVE PREVIOUS ID
0329 75043 116022   JSB UHDBA,I      OUTPUT THE HEADING
0330 75044 116023   JSB SCHOU,I      AND SUSPEND
0331*
0332 75045 060321   LDA .-25         25 WORDS IN

```


0333	75046	070030	STA	LTEMP	HEADING
0334	75047	063511	LDA	UDHDA	
0335	75050	070031	STA	LTEMP+1	
0336	75051		UDIR3 EQU	*	
0337	75051	160031	LDA	LTEMP+1, I	OUTPUT
0338	75052	001727	ALF,	ALF	
0339	75053	010443	AND	B377	THE
0340	75054	016132	JSB	LOUT	
0341	75055	160031	LDA	LTEMP+1, I	DIRECTORY
0342	75056	010443	AND	B377	
0343	75057	016132	JSB	LOUT	HEADING
0344	75060	034031	ISZ	LTEMP+1	
0345	75061	034030	ISZ	LTEMP	
0346	75062	027051	JMP	UDIR3	
0347	75063	116023	JSB	SCHOU, I	SUSPEND
0348*					
0349	75064	060274	LDA	INF	SET UP LTEMP[0:3] FOR
0350	75065	070031	STA	LTEMP+1	INITIAL SEARCH
0351	75066	070032	STA	LTEMP+2	
0352	75067	070033	STA	LTEMP+3	
0353	75070	064273	LDB	MLINK+1	
0354	75071	044354	ADB	.*?RTIM=?LINK	
0355	75072	160001	LDA	B, I	RETRIEVE
0356	75073	070030	STA	LTEMP	STARTING ID
0357*					
0358	75074		UDIR4 EQU	*	
0359	75074	116005	JSB	DLOKP, I	SEARCH DIRECTORY FOR
0360	75075	000000	NOP		PREVIOUS ENTRY
0361	75076		UDIR5 EQU	*	
0362	75076	060035	LDA	LTEMP+5	MOVE
0363	75077	040366	ADA	.*+12	TO NEXT
0364	75100	070035	STA	LTEMP+5	ENTRY
0365	75101	140034	ADA	LTEMP+4, I	
0366	75102	040674	ADA	MLIBD	
0367	75103	002002	SZA		END OF TRACK
0368	75104	027123	JMP	UDIR6	NO
0369*					
0370	75105	064034	LDB	LTEMP+4	YES, BUMP TO
0371	75106	044361	ADB	.*+7	NEXT ONE
0372	75107	150001	CPA	B, I	LOOP IF EMPTY
0373	75110	027106	JMP	.*+2	
0374*					
0375	75111	074034	STB	LTEMP+4	
0376	75112	160001	LDA	B, I	
0377	75113	070072	STA	WORD	LENGTH OF TRACK
0378	75114	044360	ADB	.*+6	
0379	75115	160001	LDA	B, I	DRUM ADDRESS
0380	75116	064566	LDB	LIBDI	CORE ADDRESS
0381	75117	016231	JSB	DRUML	READ IT
0382	75120	027415	JMP	UDI13	READ FAILURE
0383*					
0384	75121	060562	LDA	LIBD	SET POINTER
0385	75122	070035	STA	LTEMP+5	TO FIRST ENTRY
0386*					
0387	75123		UDIR6 EQU	*	

```

0388 75123 027130      JMP UDIR7      SPACE
0389 75124 000000      NOP
0390 75125 000000      NOP           FOR
0391 75126 000000      NOP
0392 75127 000000      NOP           SDIRECTORY
0393 75130              UDIR7 EQU *
0394 75130 160035      LDA LTEMP+5,I GET USER ID
0395 75131 064273      LDB MLINK+1
0396 75132 044354      ADB .+?RTIM-?LINK
0397 75133 170001      STA B,I      SAVE IT
0398 75134 050351      CPA .-1      END OF DIRECTORY?
0399 75135 026226      JMP LLEND    YES
0400 75136 050030      CPA LTEMP    NO, SAME AS PREVIOUS ONE?
0401 75137 027160      JMP UDIR8    YES
0402*
0403 75140 001323      RAR,RAR     NO, POSITION
0404 75141 001727      ALF,ALF     LETTER
0405 75142 010411      AND .+37B   KEEP ONLY 5 BITS
0406 75143 040772      ADA B100    CONVERT TO ASCII
0407 75144 016132      JSB LOUT    OUTPUT IT
0408 75145 160035      LDA LTEMP+5,I GET ID AGAIN
0409 75146 010602      AND B1777   NUMERICAL PART
0410 75147 006400      CLB
0411 75150 100400      DIV .100    FIRST DIGIT IN A, LAST 2 IN B
              75151 000437
0412 75152 074040      STB LTEMP+8
0413 75153 040432      ADA .+60B   CONVERT TO ASCII
0414 75154 016132      JSB LOUT    AND OUTPUT
0415 75155 060040      LDA LTEMP+8 OUTPUT LAST
0416 75156 017434      JSB UDIOW   TWO DIGITS
0417 75157 027164      JMP UDIR9
0418*
0419 75160              UDIR8 EQU *
0420 75160 063512      LDA UDISS   REPLACE
0421 75161 017447      JSB UDIOW   ID WITH
0422 75162 063512      LDA UDISS   FOUR
0423 75163 017447      JSB UDIOW   BLANKS
0424*
0425 75164              UDIR9 EQU *
0426 75164 064273      LDB MLINK+1
0427 75165 044355      ADB .+?TEMP-?LINK
0428 75166 074040      STB LTEMP+8 => INTO TTY TABLE
0429 75167 063512      LDA UDISS   2 BLANKS
0430 75170 017447      JSB UDIOW
0431 75171 034035      ISZ LTEMP+5
0432 75172 160035      LDA LTEMP+5,I OUTPUT 3 WORDS
0433 75173 170040      STA LTEMP+8,I
0434 75174 017447      JSB UDIOW
0435 75175 034040      ISZ LTEMP+8
0436 75176 034035      ISZ LTEMP+5 OF NAME WHILE
0437 75177 160035      LDA LTEMP+5,I
0438 75200 170040      STA LTEMP+8,I
0439 75201 017447      JSB UDIOW
0440 75202 034040      ISZ LTEMP+8 SAVING THEM IN
0441 75203 034035      ISZ LTEMP+5

```

0442	75204	160035	LDA	LTEMP+5,I	
0443	75205	170040	STA	LTEMP+8,I	
0444	75206	017447	JSB	UDIOW	USER'S ITY TABLE
0445	75207	063512	LDA	UDISS	2 BLANKS
0446	75210	017447	JSB	UDIOW	
0447*					
0448	75211	064035	LDB	LTEMP+5	
0449	75212	044354	ADB	#+2	
0450	75213	074035	STB	LTEMP+6	=> DATE
0451	75214	160035	LDA	LTEMP+5,I	
0452	75215	010502	AND	B777	GET DAY OF YEAR
0453	75216	006400	CLB		
0454	75217	100400	DIV	#+10	1ST 2 DIGITS IN A, LAST ONE IN B
	75220	000364			
0455	75221	074040	STB	LTEMP+8	
0456	75222	017434	JSB	UDINM	OUTPUT FIRST 2
0457	75223	060040	LDA	LTEMP+8	GET LAST ONE
0458	75224	040432	ADA	#+60B	CONVERT TO ASCII
0459	75225	016132	JSB	LOUT	AND OUTPUT
0460	75226	060431	LDA	#+57B	'/'
0461	75227	016132	JSB	LOUT	
0462	75230	160035	LDA	LTEMP+5,I	
0463	75231	001727	ALF,ALF		POSITION
0464	75232	001300	RAR		YEAR AND
0465	75233	010441	AND	B177	MASK
0466	75234	017434	JSB	UDINM	OUTPUT IT
0467*					
0468	75235	063512	LDA	UDISS	2 BLANKS
0469	75236	017447	JSB	UDIOW	
0470	75237	064035	LDB	LTEMP+5	
0471	75240	044347	ADB	#+3	=> SECOND WORD OF NAME
0472	75241	160001	LDA	B,I	
0473	75242	006004	INB		
0474	75243	002021	SSA,RSS		FILE?
0475	75244	027247	JMP	UDI10	NO
0476	75245	063513	LDA	UDIRF	YES, GET AN 'F'
0477	75246	027255	JMP	UDI11	
0478	75247		UDI10 EQU *		
0479	75247	160001	LDA	B,I	
0480	75250	002021	SSA,RSS		SEMI-COMPILED?
0481	75251	027254	JMP	UDI11-1	NO
0482	75252	063514	LDA	UDIRC	YES, GET A 'C'
0483	75253	002001	RSS		
0484	75254	060412	LDA	#+40B	A BLANK
0485	75255		UDI11 EQU *		
0486	75255	044350	ADB	#+2	
0487	75256	074035	STB	LTEMP+6	=> 1ST WORD OF NAME
0488	75257	016132	JSB	LOUT	OUTPUT A CHAR
0489	75260	164035	LDB	LTEMP+5,I	
0490	75261	006021	SSB,RSS		PROTECTED?
0491	75262	027265	JMP	#+3	NO
0492	75263	063515	LDA	UDIRP	YES, GET A 'P'
0493	75264	002001	RSS		
0494	75265	060412	LDA	#+40B	A BLANK
0495	75266	016132	JSB	LOUT	OUTPUT CHAR

0496	75267	060412	LDA .+40B	A BLANK
0497	75270	016132	JSB LOUT	
0498*				
0499	75271	064035	LDB LTEMP+5	
0500	75272	044364	ADB .+10	*> LENGTH
0501	75273	160001	LDA B,I	
0502	75274	044347	ADB .-3	
0503	75275	074035	STB LTEMP+5	
0504	75276	002020	SSA	COMPLEMENT
0505	75277	003004	CMA,INA	IF NEGATIVE
0506	75300	006400	CLB	
0507	75301	100400	DIV DVSR	FIRST DIGIT IN A, LAST 4 IN B
	75302	001032		
0508	75303	074040	STB LTEMP+8	
0509	75304	040432	ADA .+60B	CONVERT TO ASCII
0510	75305	016132	JSB LOUT	AND OUTPUT
0511	75306	060040	LDA LTEMP+8	
0512	75307	006400	CLB	
0513	75310	100400	DIV .100	DIGITS 2-3 IN A, 4-5 IN B
	75311	000437		
0514	75312	074040	STB LTEMP+8	
0515	75313	017434	JSB UDINM	OUTPUT 2-3
0516	75314	060040	LDA LTEMP+8	
0517	75315	017434	JSB UDINM	OUTPUT 4-5
0518*				
0519	75316	063512	LDA UDISS	2 BLANKS
0520	75317	017447	JSB UDIOW	
0521	75320	164035	LDB LTEMP+5,I	GET
0522	75321	034035	ISZ LTEMP+5	DISC
0523	75322	160035	LDA LTEMP+5,I	ADDRESS
0524	75323	100400	DIV DVSR	1ST 2 DIGITS IN A, LAST 4 IN B
	75324	001032		
0525	75325	074040	STB LTEMP+8	
0526	75326	017434	JSB UDINM	OUTPUT FIRST 2
0527	75327	060040	LDA LTEMP+8	
0528	75330	006400	CLB	
0529	75331	100400	DIV .100	DIGITS 3-4 IN A, 5-6 IN B
	75332	000437		
0530	75333	074040	STB LTEMP+8	
0531	75334	017434	JSB UDINM	OUTPUT 3-4
0532	75335	060040	LDA LTEMP+8	
0533	75336	017434	JSB UDINM	OUTPUT 5-6
0534*				
0535	75337	064035	LDB LTEMP+5	
0536	75340	044350	ADB .-2	
0537	75341	074035	STB LTEMP+5	*> DRUM ADDRESS
0538	75342	160035	LDA LTEMP+5,I	
0539	75343	002003	SZA,RSS	
0540	75344	027376	JMP UDI12	SKIP PRINTING IF ZERO
0541	75345	063512	LDA UDISS	2 BLANKS
0542	75346	017447	JSB UDIOW	
0543	75347	160035	LDA LTEMP+5,I	
0544	75350	001222	RAL,RAL	DRUM NUMBER
0545	75351	010355	AND .+3	IN LOWEST 2 BITS
0546	75352	040432	ADA .+60B	CONVERT TO ASCII

0547	75353	016132	JSB	LOUT	AND OUTPUT
0548	75354	060431	LDA	.,+57B	'/'
0549	75355	016132	JSB	LOUT	
0550	75356	160035	LDA	LTEMP+5,I	
0551	75357	001727	ALF,ALF		TRACK NUMBER IN
0552	75360	010734	AND	B77	LOWEST 6 BITS
0553	75361	017434	JSB	UDINM	OUTPUT IT
0554	75362	060431	LDA	.,+57B	'/'
0555	75363	016132	JSB	LOUT	
0556	75364	160035	LDA	LTEMP+5,I	SECTOR NUMBER IN
0557	75365	010441	AND	B177	LOWEST 8 BITS
0558	75366	006400	CLB		
0559	75367	100400	DIV	.100	1ST DIGIT IN A, LAST 2 IN B
	75370	000437			
0560	75371	074040	STB	LTEMP+8	
0561	75372	040432	ADA	.,+60B	CONVERT 1ST DIGIT
0562	75373	016132	JSB	LOUT	TO ASCII AND OUTPUT
0563	75374	060040	LDA	LTEMP+8	DVT PUT LAST 2
0564	75375	017434	JSB	UDINM	
0565	75376		UDI12	EQU *	
0566	75376	060375	LDA	.,+23B	X=OFF
0567	75377	016132	JSB	LOUT	
0568	75400	060367	LDA	.,+15B	CR
0569	75401	016132	JSB	LOUT	
0570	75402	060364	LDA	.,+12B	LF
0571	75403	016132	JSB	LOUT	
0572	75404	116023	JSB	SCHOU,I	SUSPEND
0573	75405	064520	LDB	DLTEM	MOVE NAME
0574	75406	074051	STB	MOVED	
0575	75407	064273	LDB	MLINK+1	FROM TTY
0576	75410	044354	ADB	.,+?RTIM-?LINK	
0577	75411	074050	STB	MOVES	TABLE TO
0578	75412	064346	LDB	.,-4	
0579	75413	016257	JSB	MOVEW	LTEMP{0:3}
0580	75414	027074	JMP	UDIR4	
0581	75415		UDI13	EQU *	
0582	75415	060324	LDA	.,-22	
0583	75416	067420	LDB	.,+2	
0584	75417	026432	JMP	LIBER	
0585	75420	075421	DEF	.,+1	
0586	75421	006412	OCT	6412	
0587	75422	041501	ASC	10,CAN'T READ DIRECTORY	
	75423	047047			
	75424	052040			
	75425	051105			
	75426	040504			
	75427	020104			
	75430	044522			
	75431	042503			
	75432	052117			
	75433	051131			

0588*

0589* UDINM CONVERTS A #<100 TO ASCII AND OUTPUTS IT

0590*

0591 75434 000000 UDINM NOP

```

0592 75435 006400      CLB
0593 75436 100400      DIV ,+10
      75437 000364
0594 75440 074043      STB LTEMP+11
0595 75441 040432      ADA ,+60B
0596 75442 016132      JSB LOUT
0597 75443 060043      LDA LTEMP+11
0598 75444 040432      ADA ,+60B
0599 75445 016132      JSB LOUT
0600 75446 127434      JMP UDINM,I
0601*
0602* UDIOW OUTPUTS THE TWO CHARACTERS OF A WORD
0603*
0604 75447 000000      UDIOW NOP
0605 75450 070043      STA LTEMP+11
0606 75451 001727      ALF,ALF
0607 75452 010443      AND B377
0608 75453 016132      JSB LOUT
0609 75454 060043      LDA LTEMP+11
0610 75455 010443      AND B377
0611 75456 016132      JSB LOUT
0612 75457 127447      JMP UDIOW,I
0613 75460 005040      UDIHD OCT 5040      LF=BLANK
0614 75461 044504      ASC 9,ID          NAME      DATE
      75462 020040
      75463 020040
      75464 047101
      75465 046505
      75466 020040
      75467 020040
      75470 042101
      75471 052105
0615 75472 020040      ASC 13,          LENGTH  DISC      DRU
      75473 020040
      75474 020114
      75475 042516
      75476 043524
      75477 044040
      75500 020040
      75501 042111
      75502 051503
      75503 020040
      75504 020040
      75505 020104
      75506 051125
0616 75507 046423      OCT 46423      M=XOFF
0617 75510 006412      OCT 6412      CR=LF
0618 75511 075460      UDHDA DEF UDIHD
0619 75512 020040      UDISS ASC 1,
0620 75513 000106      UDIRF OCT 106
0621 75514 000103      UDIRC OCT 103
0622 75515 000120      UDIRP OCT 120
0623 75516      SDIRS EQU *

```

0625* SDIRECTORY IS AVAILABLE TO USER A000 AND CAUSES THE SAME PRINTOUT
0626* AS DIRECTORY, EXCEPT THAT ONLY SANCTIFIED PROGRAMS AND FILES
0627* (THOSE CURRENTLY RESIDING ON THE DRUM) ARE LISTED. SDIRECTORY
0628* MUST FOLLOW DIRECTORY.

0629	75000		ORG LIBRA	
0630	75000	064273	LD0 MLINK+1	
0631	75123		ORG UDIR6	
0632	75123	060035	LDA LTEMP+5	IS
0633	75124	040361	ADA .+7	THIS
0634	75125	160000	LDA A,I	ENTRY
0635	75126	002003	SZA,RSS	SANCTIFIED?
0636	75127	027076	JMP UDIR5	NO, LOOK AT NEXT ONE

0002* THE REPORT COMMAND IS AVAILABLE TO USER A000 AND CAUSES IDT INFO
 0003* TO BE LISTED ON THE USER CONSOLE. EACH USER ID IS LISTED, ALONG
 0004* WITH THE DISC AND TIME USED TO DATE. DISC STORAGE IS LISTED IN
 0005* WORDS, AND TIME IS LISTED IN MINUTES.

0006*

```

0007 75000          ORG LIBRA
0008 75000 064273   LDB MLINK+1
0009 75001 044341   ADB ,+?ID=?LINK
0010 75002 160001   LDA B,I          GET ID
0011 75003 050612   CPA A000          A000?
0012 75004 027023   JMP UREP1        YES
0013 75005 060327   LDA ,=19        NO, NOT ALLOWED
0014 75006 067010   LDB **2
0015 75007 026432   JMP LIBER
0016 75010 075011   DEF **1
0017 75011 005120   OCT 5120
0018 75012 051111   ASC 9,RIVILEGED COMMAND

```

```

75013 053111
75014 046105
75015 043505
75016 042040
75017 041517
75020 046515
75021 040516
75022 042040

```

```

0019 75023          UREP1 EQU *
0020 75023 002404   CLA,INA          DEFAULT ID
0021 75024 070052   STA ID          OF 1=1
0022 75025 016164   JSB LCHAR       GET FIRST CR
0023 75026 027036   JMP UREP2        CR
0024 75027 064273   LDB MLINK+1
0025 75030 044336   ADB ,+?TNUM=?LINK
0026 75031 160001   LDA B,I         BACKSPACE
0027 75032 030251   IOR BKS         IN BUFFER
0028 75033 114500   JSB S148C,I
0029 75034 016315   JSB GETID       GET THE STARTING ID
0030 75035 026430   JMP ILFER
0031 75036          UREP2 EQU *
0032 75036 060052   LDA ID          SAVE STARTING
0033 75037 064273   LDB MLINK+1     ID
0034 75040 044354   ADB ,+?RTIM=?LINK
0035 75041 170001   STA B,I
0036 75042 116022   JSB UHDBA,I     OUTPUT HEADING
0037 75043 116023   JSB SCHOU,I     AND SUSPEND
0038*
0039 75044 063353   LDA UREJ0       30 WORDS
0040 75045 070040   STA LTEMP+8     IN HEADING
0041 75046 063314   LDA URHDA       => FIRST ONE
0042 75047 070041   STA LTEMP+9
0043 75050          UREP3 EQU *
0044 75050 160041   LDA LTEMP+9,I  OUTPUT
0045 75051 001727   ALF,ALF
0046 75052 010443   AND B377
0047 75053 016132   JSB LOUT        REPORT
0048 75054 160041   LDA LTEMP+9,I

```


0049	75055	010443	AND	B377	
0050	75056	016132	JSB	LOUT	HEADING
0051	75057	034041	ISZ	LTEMP+9	
0052	75060	034040	ISZ	LTEMP+8	
0053	75061	027050	JMP	UREP3	AND SUSPEND
0054	75062	116023	JSB	SCHOU,I	
0055*					
0056	75063		URE22	EQU *	
0057	75063	064273	LDB	MLINK+1	
0058	75064	044354	ADB	,+7RTIM-?LINK	
0059	75065	160001	LDA	B,I	RETRIEVE
0060	75066	070052	STA	ID	STARTING ID
0061	75067	016370	JSB	GTIL	FIND WHAT TRACK IT'S ON
0062	75070	060347	LDA	.-3	3 ID'S
0063	75071	070035	STA	LTEMP+5	PER LINE
0064	75072	060076	LDA	IDLNP	GET POINTER TO LENGTH WORD
0065	75073		UREP4	EQU *	
0066	75073	070030	STA	LTEMP	SAVE LIVE TABLE ENTRY
0067	75074	164000	LDB	A,I	GET TRACK LENGTH
0068	75075	006002	SZB		SKIP IF ZERO
0069	75076	027103	JMP	UREP5	
0070	75077		URE21	EQU *	
0071	75077	053354	CPA	URDCL	LAST ID TRACK?
0072	75100	027256	JMP	URE15	
0073	75101	040355	ADA	.+3	NO, ADVANCE TO NEXT ONE
0074	75102	027073	JMP	UREP4	
0075	75103		UREP5	EQU *	
0076	75103	074072	STB	WORD	SAVE ACTUAL LENGTH
0077	75104	007004	CMB	,INB	
0078	75105	044562	ADB	LIBD	MAKE POINTER TO LAST ENTRY+1
0079	75106	074032	STB	LTEMP+2	
0080	75107	003400	CCA		
0081	75110	040030	ADA	LTEMP	
0082	75111	160000	LDA	A,I	GET DRUM ADDRESS
0083	75112	064566	LDB	LIBDI	
0084	75113	016231	JSB	DRUML	READ IT IN
0085	75114	116015	JSB	SICKP,I	
0086	75115	060562	LDA	LIBD	
0087	75116		UREP6	EQU *	
0088	75116	050032	CPA	LTEMP+2	CHECK FOR END
0089	75117	027127	JMP	URE25	NOT ON THIS TRACK
0090	75120	164000	LDB	A,I	GET ID
0091	75121	007000	CMB		
0092	75122	044052	ADB	ID	
0093	75123	006020	SSB		ARE WE PAST YET?
0094	75124	027144	JMP	UREP9	
0095	75125	040362	ADA	.+8	
0096	75126	027116	JMP	UREP6	
0097	75127		URE25	EQU *	
0098	75127	060030	LDA	LTEMP	
0099	75130	027077	JMP	URE21	
0100	75131		URE11	EQU *	
0101	75131	074072	STB	WORD	SAVE LENGTH
0102	75132	007004	CMB	,INB	
0103	75133	044562	ADB	LIBD	MAKE POINTER TO LAST WORD +1

0104	75134	074032	STB	LTEMP+2	
0105	75135	003400	CCA		
0106	75136	040030	ADA	LTEMP	
0107	75137	160000	LDA	A,I	DRUM ADDRESS
0108	75140	064566	LDB	LIBDI	CORE ADDRESS
0109	75141	016231	JSB	DRUML	
0110	75142	116015	JSB	SICKP,I	
0111	75143	060562	LDA	LIBD	
0112*					
0113	75144		UREP0	EQU *	
0114	75144	070034	STA	LTEMP+4	
0115	75145	160034	LDA	LTEMP+4,I	GET ID
0116	75146	064273	LDB	MLINK+1	
0117	75147	044354	ADB	.+?RTIM-?LINK	
0118	75150	170001	STA	B,I	SAVE ID
0119	75151	001121	ARS	ARS	SHIFT
0120	75152	001727	ALF	ALF	LETTER
0121	75153	010411	AND	.+37B	TO 4.0
0122	75154	040772	ADA	B100	ASCII OFFSET
0123	75155	016132	JSB	LOUT	OUTPUT IT
0124	75156	160034	LDA	LTEMP+4,I	GET ID AGAIN
0125	75157	010602	AND	B1777	MASK NUMBER PART
0126	75160	006400	CLB		
0127	75161	100400	DIV	.100	1ST DIGIT IN A, LAST 2 IN B
	75162	000437			
0128	75163	074040	STB	LTEMP+8	
0129	75164	040432	ADA	.+60B	
0130	75165	016132	JSB	LOUT	OUTPUT 1ST
0131	75166	060040	LDA	LTEMP+8	
0132	75167	017261	JSB	URENM	OUTPUT LAST 2
0133	75170	060034	LDA	LTEMP+4	=> TIME
0134	75171	040357	ADA	.+5	USED
0135	75172	070034	STA	LTEMP+4	AREA
0136	75173	060412	LDA	.+40B	BLANK
0137	75174	016132	JSB	LOUT	
0138	75175	160034	LDA	LTEMP+4,I	GET TIME
0139	75176	017274	JSB	URETR	OUTPUT IT
0140	75177	034034	ISZ	LTEMP+4	=> DISC
0141	75200	034034	ISZ	LTEMP+4	USED
0142	75201	060412	LDA	.+40B	BLANK
0143	75202	016132	JSB	LOUT	
0144	75203	160034	LDA	LTEMP+4,I	GET DISC
0145	75204	017274	JSB	URETR	OUTPUT IT
0146	75205	060412	LDA	.+40B	FOUR
0147	75206	016132	JSB	LOUT	
0148	75207	060412	LDA	.+40B	
0149	75210	016132	JSB	LOUT	BLANKS
0150	75211	060412	LDA	.+40B	
0151	75212	016132	JSB	LOUT	
0152	75213	060412	LDA	.+40B	
0153	75214	016132	JSB	LOUT	
0154	75215	060034	LDA	LTEMP+4	
0155	75216	002004	INA		BUMP TO NEXT ID
0156	75217	050032	CPA	LTEMP+2	DONE?
0157	75220	002001	RSS		YES

```

0158 75221 027247      JMP URE12      NO, GO CHECK FOR ROOM
0159 75222      URE10 EQU *
0160 75222 060030      LDA LTEMP     NO, LAST
0161 75223 053354      CPA URDCL     ID TRACK?
0162 75224 027252      JMP URE14     YES, DONE
0163 75225 040355      ADA .+3       NO, ADVANCE TO
0164 75226 070030      STA LTEMP     NEXT IDEC ENTRY
0165 75227 164000      LDB A,I       GET COUNT ON THIS TRACK
0166 75230 006003      SZB,RSS      IF ZERO, CHECK
0167 75231 027222      JMP URE10     NEXT ONE
0168 75232 034035      ISZ LTEMP+5   ANY ROOM LEFT ON LINE
0169 75233 027131      JMP URE11     YES
0170 75234      URE13 EQU *
0171 75234 060375      LDA .+23B    XOFF
0172 75235 016132      JSB LOUT
0173 75236 060367      LDA .+15B    CR
0174 75237 016132      JSB LOUT
0175 75240 060364      LDA .+12B    LF
0176 75241 016132      JSB LOUT
0177 75242 064273      LDB MLINK+1
0178 75243 044354      ADB .+?RTIM=?LINK
0179 75244 134001      ISZ B,I       BUMP ID
0180 75245 116023      JSB SCHOU,I   SUSPEND
0181 75246 027063      JMP URE22
0182 75247      URE12 EQU *
0183 75247 034035      ISZ LTEMP+5   END OF LINE
0184 75250 027144      JMP UREP9     NO, DO ANOTHER ENTRY
0185 75251 027234      JMP URE13     YES, GO SUSPEND
0186 75252      URE14 EQU *
0187 75252 060375      LDA .+23B    X=OFF
0188 75253 016132      JSB LOUT
0189 75254 060367      LDA .+15B    CR
0190 75255 016132      JSB LOUT
0191 75256      URE15 EQU *
0192 75256 060364      LDA .+12B    LF
0193 75257 016132      JSB LOUT
0194 75260 026226      JMP LLEND    LF AND END
0195*
0196* URENM CONVERTS * #<100 TO ASCII AND OUTPUTS IT
0197*
0198 75261 000000      URENM NOP
0199 75262 006400      CLB
0200 75263 100400      DIV .+10
      75264 000364
0201 75265 074043      STB LTEMP+11
0202 75266 040432      ADA .+60B
0203 75267 016132      JSB LOUT
0204 75270 060043      LDA LTEMP+11
0205 75271 040432      ADA .+60B
0206 75272 016132      JSB LOUT
0207 75273 127261      JMP URENM,I
0208*
0209* URETR OUTPUTS A 5-DIGIT NUMBER
0210*
0211 75274 000000      URETR NOP

```

0212	75275	006400	CLB					
0213	75276	100400	DIV	DVSR				
	75277	001032						
0214	75300	074044	STB	LTEMP+12				
0215	75301	040432	ADA	.+60B				
0216	75302	016132	JSB	LOUT	1ST	DIGIT		
0217	75303	060044	LDA	LTEMP+12				
0218	75304	006400	CLB					
0219	75305	100400	DIV	.100				
	75306	000437						
0220	75307	074044	STB	LTEMP+12				
0221	75310	017261	JSB	URENM	DIGITS	2=3		
0222	75311	060044	LDA	LTEMP+12				
0223	75312	017261	JSB	URENM	DIGITS	4=5		
0224	75313	127274	JMP	URETR,1				
0225	75314	075315	URHDA	DEF	URPHD			
0226	75315	005040	URPHD	OCT	5040			
0227	75316	044504	ASC	20, ID	TIME	SPACE	ID	TIME
	75317	020040						
	75320	052111						
	75321	046505						
	75322	020040						
	75323	051520						
	75324	040503						
	75325	042440						
	75326	020040						
	75327	020040						
	75330	044504						
	75331	020040						
	75332	052111						
	75333	046505						
	75334	020040						
	75335	051520						
	75336	046503						
	75337	042440						
	75340	020040						
	75341	020040						
0228	75342	044504	ASC	7, ID	TIME	SPAC		
	75343	020040						
	75344	052111						
	75345	046505						
	75346	020040						
	75347	051520						
	75350	040503						
0229	75351	042423	OCT	042423	E=XUFF			
0230	75352	006412	OCT	6412	LR=LF			
0231	75353	177742	URE30	DEC	=30			
0232	75354	000110	URDCL	DEF	IDEC+8			
0233	75355		\$REPS	EQU	*			

0235* THE STATUS COMMAND, AVAILABLE TO USER A000, PRINTS A SUMMARY OF
 0236* SYSTEM RESOURCES, AND THE EXTENT OF THEIR UTILIZATION, ON THE
 0237* USER CONSOLE.

0238*

0239	75000		ORG LIBRA	
0240	75000	064273	LDB MLINK+1	
0241	75001	044341	ADB .+?ID=?LINK	
0242	75002	160001	LDA B,I	GET ID
0243	75003	050612	CPA A000	A000?
0244	75004	027023	JMP USTA0	YES
0245	75005	060327	LDA .-19	NO, NOT ALLOWED
0246	75006	067010	LDB ++2	
0247	75007	026432	JMP LIBER	
0248	75010	075011	DEF ++1	
0249	75011	005120	OCT 5120	
0250	75012	051111	ASC 9,RIVILEGED COMMAND	

75013 053111
 75014 046105
 75015 043505
 75016 042040
 75017 041517
 75020 046515
 75021 040516
 75022 042040

0251	75023		USTA0 EQU *	
0252	75023	116022	JSB UHDBA,I	PRINT HEADING
0253	75024	116023	JSB SCHOU,I	AND SUSPEND

0254*

0255	75025	017656	JSB USTST	LF,MAG#
0256	75026	005115	OCT 5115	
0257	75027	040507	ASC 2,AG#	
	75030	036440		
0258	75031	000000	OCT 0	
0259	75032	060176	LDA MAGSC	MAGTAPE
0260	75033	017701	JSB USTOC	SELECT CODE
0261	75034	064176	LDB MAGSC	
0262	75035	060424	LDA .+528	!*
0263	75036	006020	SSB	SKIP IF 3030
0264	75037	016132	JSB LOU	SNOWFLAKE FOR 7970
0265	75040	017656	JSB USTST	
0266	75041	020040	ASC 4, DRUM#	

75042 042122
 75043 052515
 75044 036440

0267	75045	000000	OCT 0	
0268	75046	060346	LDA .-4	DRUM
0269	75047	070036	STA LTEMP+6	COUNTER
0270	75050		USTA1 EQU *	
0271	75050	060036	LDA LTEMP+6	
0272	75051	040356	ADA .+4	
0273	75052	040676	ADA ?ATBL	
0274	75053	160000	LDA 0,I	GET SELECT CODE
0275	75054	010734	AND B77	MASK AND
0276	75055	017701	JSB USTOC	OUTPUT
0277	75056	060412	LDA .+40B	BLANK

0278	75057	016132	JSB	LOUT				
0279	75060	034036	ISZ	LTEMP+6	DONE?			
0280	75061	027050	JMP	USTA1	NO			
0281	75062	017745	JSB	XCR LF				
0282	75063	116023	JSB	SCHOU,I	SUSPEND			
0283	75064	017656	JSB	USTST				
0284	75065	005104	OCT	5104	LF=0			
0285	75066	044523	ASC	2,ISCS				
	75067	041523						
0286	75070	011415	OCT	11415	XOFF=CR			
0287	75071	005040	OCT	5040	LF=BLANK			
0288	75072	020114	ASC	19, LOGICAL	SELECT	UNIT	FIRST	LAST
	75073	047507						
	75074	044503						
	75075	040514						
	75076	020040						
	75077	051505						
	75100	045105						
	75101	041524						
	75102	020040						
	75103	020125						
	75104	047111						
	75105	052040						
	75106	020040						
	75107	043111						
	75110	051123						
	75111	052040						
	75112	020040						
	75113	046101						
	75114	051524						
0289	75115	011415	OCT	11415	X=OFF=CR			
0290	75116	005040	OCT	5040	LF=BLANK			
0291	75117	020040	ASC	20, UNIT	CODE	NUMBER	BLOCK	BLOCK
	75120	052516						
	75121	044524						
	75122	020040						
	75123	020040						
	75124	020103						
	75125	047504						
	75126	042440						
	75127	020040						
	75130	047125						
	75131	046502						
	75132	042522						
	75133	020040						
	75134	041114						
	75135	047503						
	75136	045440						
	75137	020040						
	75140	041114						
	75141	047503						
	75142	045440						
0292	75143	000000	OCT	0				
0293	75144	017745	JSB	XCR LF	XOFF=CR-LF			
0294	75145	116023	JSB	SCHOU,I	SUSPEND			

0295	75146	002400	CLA	FOR LOGICAL
0296	75147	070030	STA LTEMP	DISC 0
0297	75150		USTA4 EQU *	
0298	75150	060030	LDA LTEMP	FINISHED
0299	75151	050362	CPA ,+8	ALL DISCS?
0300	75152	027266	JMP USTA5	YES
0301	75153	100200	MPY ,+6	NO
	75154	000360		
0302	75155	040210	ADA MHAD	
0303	75156	040354	ADA ,+2	
0304	75157	164000	LDB A,I	
0305	75160	164001	LDB B,I	GET SELECT CODE
0306	75161	006003	SZB,RSS	
0307	75162	027264	JMP USTA5-2	SKIP IF ZERO
0308	75163	070031	STA LTEMP+1	
0309	75164	017656	JSB USTST	4 BLANKS
0310	75165	020040	ASC 2,	
	75166	020040		
0311	75167	000000	OCT 0	
0312	75170	060412	LDA ,+40B	BLANK
0313	75171	016132	JSB LOUT	
0314	75172	060030	LDA LTEMP	LOGICAL DISC NUMBER
0315	75173	017710	JSB USTDG	
0316	75174	017656	JSB USTST	6 BLANKS
0317	75175	020040	ASC 3,	
	75176	020040		
	75177	020040		
0318	75200	000000	OCT 0	
0319	75201	060412	LDA ,+40B	BLANK
0320	75202	016132	JSB LOUT	
0321	75203	160031	LDA LTEMP+1,I	
0322	75204	160000	LDA A,I	
0323	75205	001727	ALF,ALF	
0324	75206	010734	AND B77	
0325	75207	017701	JSB USTOC	SELECT CODE
0326	75210	017656	JSB USTST	6 BLANKS
0327	75211	020040	ASC 3,	
	75212	020040		
	75213	020040		
0328	75214	000000	OCT 0	
0329	75215	160031	LDA LTEMP+1,I	
0330	75216	160000	LDA A,I	
0331	75217	010355	AND ,+3	
0332	75220	017710	JSB USTDG	UNIT NUMBER
0333	75221	017656	JSB USTST	4 BLANKS
0334	75222	020040	ASC 2,	
	75223	020040		
0335	75224	000000	OCT 0	
0336	75225	060412	LDA ,+40B	BLANK
0337	75226	016132	JSB LOUT	
0338	75227	060031	LDA LTEMP+1	GET SECTOR
0339	75230	040350	ADA ,=2	
0340	75231	164000	LDB A,I	ADDRESS OF
0341	75232	002004	INA	
0342	75233	160000	LOA A,I	THIS DISC

0343	75234	004065	CLE,ERB	CONVERT
0344	75235	001540	ERA,CLE	TO BLOCKS
0345	75236	040356	ADA ,+4	FIRST AVAILABLE
0346	75237	002040	SEZ	BLOCK IS #4
0347	75240	006004	INB	
0348	75241	017716	JSB UST6D	FIRST BLOCK
0349	75242	017656	JSB USTST	2 BLANKS
0350	75243	020040	ASC 1,	
0351	75244	000000	OCT 0	
0352	75245	060031	LDA LTEMP+1	GET SECTOR
0353	75246	040356	ADA ,+4	
0354	75247	164000	LDB A,I	ADDRESS OF
0355	75250	002004	INA	
0356	75251	160000	LDA A,I	NEXT DISC
0357	75252	004065	CLE,ERB	CONVERT
0358	75253	001540	ERA,CLE	TO BLOCKS
0359	75254	040351	ADA ,=1	LAST BLOCK
0360	75255	002041	SEZ,RSS	IS 1 LESS
0361	75256	044351	ADB ,=1	
0362	75257	017716	JSB UST6D	LAST BLOCK
0363	75260	017745	JSB XCRLF	XOFF=CR=LF
0364	75261	017755	JSB USTSV	SAVE VARIABLES
0365	75262	116023	JSB SCHOU,I	SUSPEND
0366	75263	017766	JSB USTRV	RETRIEVE VARIABLES
0367	75264	034030	ISZ LTEMP	
0368	75265	027150	JMP USTA4	
0369	75266		EQU *	
0370	75266	017656	JSB USTST	
0371	75267	005114	OCT 5114	
0372	75270	047503	ASC 9,OCKED	DRUM TRACKS
	75271	045505		
	75272	042040		
	75273	042122		
	75274	052515		
	75275	020124		
	75276	051101		
	75277	041513		
	75300	051440		
0373	75301	000000	OCT 0	
0374	75302	017745	JSB XCRLF	
0375	75303	002400	CLA	
0376	75304	070030	STA LTEMP	TRACK # (0=63)
0377	75305	070032	STA LTEMP+2	DRUM # (0=3)
0378	75306	002404	CLA,INA	
0379	75307	070031	STA LTEMP+1	MASK
0380	75310		EQU *	
0381	75310	060676	LDA ?ATBL	
0382	75311	040032	ADA LTEMP+2	
0383	75312	164000	LDB A,I	IS DRUM
0384	75313	006003	8ZB,RSS	PRESENT?
0385	75314	027410	JMP UST15	NO
0386	75315		EQU *	
0387	75315	002400	CLA	YES, INITIALIZE
0388	75316	070034	STA LTEMP+4	COUNT OF ENTRIES
0389	75317		EQU *	

0390	75317	017604	JSB	USTTZ	TEST THIS TRACK
0391	75320	002001	RSS		UNLOCKED
0392	75321	027325	JMP	USTA9	LOCKED
0393	75322	017621	JSB	USTBP	BUMP POINTERS
0394	75323	027401	JMP	UST14	END OF DRUM
0395	75324	027317	JMP	USTA8	
0396	75325		USTA9	EQU *	
0397	75325	002400	CLA		
0398	75326	050034	CPA	LTEMP+4	FIRST ENTRY ON LINE?
0399	75327	002001	RSS		YES
0400	75330	027335	JMP	UST10	NO
0401	75331	060032	LDA	LTEMP+2	OUTPUT
0402	75332	017710	JSB	USTDG	DRUM #
0403	75333	060436	LDA	B72	' :
0404	75334	016132	JSB	LOUT	
0405	75335		UST10	EQU *	
0406	75335	017656	JSB	USTST	2 BLANKS
0407	75336	020040	ASC	1,	
0408	75337	000000	UCT	0	
0409	75340	060030	LDA	LTEMP	OUTPUT TRACK #
0410	75341	017672	JSB	UST2D	
0411	75342	034034	ISZ	LTEMP+4	
0412	75343	017621	JSB	USTBP	BUMP POINTERS
0413	75344	027401	JMP	UST14	END OF DRUM
0414	75345	017604	JSB	USTTZ	TEST NEXT TRACK
0415	75346	027362	JMP	UST12	UNLOCKED (ONLY ONE)
0416	75347		UST11	EQU *	
0417	75347	017621	JSB	USTBP	LOCKED, BUMP POINTERS
0418	75350	027375	JMP	UST13	END OF DRUM
0419	75351	017604	JSB	USTTZ	TEST NEXT TRACK
0420	75352	002001	RSS		UNLOCKED
0421	75353	027347	JMP	UST11	LOCKED, GO TO NEXT ONE
0422	75354	060427	LDA	+55B	' :
0423	75355	016132	JSB	LOUT	
0424	75356	003400	CCA		
0425	75357	040030	ADA	LTEMP	OUTPUT TRACK #
0426	75360	017672	JSB	UST2D	
0427	75361	034034	ISZ	LTEMP+4	
0428	75362		UST12	EQU *	
0429	75362	017621	JSB	USTBP	BUMP POINTERS
0430	75363	027401	JMP	UST14	END OF DRUM
0431	75364	060034	LDA	LTEMP+4	MORE ROOM
0432	75365	040332	ADA	=-16	ON THIS
0433	75366	002020	SSA		LINE?
0434	75367	027317	JMP	USTA8	YES
0435	75370	017745	JSB	XCRLF	NO
0436	75371	017755	JSB	USTSV	SAVE VARIABLES
0437	75372	116023	JSB	SCHOU, I	SUSPEND
0438	75373	017766	JSB	USTRV	RETRIEVE VARIABLES
0439	75374	027315	JMP	USTA7	
0440	75375		UST13	EQU *	
0441	75375	060427	LDA	+55B	' :
0442	75376	016132	JSB	LOUT	
0443	75377	063634	LDA	US.63	LAST TRACK IS 63
0444	75400	017672	JSB	UST2D	

0445	75401	UST14	EQU *	
0446	75401 060034		LDA LTEMP+4	
0447	75402 002003		SZA, RSS	
0448	75403 027410		JMP UST15	SKIP PRINTING BLANK LINE
0449	75404 017745		JSB XCRLF	
0450	75405 017755		JSB USTSV	SAVE VARIABLES
0451	75406 116023		JSB SCHOU, I	SUSPEND
0452	75407 017766		JSB USTRV	RETRIEVE VARIABLES
0453	75410	UST15	EQU *	
0454	75410 060032		LDA LTEMP+2	
0455	75411 002004		INA	BUMP DRUM #
0456	75412 050356		CPA ,+4	
0457	75413 027416		JMP UST16	DONE
0458	75414 070032		STA LTEMP+2	
0459	75415 027310		JMP USTA6	
0460	75416	UST16	EQU *	
0461	75416 017656		JSB USTST	
0462	75417 005114		OCT 5114	
0463	75420 047503		ASC 9, OCKED DISC BLOCKS	
	75421 045505			
	75422 042040			
	75423 042111			
	75424 051503			
	75425 020102			
	75426 046117			
	75427 041513			
	75430 051440			
0464	75431 000000		OCT 0	
0465	75432 017745		JSB XCRLF	XOFF=CR-LF
0466	75433 116023		JSB SCHOU, I	SUSPEND
0467	75434 002400		CLA	
0468	75435 070034		STA LTEMP+4	
0469	75436 060210		LDA MHAD	=> FIRST DISC
0470	75437	UST17	EQU *	
0471	75437 070030		STA LTEMP	
0472	75440 060562		LDA LIBD	INITIALIZE
0473	75441 070031		STA LTEMP+1	BUFFER POINTER
0474	75442 060030		LDA LTEMP	
0475	75443 040354		ADA ,+2	
0476	75444 164000		LDB A, I	
0477	75445 164001		LDB B, I	GET SELECT CODE
0478	75446 006003		SZB, RSS	
0479	75447 027551		JMP UST22	DISC NOT PRESENT
0480	75450	UST18	EQU *	
0481	75450 104200		DLU LTEMP, I	COMPUTE
	75451 100030			
0482	75452 000065		CLE, ERA	
0483	75453 00E540		ERB, CLE	ADDRESS
0484	75454 044355		ADB ,+3	
0485	75455 002040		SEZ	OF BAD
0486	75456 002004		INA	
0487	75457 104400		DST LTEMP+14	BLOCKS
	75460 000046			
0488	75461 060762		LUA M256	
0489	75462 070215		STA MWORD	

0490	75463	063777	LDA	UDL14	
0491	75464	064566	LDB	LIBDI	
0492	75465	114217	JSB	DISCZ,I	READ BAD BLOCKS
0493	75466	027641	JMP	USTER	
0494	75467	002400	CLA		PUT ZERO AT
0495	75470	173636	STA	USTQV,I	BUFFER END
0496	75471		UST19	EQU *	
0497	75471	160031	LDA	LTEMP+1,I	GET LOCKED BLOCK ADDRESS
0498	75472	002003	SZA	,RSS	
0499	75473	027551	JMP	UST22	IF ZERO, FINISHED TABLE
0500	75474	104200	DL0	LTEMP,I	COMPUTE
	75475	100030			
0501	75476	000060	CLE	,ERA	
0502	75477	005540	ERB	,CLE	LOGICAL
0503	75500	144031	ADB	LTEMP+1,I	
0504	75501	002040	SEZ		BLOCK
0505	75502	002004	INA		
0506	75503	101100	SWP		ADDRESS
0507	75504	104400	DST	LTEMP+14	
	75505	000046			
0508	75506	017716	JSB	UST6D	FIRST BLOCK
0509	75507	034031	ISZ	LTEMP+1	
0510	75510	003400	CCA		
0511	75511	140031	ADA	LTEMP+1,I	
0512	75512	002003	SZA	,RSS	IF ONLY ONE BLOCK, DON'T
0513	75513	027527	JMP	UST20	PRINT SECOND ADDRESS
0514	75514	070035	STA	LTEMP+5	
0515	75515	060427	LDA	,+55B	'-'
0516	75516	016132	JSB	LOUT	
0517	75517	104200	DL0	LTEMP+14	COMPUTE
	75520	000046			
0518	75521	000040	CLE		LAST
0519	75522	040035	ADA	LTEMP+5	BLOCK
0520	75523	002040	SEZ		ADDRESS
0521	75524	006004	INB		
0522	75525	017716	JSB	UST6D	OUTPUT IT
0523	75526	002404	CLA	,INA	UPDATE
0524	75527		UST20	EQU *	
0525	75527	002004	INA		COUNT OF
0526	75530	040034	ADA	LTEMP+4	
0527	75531	070034	STA	LTEMP+4	ENTRIES ON LINE
0528	75532	034031	ISZ	LTEMP+1	
0529	75533	040342	ADA	,=8	
0530	75534	002021	SSA	,RSS	
0531	75535	027542	JMP	UST21	PRINT FULL LINE
0532	75536	017656	JSB	USTST	2 BLANKS
0533	75537	020040	ASC	1,	
0534	75540	000000	OCT	0	
0535	75541	027471	JMP	UST19	
0536	75542		UST21	EQU *	
0537	75542	017745	JSB	XCRLF	XOFF=CR=LF
0538	75543	017755	JSB	USTSV	SAVE VARIABLES
0539	75544	116023	JSB	SCHOU,I	SUSPEND
0540	75545	017766	JSB	USTRV	RESTORE VARIABLES
0541	75546	002400	CLA		RDSET ENTRY

```

0542 75547 070034      STA LTEMP+4      COUNTER
0543 75550 027450      JMP UST18
0544 75551      UST22 EQU *
0545 75551 060030      LDA LTEMP
0546 75552 040360      ADA ,+6          NEXT DISC
0547 75553 064210      LDB MHAD
0548 75554 044432      ADB ,+48
0549 75555 050001      CPA B           FINISHED ALL 8
0550 75556 002001      RSS           YES
0551 75557 027437      JMP UST17      NO
0552 75560 060034      LDA LTEMP+4
0553 75561 002002      SZA
0554 75562 017745      JSB XCRLF      NON-BLANK LINE
0555 75563 017656      JSB USTST
0556 75564 005114      OCT 5114
0557 75565 044516      ASC 7,LINE PRINTER *
      75566 042440
      75567 050122
      75570 044516
      75571 052105
      75572 051040
      75573 036440
0558 75574 000000      OCT 0
0559 75575 103100      CLF 0
0560 75576 064273      LDB MLINK+1
0561 75577 044351      ADB ,+?STAT=?LINK
0562 75600 134001      ISZ B,I        SET STATUS TO OVERLAY
0563 75601 060506      LDA #LIB#      RESTART ADDRESS
0564 75602 002004      INA           SO #OUTC WILL WORK
0565 75603 127635      JMP UST50,I
0566*
0567* USTTZ TESTS THE CURRENT TRAX POSITION. EXIT TO (P+1) IF 0, (P+2)
0568* IF 1.
0569*
0570 75604 000000      USTTZ NOP
0571 75605 064032      LDB LTEMP+2    DRUM #
0572 75606 005222      RBL,RBL        MULTIPLY BY 4
0573 75607 044512      ADB DTRAX      => 1ST TRAX ELEMENT
0574 75610 060030      LDA LTEMP
0575 75611 001121      ARS,ARS
0576 75612 001121      ARS,ARS
0577 75613 044000      ADB A          POSITION IN TRAX
0578 75614 160001      LDA B,I
0579 75615 010031      AND LTEMP+1    MASK
0580 75616 002002      SZA           0 EXISTS TO P+1
0581 75617 037604      ISZ USTTZ      1 EXISTS TO P+2
0582 75620 127604      JMP USTTZ,I
0583*
0584* USTBP BUMPS THE POINTERS TO THE TRAX TABLE. IT EXITS TO (P+1) IF
0585* A DRUM IS FINISHED, OTHERWISE TO (P+2).
0586*
0587 75621 000000      USTBP NOP
0588 75622 060031      LDA LTEMP+1    MASK
0589 75623 001200      RAL           ROTATE IT
0590 75624 070031      STA LTEMP+1

```

0591	75625	060030	LDA	LTEMP	
0592	75626	002004	INA		BUMP TRACK #
0593	75627	050772	CPA	B,00	FINISHED A DRUM?
0594	75630	002401	CLA	RSS	YES, SET TRACK # TO ZERO
0595	75631	037621	ISZ	USTBP	NO, EXIT TO (P+2)
0596	75632	070030	STA	LTEMP	
0597	75633	127621	JMP	USTBP,I	
0598	75634	000077	US,63	DEC 63	
0599	75635	071662	USTSO	DEF SCHSQ	
0600	75636	001630	USTQV	DEF LIBUS+256	

```

0602 75641          ORG LIBRA+512-95
0603 75641 060330  USTER LDA  .-18
0604 75642 067644          LDB  ++2
0605 75643 026432          JMP  LIBER
0606 75644 075645          DEF  ++1
0607 75645 006412          OCT  6412
0608 75646 041501          ASC  8,CAN'T READ TABLE
      75647 047047
      75650 052040
      75651 051105
      75652 040504
      75653 020124
      75654 040502
      75655 046105

```

0609*

0610* USTST OUTPUTS A STRING

0611*

```

0612 75656 000000  USTST NOP
0613 75657 163656          LDA  USTST,I
0614 75660 002003          SZA, RSS      ZERO IS
0615 75661 127656          JMP  USTST,I      END
0616 75662 001727          ALF, ALF
0617 75663 010443          AND  B377
0618 75664 016132          JSB  LOUT      RIGHT CHAR
0619 75665 163656          LDA  USTST,I
0620 75666 010443          AND  B377
0621 75667 016132          JSB  LOUT
0622 75670 037656          ISZ  USTST
0623 75671 027657          JMP  USTST+1

```

0624*

0625* UST2D OUTPUTS A 2-DIGIT NUMBER

0626*

```

0627 75672 000000  UST2D NOP
0628 75673 006400          CLB
0629 75674 100400          DIV  .+10
      75675 000364
0630 75676 017710          JSB  USTDG
0631 75677 017710          JSB  USTDG
0632 75700 127672          JMP  UST2D,I

```

0633*

0634* USTOC OUTPUTS A 2-DIGIT OCTAL INTEGER

0635*

```

0636 75701 000000  USTOC NOP
0637 75702 006400          CLB
0638 75703 100400          DIV  .+8
      75704 000362
0639 75705 017710          JSB  USTDG
0640 75706 017710          JSB  USTDG
0641 75707 127701          JMP  USTOC,I

```

0642*

0643* UST DG OUTPUTS A DIGIT

0644*

```

0645 75710 000000  USTDG NOP
0646 75711 074040          STB  LTEMP+8
0647 75712 040432          ADA  .+608

```

```

0648 75713 016132      JSB LOUT
0649 75714 060040      LDA LTEMP+8
0650 75715 127710      JMP USTDG,I
0651*
0652* UST6D OUTPUTS A 6-DIGIT NUMBER
0653*
0654 75716 000000      UST6D NOP
0655 75717 100400      DIV DVSR8
      75720 001032
0656 75721 074037      STB LTEMP+7
0657 75722 017672      JSB UST2D      DIGITS 1-2
0658 75723 060037      LDA LTEMP+7
0659 75724 006400      CLB
0660 75725 100400      DIV .100
      75726 000437
0661 75727 074037      STB LTEMP+7
0662 75730 017672      JSB UST2D
0663 75731 060037      LDA LTEMP+7
0664 75732 017672      JSB UST2D      DIGITS 5-6
0665 75733 127716      JMP UST6D,I
0666*
0667* UST3D OUTPUTS A 3-DIGIT NUMBER
0668*
0669 75734 000000      UST3D NOP
0670 75735 006400      CLB
0671 75736 100400      DIV .100
      75737 000437
0672 75740 017710      JSB USTDG      DIGIT 1
0673 75741 017672      JSB UST2D      DIGITS 2-3
0674 75742 060412      LDA .+40B     BLANK
0675 75743 016132      JSB LOUT
0676 75744 127734      JMP UST3D,I
0677*
0678* XCRLF OUTPUTS X-OFF, CARRIAGE RETURN AND LINEFEED
0679*
0680 75745 000000      XCRLF NOP
0681 75746 060375      LDA .+23B     XOFF
0682 75747 016132      JSB LOUT
0683 75750 060367      LDA .+15B     CR
0684 75751 016132      JSB LOUT
0685 75752 060364      LDA .+12B     CF
0686 75753 016132      JSB LOUT
0687 75754 127745      JMP XCRLF,I
0688*
0689* USTSV SAVES STATUS VARIABLES
0690*
0691 75755 000000      USTSV NOP
0692 75756 064273      LDB MLINK+1
0693 75757 044355      ADB .+?TEMP=?LINK
0694 75760 074051      STB MOVED
0695 75761 064520      LDB DLTEM
0696 75762 074050      STB MOVES
0697 75763 064347      LDB .-3
0698 75764 016257      JSB MOVEW
0699 75765 127755      JMP USTSV,I

```

0700*

0701* USTRV RESTORES STATUS VARIABLES

0702*

0703	75766	000000	USTRV	NOP
0704	75767	064273	LDB	MLINK+1
0705	75770	044355	ADB	,+?TEMP-?LINK
0706	75771	074050	STB	MOVES
0707	75772	064520	LDB	DLTEM
0708	75773	074051	STB	MOVED
0709	75774	064347	LDB	,=3
0710	75775	016257	JSB	MOVEW
0711	75776	127766	JMP	USTRV,I
0712	75777	000046	UDL14	DEF LTEMP+14
0713	76000		SSIAS	EQU *

0002	75000	ORG LIBRA	
0003	75000	LDA LPS	GET THE LINE
0004	75001	JSB S14SC,I	PRINTER STATUS
0005	75002	SFS CH2	FROM THE I/O
0006	75003	JMP *-1	PROCESSOR
0007	75004	LIA CH2	A = STATUS
0008	75005	STA LTEMP	
0009	75006	AND B77	A = SELECT CODE
0010	75007	JSB USTOC	OUTPUT THE SC
0011	75010	LDA .+52B	A = '*'
0012	75011	LOB LTEMP	B = LP STATUS
0013	75012	SSB	CHECK FOR 2610A LP
0014	75013	JSB LOUT	YES = OUTPUT '*'
0015	75014	LDA .+52B	A = '*'
0016	75015	LOB LTEMP	
0017	75016	RBL	
0018	75017	SSB	CHECK FOR 2767A LP
0019	75020	JSB LOUT	YES = OUTPUT '*'
0020	75021	JSB USTST	
0021	75022	ASC 5,	USER *
	75023		
	75024		
	75025		
	75026		
0022	75027	OCT 0	
0023	75030	LOB PRIST	GET USER INDICATOR AND
0024	75031	SZB,RSS	CHECK FOR USE
0025	75032	JMP USTA2	NO
0026	75033	LDA B,I	YES,
0027	75034	ALF,ALF	OUTPUT
0028	75035	JSB UST2D	USER TTY#
0029	75036	USTA2 JSB XCRLF	
0030	75037	JSB USTST	
0031	75040	OCT 5111	
0032	75041	ASC 2,DT	
	75042		
0033	75043	OCT 0	
0034	75044	LDA .+3	3 IDT
0035	75045	STA LTEMP+3	TRACKS
0036	75046	LOB USTID	
0037	75047	STB LTEMP+4	
0038	75050	UST30 EQU *	
0039	75050	LDA LTEMP+4,I	GET ADDRESS
0040	75051	ISZ LTEMP+4	
0041	75052	SZA,RSS	
0042	75053	JMP UST31	SKIP IF ZERO
0043	75054	LOB LTEMP+4,I	GET LENGTH
0044	75055	JSB USTLL	OUTPUT THEM
0045	75056	UST31 EQU *	
0046	75056	ISZ LTEMP+4	
0047	75057	ISZ LTEMP+4	
0048	75060	ISZ LTEMP+3	
0049	75061	JMP UST30	
0050	75062	JSB XCRLF	XOFF=CR=LF
0051	75063	JSB USTST	

0052	75064	006412	OCT 6412	CR-LF
0053	75065	040504	ASC 2,ADT	
	75066	052040		
0054	75067	000000	OCT 0	
0055	75070	060112	LDA ADLOC	OUTPUT ADT
0056	75071	064113	LDB ADLEN	ADDRESS AND
0057	75072	017447	JSB USTLL	LENGTH
0058*				
0059	75073	017745	JSB XCRLF	
0060	75074	017656	JSB USTST	
0061	75075	005104	OCT 5104	
0062	75076	044523	ASC 4,ISC ADTS	
	75077	041440		
	75100	040504		
	75101	052123		
0063	75102	000000	OCT 0	
0064	75103	017745	JSB XCRLF	
0065	75104	116023	JSB SCHOU,I	
0066	75105	060346	LDA ,=4	4 PER
0067	75106	070033	STA LTEMP+3	LINE
0068	75107	067626	LDB USTDC	=> 1ST DISC ADT
0069	75110		UST32 EQU *	
0070	75110	074030	STB LTEMP	
0071	75111	160030	LDA LTEMP,I	GET ADDRESS
0072	75112	002003	SZA,RSS	
0073	75113	027125	JMP UST33	SKIP IF ZERO
0074	75114	064030	LDB LTEMP	
0075	75115	044362	ADB ,+DADLN-DADLC	
0076	75116	164001	LDB B,I	GET LENGTH
0077	75117	017447	JSB USTLL	OUTPUT THEM
0078	75120	034033	ISZ LTEMP+3	LINE FULL
0079	75121	027125	JMP UST33	NO
0080	75122	017745	JSB XCRLF	YES
0081	75123	060346	LDA ,=4	
0082	75124	070033	STA LTEMP+3	
0083	75125		UST33 EQU *	
0084	75125	064030	LDB LTEMP	
0085	75126	006004	INB	
0086	75127	057632	CPB USTDL	FINISHED ALL DISC ADTS?
0087	75130	002001	RSS	YES
0088	75131	027110	JMP UST32	NO
0089	75132	060033	LDA LTEMP+3	
0090	75133	050346	CPA ,=4	
0091	75134	002001	RSS	SKIP BLANK LINE
0092	75135	017745	JSB XCRLF	
0093	75136	116023	JSB SCHOU,I	
0094*				
0095	75137	017656	JSB USTST	
0096	75140	005104	OCT 5104	
0097	75141	044522	ASC 2,IREC	
	75142	042503		
0098	75143	000000	OCT 0	
0099	75144	017745	JSB XCRLF	
0100	75145	060346	LDA ,=4	4 PER
0101	75146	070033	STA LTEMP+3	LINE

0102	75147	067624	LDB	USTD6	=> 1ST DIREC ENTRY
0103	75150		UST34	EQU *	
0104	75150	074030	STB	LTEMP	
0105	75151	160030	LDA	LTEMP,I	GET ADDRESS
0106	75152	002003	SZA	RSS	
0107	75153	027170	JMP	UST35	SKIP IF ZERO
0108	75154	064030	LDB	LTEMP	
0109	75155	044344	ADB	,-6	
0110	75156	164001	LDB	B,I	GET LENGTH
0111	75157	017447	JSB	USTLL	OUTPUT THEM
0112	75160	034033	ISZ	LTEMP+3	LINE FULL
0113	75161	027170	JMP	UST35	NO
0114	75162	017745	JSB	XCRLF	YES,XOFF=CR=CF
0115	75163	017755	JSB	USTSV	
0116	75164	116023	JSB	SCHOU,I	SUSPEND
0117	75165	017766	JSB	USTRV	RESTORE VARIABLES
0118	75166	060346	LDA	,-4	
0119	75167	070033	STA	LTEMP+3	
0120	75170		UST35	EQU *	
0121	75170	064030	LDB	LTEMP	
0122	75171	044361	ADB	,-7	
0123	75172	057625	CPB	USTDU	FINISHED ALL DIREC ENTRIES?
0124	75173	002001	RSS		YES
0125	75174	027150	JMP	UST34	NO
0126	75175	060033	LDA	LTEMP+3	
0127	75176	050346	CPA	,-4	
0128	75177	002001	RSS		SKIP PRINTING OF BLANK LINE
0129	75200	017745	JSB	XCRLF	
0130	75201	017656	JSB	USTST	
0131	75202	005123	OCT	5123	
0132	75203	054523	ASC	3,YSTEM	
	75204	052105			
	75205	046440			
0133	75206	000000	OCT	0	
0134	75207	002400	CLA		
0135	75210	070033	STA	LTEMP+3	SET COMPARE DRUM ADDRESS
0136	75211	067627	LDB	USTTB	B => BEGINNING OF COM TABLE
0137	75212		UST50	EQU *	
0138	75212	074034	STB	LTEMP+4	
0139	75213	160001	LDA	B,I	GET THE NEXT USED DRUM ADDRESS
0140	75214	010764	AND	M120	MASK OFF THE SECTOR PART
0141	75215	050033	CPA	LTEMP+3	IS IT ALREADY PRINTED?
0142	75216	027221	JMP	UST36	YES
0143	75217	070033	STA	LTEMP+3	NO
0144	75220	017464	JSB	USTDS	
0145	75221		UST36	EQU *	
0146	75221	064034	LDB	LTEMP+4	GET COM TABLE POINTER
0147	75222	006004	INB		ADVANCE TO NEXT ENTRY
0148	75223	057630	CPB	USTTE	CHECK FOR END OF TABLE
0149	75224	002001	RSS		
0150	75225	027212	JMP	UST50	SCAN ON
0151	75226	017745	JSB	XCRLF	
0152	75227	017656	JSB	USTST	
0153	75230	005125	OCT	5125	
0154	75231	051505	ASC	2,SERS	

	75232	051123			
0155	75233	000000		OCT 0	
0156	75234	017745		JSB XCRLF	
0157	75235	116023		JSB SCHOU,I	
0158	75236	060342		LDA ,=8	8 PER
0159	75237	070033		STA LTEMP+3	LINE
0160	75240	067633		LDB USTSW	*-> DISC ADDRESS FOR TTY00
0161	75241		UST37	EQU *	
0162	75241	074030		STB LTEMP	
0163	75242	160030		LDA LTEMP,I	GET ADDRESS
0164	75243	002003		SZA,RSS	
0165	75244	027263		JMP UST39	DONE IF ZERO
0166	75245	017464		JSB USTDS	OUTPUT IT
0167	75246	034033		ISZ LTEMP+3	LINE FULL?
0168	75247	027256		JMP UST38	NO
0169	75250	017745		JSB XCRLF	
0170	75251	017755		JSB USTSV	YES
0171	75252	116023		JSB SCHOU,I	
0172	75253	017766		JSB USTRV	
0173	75254	060342		LDA ,=8	
0174	75255	070033		STA LTEMP+3	
0175	75256		UST38	EQU *	
0176	75256	064030		LDB LTEMP	
0177	75257	044375		ADB ,+TTY01=TTY00	
0178	75260	057634		CPB USTUS	FINISHED ALL USERS
0179	75261	002001		RSS	YES
0180	75262	027241		JMP UST37	NO
0181	75263		UST39	EQU *	
0182	75263	060033		LDA LTEMP+3	
0183	75264	050342		CPA ,=8	
0184	75265	002001		RSS	SKIP BLANK LINE
0185	75266	017745		JSB XCRLF	
0186*					
0187	75267	017656		JSB USTST	
0188	75270	005104		OCT 5104	
0189	75271	044523		ASC 7,ISC	ALLOCATION
	75272	041440			
	75273	040514			
	75274	046117			
	75275	041501			
	75276	052111			
	75277	047516			
0190	75300	011415		OCT 11415	XOFF=CR
0191	75301	005012		OCT 5012	LF=LF
0192	75302	020040		ASC 3, IDT	
	75303	044504			
	75304	052040			
0193	75305	000000		OCT 0	
0194	75306	017745		JSB XCRLF	
0195	75307	017554		JSB USTDR	READ DAT
0196	75310	060347		LDA ,=3	3 ENTRIES
0197	75311	064356		LDB ,+4	*-> 1ST IDT ENTRY
0198	75312	017505		JSB USTDA	PRINT IDT
0199	75313	116023		JSB SCHOU,I	SUSPEND
0200	75314	017656		JSB USTST	

0201	75315	005040	OCT 5040	
0202	75316	020104	ASC 5, DISC ADT	
	75317	044523		
	75320	041440		
	75321	040504		
	75322	052040		
0203	75323	000000	OCT 0	
0204	75324	017745	JSB XCRLF	
0205	75325	017554	JSB USTDR	READ DAT
0206	75326	060342	LDA ,=8	8 ENTRIES
0207	75327	064367	LDB ,+13	=> 1ST DISC ADT ENTRY
0208	75330	017505	JSB USTDA	SET UP BUFFER FOR ADT
0209	75331	017656	JSB USTST	
0210	75332	005040	OCT 5040	LF=BLANK
0211	75333	020104	ASC 3, DIREC	
	75334	044522		
	75335	042503		
0212	75336	000000	OCT 0	
0213	75337	017745	JSB XCRLF	XOFF=CR=LF
0214	75340	116023	JSB SCHOU,I	SUSPEND
0215	75341	017554	JSB USTDR	READ DAT
0216	75342	060342	LDA ,=8	8 PER
0217	75343	070033	STA LTEMP+3	LINE
0218	75344	064562	LDB LIBD	
0219	75345	044417	ADB ,+37	=> 1ST DIREC ENTRY
0220	75346		UST40 EQU *	
0221	75346	017520	JSB USTSR	CALL SAVE ROOM SUBROUTINE
0222	75347	027361	JMP UST41	ZERO DISC ADDRESS
0223	75350	034033	ISZ LTEMP+3	LINE FULL?
0224	75351	027361	JMP UST41	NO
0225	75352	017745	JSB XCRLF	YES
0226	75353	017755	JSB USTSV	
0227	75354	116023	JSB SCHOU,I	SUSPEND
0228	75355	017766	JSB USTRV	
0229	75356	060342	LDA ,=8	
0230	75357	070033	STA LTEMP+3	
0231	75360	017554	JSB USTDR	READ DAT AGAIN
0232	75361		UST41 EQU *	
0233	75361	064030	LDB LTEMP	
0234	75362	044355	ADB ,+3	
0235	75363	060207	LDA DATLN	
0236	75364	003004	CMA,INA	
0237	75365	002004	INA	
0238	75366	040562	ADA LIBD	
0239	75367	054000	CPB A	FINISHED ALL ENTRIES?
0240	75370	002001	RSS	YES
0241	75371	027346	JMP UST40	NO
0242	75372	060033	LDA LTEMP+3	
0243	75373	050342	CPA ,=8	
0244	75374	002001	RSS	SKIP BLANK LINE
0245	75375	017745	JSB XCRLF	
0246	75376	017656	JSB USTST	
0247	75377	005040	OCT 5040	
0248	75400	020123	ASC 4, SYSTEM	
	75401	054523		

	75402	052105		
	75403	046440		
0249	75404	000000	OCT 0	
0250	75405	017745	JSB XCRLF	
0251	75406	116023	JSB SCHOU,I	
0252	75407	017554	JSB USTDR	GET DAT BACK
0253	75410	064562	LDB LIBD	
0254	75411	160001	LDA B,I	
0255	75412	070033	STA LTEMP+3	SAVE LENGTH
0256	75413	006004	INB	
0257	75414	104200	OLD B,I	GET ADDRESS OF
	75415	100001		
0258	75416	101100	SWP	SYSTEM LIBRARY
0259	75417	017716	JSB UST6D	OUTPUT IT
0260	75420	060412	LDA .+40B	BLANK
0261	75421	016132	JSB LOUT	
0262	75422	060033	LDA LTEMP+3	OUTPUT
0263	75423	017734	JSB UST3D	LENGTH
0264	75424	017656	JSB USTST	2 BLANKS
0265	75425	020040	ASC 1,	
0266	75426	000000	OCT 0	
0267	75427	064205	LDB LDBSA	GET POINTER
0268	75430	044355	ADB .+3	TO 1ST DISC
0269	75431	074030	STB LTEMP	ADDRESS IN SST
0270	75432	060346	LDA .-4	
0271	75433	017573	JSB USTSS	SEGMENTS 1-4
0272	75434	017755	JSB USTSV	
0273	75435	116023	JSB SCHOU,I	
0274	75436	017766	JSB USTRV	
0275	75437	060345	LDA .-5	
0276	75440	017573	JSB USTSS	SEGMENTS 5-9
0277	75441	017755	JSB USTSV	
0278	75442	116023	JSB SCHOU,I	
0279	75443	017766	JSB USTRV	
0280	75444	060346	LDA .-4	
0281	75445	017573	JSB USTSS	SEGMENTS 10-13
0282	75446	026226	JMP LLEND	

```

0284*
0285* USTLL OUTPUTS A DRUM LOCATION AND LENGTH
0286*
0287 75447 000000 USTLL NOP
0288 75450 074035 STB LTEMP+5 SAVE LENGTH
0289 75451 017464 JSB USTDS OUTPUT DRUM ADDRESS
0290 75452 060035 LDA LTEMP+5 GET LENGTH
0291 75453 003004 CMA,INA MAKE POSITIVE
0292 75454 006400 CLB
0293 75455 100400 DIV DV9RS+1
      75456 001033
0294 75457 017710 JSB USTDG 1ST DIGIT
0295 75460 017734 JSB UST3D LAST 3 DIGITS
0296 75461 060412 LDA .+40B BLANK
0297 75462 016132 JSB LOUT
0298 75463 127447 JMP USTLL,I
0299*
0300* USTOS OUTPUTS A DRUM ADDRESS AS 8 CHARS FOLLOWED BY A BLANK
0301*
0302 75464 000000 USTOS NOP
0303 75465 070036 STA LTEMP+6
0304 75466 001222 RAL,RAL GET DRUM#
0305 75467 010355 AND .+3
0306 75470 017710 JSB USTDG
0307 75471 060431 LDA .+57B '/'
0308 75472 016132 JSB LOUT
0309 75473 060036 LDA LTEMP+6
0310 75474 001727 ALF,ALF
0311 75475 010734 AND B77 GET TRACK#
0312 75476 017672 JSB UST2D
0313 75477 060431 LDA .+57B '/'
0314 75500 016132 JSB LOUT
0315 75501 060036 LDA LTEMP+6
0316 75502 010441 AND B177 GET SECTOR #
0317 75503 017734 JSB UST3D
0318 75504 127464 JMP USTDS,I
0319*
0320* USTDA PRINTS DISC ALLOCATION FOR THE IOT AND DISC ADT
0321*
0322 75505 000000 USTDA NOP
0323 75506 070033 STA LTEMP+3 # OF ENTRIES
0324 75507 044562 ADB LIBD => 1ST ONE WE WANT
0325 75510 USTD1 EQU *
0326 75510 017520 JSB USTSR CALL SUBROUTINE THAT SAVES ROOM
0327 75511 000000 NOP
0328 75512 USTD2 EQU *
0329 75512 064030 LDB LTEMP
0330 75513 044355 ADB .+3 => NEXT ONE
0331 75514 034033 ISZ LTEMP+3 FINISHED?
0332 75515 027510 JMP USTD1 NO
0333 75516 017745 JSB XCRLF
0334 75517 127505 JMP USTDA,I YES
0335*
0336* SUBROUTINE TO SAVE ENOUGH ROOM YHAT THIS ROUTINE WILL FIT
0337*

```

```

0338 75520 000000  USTSR NOP
0339 75521 074030          STB LTEMP
0340 75522 104200          DLD LTEMP,I   GET DISC ADDRESS
       75523 100030
0341 75524 002003          SZA,RSS
0342 75525 006002          SZB
0343 75526 002001          RSS
0344 75527 127520          JMP USTSR,I
0345 75530 101100          SWP
0346 75531 017716          JSB UST6D     OUTPUT IT
0347 75532 017656          JSB USTST     2 BLANKS
0348 75533 029040          ASC 1,
0349 75534 000000          OCT 0
0350 75535 037520          ISZ USTSR
0351 75536 127520          JMP USTSR,I
0352*
0353* USTBR READS THE BOOTSTRAP
0354*
0355 75537 000000  USTBR NOP
0356 75540 060750          LDA M512
0357 75541 070215          STA MWORD     LENGTH
0358 75542 002400          CLA
0359 75543 006404          CLB,INB
0360 75544 104400          DST LTEMP+14  DISC ADDRESS
       75545 000046
0361 75546 064205          LDB LDBSA     CORE ADDRESS
0362 75547 045030          ADB BIT15
0363 75550 063777          LDA UDL14
0364 75551 114217          JSB DISCZ,I   READ IT
0365 75552 027641          JMP USTER
0366 75553 127537          JMP USTBR,I
0367*
0368* USTDR READS THE DISC ALLOCATION TABLE
0369*
0370 75554 000000  USTDR NOP
0371 75555 017537          JSB USTBR     READ BOOTSTRAP
0372 75556 064206          LDB LSTDA
0373 75557 044354          ADB ,+2
0374 75560 104200          DLD B,I
       75561 100001
0375 75562 104400          DST LTEMP+14  ADDRESS OF DAT
       75563 000046
0376 75564 063777          LDA UDL14     => DISC ADDRESS
0377 75565 064207          LDB DATLN
0378 75566 074215          STB MWORD     LENGTH
0379 75567 064566          LDB LIBDI     CORE ADDRESS
0380 75570 114217          JSB DISCZ,I   READ IT
0381 75571 027641          JMP USTER
0382 75572 127554          JMP USTDR,I
0383*
0384* USTSS FILLS THE BUFFER WITH SYSTEM SEGMENT
0385* ADDRESSES AND LENGTHS
0386*
0387 75573 000000  USTSS NOP
0388 75574 070033          STA LTEMP+3   SAVE # OF SEGMENTS

```


0389	75575	017537	JSB	USTBR	READ BOOTSTRAP
0390	75576		USTS1	EQU *	
0391	75576	104200	OLD	LTEMP,I	GET DISC ADDRESS
	75577	100030			
0392	75600	101100	SWP		
0393	75601	017716	JSB	UST6D	OUTPUT IT
0394	75602	060412	LDA	.,+40B	BLANK
0395	75603	016132	JSB	LOUT	
0396	75604	064030	LOB	LTEMP	
0397	75605	044360	ADB	.,-2	
0398	75606	160001	LDA	B,I	GET LENGTH
0399	75607	044360	ADB	.,+6	
0400	75610	074030	STB	LTEMP	
0401	75611	001727	ALF	,ALF	CONVERT
0402	75612	030762	IOR	HIMSK	
0403	75613	003004	CMA	,INA	TO BLOCKS
0404	75614	017734	JSB	UST3D	OUTPUT IT
0405	75615	017656	JSB	USTST	2 BLANKS
0406	75616	020040	ASC	1,	
0407	75617	000000	OCT	0	
0408	75620	034033	IBZ	LTEMP+3	
0409	75621	027576	JMP	USTS1	
0410	75622	017745	JSB	XCRLF	
0411	75623	127573	JMP	USTSS,I	
0412	75624	030006	USTD6	DEF DIREC+6	
0413	75625	031060	USTDU	DEF DIREU+6	
0414	75626	000115	USTDC	DEF DADLC	
0415	75627	072034	USTTB	DEF COM6	
0416	75630	072137	USTTE	DEF COMTE	
0417	75631	000101	USTID	DEF IDEC+1	
0418	75632	000125	USTDL	DEF DADLN	
0419	75633	061130	USTSW	DEF TTY00+?DISC	
0420	75634	062270	USTUS	DEF TTY32+?DISC	

0422* THE DELETE COMMAND ALLOWS A USER TO DELETE A SECTION OF HIS
 0423* PROGRAM IN A SINGLE LINE. THE FORMAT IS:
 0424* DELETE=M,N
 0425* OR
 0426* DELETE=M
 0427* WITH THE FIRST FORMAT, ALL LINES FROM M THROUGH N ARE
 0428* DELETED. WITH THE SECOND, ALL LINES FROM M TO THE END OF
 0429* THE PROGRAM ARE DELETED.

0431	75000		ORG LIBRA	
0432	75000	017074	JSB DELNM	GET M.
0433	75001	070030	STA DELM	
0434	75002	063126	LDA DEL99	
0435	75003	054426	CPB .+54B	IF COMMA FOLLOWS, GO
0436	75004	017074	JSB DELNM	GET N.
0437	75005	070031	STA DELN	
0438	75006	054367	CPB .+15B	NEXT CHAR MUST BE A CR.
0439	75007	027011	JMP DEL2	
0440	75010	026430	JMP ILFER	
0441*				
0442	75011	003000	DEL2 CMA	CHECK FOR M<=N
0443	75012	040030	ADA DELM	
0444	75013	002021	SSA,RSS	
0445	75014	026430	JMP ILFER	
0446*				
0447	75015	016047	JSB RDPRG	READ IN PROGRAM AND
0448	75016	015322	JSB DCMPL	DECOMPILE IT.
0449*				
0450	75017	060056	LDA PBPTR	LOCATE FIRST
0451	75020	064030	LDB DELM	STATEMENT TO BE DELETED.
0452	75021	015314	JSB FNDPS	
0453	75022	002001	RSS	
0454	75023	000000	NOP	
0455	75024	074051	STB MOVED	
0456*				
0457	75025	060056	LDA PBPTR	LOCATE FIRST STATEMENT
0458	75026	064031	LDB DELN	NOT TO BE DELETED.
0459	75027	070050	STA MOVES	
0460	75030	057126	CPB DEL99	
0461	75031	027037	JMP DEL3	
0462	75032	006004	INB	
0463	75033	015314	JSB FNDPS	
0464	75034	002001	RSS	
0465	75035	000000	NOP	
0466	75036	074050	STB MOVES	
0467*				
0468	75037	064050	DEL3 LDB MOVES	IF DEST=SOURCE, NOTHING DELETED.
0469	75040	054051	CPB MOVED	
0470	75041	027054	JMP DEL4	
0471	75042	007004	CMB,INB	OTHERWISE, MOVE UP.
0472	75043	044056	ADB PBPTR	
0473	75044	007004	CMB,INB	
0474	75045	016257	JSB MOVEW	
0475	75046	060051	LDA MOVED	SET NEW VALUE OF
0476	75047	070056	STA PBPTR	PBPTR.

0477	75050	060273		LDA	MLINK+1	TELL SCHEDULER THAT
0478	75051	040335		ADA	,-7LINK	PROGRAM IS IN CORE.
0479	75052	070257		STA	MAIN	
0480	75053	026226		JMP	LLEND	
0481*						
0482	75054	060273	DEL4	LDA	MLINK+1	
0483	75055	040335		ADA	,-7LINK	
0484	75056	070257		STA	MAIN	
0485	75057	060331		LDA	,-17	
0486	75060	067062		LDB	++2	
0487	75061	026432		JMP	LIBER	
0488	75062	075063		DEF	++1	
0489	75063	005116		OCT	5116	LF=N
0490	75064	047524		ASC	7,OTHING	DELETED
	75065	044111				
	75066	047107				
	75067	020104				
	75070	042514				
	75071	042524				
	75072	042504				
0491	75073	006400				
			OCT 6400			CR
0492*						
0493*	DELNM	READS A	NUMBER FROM THE USER'S	BUFFER. IN CASE OF ERROR	IT	
0494*	GOES TO	DEL1.	OTHERWISE IT RETURNS	WITH A=# AND B=	NEXT CHAR.	
0495*						
0496	75074	000000	DELNM	NOP		
0497	75075	002400		CLA		INITIALIZE TO 0.
0498	75076		DEL7	EQU *		
0499	75076	070032		STA	DELT	
0500	75077	016164		JSB	LCHAR	GET A CHARACTER
0501	75100	000000		NOP		
0502	75101	070001		STA	1	SAVE IN B.
0503	75102	040316		ADA	M72B	TEST FOR DIGIT.
0504	75103	002021		SSA	,RSS	
0505	75104	027122		JMP	DEL6	
0506	75105	040364		ADA	,+10	
0507	75106	002020		SSA		
0508	75107	027122		JMP	DEL6	
0509	75110	064032		LDB	DELT	
0510	75111	047127		ADB	DELMX	
0511	75112	006021		SSB	,RSS	
0512	75113	026430		JMP	ILFER	
0513	75114	064032		LDB	DELT	MPY OLD VALUE BY 10.
0514	75115	005222		RBL	,RBL	
0515	75116	044032		ADB	DELT	
0516	75117	005200		RBL		
0517	75120	040001		ADA	1	ADD IN NEW.
0518	75121	027076		JMP	DEL7	LOOP.
0519*						
0520	75122	060032	DEL6	LDA	DELT	GET VALUE
0521	75123	002002		SZA		FAIL IF ZERO.
0522	75124	127074		JMP	DELNM,I	
0523	75125	026430		JMP	ILFER	
0524*						
0525	00030		DELM	EQU	LTEMP	

0526	00031		DELN	EQU	LTEMP+1
0527	00032		DELT	EQU	LTEMP+2
0528	75126	023417	DEL99	DEC	9999
0529	75127	176030	DELMX	DEC	=1000
0530	75130		SDEL	EQU	*

0532* THE TIME COMMAND PRINTS THE USER'S CONSOLE TIME DURING THIS
 0533* SESSION AND HIS TOTAL CONSOLE TIME TO DATE.

0535	75000		ORG LIBRA	
0537	75000	060332	LDA , -16	OUTPUT START OF
0538	75001	067047	LDB TIM1	MESSAGE,
0539	75002	016137	JSB LTYPR	
0540*				
0541	75003	060273	LDA MLINK+1	COMPUTE LOC OF USER'S
0542	75004	040345	ADA ,+?TIME=?LINK	STARTING TIME,
0543	75005	104200	DL0 0,I	GET STARTING TIME,
	75006	100000		
0544	75007	003004	CMA,INA	MAKE NEGATIVE AND
0545	75010	007004	CMB,INB	SAVE IN TIMT,
0546	75011	104400	DST TIMT	
	75012	000031		
0547	75013	104200	DL0 DATIM	GET CURRENT TIME,
	75014	000201		
0548	75015	040031	ADA TIMT	COMPUTE DIRRERENCES; A## OF HRS;
0549	75016	000040	CLE	B## OF 100 MS UNITS,
0550	75017	044032	ADB TIMT+1	E##-SIGN OF B,
0551	75020	074032	STB TIMT+1	SAVE UNITS,
0552	75021	100200	MPY D60	CHANGE HRS TO MINS,
	75022	000724		
0553	75023	070031	STA TIMT	
0554	75024	060032	LDA TIMT+1	GET UNIT COUNT, IF E##
0555	75025	002041	SEZ,RSS	THEN COUNT IS NEGATIVE,
0556	75026	007400	CCB	
0557	75027	100400	DIV D600	CHANGE TO MINS,
	75030	000456		
0558	75031	040031	ADA TIMT	ADD IN PREVIOUS AMT,
0559	75032	070031	STA TIMT	
0560	75033	017076	JSB TIMPR	PRINT IT,
0561*				
0562	75034	060334	LDA , -14	OUTPUT SOME MORE
0563	75035	067060	LDB TIM2	CHARACTERS,
0564	75036	016137	JSB LTYPR	
0565*				
0566	75037	016107	JSB RDIDT	READ IN THE IDT
0567*				
0568	75040	044357	ADB ,+5	GET TIME TO DATE,
0569	75041	160001	LDA 1,I	
0570	75042	040031	ADA TIMT	ADD IN CURRENT TIME,
0571	75043	017076	JSB TIMPR	PRINT IT,
0572*				
0573	75044	060367	LDA ,+15B	OUTPUT CR,
0574	75045	016132	JSB LOUT	
0575	75046	026226	JMP LLEND	TERMINATE,
0576*				
0577	75047	075050	DEF **1	
0578	75050	005103	OCT 5103	LF=C
0579	75051	047516	ASC 7,ONSOLE	TIME *
	75052	051517		
	75053	046105		

	75054	020124		
	75055	044515		
	75056	042440		
	75057	036440		
0580	75060	075061	TIM2	DEF **1
0581	75061	020124		ASC 7, TOTAL TIME *
	75062	047524		
	75063	040514		
	75064	020124		
	75065	044515		
	75066	042440		
	75067	036440		
0582	75070	075071	TIM3	DEF **1
0583	75071	020115		ASC 5, MINUTES.
	75072	044516		
	75073	052524		
	75074	042523		
	75075	027040		
0584*				
0585*	TIMPR	OUTPUTS	THE INTEGER IN A	TO THE CONSOLE.
0586*				
0587	75076	000000	TIMPR	NOP
0588	75077	002003		SZA, RSS SPECIAL CASE OF ZERO.
0589	75100	027125		JMP TIMP1
0590	75101	070033		STA TIMNM SAVE ORIGINAL NUMBER.
0591	75102	067133		LDB TIMXK GET INITIAL DIVISOR OF 10000.
0592	75103	074034		STB TIMDV
0593	75104	006400	TIMP4	CLB COMPUTE A DIGIT.
0594	75105	100400		DIV TIMDV
	75106	000034		
0595	75107	074030		STB TIMN SAVE REMAINDER.
0596	75110	054033		CPB TIMNM IF REMAINDER*ORIGINAL NUMBER
0597	75111	027114		JMP TIMP2 THIS IS A LEADING ZERO.
0598	75112	040432		ADA .+60B OUTPUT
0599	75113	016132		JSB LOUT DIGIT.
0600	75114	060034	TIMP2	LDA TIMDV PRODUCE NEW DIVISOR.
0601	75115	006400		CLB
0602	75116	100400		DIV .+10
	75117	000364		
0603	75120	070034		STA TIMDV
0604	75121	002003		SZA, RSS DONE IF DIVISOR IS ZERO.
0605	75122	027127		JMP TIMP3
0606	75123	060030		LDA TIMN GET # AGAIN AND LOOP.
0607	75124	027104		JMP TIMP4
0608	75125	060432	TIMP1	LDA .+60B OUTPUT SINGLE 0.
0609	75126	016132		JSB LOUT
0610	75127	060341	TIMP3	LDA .-9 PRINT
0611	75130	067070		LDB TIM3 "MINUTES,"
0612	75131	016137		JSB LTYPR
0613*				
0614	75132	127076		JMP TIMPR, I
0615*				
0616	75133	023420	TIMXK	DEC 10000
0617	00030		TIMN	EQU LTEMP
0618	00031		TIMT	EQU LTEMP+1

0619 00033
0620 00034
0621 75134

TIMNM EQU LTEMP+3
TIMDV EQU LTEMP+4
STIM EQU *

0002* THE PROTECT COMMAND CAN BE USED BY A000 AND BY GROUP LIBRARIANS
 0003* TO RESTRICT THE USE OF PROGRAMS AND FILES BY OTHER USERS.
 0004* A PROTECTED PUBLIC OR GROUP LIBRARY PROGRAM MAY NOT BE LISTED,
 0005* SAVED, CSAVED, OR PUNCHED IN ANY WAY BY ANOTHER USER. A
 0006* PROTECTED FILE MAY NOT BE ACCESSED AT ALL. THE PROTECT
 0007* COMMAND SIMPLY SETS BIT 15 OF WORD 1 OF THE DIRECTORY ENTRY
 0008* FOR THE PROGRAM OR FILE.

```

0010 75000          ORG LIBRA

0012 75000 064273   LDB MLINK+1   GET USER'S ID
0013 75001 044341   ADB ,+?ID=?LINK
0014 75002 160001   LDA B,I
0015 75003 070030   STA LTEMP       PLACE ID INTO LTEMP
0016 75004 010602   AND B1777      CHECK
0017 75005 006400   CLB           FOR
0018 75006 100400   DIV .100      PRIVILEGED
          75007 000437
0019 75010 006003   SZB,RSS       USER
0020 75011 027030   JMP PRO1

0021*
0022 75012 060327   LDA ,=19
0023 75013 067015   LOB ++2
0024 75014 026432   JMP LIBER
0025 75015 075016   DEF ++1
0026 75016 005120   OCT 5120      LF=P
0027 75017 051111   ASC 9,RIVILEGED COMMAND
          75020 053111
          75021 046105
          75022 043505
          75023 042040
          75024 041517
          75025 046515
          75026 040516
          75027 042040

0028*
0029 75030 060520   PRO1 LDA DLTEM   SET POINTER TO PROGRAM NAME
0030 75031 070037   STA PROC
0031 75032 060347   LDA ,=3       SET UP COUNTER.
0032 75033 070036   STA PROD
0033 75034 016164   JSB LCHAR     GET FIRST CHAR.
0034 75035 027053   JMP PRO2     ERROR IF NONE.
0035 75036 001727   PRO3 ALF,ALF   SAVE CHARACTER IN
0036 75037 034037   ISZ PROC     TABLE.
0037 75040 170037   STA PROC,I
0038 75041 016164   JSB LCHAR     GET RIGHT CHAR.
0039 75042 060412   LDA ,+40B    IF END CHANGE TO BLANK
0040 75043 130037   IOR PROC,I
0041 75044 170037   STA PROC,I
0042 75045 016164   JSB LCHAR     GET NEXT CHAR.
0043 75046 060412   LDA ,+40B
0044 75047 034036   ISZ PROD     DO WE WANT IT?
0045 75050 027036   JMP PRO3     YES.
0046 75051 050412   CPA ,+40B    MUST BE A BLANK.
0047 75052 027066   JMP PRO4

```



```

0048*
0049 75053 060335 PRO2 LDA .-13
0050 75054 067056     LDB ++2
0051 75055 026432     JMP LIBER
0052 75056 075057     DEF ++1
0053 75057 005111     OCT 5111     LF=I
0054 75060 047126     ASC 6,NVALID NAME
      75061 040514
      75062 044504
      75063 020116
      75064 040515
      75065 042440

0055*
0056 75066 116005 PRO4 JSB DLOKP,I     SEARCH FOR PROG IN DIRECTORY
0057 75067 027103     JMP PRO6     FOUND.
0058*
0059 75070 060334     LDA .-14
0060 75071 067073     LDB ++2
0061 75072 026432     JMP LIBER
0062 75073 075074     DEF ++1
0063 75074 005116     OCT 5116     LF=N
0064 75075 047440     ASC 6,0 SUCH ENTRY
      75076 051525
      75077 041510
      75100 020105
      75101 047124
      75102 051131

0065*
0066 75103 064035 PRO6 LDB LTEMP+5     SET PROTECT BIT.
0067 75104 006004     INB
0068 75105 160001     LDA 1,I
0069 75106 031036 PRO7 IOR BIT15
0070 75107 170001     STA 1,I
0071 75110 060201     LDA DATIM     SET THE LAST
0072 75111 044357     ADB .+5     CHANGED DATE
0073 75112 170001     STA H,I
0074*
0075 75113 064034     LDB LTEMP+4     WRITE OUT DIRECTORY.
0076 75114 160001     LDA 1,I
0077 75115 070072     STA WORD
0078 75116 044360     ADB .+6
0079 75117 160001     LDA 1,I
0080 75120 064562     LDB LIBD
0081 75121 016231     JSB DRUML
0082 75122 002001     RSS
0083 75123 026226     JMP LLEND
0084 75124 060034     LDA LTEMP+4
0085 75125 164000     LDB A,I
0086 75126 040360     ADA .+6
0087 75127 116016     JSB SALVP,I
0088 00036     PROC EQU LTEMP+6
0089 00037     PROC EQU LTEMP+7
0090 75130     SPRO EQU *

```

0092* UNPROTECT IS IDENTICAL TO PROTECT EXCEPT THAT IT CLEARS THE
0093* PROTECT BIT INSTEAD OF SETTING IT.

0094	75000	ORG LIBRA
0095	75000 064273	LDB MLINK+1
0096	75106	ORG PR07
0097	75106 001665	ELA,CLE,ERA

0099* THE OPEN COMMAND IS A USER FUNCTION WHICH CAUSES THE SYSTEM TO
 0100* CREATE ROOM FOR A DATA FILE. THE FORMAT FOR THE COMMAND IS:

0101*

0102* OPEN - FILENAME, FILE LENGTH, RECORD SIZE

0103*

0104* THE FILENAME IS SUBJECT TO ALL THE RULES OF PROGRAM NAMES, THE
 0105* LENGTH IS A DECIMAL INTEGER FROM 1 TO 32767 INDICATING THE FILE
 0106* LENGTH IN RECORDS. RECORD SIZE IS A DECIMAL INTEGER FROM 64 TO
 0107* 256 INDICATING THE RECORD SIZE IN WORDS.

0109	75000		ORG LIBRA	
0110	75000	060273	LDA MLINK+1	GET ID AND STORE
0111	75001	040341	ADA ,+?ID-?LINK	IN LTEMP.
0112	75002	160000	LDA 0,I	
0113	75003	070030	STA LTEMP	
0114	75004	060520	LDA DLTEM	SET UP POINTER FOR
0115	75005	070042	STA OPEP	NAME,
0116	75006	060347	LDA ,+J	SET UP COUNTER,
0117	75007	070043	STA OPEC	
0118	75010	002400	CLA	SET FLAG SAYING FIRST
0119	75011	070040	STA OPEF	CHAR,
0120	75012	017041	JSB OPER	GET A CHARACTER,
0121	75013	001727	ALF,ALF	STORE IN
0122	75014	034042	ISZ OPEP	NAME AREA.
0123	75015	170042	STA OPEP,I	
0124	75016	017041	JSB OPER	GET RIGHT CHAR.
0125	75017	130042	IOR OPEP,I	MERGE IN.
0126	75020	170042	STA OPEP,I	
0127	75021	034043	ISZ OPEC	TEST FOR ANY MORE.
0128	75022	027012	JMP OPE1	
0129*				
0130	75023	017041	JSB OPER	NEXT CHARACTER MUST BE
0131	75024	050412	CPA ,+40B	BLANK.
0132	75025	027116	JMP OPE2	
0133	75026	060334	LDA ,+14	
0134	75027	067031	LDB ++2	
0135	75030	026432	JMP LIBER	
0136	75031	075032	DEF ++1	
0137	75032	005116	OCT 5116	LF=N
0138	75033	040515	ASC 6,AME	TOO LONG
	75034	042440		
	75035	052117		
	75036	047440		
	75037	046117		
	75040	047107		
0139*				
0140	75041	000000	OPER NOP	GET NEXT CHAR FOR NAME.
0141	75042	060040	LDA OPEF	TEST TO SEND BACK BLANK.
0142	75043	050412	CPA ,+40B	
0143	75044	127041	JMP OPER,I	
0144	75045	016164	OPER1 JSB LCHAR	GET NEXT CHAR.
0145	75046	026430	JMP ILFER	FAIL IF NONE.
0146	75047	064000	LDB 0	SAVE IN B.
0147	75050	010730	AND ,140	SKIP CONTRGL CHARS.

0148	75051	002002		SZA	
0149	75052	050730		CPA .140	
0150	75053	027045		JMP OPER1	
0151	75054	060040		LDA OPEF	GET 1ST CHAR, FLAG.
0152	75055	002002		SZA	TEST FOR 1ST CHAR.
0153	75056	027070		JMP OPER2	NOT,
0154	75057	054426		CPB .+54B	TEST FOR COMMA OR \$
0155	75060	026430		JMP ILFER	
0156	75061	054416		CPB .+44B	
0157	75062	027076		JMP OPE16	
0158	75063	054424		CPB .+52B	TEST FOR *
0159	75064	027076		JMP OPE16	
0160	75065	060001	OPER3	LDA 1	RETURN CHAR IN B
0161	75066	034040		ISZ OPEF	
0162	75067	127041		JMP OPER,I	
0163	75070	054426	OPER2	CPB .+54B	COMMA TEST
0164	75071	002001		RSS	
0165	75072	027065		JMP OPER3	
0166	75073	060412		LDA .+40B	
0167	75074	070040		STA OPEF	
0168	75075	127041		JMP OPER,I	
0169*					
0170	75076	060322	OPE16	LDA .+24	
0171	75077	067101		LDB .+2	
0172	75100	026432		JMP LIBER	
0173	75101	075102		DEF .+1	
0174	75102	005111		OCT 5111	LF=I
0175	75103	046114		ASC 11,LLEGAL	FIRST CHARACTER
	75104	042507			
	75105	040514			
	75106	020106			
	75107	044522			
	75110	051524			
	75111	020103			
	75112	044101			
	75113	051101			
	75114	041524			
	75115	042522			
0176*					
0177*	GET FILE LENGTH,				
0178*					
0179	75116	002400	OPE2	CLA	INITIALIZE # TO 0
0180	75117	070040		STA OPEF	
0181	75120	016164		JSB LCHAR	GET A CHAR,
0182	75121	027154		JMP OPE51	DONE
0183	75122	050426		CPA .+54B	IS IT A COMMA?
0184	75123	027136		JMP OPE50	YES, GO GET RECORD SIZE
0185	75124	040316		ADA M72B	DIGIT TEST,
0186	75125	002021		SSA,RSS	
0187	75126	026430		JMP ILFER	
0188	75127	040364		ADA .+10	
0189	75130	002020		SSA	
0190	75131	026430		JMP ILFER	
0191	75132	070043		STA OPEC	SAVE DIGIT,
0192	75133	060040		LDA OPEF	

0193	75134	017700		JSB OPE5B	
0194	75135	027117		JMP OPE2+1	
0195*					
0196*	GET RECORD SIZE				
0197*					
0198	75136	002400	OPE50	CLA	INITIALIZE SIZE TO 0
0199	75137	070042		STA OPEP	
0200	75140	016164		JSB LCHAR	GET A CHARACTER
0201	75141	027156		JMP OPE3	DONE
0202	75142	040316		ADA M720	DIGIT TEST
0203	75143	002021		SSA, RSS	
0204	75144	026430		JMP ILFER	
0205	75145	040364		ADA ,+10	
0206	75146	002020		SSA	
0207	75147	026430		JMP ILFER	
0208	75150	070043		STA OPEC	SAVE DIGIT
0209	75151	060042		LDA OPEP	BUILD
0210	75152	017700		JSB OPE5B	
0211	75153	027137		JMP OPE50+1	GET NEXT DIGIT
0212*					
0213	75154	060444	OPE51	LDA B400	DEFAULT RECORD SIZE
0214	75155	070042		STA OPEP	IS 256 WORDS
0215	75156	060040	OPE3	LDA OPEF	TEST FOR LEGAL VALUE.
0216	75157	002021		SSA, RSS	
0217	75160	002003		SZA, RSS	
0218	75161	026430		JMP ILFER	ERROR IF ZERO OR NEGATIVE
0219	75162	060042		LDA OPEP	GET RECORD SIZE
0220	75163	040610		ADA M64	
0221	75164	002020		SSA	LESS THAN 64?
0222	75165	026430		JMP ILFER	YES, AND THAT'S NOT PLAYING
0223*					BY THE RULES.
0224	75166	043757		ADA OM103	
0225	75167	002021		SSA, RSS	GREATER THAN 256?
0226	75170	026430		JMP ILFER	THAT'S EQUALLY A NO=NO
0227*					
0228	75171	016107		JSB RDIDT	GET APPROPRIATE IDT TRACK
0229	75172	044360		ADB ,+6	TEST FOR USER OUT OF DISK SPACE
0230	75173	160001		LDA 1, I	
0231	75174	003100		CMA, CLE	
0232	75175	006004		INB	
0233	75176	140001		ADA 1, I	
0234	75177	040040		ADA OPEF	
0235	75200	002041		SEZ, RSS	
0236	75201	027220		JMP OPE4	
0237*					
0238	75202	067205		LDB ,+3	
0239	75203	060327	OPE7	LDA ,+19	
0240	75204	026432		JMP LIBER	
0241	75205	075206		DEF ,+1	
0242	75206	005114		OCT 5114	LF=L
0243	75207	044502		ASC 9, I	BRARY SPACE FULL
	75210	051101			
	75211	051131			
	75212	020123			
	75213	050101			

75214 041505
 75215 020106
 75216 052514
 75217 046040

0244*

0245* SEARCH ADT FOR SPACE TO PUT THE FILE.

0246*

```

0247 75220          OPE4 EQU *
0248 75220 060342   LDA  ,=8          SET COUNT OF ADT'S TO SEARCH
0249 75221 070041   STA OPEDF
0250 75222          OPE4A EQU *
0251 75222 062010   LDA RKCYP        ADVANCE THE CURRENT
0252 75223 002004   INA              ADT TRACK POINTER
0253 75224 053766   CPA DALNA        CHECK FOR END OF TABLE
0254 75225 063765   LDA DALCA        CYCLE TO BEGINNING IF SO
0255 75226 072010   STA RKCYP
0256 75227 040362   ADA  ,+DADLN=DADLC  POINTER TO LENGTH TABLE
0257 75230 070044   STA OPELN
0258 75231 160044   LDA OPELN,I     IS THIS DISK
0259 75232 002003   SZA ,RSS        AVAILABLE?
0260 75233 027260   JMP OPE6A       NO, TRY NEXT ADT
0261 75234 070072   STA WORD        YES
0262 75235 162010   LDA RKCYP,I     READ IN
0263 75236 064566   LDB LIBDI        THE DISK ADT
0264 75237 016231   JSB DRUML        TRACK
0265 75240 027260   JMP OPE6A       DRUM ERROR: SKIP TRACK FOR NOW
0266 75241 007400   CCB             COMPUTE
0267 75242 160044   LDA OPELN,I     ENTRY
0268 75243 100400   DIV  ,+3        COUNT
0269 75245 070043   STA OPEC        AND SAVE
0270 75246 064562   LOB LIBD        => FIRST ENTRY
0271 75247 044354   ADB  ,+2        LENGTH WORD
0272 75250 160001   OPE6 LDA 1,I     TEST FOR BIG ENOUGH.
0273 75251 003100   CMA ,CLE
0274 75252 040040   ADA OPEF
0275 75253 002041   SEZ ,RSS
0276 75254 027276   JMP OPE5        IT IS.
0277 75255 044355   ADB  ,+3
0278 75256 034043   ISZ OPEC
0279 75257 027250   JMP OPE6
0280 75260          OPE6A EQU *
0281 75260 034041   ISZ OPEDF       HAVE WE TRIED ALL ADT'S?
0282 75261 027222   JMP OPE4A       NO, TRY NEXT ONE
0283 75262          OPE12 EQU *
0284 75262 060332   LDA  ,=16
0285 75263 067265   LDB  ,+2
0286 75264 026432   JMP LIBER
0287 75265 075266   DEF  ,+1
0288 75266 005123   OCT 5123        LF=8
0289 75267 054523   ASC 7, YSTEM OVERLOAD
0289 75270 052105
0289 75271 046440
0289 75272 047526
0289 75273 042522

```

	75274	046117		
	75275	040504		
0290*				
0291	75276	060040	OPE5	LDA OPEF
0292	75277	003004		CMA, INA
0293	75300	140001		ADA B, I
0294	75301	070041		STA OPEDF
0295	75302	044350		ADB -2
0296	75303	074043		STB OPEC
0297	75304	104200		DLD 1, I
	75305	100001		
0298	75306	104400		DST OPEDA
	75307	000036		
0299	75310	002400		CLA
0300	75311	070045		STA OPEDU
0301*				
0302	75312	060032		LDA LTEMP+2
0303	75313	031036		IOR BIT15
0304	75314	070032		STA LTEMP+2
0305	75315	116005		JSB DLOKP, 1
0306	75316	027734		JMP OPE8
0307*				
0308	75317	164034		LDB LTEMP+4, I
0309	75320	054714		CPB M8184
0310	75321	027750		JMP OPE98
0311*				
0312	75322	007000		CMB
0313	75323	044562		ADB LIBD
0314	75324	074050		STB MOVES
0315	75325	044366		ADB +12
0316	75326	074051		STB MOVED
0317	75327	007000		CMB
0318	75330	044402		ADB +24
0319	75331	044035		ADB LTEMP+5
0320	75332	016243		JSB MOVEB
0321*				
0322	75333	060520		LDA DLTEM
0323	75334	070050		STA MOVES
0324	75335	060035		LDA LTEMP+5
0325	75336	040366		ADA +12
0326	75337	070051		STA MOVED
0327	75340	064346		LDB -4
0328	75341	016257		JSB MOVEW
0329	75342	060042		LDA OPEP
0330	75343	170051		STA MOVED, I
0331	75344	034051		ISZ MOVED
0332	75345	016076		JSB DATE
0333	75346	170051		STA MOVED, I
0334	75347	034051		ISZ MOVED
0335	75350	060201		LDA DATIM
0336	75351	170051		STA MOVED, I
0337	75352	034051		ISZ MOVED
0338	75353	002400		CLA
0339	75354	170051		STA MOVED, I
0340	75355	034051		ISZ MOVED

SAVE
 =NUMBER
 OF SECTORS
 LEFT
 SAVE LOCATION OF
 DISC ADT ENTRY
 SAVE DISC
 ADDRESS
 CLEAR DRUM
 ADDRESS
 SET
 FILES
 BIT
 SEARCH FOR ENTRY
 ENTRY FOUND = ILLEGAL.
 IF DIRECTORY TRACK IS
 FULL, DO
 SUPERSAVE (THE SAVE OF STEEL)
 SET UP SOURCE
 FOR MOVE.
 SET UP DESTINATION
 COMPUTE LENGTH.
 MOVE 4 WORDS IN FOR
 NEW ENTRY.
 GET LOGICAL RECORD SIZE
 AND PUT IT IN DIRECTORY
 BUMP POINTER
 GET DATE
 SET IT IN LAST REFERENCE DATE
 GET HOUR OF YEAR
 SET IT IN LAST CHANGE DATE
 ZERO DRUM ADDRESS - UNSANCTIFIED

0341	75356	104200	OLD OPEDA	GET DISC ADDRESS
	75357	000036		
0342	75360	104400	DST MOVED,I	INTO DIRECTORY
	75361	100051		
0343	75362	060355	LDA .+3	INSERT FILE
0344	75363	040051	ADA MOVED	LENGTH INTO
0345	75364	064040	LDB OPEF	LAST WORD OF
0346	75365	174000	STB A,I	DIRECTORY ENTRY
0347*				
0348	75366	160034	LDA LTEMP+4,I	ADJUST DIRECTORY
0349	75367	040336	ADA .-12	LENGTH
0350	75370	170034	STA LTEMP+4,I	
0351	75371	070072	STA WORD	
0352	75372	060034	LDA LTEMP+4	WRITE DIRECTORY
0353	75373	002004	INA	BACK OUT.
0354	75374	070051	STA MOVED	
0355	75375	040357	ADA .+5	
0356	75376	160000	LDA 0,I	
0357	75377	064562	LDB LIBD	
0358	75400	074050	STB MOVES	
0359	75401	016231	JSB DRUML	
0360	75402	116017	JSB DEADP,I	DRUM ERROR, IT'S CURTAINS
0361*				
0362	75403	064346	LDB .-4	RESET
0363	75404	016257	JSB MOVEW	DIREC.
0364*				
0365	75405		OPE11 EQU *	
0366	75405	016107	JSB RDIDT	GET IDT TRACK AGAIN
0367	75406	044361	ADB .+7	
0368	75407	060040	LDA OPEF	ADJUST AMOUNT OF DISC USED.
0369	75410	140001	ADA 1,I	
0370	75411	170001	STA 1,I	
0371	75412	160075	LDA IDLCP,I	WRITE
0372	75413	064562	LDB LIBD	OUT
0373	75414	016231	JSB DRUML	IDT
0374	75415	116017	JSB DEADP,I	DRUM ERROR, BYE-BYE
0375	75416	160044	LDA OPELN,I	READ
0376	75417	070072	STA WORD	IN
0377	75420	162010	LDA RKCYP,I	DISK
0378	75421	064566	LDB LIBDI	ADT
0379	75422	016231	JSB DRUML	TRACK
0380	75423	027674	JMP OPE14	CAN'T, SO MAKE IT DISAPPEAR
0381*				
0382	75424	064041	LDB OPEDF	GET # OF SECTORS LEFT IN ADT.
0383	75425	006002	SZB	REST FOR ANY PART LEFT
0384	75426	027445	JMP OPE9	NON EMPTY ADT ENTRY.
0385*				
0386	75427	064043	LDB OPEC	SQUEEZE OUT ADT ENTRY.
0387	75430	074051	STB MOVED	
0388	75431	044355	ADB .+3	
0389	75432	074050	STB MOVES	
0390	75433	044674	ADB MLIBD	
0391	75434	044072	ADB WORD	
0392	75435	016257	JSB MOVEW	
0393*				

0394	75436	060355	LDA	.,+3	REDUCE
0395	75437	164044	LDB	OPELN,I	DISC ADT
0396	75440	044000	ADB	A	LENGTH
0397	75441	174044	STB	OPELN,I	BY 3
0398	75442	040072	ADA	WORD	ALSO REDUCE
0399	75443	070072	STA	WORD	TRANSFER LENGTH
0400	75444	027461	JMP	OPE10	
0401*					
0402	75445	104200	OPE9	DLD OPEC,I	UPDATE
	75446	100043			
0403	75447	000040	CLE		
0404	75450	044040	ADB	OPEF	DISC
0405	75451	002040	SEZ		
0406	75452	002004	INA		ADDRESS
0407	75453	104400	DST	OPEC,I	
	75454	100043			
0408	75455	064043	LDB	OPEC	SAVE
0409	75456	044354	ADB	.,+2	REMAINING
0410	75457	060041	LDA	OPEDF	BLOCKS
0411	75460	170001	STA	0,I	LENGTH
0412*					
0413	75461		OPE10	EGU *	
0414	75461	162010	LDA	RKCYP,I	WRITE
0415	75462	064562	LDB	LIBD	DISC ADT
0416	75463	016231	JSB	DRUML	BACK
0417	75464	027674	JMP	OPE14	CAN'T, SO MAKE IT DISAPPEAR
0418*					
0419	75465	067760	OPE15	LDB M40	FILL
0420	75466	074043	STB	OPEC	USER
0421	75467	064562	LDB	LIBD	AREA
0422	75470	003400	CCA		WITH
0423	75471	170001	STA	0,I	END-
0424	75472	044444	ADB	B400	OF-
0425	75473	034043	ISZ	OPEC	FILE
0426	75474	027471	JMP	.,+3	MARKS
0427*					
0428	75475	060340	LDA	.,-10	INITIALIZE WRITES-BEFORE-
0429	75476	070043	STA	OPEC	SUSPEND COUNT
0430	75477	063755	LDA	M10K	INITIALIZE
0431	75500	070215	STA	MWORD	WORD COUNT
0432*					
0433	75501	064040	OPE52	LDB OPEF	GET REMAINING RECORD COUNT
0434	75502	047760	ADB	M40	MORE THAN
0435	75503	006020	SSB		40?
0436	75504	027661	JMP	OPE13	NO, GO DO PARTIAL WRITE
0437	75505	074040	STB	OPEF	YES, UPDATE COUNT
0438	75506	063764	LDA	OPEDI	POINTER TO DISC TO DISC ADDRESS
0439	75507	064562	LDB	LIBD	CORE ADDRESS
0440	75510	114217	JSB	DISCZ,I	WRITE 40 FILE MARKS
0441	75511	027710	JMP	OPEDE	FAILURE: GO PRINT ERROR
0442	75512	104200	DLD	OPEDA	UPDATE
	75513	000036			
0443	75514	000040	CLE		
0444	75515	044422	ADB	.,+40	DISC
0445	75516	002040	SEZ		

0446	75517	002004	INA	ADDRESS
0447	75520	104400	DST OPEDA	
	75521	000036		
0448*				
0449	75522	034043	ISZ OPEC	TIME TO SESPEND?
0450	75523	027501	JMP OPE52	NO, CONTINUE
0451*				
0452*	AFTER 10 WRITES OF 40 FILE MARKS EACH, SUSPEND.			
0453*				
0454	75524	064273	LDB MLINK+1	GET POINTER TO DISC
0455	75525	044354	ADB .+?RTIM=?LINK	ADDRESS STORAGE
0456	75526	060037	LDA OPEDA+1	GET LOW PART AND
0457	75527	170001	STA B,I	STASH IN TTY TABLE
0458	75530	006004	INB	
0459	75531	060031	LDA LTEMP+1	STORE
0460	75532	170001	STA B,I	ALSO
0461	75533	006004	INB	FILE
0462	75534	074043	STB OPEC	NAME
0463	75535	104200	DLD LTEMP+2	IN TTY
	75536	000032		
0464	75537	104400	DST OPEC,I	TABLE
	75540	100043		
0465	75541	103100	CLF 0	DISABLE INTERRUPTS
0466	75542	064273	LDB MLINK+1	SET
0467	75543	044353	ADB .+?PLEV=?LINK	PRIORITY
0468	75544	060356	LDA .+4	TO
0469	75545	170001	STA B,I	4
0470	75546	044347	ADB .+?RSTR=?PLEV	SET
0471	75547	063762	LDA OP17P	RESTART
0472	75550	170001	STA B,I	ADDRESS
0473	75551	002400	CLA	BLOCK
0474	75552	170634	STA DCLC1,I	CLOCK
0475	75553	102100	STF 0	ENABLE INTERRUPTS
0476	75554	064273	LDB MLINK+1	REMOVE
0477	75555	160001	LDA B,I	USER
0478	75556	070273	STA MLINK+1	FROM 0
0479	75557	016563	JSB INSEQ	AND REINSERT HIM (OR HER)
0480	75560	127501	JMP **+1,I	GO TO
0481	75561	070362	DEF SCH1	SCHEDULER
0482*				
0483*				
0484*	OPEN WILL BE RESTARTED HERE.			
0485*				
0486	75562	064273	OPE17 LDB MLINK+1	GET
0487	75563	044341	ADB .+?ID=?LINK	USER
0488	75564	160001	LDA B,I	ID
0489	75565	070030	STA LTEMP	
0490	75566	044365	ADB .+?RTIM=?ID	GET LOW
0491	75567	160001	LDA B,I	WORD OF CURRENT
0492	75570	070037	STA OPEDA+1	DISC ADDRESS
0493	75571	006004	INB	
0494	75572	160001	LDA B,I	GET
0495	75573	070031	STA LTEMP+1	FILE
0496	75574	006004	INB	NAME
0497	75575	104200	DLD B,I	BEING

0498	75576	100001			
	75577	104400	DST	LTEMP+2	INITIALIZED
	75600	000032			
0499*					
0500	75601	116005	JSB	DLOKP, I	CHECK FOR FILE'S EXISTENCE
0501	75602	002001	RSS		IT'S THERE
0502	75603	026226	JMP	LLEND	IT'S GONE: TERMINATE
0503	75604	064035	LDB	LTEMP+5	GET
0504	75605	044354	ADB	.,+2	WORD
0505	75606	160001	LDA	B, I	2
0506	75607	002021	SSA, RSS		IS IT A FILE?
0507	75610	026226	JMP	LLEND	NO, TERMINATE
0508	75611	044360	ADB	.,+6	=> DISC ADDRESS
0509	75612	160001	LDA	B, I	SET TENTATIVE UPPER
0510	75613	070036	STA	OPEDA	WORD OF CURRENT DISC ADDRESS
0511	75614	074043	STB	OPEC	SAVE DISC
0512	75615	044355	ADB	.,+3	ADDRESS AND
0513	75616	074042	STB	OPEP	LENGTH POINTERS
0514	75617	017630	JSB	OPERC	CHECK CURRENT FOR IN RANGE
0515	75620	027625	JMP	OPE18	IT IS: PROCEED
0516	75621	034036	ISZ	OPEDA	TRY ONE HIGHER UPPER WORD
0517	75622	017630	JSB	OPERC	AGAIN CHECK FOR IN RANGE
0518	75623	002001	RSS		GOOD
0519	75624	026226	JMP	LLEND	BAD, GIVE UP
0520	75625	007004	OPE18	CMB, INB	GET REMAINING RECORD
0521	75626	074040	STB	OPEF	COUNT AND STORE
0522	75627	027465	JMP	OPE15	GO WRITE SOME FILE MARKS
0523*					
0524	75630	000000	OPERC	NOP	
0525	75631	104200		DLD OPEC, I	GET FILE START
	75632	100043			
0526	75633	017647	JSB	OPEDS	SUBSTRACT IT FROM CURRENT ADDRESS
0527	75634	002120	CLE, SSA		IN RANGE?
0528	75635	027645	JMP	OPE19	NO, GO FAIL
0529	75636	104200		DLD OPEC, I	GET FILE START
	75637	100043			
0530	75640	144042	ADB	OPEP, I	CALCULATE DISC
0531	75641	002040	SEZ		ADDRESS OF ONE
0532	75642	002004	INA		BEYOND FILE END
0533	75643	017647	JSB	OPEDS	SUBTRACT IT FROM CURRENT ADDRESS
0534	75644	002021	SSA, RSS		IN RANGE?
0535	75645	037630	OPE19	ISZ OPERC	NO, BUMP RETURN
0536	75646	127630		JMP OPERC, I	
0537*					
0538*					
0539	75647	000000	OPEDS	NOP	
0540	75650	007104		CMB, CLE, INB	NEGATE
0541	75651	003040		CMA, SEZ	A, B
0542	75652	002004		INA	CONTENTS
0543	75653	000040		CLE	
0544	75654	044037		ADB OPEDA+1	ADD
0545	75655	002040		SEZ	TO
0546	75656	002004		INA	OPEDA, OPEDA+1
0547	75657	040036		ADA OPEDA	CONTENTS
0548	75660	127647		JMP OPEDS, I	

0549*				
0550*				
0551	75661		OPE13 EQU *	
0552	75661	064040	LDB OPEF	GET RECORDS LEFT
0553	75662	006003	SZB,RSS	IF NONE,
0554	75663	026226	JMP LLEND	DON'T BOTHER
0555	75664	005727	BLF,BLF	NUMBER OF
0556	75665	007004	CMB,INB	WORDS TO
0557	75666	074215	STB MWORD	TRANSFER
0558	75667	063764	LDA OPEDI	WRITE
0559	75670	064562	LDB LIBD	OUT TO
0560	75671	114217	JSB DISCZ,I	DISC
0561	75672	027710	JMP OPEDE	UNSUCCESSFUL DISK TRANSFER
0562	75673	026226	JMP LLEND	TERMINATE
0563*				
0564	75674	002400	OPE14 CLA	
0565	75675	170044	STA OPELN,I	ZERO LENGTH
0566	75676	172010	STA RKCYP,I	ZERO DRUM ADDRESS
0567	75677	027465	JMP OPE15	
0568*				
0569	75700	000000	OPE5B NOP	
0570	75701	100200	MPY ,+10	BUILD NEW
	75702	000364		
0571	75703	000040	CLE	NUMBER.
0572	75704	040043	ADA OPEC	
0573	75705	006043	SEZ,SZB,RSS	OVERFLOW CHECK.
0574	75706	127700	JMP OPE5B,I	EXIT
0575	75707	026430	JMP ILFER	
0576	75710		OPEDE EQU *	
0577	75710	063761	LDA OM31	GET CHARACTER COUNT
0578	75711	067713	LDB ++2	AND POINTER
0579	75712	026432	JMP LIBER	
0580	75713	075714	DEF ++1	
0581	75714	005125	OCT 5125	
0582	75715	047123	ASC 15,NSUCCESSFUL; KILL AND REPEAT.	
	75716	052503		
	75717	041505		
	75720	051523		
	75721	043126		
	75722	046073		
	75723	020113		
	75724	044514		
	75725	046040		
	75726	040516		
	75727	042040		
	75730	051105		
	75731	050105		
	75732	040524		
	75733	027040		
0583*				
0584	75734		OPE8 EQU *	
0585	75734	060332	LDA ,+16	
0586	75735	067737	LDB ++2	
0587	75736	026432	JMP LIBER	
0588	75737	075740	DEF ++1	

0589	75740	005104	OCT	5104	
0590	75741	052520	ASC	7,UPPLICATE	ENTRY
	75742	046111			
	75743	041501			
	75744	052105			
	75745	020105			
	75746	047124			
	75747	051131			
0591*					
0592	75750		OPE98	EQU	*
0593	75750	063756	LDA	OM507	SET UP OVERLAY
0594	75751	070072	STA	WORD	
0595	75752	163763	LDA	OPEOV, I	
0596	75753	064504	LDB	#LIBI	
0597	75754	027773	JMP	OPEOR	
0598	75755	154000	M10K	DEC	=10240
0599	75756	177005	OM507	DEC	=507
0600	75757	177477	OM193	DEC	=193
0601	75760	177730	M40	DEC	=40
0602	75761	177741	OM31	DEC	=31
0603*					
0604	00040		OPEF	EQU	LTEMP+8
0605	00041		OPEDF	EQU	LTEMP+9
0606	00042		OPEP	EQU	LTEMP+10
0607*	OPEP IS REFERRED TO AS SAVP BY SUPERSAVE (AND SAVE)				
0608	00043		OPEC	EQU	LTEMP+11
0609	00044		OPELN	EQU	LTEMP+12
0610	00045		OPEDU	EQU	LTEMP+13
0611	00036		OPEDA	EQU	LTEMP+6
0612*					
0613	75762	075562	OP17P	DEF	OPE17
0614	75763	072044	OPEOV	DEF	SAVO+COM6-COM3
0615	75764	000036	OPEDI	DEF	OPEDA
0616	75765	000115	DALCA	DEF	DADLC
0617	75766	000125	DALNA	DEF	DADLN
0618*					
0619	75773		ORG	LIBRA+507	
0620	75773	016231	OPEOR	JSB	DRUML
0621	75774	116015		JSB	SICKP, I OUCH, DIE GRACEFULLY
0622	75775	027000		JMP	LIBRA
0623	75776	027405		JMP	OPE11 NORMAL RETURN.
0624	75777	027262		JMP	OPE12 ERROR RETURN
0625	76000		SOPE	EQU	*

0002* THE LENGTH COMMAND CAUSES THE LENGTH OF THE USER'S PROGRAM TO
 0003* BE PRINTED ON THE USER'S CONSOLE.

```

0005 75000          ORG LIBRA
0006 75000 016047   JSB RDPRG      READ IN USER PROGRAM.
0007 75001 064273   LDB MLINK+1
0008 75002 044340   ADB ,+?PRG=?LINK
0009 75003 160001   LDA 1,I        GET POINTER TO END OF
0010 75004 070030   STA LTEMP     PROGRAM.
0011 75005 050702   CPA PBUFF     IF NULL PROGRAM GO TO PRINTOUT
0012 75006 027016   JMP LEN1     SECTION.
0013 75007 044347   ADB ,+?FLAG=?PROG
0014 75010 160001   LDA 1,I        TEST FOR COMPILED.
0015 75011 010364   AND CFLAG
0016 75012 002003   SZA,RSS
0017 75013 027016   JMP LEN1     USER NOT COMPILED.
0018 75014 061575   LDA SYMTB     USE SOURCE PROGRAM POINTER
0019 75015 002001   RSS
0020 75016 060030   LEN1 LDA LTEMP
0021 75017 003000   CMA          COMPUTE LENGTH IN WORDS.
0022 75020 041577   ADA SPROG
0023 75021 003000   CMA
0024 75022 002020   SSA          IF NEGATIVE,
0025 75023 002400   CLA          SET TO ZERO
0026 75024 070030   STA LTEMP
0027*
0028 75025 060364   LDA ,+12B    OUTPUT LINE FEED.
0029 75026 016132   JSB LOUT
0030 75027 060350   LDA ,=2     SET COUNTER.
0031 75030 070031   STA LTEMP+1
0032 75031 060030   LDA LTEMP    GET FIRST 2 DIGITS IN A.
0033 75032 006400   CLB        LAST 2 IN B.
0034 75033 100400   DIV .100
          75034 000437
0035 75035 074030   STB LTEMP
0036 75036 006400   LEN2 CLB
0037 75037 100400   DIV ,+10    GET 2 DIGITS.
          75040 000364
0038 75041 074032   STB LTEMP+2 SAVE 2ND.
0039 75042 040432   ADA ,+60B
0040 75043 016132   JSB LOUT    PRINT 1ST
0041 75044 060032   LDA LTEMP+2
0042 75045 040432   ADA ,+60B    PRINT
0043 75046 016132   JSB LOUT    2ND.
0044 75047 060030   LDA LTEMP    GET 2ND PAIR.
0045 75050 034031   ISZ LTEMP+1 TEST FOR DONE.
0046 75051 027036   JMP LEN2
0047 75052 060344   LDA ,=6     PRINT " WORDS".
0048 75053 067055   LDB ++2
0049 75054 026432   JMP LIBER
0050 75055 075056   DEF ++1
0051 75056 020127   ASC 3, WORDS
          75057 047522
          75060 042123
0052 75061          SLEN EQU *
```

0054* THE ECHO COMMAND IS USED TO TELL THE SYSTEM WHETHER A TELETYPE
 0055* IS FULL DUPLEX OR HALF DUPLEX. TYPING
 0056* ECHO-OFF SAYS HALF DUPLEX.
 0057* AND
 0058* ECHO-ON SAYS FULL DUPLEX.

0060	75000		ORG	LIBRA	
0061	75000	016164	JSB	LCHAR	TEST FOR FIRST CHARACTER O.
0062	75001	026430	JMP	ILFER	
0063	75002	053040	CPA	ECHO	
0064	75003	002001	RSS		
0065	75004	026430	JMP	ILFER	FAIL.
0066	75005	016164	JSB	LCHAR	GET NEXT CHARACTER.
0067	75006	026430	JMP	ILFER	FAIL IF NONE.
0068	75007	053036	CPA	ECHN	TEST FOR N.
0069	75010	027023	JMP	ECH1	
0070	75011	053037	CPA	ECHF	TEST FOR F.
0071	75012	002001	RSS		
0072	75013	026430	JMP	ILFER	FAIL IF NOT.
0073	75014	016164	JSB	LCHAR	TEST FOR F.
0074	75015	026430	JMP	ILFER	
0075	75016	053037	CPA	ECHF	
0076	75017	002001	RSS		
0077	75020	026430	JMP	ILFER	
0078	75021	060235	LDA	ECF	SET ECHO OFF
0079	75022	002001	RSS		
0080	75023	060234	ECH1 LDA	ECO	SET ECHO ON
0081	75024	070030	STA	LTEMP	
0082	75025	016164	JSB	LCHAR	TEST FOR CR.
0083	75026	002001	RSS		
0084	75027	026430	JMP	ILFER	
0085*					
0086	75030	064273	LDB	M LINK+1	
0087	75031	044336	ADB	.+?TNUM-?LINK	
0088	75032	160001	LDA	1, I	SEND
0089	75033	030030	IOR	LTEMP	ECHO
0090	75034	114500	JSB	S148C, I	TO 2114
0091	75035	026226	JMP	LLEND	
0092*					
0093	75036	000116	ECHN	OCT	116
0094	75037	000106	ECHF	OCT	106
0095	75040	000117	ECHO	OCT	117
0096	75041		SECH	EQU	*

0098*
 0099* THE MESSAGE COMMAND IS USED TO SEND A MESSAGE TO
 0100* THE SYSTEM CONSOLE. THE PORT NUMBER OF THE REQUESTING
 0101* USER IS ALSO OUTPUT. IF THE MESSAGE QUEUE IS FULL AT
 0102* THE TIME OF THE REQUEST, THEN THE USER IS INFORMED
 0103* AND HIS MESSAGE IS IGNORED. IF NOT, IT IS PLACED ON
 0104* THE QUEUE. A MESSAGE MORE THAN 68 CHARACTERS LONG WILL
 0105* BE TRUNCATED. EACH MESSAGE FITS IN A 39 WORD BUFFER
 0106* WHOSE FORMAT IS:

0107*
 0108* <LENGTH><CRLF><PORT>< ><MESSAGE><CRLF>
 0109*

0110	75000	ORG LIBRA	
0111	75000	LDA MSGCT	IS THE MESSAGE QUEUE
0112	75001	ADA ,=2	ALREADY FULL?
0113	75002	SSA,RSS	
0114	75003	JMP MESS1	YES, TELL USER
0115	75004	LDA MSQP3	> NEXT AVAILABLE BUFFER
0116	75005	INA	PUT CR LF INTO
0117	75006	LDB CRLF	THE MESSAGE BUFFER
0118	75007	STB A,I	
0119	75010	INA	
0120	75011	STA MSQP2	SET POINTER
0121	75012	LDA MLINK+1	GET THE USER NUMBER
0122	75013	ADA ,+?TNUM-?LINK	
0123	75014	LDA A,I	INTO THE A REGISTER
0124	75015	ALF,ALF	
0125	75016	CLB	SET UP FOR AND
0126	75017	DIV ,+10	DIVIDE BY TEN
	75020		
0127	75021	ALF,ALF	CONVERT TO ASCII
0128	75022	IOR B	
0129	75023	IOR ASC00	
0130	75024	STA MSQP2,I	STORE INTO BUFFER
0131	75025	ISZ MSQP2	ADVANCE POINTER
0132	75026	LDA ASC00	GET TWO BLANKS
0133	75027	STA MSQP2,I	AND PLACE IN THE BUFFER
0134	75030	LDB MSQP2	TURN BUFFER POINTER
0135	75031	INB	
0136	75032	RBL	INTO
0137	75033	STB MSQP2	A CHARACTER POINTER
0138	75034	LDA ,+6	
0139	75035	STA MSSCT	SET CHARACTER COUNT
0140	75036	CLA	
0141	75037	STA LCHR2	PREVENT BLANK SUPPRESSION
0142	75040	JSB LCHAR	GET A CHARACTER
0143	75041	JMP MESER	EMPTY MESSAGE IS AN ERROR
0144	75042	MESS2 EQU *	
0145	75042	LDB ,.74	IS THE MESSAGE TOO LONG?
0146	75043	CPB MSSCT	
0147	75044	JMP MESS4	YES, TRUNCATE HERE
0148	75045	JSB MESCH	STORE CHARACTER INTO BUFFER
0149	75046	JSB LCHAR	GET ANOTHER CHARACTER
0150	75047	JMP MESS4	CR SEZ END OF MESSAGE
0151	75050	JMP MESS2	NO, PUT THIS CHARACTER INTO BUFF


```

0152*
0153 75051          MESS4 EQU *
0154 75051 060364   LDA ,+120      LF
0155 75052 017104   JSB MESSCH
0156 75053 063120   LDA MSSCT      SET CHARACTER COUNT
0157 75054 170310   STA MSQP3,I    INTO BUFFER
0158 75055 067117   LDB MESSWK     RESTORE LCHAR
0159 75056 076202   STB LCHR2
0160 75057 034300   ISZ MSQCT     INCREMENT THE MESSAGE COUNTER
0161 75060 064310   LDB MSQP3     ADVANCE POINTER
0162 75061 044421   ADB ,+MESLN   FOR
0163 75062 054311   CPB MSGND     THE
0164 75063 064312   LDB MSQMG     NEXT
0165 75064 074310   STB MSQP3     MESSAGE
0166 75065 026226   JMP LLEND     EXIT

```

```

0167*
0168 75066          MESER EQU *
0169 75066 067117   LDB MESSWK     FIX LCHAR AND
0170 75067 076202   STB LCHR2
0171 75070 026430   JMP ILFER     GIVE ERROR EXIT

```

```

0172*
0173 75071          MESS1 EQU *
0174 75071 060334   LDA , -14
0175 75072 067074   LDB ++2
0176 75073 026432   JMP LIBER
0177*
0178 75074 075075   DEF ++1
0179 75075 005103   OCT 5103
0180 75076 047516   ASC 6,ONSOLE BUSY
      75077 051517
      75100 046105
      75101 020102
      75102 052523
      75103 054440

```

0181* THIS ROUTINE PUTS INDIVIDUAL CHARACTERS INTO THE BUFFER

```

0182*
0183*
0184 75104 000000   MESSCH NOP
0185 75105 067121   LDB MSQP2     LOAD THE BUFFER POINTER
0186 75106 004065   CLE,ERB      TURN INTO WORD POINTER
0187 75107 002041   SEZ,RSB      SKIP IF LOWER CHARACTER
0188 75110 001727   ALF,ALF     CHARACTER TO LEFT
0189 75111 002040   SEZ          SKIP IF UPPER CHARACTER
0190 75112 130001   IOR B,I      OR IN UPPER CHARACTER
0191 75113 170001   STA B,I      STORE CHARACTER (S)
0192 75114 037121   ISZ MSQP2    ADVANCE CHARACTER POINTER
0193 75115 037120   ISZ MSSCT    INCREMENT COUNT
0194 75116 127104   JMP MESSCH,I RETURN

```

```

0195*
0196 75117 026170   MESSWK JMP LCHR1
0197 75120 000000   MSSCT BSS 1
0198 75121 000000   MSQP2 BSS 1
0199 75122 000112   ,.74 DEC 74
0200 75123          SMES EQU *

```

0202* THE LPRINTER COMMAND IS USED TO REQUEST THE USE OF THE LINE
 0203* PRINTER. THE FORMAT IS:
 0204* LPRINTER=(CHARACTER STRING)
 0205*

0207	75000		ORG LIBRA	
0208	75000	060273	LDA MLINK+1	GET TTY# ADDRESS
0209	75001	040336	ADA ,+?TNUM=?LINK	
0210	75002	070030	STA PRITY	SAVE IT
0211	75003	060255	LDA PRIST	GET LP INDICATOR
0212	75004	002003	SZA,RSS	LP BUSY?
0213	75005	027013	JMP LPR1	NO
0214	75006	050030	CPA PRITY	YES = DOES USER
0215	75007	002001	RSS	HAVE LP?
0216	75010	027031	JMP LPR2	NO
0217	75011	070256	STA LFLAG	YES = SET LPR COMMAND FLAG
0218	75012	026226	JMP LLEND	TERMINATE
0219*				
0220	75013	160030	LPR1 LDA PRITY,I	GET TTY#
0221	75014	030246	IOR LPR	ADD OPCODE
0222	75015	114500	JSB S14SC,I	TELL I/O PROCESSOR
0223	75016	102311	SFS CH2	AND WAIT FOR
0224	75017	027016	JMP *-1	RESPONSE
0225	75020	102511	LIA CH2	GET RESPONSE
0226	75021	002003	SZA,RSS	DID USER GET LP?
0227	75022	027034	JMP LPR3	NO = NOT AVAILABLE
0228	75023	002020	SSA	
0229	75024	026430	JMP ILFER	NO = HEADING TOO LONG
0230	75025	060030	LDA PRITY	YES = GET TTY# ADDRESS
0231	75026	070255	STA PRIST	AND SET LP INDICATOR
0232	75027	070256	STA LFLAG	SET LPR COMMAND FLAG
0233	75030	026226	JMP LLEND	TERMINATE
0234	75031	060341	LPR2 LDA ,=9	LP BUSY
0235	75032	067037	LDB LPM1	
0236	75033	026432	JMP LIBER	
0237	75034	060327	LPR3 LDA ,=19	LP NOT AVAILABLE
0238	75035	067045	LDB LPM2	
0239	75036	026432	JMP LIBER	
0240*				
0241			SUP	
0242	75037	075040	LPM1 DEF ++1	
0243	75040	005114	OCT 5114	
0244	75041	050040	ASC 3,P BUSY	
0245	75044	006400	OCT 6400	
0246	75045	075046	LPM2 DEF ++1	
0247	75046	005114	OCT 5114	
0248	75047	050040	ASC 8,P NOT AVAILABLE	
0249	75057	006400	OCT 6400	
0250			UNS	
0251	00030		PRITY EQU LTEMP	
0252	75060		SLPR EQU *	

0254* THIS COMMAND GIVES A PRINT OUT OF THE BAUD RATE &
 0255* CHAR. SIZE FOR WHICH THE PORT IS CONFIGURED.

0256*
 0257* THE DATA PRINTED IS:

0258* PORT NR.
 0259* BAUD RATE
 0260* CHAR. SIZE

0261*
 0262* FORMAT:

0263*
 0264* PORT=PORT#(,PORT),.....) CR

0265* OR
 0266* PORT=ALL

0267*			
0268	75000		ORG LIBRA
0269	75000	064273	LDB MLINK+1
0270	75001	044341	ADB .+7ID=?LINK
0271	75002	160001	LDA B,I GET ID.
0272	75003	050612	CPA A000 A0007
0273	75004	027023	JMP UPO0 YES.
0274	75005	060327	LDA .-19 NO. NOT ALLOWED!
0275	75006	067010	LDB ++2
0276	75007	026432	JMP LIBER
0277	75010	075011	DEF ++1
0278	75011	005120	OCT 5120
0279	75012	051111	ASC 9,RIVILEGED COMMAND

75013 053111
 75014 046105
 75015 043505
 75016 042040
 75017 041517
 75020 046515
 75021 040516
 75022 042040

0280	75023		UPO0 EQU *	
0281	75023	002400	CLA	
0282	75024	070030	STA LTEMP	
0283	75025	070031	STA LTEMP+1	
0284	75026	070032	STA LTEMP+2	
0285	75027	070034	STA UPOC1	
0286	75030	060177	LDA NPORT	SET UP LIMIT.
0287	75031	070033	STA UPOCN	
0288	75032	016164	JSB LCHAR	GET CHARACTER.
0289	75033	026430	JMP ILFER	CR, ERROR.
0290	75034	053422	CPA UPO.A	NO CR. "A"?
0291	75035	027062	JMP UPO4	YES.
0292	75036		Up015 EQU *	
0293	75036	017320	JSB UPOD6	NO, DIGIT?
0294	75037		UPU1 EQU *	
0295	75037	017330	JSB UPOSP	YES, COMPUTE PORT NR.
0296	75040	016164	JSB LCHAR	GET CHARACTER.
0297	75041	027045	JMP UPO3	CR.
0298	75042	050426	CPA .+540	NO CR. COMMA?
0299	75043	002001	RSS	YES.
0300	75044	027036	JMP UPO15	NO.

0301	75045		UP03	EQU *	
0302	75045	060034		LDA UPOC1	CHECK LEGALITY.
0303	75046	040033		ADA UPOCN	
0304	75047	002021		SSA,RSS	> LIMIT?
0305	75050	026430		JMP ILFER	YES, ERROR.
0306	75051	017256		JSB UPOIN	NO. SET INDICATOR.
0307*					
0308*					
0309	75052	060265		LDA LCHCR	PICK UP LAST CHAR.
0310	75053	050367		CPA ,+15B	WAS IT A CR?
0311	75054	027110		JMP UPO5	YES, GIVE THE INFORMATION.
0312	75055	002400		CLA	
0313	75056	070034		STA UPOC1	
0314	75057	016164		JSB LCHAR	NO. GET NEXT CHARACTER.
0315	75060	027110		JMP UPO5	CR. GIVE THE INFORMATION.
0316	75061	027036		JMP UPO15	NO CR.
0317*					
0318*					
0319	75062		UP04	EQU *	COMMAND FOR ALL PORTS GIVEN.
0320	75062	016164		JSB LCHAR	GET NEXT CHAR
0321	75063	026430		JMP ILFER	CR. ERROR.
0322	75064	053423		CPA UPO.L	NO CR, ="L"?
0323	75065	002001		RSS	
0324	75066	026430		JMP ILFER	NO. ERROR.
0325	75067	016164		JSB LCHAR	YES, GET NEXT CHAR.
0326	75070	026430		JMP ILFER	CR. ERROR!
0327	75071	053423		CPA UPO.L	"L"?
0328	75072	002001		RSS	
0329	75073	026430		JMP ILFER	NO. ERROR.
0330	75074	016164		JSB LCHAR	YES, GET NEXT CHAR.
0331	75075	002001		RSS	
0332	75076	026430		JMP ILFER	NO CR, ERROR.
0333	75077	002400		CLA	CR.
0334	75100		UP018	EQU *	
0335	75100	070034		STA UPOC1	
0336	75101	040033		ADA UPOCN	
0337	75102	002021		SSA,RSS	>LIMIT?
0338	75103	027110		JMP UPO5	YES.
0339	75104	017256		JSB UPOIN	NO. SET INDICATOR.
0340	75105	060034		LDA UPOC1	BUMP PORT NR.
0341	75106	002004		INA	
0342	75107	027100		JMP UPO18	
0343*					GIVE THE INFORMATION.
0344	75110		UP05	EQU *	PRINT HEADING.
0345	75110	017340		JSB UPOPR	
0346	75111	005040		OCT 5040	LF=SPACE
0347	75112	050117		ASC 4,PORT	
		75113			
		75114			
		75115			
0348	75116	041101		ASC 6,BAUD RATE	
		75117			
		75120			
		75121			
		75122			

0349	75123	020040			
	75124	041510		ASC 5,CHAR.	SIZE
	75125	040522			
	75126	027040			
	75127	051511			
	75130	055105			
0350	75131	006412		OCT 6412	CR=LF
0351	75132	000000		OCT 0	
0352	75133	017400		JSB UPTSV	SAVE VARIABLES,
0353	75134	116023		JSB SCHOU,I	SUSPEND.
0354	75135	017411		JSB UPTRV	RETRIEVE VARIABLES.
0355	75136		UP06	EQU *	
0356	75136	060032		LDA LTEMP+2	
0357	75137	050372		CPA .+16	DONE?
0358	75140	027157		JMP UP014	YES,
0359	75141	006400		CLB	CLEAR (B) AND GET
0360	75142	060030		LDA LTEMP	LOWER INDICATOR,
0361	75143	000010		SLA	BIT SET?
0362	75144	006004		INB	YES, BUMP (B).
0363	75145	001300		RAR	ROTATE RIGHT,
0364	75146	070030		STA LTEMP	RESTORE INDICATOR,
0365	75147	006003		SZB,RSS	IF BIT=0, JUMP,
0366	75150	027155		JMP UP016	OTHERWISE SET UP BUFFER
0367	75151	017200		JSB UP07	AND PRINT.
0368	75152	017400		JSB UPTSV	SAVE VARIABLES,
0369	75153	116023		JSB SCHOU,I	SUSPEND.
0370	75154	017411		JSB UPTRV	RETRIEVE VARIABLES.
0371	75155		UP016	EQU *	
0372	75155	034032		ISZ LTEMP+2	BUMP COUNTER.
0373	75156	027136		JMP UP06	GO BACK.
0374*					
0375	75157		UP014	EQU *	
0376	75157	060032		LDA LTEMP+2	
0377	75160	050412		CPA .+32	DONE?
0378	75161	026226		JMP LLEND	YES, GET OUT.
0379	75162	006400		CLB	CLEAR (B) AND GET
0380	75163	060031		LDA LTEMP+1	UPPER INDICATOR,
0381	75164	000010		SLA	BIT SET?
0382	75165	006004		INB	YES, BUMP (B).
0383	75166	001300		RAR	ROTATE RIGHT.
0384	75167	070031		STA LTEMP+1	RESTORE INDICATOR.
0385	75170	006003		SZB,RSS	IF BIT=0, JUMP,
0386	75171	027176		JMP UP017	OTHERWISE SET UP BUFFER
0387	75172	017200		JSB UP07	AND PRINT.
0388	75173	017400		JSB UPTSV	SAVE VARIABLES,
0389	75174	116023		JSB SCHOU,I	SUSPEND.
0390	75175	017411		JSB UPTRV	RETRIEVE VARIABLES.
0391	75176		UP017	EQU *	
0392	75176	034032		ISZ LTEMP+2	BUMP COUNTER.
0393	75177	027157		JMP UP014	GO BACK.
0394*					
0395*					
0396	75200	000000	UP07	NOP	
0397	75201	017340		JSB UP0PR	BLANK-BLANK
0398	75202	020040		OCT 20040	

0399	75203	000000	OCT 0	
0400	75204	060412	LDA ,+40B	BLANK
0401	75205	016132	JSB LOUT	
0402	75206	060032	LDA LTEMP+2	GET PORT NR.
0403	75207	017354	JSB UPD2D	OUTPUT PORT NR.
0404	75210		UPO9 EQU *	
0405	75210	017340	JSB UPOPR	PRINT 6 BLANKS.
0406	75211	020040	ASC 3,	
	75212	020040		
	75213	020040		
0407	75214	000000	OCT 0	
0408	75215	060032	LDA LTEMP+2	GET PORT NR.
0409	75216	001727	ALF,ALF	ROTATE.
0410	75217	032775	IOR WSP	MERGE WITH OPCODE.
0411	75220	114500	JSB S14SC,I	ASK FOR BAUD RATE.
0412	75221	102311	SFS CH2	
0413	75222	027221	JMP *-1	
0414	75223	102511	LIA CH2	GET BAUD RATE.
0415	75224	017371	JSB UPD3D	OUTPUT BAUD RATE.
0416	75225	017340	JSB UPOPR	OUTPUT 10 BLANKS.
0417	75226	020040	ASC 5,	
	75227	020040		
	75230	020040		
	75231	020040		
	75232	020040		
0418	75233	000000	OCT 0	
0419	75234	060032	LDA LTEMP+2	GET PORT NR.
0420	75235	001727	ALF,ALF	ROTATE.
0421	75236	030252	IOR WCS	
0422	75237	114500	JSB S14SC,I	ASK FOR CHAR SIZE.
0423	75240	102311	SFS CH2	
0424	75241	027240	JMP *-1	
0425	75242	102511	LIA CH2	GET CHAR.SIZE.
0426	75243	002003	SZA,RSS	=0?
0427	75244	027247	JMP UPO12	YES.
0428	75245	017363	JSB UPDDG	NO, PRINT IT.
0429	75246	027251	JMP UPO13	
0430	75247		UPO12 EQU *	
0431	75247	060424	LDA ,+42	PRINT "*",
0432	75250	016132	JSB LOUT	
0433	75251		UPO13 EQU *	
0434	75251	060367	LDA ,+15B	CR.
0435	75252	016132	JSB LOUT	
0436	75253	060364	LDA ,+12B	LF.
0437	75254	016132	JSB LOUT	
0438	75255	127200	JMP UPO7,I	RETURN.
0439*				
0440*				
0441	75256	000000	UPOIN NOP	SETS PORT BIT IN INDICATOR.
0442	75257	060034	LDA UPOC1	A=PORT#
0443	75260	064000	LDB A	B=PORT#
0444	75261	005323	RBR,RBR	ROTATE BIT#4 INTO BIT#0.
0445	75262	005323	RBR,RBR	
0446	75263	004010	SLB	PORT#> 15?
0447	75264	040332	ADA ,=-16	YES, MAKE PORT# FROM 0-15.

0448	75265	003004		CMA, INA	NO, NEGATE,
0449	75266	070036		STA UPCCN	SET UP COUNTER.
0450	75267	060030		LDA LTEMP	A=LOWER INDIVATOR,
0451	75270	004010		SLB	UPPER OR LOWER PORT?
0452	75271	060031		LDA LTEMP+1	UPPER,
0453	75272	064036		LDB UPCCN	B=COUNTER.
0454	75273		UPON1	EQU *	
0455	75273	006003		SZB, RSS	DONE?
0456	75274	027300		JMP UPON2	YES.
0457	75275	001300		RAR	NO, ROTATE RIGHT.
0458	75276	006004		INB	BUMP COUNTER.
0459	75277	027273		JMP UPON1	GO BACK.
0460	75300		UPON2	EQU *	
0461	75300	030353		IOR .+1	SET BIT,
0462*					
0463	75301	064036		LDB UPCCN	B=COUNTER.
0464	75302		UPON3	EQU *	
0465	75302	006003		SZB, RSS	DONE?
0466	75303	027307		JMP UPON4	YES.
0467	75304	001200		RAL	NO, ROTATE LEFT.
0468	75305	006004		INB	BUMP COUNTER.
0469	75306	027302		JMP UPON3	GO BACK.
0470	75307		UPON4	EQU *	
0471	75307	064034		LDB UPOC1	
0472	75310	005323		RBR, RBR	
0473	75311	005323		RBR, RBR	
0474	75312	004010		SLB	UPPER OR LOWER PORT?
0475	75313	027316		JMP UPON5	
0476	75314	070030		STA LTEMP	LOWER, STORE IN LOWER INDIC,
0477	75315	002001		RSS	
0478	75316		UPON5	EQU *	
0479	75316	070031		STA LTEMP+1	UPPER, STORE IN UPPER INDIC.
0480	75317	127256		JMP UPOIN, I	EXIT,
0481*					
0482*					
0483	75320	000000	UPODG	NOP	
0484	75321	040316		ADA M720	DIGIT?
0485	75322	002021		SSA, RSS	
0486	75323	026430		JMP ILFER	NO, ERROR,
0487	75324	040364		ADA .+10	MAY BE.
0488	75325	002020		SSA	
0489	75326	026430		JMP ILFER	ERROR,
0490	75327	127320		JMP UPODG, I	RETURN.
0491*					
0492*					
0493	75330	000000	UPOSP	NOP	
0494	75331	070035		STA UPOC2	SAVE (A).
0495	75332	060034		LDA UPOC1	UPDATE
0496	75333	100200		MPY .+10	
	75334	000364			
0497	75335	040035		ADA UPOC2	PORT
0498	75336	070034		STA UPOC1	NUMBER.
0499	75337	127330		JMP UPOSP, I	
0500*					
0501*	UOPR OUTPUTS A STRING.				

```

0502*
0503 75340 000000 UPOPR NOP
0504 75341 163340 LDA UPOPR,I
0505 75342 002003 SZA,RSS END OF STRING?
0506 75343 127340 JMP UPOPR,I YES, RETURN,
0507 75344 001727 ALF,ALF NO. OUTPUT
0508 75345 010443 AND B377 LEFT
0509 75346 016132 JSB LOUT CHARACTER,
0510 75347 163340 LDA UPOPR,I OUTPUT
0511 75350 010443 AND B377 RIGHT
0512 75351 016132 JSB LOUT CHARACTER,
0513 75352 037340 ISZ UPOPR GET NEXT WORD.
0514 75353 027341 JMP UPOPR+1
0515*
0516* UPD2D PRINTS A 2-DIGIT NR.
0517*
0518 75354 000000 UPD2D NOP
0519 75355 006400 CLB
0520 75356 100400 DIV .+10
      75357 000364
0521 75360 017363 JSB UPDDG
0522 75361 017363 JSB UPDDG
0523 75362 127354 JMP UPD2D,I
0524*
0525* UPDDG PRINTS A DIGIT.
0526*
0527 75363 000000 UPDDG NOP
0528 75364 074040 STB LTEMP+8
0529 75365 040432 ADA .+608
0530 75366 016132 JSB LOUT
0531 75367 060040 LDA LTEMP+8
0532 75370 127363 JMP UPDDG,I
0533*
0534*
0535* UPD3D OUTPUTS A 3-DIGIT NUMBER.
0536*
0537 75371 000000 UPD3D NOP
0538 75372 006400 CLB
0539 75373 100400 DIV .100
      75374 000437
0540 75375 017363 JSB UPDDG OUTPUT FIRST DIGIT.
0541 75376 017354 JSB UPD2D OUTPUT LAST TWO.
0542 75377 127371 JMP UPD3D,I
0543*
0544*
0545* UPTSV SAVES VARIABLES.
0546*
0547 75400 000000 UPTSV NOP
0548 75401 064273 LDB MLINK+1
0549 75402 044355 ADB .+?TEMP-?LINK
0550 75403 074051 STB MOVED
0551 75404 064520 LDB DLTEM
0552 75405 074050 STB MOVES
0553 75406 064347 LDB .-3
0554 75407 016257 JSB MOVEW

```



```

0555 75410 127400      JMP UPTSV,I
0556*
0557*  UPTRV RESTORES VARIABLES.
0558*
0559 75411 000000      UPTRV NOP
0560 75412 064273      LDB MLINK+1
0561 75413 044355      ADB ,+?TEMP-?LINK
0562 75414 074050      STB MOVES
0563 75415 064520      LDB DLTEM
0564 75416 074051      STB MOVED
0565 75417 064347      LDB ,=3
0566 75420 016257      JSB MOVEW
0567 75421 127411      JMP UPTRV,I
0568*
0569*
0570*
0571 75422 000101      UPO,A OCT 101      =A.
0572 75423 000114      UPO,L OCT 114      =L.
0573 00033      UPOCN EQU LTEMP+3
0574 00034      UPOC1 EQU LTEMP+4
0575 00035      UPOC2 EQU LTEMP+5
0576 00036      UPCCN EQU LTEMP+6
0577 75424      SPORS EQU *

```

0579* THE REPORT COMMAND CAUSES IDT INFO TO BE LISTED ON THE SYSTEM
 0580* TELETYPE. EACH USER ID IS LISTED, ALONG WITH THE DISC AND TIME
 0581* USED TO DATE. DISC STORAGE IS LISTED IN WORDS, AND TIME IS LISTED
 0582* IN MINUTES.

0584	75000		ORG LIBRA	
0585	75000	002404	CLA,INA	START WITH ID OF 1 = 1
0586	75001	070052	STA ID	IN CASE WE DON'T GO TO GETID
0587	75002	114572	JSB T35CH,I	SEE WHAT FIRST CHARACTER IS
0588	75003	027011	JMP REPNI	CR = - START AT BEGINNING
0589	75004	003400	CCA	A ← -1
0590	75005	040054	ADA T35CP	MOVE BACK BUFFER POINTER
0591	75006	070054	STA T35CP	
0592	75007	016315	JSB GETID	GET STARTING ID CODE
0593	75010	026275	JMP LFRER	SHOULD END WITH CR
0594	75011		REPNI EQU *	
0595	75011	060052	LDA ID	SAVE ID
0596	75012	072654	STA REPLN	IN BUFFER
0597	75013	116021	JSB HDBFA,I	PRINY HEADING
0598	75014	016213	JSB T35SP	AND SUSPEND
0599*				
0600	75015	062654	LDA REPLN	RESTORE
0601	75016	070052	STA ID	ID
0602	75017	060305	LDA T35B1	TO PRINT
0603	75020	070051	STA MOVED	BUFFER.
0604	75021	063267	LDA REPHD	
0605	75022	070050	STA MOVES	
0606	75023	067333	LDB REP29	
0607	75024	016257	JSB MOVEW	
0608	75025	016370	JSB GTIL	FIND WHAT TRACK IT'S ON
0609	75026	060076	LDA IDLNP	GET POINTER TO LENGTH WORD
0610	75027		REPAB EQU *	
0611	75027	072653	STA REPPT	SAVE LIVE TABLE ENTRY
0612	75030	164000	LDB A,I	GET THIS TRACKS LENGTH
0613	75031	006002	SZB	SKIP IF TRACK EMPTY
0614	75032	027037	JMP REPAF	GOOD TRACK, GO
0615	75033		REPSG EQU *	
0616	75033	053325	CPA RIDCL	LAST ID TRACK?
0617	75034	027072	JMP REPS	YES, EMPTY ID TABLE
0618	75035	040355	ADA ,+3	ADVANCE TO NEXT ENTRY
0619	75036	027027	JMP REPAB	
0620	75037		REPAF EQU *	
0621	75037	074072	STB WORD	SAVE ACTUAL LENGTH
0622	75040	062653	LDA REPPT	
0623	75041	040351	ADA ,=1	
0624	75042	160000	LDA A,I	GET DRUM ADDRESS
0625	75043	064566	LDB LIBDI	
0626	75044	016231	JSB DRUML	READ IT IN
0627	75045	116015	JSB SICKP,I	CAN'T, DIE GRACEFULLY
0628	75046	064072	LDB WORD	
0629	75047	007004	CMB,INB	
0630	75050	044562	ADB LIBD	MAKE POINTER TO LAST ENTRY+1
0631	75051	074030	STB REPBF	
0632	75052	064562	LDB LIBD	

0633	75053		REPSC EQU *	
0634	75053	062663	LDA REPPT	
0635	75054	054030	CPB REPBF	CHECK FOR END
0636	75055	027033	JMP REPSG	NOT ON THIS TRACK
0637	75056	160001	LDA B,I	GET THIS ID
0638	75057	003000	CMA	
0639	75060	040052	ADA ID	ARE WE PAST YET
0640	75061	002020	SSA	
0641	75062	027065	JMP REPSE	YES, THIS IS WHERE WE START
0642	75063	044362	ADB .+8	MOVE UP TO NEXT ENTRY
0643	75064	027053	JMP REPSC	
0644	75065		REPSE EQU *	
0645	75065	044674	ADB MLIBD	MAKE POINTER FOR LATER
0646	75066	044072	ADB WORD	
0647	75067	076654	STB REPLN	SET COUNT ON THIS TRACK
0648	75070	063334	LDA REP57	GET CHARACTER COUNT
0649	75071	027075	JMP REP1	
0650	75072		REPS EQU *	
0651	75072	063334	LDA REP57	WE WILL PRINT 57 CHARACTERS.
0652	75073	064305	REP2 LDB T35B1	OTHERWISE, JUST PRINT THE
0653	75074	026271	JMP LEND+2	HEADING AND TERMINATE.
0654*				
0655	75075	064305	REP1 LDB T35B1	PRINT AND
0656	75076	016213	JSB T35SP	SUSPEND.
0657*				
0658	75077	060305	LDA T35B1	SET BUFFER
0659	75100	070030	STA REPBF	POINTER.
0660	75101		REPNT EQU *	
0661	75101	066653	LDB REPPT	GET CURRENT TRACK POINTER
0662	75102	044351	ADB .-1	
0663	75103	160001	LDA B,I	GET LOCATION
0664	75104	070033	STA REPK	SAVE DRUM ADDRESS
0665	75105	162653	LDA REPPT,1	COMPUTE PARAMETERS FOR DRUM
0666	75106	003004	CMA,INA	TRANSFER.
0667	75107	042654	ADA REPLN	
0668	75110	070031	STA REPID	REPLN=IDLEN.
0669	75111	006400	CLB	
0670	75112	101046	LSR 6	DIV BY 64 TO GET # OF SECTORS
0671	75113	070001	STA 1	TO SKIP.
0672	75114	040033	ADA REPK	COMPUTE DRUM ADDRESS
0673	75115	005700	BLF	COMPUTE # OF WORDS
0674	75116	005222	RBL,RBL	TO TRANSFER.
0675	75117	007004	CMB,INB	
0676	75120	044031	ADB REPID	
0677	75121	074031	STB REPID	LN=IDLEN=(LN-IDLEN)/64*64
0678	75122	044402	ADB .+24	SET TRANSFER LENGTH TO READ
0679	75123	007004	CMB,INB	3 NEW ID RECORDS.
0680	75124	074072	STB WORD	
0681	75125	064566	LDB LIBDI	
0682	75126	016231	JSB DRUML	
0683	75127	116015	JSB SICKP,1	DRUM ERROR, GO DIE GRACEFULLY
0684	75130	060031	LDA REPID	SET REPID TO POINT TO THE
0685	75131	040562	ADA LIBD	FIRST ENTRY TO BE CONVERTED.
0686	75132	070031	STA REPID	
0687*				

0688*

0689* NOW CONVERT ENTRIES INTO THE BUFFER, REPID POINTS AT THE ENTRY,
 0690* REPBF POINTS TO THE OUTPUT BUFFER,

0691*

0692	75133	160031	REP4	LDA REPID,I	GET ID.
0693	75134	010602		AND B1777	MASK NUMBER PART.
0694	75135	006400		CLB	GET #/100 IN A, # MOD 100 IN B.
0695	75136	100400		DIV ,100	
	75137	000437			
0696	75140	074032		STB REPT	SAVE LAST 2 DIGITS.
0697	75141	070001		STA 1	COMBINE FIRST DIGIT WITH
0698	75142	160031		LDA REPID,I	LETTER.
0699	75143	001121		ARS,ARS	
0700	75144	013330		AND REPMS	
0701	75145	040001		ADA 1	
0702	75146	043331		ADA REPFX	
0703	75147	170030		STA REPBF,I	STORE ASCII LETTER&DIGIT IN BUF.
0704	75150	034030		ISZ REPBF	
0705	75151	060032		LDA REPT	CONVERT LAST 2 DIGITS
0706	75152	017233		JSB REPNM	AND STORE IN BUFFER.
0707	75153	170030		STA REPBF,I	
0708	75154	034030		ISZ REPBF	MOVE REPBF TO POINT AT TIME AREA
0709	75155	060031		LDA REPID	SET REPID TO POINT
0710	75156	040357		ADA ,+5	TO USERS TIME.
0711	75157	070031		STA REPID	
0712	75160	160031		LDA REPID,I	GET USERS TIME.
0713	75161	017243		JSB REPTR	CONVERT INTO BUFFER.
0714	75162	034031		ISZ REPID	POINT TO DISC USED
0715	75163	034031		ISZ REPID	AND
0716	75164	160031		LDA REPID,I	
0717	75165	017243		JSB REPTR	CONVERT IT.
0718	75166	060570		LDA ASCBB	GET A PAIR OF BLANKS
0719	75167	170030		STA REPBF,I	BLANK OUT THIS SPOT
0720	75170	034030		ISZ REPBF	MOVE BUFFER POINTER UP FOR
0721	75171	034030		ISZ REPBF	NEXT ENTRY.
0722	75172	034031		ISZ REPID	MOVE ID POINTER ALSO.
0723	75173	066654		LDB REPLN	BUMP ID ENTRY COUNTER.
0724	75174	044362		ADB ,+8	
0725	75175	076654		STB REPLN	
0726	75176	006002		SZB	IF ANY LEFT, TEST FOR BUFFER
0727	75177	027226		JMP REP3	FULL.

0728*

0729* ARRIVE HERE WHEN WE HAVE COMPLETED AN ID TRACK

0730*

0731	75200		REPET EQU *		
0732	75200	062653		LDA REPPT	GET CURRENT IDEC TABLE POINTER
0733	75201	053325		CPA RIDCL	WAS THIS THE LAST IDT TRACK?
0734	75202	027216		JMP REPEV	YES, DONE WITH REPORT
0735	75203	040355		ADA ,+3	NO, ADVANCE TO THE NEXT IDEC ENT
0736	75204	072653		STA REPPT	
0737	75205	164000		LDB A,I	GET COUNT ON THIS TRACK
0738	75206	076654		STB REPLN	AND SET THE COUNTER
0739	75207	006003		SZB,RSS	
0740	75210	027200		JMP REPET	EMPTY TRACK, TRY NEXT
0741	75211	063335		LDA REP56	IF END OF BUFFER,

0742	75212	064030	LDB	REPBF	GO TO PRINT
0743	75213	057327	CPB	REPND	AND SUSPEND
0744	75214	027075	JMP	REP1	
0745	75215	027101	JMP	REPNT	OTHERWISE READ NEXT TRACK AND
0746*					DO ANOTHER ENTRY
0747	75216		REPEV	EQU *	
0748	75216	060350	LDA	.-2	
0749	75217	040030	ADA	REPBF	
0750	75220	067336	LDB	REPSL	
0751	75221	174000	STB	A, I	SPACE-LF
0752	75222	040355	ADA	.+3	COMPUTE #
0753	75223	043326	ADA	REPTT	OF CHARACTERS.
0754	75224	001000	ALS		
0755	75225	027073	JMP	REP2	
0756*					
0757	75226	063335	REP3	LDA REP56	IF END OF
0758	75227	064030	LDB	REPBF	BUFFER, GO TO
0759	75230	057327	CPB	REPND	PRINT AND SUSPEND.
0760	75231	027075	JMP	REP1	
0761	75232	027133	JMP	REP4	ELSE GO DO NEXT ENTRY.
0762*					
0763	75233	000000	REPNM	NOP	CONVERT A #<100 TO ASCII.
0764	75234	006400	CLB		GET 1ST DIGIT IN A.
0765	75235	100400	DIV	.+10	2ND IN B.
	75236	000364			
0766	75237	001727	ALF, ALF		PACK AND
0767	75240	040001	ADA	1	ADD ON ASCII
0768	75241	040574	ADA	ASC00	BITS.
0769	75242	127233	JMP	REPNM, I	
0770*					
0771	75243	000000	REPTR	NOP	TRANSLATE A 5-DIGIT NUMBER
0772	75244	006400	CLB		INTO THE BUFFER.
0773	75245	100400	DIV	DVSR5	CONVERT FIRST
	75246	001032			
0774	75247	043332	ADA	REP00	DIGIT.
0775	75250	170030	STA	REPBF, I	PUT IN
0776	75251	034030	ISZ	REPBF	BUFFER.
0777	75252	060001	LDA	1	NOW GET THE REST.
0778	75253	006400	CLB		
0779	75254	100400	DIV	.100	COMPUTE AS 2 2-DIGIT #8.
	75255	000437			
0780	75256	074033	STB	REPK	SAVE 2ND HALF.
0781	75257	017233	JSB	REPNM	CONVERT AND STORE
0782	75260	170030	STA	REPBF, I	FIRST PART.
0783	75261	034030	ISZ	REPBF	
0784	75262	060033	LDA	REPK	SAME WITH
0785	75263	017233	JSB	REPNM	2ND PART.
0786	75264	170030	STA	REPBF, I	
0787	75265	034030	ISZ	REPBF	
0788	75266	127243	JMP	REPTR, I	
0789*					
0790	75267	075270	REPHD	DEF **1	
0791	75270	005040	OCT	5040	
0792	75271	044504	ASC	20, ID	TIME SPACE
	75272	020040			ID TIME SPACE

	75273	052111	
	75274	046505	
	75275	020040	
	75276	051520	
	75277	040503	
	75300	042440	
	75301	020040	
	75302	020040	
	75303	044504	
	75304	020040	
	75305	052111	
	75306	046505	
	75307	020040	
	75310	051520	
	75311	040503	
	75312	042440	
	75313	020040	
	75314	020040	
0793	75315	044504	ASC 8,10 TIME SPACE
	75316	020040	
	75317	052111	
	75320	046505	
	75321	020040	
	75322	051520	
	75323	040503	
	75324	042440	
0794	75325	000110	RIOCL DEF IDEC+8
0795	74653		REPPT EQU T35BF+34
0796	74654		REPLN EQU T35BF+35
0797	00030		REPBF EQU LTEMP
0798	00031		REPID EQU LTEMP+1
0799	00032		REPT EQU LTEMP+2
0800	00033		REPK EQU LTEMP+3
0801	75326	103165	REPTT ABS -T35BF=2
0802	75327	074647	REPND DEF T35BF+30
0803	75330	017400	REPMS OCT 17400
0804	75331	040060	REPFX ASC 1,00
0805	75332	020060	REP80 ASC 1, 0
0806	75333	177743	REP29 DEC =29
0807	75334	000071	REP57 DEC 57
0808	75335	000070	REP56 DEC 56
0809	75336	020012	REPSL OCT 20012
0810	75337		SREP EQU *

0002* THE DIRECTORY COMMAND IS A SYSTEM COMMAND WHICH CAUSES THE
 0003* CONTENTS OF THE DISC DIRECTORY TO BE PRINTED ON THE SYSTEM
 0004* CONSOLE, THE FORMAT OF THE PRINTOUT IS AS FOLLOWS:
 0005*
 0006* <ID> <NAME> <PURGE DATE> <FLAGS> <LENGTH> <DISC ADR> <DRUM ADR>
 0007*
 0008* THE PURGE DATE IS PRINTED AS A 3-DIGIT INTEGER INDICATING THE DAY
 0009* OF THE YEAR AND A 2-DIGIT INTEGER INDICATING THE YEAR. THE DRUM
 0010* ADDRESS CONSISTS OF 3 INTEGERS INDICATING DRUM, TRACK, AND SECTOR.
 0011* THE DISC ADDRESS IS A LOGICAL BLOCK NUMBER.
 0012* THE LENGTH IS IN WORDS FOR PROGRAMS, RECORDS FOR FILES.
 0013* THESE ARE ALL PRINTED IN DECIMAL.
 0014* TYPING DIR, ID WILL START THE LISTING WITH THAT ID,
 0015* SDIRECTORY MUST FOLLOW DIRECTORY IN SEQUENCE.

```

0017 75000          ORG LIBRA

0019 75000 002404   CLA, INA          START WITH ID OF 1 - 1
0020 75001 070052   STA ID              IN CASE WE DONT GO TO GETID,
0021 75002 114572   JSB T35CH, I       SEE WHAT FIRST CHARACTER IS
0022 75003 027011   JMP DIRNI         CR = - START AT BEGINNING OF DIR
0023 75004 003400   CCA              A ← - 1
0024 75005 040054   ADA T35CP        MOVE BACK BUFFER POINTER.
0025 75006 070054   STA T35CP
0026 75007 016315   JSB GETID        GET STARTING ID CODE
0027 75010 026275   JMP LFRER        SHOULD END WITH CR
0028 75011          DIRNI EQU *
0029 75011 003400   CCA              A ← - 1
0030 75012 040052   ADA ID           LOOK FOR PREVIOUS ID WITH
0031 75013 072654   STA T35BF+35    NAME OF INFINITY.
0032 75014 116021   JSB HDBFA, I    PRINT HEADING
0033 75015 016213   JSB T359P        AND SUSPEND
0034 75016 063367   LDA DIR1        MOVE HEADING TO
0035 75017 070050   STA MOVES       PRINT BUFFER.
0036 75020 060305   LDA T35B1
0037 75021 070051   STA MOVED
0038 75022 064322   LDB .-24
0039 75023 016257   JSB MOVEW
0040 75024 060432   LDA .+48        PRINT
0041 75025 064305   LDB T35B1        HEADING AND
0042 75026 016213   JSB T359P        SUSPEND.

0043*
0044 75027 060274   LDA INF         SET UP LTEMP(0;3) FOR
0045 75030 070031   STA LTEMP+1     INITIAL DIRECTORY SEARCH .
0046 75031 070032   STA LTEMP+2
0047 75032 070033   STA LTEMP+3
0048 75033 062654   LDA T35BF+35    GET SAVED STARTING ID.
0049 75034 070030   STA LTEMP

0050*
0051 75035 116005   DIR2 JSB DLOKP, I PERFORM DIRECTORY SEARCH FOR
0052 75036 000000   NOP             LAST ENTRY.
0053 75037 060035   DIRB LDA LTEMP+5 MOVE POINTER UP TO
0054 75040 040366   ADA .+12        NEXT ENTRY
0055 75041 070035   STA LTEMP+5

```

0056	75042	140034		ADA	LTEMP+4,I	TEST FOR END OF TRACK.
0057	75043	040674		ADA	MLIBD	
0058	75044	002002		SZA		
0059	75045	027064		JMP	DIR3	NOT END OF TRACK.
0060*						
0061	75046	064034		LDB	LTEMP+4	BUMP TRACK POINTER TO NEXT
0062	75047	044361		ADB	.+7	TRACK.
0063	75050	150001		CPA	1,I	LOOP IF EMPTY.
0064	75051	027047		JMP	+=2	
0065*						
0066*	FOUND NEXT NON-EMPTY TRACK--WANT TO READ IT IN.					
0067*						
0068	75052	074034		STB	LTEMP+4	
0069	75053	160001		LDA	1,I	SET WORD LENGTH.
0070	75054	070072		STA	WORD	
0071	75055	044360		ADB	.+6	
0072	75056	160001		LDA	1,I	GET DRUM ADDRESS.
0073	75057	064566		LDB	LIBDI	
0074	75060	016231		JSB	DRUML	READ TRACK
0075	75061	027335		JMP	DIRFM	DRUM ERROR, GO TELL OP
0076*						
0077	75062	060562		LDA	LIBD	SET POINTER TO ENTRY.
0078	75063	070035		STA	LTEMP+5	
0079*						
0080	75064	027071	DIR3	JMP	DIR9	
0081	75065	000000		NOP		SPACE FOR
0082	75066	000000		NOP		SANCTIFIED
0083	75067	000000		NOP		TEST IN
0084	75070	000000		NOP		SDIRECTORY
0085	75071	160035	DIR9	LDA	LTEMP+5,I	GET USER ID
0086	75072	072654		STA	T35BF+35	LEAVE IN BUFFER;
0087	75073	050351		CPA	.-1	IF NEGATIVE, WE'RE AT END OF
0088	75074	026267		JMP	LEND	DIRECTORY, SO TERMINATE.
0089	75075	050030		CPA	LTEMP	IF ID SAME AS LAST TIME, GO PUT
0090	75076	027115		JMP	DIR4	BLANKS IN.
0091*						
0092	75077	010602		AND	B1777	GET NUMERICAL PART OF ID.
0093	75100	006400		CLB		
0094	75101	100400		DIV	.100	GET FIRST DIGIT IN A, LAST 2 IN B
		75102				
0095	75103	072611		STA	T35BF	SAVE FIRST DIGIT.
0096	75104	160035		LDA	LTEMP+5,I	GET ID AGAIN.
0097	75105	001323		RAR	RAR	POSITION LETTER.
0098	75106	013420		AND	DIRMS	KEEP ONLY THOSE 5 BITS.
0099	75107	042611		ADA	T35BF	ADD IN DIGIT.
0100	75110	043421		ADA	DIRFX	CONVERT TO ASCII.
0101	75111	072611		STA	T35BF	
0102	75112	060001		LDA	1	
0103	75113	017325		JSB	DIRNM	CONVERT LAST 2 DIGITS TO
0104	75114	027117		JMP	+=3	ASCII AND STORE IN BUFFER.
0105*						
0106	75115	062613	DIR4	LDA	T35BF+2	PLACE BLANKS IN ID POSITION IN
0107	75116	072611		STA	T35BF	BUFFER.
0108	75117	072612		STA	T35BF+1	
0109*						

0110	75120	034035	ISZ LTEMP+5	MOVE PROGRAM NAME INTO BUFFER.
0111	75121	160035	LDA LTEMP+5,1	
0112	75122	072614	STA T35BF+3	
0113	75123	034035	ISZ LTEMP+5	
0114	75124	104200	DLD LTEMP+5,1	
	75125	100035		
0115	75126	104400	DST T35BF+4	
	75127	074615		
0116*				
0117	75130	064035	LOB LTEMP+5	SET POINTER TO DATE LOCATION.
0118	75131	044355	ADB .+3	
0119	75132	074035	STB LTEMP+5	
0120	75133	160035	LDA LTEMP+5,1	GET DATE.
0121	75134	010502	AND B777	GET DAY OF YEAR.
0122	75135	006400	CLB	
0123	75136	100400	DIV .+10	SET A=1ST 2 DIGITS, B=LAST ONE.
	75137	000364		
0124	75140	005727	BLF, BLF	POSITION LAST DIGIT IN LEFT
0125	75141	047422	ADB DIR0S	HALF AND MERGE IN ASCII.
0126	75142	076621	STB T35BF+8	STORE IN BUFFER.
0127	75143	017325	JSB DIRNM	CONVERT 1ST 2 DIGITS AND STORE
0128	75144	072620	STA T35BF+7	IN BUFFER.
0129	75145	160035	LDA LTEMP+5,1	GET YEAR.
0130	75146	001727	ALF, ALF	POSITION.
0131	75147	001300	RAR	
0132	75150	010441	AND B177	MASK,
0133	75151	017325	JSB DIRNM	CONVERT,
0134	75152	072622	STA T35BF+9	STORE.
0135*				
0136	75153	034035	ISZ LTEMP+5	BUMP POINTER TO
0137	75154	034035	ISZ LTEMP+5	DRUM ADDRESS
0138	75155	160035	LDA LTEMP+5,1	GET DRUM ADDRESS
0139	75156	002003	SZA, RSS	IS IT ZERO?
0140	75157	027204	JMP DIR7	YES, SKIP DRUM ADDRESS FORMATTIN
0141	75160	001222	RAL, RAL	POSITION DRUM NO. IN LOW 2 BITS
0142	75161	010355	AND .+3	KEEP IT.
0143	75162	001727	ALF, ALF	POSITION AS LEFT CHAR.
0144	75163	043422	ADA DIR0S	ADD IN ASCII JUNK.
0145	75164	072635	STA T35BF+20	STORE IN BUFFER
0146*				
0147	75165	160035	LDA LTEMP+5,1	GET DRUM ADDRESS AGAIN
0148	75166	001727	ALF, ALF	POSITION TRACK IN LOW 6 BITS.
0149	75167	010734	AND B77	KEEP ONLY THOSE BITS.
0150	75170	017325	JSB DIRNM	CONVERT.
0151	75171	072636	STA T35BF+21	STORE IN BUFFER
0152*				
0153	75172	160035	LDA LTEMP+5,1	GET DRUM ADDRESS AGAIN
0154	75173	010441	AND B177	KEEP ONLY SECTOR ADDRESS.
0155	75174	006400	CLB	GET FIRST DIGIT IN A,
0156	75175	100400	DIV .100	LAST 2 IN B.
	75176	000437		
0157	75177	043423	ADA DIR0S	CONVERT FIRST ONE.
0158	75200	072637	STA T35BF+22	
0159	75201	060001	LDA 1	CONVERT LAST
0160	75202	017325	JSB DIRNM	TWO.

0161	75203	072640		STA T35BF+23	
0162*					
0163	75204	034035	DIR7	ISZ LTEMP+5	BUMP POINTER TO DISC ADDRESS
0164	75205	164035		LDB LTEMP+5,I	GET HIGH PART IN B
0165	75206	034035		ISZ LTEMP+5	
0166	75207	160035		LDA LTEMP+5,I	GET LOW PART IN A
0167	75210	100400		DIV DVSR5	GET FIRST 2 DIGITS IN A
	75211	001032			
0168	75212	076632		STB T35BF+17	SAVE THE REST
0169	75213	017325		JSB DIRNM	CONVERT TO ASCII
0170	75214	072631		STA T35BF+16	STORE IN BUFFER
0171	75215	062632		LDA T35BF+17	RETRIEVE REST OF DIGITS
0172	75216	006400		CLB	GET DIGITS 3 AND 4
0173	75217	100400		DIV .100	INTO A
	75220	000437			
0174	75221	076633		STB T35BF+18	SAVE 5 AND 6
0175	75222	017325		JSB DIRNM	CONVERT TO ASCII
0176	75223	072632		STA T35BF+17	STORE IN BUFFER
0177	75224	062633		LDA T35BF+18	GET DIGITS 5 AND 6
0178	75225	017325		JSB DIRNM	CONVERT TO ASCII
0179	75226	072633		STA T35BF+18	STORE IN BUFFER
0180*					
0181	75227	034035		ISZ LTEMP+5	BUMP POINTER TO LENGTH,
0182	75230	034035		ISZ LTEMP+5	
0183	75231	160035		LDA LTEMP+5,I	GET LENGTH,
0184	75232	002020		SSA	
0185	75233	003004		CMA,INA	MAKE POSITIVE IF NECESSARY
0186	75234	006400		CLB	GET FIRST DIGIT IN A, LAST 4
0187	75235	100400		DIV DVSR5	IN B
	75236	001032			
0188	75237	043430		ADA ASCB0	CONVERT FIRST TO ASCII
0189	75240	072625		STA T35BF+12	STORE IN BUFFER
0190	75241	060001		LDA B	GET DIGITS 2 = 5
0191	75242	006400		CLB	GET DIGITS 2 = 3 IN A, 4 = 5
0192	75243	100400		DIV .100	IN B,
	75244	000437			
0193	75245	076627		STB T35BF+14	SAVE LAST TWO
0194	75246	017325		JSB DIRNM	CONVERT 2 AND 3 TO ASCII
0195	75247	072626		STA T35BF+13	STORE IN BUFFER
0196	75250	062627		LDA T35BF+14	GET LAST TWO
0197	75251	017325		JSB DIRNM	CONVERT TO ASCII
0198	75252	072627		STA T35BF+14	STORE IN BUFFER
0199	75253	062613		LDA T35BF+2	BLANK OUT
0200	75254	072630		STA T35BF+15	NEXT TWO COLUMNS
0201*					
0202	75255	064035		LDB LTEMP+5	
0203	75256	044341		ADB .-9	*> SECOND WORD OF NAME
0204	75257	160001		LDA 1,I	
0205	75260	006004		INB	BUMP POINTER TO THIRD WORD
0206	75261	002021		SSA,RSS	FILE?
0207	75262	027266		JMP DIR5	NO
0208	75263	063426		LDA DASC5	YES, GET AN F
0209	75264	027273		JMP DIR6	
0210	75265	160001	DIR5	LDA B,I	
0211	75266	002021		SSA,RSS	SEMI-COMPILED?

0212	75267	027272	JMP	++3	NO	
0213	75270	063424	LDA	DA\$CC	YES, GET A C	
0214	75271	002001	RSS			
0215	75272	060412	LDA	.,+40B	GET A SPACE	
0216	75273	044350	DIR6	ADB	.,-2	=> FIRST WORD OF NAME
0217	75274	001727	ALF	,ALF	MOVE CHARACTER TO HIGH 8 BITS	
0218	75275	164001	LDB	B,I		
0219	75276	006021	SSB	,RSS	PROTECTED?	
0220	75277	027302	JMP	++3	NO	
0221	75300	033426	IOR	DA\$CP	MERGE IN A P	
0222	75301	002001	RSS			
0223	75302	030412	IOR	.,+40B	MERGE IN A SPACE	
0224	75303	072624	STA	T35BF+11	STORE IN BUFFER	
0225	75304	064035	LDB	LTEMP+5		
0226	75305	044346	ADB	.,-4		
0227	75306	160001	LDA	B,I	GET DRUM ADDRESS	
0228	75307	002002	SZA		IS THERE ONE TO PRINT?	
0229	75310	060364	LDA	.,+10	YES	
0230	75311	040420	ADA	.,+38	PRINT THE LINE	
0231	75312	064305	LDB	T35B1		
0232	75313	016213	JSB	T359P	SUSPEND.	
0233*						
0234	75314	062654	LDA	T35BF+35	SET UP LTEMP(0:3) IN ORDER TO	
0235	75315	066614	LDB	T35BF+3		
0236	75316	104400	DST	LTEMP	FIND NEXT PROGRAM	
	75317	000030				
0237	75320	104200	DLI	T35BF+4		
	75321	074615				
0238	75322	104400	DST	LTEMP+2		
	75323	000032				
0239	75324	027035	JMP	DIR2	LOOP FOR NEXT OUTPUT.	
0240*						
0241*						
0242*						
0243	75325	000000	DIRNM	NOP	CONVERT A # <100 TO ASCII.	
0244	75326	006400	CLB			
0245	75327	100400	DIV	.,+10		
	75330	000364				
0246	75331	001727	ALF	,ALF		
0247	75332	040001	ADA	1		
0248	75333	040574	ADA	ASC00		
0249	75334	127325	JMP	DIRNM,I		
0250	75335		DIRFM	EQU *		
0251	75335	063350	LDA	DIRSO		
0252	75336	070050	STA	MOVES		
0253	75337	060305	LDA	T35B1		
0254	75340	070051	STA	MOVED		
0255	75341	064316	LDB	DIRSP		
0256	75342	005100	BRS			
0257	75343	016257	JSB	MOVEW		
0258	75344	060316	LDA	DIRSP		
0259	75345	003004	CMA	,INA		
0260	75346	067350	LDB	DIRSO		
0261	75347	026271	JMP	LEND+2		
0262	75350	075351	DIRSO	DEF	++1	

0263	75351	005103	OCT	5103			
0264	75352	040516	ASC	13,	ANIT	READ	DIRECTORY TRACK
	75353	023524					
	75354	020122					
	75355	042501					
	75356	042040					
	75357	042111					
	75360	051105					
	75361	041524					
	75362	047522					
	75363	054440					
	75364	052122					
	75365	040503					
	75366	045440					
0265	00316		DIRSP	EQU	,+DIRSO=**+DIRSO=**+2		
0266	75367	075370	DIR1	DEF	**1		
0267	75370	005040	OCT	5040	LF=BLANK		
0268	75371	044504	ASC	9, ID	NAME	DATE	
	75372	020040					
	75373	020040					
	75374	047101					
	75375	046505					
	75376	020040					
	75377	020040					
	75400	042101					
	75401	052105					
0269	75402	020040	ASC	14,	LENGTH	DISC	DRUM
	75403	020040					
	75404	020114					
	75405	042516					
	75406	043524					
	75407	044040					
	75410	020040					
	75411	042111					
	75412	051503					
	75413	020040					
	75414	020040					
	75415	020104					
	75416	051125					
	75417	046440					
0270	75420	017400	DIRMS	OCT	17400		
0271	75421	040060	DIRFX	ASC	1,00		
0272	75422	030057	DIR0S	ASC	1,0/		
0273	75423	027460	DIRS0	ASC	1,/0		
0274	75424	000103	DASCC	OCT	103		
0275	75425	000106	DASCF	OCT	106		
0276	75426	000120	DASCP	OCT	120		
0277	75427	000040	DASCS	OCT	40		
0278	75430	020060	ASCB0	ASC	1, 0		
0279	75431	020040	ASCSS	ASC	2,		
	75432	020040					
0280	75433		SDIR	EQU	*		

0282* SDIRECTORY IS A SYSTEM COMMAND WHICH CAUSES THE SAME PRINTOUT
 0283* AS DIRECTORY, EXCEPT THAT ONLY SANCTIFIED PROGRAMS AND FILES
 0284* (THOSE CURRENTLY RESIDING ON DRUM) ARE LISTED. SDIRECTORY MUST
 0285* BE LOADED IMMEDIATELY AFTER DIRECTORY.

0287	75000		ORG LIBRA	
0288	75000	002404	CLA,INA	
0289	75064		ORG DIR3	
0290	75064	060035	LDA LTEMP+5	IS
0291	75065	040361	ADA .+7	THIS
0292	75066	160000	LDA A,I	ENTRY
0293	75067	002003	SZA,RSS	SANCTIFIED?
0294	75070	027037	JMP DIR8	NO, LOOK AT NEXT ONE

```

0296* THE STATUS COMMAND PRINTS A SUMMARY OF THE SYSTEM RESOURCES,
0297* AND THE EXTENT OF THEIR UTILIZATION, ON THE SYSTEM TELETYPE.
0298 75000          ORG LIBRA
0299 75000 116021   JSB HDBFA,I   PRINT HEADING
0300 75001 016213   JSB T35SP    AND SUSPEND
0301 75002 060303   LDA T35B2  INITIALIZE
0302 75003 072562   STA STABF  BUFFER POINTER
0303*
0304* PRINT SELECT CODES,
0305*
0306 75004 017666   JSB STAST  PRINT LF,MAG#
0307 75005 005115   OCT 5115
0308 75006 040507   ASC 2,AG#
      75007 036440
0309 75010 000000   NOP
0310 75011 060176   LDA MAGSC  PRINT MAGSC.
0311 75012 017707   JSB STAUC
0312 75013 064176   LDB MAGSC  GET SELECT CODE,
0313 75014 060424   LDA ,+52B  GET '*'
0314 75015 006020   SSB       SKIP IF 3030
0315 75016 017740   JSB STACH  PUT '*' INTO LINE FOR 7970
0316 75017 017666   JSB STAST
0317 75020 020040   ASC 4, DRUM# PRINT "DRUM#"
      75021 042122
      75022 052515
      75023 036440
0318 75024 000000   NOP
0319 75025 060346   LDA ,=4    SET UP DRUM COUNTER
0320 75026 070036   STA LTEMP+6
0321 75027 060036   STAD1 LDA LTEMP+6  GET SELECT
0322 75030 040356   ADA ,+4    CODE
0323 75031 040676   ADA ?ATBL  OF DRUM
0324 75032 160000   LDA 0,I
0325 75033 010734   AND B77   MASK SC.
0326 75034 017707   JSB STAUC  OUTPUT SC.
0327 75035 060412   LDA ,+40B
0328 75036 017740   JSB STACH  OUTPUT BLANK
0329 75037 034036   ISZ LTEMP+6  DONE?
0330 75040 027027   JMP STAD1  NO.
0331 75041 017654   JSB STAPR
0332*
0333 75042 017666   JSB STAST
0334 75043 005104   OCT 5104   LF=D
0335 75044 044523   ASC 2,ISCS
      75045 041523
0336 75046 011415   OCT 11415  XOFF=CR
0337 75047 005040   OCT 5040   LF=BLANK
0338 75050 020114   ASC 19, LOGICAL SELECT  UNIT  FIRST  LAST
      75051 047507
      75052 044503
      75053 040514
      75054 020040
      75055 051505
      75056 046105
      75057 041524

```

75060 020040
 75061 020125
 75062 047111
 75063 052040
 75064 020040
 75065 043111
 75066 051123
 75067 052040
 75070 020040
 75071 046101
 75072 051524
 0339 75073 000000
 0340 75074 017654
 0341 75075 017666
 0342 75076 020040
 75077 020125
 75100 047111
 75101 052040
 75102 020040
 75103 020040
 75104 041517
 75105 042105
 75106 020040
 75107 020116
 75110 052515
 75111 041105
 75112 051040
 75113 020102
 75114 046117
 75115 041513
 75116 020040
 75117 020102
 75120 046117
 0343 75121 041513
 0344 75122 000000
 0345 75123 017654
 0346 75124 002400
 0347 75125 072001
 0348 75126
 0349 75126 062001
 0350 75127 050362
 0351 75130 027241
 0352 75131 100200
 75132 000360
 0353 75133 040210
 0354 75134 040354
 0355 75135 164000
 0356 75136 164001
 0357 75137 006003
 0358 75140 027237
 0359 75141 070031
 0360 75142 017666
 0361 75143 020040
 75144 020040
 0362 75145 000000

OCT 0
 JSB STAPR FIRST LINE OF DISC HEADING
 JSB STAST
 ASC 19, UNIT CODE NUMBER BLOCK BLO

ASC 1,CK
 OCT 0
 JSB STAPR SECOND LINE OF DISC HEADING
 CLA FOR LOGICAL
 STA STAV1 DISC 0
 STADI EQU *
 LDA STAV1 FINISHED
 CPA .+8 ALL DISCS?
 JMP STALT YES
 MPY .+6 NO

ADA MHAD
 ADA .+2
 LDB A,I GET SELECT CODE
 LDB B,I
 SZB,RSS
 JMP STALT=2 SKIP IF ZERO
 STA LTEMP+1 SAVE SELECT CODE/UNIT
 JSB STAST 4 BLANKS
 ASC 2,
 OCT 0

0363	75146	060412	LDA ,+40B	BLANK
0364	75147	017740	JSB STACH	
0365	75150	062001	LDA STAV1	LOGICAL DISC NUMBER
0366	75151	017716	JSB STADG	
0367	75152	017666	JSB STAST	6 BLANKS
0368	75153	020040	ASC 3,	
	75154	020040		
	75155	020040		
0369	75156	000000	OCT 0	
0370	75157	060412	LDA ,+40B	BLANK
0371	75160	017740	JSB STACH	
0372	75161	160031	LDA LTEMP+1,I	
0373	75162	160000	LDA A,I	
0374	75163	001727	ALF,ALF	
0375	75164	010734	AND B77	
0376	75165	017707	JSB STAOC	DISC SELECT CODE
0377	75166	017666	JSB STAST	6 BLANKS
0378	75167	020040	ASC 3,	
	75170	020040		
	75171	020040		
0379	75172	000000	OCT 0	
0380	75173	160031	LDA LTEMP+1,I	
0381	75174	160000	LDA A,I	
0382	75175	010355	AND ,+3	
0383	75176	017716	JSB STADG	UNIT NUMBER
0384	75177	017666	JSB STAST	4 BLANKS
0385	75200	020040	ASC 2,	
	75201	020040		
0386	75202	000000	OCT 0	
0387	75203	060412	LDA ,+40B	BLANK
0388	75204	017740	JSB STACH	
0389	75205	060031	LDA LTEMP+1	GET SECTOR
0390	75206	040350	ADA ,=2	
0391	75207	164000	LDB A,I	ADDRESS OF
0392	75210	002004	INA	
0393	75211	160000	LDA A,I	THIS DISC
0394	75212	004065	CLE,ERB	CONVERT
0395	75213	001540	ERA,CLE	TO BLOCKS
0396	75214	040356	ADA ,+4	FIRST AVAILABLE
0397	75215	002040	SEZ	BLOCK IS #4
0398	75216	006004	INB	
0399	75217	017722	JSB STA6D	FIRST BLOCK
0400	75220	017666	JSB STAST	2 BLANKS
0401	75221	020040	ASC 1,	
0402	75222	000000	OCT 0	
0403	75223	060031	LDA LTEMP+1	GET SECTOR
0404	75224	040356	ADA ,+4	
0405	75225	164000	LDB A,I	ADDRESS OF
0406	75226	002004	INA	
0407	75227	160000	LDA A,I	NEXT DISC
0408	75230	004065	CLE,ERB	CONVERT
0409	75231	001540	ERA,CLE	TO BLOCKS
0410	75232	040351	ADA ,=1	LAST BLOCK
0411	75233	002041	SEZ,RSS	IS 1 LESS
0412	75234	044351	AUB ,=1	

0413	75235	017722	JSB	STA6D	LAST BLOCK
0414	75236	017654	JSB	STAPR	PRINT IT
0415	75237	036001	ISZ	STAV1	
0416	75240	027126	JMP	STADI	
0417	75241		STALT	EQU *	
0418	75241	017666	JSB	STAST	
0419	75242	005114	OCT	5114	
0420	75243	047503	ASC	9,OCKED	DRUM TRACKS
	75244	045505			
	75245	042040			
	75246	042122			
	75247	052515			
	75250	020124			
	75251	051101			
	75252	041613			
	75253	051440			
0421	75254	000000	OCT	0	
0422	75255	017654	JSB	STAPR	
0423	75256	002400	CLA		
0424	75257	072001	STA	STAV1	TRACK # (0-63)
0425	75260	072003	STA	STAV3	DRUM # (0-3)
0426	75261	002404	CLA,INA		
0427	75262	072002	STA	STAV2	MASK
0428	75263		STLT0	EQU *	
0429	75263	060676	LDA	?ATBL	
0430	75264	042003	ADA	STAV3	
0431	75265	164000	LDB	A,I	IS DRUM
0432	75266	006003	SZB,RSS		PRESENT?
0433	75267	027354	JMP	STLT7	NO
0434	75270		STLT1	EQU *	
0435	75270	002400	CLA		YES, INITIALIZE
0436	75271	070030	STA	LTEMP	COUNT OF ENTRIES
0437	75272		STLT5	EQU *	
0438	75272	017600	JSB	STATZ	TEST THIS TRACK
0439	75273	002001	RSS		UNLOCKED
0440	75274	027300	JMP	STLT2	LOCKED
0441	75275	017615	JSB	STLBP	
0442	75276	027351	JMP	STLT6	END OF DRUM
0443	75277	027272	JMP	STLT5	
0444	75300		STLT2	EQU *	
0445	75300	002400	CLA		
0446	75301	050030	CPA	LTEMP	FIRST ENTRY OR LINE?
0447	75302	002001	RSS		YES
0448	75303	027310	JMP	STLT3	NO
0449	75304	062003	LDA	STAV3	OUTPUT
0450	75305	017716	JSB	STADG	DRUM #
0451	75306	060436	LDA	B72	131
0452	75307	017740	JSB	STACH	
0453	75310		STLT3	EQU *	
0454	75310	017666	JSB	STAST	2 BLANKS
0455	75311	020040	ASC	1,	
0456	75312	000000	OCT	0	
0457	75313	062001	LDA	STAV1	OUTPUT TRACK #
0458	75314	017700	JSB	STA2D	
0459	75315	034030	ISZ	LTEMP	

0460	75316	017615	JSB	STLBP	BUMP POINTERS
0461	75317	027351	JMP	STLT6	END OF DRUM
0462	75320	017600	JSB	STATZ	TEST NEXT TRACK
0463	75321	027335	JMP	STLT8	UNLOCKED (ONLY ONE)
0464	75322		STLT4	EQU *	
0465	75322	017615	JSB	STLBP	LOCKED, BUMP POINTERS
0466	75323	027345	JMP	STLT9	END OF DRUM
0467	75324	017600	JSB	STATZ	TEST NEXT TRACK
0468	75325	002001	RSS		UNLOCKED
0469	75326	027322	JMP	STLT4	LOCKED, GO TO NEXT ONE
0470	75327	060427	LDA	.,+55B	'-'
0471	75330	017740	JSB	STACH	
0472	75331	003400	CCA		
0473	75332	042001	ADA	STAV1	OUTPUT TRACK #
0474	75333	017700	JSB	STA2D	
0475	75334	034030	ISZ	LTEMP	
0476	75335		STLT8	EQU *	
0477	75335	017615	JSB	STLBP	BUMP POINTERS
0478	75336	027351	JMP	STLT6	END OF DRUM
0479	75337	060030	LDA	LTEMP	MORE ROOM
0480	75340	040332	ADA	.-16	ON THIS
0481	75341	002020	SSA		LINE?
0482	75342	027272	JMP	STLT5	YES
0483	75343	017654	JSB	STAPR	NO, PRINT AND SUSPEND
0484	75344	027270	JMP	STLT1	
0485	75345		STLT9	EQU *	
0486	75345	060427	LDA	.,+55B	'-'
0487	75346	017740	JSB	STACH	
0488	75347	063630	LDA	\$1.63	LAST TRACK IS 63
0489	75350	017700	JSB	STA2D	
0490	75351		STLT6	EQU *	
0491	75351	060030	LDA	LTEMP	
0492	75352	002002	SZA		SKIP PRINTING
0493	75353	017654	JSB	STAPR	BLANK LINE
0494	75354		STLT7	EQU *	
0495	75354	062003	LDA	STAV3	
0496	75355	002004	INA		BUMP DRUM #
0497	75356	050356	CPA	.,+4	
0498	75357	027362	JMP	STLT10	DONE
0499	75360	072003	STA	STAV3	
0500	75361	027263	JMP	STLT0	
0001	75362		STLT10	EQU *	
0002	75362	017666	JSB	STAST	
0003	75363	005114	OCT	5114	
0004	75364	047503	ASC	9,OCKED DISC BLOCKS	
	75365	045505			
	75366	042040			
	75367	042111			
	75370	051503			
	75371	020102			
	75372	046117			
	75373	041513			
	75374	051440			
0005	75375	000000	OCT	0	
0006	75376	017654	JSB	STAPR	

0007	75377	002400	CLA		
0008	75400	070033	STA LTEMP+3		
0009	75401	060210	LDA MHAD	⇒ FIRST DISC	
0010	75402		STALY EQU *		
0011	75402	072001	STA STAV1		
0012	75403	060562	LDA LIBD	INITIALIZE	
0013	75404	072002	STA STAV2	BUFFER POINTER	
0014	75405	062001	LDA STAV1		
0015	75406	040354	ADA ,+2		
0016	75407	164000	LDB A,I	GET SELECT CODE	
0017	75410	164001	LDB B,I		
0018	75411	006003	SZB,RSS		
0019	75412	027511	JMP STALX	DISC NOT PRESENT	
0020	75413		STALY EQU *		
0021	75413	104200	OLD STAV1,I	COMPUTE	
		75414			
		75415			
0022	75415	000065	CLE,ERA		
0023	75416	005540	ERB,CLE	ADDRESS	
0024	75417	044355	ADB ,+3		
0025	75420	002040	SEZ	OF BAD	
0026	75421	002004	INA		
0027	75422	104400	DST LTEMP	BLOCKS	
		75423			
0028	75424	060762	LDA M256		
0029	75425	070215	STA MWORD		
0030	75426	060520	LDA DLTEM		
0031	75427	064566	LDB LIBDI		
0032	75430	114217	JSB DISCZ,I	READ BAD BLOCKS	
0033	75431	026311	JMP DDERR		
0034	75432	002400	CLA	PUT ZERO AT	
0035	75433	173772	STA STAQV,I	BUFFER END	
0036	75434		STALZ EQU *		
0037	75434	162002	LDA STAV2,I	GET LOCKED BLOCK ADDRESS	
0038	75435	002003	SZA,RSS		
0039	75436	027511	JMP STALX	IF ZERO, FINISHED TABLE	
0040	75437	104200	OLD STAV1,I	COMPUTE	
		75440			
		75441			
0041	75441	000065	CLE,ERA		
0042	75442	005540	ERB,CLE	LOGICAL	
0043	75443	146002	ADB STAV2,I		
0044	75444	002040	SEZ	BLOCK	
0045	75445	002004	INA		
0046	75446	101100	SWP	ADDRESS	
0047	75447	104400	DST LTEMP		
		75450			
0048	75451	017722	JSB STA6D	FIRST BLOCK	
0049	75452	036002	ISZ STAV2		
0050	75453	003400	CCA		
0051	75454	142002	ADA STAV2,I		
0052	75455	002003	SZA,RSS	IF ONLY ONE BLOCK, DON'T	
0053	75456	027472	JMP STAPZ	PRINT SECOND ADDRESS	
0054	75457	070032	STA LTEMP+2		
0055	75460	060427	LDA ,+55B		
0056	75461	017740	JSB STACH		
0057	75462	104200	OLD LTEMP	COMPUTE	

0058	75463	000030			
0059	75464	000040	CLE		- LAST
0060	75465	040032	ADA	LTEMP+2	BLOCK
0061	75466	002040	SEZ		ADDRESS
0062	75467	006004	INB		
0063	75470	017722	JSB	STA6D	OUTPUT IT
0064	75471	002404	CLA,	INA	UPDATE
0065	75472	002004	STAPZ	EQU *	
0066	75473	040033	INA		COUNT OF
0067	75474	070033	ADA	LTEMP+3	
0068	75475	036002	STA	LTEMP+3	ENTRIES ON LINE
0069	75476	040342	ISZ	STAV2	
0070	75477	002021	ADA	,=8	
0071	75500	027505	SSA,	RSS	
0072	75501	017666	JMP	STAPL	PRINT FULL LINE
0073	75502	020040	JSB	STAST	2 BLANKS
0074	75503	000000	ASC	1,	
0075	75504	027434	OCT	0	
0076	75505	017654	JMP	STALZ	
0077	75505	017654	STAPL	EQU *	
0078	75506	002400	JSB	STAPR	
0079	75507	070033	CLA		RESET ENTRY
0080	75510	027413	STA	LTEMP+3	COUNTER
0081	75511	062001	JMP	STALY	
0082	75511	062001	STALX	EQU *	
0083	75512	040360	LDA	STAV1	
0084	75513	064210	ADA	,+6	NEXT DISC
0085	75514	044432	LDB	MHAD	
0086	75515	050001	ADB	,+48	
0087	75516	002001	CPA	B	FINISHED ALL 8?
0088	75517	027402	RSS		YES
0089	75520	060033	JMP	STALV	NO
0090	75521	002002	LDA	LTEMP+3	
0091	75522	017654	SZA		
0092	75523	017666	JSB	STAPR	DUMP REST OF BUFFER
0093	75524	005114	JSB	STAST	
0094	75525	044516	OCT	5114	
	75526	042440	ASC	7,INE	PRINTER .
	75527	050122			
	75530	044516			
	75531	052105			
	75532	051040			
	75533	036440			
0095	75534	000000	OCT	0	
0096	75535	060250	LDA	LPS	GET THE LINE
0097	75536	114500	JSB	S14SC,I	PRINTER STATUS
0098	75537	102311	SFS	CH2	FROM THE I/O
0099	75540	027537	JMP	*=1	PROCESSOR
0100	75541	102511	LIA	CH2	A * STATUS
0101	75542	070030	STA	LTEMP	
0102	75543	010734	AND	B77	A * SELECT CODE
0103	75544	017707	JSB	STAOC	PUT THE SC IN THE BUFFER
0104	75545	060424	LDA	,+52B	A * '!'
0105	75546	064030	LDB	LTEMP	B * LP STATUS

0106	75547	006020	SSB	CHECK FOR 2610A LP
0107	75550	017740	JSB STACH	YES - PUT '*' IN THE BUFFER
0108	75551	060424	LDA .+52B	A = '*'
0109	75552	064030	LDB LTEMP	
0110	75553	005200	RBL	
0111	75554	006020	SSB	CHECK FOR 2767A LP
0112	75555	017740	JSB STACH	YES - PUT '*' IN THE BUFFER
0113	75556	017666	JSB STAST	
0114	75557	020040	ASC 5,	USER *
	75560	020040		
	75561	052523		
	75562	042522		
	75563	020075		
0115	75564	000000	OCT 0	
0116	75565	064255	LDB PRIST	GET USER INDICATOR AND
0117	75566	006003	SZB,RSS	CHECK FOR USE
0118	75567	027573	JMP STLP	NO
0119	75570	160001	LDA B,I	YES,
0120	75571	001727	ALF,ALF	OUTPUT
0121	75572	017700	JSB STA20	USER TTY#
0122	75573	017654	STLP JSB STAPR	PRINT THE BUFFER
0123	75574	103100	CLF 0	
0124	75575	034277	ISZ T35ST	CHANGE STATUS TO OVERLAY
0125	75576	060506	LDA #LIB#	RESTART AT LIBRA
0126	75577	027656	JMP STAPR+2	PRINT THE LINE AND SUSPEND
0127*				
0128*	STATZ	TESTS THE CURRENT TRAX POSITION, EXIT TO (P+1) IF 0, (P+2)		
0129*	IF 1.			
0130*				
0131	75600	000000	STATZ NOP	
0132	75601	066003	LDB STAV3	DRUM NO.
0133	75602	005222	RBL,RBL	MULTIPLY BY 4
0134	75603	044512	ADB DTRAX	=> FIRT TRAX ELEMENT
0135	75604	062001	LDA STAV1	
0136	75605	001121	ARS,ARS	
0137	75606	001121	ARS,ARS	
0138	75607	044000	ADB A	POSITION IN TRAX
0139	75610	160001	LDA B,I	
0140	75611	012002	AND STAV2	MASK
0141	75612	002002	SZA	0 EXISTS TO P+1
0142	75613	037600	ISZ STATZ	1 EXISTS TO P+2
0143	75614	127600	JMP STATZ,I	
0144*				
0145*	STLBP	BUMPS THE POINTERS TO THE TRAX TABLE. IT EXISTS TO (P+1) IF		
0146*	A DRUM	IS FINISHED, OTHERWISE TO (P+2).		
0147*				
0148	75615	000000	STLBP NOP	
0149	75616	062002	LDA STAV2	MASK
0150	75617	001200	RAL	ROTATE IT
0151	75620	072002	STA STAV2	
0152	75621	062001	LDA STAV1	
0153	75622	002004	INA	BUMP TRACK #
0154	75623	050772	CPA B100	FINISHED THIS DRUM?
0155	75624	002401	CLA,RSS	YES, SET TRACK # TO ZERO
0156	75625	037615	ISZ STLBP	NO, EXIT TO (P+2)

0157 75626 072001 STA STAV1
0158 75627 127615 JMP STLBP,I
0159*
0160 75630 000077 ST.63 DEC 63

```

0162 75654          ORG LIBRA+512=84
0163*
0164* STAPR PRINTS THE BUFFER.
0165*
0166 75654 000000  STAPR NOP
0167 75655 063654  LDA STAPR      SAVE RETURN ADDRESS.
0168 75656 072213  STA T35SP
0169 75657 060303  LDA T35B2      COMPUTE # OF CHARS.
0170 75660 003004  CMA,INA
0171 75661 042562  ADA STABF
0172 75662 064303  LDB T35B2      RESET BUFFER
0173 75663 076562  STB STABF      POINTER.
0174 75664 064305  LDB T35B1
0175 75665 026214  JMP T35B+1     OUTPUT.
0176*
0177* STAST OUTPUTS A STRING
0178*
0179 75666 000000  STAST NOP
0180 75667 163666  LDA STAST,I    GET CHAR. PAIR
0181 75670 002003  SZR,RSS
0182 75671 127666  JMP STAST,I
0183 75672 001727  ALF,ALF       OUTPUT LEFT CHAR.
0184 75673 017740  JSB STACH
0185 75674 163666  LDA STAST,I    OUTPUT RIGHT CHAR.
0186 75675 017740  JSB STACH
0187 75676 037666  ISZ STAST      BUMP POINTER.
0188 75677 027667  JMP STAST+1    LOOP.
0189*
0190* STA2D OUTPUTS A 2 DIGIT NUMBER.
0191*
0192 75700 000000  STA2D NOP
0193 75701 006400  CLB
0194 75702 100400  DIV .+10
      75703 000364
0195 75704 017716  JSB STADG
0196 75705 017716  JSB STADG
0197 75706 127700  JMP STA2D,I
0198*
0199* STAOC OUTPUTS A 2-DIGIT OCTAL INTEGER.
0200*
0201 75707 000000  STAOC NOP
0202 75710 006400  CLB
0203 75711 100400  DIV .+8
      75712 000362
0204 75713 017716  JSB STADG
0205 75714 017716  JSB STADG
0206 75715 127707  JMP STAOC,I
0207*
0208* STADG OUTPUTS A DIGIT.
0209*
0210 75716 000000  STADG NOP
0211 75717 040432  ADA .+60B
0212 75720 017740  JSB STACH
0213 75721 127716  JMP STADG,I
0214*

```

```

0215* STA6D OUTPUTS A 6-DIGIT NUMBER
0216*
0217 75722 000000 STA6D NOP
0218 75723 100400 DIV DVSR5
      75724 001032
0219 75725 074037 STB LTEMP+7
0220 75726 017700 JSB STA2D FIRST TWO DIGITS
0221 75727 060037 LDA LTEMP+7
0222 75730 006400 CLB
0223 75731 100400 DIV .100
      75732 000437
0224 75733 074037 STB LTEMP+7
0225 75734 017700 JSB STA2D SECOND TWO DIGITS
0226 75735 060037 LDA LTEMP+7
0227 75736 017700 JSB STA2D THIRD TWO DIGITS
0228 75737 127722 JMP STA6D,I
0229*
0230* STACH INSERTS A CHARACTER INTO THE BUFFER,
0231*
0232 75740 000000 STACH NOP
0233 75741 074040 STB LTEMP+8 SAVE B-REG.
0234 75742 010441 AND B177 CLEAR TOP BITS.
0235 75743 066562 LDB STABF GET BUFFER POINTER.
0236 75744 004065 CLE,ERB
0237 75745 002041 SEZ,RSS
0238 75746 001737 ALF,SLA,ALF CHARACTER ON LEFT.
0239 75747 130001 IOR 1,I CHARACTER ON RIGHT.
0240 75750 170001 STA 1,I
0241 75751 036562 ISZ STABF BUMP POINTER.
0242 75752 060040 LDA LTEMP+8 RESTORE OLD B-REG. INTO A.
0243 75753 127740 JMP STACH,I
0244*
0245* STA3D OUTPUTS A 3-DIGIT NUMBER,
0246*
0247 75754 000000 STA3D NOP
0248 75755 006400 CLB
0249 75756 100400 DIV .100 GET 1ST DIGIT IN A, LAST 2 IN B.
      75757 000437
0250 75760 017716 JSB STADG OUTPUT FIRST DIGIT.
0251 75761 017700 JSB STA2D OUTPUT LAST TWO.
0252 75762 060412 LDA .+40B
0253 75763 017740 JSB STACH OUTPUT BLANK.
0254 75764 127754 JMP STA3D,I
0255 75765 030006 STAD6 DEF DIREC+6
0256 75766 031066 STADU DEF DIREU+6
0257 75767 000115 STADC DEF DADLC
0258 75770 072034 STATB DEF COM6
0259 75771 072137 STATE DEF COMTE
0260 75772 001630 STAQV DEF LIBU9+256
0261 75773 000101 STAID DEF IDEC+1
0262 75774 000125 STADL DEF DADLN
0263 75775 061130 STASW DEF TTY00+?DISC
0264 75776 062270 STAUS DEF TTY32+?DISC
0265 75777 074002 DSTV2 DEF STAV2
0266 76000 $STA EQU *

```


0268	75000		ORG LIBRA	
0269	75000	017666	JSB STAST	PRINT
0270	75001	044504	ASC 2, IDT	IDT
	75002	052040		
0271	75003	000000	OCT 0	
0272	75004	060347	LDA .-3	3 IDT
0273	75005	070033	STA LTEMP+3	TRACKS
0274	75006	067773	LDB STAID	
0275	75007	074034	STB LTEMP+4	
0276	75010		STAIR EQU *	
0277	75010	160034	LDA LTEMP+4, I	GET ADDRESS
0278	75011	034034	ISZ LTEMP+4	
0279	75012	002003	SZA, RSS	
0280	75013	027016	JMP STAIQ	SKIP IF ZERO
0281	75014	164034	LDB LTEMP+4, I	GET LENGTH
0282	75015	017411	JSB STALL	OUTPUT THEM
0283	75016		STAIQ EQU *	
0284	75016	034034	ISZ LTEMP+4	
0285	75017	034034	ISZ LTEMP+4	
0286	75020	034033	ISZ LTEMP+3	
0287	75021	027010	JMP STAIR	
0288	75022	017654	JSB STAPR	
0289	75023	017666	JSB STAST	
0290	75024	006412	OCT 6412	
0291	75025	040504	ASC 2, ADT	
	75026	052040		
0292	75027	000000	OCT 0	
0293	75030	060112	LDA ADLOC	
0294	75031	064113	LDB ADLEN	
0295	75032	017411	JSB STALL	
0296*				
0297*			PRINT OUT THE DISK ADT	
0298*				
0299	75033	017666	JSB STAST	
0300	75034	006412	OCT 6412, 5104	
	75035	005104		
0301	75036	044523	ASC 4, ISC ADTS	
	75037	041440		
	75040	040504		
	75041	052123		
0302	75042	000000	OCT 0	
0303	75043	017654	JSB STAPR	PRINT THE BUFFER
0304	75044	060346	LDA .-4	4 PER
0305	75045	070033	STA LTEMP+3	LINE
0306	75046	067767	LDB STADC	=> 1ST DISC ADT
0307	75047		STADJ EQU *	
0308	75047	076001	STB STAV1	
0309	75050	162001	LDA STAV1, I	GET ADDRESS
0310	75051	002003	SZA, RSS	
0311	75052	027064	JMP STADK	SKIP IF ZERO
0312	75053	066001	LDB STAV1	
0313	75054	044362	A0B .+DADLN-DADLC	
0314	75055	164001	LDB B, I	GET LENGTH
0315	75056	017411	JSB STALL	OUTPUT THEM
0316	75057	034033	ISZ LTEMP+3	LINE FULL?

0317	75060	027064	JMP	STADK	NO
0318	75061	017654	JSB	STAPR	YES, PRINT IT
0319	75062	060346	LDA	,-4	
0320	75063	070033	STA	LTEMP+3	
0321	75064		STADK	EQU *	
0322	75064	066001	LDB	STAV1	
0323	75065	006004	INB		
0324	75066	057774	CPB	STADL	FINISHED ALL DISC ADIS?
0325	75067	002001	RSS		YES
0326	75070	027047	JMP	STADJ	NO
0327	75071	060033	LDA	LTEMP+3	
0328	75072	050346	CPA	,-4	
0329	75073	002001	RSS		SKIP PRINTING OF BLANK LINE
0330	75074	017654	JSB	STAPR	
0331*					
0332*					
0333*					THIS SECTION PRINTS OUT THE DIRECTORY
0334*					TRACKS THAT ARE ON THE DRUM
0335*					
0336	75075	017666	JSB	STAST	
0337	75076	006412	OCT	6412	
0338	75077	042111	ASC	3,DIREC	
	75100	051105			
	75101	041440			
0339	75102	000000	OCT	0	
0340	75103	017654	JSB	STAPR	
0341	75104	060346	LDA	,-4	4 PER
0342	75105	070033	STA	LTEMP+3	LINE
0343	75106	067765	LDB	STAD6	*-> FIRST DIREC ENTRY
0344	75107		STADX	EQU *	
0345	75107	076001	STB	STAV1	
0346	75110	162001	LDA	STAV1,I	GET ADDRESS
0347	75111	002003	SZA	RSS	
0348	75112	027124	JMP	STADY	SKIP IF ZERO
0349	75113	066001	LDB	STAV1	
0350	75114	044344	ADB	,-6	
0351	75115	164001	LDB	B,I	GET LENGTH
0352	75116	017411	JSB	STALL	OUTPUT THEM
0353	75117	034033	ISZ	LTEMP+3	LINE FULL?
0354	75120	027124	JMP	STADY	NO
0355	75121	017654	JSB	STAPR	YES, PRINT IT
0356	75122	060346	LDA	,-4	
0357	75123	070033	STA	LTEMP+3	
0358	75124		STADY	EQU *	
0359	75124	066001	LDB	STAV1	
0360	75125	044361	ADB	,-7	
0361	75126	057766	CPB	STADU	FINISHED ALL DIREC ENTRIES?
0362	75127	002001	RSS		YES
0363	75130	027107	JMP	STADX	NO
0364	75131	060033	LDA	LTEMP+3	
0365	75132	050346	CPA	,-4	
0366	75133	002001	RSS		SKIP PRINTING OF BLANK LINE
0367	75134	017654	JSB	STAPR	
0368*					
0369	75135	017666	JSB	STAST	PRINT

0370	75136	005123	OCT	5123	
0371	75137	054523	ASC	3, YSTEM	
	75140	052105			
	75141	046440			
0372	75142	000000	OCT	0	
0373	75143	002400	CLA		
0374	75144	070033	STA	LTEMP+3	SET COMPARE DRUM ADDRESS
0375	75145	067770	LDB	STATB	B => BEGINNING OF COM TABLE
0376	75146		STANE	EQU *	
0377	75146	074034	STB	LTEMP+4	
0378	75147	160001	LDA	B, I	GET THE NEXT USED DRUM ADDRESS
0379	75150	010764	AND	M128	MASK OFF THE SECTOR PART
0380	75151	050033	CPA	LTEMP+3	IS IT ALREADY PRINTED
0381	75152	027155	JMP	STANG	YES
0382	75153	070033	STA	LTEMP+3	NO, PRINT OUT TRACK PART
0383	75154	017426	JSB	STADS	
0384	75155		STANG	EQU *	
0385	75155	064034	LDB	LTEMP+4	GET COM TABLE POINTER
0386	75156	006004	INB		ADVANCE TO NEXT ENTRY
0387	75157	057771	CPB	STATE	CHECK FOR END OF TABLE
0388	75160	002001	RSS		
0389	75161	027146	JMP	STANE	SCAN ON
0390	75162	017666	JSB	STAST	
0391	75163	006412	OCT	6412, 5125	
	75164	005125			
0392	75165	051505	ASC	2, SERS	
	75166	051123			
0393	75167	000000	OCT	0	
0394	75170	017654	JSB	STAPR	
0395*					
0396	75171	060342	LDA	.-8	8 PER
0397	75172	070033	STA	LTEMP+3	LINE
0398	75173	067775	LDB	STASW	=> DISC ADDRESS FOR TTY00
0399	75174		STASX	EQU *	
0400	75174	076001	STB	STAV1	
0401	75175	162001	LDA	STAV1, I	GET ADDRESS
0402	75176	002003	SZA	RSS	
0403	75177	027213	JMP	STASZ	DONE IF ZERO
0404	75200	017426	JSB	STADS	OUTPUT IT
0405	75201	034033	ISZ	LTEMP+3	LINE FULL
0406	75202	027206	JMP	STASY	NO
0407	75203	017654	JSB	STAPR	YES, OUTPUT IT
0408	75204	060342	LDA	.-8	
0409	75205	070033	STA	LTEMP+3	
0410	75206		STASY	EQU *	
0411	75206	066001	LDB	STAV1	
0412	75207	044375	ADB	.-+TTY01=TTY00	
0413	75210	057776	CPB	STASU	FINISHED ALL USERS
0414	75211	002001	RSS		YES
0415	75212	027174	JMP	STASX	NO
0416	75213		STASZ	EQU *	
0417	75213	060033	LDA	LTEMP+3	
0418	75214	050342	CPA	.-8	
0419	75215	002001	RSS		SKIP PRINTING BLANK LINE
0420	75216	017654	JSB	STAPR	

```

0421*
0422* PRINT OUT DISC ALLOCATION TABLE
0423*
0424 75217 017666 JSB STAST
0425 75220 005104 OCT 5104
0426 75221 044523 ASC 7, ISC ALLOCATION
      75222 041440
      75223 040514
      75224 046117
      75225 041501
      75226 052111
      75227 047510
0427 75230 011415 OCT 11415 XOFF=CR
0428 75231 005012 OCT 5012
0429 75232 020040 ASC 3, IDT
      75233 044504
      75234 052040
0430 75235 000000 OCT 0
0431 75236 017654 JSB STAPR
0432 75237 017473 JSB STABR READ BOOTSTRAP
0433 75240 064206 LDB LSTDA
0434 75241 044354 ADB ,+2
0435 75242 104200 DLD B,I
      75243 100001
0436 75244 104400 DST STAV2 SAVE ADDRESS OF DAT
      75245 074002
0437 75246 017510 JSB STADR READ DAT
0438 75247 060347 LDA ,=3 3 ENTRIES
0439 75250 064356 LDB ,+4 => 1ST IDT ENTRY
0440 75251 017447 JSB STADA SET UP BUFFER FOR IDT
0441 75252 017654 JSB STAPR PRINT IT
0442 75253 017666 JSB STAST
0443 75254 005040 OCT 5040
0444 75255 020104 ASC 5, DISC ADT
      75256 044523
      75257 041440
      75260 040504
      75261 052040
0445 75262 000000 OCT 0
0446 75263 017654 JSB STAPR
0447 75264 017510 JSB STADR READ DAT BACK
0448 75265 060342 LDA ,=8 8 ENTRIES
0449 75266 064367 LDB ,+13 => FIRST DISC ADT ENTRY
0450 75267 017447 JSB STADA SET UP BUFFER FOR ADT
0451 75270 017654 JSB STAPR PRINT IT
0452 75271 017666 JSB STAST
0453 75272 005040 OCT 5040
0454 75273 020104 ASC 3, DIREC
      75274 044522
      75275 042503
0455 75276 000000 OCT 0
0456 75277 017664 JSB STAPR
0457 75300 017510 JSB STADR READ DAT
0458 75301 060342 LDA ,=8 8 PER
0459 75302 070033 STA LTEMP+3 LINE

```

0460	75303	064562	LDB LIBD	
0461	75304	044417	ADB .+37	=> FIRST DIREC ENTRY
0462	75305		STATX EQU *	
0463	75305	076001	STB STAV1	
0464	75306	104200	DLD STAV1,I	GET DISC ADDRESS
	75307	174001		
0465	75310	002003	SZA,RSS	
0466	75311	006002	SZB	
0467	75312	002001	RSS	
0468	75313	027327	JMP STATY	SKIP IF ZERO
0469	75314	101100	SWP	
0470	75315	017722	JSB STA6D	OUTPUT IT
0471	75316	017666	JSB STAST	2 BLANKS
0472	75317	020040	ASC 1,	
0473	75320	000000	OCT 0	
0474	75321	034033	ISZ LTEMP+3	LINE FULL?
0475	75322	027327	JMP STATY	NO
0476	75323	017654	JSB STAPR	YES, PRINT IT
0477	75324	060342	LDA .+8	
0478	75325	070033	STA LTEMP+3	
0479	75326	017510	JSB STADR	READ DAT AGAIN
0480	75327		STATY EQU *	
0481	75327	066001	LDB STAV1	
0482	75330	044355	ADB .+3	
0483	75331	060207	LDA DATLN	
0484	75332	003004	CMA,INA	
0485	75333	002004	INA	
0486	75334	040562	ADA LIBD	
0487	75335	054000	CPB A	FINISHED ALL ENTRIES?
0488	75336	002001	RSS	YES
0489	75337	027305	JMP STATX	NO
0490	75340	060033	LDA LTEMP+3	
0491	75341	050342	CPA .+8	
0492	75342	002001	RSS	SKIP PRINTING BLANK LINE
0493	75343	017654	JSB STAPR	
0494	75344	017666	JSB STAST	
0495	75345	005040	OCT 5040	
0496	75346	020123	ASC 4, SYSTEM	
	75347	054523		
	75350	052105		
	75351	046440		
0497	75352	000000	OCT 0	
0498	75353	017654	JSB STAPR	
0499	75354	017510	JSB STADR	GET DAT BACK
0500	75355	064562	LDB LIBD	
0501	75356	160001	LDA B,I	
0502	75357	070033	STA LTEMP+3	SAVE LENGTH
0503	75360	006004	INB	
0504	75361	104200	DLD B,I	GET ADDRESS OF
	75362	100001		
0505	75363	101100	SWP	SYSTEM LIBRARY
0506	75364	017722	JSB STA6D	OUTPUT IT
0507	75365	060412	LDA .+40B	BLANK
0508	75366	017740	JSB STACH	
0509	75367	060033	LDA LTEMP+3	OUTPUT LENGTH

0510	75370	017754	JSB STA3D	
0511	75371	017666	JSB STAST	2 BLANKS
0512	75372	020040	ASC 1,	
0513	75373	000000	OCT 0	
0514	75374	064205	LDB LDBSA	
0515	75375	044355	ADB .+3	FIRST DISC
0516	75376	076001	STB STAV1	ADDRESS IN SST
0517	75377	060346	LDA .-4	
0518	75400	017520	JSB STASS	SEGMENTS 1-4
0519	75401	017654	JSB STAPR	
0520	75402	060345	LDA .-5	
0521	75403	017520	JSB STASS	SEGMENTS 5-9
0522	75404	017654	JSB STAPR	
0523	75405	060346	LDA .-4	
0524	75406	017520	JSB STASS	SEGMENTS 10-13
0525	75407	017654	JSB STAPR	
0526	75410	026267	JMP LEND	DONE

0002*

0003* STALL OUTPUTS A DRUM LOCATION AND LENGTH

0004*

0005	75411	000000	STALL	NOP	
0006	75412	074032		STB LTEMP+2	SAVE LENGTH.
0007	75413	017426		JSB STADS	OUTPUT DRUM ADDRESS
0008	75414	060032		LDA LTEMP+2	GET LENGTH.
0009	75415	003004		CMA, INA	MAKE POSITIVE.
0010	75416	006400		CLB	
0011	75417	100400		DIV DV9RS+1	GET FIRST DIGIT.
	75420	001033			
0012	75421	017716		JSB STADG	PRINT IT.
0013	75422	017754		JSB STA3D	PRINT REMAINING 3.
0014	75423	060412		LDA ,+40B	
0015	75424	017740		JSB STACH	OUTPUT BLANK.
0016	75425	127411		JMP STALL, I	

0017*

0018* STADS OUTPUTS A DRUM ADDRESS AS 8 CHARS FOLLOWED BY A BLANK

0019*

0020	75426	000000	STADS	NOP	
0021	75427	070031		STA LTEMP+1	
0022	75430	001222		RAL, RAL	GET DRUM NUMBER
0023	75431	010355		AND ,+3	
0024	75432	017716		JSB STADG	
0025	75433	060431		LDA ,+57B	SLASH.
0026	75434	017740		JSB STACH	
0027	75435	060031		LDA LTEMP+1	GET TRACK NO.
0028	75436	001727		ALF, ALF	
0029	75437	010734		AND B77	
0030	75440	017700		JSB STA2D	
0031	75441	060431		LDA ,+57B	SLASH.
0032	75442	017740		JSB STACH	
0033	75443	060031		LDA LTEMP+1	SECTOR NO.
0034	75444	010441		AND B177	
0035	75445	017754		JSB STA3D	
0036	75446	127426		JMP STADS, I	

0037*

0038* STADA PRINTS DISC ALLOCATION FOR THE IDT AND DISC ADT

0039*

0040	75447	000000	STADA	NOP	
0041	75450	070033		STA LTEMP+3	NUMBER OF ENTRIES
0042	75451	044562		ADB LIBD	* > 1ST ENTRY WE WANT
0043	75452		STAA1	EQU *	
0044	75452	074034		STB LTEMP+4	
0045	75453	104200		DLD LTEMP+4, I	GET DISC ADDRESS
	75454	100034			
0046	75455	002003		SZA, RSS	
0047	75456	006002		SZB	
0048	75457	002001		RSS	
0049	75460	027466		JMP STAA2	SKIP IF ZERO
0050	75461	101100		SWP	
0051	75462	017722		JSB STA6D	OUTPUT IT
0052	75463	017666		JSB STAST	2 BLANKS
0053	75464	020040		ASC 1,	
0054	75465	000000		OCT 0	

```

0055 75466          STAA2 EQU *
0056 75466 064034    LDB LTEMP+4
0057 75467 044355    ADB .+3          => NEXT ONE
0058 75470 034033    ISZ LTEMP+3     FINISHED?
0059 75471 027452    JMP STAA1        NO
0060 75472 127447    JMP STADA,I      YES
0061*
0062* STABR READS THE BOOTSTRAP
0063*
0064 75473 000000    STABR NOP
0065 75474 060750    LDA M512
0066 75475 070213    STA MWORD        LENGTH
0067 75476 002400    CLA
0068 75477 006404    CLB,INB
0069 75500 104400    DST LTEMP        DISC ADDRESS
          75501 000030
0070 75502 064205    LDB LUBSA        CORE ADDRESS
0071 75503 045036    ADB BIT15
0072 75504 060520    LDA DLTEM
0073 75505 114217    JSB DISCZ,I      READ IT
0074 75506 026311    JMP DDERR
0075 75507 127473    JMP STABR,I
0076*
0077* STADR READS THE DISC ALLOCATION TABLE
0078*
0079 75510 000000    STADR NOP
0080 75511 063777    LDA DSTV2        => DISC ADDRESS IN STAV2 + STAV3
0081 75512 064207    LDB DATLN
0082 75513 074215    STB MWORD        LENGTH
0083 75514 064566    LDB LIBDI        CORE ADDRESS
0084 75515 114217    JSB DISCZ,I      READ IT
0085 75516 026311    JMP DDERR
0086 75517 127510    JMP STADR,I
0087*
0088* STASS FILLS THE BUFFER WITH SYSTEM SEGMENT
0089* ADDRESS AND LENGTHS
0090*
0091 75520 000000    STASS NOP
0092 75521 070033    STA LTEMP+3     SAVE # OF SEGMENTS
0093 75522 017473    JSB STABR        READ BOOTSTRAP
0094 75523          STAS1 EQU *
0095 75523 104200    DLD STAV1,I     GET DISC ADDRESS
          75524 174001
0096 75525 101100    SWP
0097 75526 017722    JSB STA6D        OUTPUT IT
0098 75527 060412    LDA .+40B       BLANK
0099 75530 017740    JSB STACH
0100 75531 066001    LDB STAV1
0101 75532 044350    ADB .-2
0102 75533 160001    LDA B,I         GET LENGTH
0103 75534 044360    ADB .+6
0104 75535 076001    STB STAV1
0105 75536 001727    ALF,ALF        CONVERT
0106 75537 030762    IOR HIMSK
0107 75540 003004    CMA,INA        TO BLOCKS

```


0108	75541	017754	JSB STA3D	OUTPUT IT
0109	75542	017666	JSB STAST	2 BLANKS
0110	75543	020040	ASC 1,	
0111	75544	000000	OCT 0	
0112	75545	034033	ISZ LTEMP+3	
0113	75546	027523	JMP STAS1	
0114	75547	127520	JMP STASS,I	

```

0116* THIS COMMAND GIVES A PRINT OUT OF THE BAUD RATE &
0117* CHAR,SIZE FOR WHICH THE PORT IS CONFIGURED.
0118*
0119* THE DATA PRINTED IS:
0120*     PORT NR.
0121*     BAUD RATE
0122*     CHAR, SIZE
0123*
0124* FORMAT:
0125*
0126*     PORT=PORT#[,PORT#,.....] CR
0127* OR
0128*     PORT=ALL
0129*
0130 75000          ORG LIBRA
0131 75000 002400   CLA          CLEAR INDICATORS.
0132 75001 072767   STA POR31
0133 75002 072770   STA POR32
0134 75003 072771   STA PORTL
0135 75004 070031   STA PORC1
0136 75005 060177   LDA NPORT    SET UP LIMIT.
0137 75006 070030   STA PORCN
0138 75007 114572   JSB T35CH,I  GET CHAR,
0139 75010 026275   JMP LFRER    CR, ERROR!
0140 75011 053372   CPA POR,A   NO CR, #"A"?
0141 75012 027037   JMP POR3    YES.
0142 75013          POR13 EQU *
0143 75013 017270   JSB POR0D0  NO. DIGIT?
0144 75014          POR0  EQU *
0145 75014 017362   JSB PORSP   YES. COMPUTE PORT NR.
0146 75015 114572   JSB T35CH,I GET NEXT CHAR.
0147 75016 027022   JMP POR2    CR,
0148 75017 050426   CPA .+54B  NO CR, COMMA?
0149 75020 002001   RSS       YES.
0150 75021 027013   JMP POR13   NO.
0151*
0152 75022          POR2  EQU *
0153 75022 060031   LDA PORC1  CHECK LEGALITY.
0154 75023 040030   ADA PORCN
0155 75024 002021   SSA,RSS   >LIMIT?
0156 75025 026275   JMP LFRER  YES. ERROR!
0157 75026 017226   JSB PORIN  NO. SET INDICATOR.
0158 75027 060055   LDA T35LC PICK UP LAST CHAR.
0159 75030 050367   CPA .+15B WAS IT A CRT
0160 75031 027066   JMP POR4   YES. GIVE THE INFORMATION.
0161 75032 002400   CLA
0162 75033 070031   STA PORC1
0163 75034 114572   JSB T35CH,I NO. GET NEXT CHAR.
0164 75035 027065   JMP POR4   CR. GIVE THE INFORMATION.
0165 75036 027013   JMP POR13  NO CR.
0166*
0167*
0168 75037          POR3  EQU *
0169 75037 114572   JSB T35CH,I COMMAND FOR ALL PORTS GIVEN.
0170 75040 026275   JMP LFRER  GET NEXT CHAR.
                                CR, ERROR!

```

0171	75041	053373	CPA	POR,L	NO CR, "L"?
0172	75042	002001	RSS		
0173	75043	026275	JMP	LFRRR	NO, ERROR!
0174	75044	114572	JSB	T35CH,I	YES, GET NEXT CHAR.
0175	75045	026275	JMP	LFRRR	CR, ERROR!
0176	75046	053373	CPA	POR,L	"L"?
0177	75047	002001	RSS		
0178	75050	026275	JMP	LFRRR	NO, ERROR!
0179	75051	114572	JSB	T35CH,I	YES, GET NEXT CHAR.
0180	75052	002001	RSS		
0181	75053	026275	JMP	LFRRR	NO CR, ERROR!
0182	75054	002400	CLA		CR!
0183	75055		POR9	EQU *	
0184	75055	070031	STA	PORC1	
0185	75056	040030	ADA	PORCN	
0186	75057	002021	SSA,RSS		>LIMIT?
0187	75060	027065	JMP	POR4	YES,
0188	75061	017226	JSB	PORIN	NO, SET INDICATOR,
0189	75062	060031	LDA	PORC1	BUMP PORT NR.
0190	75063	002004	INA		
0191	75064	027055	JMP	POR9	
0192*					GIVE THE INFORMATION.
0193	75065		POR4	EQU *	
0194	75065	060303	LDA	T35B2	INITIALIZE
0195	75066	072562	STA	STABF	BUFFER POINTER,
0196	75067	017312	JSB	PROST	OUTPUT HEADING,
0197	75070	005040	OCT	5040	LF_SPACE
0198	75071	050117	ASC	4,PORT	
	75072	051124			
	75073	020040			
	75074	020040			
0199	75075	041101	ASC	6,BAUD RATE	
	75076	052504			
	75077	020122			
	75100	040524			
	75101	042440			
	75102	020040			
0200	75103	041510	ASC	5,CHAR. SIZE	
	75104	040522			
	75105	027040			
	75106	051511			
	75107	055105			
0201	75110	000000	OCT	0	
0202	75111	060412	LDA	,+32	A= NR. OF CHARS.
0203	75112	064305	LDB	T35B1	B= BUFFER POINTER,
0204	75113	016213	JSB	T35SP	PRINT & SUSPEND,
0205	75114	060303	LDA	T35B2	RESET BUFFER POINTER.
0206	75115	072562	STA	STABF	
0207*					
0208	75116		POR5	EQU *	
0209	75116	062771	LDA	PORTL	
0210	75117	050372	CPA	,+16	DONE?
0211	75120	027135	JMP	POR22	YES,
0212	75121	006400	CLB		CLEAR (B) AND GET
0213	75122	062767	LDA	PORS1	LOWER INDICATOR,

0214	75123	000010	SLA	BIT SET?
0215	75124	006004	INB	YES, BUMP (B).
0216	75125	001300	RAR	ROTATE RIGHT.
0217	75126	072767	STA POR51	RESTORE INDICATOR.
0218	75127	006003	SZB,RSS	IF BIT=0, JUMP.
0219	75130	027133	JMP POR7	OTHERWISE SET UP BUFFER.
0220	75131	017154	JSB POR6	
0221	75132	017300	JSB PROPR	PRINT BUFFER AND SUSPEND.
0222	75133		POR7 EQU *	
0223	75133	036771	ISZ PORTL	BUMP COUNTER.
0224	75134	027116	JMP POR5	GO BACK.
0225*				
0226	75135		POR22 EQU *	
0227	75135	062771	LDA PORTL	
0228	75136	050412	CPA .+32	DONE?
0229	75137	026267	JMP LEND	YES, GET OUT.
0230	75140	006400	CLB	CLEAR (B) AND GET
0231	75141	062770	LDA POR52	UPPER INDICATOR.
0232	75142	000010	SLA	BIT SET?
0233	75143	006004	INB	YES, BUMP (B).
0234	75144	001300	RAR	ROTATE RIGHT.
0235	75145	072770	STA POR52	RESTORE INDICATOR.
0236	75146	006003	SZB,RSS	IF BIT=0, JUMP.
0237	75147	027152	JMP POR8	OTHERWISE SET UP BUFFER.
0238	75150	017154	JSB POR6	
0239	75151	017300	JSB PROPR	PRINT BUFFER AND SUSPEND.
0240	75152		POR8 EQU *	
0241	75152	036771	ISZ PORTL	BUMP COUNTER.
0242	75153	027135	JMP POR22	GO BACK.
0243*				
0244*				
0245*				
0246	75154	000000	POR6 NOP	
0247	75155	060412	LDA .+40B	OUTPUT A BLANK.
0248	75156	017324	JSB PROCH	
0249	75157	017312	JSB PROST	OUTPUT 2 BLANKS.
0250	75160	020040	ASC 1,	
0251	75161	000000	OCT 0	
0252	75162	062771	LDA PORTL	GET PORT NR.
0253	75163	017344	JSB PRO2D	OUTPUT PORT NR.
0254	75164	017312	JSB PROST	OUTPUT 6 BLANKS.
0255	75165	020040	ASC 3,	
	75166	020040		
	75167	020040		
0256	75170	000000	OCT 0	
0257	75171	062771	LDA PORTL	GET PORT NR.
0258	75172	001727	ALF,ALF	ROTATE INTO POSITION.
0259	75173	032775	IOR WSP	MERGE INTO OPCODE.
0260	75174	114500	JSB S14SC,I	ASK FOR BAUD RATE.
0261	75175	102311	SFS CH2	
0262	75176	027175	JMP *-1	
0263	75177	102511	LIA CH2	GET BAUD RATE.
0264	75200	017353	JSB PRO3D	OUTPUT BAUD RATE.
0265	75201	017312	JSB PROST	OUTPUT 10 BLANKS.
0266	75202	020040	ASC 5,	

75203	020040		
75204	020040		
75205	020040		
75206	020040		
0267	75207	000000	OCT 0
0268	75210	062771	LDA PORTL
0269	75211	001727	ALF,ALF
0270	75212	030252	IOR WCS
0271	75213	114500	JSB S14SC,I
0272	75214	102311	SFS CH2
0273	75215	027214	JMP *-1
0274	75216	102511	LIA CH2
0275	75217	002003	SZA,RSS
0276	75220	027223	JMP POR11
0277	75221	017340	JSB PRODG
0278	75222	127154	JMP POR6,I
0279	75223		POR11 EQU *
0280	75223	060424	LDA .+42
0281	75224	017324	JSB PROCH
0282	75225	127154	JMP POR6,I
0283*			
0284*			
0285*			
0286	75226	000000	PORIN NOP
0287	75227	060031	LDA PORC1
0288	75230	064000	LDB A
0289	75231	005323	RBR,RBR
0290	75232	005323	RBR,RBR
0291	75233	004010	SLB
0292	75234	040332	ADA .-16
0293	75235	003004	CMA,INA
0294	75236	070033	STA PRCCN
0295*			
0296	75237	062767	LDA POR51
0297	75240	004010	SLB
0298	75241	062770	LDA POR52
0299	75242	064033	LDB PRCCN
0300	75243		POR11 EQU *
0301	75243	006003	SZB,RSS
0302	75244	027250	JMP POR12
0303	75245	001300	KAR
0304	75246	006004	INB
0305	75247	027243	JMP POR11
0306	75250		POR12 EQU *
0307	75250	030353	IOR .+1
0308*			
0309	75251	064033	LDB PRCCN
0310	75252		POR13 EQU *
0311	75252	006003	SZB,RSS
0312	75253	027257	JMP POR14
0313	75254	001200	RAL
0314	75255	006004	INB
0315	75256	027262	JMP POR13
0316	75257		POR14 EQU *
0317	75257	064031	LDB PORC1

GET PORT NR.
ROTATE INTO POSITION.

ASK FOR CHAR. SIZE.

GET CHAR. SIZE.
#0?

YES.
NO. OUTPUT IT.
RETURN.

OUTPUT "*" .

RETURN.

SETS PORT BIT IN INDICATOR.
A#PORT#
B#PORT#
ROTATE BIT#4 INTO BIT#0.

PORT#>15?
YES. MAKE PORT# FROM 0-15.
NO. NEGATE.
SET UP COUNTER.

A#LOWER INDICATOR.
UPPER OR LOWER PORT?
UPPER. A#UPPER INDICATOR.
B#COUNTER.

DONE?
YES.
NO. ROTATE RIGHT ONE BIT.
BUMP COUNTER.
GO BACK.

SET BIT.

B#COUNTER.

DONE?
YES.
NO. ROTATE LEFT ONE BIT.
BUMP COUNTER.
GO BACK.

0318	75260	005323	RBR,RBR	
0319	75261	005323	RBR,RBR	
0320	75262	004010	SLB	UPPER OR LOWER PORT?
0321	75263	027266	JMP PORI5	
0322	75264	072767	STA POR51	LOWER. STORE IN LOWER INDICATOR.
0323	75265	002001	RSS	
0324	75266		PORI5 EQU *	
0325	75266	072770	STA POR52	UPPER. STORE IN UPPER INDICATOR.
0326	75267	127226	JMP PORIN,I	EXIT.
0327*				
0328	75270	000000	PORDG NOP	CHECK IF DIGIT IS INPUT.
0329	75271	040316	ADA M72B	DIGIT?
0330	75272	002021	SSA,RSS	
0331	75273	026275	JMP LFRER	NO. ERROR!
0332	75274	040364	ADA .+10	MAY BE.
0333	75275	002020	SSA	
0334	75276	026275	JMP LFRER	NO. ERROR!
0335	75277	127270	JMP PORDG,I	DIGIT! RETURN.
0336*				
0337*				
0338*				
0339*				
0340*	PROPR PRINTS THE BUFFER.			
0341*				
0342	75300	000000	PROPR NOP	
0343	75301	063300	LDA PROPR	SAVE RETURN ADDRESS.
0344	75302	072213	STA T358P	
0345	75303	060303	LDA T3582	COMPUTE NR. OF CHARS.
0346	75304	003004	CMA,INA	
0347	75305	042562	ADA STABF	
0348	75306	064303	LDB T3582	RESET BUFFER
0349	75307	076562	STB STABF	POINTER.
0350	75310	064305	LDB T3581	
0351	75311	026214	JMP T358P+1	OUTPUT.
0352*				
0353*	PROST OUTPUTS A STRING.			
0354*				
0355	75312	000000	PROST NOP	
0356	75313	163312	LDA PROST,I	GET CHAR. PAIR.
0357	75314	002003	SZA,RSS	
0358	75315	127312	JMP PROST,I	
0359	75316	001727	ALF,ALF	OUTPUT LEFT CHAR.
0360	75317	017324	JSB PROCH	
0361	75320	163312	LDA PROST,I	OUTPUT RIGHT CHAR.
0362	75321	017324	JSB PROCH	
0363	75322	037312	ISZ PROST	BUMP POINTER.
0364	75323	027313	JMP PROST+1	LOOP.
0365*				
0366*	PROCH INSERTS A CHAR. INTO BUFFER.			
0367*				
0368	75324	000000	PROCH NOP	
0369	75325	074034	STB SPS2	SAVE B.
0370	75326	010441	AND B177	CLEAR LEFT PART.
0371	75327	066562	LDB STABF	GET BUFFER POINTER.
0372	75330	004065	CLE,ERB	

0373	75331	002041	SEZ,RSS	
0374	75332	001737	ALF,SLA,ALF	CHAR. ON LEFT.
0375	75333	130001	IOR 1,I	CHAR. ON RIGHT.
0376	75334	170001	STA 1,I	
0377	75335	036562	ISZ STABF	BUMP POINTER,
0378	75336	060034	LDA SPS2	A = B.
0379	75337	127324	JMP PROCH,I	
0380*				
0381*			PRODG OUTPUTS A DIGIT.	
0382*				
0383	75340	000000	PRODG NOP	
0384	75341	040432	ADA ,+60B	
0385	75342	017324	JSB PROCH	
0386	75343	127340	JMP PRODG,I	
0387*				
0388*			PRO2D OUTPUTS A 2-DIGIT NUMBER.	
0389*				
0390	75344	000000	PRO2D NOP	
0391	75345	006400	CLB	
0392	75346	100400	DIV ,+10	
		75347	000364	
0393	75350	017340	JSB PRODG	
0394	75351	017340	JSB PRODG	
0395	75352	127344	JMP PRO2D,I	
0396*				
0397*			PRO3D OUTPUTS A 3-DIGIT NUMBER.	
0398*				
0399	75353	000000	PRO3D NOP	
0400	75354	006400	CLB	
0401	75355	100400	DIV ,100	
		75356	000437	
0402	75357	017340	JSB PRODG	OUTPUT FIRST DIGIT.
0403	75360	017344	JSB PRO2D	OUTPUT LAST TWO.
0404	75361	127353	JMP PRO3D,I	
0405*				
0406	75362		PORSP EQU *	
0407	75362	000000	NOP	
0408	75363	070032	STA PORC2	SAVE (A).
0409	75364	060031	LDA PORC1	UPDATE
0410	75365	100200	MPY ,+10	
		75366	000364	
0411	75367	040032	ADA PORC2	PORT
0412	75370	070031	STA PORC1	NUMBER.
0413	75371	127362	JMP PORSP,I	
0414*				
0415*				
0416*				
0417*				
0418	00030		PORCN EQU LTEMP	
0419	75372	000101	POR,A OCT 101	=A
0420	75373	000114	POR,L OCT 114	=L
0421	00031		PORC1 EQU LTEMP+1	
0422	00032		PORC2 EQU LTEMP+2	
0423	00033		PRCCN EQU LTEMP+3	
0424	00034		SPS2 EQU LTEMP+4	

PAGE 0567 #48 PORT - SYSTEM CONSOLE.

0425 75374

SPOR EQU *

0480	75056	160032		LDA ROSID,I	
0481	75057	001121		ARS,ARS	
0482	75060	013112		AND ROSMS	
0483	75061	040001		ADA 1	
0484	75062	043113		ADA ROSFX	
0485	75063	170030		STA ROSP,I	STORE IN BUFFER,
0486	75064	034030		ISZ ROSP	
0487	75065	060033		LDA ROST	GET LAST 2 DIGITS,
0488	75066	006400		CLB	
0489	75067	100400		DIV ,+10	SEPARATE THEM,
	75070	000364			
0490	75071	001727		ALF,ALF	PACK AND CONVERT
0491	75072	040001		ADA 1	TO ASCII,
0492	75073	040574		ADA ASC00	
0493	75074	027100		JMP ROS4	GO STORE IN BUFFER,
0494	75075	063114	ROS3	LDA ROSDD	IF NO ID, PUT DOTS IN BUFFER,
0495	75076	170030		STA ROSP,I	
0496	75077	034030		ISZ ROSP	
0497	75100	170030	ROS4	STA ROSP,I	
0498	75101	034030		ISZ ROSP	
0499	75102	060032		LDA ROSID	ADVANCE ID POINTER,
0500	75103	040375		ADA ,+TTY01-TTY00	
0501	75104	070032		STA ROSID	
0502	75105	034031		ISZ ROSC	ANY MORE?
0503	75106	027042		JMP ROS1	YES,
0504	75107	037031		ISZ ROST0	
0505	75110	127031		JMP ROST0,I	NO
0506*					
0507	00030		ROSP	EQU LTEMP	
0508	00031		ROSC	EQU LTEMP+1	
0509	75111	005040	ROSLB	OCT 5040	
0510	00032		ROSID	EQU LTEMP+2	
0511	00033		ROST	EQU LTEMP+3	
0512	75112	017400	RUSMS	OCT 17400	
0513	75113	040060	ROSFX	ASC 1,00	
0514	75114	027056	ROSDD	ASC 1,..	
0515	75115		\$ROS	EQU *	

0517* THE ANNOUNCE (ANNOY) COMMAND IS USED TO SEND A MESSAGE FROM THE
 0518* SYSTEM CONSOLE TO THE USER CONSOLES, THE FORMAT IS

0519*
 0520* ANN=<PORT #>,<MESSAGE>

0521*
 0522* WHERE PORT # IS AN INTEGER BETWEEN 0 AND 31 OR 'ALL' AND MESSAGE
 0523* IS A STRING OF CHARACTERS ENDING WITH A CARRIAGE RETURN,
 0524*

0525	75000		ORG LIBRA	
0526	75000	114572	JSB T35CH,I	GET 1ST CHAR
0527	75001	026275	JMP LFRER	
0528	75002	053167	CPA ANN,A	'A'?
0529	75003	027046	JMP ANN2	YES
0530	75004	040316	ADA M72B	NO,
0531	75005	002021	SSA,RSS	DIGIT?
0532	75006	026275	JMP LFRER	NO
0533	75007	040364	ADA .+10	MAYBE
0534	75010	002020	SSA	
0535	75011	026275	JMP LFRER	NO
0536	75012	070030	STA LTEMP	YES, SAVE IT
0537	75013	114572	JSB T35CH,I	NEXT CHAR
0538	75014	026275	JMP LFRER	
0539	75015	050426	CPA .+54B	COMMA?
0540	75016	027043	JMP ANN1	YES
0541	75017	040316	ADA M72B	NO,
0542	75020	002021	SSA,RSS	DIGIT?
0543	75021	026275	JMP LFRER	NO
0544	75022	040364	ADA .+10	MAYBE
0545	75023	002020	SSA	
0546	75024	026275	JMP LFRER	NO
0547	75025	070031	STA LTEMP+1	YES
0548	75026	060030	LDA LTEMP	COMPUTE
0549	75027	100200	MPY .+10	
	75030	000364		
0550	75031	040031	ADA LTEMP+1	NUMBER
0551	75032	070030	STA LTEMP	
0552	75033	040177	ADA NPORT	
0553	75034	002021	SSA,RSS	TOO BIG?
0554	75035	026275	JMP LFRER	YES, ERROR
0555	75036	114572	JSB T35CH,I	NEXT CHAR
0556	75037	026275	JMP LFRER	
0557	75040	050426	CPA .+54B	COMMA?
0558	75041	002001	RSS	YES
0559	75042	026275	JMP LFRER	NO
0560	75043		ANN1 EQU *	
0561	75043	003400	CCA	SET FOR
0562	75044	070031	STA LTEMP+1	ONE PORT
0563	75045	027065	JMP ANN3	
0564	75046		ANN2 EQU *	
0565	75046	114572	JSB T35CH,I	NEXT CHAR
0566	75047	026275	JMP LFRER	
0567	75050	053170	CPA ANN,L	'L'?
0568	75051	114572	JSB T35CH,I	YES, NEXT CHAR
0569	75052	026275	JMP LFRER	NO
0570	75053	053170	CPA ANN,L	'L'?

0571	75054	114572	JSB	T35CH,I	YES, NEXT CHAR
0572	75055	026275	JMP	LFRER	NO
0573	75056	050426	CPA	.,+54B	COMMA?
0574	75057	002001	RSS		YES
0575	75060	026275	JMP	LFRER	NO
0576	75061	060177	LDA	NPORT	# OF PORTS TO SEND MESSAGE TO
0577	75062	070031	STA	LTEMP+1	
0578	75063	002400	CLA		1ST PORT IS 0
0579	75064	070030	STA	LTEMP	
0580	75065		ANN3	EQU *	
0581	75065	060367	LDA	.,+15B	CR
0582	75066	017132	JSB	ANNCH	
0583	75067	060364	LDA	.,+12B	LF
0584	75070	017132	JSB	ANNCH	
0585	75071	060364	LDA	.,+12B	LF
0586	75072	017132	JSB	ANNCH	
0587	75073		ANN4	EQU *	
0588	75073	002400	CLA		ALLOW
0589	75074	072044	STA	T35C1	BLANKS
0590	75075	114572	JSB	T35CH,I	NEXT CHAR
0591	75076	027101	JMP	ANN5	CR
0592	75077	017132	JSB	ANNCH	OUTPUT IT
0593	75100	027073	JMP	ANN4	LOOP
0594	75101		ANN5	EQU *	
0595	75101	017132	JSB	ANNCH	CR
0596	75102	060364	LDA	.,+12B	LF
0597	75103	017132	JSB	ANNCH	
0598	75104	060364	LDA	.,+12B	LF
0599	75105	017132	JSB	ANNCH	
0600	75106	063171	LDA	ANNJM	RESTORE BLANK
0601	75107	072044	STA	T35C1	BLANK SUPPRESSION
0602	75110		ANN6	EQU *	
0603	75110	060375	LDA	.,+TTY01-T1Y00	
0604	75111	100200	MPY	LTEMP	
		75112			
0605	75113	064000	LDB	A	
0606	75114	044546	ADB	DTTY0	B=> USER'S TTY TABLE
0607	75115	044366	ADB	.,+?STAT	
0608	75116	160001	LDA	B,I	A= STATUS
0609	75117	050354	CPA	.,+2	IS STATUS INPUT WAIT?
0610	75120	002001	RSS		
0611	75121	027126	JMP	ANN7	NO.
0612	75122	060030	LDA	LTEMP	YES.
0613	75123	001727	ALF,ALF		RE-ISSUE INPUT
0614	75124	030231	IOR	IWT	WAIT REQUEST.
0615	75125	114500	JSB	S148C,I	
0616	75126		ANN7	EQU *	
0617	75126	034030	ISZ	LTEMP	BUMP PORT#
0618	75127	034031	ISZ	LTEMP+1	ALL PORTS DONE?
0619	75130	027110	JMP	ANN6	NO.
0620	75131	026267	JMP	LEND	
0621*					
0622	75132	000000	ANNCH	NOP	
0623	75133	070032	STA	LTEMP+2	SAVE CHAR
0624	75134	060031	LDA	LTEMP+1	# OF PORTS

0625	75135	070033		STA	LTEMP+3	
0626	75136	060030		LDA	LTEMP	1ST PORT
0627	75137	070034		STA	LTEMP+4	
0628	75140		ANNC1	EQU	*	
0629	75140	060034		LDA	LTEMP+4	ASK 2114
0630	75141	001727		ALF,	ALF	IF BUFFER
0631	75142	030244		IQR	IBF	IS FULL
0632	75143	114500		JSB	S14SC,I	
0633	75144	102311		SFS	CH2	
0634	75145	027144		JMP	*-1	
0635	75146	102511		LIA	CH2	
0636	75147	002002		SZA		
0637	75150	027140		JMP	ANNC1	YES
0638	75151	060034		LDA	LTEMP+4	NO
0639	75152	001727		ALF,	ALF	
0640	75153	064255		LDB	PRIST	IS THE LP
0641	75154	006003		SZB,	RSS	IN USE?
0642	75155	027160		JMP	ANNC2	NO
0643	75156	150001		CPA	B,I	YES - IF THIS USER HAS
0644	75157	027163		JMP	ANNC3	LP, DO NOT SEND MESSAGE
0645	75160	030220	ANNC2	IQR	OCR	
0646	75161	030032		IQR	LTEMP+2	
0647	75162	114500		JSB	S14SC,I	OUTPUT CHAR
0648	75163	034034	ANNC3	ISZ	LTEMP+4	BUMP PORT *
0649	75164	034033		ISZ	LTEMP+3	ALL PORTS DONE?
0650	75165	027140		JMP	ANNC1	NO
0651	75166	127132		JMP	ANNCH,I	YES
0652	75167	000101	ANN,A	OCT	101	
0653	75170	000114	ANN,L	OCT	114	
0654	75171	026031	ANNJM	JMP	T35C0	
0655	75172		SANN	EQU	*	

0657* RESET ALLOWS A USER'S TIME-TO-DATE ENTRY TO BE MODIFIED.
 0658* THE FORMAT IS AS FOLLOWS:
 0659*
 0660* RESET=ALL ALL TIMES ARE SET TO ZERO
 0661*
 0662* RESET-ID SPECIFIED USER'S TIME SET TO ZERO
 0663*
 0664* RESET-ID,TIME SPECIFIED ID SET TO SPECIFIED TIME.
 0665*

```

0667 75000          ORG LIBRA
0668*
0669 75000 002400   CLA          INITIALIZE ID TO 0.
0670 75001 070052   STA ID
0671 75002 070031   STA REST  INITIALIZE TIME ALSO.
0672 75003 114572   JSB T35CH,I  GET 1ST CHAR.
0673 75004 026275   JMP LFRER    CR = = NO PARAMETERS
0674*
0675 75005 053160   CPA RESCA   "A" ?
0676 75006 027115   JMP RESX1   YES
0677 75007 003400   CGA          BACKSPACE
0678 75010          RESXE EQU *
0679 75010 040054   ADA T35CP   BUFFER POINTER.
0680 75011 070054   STA T35CP
0681*
0682 75012 016315   JSB GETID   GET THE ID.
0683 75013 027133   JMP RES2    GO GET TIME--NO CARRIAGE RETURN.
0684*
0685 75014          RES1 EQU *
0686 75014 164076   LDB IDLNP,I SET DRUM TRANSFER LENGTH
0687 75015 074072   STB WORD
0688 75016 101023   ASR 3       SET RESC=# OF ENTRIES -1.
0689 75017 044351   ADB ,-1
0690 75020 074030   STB RESC
0691 75021 160075   LDA IDLCP,I INITIATE DRUM
0692 75022 064566   LDB LIBDI   TRANSFER.
0693 75023 016231   JSB DRUML
0694 75024 116015   JSB SICKP,I DRUM ERROR, GO DIE GRACEFULLY
0695*
0696 75025 064562   LDB LIBD
0697 75026 060052   LDA ID
0698 75027 002003   SZA,RSS    IF ID=0 WE WANT TO CLEAR
0699 75030 027105   JMP RES4    ALL TIMERS.
0700*
0701 75031 034030   RES5 ISZ RESC SEARCH IDT FOR CORRECT ENTRY.
0702 75032 027046   JMP RES51   TEST ENTRY
0703*
0704 75033 063163   LDA RESER  GET ERROR MESSAGE POINTER
0705 75034 070050   STA MOVES  SET UP FOR MOVE ROUTINE
0706 75035 060305   LDA T35B1
0707 75036 070051   STA MOVED
0708 75037 064336   LDB RESES  GET CHARACTER COUNT
0709 75040 005100   BRS
0710 75041 016257   JSB MOVEW
    
```

0711	75042	060336	LDA RESES	GET CHAR COUNT
0712	75043	003004	CMA, INA	MAKE NEGATIVE CHAR COUNT
0713	75044	067163	LDB RESER	
0714	75045	026271	JMP LEND+2	
0715*				
0716	75046		RES51 EQU *	
0717	75046	150001	CPA 1, I	IS THIS THE ENTRY?
0718	75047	027052	JMP ++3	YES.
0719	75050	044362	ADB .+8	
0720	75051	027031	JMP RES5	
0721*				
0722	75052	044357	ADB .+5	SET IN
0723	75053	060031	LDA REST	NEW TIME.
0724	75054	170001	STA 1, I	
0725*				
0726	75055		RES6 EQU *	
0727	75055	160076	LDA IDLNP, I	WRITE ID
0728	75056	070072	STA WORD	TABLE BACK.
0729	75057	160075	LDA IDLCP, I	
0730	75060	064562	LDB LIBD	
0731	75061	016231	JSB DRUML	
0732	75062	027102	JMP RES62	DRUM ERROR
0733	75063	060052	LDA ID	CHECK FOR ALL
0734	75064	002002	SZA	
0735	75065	026267	JMP LEND	
0736	75066		RES61 EQU *	
0737	75066	060076	LDA IDLNP	ADVANCE ID TABLE POINTERS
0738	75067	040355	ADA .+3	
0739	75070	070076	STA IDLNP	
0740	75071	060075	LDA IDLCP	
0741	75072	040355	ADA .+3	
0742	75073	070075	STA IDLCP	
0743	75074	053162	CPA RESLE	CHECK FOR ALL ID TRACKS
0744	75075	026267	JMP LEND	DONE
0745	75076	160075	LDA IDLCP, I	CHECK TO SEE IF THE TRACK
0746	75077	002003	SZA, RSS	HAS BEEN ASSIGNED
0747	75100	027066	JMP RES61	NO, SKIP IT
0748	75101	027014	JMP RES1	NO
0749	75102		RES62 EQU *	
0750	75102	060075	LDA IDLCP	
0751	75103	164076	LDB IDLNP, I	
0752	75104	116016	JSB SALVP, I	
0753*				
0754	75105	044357	RES4 ADB .+5	CLEAR ALL TIMERS.
0755	75106	060031	LDA REST	GET TIME
0756	75107		RES42 EQU *	
0757	75107	034030	ISZ RESC	TEST FOR ANY MORE.
0758	75110	002001	RSS	
0759	75111	027055	JMP RES6	GO WRITE IDI BACK OUT.
0760	75112	170001	STA 1, I	STORE TIME
0761	75113	044362	ADB .+8	BUMP ADDRESS TO NEXT ENTRY.
0762	75114	027107	JMP RES42	LOOP
0763*				
0764	75115		RESX1 EQU *	
0765	75115	114572	JSB T35CH, I	GET NEXT CHARACTER

0766	75116	026275		JMP LFRER	ERROR, NOT ENOUGH CHARACTERS
0767	75117	053161		CPA RESCL	"L" ?
0768	75120	027123		JMP RESX2	YES
0769	75121	060350		LDA .-2	
0770	75122	027010		JMP RESXE	GO TRY TO PACK ID
0771	75123		RESX2	EQU *	
0772	75123	016370		JSB GTIL	SET UP IDLNP & IDLCP
0773	75124	114572		JSB T35CH,I	GET ANOTHER
0774	75125	026275		JMP LFRER	ERROR, NOT ENOUGH CHARACTERS
0775	75126	053161		CPA RESCL	"L" ?
0776	75127	027131		JMP RESX3	YES, RESET ALL USERS
0777	75130	026275		JMP LFRER	NOT "ALL" OR LEGAL ID
0778	75131		RESX3	EQU *	
0779	75131	114572		JSB T35CH,I	GET ANOTHER CHARACTER
0780	75132	027014		JMP RES1	CR, RESET TO ZERO
0781*					
0782*	COMPUTE THE TIME				
0783*					
0784	75133	050426	RES2	CPA .+540	TEST FOR COMMA
0785	75134	114572		JSB T35CH,I	COMMA OK--GET NEXT CHAR.
0786	75135	026275		JMP LFRER	ERROR IF NONE.
0787	75136	027141		JMP **3	
0788	75137	114572	RES3	JSB T35CH,I	GET NEXT CHAR.
0789	75140	027014		JMP RES1	
0790	75141	040316		ADA M72B	TEST FOR DIGIT.
0791	75142	002021		SSA,RSS	
0792	75143	026275		JMP LFRER	ERROR.
0793	75144	040364		ADA .+10	
0794	75145	002120		CLE,SSA	
0795	75146	026275		JMP LFRER	ERROR.
0796	75147	070032		STA RESD	SAVE DIGIT.
0797	75150	060031		LDA REST	GET PARTIAL RESULT.
0798	75151	100200		MPY .+10	COMPUTE NEW VALUE.
	75152	000364			
0799	75153	040032		ADA RESD	ADD IN NEW DIGIT.
0800	75154	070031		STA REST	SAVE NEW RESULT.
0801	75155	006043		SEZ,SZB,RSS	TEST FOR OVERFLOW.
0802	75156	027137		JMP RES3	
0803	75157	026275		JMP LFRER	ERROR.
0804*					
0805	75160	000101	RESCA	OCT 101	ASCII "A"
0806	75161	000114	RESCL	OCT 114	ASCII "L"
0807	75162	000112	RESLE	DEF IDEC+10	
0808	75163	075164	RESER	DEF **1	
0809	75164	005116		OCT 5116	
0810	75165	047440		ASC 5,0 SUCH ID	
	75166	051525			
	75167	041510			
	75170	020111			
	75171	042040			
0811	00336		RESES	EQU .+RESER-**+RESEN-**+2	
0812*					
0813	00030		RESC	EQU LTEMP	
0814	00031		REST	EQU LTEMP+1	
0815	00032		RESD	EQU LTEMP+2	

0816 75172

\$RES EQU *

0002* THE CHANGEID COMMAND CAN BE USED TO MODIFY THE PARAMETERS IN AN
 0003* ID ENTRY. THE MODIFIABLE ENTRIES ARE THE PASSWORD, TIME ALLOWED,
 0004* AND DISC ALLOWED. THE POSSIBLE FORMATS ARE:

0005*
 0006* CHANGEID=ID,PASSWORD,TIME,DISC
 0007* CHANGEID=ID,PASSWORD,TIME
 0008* CHANGEID=ID,PASSWORD,,DISC
 0009* CHANGEID=ID,,TIME,DISC
 0010* CHANGEID=ID,PASSWORD
 0011* CHANGEID=ID,,TIME
 0012* CHANGEID=ID,,,DISC

```

0014 75000          ORG LIBRA

0016 75000 016315   JSB GETID      GET ID ENTRY.
0017 75001 002001   RSS           SKIP TO COMMA TEST.
0018 75002 026275   JMP LFRER      FAIL IF NOTHING FOLLOWS.
0019 75003 050426   CPA ,+54B     TEST FOR COMMA FOLLOWING.
0020 75004 002001   RSS           OK.
0021 75005 026275   JMP LFRER      FAIL IF NO COMMA FOLLOWS.
0022*
0023 75006 160076   LDA IDLNP,I   READ IN THE IDT
0024 75007 070072   STA WORD
0025 75010 160075   LDA IDLCP,I
0026 75011 064566   LDB LIBDI
0027 75012 016231   JSB DRUML
0028 75013 116015   JSB SICKP,I   DRUM ERROR, DIE WITH CLASS
0029*
0030 75014 164076   LDB IDLNP,I   SEARCH ID TABLE
0031 75015 007004   CMB,INB      FOR CORRECT ID.
0032 75016 044562   ADB LIBD
0033 75017 060052   LDA ID
0034 75020 054562   CHA1 CPB LIBD TEST FOR IDT EXHAUSTED.
0035 75021 027026   JMP CHA2
0036 75022 044342   ADB ,=8      MOVE BACK TO NEXT ENTRY.
0037 75023 150001   CPA 1,I      TEST FOR CORRECT ENTRY.
0038 75024 027047   JMP CHA3     FOUND IT.
0039 75025 027020   JMP CHA1
0040*
0041 75026 063040   CHA2 LDA CHA2E  OUPUT NO ID MESSAGE.
0042 75027 070050   STA MOVES
0043 75030 060305   LDA T35B1
0044 75031 070051   STA MOVED
0045 75032 064344   LDB ,=6
0046 75033 016257   JSB MOVEW
0047 75034 060365   LDA ,+11
0048 75035 064306   LDB T35B1
0049 75036 114522   JSB TTY35,I
0050 75037 026272   JMP LENDR    TERMINATE.
0051 75040 075041   CHA2E DEF ++1
0052 75041 005116   OCT 5116    LF=N
0053 75042 047440   ASC 5,0     SUCH ID
       75043 051525
       75044 041510
  
```

75045 020111
75046 042040

0054*

0055* B NOW POINTS TO THE CORRECT ID.

0056*

0057 75047 006004 CHA3 INB
0058 75050 074030 STB CHAID
0059 75051 074031 STB CHAI1
0060 75052 114572 JSB T35CH,I
0061 75053 026275 JMP LFRER
0062 75054 050426 CPA .+54B
0063 75055 027115 JMP CHA5
0064 75056 006400 CLB
0065 75057 034030 ISZ CHAID
0066 75060 174030 STB CHAID,I
0067 75061 034030 ISZ CHAID
0068 75062 174030 STB CHAID,I
0069 75063 064031 LDB CHAI1
0070 75064 074030 STB CHAID
0071 75065 064347 LDB .-3
0072 75066 074032 STB CHAC
0073 75067 001727 CHA4 ALF,ALF
0074 75070 170030 STA CHAID,I
0075 75071 114572 JSB T35CH,I
0076 75072 027133 JMP CHAI0
0077 75073 050426 CPA .+54B
0078 75074 027115 JMP CHA5
0079 75075 130030 IOR CHAID,I
0080 75076 170030 STA CHAID,I
0081 75077 034032 ISZ CHAC
0082 75100 002001 RSS
0083 75101 027110 JMP CHA6
0084 75102 034030 ISZ CHAID
0085 75103 114572 JSB T35CH,I
0086 75104 027133 JMP CHAI0
0087 75105 050426 CPA .+54B
0088 75106 027115 JMP CHA5
0089 75107 027067 JMP CHA4

SET CHAID TO POINT TO THE
PASSWORD.
STORE COPY IN CHAI1.
GET FIRST CHARACTER OF POSSIBLE
PASSWORD--ERROR IF NONE.
IF COMMA, WE DON'T WANT TO
CHANGE PASSWORD.
INITIALIZE FASSWORD
TO NULLS.

SET CHAID TO POINT AT
PASSWORD AGAIN.
SET COUNTER FOR 3 WORD
PASSWORD.
SET LEFT CHARACTER OF WORD.

GET RIGHT CHARACTER.
TERMINATE IF CR.
IF COMMA, WE'RE DONE WITH
PASSWORD.
MERGE IN WITH LEFT CHAR.

TEST FOR ALL OF PASSWORD IN.
NOT ALL IN YET.

BUMP POINTER.
GET ANOTHER PASSWORD CHARACTER.
DONE IF CR.
TEST FOR COMMA.
LOOP.

0090*

0091 75110 114572 CHA6 JSB T35CH,I
0092 75111 027133 JMP CHAI0
0093 75112 050426 CPA .+54B
0094 75113 002001 RSS
0095 75114 026275 JMP LFRER

TEST FOR TOO MANY PASSWORD CHARS
END OF REQUEST.
TEST COMMA.
FAIL.

0096*

0097 75115 060031 CHA5 LDA CHAI1
0098 75116 040355 ADA .+3
0099 75117 070030 STA CHAID

SET CHAID TO POINT TO
TIME ALLOWED.

0100*

0101 75120 114572 JSB T35CH,I
0102 75121 026275 JMP LFRER
0103 75122 050426 CPA .+54B
0104 75123 002001 RSS
0105 75124 017145 JSB CHA#
0106 75125 034030 ISZ CHAID

GET 1ST CHAR OF POSSIBLE TIME.
ERROR IF NONE.
IF COMMA, GO TO DO DISC PART.
OTHERWISE GET NEW ALLOTTED TIME.
SET POINTER TO ALLOTTED DISC

```

0107 75126 034030      ISZ CHAID      SPACE.
0108 75127 114572      JSB T35CH,I   GET FIRST DIGIT OF DISC.
0109 75130 026275      JMP LFRER     FAIL IF NONE.
0110 75131 017145      JSB CHA#     COMPUTE IT.
0111 75132 026275      JMP LFRER     RETURN HERE IS ILLEGAL.
0112*
0113 75133              CHA10 EQU *
0114 75133 160075      LDA IDLNP,I   WRITE OUT THE NEW ID TABLE
0115 75134 070072      STA WORD
0116 75135 160075      LDA IDLCP,I
0117 75136 064562      LDB LIBD
0118 75137 016231      JSB DRUML
0119 75140 002001      RSS
0120 75141 026267      JMP LEND      TERMINATE.
0121*
0122 75142 060075      LDA IDLCP
0123 75143 164076      LDB IDLNP,I
0124 75144 118016      JSB SALVP,I
0125*
0126* CHA# SCANS THE INPUT BUFFER FOR A # FROM 0 TO 65535. IF IT FINDS
0127* ONE, IT STORES IT IN CHAID,I. IF NO CHARACTER FOLLOWS THE #,
0128* CHA# TRANSFERS TO CHA10. IF A COMMA FOLLOWS IT RETURNS. IF AN
0129* ERROR IS FOUND, IT TRANSFERS TO LFRER, THE 1ST CHARACTER OF
0130* THE NUMBER IS IN A UPON ENTRY.

0132 75145 000000      CHA# NOP
0133 75146 006400      CLB          INITIALIZE # TO ZERO.
0134 75147 174030      STB CHAID,I
0135 75150 040316      CHA7 ADA M72B  TEST FOR DIGIT.
0136 75151 002021      SSA,RSS
0137 75152 026275      JMP LFRER     FAIL.
0138 75153 040364      ADA ,+10
0139 75154 002020      SSA
0140 75155 026275      JMP LFRER     FAIL.
0141 75156 070033      STA CHAD     SAVE DIGIT.
0142 75157 160030      LDA CHAID,I  GET OLD VALUE.
0143 75160 100200      MPY ,+10     * 10
          75161 000364
0144 75162 000040      CLE
0145 75163 040033      ADA CHAD     + NEW DIGIT.
0146 75164 006043      SEZ,SZB,RSS  TEST FOR OVERFLOW.
0147 75165 002001      RSS         OK
0148 75166 026275      JMP LFRER     FAIL
0149 75167 170030      STA CHAID,I  STORE AGAIN.
0150 75170 114572      JSB T35CH,I  GET NEXT CHAR.
0151 75171 027133      JMP CHA10    DONE IF CR.
0152 75172 050426      CPA ,+54B    RETURN IF COMMA.
0153 75173 127145      JMP CHA#,I
0154 75174 027150      JMP CHA7     ELSE LOOP.

0156 00030      CHAID EQU LTEMP
0157 00031      CHA11 EQU LTEMP+1
0158 00032      CHAC  EQU LTEMP+2
0159 00033      CHAD  EQU LTEMP+3
0160 75175      SCHA  EQU *

```

0162* THE SLEEP COMMAND IS A SYSTEM COMMAND WHICH IS USED FOR SYSTEM
 0163* SHUTDOWN. THE SLEEP ROUTINE PERFORMS THE FOLLOWING FUNCTIONS:

- 0164*
 0165* 1) PLACE ALL USERS IN DISCONNECT MODE.
 0166* 2) OUTPUT SPECIFIED MESSAGE TO ALL TERMINALS.
 0167* 3) DISCONNECT ALL USERS.
 0168* 4) LOG OFF ALL ACTIVE USERS.
 0169* 5) FIXUP ALL USER TRACKS AND FUSS.
 0170* 6) GARBAGE COLLECT LIBRARY.
 0171* 7) DUMP SYSTEM TO MAG TAPE.

```

0173 75000          ORG LIBRA
0174 75000 103100   CLF 0
0175 75001 027030   JMP SLERE
0176 75002 000000   BSS 22          ROOM FOR HIBERNATE CODE
0177 75030          SLERE EQU *
0178 75030 063425   LDA SLEST
0179 75031 070010   STA CH1          WIPE OUT RECEIVE CHANNEL
0180 75032 002400   CLA
0181 75033 072044   STA T35C1       NO DEBLANKING
0182 75034 170634   STA DCLC1,I
0183 75035 060272   LDA MLINK
0184 75036 070300   STA T35LK
0185 75037 064546   LDB DTTY0
0186 75040 060444   SLE1 LDA DFCHK   CLEAR
0187 75041 110001   AND 1,I         BIT FLAG
0188 75042 170001   STA 1,I         WORD
0189 75043 044366   ADB ,+?STAT
0190 75044 060350   LDA XDISC       SET STATUS
0191 75045 170001   STA 1,I         TO ABORT
0192 75046 044337   ADB ,+?TNUM-?STAT
0193 75047 160001   LDA B,I         GET TTY NUMBER
0194 75050 030241   IOR KAO
0195 75051 114500   JSB S14SC,I     KILL OUTPUT
0196 75052 044374   ADB ,+?TNUM+TTY01-TTY00
0197 75053 054550   CPB DTT32       FINISHED ALL USERS?
0198 75054 002001   RSS            YES
0199 75055 027040   JMP SLE1        NO
0200 75056 160640   LDA DCLC2,I
0201 75057 170634   STA DCLC1,I
0202 75060 060662   LDA ONE1        OUTPUT
0203 75061 064666   LDB DEH         LINE FEED
0204 75062 114522   JSB TTY35,I

```

0205*
 0206* REMOVE USER, IF ANY, FROM THE LINE PRINTER

```

0207*
0208 75063 060247   LDA LPD         GET OPCODE
0209 75064 114500   JSB S14SC,I     TELL I/O PROCESSOR

```

0210*
 0211* OUTPUT SLEEP MESSAGE TO ALL ACTIVE TERMINALS.

```

0212*
0213 75065 060367   LDA ,+15B       FIRST OUTPUT CR-LF-LF
0214 75066 017402   JSB SLECH
0215 75067 060364   LDA ,+12B

```

0216	75070	017402		JSB SLECH	
0217	75071	060364		LDA .+128	
0218	75072	017402		JSB SLECH	
0219*					
0220	75073	016025		JSB T35C0	GET INPUT CHARACTER.
0221	75074	027077		JMP ++3	END OF INPUT
0222	75075	017402		JSB SLECH	
0223	75076	027073		JMP +-3	
0224*					
0225	75077	017402		JSB SLECH	FOLLOW BY ANOTHER CRLFLF.
0226	75100	060364		LDA .+128	
0227	75101	017402		JSB SLECH	
0228	75102	060364		LDA .+128	
0229	75103	017402		JSB SLECH	
0230*					
0231	75104	064546		LDB DTTY0	
0232	75105	006004		INB	
0233	75106	060317		LDA M32	
0234	75107	070031		STA LTEMP+1	
0235	75110	060232	SLE0	LDA HUU	HANG UP
0236	75111	130001		IOR 1,I	ALL
0237	75112	114500		JSB S149C,I	USERS
0238	75113	044375		ADB .+TTY01-TTY00	
0239	75114	034031		ISZ LTEMP+1	FINISHED ALL USERS?
0240	75115	027110		JMP SLE0	NO
0241*					
0242*	UPDATE LAST CHANGE DATE				
0243*					
0244	75116	002400		CLA	BLOCK CLOCK.
0245	75117	170634		STA DCLC1,I	
0246	75120	064546		LDB DTTY0	
0247	75121		SLE7	EQU *	
0248	75121	074030		STB LTEMP	
0249	75122	160030		LDA LTEMP,I	
0250	75123	010444		AND DFCHK	
0251	75124	002003		SZA,RSS	DATE NEED UPDATING?
0252	75125	027145		JMP SLE8	NO
0253	75126	044355		ADB .+?PROG	YES
0254	75127	160001		LDA B,I	
0255	75130	003000		CMA	
0256	75131	041221		ADA USE	
0257	75132	070072		STA WORD	
0258	75133	044351		ADB .+?DISC=?PROG	
0259	75134	160001		LDA B,I	
0260	75135	065222		LDB USEI	
0261	75136	016231		JSB DRUML	READ PROGRAM FROM SWAP TRACK
0262	75137	027145		JMP SLE8	ERROR
0263	75140	061502		LDA FCNTR	
0264	75141	003004		CMA,INA	
0265	75142	064030		LDB LTEMP	
0266	75143	044356		ADB .+?ID	
0267	75144	117424		JSB LSD,I	UPDATE LAST CHANGE DATE
0268	75145		SLE8	EQU *	
0269	75145	064030		LDB LTEMP	
0270	75146	002400		CLA	

0271	75147	170001	STA B,I	ZERO BIT FLAG WORD
0272	75150	044375	ADB ,+TTY01-TTY00	
0273	75151	054550	CPB DTTJ2	FINISHED ALL TTYS?
0274	75152	002001	RSS	YES
0275	75153	027121	JMP SLE7	NO
0276*				
0277*	NOW WE HAVE TO LOG OFF ALL ACTIVE USER.			
0278*				
0279	75154	160640	LDA DCLC2,I	UNBLOCK CLOCK.
0280	75155	170634	STA DCLC1,I	
0281	75156	064546	LDB DTTY0	SEARCH USER TABLES.
0282	75157	044356	ADB ,+?ID	FOR ACTIVE IDS.
0283	75160	060317	LDA M32	
0284	75161	070030	STA LTEMP	
0285	75162	160001	LDA 1,I	GET ID.
0286	75163	002003	SZA,RSS	TEST FOR ACTIVE.
0287	75164	027306	JMP SLE3	NOT ACTIVE.
0288	75165	074031	STB LTEMP+1	SAVE POINTER.
0289*				
0290*	COMPUTE TIME USED.			
0291*				
0292	75166	044356	ADB ,+?TIME-?ID	
0293	75167	104200	DLI 1,I	GET STARTING TIME
	75170	100001		
0294	75171	003004	CMA,INA	SET BOTH PARTS NEGATIVE.
0295	75172	007004	CMB,INB	
0296	75173	103100	CLF 0	
0297	75174	040201	ADA DATIM	A## OF HRS. USED.
0298	75175	000040	CLE	
0299	75176	044202	ADB DATIM+1	B## OF UNITS, WITH OVERFLOW IN E
0300	75177	102100	STF 0	
0301	75200	074032	STB LTEMP+2	SAVE # OF UNITS.
0302	75201	100200	MPY D00	HRS##> MINS.
	75202	000724		
0303	75203	070033	STA LTEMP+3	
0304	75204	060032	LDA LTEMP+2	GET UNIT COUNT; IF E=0 THEN
0305	75205	002041	SEZ,RSS	COUNT AS NEGATIVE
0306	75206	007400	CCB	
0307	75207	100400	DIV D600	CHANGE TO MINUTES.
	75210	000456		
0308	75211	040033	ADA LTEMP+3	ADD IN OTHER MINUTES.
0309	75212	070032	STA LTEMP+2	TOTAL IN LTEMP(2).
0310*				
0311*	SEARCH IDT FOR USER.			
0312*				
0313	75213	160031	LDA LTEMP+1,I	GET THIS CLODS ID CODE
0314	75214	070052	STA ID	
0315	75215	016370	JSB GTIL	FIND WHICH IDT TRACK IT'S ON
0316	75216	160076	LDA IDLNP,I	GET LENGTH
0317	75217	070072	STA WORD	FOR DRUM DRIVER
0318	75220	160075	LDA IDLCP,I	
0319	75221	064566	LDB LIBDI	
0320	75222	016231	JSB DRUML	READ IN APPROPRIATE IDT TRACK
0321	75223	116015	JSB SICKP,I	CAN'T, DIE, KEEPING CHARISMA
0322	75224	160031	LDA LTEMP+1,I	GET ID AGAIN.

0323	75225	064562	LDB LIBD	GET IDT POINTER,
0324	75226	150001	CPA 1,I	
0325	75227	027232	JMP **3	
0326	75230	044362	ADB .+8	
0327	75231	027226	JMP *-3	
0328*				
0329*	UPDATE IDT ENTRY,			
0330*				
0331	75232	044357	ADB .+5	COMPUTER NEW TOTAL TIME,
0332	75233	000040	CLE	
0333	75234	160001	LDA 1,I	
0334	75235	040032	ADA LTEMP+2	
0335	75236	002040	SEZ	IF OVERFLOW,
0336	75237	003400	CCA	USE MAXIMUM.
0337	75240	170001	STA 1,I	
0338*				
0339	75241	060604	LDA LOGCT	CHECK FOR ROOM IN LOG TABLE.
0340	75242	050412	CPA .+32	
0341	75243	027241	JMP **2	
0342	75244	060620	LDA LOGP2	SET LOGP2 TO NEXT LOCATION IN
0343	75245	002004	INA	LOG TABLE.
0344	75246	050630	CPA LOGND	
0345	75247	060626	LDA LOG8G	
0346	75250	070620	STA LOGP2	
0347	75251	160031	LDA LTEMP+1,I	PLACE ID IN LOG TABLE.
0348	75252	031036	IOR BIT15	
0349	75253	170620	STA LOGP2,I	
0350	75254	034620	ISZ LOGP2	
0351	75255	104200	OLD DATIM	COMPUTE TIME OF DAY.
	75256	000201		
0352	75257	074032	STB LTEMP+2	SAVE UNIT COUNTER
0353	75260	006400	CLB	GET NO OF HRS.
0354	75261	100400	DIV .+24	
	75262	000402		
0355	75263	060001	LDA 1	
0356	75264	100200	MPY D60	CHANGE TO MINS.
	75265	000724		
0357	75266	070033	STA LTEMP+3	SAVE,
0358	75267	060032	LDA LTEMP+2	CHANGE UNITS TO MINS.
0359	75270	040704	ADA D36K	
0360	75271	100400	DIV D600	
	75272	000456		
0361	75273	040033	ADA LTEMP+3	COMPUTE TOTAL TIME.
0362	75274	001722	ALF,RAL	ROTATE
0363	75275	040030	ADA LTEMP	ADD IN PORT NO.
0364	75276	040412	ADA .+32	
0365	75277	170620	STA LOGP2,I	STORE IN TABLE.
0366	75300	034604	ISZ LOGCT	BUMP COUNTER.
0367*				
0368	75301	160075	LDA IDLCP,I	
0369	75302	064562	LDB LIBD	
0370	75303	016231	JSB DRUML	WRITE OUT MODIFIED IDT TRACK
0371	75304	027377	JMP SLE6	BLEW IT, TRY TO SALVAGE
0372	75305	064031	LDB LTEMP+1	GET POINTER AGAIN.
0373	75306	044375	ADB .+TTY01-TTY00	

SLE3

0374	75307	034030	ISZ	LTEMP	TEST FOR DONE.
0375	75310	027162	JMP	SLE2	
0376*					
0377*					
0378	75311	060604	LDA	LOGCT	WAIT FOR LOG TABLE TO EMPTY.
0379	75312	002002	SZA		
0380	75313	027311	JMP	**2	
0381	75314	050313	CPA	T35F1	WAIT FOR TTY TO STOP.
0382	75315	002001	RSS		
0383	75316	027314	JMP	**2	
0384*					
0385*					
0386*					
0387	75317	064210	LDB	MHAD	FIND
0388	75320	044354	ADB	.*2	
0389	75321	160001	LDA	B,I	AN
0390	75322	160000	LDA	A,I	
0391	75323	002002	SZA		
0392	75324	027327	JMP	**3	ACTIVE
0393	75325	044360	ADB	.*6	
0394	75326	027321	JMP	SLE5	DISC
0395	75327	044350	ADB	.-2	
0396	75330	104200	DL0	B,I	CONVERT
	75331	100001			
0397	75332	000065	CLE,ERA		SECTORS
0398	75333	005540	ERB,CLE		TO BLOCKS
0399	75334	006004	INB		GET
0400	75335	002040	SEZ		BOOTSTRAP
0401	75336	002004	INA		ADDRESS
0402	75337	104400	DST	SLEBA	
	75340	075432			
0403	75341	060750	LDA	M512	512 WORDS IN
0404	75342	070215	STA	MWORD	BOOTSTRAP
0405	75343	063426	LDA	SLEBD	READ
0406	75344	064205	LDB	LDBSA	
0407	75345	045036	ADB	BIT15	BOOTSTRAP
0408	75346	114217	JSB	DISCZ,I	
0409	75347	116015	JSB	SICKP,I	
0410	75350	060350	LDA	.-2	2 PARTS
0411	75351	073430	STA	SLECT	TO LOADER
0412	75352	060206	LDA	LSTDA	COMPUTE ADDRESS
0413	75353	073431	STA	SLETP	OF SEGMENT TABLE
0414	75354	104200	DL0	SLETP,I	GET LENGTH AND CORE ADDRESS
	75355	175431			
0415	75356	070215	STA	MWORD	
0416	75357	037431	ISZ	SLETP	
0417	75360	037431	ISZ	SLETP	
0418	75361	045036	ADB	BIT15	
0419	75362	063431	LDA	SLETP	
0420	75363	114217	JSB	DISCZ,I	READ A PORTION OF THE LOADER
0421	75364	116015	JSB	SICKP,I	
0422	75365	037431	ISZ	SLETP	
0423	75366	037431	ISZ	SLETP	
0424	75367	037430	ISZ	SLECT	FINISHED BOTH PARTS?
0425	75370	027354	JMP	SLE4	NO

```

0426*
0427 75371 063427 LDA HLT4C YES, SET POWER
0428 75372 070004 STA 4 FAIL TO HALT
0429 75373 107700 CLC 0,C
0430 75374 002400 SLEHI CLA A = 0 SEZ SLEEP
0431 75375 127376 JMP SLECA,I TRANSFER TO LOADER DISC DUMP
0432 75376 020000 SLECA OCT 20000
0433*
0434 75377 060075 SLE6 LDA IDLCP
0435 75400 064072 LDB WORD
0436 75401 116016 JSB SALVP,I
0437*
0438*
0439* SLECH OUTPUTS THE CHARACTER IN A TO ALL ACTIVE
0440* USER TERMINALS.
0441*
0442 75402 000000 SLECH NOP
0443 75403 070030 STA LTEMP SAVE CHARACTER.
0444 75404 060317 LDA M32 SET
0445 75405 070031 STA LTEMP+1 COUNTER.
0446 75406 064546 LDB DTTY0 GET INITIAL POINTER.
0447 75407 044356 ADB .+?ID
0448 75410 160001 SLEC1 LDA 1,I TEST FOR ACTIVE.
0449 75411 002003 SZA,RSS
0450 75412 027420 JMP SLEC2 INACTIVE.
0451 75413 074032 STB LTEMP+2 SAVE POINTER.
0452 75414 060030 LDA LTEMP
0453 75415 044346 ADB .-?ID
0454 75416 114576 JSB OUTCH,I OUTPUT IT.
0455 75417 064032 LDB LTEMP+2 GET ID POINTER AGAIN.
0456 75420 044375 SLEC2 ADB .+TTY01-TTY00
0457 75421 034031 ISZ LTEMP+1 TEST FOR DONE.
0458 75422 027410 JMP SLEC1
0459 75423 127402 JMP SLECH,I
0460*
0461 75424 073353 L9D DEF LCD
0462 75425 103710 SLEST STC CH1,C RESPOND TO 2114 SO NO HANG-UP
0463 75426 075432 SLEBD DEF SLEBA
0464 75427 103004 HLT4C HLT 4,C
0465*
0466 75430 000000 SLECT BSS 1
0467 75431 000000 SLETP BSS 1
0468 75432 000000 SLEBA BSS 2
0469*
0470 75434 SSLE EQU *

```

0472* THE HIBERNATE COMMAND IS IDENTICAL TO THE SLEEP COMMAND
 0473* EXCEPT THAT IT UPDATES THE HDATE WORD IN THE EQUIPMENT TABLE AND
 0474* TELLS THE MAG TAPE SLEEP TO DUMP THE ENTIRE SYSTEM TO TAPE,

0475*

```

0476 75000          ORG LIBRA
0477 75000 103100   CLF 0
0478 75001 060176   LDA MAGSC      CHECK FOR MAG TAPE
0479 75002 002002   SZA
0480 75003 027026   JMP HIBA      TAPE PRESENT, OKAY
0481*
0482 75004 063017   LDA HIBR1     SET UP
0483 75005 070050   STA MOVES     SOURCE
0484 75006 060305   LDA T35B1    AND
0485 75007 070051   STA MOVED     DESTINATION
0486 75010 064336   LDB HIBS1    FOR MOVE ROUTINE
0487 75011 005100   BRS          MAKE WORD COUNT
0488 75012 016257   JSB MOVEW    MOVE MESSAGE INTO BUFFER
0489 75013 060336   LDA HIBS1    LOAD CHARACTER COUNT
0490 75014 003004   CMA, INA
0491 75015 064305   LDB T35B1
0492 75016 026271   JMP LEND+2   PRINT ERROR MESSAGE
0493 75017 075020   HIBR1 DEF *+1
0494 75020 005116   OCT 5116
0495 75021 047440   ASC 5,0 MAG TAPE
      75022 046501
      75023 043440
      75024 052101
      75025 050105
0496 00336          HIBS1 EQU ,+HIBR1-*,+HIBR1-*,+2
0497 75026          HIBA EQU *
0498 75026 060201   LDA DATIM    LOAD THE CURRENT TIME AND
0499 75027 070203   STA HDATE   SET INTO THE EQUIPMENT TABLE
0500 75374          ORG SLEHI
0501 75374 003400   CCA        A * -1 SEZ HIBERNATE
    
```

0002* NEWID CREATES NEW ENTRIES IN THE SYSTEM ID TABLE, THE INPUT
 0003* FORMAT IS AS FOLLOWS:
 0004*
 0005* NEWID IDCODE, PASSWORD, TIME, DISC
 0006*
 0007* THESE PROVIDE, RESPECTIVELY, WORDS 0, 1-3, 4, AND 6 OF THE ID ENTRY.
 0008* WORDS 5 AND 7 ARE INITIALIIZED TO ZERO.

```

0010 75000 ORG LIBRA
0011*
0012* NOW INTERPRET PARAMETERS
0013*
0014 75000 016315 JSB GETID GET
0015 75001 002001 RSS
0016 75002 026275 JMP LFRER ID ENTRY.
0017 75003 050426 CPA ,+54B TEST FOR COMMA.
0018 75004 002401 CLA, RSS OK
0019 75005 026275 JMP LFRER NOT OK
0020*
0021* INPUT ID=TABLE *
0022 75006 160076 LDA IDLNP, I A = LENGTH OF ID TABLE
0023 75007 070072 STA WORD
0024 75010 160075 LDA IDLCP, I CALL DRUM DRIVER TO
0025 75011 064566 LDB LIBDI INPUT IDTABLE.
0026 75012 044362 ADB ,+8
0027 75013 114770 JSB DRUM, I
0028 75014 064052 LDB ID
0029 75015 074030 STB LTEMP
0030*
0031* NOW SCAN PASSWORD
0032*
0033 75016 002400 CLA
0034 75017 070055 STA T35LC
0035 75020 017231 JSB NEWIP
0036 75021 070031 STA LTEMP+1
0037 75022 017231 JSB NEWIP
0038 75023 070032 STA LTEMP+2
0039 75024 017231 JSB NEWIP
0040 75025 070033 STA LTEMP+3
0041*
0042* GET THE ALLOWED TIME
0043*
0044 75026 060055 LDA T35LC CHECK FOR
0045 75027 050426 CPA ,+54B COMMA
0046 75030 027030 JMP NEWI4
0047 75031 114572 JSB T35CH, I GET NEXT CHAR.
0048 75032 026275 JMP LFRER
0049 75033 050426 CPA ,+54B MUST BE A COMMA.
0050 75034 002001 RSS
0051 75035 026275 JMP LFRER
0052*
0053 75036 017176 NEWI4 JSB NEWI# GET THE ALLOTTED TIME
0054 75037 070034 STA LTEMP+4 IN MINUTES.
0055 75040 060055 LDA T35LC
    
```

0056	75041	050426	CPA	.,+54B	
0057	75042	002001	RSS		
0058	75043	026275	JMP	LFRRER	
0059*					
0060	75044	017176	JSB	NEWI#	GET THE DISC ALLOWED.
0061	75045	070036	STA	LTEMP+6	
0062	75046	006400	CLB		
0063	75047	074035	STB	LTEMP+5	
0064	75050	074037	STB	LTEMP+7	
0065	75051	060055	LDA	T35LC	MUST BE END OF
0066	75052	050367	CPA	.,+16B	LINE,
0067	75053	002001	RSS		
0068	75054	026275	JMP	LFRRER	
0069*					
0070	75055	060261	LDA	ENDRM	TEST FOR DRUM INPUT DONE
0071	75056	002020	SSA		
0072	75057	027055	JMP	+=2	
0073	75060	002002	SZA		
0074	75061	116015	JSB	SICKP,I	CROAK CREATIVELY
0075*					
0076	75062	164076	LDB	IDLNP,I	SET B TO POINT TO LAST ID ENTRY
0077	75063	007004	CMB	INB	
0078	75064	044562	ADB	LIBD	
0079	75065	002001	RSS		
0080	75066		NEWI7	EQU *	
0081	75066	044342	ADB	.,=8	POINT TO NEXT ENTRY
0082	75067	054562	CPB	LIBD	DONE WITH ID TABLE?
0083	75070	027077	JMP	NEWI5	YES,
0084	75071	160001	LDA	1,I	GET TABLE ID.
0085	75072	040053	ADA	MID	SUBTRACT TEST ID.
0086	75073	002003	SZA	RSS	TEST FOR EQUAL
0087	75074	027140	JMP	NEWI6	GO PRINT MESSAGE.
0088	75075	002021	SSA	RSS	IF LESS WE FOUND A HOLE.
0089	75076	027066	JMP	NEWI7	ELSE LOOP.
0090	75077		NEWI5	EQU *	
0091	75077	160076	LDA	IDLNP,I	GET LENGTH
0092	75100	053611	CPA	N8192	CHECK FOR TRACK FULL
0093	75101	027252	JMP	NWSU	AND SUPERNEW IF SO
0094*					
0095*	SLIDE	ID TABLE UP			
0096*					
0097	75102	060562	LDA	LIBD	MOVE THE
0098	75103	070051	STA	MOVED	FIRST PART
0099	75104	040362	ADA	.,+8	OF THE ID
0100	75105	070050	STA	MOVES	TABLE
0101	75106	007004	CMB	INB	COMPUTE LENGTH OF MOVE.
0102	75107	044562	ADB	LIBD	
0103	75110	016257	JSB	MOVEW	
0104	75111	060520	LDA	DLTEM	MOVE THE
0105	75112	070050	STA	MOVES	NEW PART
0106	75113	064342	LDB	.,=8	IN.
0107	75114	016257	JSB	MOVEW	
0108	75115	061230	LDA	LIBUS	SET UP
0109	75116	007400	CCB		NEW
0110	75117	044075	ADB	IDLCP	FIRST ID

```

0111 75120 170001          STA B,I           ON TRACK
0112*
0113 75121 160076          LDA IDLNP,I       MODIFY IDLENGTH
0114 75122 040342          ADA ,=8
0115 75123 170076          STA IDLNP,I
0116 75124 070072          STA WORD
0117 75125 160075          LDA IDLCP,I       OUTPUT
0118 75126 064562          LDB LIBD          TO
0119 75127 016231          JSB DRUML         DRUM
0120 75130 002001          RSS
0121 75131 026267          JMP LEND
0122 75132 060075          LDA IDLCP
0123 75133 164076          LDB IDLNP,I
0124 75134 116016          JSB SALVP,I
0125*
0126 75135 063155          NEWI2 LDA NEWIA     OUTPUT TABLE FULL MESSAGE
0127 75136 064343          LDB NEWIB
0128 75137 027142          JMP NEWI8
0129 75140 063166          NEWI6 LDA NEWIE     OUTPUT DUPLICATE ENTRY MESSAGE.
0130 75141 064342          LDB NEWIF
0131*
0132 75142 070050          NEWI8 STA MOVES      SET UP FOR MOVE
0133 75143 060305          LDA T35B1         ROUTINE
0134 75144 070051          STA MOVED         MOVE STRING
0135 75145 074030          STB LTEMP         INTO BUFFER.
0136 75146 016257          JSB MOVEW
0137 75147 060030          LDA LTEMP
0138 75150 001000          ALS
0139 75151 003004          CMA,INA           CALL
0140 75152 064305          LDB T35B1         DRIVER.
0141 75153 114522          JSB TTY35,I
0142 75154 026272          JMP LENDR        TERMINATE.
0143*
0144* OUTPUT MESSAGES
0145*
0146 75155 075156          NEWIA DEF ++1
0147 75156 005111          OCT 5111
0148 75157 042040          ASC 6,D TABLE FULL
       75160 052101
       75161 041114
       75162 042440
       75163 043125
       75164 046114
0149 00343          NEWIB EQU ,=++NEWIA+1
0150 75165 075166          NEWIE DEF ++1
0151 75166 005104          OCT 5104
0152 75167 052520          ASC 7,UPPLICATE ENTRY
       75170 046111
       75171 041501
       75172 052105
       75173 020105
       75174 047124
       75175 051131
0153 00342          NEWIF EQU ,=++NEWIE+1
0154 75176 000000          NEWI# NOP        SCAN FOR A NUMBER.

```

0155	75177	002400	CLA	INITIALIZE
0156	75200	073630	STA NEWIT	TO ZERO.
0157	75201	114572	JSB T35CH,I	GET NEXT CHARACTER
0158	75202	027227	JMP NEWIZ	DONE
0159	75203	040316	ADA M72B	TEST FOR DIGIT
0160	75204	002021	SSA,RSS	
0161	75205	027227	JMP NEWIZ	NOT A DIGIT
0162	75206	040364	ADA ,+10	
0163	75207	002120	CLE,SSA	
0164	75210	027227	JMP NEWIZ	
0165	75211	067630	LDB NEWIT	
0166	75212	005626	ELB,ELB	
0167	75213	006051	SEZ,SLB,RSS	
0168	75214	002001	RSS	
0169	75215	026275	JMP LFRER	
0170	75216	047630	ADB NEWIT	
0171	75217	005600	ELB	
0172	75220	006051	SEZ,SLB,RSS	
0173	75221	002001	RSS	
0174	75222	026275	JMP LFRER	
0175	75223	040001	ADA 1	
0176	75224	002040	SEZ	
0177	75225	026275	JMP LFRER	
0178	75226	027200	JMP NEWI#+2	
0179	75227	063630	NEWIZ LDA NEWIT	
0180	75230	127176	JMP NEWI#,I	
0181	75231	000000	NEWIP NOP	GET NEXT 2 PASSWORD LETTERS.
0182	75232	002400	CLA	
0183	75233	064055	LDB T35LC	IF LAST CHARACTER A
0184	75234	054426	CPB ,+54B	COMMA, RETURN ZERO.
0185	75235	127231	JMP NEWIP,I	
0186	75236	114572	JSB T35CH,I	GET NEXT CHAR.
0187	75237	026275	JMP LFRER	
0188	75240	050426	CPA ,+54B	IF A COMMA
0189	75241	027232	JMP NEWIP+1	
0190	75242	001727	ALF,ALF	SAVE 1ST
0191	75243	073630	STA NEWIT	CHAR.
0192	75244	114572	JSB T35CH,I	
0193	75245	026275	JMP LFRER	
0194	75246	050426	CPA ,+54B	IF COMMA TAKE AS
0195	75247	002400	CLA	ZERO.
0196	75250	043630	ADA NEWIT	
0197	75251	127231	JMP NEWIP,I	

0198*
 0199* THIS SECTION IS CALLED TO REDISTRIBUTE
 0200* THE ID TABLE ACCROSS ALL THREE ID TRACKS.

0201*				
0202	75252	NWSU	EQU *	
0203	75252	074041	STB NWSV	SAVE POINTER TO ENTRY
0204*				PRECEDING NEW ONE
0205	75253	060342	LDA ,+8	FIND THE
0206	75254	040102	ADA IDEC+2	TOTAL LENGTH
0207	75255	040105	ADA IDEC+5	OF THE TABLE
0208	75256	040110	ADA IDEC+8	
0209	75257	064111	LDB NIDT	CHECK NUMBER OF ID TRACKS

0210	75260	054353		CPB .+1	CHECK FOR SINGLE TRACK
0211	75261	027135		JMP NEWI2	NO MORE ROOM
0212	75262	054354		CPB .+2	ONLY TWO ID TRACKS?
0213	75263	027277		JMP NWSW	YES, DEAL WITH TWO
0214	75264	064347		LDB .-3	SET COUNT OF ID TRACKS
0215	75265	074045		STB NWST	
0216	75266	007400		CCB	FIND NUMBER OF
0217	75267	101023		ASR 3	ENTRIES IN TABLE
0218	75270	100400		DIV .+3	SPREAD OVER THREE TRACKS
		75271			
0219	75272	053607		CPA N1024	
0220	75273	006003		SZB, RSS	
0221	75274	053610		CPA N1025	
0222	75275	027135		JMP NEWI2	FULL, OUTPUT ERROR
0223	75276	027311		JMP NNTA	
0224	75277		NWSW	EQU *	
0225	75277	064350		LDB .-2	
0226	75300	074045		STB NWST	SET COUNT OF ID TRACKS
0227	75301	007400		CCB	FIND NUMBER OF ENTRIES
0228	75302	101023		ASR 3	IN TABLE
0229	75303	100400		DIV .+2	
		75304			
0230	75305	053607		CPA N1024	
0231	75306	006003		SZB, RSS	
0232	75307	053610		CPA N1025	
0233	75310	027135		JMP NEWI2	FULL, OUTPUT ERROR
0234	75311		NNTA	EQU *	
0235	75311	040351		ADA .-1	INCREASE # OF ENTRIES/TRACK BY
0236	75312	070042		STA NWS5	ONE AND SAVE
0237	75313	044351		ADB .-1	LET B COUNT HOW MANY TRACKS WILL
0238	75314	074043		STB NWSB	BE THIS LARGER SIZE
0239*					
0240	75315	063613		LDA NWSNN	SET TABLE POINTER
0241	75316	070044		STA NWSP	
0242	75317	067617		LDB NWSID	
0243	75320		NNTB	EQU *	
0244	75320	160001		LDA B, I	GET DRUM ADDRESS
0245	75321	002003		SZA, RSS	SKIP IF TRACK NOT ALLOCATED
0246	75322	027331		JMP NWS5	
0247	75323	034043		ISZ NWSB	TEST FOR BIG TRACK
0248	75324	002001		RSS	YES
0249	75325	034042		ISZ NWS5	NO, SWITCH TO SMALLER SIZE
0250	75326	060042		LDA NWS5	GET TRACK SIZE
0251	75327	001020		ALS, ALS	AND CONVERT TO WORDS
0252	75330	001000		ALS	
0253	75331		NWS5	EQU *	
0254	75331	170044		STA NWSP, I	STORE TRACK SIZE IN TABLE
0255	75332	044355		ADB .+3	
0256	75333	034044		ISZ NWSP	ADVANCE SIZE TABLE POINTER
0257	75334	034045		ISZ NWST	COUNT
0258	75335	027320		JMP NNTB	
0259*					
0260*					
0261*					
0262*					

TABLE NN NOW CONTAINS THE NEW LENGTHS OF
THE THREE ID TRACKS.

0263 75336 063613 LDA NWSNN SET UP POINTER
 0264 75337 070044 STA NWSP TO LENGTH WORD

0265*

0266* THE MAIN PART OF THIS ALGORITHM CONSISTS OF TWO
 0267* SECTIONS. IN THE FIRST SECTION WE READ AS MUCH AS
 0268* POSSIBLE INTO THE SWAP AREA. IN THE SECOND SECTION
 0269* WE WRITE AS MUCH AS POSSIBLE. THE ENTIRE PROCEDURE
 0270* IS THEN REPEATED UNTIL WE ARE FINISHED.

0271* THE FOLLOWING MEANINGS ARE ASSOCIATED
 0272* WITH THESE VARIABLES:

0273*
 0274* NWSK1 => ID TABLE ENTRY FOR TRACK BEING READ
 0275* NWSL1 => ID TABLE ENTRY FOR TRACK BEING WRITTEN
 0276* NWSK2 # OF WORDS READ SO FAR FROM K1
 0277* NWSL2 # OF WORDS WRITTEN SO FAR ON L1
 0278* NWS # OF WORDS IN CORE
 0279* NWSP => # OF WORDS TO BE WRITTEN ON L1
 0280*

0281 75340 NWS7 EQU *
 0282 75340 063624 LDA NWSL2 IS # OF WORDS WRITTEN SO FAR TO
 0283 75341 003004 CMA,INA L1 # OF WORDS TO BE WRITTEN
 0284 75342 150044 CPA NWSP,I
 0285 75343 027461 JMP NWS10 YES GO

0286*
 0287 75344 NWS8 EQU *
 0288 75344 063626 LDA NWS IS THE SWAP AREA FULL?
 0289 75345 043612 ADA NT232
 0290 75346 002021 SSA,RSS
 0291 75347 027472 JMP NWS11 YES, GO TO WRITE SECTION
 0292 75350 070072 STA WORD NO, SAVE AVAILABLE WORD COUNT
 0293 75351 067620 LDB NWSK1 HAVE WE READ ALL THREE TRACKS?
 0294 75352 057623 CPB NIDC3
 0295 75353 027472 JMP NWS11 YES, GO TO WRITE SECTION
 0296 75354 163620 LDA NWSK1,I A = # ON THIS TRACK
 0297 75355 043625 ADA NWSK2 A = # NOT READ YET
 0298 75356 002002 SZA ENTIRE TRACK READ YET?
 0299 75357 027364 JMP NWS9 NO
 0300 75360 044355 ADB ,+3 YES, TRY NEXT TRACK
 0301 75361 077620 STB NWSK1
 0302 75362 073625 STA NWSK2 SET # OF WORDS READ TO ZERO
 0303 75363 027344 JMP NWS8 TEST THIS TRACK
 0304*

0305 75364 NWS9 EQU *
 0306 75364 064000 LDB A B = # OF WORDS NOT YET READ
 0307 75365 007004 CMB,INB MAKE POSITIVE
 0308 75366 044072 ADB WORD IS # ON TRACK > # WE HAVE
 0309 75367 006020 SSB ROOM FOR?
 0310 75370 027374 JMP NWS9A NO, READ ENTIRE TRACK
 0311 75371 060072 LDA WORD GET # WE CAN FIT IN
 0312 75372 040734 ADA B77 REDUCE TO NEXT SMALLER
 0313 75373 010610 AND M64 SECTOR SIZE
 0314 75374 NWS9A EQU *
 0315 75374 002003 SZA,RSS IF WE CAN'T READ ANY,
 0316 75375 027472 JMP NWS11 THEN GO TO THE WRITE SECTION
 0317*

0318	75376	070072	STA WORD	SET WORD COUNT FOR READ
0319	75377	063625	LDA NWSK2	GET # READ SO FAR
0320	75400	006400	CLB	DIVIDE BY 64 TO GET
0321	75401	101026	ASR 6	SECTOR ADDRESS
0322	75402	007400	CCB	
0323	75403	047620	ADB NWSK1	GET ID TRACK ADDRESS
0324	75404	140001	ADA B,I	COMPUTE READ ADDRESS
0325	75405	064566	LDB LIBDI	
0326	75406	047626	ADB NWS	GENERATE READ ADDRESS AND
0327	75407	016231	JSB DRUML	READ IT IN
0328	75410	116017	JSB DEADP,I	BLEW IT, ARRGH
0329*				
0330	75411	064072	LDB WORD	UPDATE COUNT OF WORDS
0331	75412	007004	CMB,INB	IN CORE
0332	75413	047626	ADB NWS	
0333	75414	077626	STB NWS	
0334	75415	064072	LDB WORD	UPDATE COUNT OF WORDS READ
0335	75416	007004	CMB,INB	FROM THIS TRACK
0336	75417	047625	ADB NWSK2	
0337	75420	077625	STB NWSK2	
0338*				
0339	75421	063627	LDA NWSTG	HAVE WE INSERTED THE NEW
0340	75422	002002	SZA	ENTRY YET?
0341	75423	027344	JMP NWS8	YES, TRY TO READ SOME MORE
0342	75424	063620	LDA NWSK1	ARE WE READING THE TRACK
0343	75425	050076	CPA IDLNP	IT WAS TO GO ON?
0344	75426	002001	RSS	YES
0345	75427	027344	JMP NWS8	NO, TRY TO READ SOME MORE
0346	75430	044562	ADB LIBD	DETERMINE IF WE HAVE READ THE
0347	75431	007000	CMB	ENTRY PRECEEDING THE NEW ONE
0348	75432	044041	ADB NWSV	
0349	75433	006021	SSB,RSS	
0350	75434	027344	JMP NWS8	
0351	75435	006004	INB	
0352*				
0353	75436	037627	ISZ NWSTG	INDICATE ENTRY HAS BEEN INSERTED
0354	75437	060562	LDA LIBD	COMPUTE
0355	75440	043626	ADA NWS	MOVE
0356	75441	040361	ADA .+7	DESTINATION
0357	75442	070051	STA MOVED	
0358	75443	040342	ADA .-8	COMPUTE MOVE SOURCE
0359	75444	070050	STA MOVES	
0360	75445	016243	J9B MOVEB	CALL THE REVERSE MOVER
0361*				
0362	75446	060050	LDA MOVES	NOW SET DESTINATION
0363	75447	002004	INA	TO POINT AT FIRST
0364	75450	070051	STA MOVED	WORD OF HOLE
0365	75451	060520	LDA DLTEM	SET SOURCE AT LTEMP
0366	75452	070050	STA MOVES	
0367	75453	064342	LDB .-8	MOVE IN ENTRY
0368	75454	016257	JSB MOVEW	
0369*				
0370	75455	063626	LDA NWS	EIGHT MORE
0371	75456	040362	ADA .+8	WORDS ARE NOW
0372	75457	073626	STA NWS	IN CORE

```

0373 75460 027344      JMP NWS8      CONTINUE READING
0374*
0375*      COME HERE WHEN THE CURRENT OUTPUT TRACK HAS BEEN FILLED
0376*
0377 75461      NWS10 EQU *
0378 75461 063621      LDA NWSL1      TEST FOR LAST TRACK
0379 75462 063622      CPA NIDC2
0380 75463 027576      JMP NWS16      ALL DONE, CLEAN UP IDEC
0381 75464 040355      ADA ,+3        ADVANCE TO NEXT TRACK
0382 75465 073621      STA NWSL1
0383 75466 002400      CLA            SET NUMBER OF WORDS WRITTEN
0384 75467 073624      STA NWSL2      SO FAR TO ZERO
0385 75470 034044      ISZ NWSP       ADVANCE POINTER TO WORDS
0386 75471 027340      JMP NWS7       TO BE WRITTEN
0387*
0388*      THIS SECTION IS THE OUTPUT SECTION. THIS SECTION
0389*      IS ONLY CALLED WHEN NO MORE CAN BE READ. THIS SECTION
0390*      WRITES OUT AS MUCH AS POSSIBLE UNTIL WE HAVE EXHAUSTED
0391*      ALL WE HAVE IN CORE OR UNTIL FURTHER OUTPUT WOULD
0392*      OVERLAY INFORMATION THAT HAS NOT BEEN READ.
0393*      THE FOLLOWING ADDITIONAL VARIABLES
0394*      ARE USED IN THIS SECTION:
0395*
0396*      NWS8 = COUNT OF WORDS THAT HAVE BEEN
0397*      WRITTEN FROM THE CURRENT CORE LOAD.
0398*
0399 75472      NWS11 EQU *
0400 75472 002400      CLA
0401 75473      NWS15 EQU *
0402 75473 070042      STA NWS8      SET # OF WORDS WRITTEN OUT
0403 75474 063624      LDA NWSL2     SET WORD = # OF WORDS LEFT TO
0404 75475 140044      ADA NWSP,1    BE WRITTEN ON L1
0405 75476 067621      LDB NWSL1     TEST FOR WRITING ON A TRACK
0406 75477 057620      CPB NWSK1     NOT YET READ
0407 75500 027514      JMP NWS12     WE ARE, CHECK FOR OVERLAY
0408 75501      NWS13 EQU *
0409 75501 064042      LDB NWS8      SET B = # LEFT IN CORE
0410 75502 007004      CMB,INB
0411 75503 047626      ADB NWS
0412 75504 074043      STB NWSB     SAVE
0413 75505 044000      ADB A        COMPARE WITH # WE WANT TO WRITE
0414 75506 006021      SSB,RSS
0415 75507 027523      JMP NWS14     HAVE ENOUGH. - COUNT IN A
0416 75510 060043      LDA NWSB     ONLY WRITE WHAT WE HAVE
0417 75511 010610      AND M64      MAKE FULL SECTOR
0418 75512 003004      CMA,INA      MAKE NEGATIVE
0419 75513 027523      JMP NWS14
0420 75514      NWS12 EQU *
0421 75514 067624      LDB NWSL2     IF WRITING ON UNREAD TRACK, MAKE
0422 75515 007004      CMB,INB      -SURE WE DON'T GO INTO UNREAD
0423 75516 047625      ADB NWSK2    AREA
0424 75517 044000      ADB A
0425 75520 007025      CMB,SSB,INB,RSS
0426 75521 040001      ADA B        CHANGE COUNT TO AVOID OVERLAYING
0427 75522 027501      JMP NWS13     UNREAD DATA

```

```

0428*
0429*           A NOW CONTAINS THE NEGATIVE COUNT OF WORDS
0430*           THAT ARE TO BE WRITTEN
0431*
0432 75523           NWS14 EQU *
0433 75523 070072   STA WORD           IF NO WORDS ARE TO BE WRITTEN,
0434 75524 002003   SZA, RSS           GO MOVE CORE FOR NEW INPUT
0435 75525 027561   JMP NWS17
0436 75526 003004   CMA, INA
0437 75527 070043   STA NWSB
0438 75530 063624   LDA NWSL2       TEST FOR FIRST WRITE ON
0439 75531 002002   SZA           THIS TRACK
0440 75532 027542   JMP NWS18
0441*
0442 75533 063621   LDA NWSL1       IF THIS IS
0443 75534 040350   ADA .-2        THE FIRST
0444 75535 064562   LDB LIBD       WRITE ON THIS
0445 75536 044042   ADB NWSB      TRACK, THEN
0446 75537 164001   LDB B, I       UPDATE THE
0447 75540 174000   STB A, I      IDEC TABLE
0448 75541 002400   CLA
0449*
0450 75542           NWS18 EQU *
0451 75542 006400   CLB           CONVERT WORD COUNT
0452 75543 101026   AGR 6        TO SECTOR ADDRESS
0453 75544 007400   CCB
0454 75545 047621   ADB NWSL1
0455 75546 140001   ADA B, I     ADD IN TRACK ADDRESS
0456 75547 064562   LDB LIBD     GENERATE
0457 75550 044042   ADB NWSB    CORE ADDRESS
0458 75551 016231   JSB DRUML    AND OUTPUT CURRENT PIECE
0459 75552 116017   JSB DEADP, I BLEW IT, ARRGH!
0460 75553 060043   LDA NWSB    ADJUST NUMBER OF WORDS
0461 75554 043624   ADA NWSL2   OUTPUT TO TRACK
0462 75555 073624   STA NWSL2
0463 75556 064043   LDB NWSB
0464 75557 040042   ADA NWSB
0465 75560 027473   JMP NWS15
0466*
0467*           COME HERE WHEN WE CAN'T WRITE ANYMORE
0468*
0469 75561           NWS17 EQU *
0470 75561 050042   CPA NWSB
0471 75562 027340   JMP NWS7     IF NOTHING WRITTEN AT ALL, GO
0472 75563 064042   LDB NWSB    TRY TO READ AGAIN
0473 75564 007004   CMB, INB    ADJUST NUMBER OF WORDS
0474 75565 047626   ADB NWS     IN CORE
0475 75566 077526   STB NWS
0476 75567 007004   CMB, INB
0477 75570 060562   LDA LIBD    MAKE NEGATIVE FOR MOVE ROUTINE
0478 75571 070051   STA MOVED   SET
0479 75572 040042   ADA NWSB    . DESTINATION
0480 75573 070050   STA MOVES   AND SOURCE
0481 75574 016257   JSB MOVEN
0482 75575 027340   JMP NWS7

```

0483*

0484*

ALL OF THE ID TRACKS HAVE NOW BEEN WRITTEN.
 BACK TO THE DRUM, UPDATE THE WORD COUNTS IN
 THE IDEC TABLE

0485*

0486*

0487*

```

0488 75576          NWS16 EQU *
0489 75576 063614   LDA NWSNN+1
0490 75577 070102   STA IDEC+2
0491 75600 063615   LDA NWSNN+2
0492 75601 070105   STA IDEC+5
0493 75602 063616   LDA NWSNN+3
0494 75603 070110   STA IDEC+8
0495 75604 002400   CLA
0496 75605 070260   STA LIB
0497 75606 026267   JMP LEND
    
```

INDICATE TO SWAPR THAT
 NO LIBRARY PROGRAM IS IN CORE

0498*

```

0499 75607 176000   N1024 DEC =1024
0500 75610 175777   N1025 DEC =1025
0501 75611 160000   N8192 DEC =8192
0502 75612 154010   NT232 ABS 8=ULEN
0503 75613 075614   NWSNN DEF ++1
0504 75614 000000   BSS 3
0505 00041          NWSV EQU LTEMP+9
0506 00042          NWS5 EQU LTEMP+10
0507 00043          NWS8 EQU LTEMP+11
0508 00044          NWSP EQU LTEMP+12
0509 00045          NWST EQU LTEMP+13
0510 75617 000101   NWSID DEF IDEC+1
0511 75620 000102   NWSK1 DEF IDEC+2
0512 75621 000102   NWSL1 DEF IDEC+2
0513 75622 000110   NIDC2 DEF IDEC+8
0514 75623 000113   NIDC3 DEF IDEC+11
0515 75624 000000   NWSL2 OCT 0
0516 75625 000000   NWSK2 OCT 0
0517 75626 000000   NWS OCT 0
0518 75627 000000   NWSTG OCT 0
0519 75630 000000   NEWIT BSS 1
0520 75631          $NEW EQU *
    
```

=> FIRST DRUM ADDRESS
 => ID TABLE ENTRY FOR READ TRACK
 => ID TABLE ENTRY FOR WRITE TRAC

= LENGHT FOR WRITE TRACK
 = LENGTH FOR READ TRACK
 = # OF WORDS IN CORE

0002* THE KILLID ROUTINE IS USED TO REMOVE ID CODES FROM THE SYSTEM
 0003* IDTABLE. THE FORMAT IS:

0004*

0005* KILLID = IDCODE

0006*

0007* IDCODE A000 CANNOT BE KILLED BY THIS COMMAND.

0008* GROUP LIBRARIANS CANNOT BE KILLED IF ANY MEMBER OF

0009* THEIR GROUP IS LOGGED ON.

0010*

0011* KILLID PERFORMS THE FOLLOWING FUNCTIONS:

0012*

0013* 1. THE ID-CODE IS REMOVED FROM THE IDT.

0014* 2. ANY USERS LOGGED ON WITH THIS NUMBER ARE DUMPED.

0015* 3. ALL LIBRARY SPACE ALLOCATED TO THIS ID IS RETURNED TO THE

0016*

SYSTEM.

0018	75000		ORG LIBRA	
0019	75000	016315	JSB GETID	TRANSLATE THE IDCODE.
0020	75001	026275	JMP LFRER	ERROR IF NO CR FOLLOWD.
0021	75002	060052	LDA ID	TEST FOR A000.
0022	75003	050612	CPA A000	
0023	75004	027164	JMP KID31	
0024*				
0025*			CHECK FOR GROUP LIBRARIAN	
0026*				
0027	75005	010602	AND B1777	MASK TO NUMBER PART
0028	75006	006400	CLB	
0029	75007	100400	DIV .100	
		75010	000437	
0030	75011	006002	SZB	SKIP IF EVEN HUNDRED
0031	75012	027043	JMP KIDAA	NOT EVEN, NOT GROUP LIBRARIAN
0032*				
0033*			CHECK TO SEE IF ANY OF HIS SUBJECTS ARE ON	
0034*				
0035	75013	060317	LDA M32	COUNT OF USERS
0036	75014	070042	STA KIDC	
0037	75015	064546	LDB DTTY0	*> FIRST TTY TABLE
0038	75016	044356	ADB .+?ID	*> FIRST ID
0039	75017		KIDAD EQU *	
0040	75017	074031	STB KIDP	SAVE POINTER
0041	75020	160001	LDA B,I	GET THE ID OF THIS USER
0042	75021	050052	CPA ID	THE SAME?
0043	75022	027037	JMP KIDAF	YES, HE GETS KILLED ANYWAY
0044	75023	010602	AND B1777	LEAVE THE NUMBER PART
0045	75024	006400	CLB	
0046	75025	100400	DIV .100	
		75026	000437	
0047	75027	100200	MPY .100	TURN BACK INTO NUMBER
		75030	000437	
0048	75031	064000	LDB A	SAVE IN B
0049	75032	160031	LDA KIDP,I	GET THE ID AGAIN
0050	75033	010732	AND M2000	LEAVE LETTER PART
0051	75034	030001	IOR B	CONSTRUCT THE GROUP ID
0052	75035	050052	CPA ID	IS THIS ONE IN HIS GROUP?

```

0053 75036 027172          JMP KIDAN          YES, DISALLOW THE KILL.
0054 75037          KIDAF EQU *
0055 75037 064031          LDB KIDP          GET THE POINTER
0056 75040 044375          ADB .+TTY01-TTY00
0057 75041 034042          ISZ KIDC          CHECK COUNTER
0058 75042 027017          JMP KIDAD          BACK TO CHECK REST
0059 75043          KIDAA EQU *
0060*
0061* READ IN IDT.
0062*
0063 75043 160076          LDA IDLNP,I      SET LENGTH FOR DRUM DRIVER
0064 75044 070072          STA WORD
0065 75045 160075          LDA IDLCP,I
0066 75046 064566          LDB LIBDI
0067 75047 016231          JSB DRUML
0068 75050 116015          JSB SICKP,I      DRUM ERROR WITH CHANCE OF RECOVER
0069*
0070* SEARCH IDT.
0071*
0072 75051 164076          LDB IDLNP,I
0073 75052 007004          CMB,INB
0074 75053 044562          ADB LIBD
0075 75054 060052          LDA ID
0076 75055 054562          KID33 CPB LIBD  TEST FOR NOT THERE.
0077 75056 027167          JMP KID32
0078 75057 044342          ADB .-8          TEST FOR FOUND.
0079 75060 150001          CPA 1,I
0080 75061 002001          RSS
0081 75062 027055          JMP KID33        FOUND IT.
0082*
0083* REMOVE ID FROM TABLE.
0084*
0085 75063 074051          STB MOVED
0086 75064 044362          ADB .+8
0087 75065 074050          STB MOVES
0088 75066 044674          ADB MLIBD
0089 75067 144076          ADB IDLNP,I
0090 75070 016257          JSB MOVEW
0091*
0092* WRITE BACK TO DISC.
0093*
0094 75071 160076          LDA IDLNP,I
0095 75072 040362          ADA .+8
0096 75073 170076          STA IDLNP,I
0097 75074 070072          STA WORD
0098 75075 160075          LDA IDLCP,I
0099 75076 064562          LDB LIBD
0100 75077 016231          JSB DRUML
0101 75100 116017          JSB DEADP,I      DRUM ERROR WITH NO HOPE
0102*
0103* SEARCH TTY TABLES FOR ANY USER TO BE DUMPED.
0104*
0105 75101 060317          LDA M32          SET COUNTER
0106 75102 070042          STA KIDC
0107 75103 003400          CCA              SET KIDT TO SAY NONE

```

0108	75104	070033		STA KIDT	FOUND YET.
0109	75105	064546		LDB DTTY0	
0110	75106	044356		ADB .+?ID	
0111	75107	160001	KID34	LDA 1,I	GET ID FROM TABLE.
0112	75110	050052		CPA ID	IS IT THIS USER?
0113	75111	027120		JMP KID35	YES--GO DUMP HIM.
0114	75112	044375	KID37	ADB .+TTY01=TTY00	
0115	75113	034042		ISZ KIDC	ANY MORE TO TEST?
0116	75114	027107		JMP KID34	YES.
0117	75115	034033		ISZ KIDT	NEED TO WRITE BACK FUSS?
0118	75116	027244		JMP KID36	YES--TRANSFER TO NEXT PART
0119	75117	027250		JMP KILBR	NO, NO USERS WERE DUMPED
0120*					
0121*	DUMP THE USER.				
0122*					
0123	75120	074043	KID35	STB KIDB	SAVE POINTER TO TABLE.
0124	75121	103100		CLF 0	INHIBIT INTERRUPT.
0125	75122	002400		CLA	CLEAR USER'S ID.
0126	75123	170001		STA 1,I	
0127	75124	044362		ADB .+?STAT=?ID	
0128	75125	060350		LDA .-2	SET USER'S STATUS TO -2 TO FORCE
0129	75126	170001		STA 1,I	DISCONNECT.
0130	75127	044336		ADB .-?STAT	
0131	75130	160001		LDA 1,I	SET COM14 BIT
0132	75131	030772		IOR COM14	TO FLAG
0133	75132	170001		STA 1,I	SCHEDULER
0134	75133	044367		ADB .+?LINK	
0135	75134	117163		JSB KIDEQ,I	REMOVE FROM QUEUE.
0136	75135	102100		STF 0	
0137	75136	034033		ISZ KIDT	IS FUSS TABLE IN CORE?
0138	75137	027146		JMP KID38	YES.
0139	75140	060732		LDA M2000	NO, READ IT IN
0140	75141	070072		STA WORD	
0141	75142	160540		LDA FUSS,I	
0142	75143	064566		LDB LIBDI	
0143	75144	016231		JSB DRUML	
0144	75145	116017		JSB DEADP,I	DRUM ERROR WITH NO HOPE
0145*					
0146	75146	060042	KID38	LDA KIDC	COMPUTE LOCATION OF USER'S FUSS
0147	75147	040412		ADA .+32	AREA
0148	75150	001720		ALF,ALS	
0149	75151	040562		ADA LIBD	
0150	75152	070031		STA KIDP	
0151	75153	064317		LDB M32	ZERO OUT USER'S FUSS AREA
0152	75154	002400		CLA	
0153	75155	170031		STA KIDP,I	
0154	75156	034031		ISZ KIDP	
0155	75157	006006		INB, SZB	
0156	75160	027155		JMP *-3	
0157*					
0158	75161	064043		LDB KIDB	GET POINTER AGAIN.
0159	75162	027112		JMP KID37	GO TEST NEXT USER.
0160*					
0161	75163	071577	KIDEQ	DEF DEQUE	
0162*					


```

0163 75164 063207 KID31 LDA KIDM1      PRINT "A000 NOT ALLOWED"
0164 75165 064331      LDB ,=-17
0165 75166 027174      JMP KIDAZ
0166 75167 063221 KID32 LDA KIDM2      PRINT "NO SUCH ID"
0167 75170 064337      LDB ,=-11
0168 75171 027174      JMP KIDAZ
0169 75172 063230 KIDAN LDA KIDM3      PRINT " GROUP LIBRARY IN USE"
0170 75173 064325      LDB ,=-21
0171 75174      KIDAZ EQU *
0172 75174 074042      STB KIDC
0173 75175 070050      STA MOVES
0174 75176 060305      LDA T35B1
0175 75177 070051      STA MOVED
0176 75200 005100      BRS
0177 75201 016257      JSB MOVEW
0178 75202 060042      LDA KIDC
0179 75203 003004      CMA,INA
0180 75204 064305      LDB T35B1
0181 75205 114522      JSB TTY35,1
0182 75206 026272      JMP LENDR
0183*
0184 75207 075210 KIDM1 DEF ++1
0185 75210 005101      OCT 5101
0186 75211 030060      ASC 8,000 NOT ALLOWED
      75212 030040
      75213 047117
      75214 052040
      75215 040514
      75216 046117
      75217 053505
      75220 042040
0187 75221 075222 KIDM2 DEF ++1
0188 75222 005116      OCT 5116
0189 75223 047440      ASC 5,0 SUCH ID
      75224 051525
      75225 041510
      75226 020111
      75227 042040
0190 75230 075231 KIDM3 DEF ++1
0191 75231 005107      OCT 5107
0192 75232 051117      ASC 10,ROUP LIBRARY IN USE
      75233 052520
      75234 020114
      75235 044502
      75236 051101
      75237 051131
      75240 020111
      75241 047040
      75242 052523
      75243 042440
0193*

```

```

0195 75244 160540 KID36 LDA FUSS,I WRITE BACK FUSS
0196 75245 064562 LDB LIBD IF ANY USERS
0197 75246 016231 JSB DRUML WERE DUMPED
0198 75247 116017 JSB DEADP,I DRUM ERROR WITH NO HOPE

```

0199*

0200*

```

0201* WE HAVE NOW GOTTEN RID OF THE USER. THE NEXT STEP IS TO
0202* RELEASE ANY SYSTEM SPACE CONSUMED BY THE USER.

```

0203*

```

0204* THIS SECTION HAS THE JOB OF REMOVING ALL
0205* FILES BELONGING TO THE ID BEING KILLED FROM THE USER LIBRARY, AND
0206* UPDATING THE ADT APPROPRIATELY.

```

0207*

```

0208 75250 KILBR EQU *
0209 75250 063552 LDA KDIRL TEST INDIVIDUAL DIRECTORIES
0210 75251 070032 KID4 STA KIDI KIDI POINTS TO THE ONE TESTED.
0211 75252 KIDRE EQU *
0212 75252 104200 OLD KIDI,I GET LENGTH AND FIRST ID.
75253 100032
0213 75254 074033 STB KIDT SAVE FIRST ID FOR LATER.
0214 75255 000040 CLE
0215 75256 044053 ADB MID B=FIRST ID= KEYID
0216 75257 002002 SZA FORGET TRACK IF IT'S EMPTY
0217 75260 006042 SEZ, SZB OR IF FIRSTID>KEYID
0218 75261 002001 RSS
0219 75262 027270 JMP KID2
0220 75263 060032 KID1 LDA KIDI
0221 75264 053551 CPA KDIR0
0222 75265 026267 JMP LEND
0223 75266 040343 ADA ,=7 BUMP TO NEXT TRACK.
0224 75267 027251 JMP KID4

```

0225*

```

0226* PROCESS DIRECTORY TRACK IN ORDER TO REMOVE KEY ID ENTRIES. THE
0227* DIRECTORY IS READ INTO THE BEGINNING OF THE WORKSPACE AND IS
0228* SCANNED IN REVERSE ORDER. A TABLE OF PATCHES IS BUILT UP
0229* STARTING AT LIBUS+0192.

```

0230*

THE FOLLOWING POINTERS ARE USED:

0231*

```

0232* KIDP1 => DIRECTORY ENTRY BEING TESTED
0233* KIDP2 => FIRST ENTRY FOLLOWING LAST KID ENTRY
0234* KIDP3 => LAST ENTRY IN DIRECTORY
0235* KIDP4 => LAST ENTRY IN PATCH TABLE

```

0236*

```

0237 75270 KID2 EQU *
0238 75270 070072 STA WORD SET UP LENGTH FOR DRUM TRANSFER
0239 75271 003004 CMA, INA
0240 75272 040562 ADA LIBD
0241 75273 040336 ADA ,=12 SET KIDP3 TO POINT TO LAST
0242 75274 070040 STA KIDP3 ENTRY IN DIRECTORY.
0243 75275 070036 STA KIDP1 SET POINTER TO CURRENT ENTRY.
0244 75276 061002 LDA L0192 INITIALIZE PATCH TABLE
0245 75277 070041 STA KIDP4 POINTER.
0246 75300 002400 CLA
0247 75301 070030 STA LOCTC SET PATCH TABLE LENGTH
0248 75302 060032 LDA KIDI GET DIRECTORY

```

0249	75303	040360	ADA	.,+6	DISC ADDRESS
0250	75304	160000	LDA	0,I	IN A,
0251	75305	064566	LDB	LIBDI	ADDRESS OF WORKSPACE
0252	75306	016231	J8B	DRUML	IN B, AND READ DRUM
0253	75307	116017	J8B	DEADP,I	DRUM ERROR WITH NO HOPE
0254*					
0255	75310	160036	KID7	LDA KIDP1,I	GET ID OF NEXT ENTRY
0256	75311	001665		ELA,CLE,ERA	
0257	75312	040053		ADA MID	COMPARE WITH KEY ID.
0258	75313	002020		SSA	TEST FOR <
0259	75314	027407		JMP KID6	
0260	75315	002002		SZA	TEST FOR >
0261	75316	027353		JMP KID8	
0262*					
0263*	FOUND AN ENTRY FOR KID. NOW REMOVE IT.				
0264*					
0265	75317	064036	LDB	KIDP1	IF THIS IS THE FIRST
0266	75320	044366	ADB	.,+12	SUCH ENTRY, SET KIDP2 AS
0267	75321	060041	LDA	KIDP4	STATED ABOVE.
0268	75322	051002	CPA	LB192	SET ONLY IF PATCH TABLE EMPTY
0269	75323	074037	STB	KIDP2	
0270	75324	050530	CPA	LULEN	
0271	75325	027361	JMP	KIDE	
0272*					
0273	75326	160032	LDA	KIDI,I	ADJUST THE DIRECTORY LENGTH.
0274	75327	040366	ADA	.,+12	
0275	75330	170032	STA	KIDI,I	
0276	75331	070072	STA	WORD	
0277*					
0278	75332	064036	LDB	KIDP1	
0279	75333	044361	ADB	.,+7	=> DRUM ADDRESS
0280	75334	160001	LDA	B,I	
0281	75335	170041	STA	KIDP4,I	SET INTO PATCH TABLE
0282	75336	034041	ISZ	KIDP4	ADVANCE POINTER
0283	75337	044356	ADB	.,+4	=> LENGTH
0284	75340	160001	LDA	B,I	A = LENGTH
0285	75341	170041	STA	KIDP4,I	SAVE IN PATCH TABLE
0286	75342	034041	ISZ	KIDP4	
0287	75343	044347	ADB	.,-3	=> DISK ADDRESS
0288	75344	104200	DL0	B,I	GET DISK ADDRESS
	75345	100001			
0289	75346	104400	DST	KIDP4,I	SAVE IN PATCH TABLE
	75347	100041			
0290	75350	034041	ISZ	KIDP4	
0291	75351	034041	ISZ	KIDP4	
0292	75352	034030	ISZ	LOCTC	INCREMENT ENTRY COUNT
0293*					
0294	75353	064036	KID8	LDB KIDP1	TEST FOR FINISHED
0295	75354	054562		CPB LIBD	EXAMINING DIRECTORY ENTRIES.
0296	75355	027407		JMP KID6	
0297	75356	044335		ADB .,-12	IF NOT, MOVE POINTER BACK TO
0298	75357	074036		STB KIDP1	NEXT ENTRY.
0299	75360	027310		JMP KID7	
0300*					
0301*	MAKE ROOM BY PUSHING UP PARTIALLY EXAMINED DIRECTORY.				

```

0302*
0303 75361          KIDE EQU *
0304 75361 064036  LDB KIDP1      SET UP
0305 75362 044366  ADB ,+12
0306 75363 074051  STB MOVED      DEST AND
0307 75364 064037  LDB KIDP2      SOURCE,
0308 75365 074050  STB MOVES
0309 75366 007000  CMB            COMPUTE #
0310 75367 044040  ADB KIDP3      OF WORDS
0311 75370 007000  CMB            TO MOVE
0312 75371 044336  ADB ,=12      AND
0313 75372 016257  JSB MOVEW     DO IT,
0314*
0315 75373 060032  LDA KIDI      => DIREC ENTRY
0316 75374 040360  ADA ,+6      => DRUM ADDRESS
0317 75375 160000  LDA A,I
0318 75376 064562  LDB LIBD
0319 75377 016231  JSB DRUML
0320 75400 116017  JSB DEADP,I  DRUM ERROR WITH NO HOPE
0321 75401 060030  LDA LOCTC    GET ENTRY COUNT
0322 75402 003004  CMA,INA
0323 75403 070030  STA LOCTC    SET NEGATIVE FOR OTHER USERS
0324 75404 017476  JSB KIDRR    RESTORE DRUM SPACE
0325 75405 116013  JSB TBDAP,I  RESTORE DISK SPACE
0326 75406 027252  JMP KIDRE    CONTINUE ON
0327*
0328* THE PATCH TABLE IS NOW BUILT. THE NEXT STEP IS TO FIXUP THE DIREC.
0329*
0330 75407          KID6 EQU *
0331 75407 060030  LDA LOCTC    CHECK LENGTH OF PATCH TABLE
0332 75410 003007  CMA,INA,SZA,RSS
0333 75411 027474  JMP KID18
0334 75412 070030  STA LOCTC    SET NEGATIVE COUNT
0335*
0336 75413 160032  LDA KIDI,I
0337 75414 002003  SZA,RSS      IF LENGTH=0 WE DONT HAVE TO
0338 75415 027453  JMP KID10    WRITE IT BACK OUT.
0339 75416 070072  STA WORD     SET UP FOR DISC DRIVER.
0340*
0341* WE FIRST HAVE TO CLOSE UP THE HOLE. THERE ARE 2
0342* CASES, DEPENDING UPON WHETHER THE HOLE IS AT THE
0343* BEGINNING OR IN THE MIDDLE.
0344*
0345 75417 060037  LDA KIDP2    WE WILL MOVE FROM KIDP2 IN
0346 75420 070050  STA MOVES    ANY CASE.
0347 75421 064033  LDB KIDT     GET FIRST ID IN B.
0348 75422 054052  CPB ID       IF = HOLE IS AT BEGINNING
0349 75423 027435  JMP KID11    GO SET NEW FIRST ID.
0350 75424 060036  LDA KIDP1    SET DEST. TO BE RIGHT AFTER
0351 75425 040366  ADA ,+12     LAST ENTRY EXAMINED
0352 75426 050050  CPA MOVES    FORGET IT IF SAME AS SOURCE.
0353 75427 027442  JMP KID12
0354 75430 064040  LDB KIDP3    COMPUTE # OF WORDS TO MOVE.
0355 75431 007004  CMB,INB
0356 75432 044037  ADB KIDP2

```

```

0357 75433 044336      ADB  .-12
0358 75434 027440      JMP  KID13      GO MOVE IT.
0359*
0360 75435 060032      KID11 LDA  KIDI      SET UP NEW FIRST ID.
0361 75436 002004      INA
0362 75437 064345      LDB  .-5
0363 75440 070051      KID13 STA  MOVED
0364 75441 016257      JSB  MOVEW
0365*
0366* NOW WRITE DIRECTORY BACK TO DISC.
0367*
0368 75442 064562      KID12 LDB  LIBD      DETERMINE CORE ADDRESS.
0369 75443 060052      LDA  ID
0370 75444 050033      CPA  KIDT
0371 75445 064037      LDB  KIDP2
0372 75446 060032      LDA  KIDI      GET DISC ADDRESS.
0373 75447 040360      ADA  .+6
0374 75450 160000      LDA  0,I
0375 75451 016231      JSB  DRUML      WRITE TO DRUM
0376 75452 116017      JSB  DEADP,I    DRUM ERROR WITH NO HOPE
0377*
0378 75453      KID10 EQU  *
0379 75453 060113      LDA  ADLEN      READ IN ADT
0380 75454 070072      STA  WORD
0381 75455 060112      LDA  ADLOC
0382 75456 064566      LDB  LIBDI
0383 75457 016231      JSB  DRUML
0384 75460 116017      JSB  DEADP,I    DRUM ERROR WITH NO HOPE
0385 75461 017476      JSB  KIDRR      RESTORE DRUM SPACE
0386*
0387* WRITE ADT TO DISC
0388*
0389 75462 064113      LDB  ADLEN
0390 75463 074072      STB  WORD
0391 75464 060112      LDA  ADLOC
0392 75465 064562      LDB  LIBD
0393 75466 016231      JSB  DRUML
0394 75467 116017      JSB  DEADP,I    DRUM ERROR WITH NO HOPE
0395*
0396 75470 116013      JSB  TBDAP,I    RESTORE DISK SPACE
0397 75471 060033      LDA  KIDT      IF FIRST DISC ENTRY
0398 75472 050052      CPA  ID        WAS NOT ID, WERE DONE.
0399 75473 027263      JMP  KID1
0400 75474 103100      KID18 CLF  0
0401 75475 026267      JMP  LEND
0402*
0403*
0404 75476 000000      KIDRR NOP
0405 75477 060113      LDA  ADLEN      READ IN ADT
0406 75500 070072      STA  WORD
0407 75501 060112      LDA  ADLOC
0408 75502 064566      LDB  LIBDI
0409 75503 016231      JSB  DRUML
0410 75504 116017      JSB  DEADP,I    DRUM ERROR WITH NO HOPE
0411*

```

0412* WRITE ADT TO DRUM

0413*

0414	75505	064113	LDB	ADLEN	
0415	75506	074072	STB	WORD	
0416	75507	060112	LDA	ADLOC	
0417	75510	064562	LDB	LIBD	
0418	75511	016231	JSB	DRUML	
0419	75512	116017	JSB	DEADP,I	DRUM ERROR WITH NO HOPE
0420	75513	060030	LDA	LOCTC	GET COUNT OF ENTRIES
0421	75514	070031	STA	KIDP	
0422	75515	065002	LDB	L8192	GET TABLE BEGINNING POINTER
0423	75516		KIDRS	EQU *	
0424	75516	074036	STB	KIDP1	SET A CONVENIENT POINTER
0425	75517	160001	LDA	B,I	GET THE DRUM ADDRESS
0426	75520	034036	ISZ	KIDP1	ADVANCE POINTER TO LENGTH WORD
0427	75521	002003	SZA	RSS	SKIP IF DRUM SPACE
0428	75522	027535	JMP	KIDRV	NO DRUM SPACE, JUST CONVERT LENG
0429	75523	070044	STA	KILD	SAVE ADDRESS FOR RSFS
0430	75524	160036	LDA	KIDP1,I	GET LENGTH WORD
0431	75525	002021	SSA	RSS	SKIP IF NEGATIVE (WORD COUNT)
0432	75526	027532	JMP	KIDRT	POSITIVE (BLOCKS)
0433	75527	007400	CCB		
0434	75530	101026	ASR	6	CONVERT TO SECTORS
0435	75531	003005	CMA	INA,RSS	
0436	75532	001020	KIDRT	ALS,ALS	CONVERT BLOCKS TO SECTORS
0437	75533	070045	STA	KILDF	SAVE LENGTH FOR RSFS
0438	75534	116012	JSB	RSFSP,I	RESTORE SPACE TO ADT
0439	75535		KIDRV	EQU *	
0440	75535	160036	LDA	KIDP1,I	GET LENGTH
0441	75536	002021	SSA	RSS	SKIP IF NEGATIVE (WORD COUNT)
0442	75537	027544	JMP	KIDRW	POSITIVE (BLOCK COUNT)
0443	75540	007400	CCB		
0444	75541	101030	ASR	8	MAKE INTO BLOCK COUNT
0445	75542	003004	CMA	INA	
0446	75543	170036	STA	KIDP1,I	ALTER TABLE FOR DISK SPACE RETUR
0447	75544		KIDRW	EQU *	
0448	75544	064036	LDB	KIDP1	GET PATCH TABLE POINTER
0449	75545	044355	ADB	.+3	ADVANCE TO NEXT ENTRY
0450	75546	034031	ISZ	KIDP	CHECK FOR END
0451	75547	027516	JMP	KIDRS	NOT END, PROCESS NEXT
0452	75550	127476	JMP	KIDRR,I	RETURN

0453*

0454*

0455	75551	030000	KDIR0	DEF	DIREC
0456	75552	031051	KDIRL	DEF	DIREL
0457	00031		KIDP	EQU	LTEMP+1
0458	00032		KIDI	EQU	LTEMP+2
0459	00033		KIDT	EQU	LTEMP+3
0460	00036		KIDP1	EQU	LTEMP+6
0461	00037		KIDP2	EQU	LTEMP+7
0462	00040		KIDP3	EQU	LTEMP+8
0463	00041		KIDP4	EQU	LTEMP+9
0464	00042		KIDC	EQU	LTEMP+10
0465	00043		KIDB	EQU	LTEMP+11
0466	75553		SKID	EQU	*

0468* THE UNLOCK COMMAND IS USED TO RESTORE TO THE SYSTEM ANY DRUM
 0469* TRACKS WHICH HAVE PREVIOUSLY BEEN LOCKED. THE FORMAT FOR THE
 0470* COMMAND IS AS FOLLOWS:

0471*

0472* UNLOCK=DRUM, TRACKF [, TRACKL]

0473*

0474* DRUM IS THE DRUM NUMBER, TRACKF AND TRACKL SPECIFY THE FIRST &
 0475* LAST TRACKS TO BE UNLOCKED. IF TRACKL IS NOT SPECIFIED, IT IS
 0476* ASSUMED TO BE EQUAL TO TRACKF.

0477*

0478	75000		ORG LIBRA	
0479	75000	017160	JSB UNLNO	GET DRUM NO. IN B
0480	75001	177774	OCT =4	
0481	75002	050426	CPA ,+54B	CHECK FOR COMMA FOLLOWING,
0482	75003	002001	RSS	
0483	75004	026275	JMP LFRER	

0484*

0485	75005	074030	STB UNLD	SAVE DRUM NUMBER
0486	75006	044676	ADB ?AT6L	MAKE SURE
0487	75007	160001	LDA 1, I	DRUM EXISTS
0488	75010	002003	SZA, RSS	
0489	75011	027250	JMP UNL1	NO DRUM

0490*

0491	75012	017160	JSB UNLNO	GET FIRST TRACK
0492	75013	177700	OCT =100	
0493	75014	074031	STB UNLF	
0494	75015	050426	CPA ,+54B	ONLY TRACK?
0495	75016	002001	RSS	NO
0496	75017	027022	JMP ++3	

0497*

0498	75020	017160	JSB UNLNO	GET LAST TRACK.
0499	75021	177700	OCT =100	
0500	75022	050367	CPA ,+15B	
0501	75023	002001	RSS	
0502	75024	026275	JMP LFRER	

0503*

0503	75025	074032	STB UNLL	
0504	75026	007000	CMB	CHECK FOR LAST TRACK >= FIRST.
0505	75027	044031	ADB UNLF	
0506	75030	006021	SSB, RSS	
0507	75031	027263	JMP UNL4	NOT OK.

0508*

0509	75032	060030	LDA UNLD	CONVERT DRUM/TRACK NO. INTO
0510	75033	100040	LSL 6	SINGLE TRACK NO.
0511	75034	040031	ADA UNLF	
0512	75035	070031	STA UNLF	
0513	75036	070033	STA UNLT	
0514	75037	060030	LDA UNLD	
0515	75040	100046	LSL 6	
0516	75041	040032	ADA UNLL	
0517	75042	070032	STA UNLL	

0518*

0519* NOW SCAN TRAX TO DETERMINE HOW MANY TRACKS WILL
 0520* ACTUALLY BE OPENED.

0521*

0522	75043	002400	CLA	INITIALLY COUNT IS 0.
------	-------	--------	-----	-----------------------

0523	75044	070034		STA UNLCN	
0524	75045	060033	UNL5	LDA UNLT	
0525	75046	017215		JSB UNLFT	FIND TRACK,
0526	75047	002002		SZA	IF LOCKED, BUMP
0527	75050	034034		ISZ UNLCN	COUNTER.
0528	75051	060033		LDA UNLT	GET TRACK VALUE,
0529	75052	050032		CPA UNLL	TEST FOR DONE.
0530	75053	027056		JMP UNL6	
0531	75054	034033		ISZ UNLT	BUMP TRACK NO.
0532	75055	027045		JMP UNL5	
0533*					
0534	75056		UNL6	EQU *	
0535	75056	060542		LDA P8192	## OF WORDS AVAIL FOR ADT
0536	75057	040113		ADA ADLEN	## OF NEW WORDS ALLOWED.
0537	75060	001100		ARS	## OF NEW ENTRIES ALLOWED.
0538	75061	064034		LDB UNLCN	COMPARE WITH # WE WANT TO ADD.
0539	75062	007004		CMB, INB	
0540	75063	044000		ADB 0	
0541	75064	006020		SSB	
0542	75065	070034		STA UNLCN	
0543*					
0544	75066	060113		LDA ADLEN	READ IN ADT.
0545	75067	070072		STA WORD	
0546	75070	060112		LDA ADLOC	
0547	75071	064566		LDB LIBDI	
0548	75072	044034		ADB UNLCN	LEAVE ROOM FOR
0549	75073	044034		ADB UNLCN	NEW ADDITIONS
0550	75074	016231		JSB DRUML	
0551	75075	026311		JMP DDERR	
0552*					
0553*	SEARCH ADT FOR FIRST ENTRY BEYOND FIRST ONE TO BE ENTERED.				
0554*					
0555	75076	064562		LDB LIBD	
0556	75077	074051		STB MOVED	
0557	75100	044034		ADB UNLCN	
0558	75101	044034		ADB UNLCN	
0559	75102	074050		STB MOVES	
0560	75103	060031	UNL9	LDA UNLF	DO WE WANT TO
0561	75104	017215		JSB UNLFT	UNLOCK THIS TRACK?
0562	75105	002003		SZA, RSS	
0563	75106	027140		JMP UNL10	NO--GO DO NEXT ONE.
0564	75107	120001		XOR 1, I	YES--CLEAR TRAX
0565	75110	170001		STA 1, I	BIT,
0566	75111	060051		LDA MOVED	CAN WE INSERT ADT ENTRY?
0567	75112	050050		CPA MOVES	
0568	75113	027140		JMP UNL10	NO--GO DO NEXT ONE.
0569	75114	060031	UNL11	LDA UNLF	SEARCH ADT FOR A PLACE TO PUT IT
0570	75115	001727		ALF, ALF	
0571	75116	003104		CMA, CLE, INA	
0572	75117	140050		ADA MOVES, I	
0573	75120	002040		SEZ	
0574	75121	027125		JMP **4	FOUND ONE.
0575	75122	064350		LDB .-2	MOVE 2 WORDS UP
0576	75123	016257		JSB MOVEW	AND TEST NEXT ENTRY.
0577	75124	027114		JMP UNL11	

0578*				
0579	75125	060031	LDA UNLF	INSERT
0580	75126	001727	ALF, ALF	ENTRY,
0581	75127	064442	LDB B200	TRACK LENGTH
0582	75130	002002	SZA	
0583	75131	027134	JMP ++3	
0584	75132	060355	LDA ,+3	TRACK 0 USES 3
0585	75133	067313	LDB B175	SECTORS FOR BOOTSTRAP
0586	75134	104400	DST MOVED, I	
	75135	100051		
0587	75136	034051	ISZ MOVED	
0588	75137	034051	ISZ MOVED	
0589*				
0590	75140	060031	UNL10 LDA UNLF	WAST THAT THE LAST TRACK?
0591	75141	050032	CPA UNLL	
0592	75142	027145	JMP ++3	YES.
0593	75143	034031	ISZ UNLF	BUMP TO NEXT TRACK.
0594	75144	027103	JMP UNL9	
0595*				
0596	75145	060034	LDA UNLCN	COMPUTE NEW ADLEN.
0597	75146	001000	ALS	
0598	75147	003004	CMA, INA	
0599	75150	040113	ADA ADLEN	
0600	75151	070113	STA ADLEN	
0601*				
0602	75152	070072	STA WORD	
0603	75153	060112	LDA ADLOC	WRITE ADT TO DRUM
0604	75154	064562	LDB LIBD	
0605	75155	016231	JSB DRUML	
0606	75156	116015	JSB SICKP, I	
0607	75157	026267	JMP LEND	
0608*				
0609*	UNLNO	INPUTS	A DECIMAL NUMBER AND CHECKS THAT IT IS SMALLER THAN	
0610*	-<JSB, 1>		IT RETURNS WITH THE NUMBER IN B AND THE FOLLOWING	
0611*	CHARACMER	IN A.		
0612*				
0613	75160	000000	UNLNO NOP	
0614	75161	017202	JSB UNLDG	GET A DIGIT.
0615	75162	026275	JMP LFRER	ILLEGAL IF NONE
0616	75163	074035	UNLN3 STB UNLN	SAVE PARTIAL RESULT.
0617	75164	147160	ADB UNLNO, I	
0618	75165	006021	SSB, RSS	
0619	75166	027263	JMP UNL4	
0620	75167	017202	JSB UNLDG	GET ANOTHER.
0621	75170	027177	JMP UNLN2	END OF NUMBER
0622	75171	060035	LDA UNLN	MULTIPLY RESULT SO FAR BY 10.
0623	75172	001222	RAL, RAL	
0624	75173	040035	ADA UNLN	
0625	75174	001200	RAL	
0626	75175	044000	ADB 0	ADD IN NEW VALUE.
0627	75176	027163	JMP UNLN3	
0628	75177	064035	UNLN2 LDB UNLN	RETURN NO.
0629	75200	037160	ISZ UNLNO	
0630	75201	127160	JMP UNLNO, I	
0631*				

0632*

0633	75202	000000	UNLDG	NOP	GET DECIMAL DIGIT.
0634	75203	016025		JSB T35C0	
0635	75204	127202		JMP UNLDG,I	NOT A DIGIT.
0636	75205	064000		LDB 0	
0637	75206	044316		ADB M72B	
0638	75207	006021		SSB,RSS	
0639	75210	127202		JMP UNLDG,I	
0640	75211	044364		ADB ,+10	
0641	75212	006021		SSB,RSS	
0642	75213	037202		ISZ UNLDG	
0643	75214	127202		JMP UNLDG,I	

0644*

0645* UNLFT FINDS THE BIT IN THE TRAX TABLE SPECIFIED BY A. IT RETURNS
 0646* WITH B POINTING AT THE APPROPRIATE TRAX WORD & A THAT WORD MASKED
 0647* BY THE APPROPRIATE BIT.

0648*

0649	75215	000000	UNLFT	NOP	
0650	75216	070001		STA 1	GET TRACK NO IN B.
0651	75217	001700		ALF	POSITION WORD NO IN
0652	75220	101044		LSR 4	LOW 4 BITS OF B, BIT NO
0653	75221	010371		AND ,+17B	IN LOW 4 OF A.
0654	75222	043227		ADA UNLBT	COMPUTE ADDRESS OF BIT MASK &
0655	75223	160000		LDA 0,I	GET THE MASK.
0656	75224	044512		ADB DTRAX	B=>TRAX WORD.
0657	75225	110001		AND 1,I	MASK &
0658	75226	127216		JMP UNLFT,I	RETURN.

0659*

0660	75227	075230	UNLBT	DEF *+1	
0661	75230	000001		OCT 1,2,4,10,20,40,100,200,400,1000,2000,4000	

75231 000002

75232 000004

75233 000010

75234 000020

75235 000040

75236 000100

75237 000200

75240 000400

75241 001000

75242 002000

75243 004000

0662

75244 010000

OCT 10000,20000,40000,100000

75245 020000

75246 040000

75247 100000

0663

75250 064331

UNL1

LDB ,=17

0664

75251 017277

JSB UNLER

0665

75252 005116

OCT 5116

0666

75253 047516

ASC 8,ONEXISTENT DRUM

75254 042530

75255 044523

75256 052105

75257 047124

75260 020104

75261 051125

	75262	046440		
0667	75263	064327	UNL4	LDB .-19
0668	75264	017277		JSB UNLER
0669	75265	005111		OCT 5111
0670	75266	046114		ASC 9,LLEGAL PARAMETERS
	75267	042507		
	75270	040514		
	75271	020120		
	75272	040522		
	75273	040515		
	75274	042524		
	75275	042522		
	75276	051440		
0671	75277	000000	UNLER	NOP
0672	75300	074033		STB UNLT
0673	75301	005100		BRS
0674	75302	063277		LDA UNLER
0675	75303	070050		STA MOVES
0676	75304	060305		LDA T3501
0677	75305	070051		STA MOVED
0678	75306	016257		JSB MOVEW
0679	75307	060033		LDA UNLT
0680	75310	003004		CMA,INA
0681	75311	064305		LDB T3501
0682	75312	026271		JMP LEND+2
0683*				
0684	75313	000175	B175	OCT 175
0685*				
0686	75314		SUNL	EQU *
0687	00030			ORG LTEMP
0688	00030	000000	UNLD	BSS 1
0689	00031	000000	UNLF	BSS 1
0690	00032	000000	UNLL	BSS 1
0691	00033	000000	UNLT	BSS 1
0692	00034	000000	UNLCN	BSS 1
0693	00035	000000	UNLN	BSS 1

0002* THE LOCK COMMAND IS USED TO TELL THE SYSTEM TO STOP USING CERTAIN
 0003* DRUM TRACKS. THIS CAN BE DONE EITHER BECAUSE THE TRACKS HAVE BEEN
 0004* FOUND FAULTY OR BECAUSE THEY HAVE INFORMATION ON THEM WHICH IS
 0005* UNRELATED TO TSB.

0006*
 0007* THE ROUTINE WILL NOT LOCK TRACKS WHICH ARE BEING USED FOR SYSTEM
 0008* PURPOSES. THESE TRACKS CAN BE LOCKED BY THE LOADER AT SYSTEM INI-
 0009* TIATION.

0010*
 0011* THE FORMAT FOR THE LOCK COMMAND IS:

0012*
 0013* LOCK=DRUM,TRACKF [,TRACKL]
 0014*

0015* ALL TRACKS ON THE SPECIFIED DRUM FROM TRACKF TO TRACKL ARE LOCKED.
 0016* IF TRACKL IS NOT SPECIFIED, ONLY ONE TRACK IS LOCKED.

0017*
 0018* THE OPERATION OF THE LOCK ROUTINE IS AS FOLLOWS:

- 0019*
 0020* 1) INTERPRET & VALIDATE PARAMETERS
 0021* 2) CHECK THAT THE SYSTEM IS NOT USING ANY OF THE
 0022* SPECIFIED TRACKS.
 0023* 3) SCAN THE DIRECTORY AND BUILD A TABLE CONTAINING
 0024* THE DISC ADDRESS OF EACH SANCTIFIED PROGRAM OR
 0025* FILE WHICH WILL BE REMOVED BY LOCKING.
 0026* 4) USING THIS TABLE, SCAN THE FUSSTABLE TO INSURE
 0027* THAT NONE OF THESE SANCTIFIED FILES ARE IN USE.
 0028* 5) UPDATE ADT AND TRAX.
 0029* 6) UPDATE DIRECTORY, ZEROING THE DRUM ADDRESS FOR
 0030* SANCTIFIED PROGRAMS AND REMOVING THE ENTRY FOR
 0031* SANCTIFIED FILES.
 0032* 7) UPDATE DISC ADT AND IDT WITH SPACE RETURNED
 0033* FROM SANCTIFIED FILES.

0034	75000		ORG LIBRA	
0035	75000	017561	JSB LOCNO	GET DRUM NO.
0036	75001	177774	OCT =4	
0037	75002	050426	CPA ,+548	CHECK FOR COMMA FOLLOWING.
0038	75003	002001	RSS	
0039	75004	026275	JMP LFRER	
0040	75005	060001	LDA 1	
0041	75006	005323	RBR,RBR	
0042	75007	074042	STB LOCD	
0043	75010	040676	ADA ?ATBL	DOES DRUM
0044	75011	160000	LDA 0,I	EXIST?
0045	75012	002003	SZA,RSS	
0046	75013	027667	JMP LOCR1	NO SUCH DRUM
0047*				
0048	75014	017561	JSB LOCNO	GET FIRST TRACK
0049	75015	177700	OCT =100	
0050	75016	005727	BLF,BLF	
0051	75017	044042	ADB LOCD	
0052	75020	074046	STB LOCF	
0053	75021	050426	CPA ,+548	TEST FOR SECOND PARAMETER.
0054	75022	002001	RSS	
0055	75023	027030	JMP ++5	
0056	75024	017561	JSB LOCNO	GET LAST TRACK

```

0057 75025 177700      OCT =100
0058 75026 005727      BLF, BLF
0059 75027 044042      ADB LOCD
0060 75030 074047      STB LOCL
0061 75031 050367      CPA .+15B      CHECK FOR CR FOLLOWING.
0062 75032 002001      RSS
0063 75033 026275      JMP LFRER
0064*
0065 75034 007000      CMB      MAKE SURE L>=F.
0066 75035 044046      ADB LOCF
0067 75036 006021      SSB, RSS
0068 75037 027700      JMP LOCR2      IT ISN'T,
0069*
0070** INSURE THAT NONE OF THE SPECIFIED TRACKS ARE BEING USED FOR
0071** SWAPPING, DIRECTORY, DISC ADT, IDT, ADT, SYSTEM LIBRARY OR
0072** BOOTSTRAP LOADER.
0073*
0074 75040 060177      LDA NPORT      SWAP
0075 75041 070031      STA LOCNT      TRACKS
0076 75042 063732      LDA LOCST      => DRUM ADDRESS
0077 75043 073045      STA LOCSW      OF TTY00
0078 75044 017616      JSB LOCTS      CHECK SWAP TRACK
0079 75045 061130      LOCSW DEF TTY00+?DISC
0080 75046 163045      LDA LOCSW, I   CHECK
0081 75047 040444      ADA B400      ADJACENT
0082 75050 070030      STA LOCTC      TRACK
0083 75051 017616      JSB LOCTS      ALSO
0084 75052 000030      DEF LOCTC
0085 75053 063045      LDA LOCSW
0086 75054 040375      ADA .+TTY01-TTY00 => NEXT DRUM ADDRESS
0087 75055 073045      STA LOCSW
0088 75056 034031      ISZ LOCNT
0089 75057 027044      JMP LOCSW-1
0090*
0091 75060 063742      LDA MM00      00 DIRECTORY
0092 75061 070031      STA LOCNT      TRACKS
0093 75062 063730      LDA LOCDL      => FIRST
0094 75063 073065      STA LOCDT      DIREC ENTRY
0095 75064 017616      JSB LOCTS      CHECK DIRECTORY TRACK
0096 75065 030006      LOCDT DEF DIREC+6
0097 75066 063065      LDA LOCDT
0098 75067 040361      ADA .+7      => NEXT DIREC ENTRY
0099 75070 073065      STA LOCDT
0100 75071 034031      ISZ LOCNT
0101 75072 027064      JMP LOCDT-1
0102*
0103 75073 060342      LDA .-8      8 DISC
0104 75074 070031      STA LOCNT      ADT'S
0105 75075 063733      LDA LOCDA      => DISC ADT
0106 75076 073100      STA LOCAD      DRUM ADDRESS
0107 75077 017616      JSB LOCTS      CHECK DISC ADT
0108 75100 000115      LOCAD DEF DADLC
0109 75101 037100      ISZ LOCAD      => NEXT DISC ADT ENTRY
0110 75102 034031      ISZ LOCNT
0111 75103 027077      JMP LOCAD-1

```

```

0112*
0113 75104 017616 JSB LOCTS
0114 75105 000101 DEF IDEC+1 FIRST IDT TRACK
0115 75106 017616 JSB LOCTS
0116 75107 000104 DEF IDEC+4 SECOND IDT TRACK
0117 75110 017616 JSB LOCTS
0118 75111 000107 DEF IDEC+7 THIRD IDT TRACK
0119*
0120 75112 017616 JSB LOCTS
0121 75113 000112 DEF ADLOC ADT
0122*
0123 75114 063734 LDA LOCCM NUMBER OF SYSTEM
0124 75115 070031 STA LOCNT LIBRARY PROGRAMS
0125 75116 063735 LDA LOCM6 => LIBRARY PROGRAM
0126 75117 073121 STA LOCSL DRUM ADDRESS
0127 75120 017616 JSB LOCTS
0128 75121 072034 LOCSL DEF COM6
0129 75122 037121 ISZ LOCSL => NEXT LIBRARY PROGRAM
0130 75123 034031 ISZ LOCNT
0131 75124 027120 JMP LOCSL-1
0132*
0133*
0134** SEARCH THE DIRECTORY FOR SANCTIFIED **
0135** ENTRIES ON SPECIFIED TRACKS **
0136*
0137*
0138* READ EACH DIRECTORY TRACK AND CHECK FOR DRUM ADDRESSES WHICH
0139* LIE IN THE RANGE OF THE TRACKS TO BE LOCKED. FOR EACH SUCH
0140* ENTRY FOUND, ADD A 4-WORD ENTRY TO A TABLE CONSISTING OF:
0141* 1) A POINTER TO THE DIREC ENTRY FOR THIS DIRECTORY TRACK
0142* 2) A POINTER TO THIS ENTRY'S POSITION IN THE DIRECTORY
0143* 3) THE TWO-WORD DISC ADDRESS OF THE FILE OR PROGRAM
0144* IF THE TABLE OVERFLOWS (MORE THAN 512 ENTRIES), TELL THE
0145* OPERATOR TO TRY LOCKING A SMALLER BLOCK OF TRACKS.
0146*
0147 75125 002400 CLA INITIALIZE COUNT OF
0148 75126 070030 STA LUCTC TABLE ENTRIES
0149 75127 065002 LDB L8192 => BEGINNING OF
0150 75130 074036 STB LOCTP TABLE BUFFER
0151 75131 067736 LDB L0DIR DIREC
0152 75132 LOCSL EQU *
0153 75132 074032 STB LOCDI POINTER
0154 75133 160001 LDA B,I ANY ENTRIES
0155 75134 002002 SZB ON THIS TRACK?
0156 75135 027142 JMP LOC12 YES
0157 75136 LOC11 EQU *
0158 75136 044361 ADB .+7 NO, BUMP POINTER
0159 75137 057737 CPB LOCDU ALL FINISHED?
0160 75140 027241 JMP LOC20 YES
0161 75141 027132 JMP LOC10 NO
0162 75142 LOC12 EQU *
0163 75142 070072 STA WORD FOR DRUM TRANSFER
0164 75143 007400 CCB COMPUTE #
0165 75144 100400 DIV .+12 OF ENTRIES
75145 000366

```

0166	75146	070031	STA LOCNT	ON TRACK
0167	75147	064032	LDB LOCDI	
0168	75150	044360	ADB .+6	
0169	75151	160001	LDA B,I	DRUM ADDRESS
0170	75152	064566	LDB LIBDI	READ IN
0171	75153	016231	JSB DRUML	DIRECTORY TRACK
0172	75154	026311	JMP DDERR	
0173*				
0174	75155	064562	LDB LIBD	INITIALIZE
0175	75156	044361	ADB .+7	DIRECTORY
0176	75157		LOC13 EQU *	
0177	75157	074033	STB LOCDP	POINTER
0178	75160	164033	LDB LOCDP,I	GET DRUM ADDRESS
0179	75161	006003	SZB,RSS	CHECK FOR ZERO
0180	75162	027220	JMP LOC15	
0181	75163	054351	CPB .-1	SKIP PSEUDO
0182	75164	027220	JMP LOC15	ENTRIES
0183	75165	060046	LDA LOCF	CHECK
0184	75166	003104	CMA,CLE,INA	AGAINST
0185	75167	040001	ADA B	LOWER
0186	75170	002041	SEZ,RSS	BOUND
0187	75171	027220	JMP LOC15	NOT IN RANGE
0188	75172	007104	CMB,CLE,INB	CHECK
0189	75173	044047	ADB LOCL	AGAINST
0190	75174	044442	ADB B200	UPPER
0191	75175	002041	SEZ,RSS	BOUND
0192	75176	027220	JMP LOC15	NOT IN RANGE
0193*				
0194	75177	064032	LOB LOCDI	SAVE POINTER TO
0195	75200	174036	STB LOCTP,I	DIREC ENTRY
0196	75201	034036	ISZ LOCTP	IN TABLE
0197	75202	064033	LDB LOCDP	SAVE POINTER TO
0198	75203	174036	STB LOCTP,I	DIRECTORY ALSO
0199	75204	034036	ISZ LOCTP	
0200	75205	006004	INB	GET DISC
0201	75206	104200	DLD B,I	ADDRESS
	75207	100001		
0202	75210	104400	DST LOCTP,I	AND SAVE
	75211	100036		
0203	75212	064036	LDB LOCTP	ADVANCE TABLE
0204	75213	044354	ADB .+2	POINTER
0205	75214	054530	CPB LULEN	TABLE OVERFLOW?
0206	75215	027226	JMP LOC16	YES
0207	75216	074036	STB LOCTP	NO
0208	75217	034030	ISZ LOCTC	BUMP COUNT OF TABLE ENTRIES
0209	75220		LOC15 EQU *	
0210	75220	064033	LDB LOCDP	BUMP DIRECTORY
0211	75221	044366	ADB .+12	POINTER
0212	75222	034031	ISZ LOCNT	FINISHED THIS DIRECTORY TRACK?
0213	75223	027157	JMP LOC13	NO
0214	75224	064032	LDB LOCDI	YES, CHECK
0215	75225	027136	JMP LOC11	NEXT TRACK
0216*				
0217	75226		LOC16 EQU *	
0218	75226	064330	LOB .-18	TABLE OVERFLOW

0219	75227	017714	JSB	LOCER	
0220	75230	005114	OCT	5114	
0221	75231	047503	ASC	8,0CK	FEWER TRACKS
	75232	045440			
	75233	043105			
	75234	053505			
	75235	051040			
	75236	052122			
	75237	040503			
	75240	045523			

0222*

0223** NOW COMPARE TABLE JUST BUILT WITH FUSS TABLE TO

0224** DETERMINE IF THE TRACKS TO BE LOCKED CONTAIN ACTIVE FILES

0225*

0226	75241		LOC20	EQU *	
0227	75241	060030	LDA	LOCTC	SKIP CHECKING
0228	75242	003007	CMA,	INA,SZA,RSS	FUSS IF NO
0229	75243	027340	JMP	LOC30	TABLE ENTRIES
0230	75244	070030	STA	LOCTC	SAVE NEGATIVE
0231	75245	060732	LDA	M2000	
0232	75246	070072	STA	WORD	
0233	75247	001100	ARS		NUMBER OF FUSS
0234	75250	070031	STA	LOCNT	TABLE ENTRIES
0235	75251	160540	LDA	FUSS,I	READ
0236	75252	064566	LDB	LIBDI	FUSS
0237	75253	016231	JSB	DRUML	TABLE
0238	75254	026311	JMP	DDERR	
0239	75255	064562	LDB	LIBD	INITIALIZE
0240	75256	074036	STB	LOCTP	FUSS POINTER
0241	75257		LOC21	EQU *	
0242	75257	104200	DLD	LOCTP,I	GET FUSS ENTRY
	75260	100036			
0243	75261	002003	SZA,RSS		CHECK
0244	75262	006002	SZB		FOR
0245	75263	002001	RSS		ZERO
0246	75264	027313	JMP	LOC23-1	IT IS, SKIP IT
0247	75265	065002	LDB	L8192	NON-ZERO, SET
0248	75266	044354	ADB	,+2	TABLE POINTER IN (B)
0249	75267	060030	LDA	LOCTC	NUMBER OF
0250	75270	070032	STA	LOCDI	TABLE ENTRIES
0251	75271		LOC22	EQU *	
0252	75271	160001	LDA	B,I	COMPARE
0253	75272	005004	INB		FIRST WORD
0254	75273	150036	CPA	LOCTP,I	OF ENTRIES
0255	75274	027301	JMP	**+5	
0256	75275	031036	IOR	BIT15	
0257	75276	150036	CPA	LOCTP,I	
0258	75277	002001	RSS		
0259	75300	027310	JMP	LOC25	UNEQUAL
0260	75301	034036	ISZ	LOCTP	EQUAL,
0261	75302	160001	LDA	B,I	COMPARE
0262	75303	150036	CPA	LOCTP,I	SECOND WORD
0263	75304	027320	JMP	LOC24	EQUAL, FILE IN USE
0264	75305	003400	CCA		UNEQUAL, MOVE
0265	75306	040036	ADA	LOCTP	POINTER BACK

0266	75307	070036		STA LOCTP	TO FIRST WORD
0267	75310		LOC25	EQU *	
0268	75310	044355		ADB ,+3	BUMP TO NEXT TABLE ENTRY
0269	75311	034032		ISZ LOCDI	ALL TABLE ENTRIES CHECKED?
0270	75312	027271		JMP LOC22	NO
0271	75313	034036		ISZ LOCTP	YES
0272	75314		LOC23	EQU *	
0273	75314	034036		ISZ LOCTP	BUMP TO NEXT FUSS ENTRY
0274	75315	034031		ISZ LOCNT	ALL FUSS ENTRIES CHECKED?
0275	75316	027257		JMP LOC21	NO
0276	75317	027340		JMP LOC30	YES
0277	75320		LOC24	EQU *	
0278	75320	044347		ADB , -3	GET POINTER
0279	75321	074036		STB LOCTP	TO DIREC
0280	75322	164001		LDB B,I	IN (B)
0281	75323	160001		LDA B,I	TRACK
0282	75324	070072		STA WORD	LENGTH
0283	75325	044360		ADB ,+6	
0284	75326	160001		LDA B,I	READ
0285	75327	064566		LDB LIBDI	DIRECTORY
0286	75330	016231		JSB DRUML	TRACK
0287	75331	026311		JMP DDERR	
0288	75332	060036		LDA LOCTP	GET POINTER
0289	75333	002004		INA	TO DRUM
0290	75334	160000		LDA A,I	ADDRESS FOR
0291	75335	073337		STA ++2	SUBROUTINE
0292	75336	017610		JSB LOCTS	OUTPUT "CAN'T
0293	75337	000000		BSS 1	LOCK" MESSAGE
0294*					
0295*	IT IS NOW PERMISSIBLE TO DO THE LOCKING, FIRST PURGE ADT.				
0296*					
0297	75340		LOC30	EQU *	
0298	75340	060113		LDA ADLEN	
0299	75341	070072		STA WORD	
0300	75342	060112		LDA ADLOC	
0301	75343	064566		LDB LIBDI	
0302	75344	016231		JSB DRUML	
0303	75345	116015		JSB SICKP,I	
0304	75346	064562		LDB LIBD	FIND FIRST ENTRY >= LOCF.
0305	75347	060046	LOC3	LDA LOCF	
0306	75350	003104		CMA,CLE,INA	
0307	75351	140001		ADA 1,I	
0308	75352	002040		SEZ	
0309	75353	027356		JMP ++3	FOUND ONE.
0310	75354	044354		ADB ,+2	
0311	75355	027347		JMP LOC3	
0312	75356	074051		STB MOVED	SAVE POINTER TO IT.
0313	75357	060047	LOC4	LDA LOCL	FIND FIRST ENTRY >= LOCL+128
0314	75360	040442		ADA B200	
0315	75361	003104		CMA,CLE,INA	
0316	75362	140001		ADA 1,I	
0317	75363	002040		SEZ	
0318	75364	027367		JMP ++3	
0319	75365	044354		ADB ,+2	
0320	75366	027357		JMP LOC4	

0321	75367	074050		STB MOVES	
0322*					
0323	75370	044674		ADB MLIBD	PERFORM
0324	75371	044113		ADB ADLEN	MOVE
0325	75372	016257		JSB MOVEW	OPERATION
0326*					
0327	75373	060051		LDA MOVED	COMPUTE ADLEN.
0328	75374	003004		CMA, INA	
0329	75375	040562		ADA LIBD	
0330	75376	070113		STA ADLEN	
0331	75377	070072		STA WORD	
0332	75400	060112		LDA ADLOC	WRITE ADT TO DRUM
0333	75401	064562		LDB LIBD	
0334	75402	016231		JSB DRUML	WRITE TO DRUM
0335	75403	116015		JSB SICKP, I	
0336*					
0337*	NOW MODIFY TRAX TABLE.				
0338*					
0339	75404	060046		LDA LOCF	GET FIRST TRACK NO IN LOCT.
0340	75405	070044	LUC5	STA LOCT	
0341	75406	006400		CLB	POSITION WORD NO IN B,
0342	75407	100104		RRL 4	BIT NO IN A.
0343	75410	001700		ALF	
0344	75411	044512		ADB DTRAX	GET POINTER TO WORD
0345	75412	074031		STB LOCNT	SAVE IT.
0346	75413	043731		ADA LOCLL	COMPUTE SHIFT INSTRUCTION.
0347	75414	073416		STA **2	
0348	75415	002404		CLA, INA	
0349	75416	100040		LSL 16	POSITION BIT.
0350	75417	002003		SZA, RSS	IF LOW BIT,
0351	75420	002004		INA	SET IT.
0352	75421	130031		IOR LOCNT, I	SET BIT IN
0353	75422	170031		STA LOCNT, I	WORD TO SAY LOCKED.
0354	75423	060044		LDA LOCT	IS IT LAST TRACK?
0355	75424	050047		CPA LOCL	
0356	75425	027430		JMP **3	YES.
0357	75426	040444		ADA B400	NO
0358	75427	027405		JMP LOC5	
0359*				*	
0360**	UPDATE DIRECTORY				**
0361*				*	
0362*					
0363*	USING THE TABLE BUILT PREVIOUSLY, UPDATE THE DIRECTORY. THE DRUM				
0364*	ADDRESS FOR PROGRAMS IS SET TO 0 (I.E. THE PROGRAM IS DESECRATED)				
0365*	SINCE A GOOD COPY OF IT EXISTS ON THE DISC. FOR FILES, THE				
0366*	DIRECTORY ENTRY IS REMOVED. THIS REQUIRES THAT SPACE BE RETURNED				
0367*	TO THE DISC ADT AND THE RECORD OF SPACE USED IN THE IDT BE				
0368*	UPDATED. IN ORDER TO ACCOMPLISH THIS THE FIRST TWO WORDS OF THE				
0369*	TABLE ARE REPLACED BY THE ID AND LENGTH. FOR PROGRAMS THE LENGTH				
0370*	IS SET TO ZERO SINCE NO SPACE IS TO BE RETURNED.				
0371*					
0372	75430	060030		LDA LOCTC	SKIP UPDATE
0373	75431	002003		SZA, RSS	IF NO
0374	75432	026267		JMP LEND	ENTRIES
0375	75433	070031		SIA LOCNT	

0376	75434	065002	LDB L8192	POINTER TO
0377	75435	074036	STB LOCTP	FIRST ONE
0378	75436		LOC40 EQU *	
0379	75436	164036	LDB LOCTP,I	=> DIREC ENTRY
0380	75437	074032	STB LOCDI	SAVE DIREC POINTER
0381	75440	160001	LDA B,I	WORD
0382	75441	070072	STA WORD	COUNT
0383	75442	003004	CMA,INA	COMPUTE END
0384	75443	040562	ADA LIBD	OF DIRECTORY
0385	75444	070037	STA LOCND	BUFFER
0386	75445	044360	ADB .+6	READ
0387	75446	160001	LDA B,I	DIRECTORY
0388	75447	064566	LDB LIBDI	TRACK
0389	75450	016231	JSB DRUML	
0390	75451	116017	JSB DEADP,I	
0391	75452	064562	LDB LIBD	INITIALIZE
0392	75453	074050	STB MOVES	MOVE
0393	75454	074051	STB MOVED	POINTERS
0394	75455		LOC41 EQU *	
0395	75455	034036	ISZ LOCTP	
0396	75456	164036	LDB LOCTP,I	=> DIRECTORY ENTRY
0397	75457	044345	ADB .-5	
0398	75460	160001	LDA B,I	
0399	75461	002020	SSA	PROGRAM?
0400	75462	027477	JMP LOC42	NO
0401	75463	044357	ADB .+5	YES, ZERO
0402	75464	002400	CLA	DRUM ADDRESS
0403	75465	170001	STA B,I	AND LENGTH
0404	75466	170036	STA LOCTP,I	IN TABLE
0405	75467	044343	ADB .-7	SAVE
0406	75470	160001	LDA B,I	
0407	75471	007400	CCB	ID IN
0408	75472	044036	ADB LOCTP	
0409	75473	170001	STA B,I	TABLE
0410	75474	044356	ADB .+4	
0411	75475	074036	STB LOCTP	
0412	75476	027524	JMP LOC44	
0413	75477		LOC42 EQU *	
0414	75477	044363	ADB .+9	SAVE
0415	75500	160001	LDA B,I	
0416	75501	170036	STA LOCTP,I	LENGTH
0417	75502	044337	ADB .-11	UPDATE POINTER
0418	75503	074033	STB LOCDP	FOR MOVE
0419	75504	160001	LDA B,I	SAVE
0420	75505	007400	CCB	
0421	75506	044036	ADB LOCTP	ID
0422	75507	170001	STA B,I	
0423	75510	044356	ADB .+4	UPDATE TABLE
0424	75511	074036	STB LOCTP	POINTER
0425*				
0426*	MOVE PORTION OF DIRECTORY			
0427*				
0428	75512	064033	LDB LOCDP	
0429	75513	007004	CMB,INB	
0430	75514	044050	ADB MOVES	

0431	75515	016257	JSB MOVEW	
0432	75516	064033	LDB LOCDP	
0433	75517	044366	AOB .+12	
0434	75520	074050	STB MOVES	
0435	75521	160032	LDA LOCDI,I	UPDATE
0436	75522	040366	ADA .+12	DIRECTORY
0437	75523	170032	STA LOCDI,I	LENGTH
0438	75524		LOC44 EQU *	
0439	75524	034031	ISZ LOCNT	FINISHED TABLE?
0440	75525	002001	RSS	NO
0441	75526	027532	JMP LOC43	YES
0442	75527	164036	LDB LUCTP,I	GET NEXT DIREC ENTRY FROM TABLE
0443	75530	054032	CPB LOCDI	SAME DIRECTORY TRACK?
0444	75531	027455	JMP LOC41	YES
0445	75532		LOC43 EQU *	
0446	75532	064037	LDB LOCND	NO, MOVE
0447	75533	007004	CMB,INB	END
0448	75534	044050	AOB MOVES	OF
0449	75535	016257	JSB MOVEW	DIRECTORY
0450	75536	064032	LDB LOCDI	WRITE
0451	75537	160001	LDA B,I	
0452	75540	070072	STA WORD	
0453	75541	006004	INB	
0454	75542	074051	STB MOVED	
0455	75543	044357	AOB .+5	OUT
0456	75544	160001	LDA B,I	
0457	75545	064562	LDB LIBD	
0458	75546	074050	STB MOVES	
0459	75547	016231	JSB DRUML	DIRECTORY
0460	75550	116017	JSB DEADP,I	
0461	75551	064346	LDB .-4	RESET
0462	75552	016257	JSB MOVEW	DIREC
0463	75553	060031	LDA LOCNT	FINISHED
0464	75554	002002	SZA	TABLE?
0465	75555	027436	JMP LOC40	NO
0466*				
0467**	UPDATE DISC ADT AND IDT			
0468*				
0469	75556	117740	JSB LOCUD,I	UPDATE DISC ADT
0470	75557	117741	JSB LOCUI,I	UPDATE IDT
0471	75560	026267	JMP LEND	TERMINATE
0472*				
0473*	LOCNO SCANS THE INPUT FOR A NUMBER, THE NUMBER MUST BE LESS THAN			
0474*	THE VALUE OF -(JSB+1), IT RETURNS WITH THE NUMBER IN B AND THE			
0475*	NEXT CHAR. IN A,			
0476*				
0477	75561	000000	LOCNO NOP	
0478	75562	017603	JSB LOCDG	GET A DIGIT.
0479	75563	026275	JMP LFRER	ILLEGAL IF NONE.
0480	75564	074043	LUCN1 STB LOCN	SAVE PARTIAL RESULT.
0481	75565	147561	AOB LOCNO,I	CHECK FOR OVERFLOW.
0482	75566	006021	SSB,RSS	
0483	75567	027700	JMP LOCK2	ERROR.
0484	75570	017603	JSB LOCDG	GET NEXT DIGIT.
0485	75571	027600	JMP LOCN2	END OF NUMBER

0486	75572	060043	LDA LOCN	MULTIPLY PREVIOUS RESULT BY 10.
0487	75573	001222	RAL,RAL	
0488	75574	040043	ADA LOCN	
0489	75575	001200	RAL	
0490	75576	044000	ADB 0	ADD IN NEW VALUE.
0491	75577	027564	JMP LOCN1	LOOP.
0492	75600	064043	LOCN2 LDB LOCN	RETURN NO.
0493	75601	037561	ISZ LOCNO	
0494	75602	127561	JMP LOCNO,I	
0495*				
0496*				
0497	75603	000000	LOCDG NOP	GET DECIMAL DIGIT.
0498	75604	016025	JSB T35C0	GET CHAR.
0499	75605	127603	JMP LOCDG,I	NONE THERE.
0500	75606	064000	LDB 0	DO DIGIT TEST.
0501	75607	044316	ADB M72B	
0502	75610	006021	SSB,RSS	
0503	75611	127603	JMP LOCDG,I	
0504	75612	044364	ADB ,+10	
0505	75613	006021	SSB,RSS	
0506	75614	037603	ISZ LOCDG	
0507	75615	127603	JMP LOCDG,I	
0508*	LOCTS DETERMINES WHETHER A GIVEN TRACK IS INCLUDED IN THE RANGE OF			
0509*	TRACKS BEING LOCKED. IF IT IS, AN ERROR MESSAGE IS PRINTED AND THE			
0510*	ROUTINE IS TERMINATED.			
0511*				
0512*	CALLING SEQUENCE:			
0513*				
0514*	JSB LOCTS			
0515*	DEF <LOCATION OF DISC ADDRESS>			
0516*	<RETURN IF OK>			
0517*				
0518	75616	000000	LOCTS NOP	
0519	75617	167616	LDB LOCTS,I	GET POINTER TO DISC ADDRESS.
0520	75620	037616	ISZ LOCTS	BUMP RETURN ADDRESS.
0521	75621	164001	LDB 1,I	GET DISC ADDRESS
0522	75622	006003	SZB,RSS	
0523	75623	127616	JMP LOCTS,I	IGNORE ZEROES
0524	75624	060046	LDA LOCF	TEST AGAINST FIRST TRACK.
0525	75625	003104	CMA,CLE,INA	
0526	75626	040001	ADA 1	
0527	75627	002041	SEZ,RSS	
0528	75630	127616	JMP LOCTS,I	
0529	75631	007104	CMB,CLE,INB	TEST AGAINST LAST TRACK.
0530	75632	044047	ADB LOCL	
0531	75633	044442	ADB B200	
0532	75634	002041	SEZ,RSS	
0533	75635	127616	JMP LOCTS,I	
0534*				
0535*	ERROR--ATTEMPT TO LOCK SYSTEM TRACK.			
0536*				
0537	75636	003400	CCA	GET DISC
0538	75637	043616	ADA LOCTS	ADDRESS
0539	75640	160000	LDA 0,I	AGAIN.
0540	75641	160000	LDA 0,I	

0541	75642	001727	ALF,ALF	KEEP TRACK NO. ONLY.
0542	75643	010734	AND B77	
0543	75644	006400	CLB	CONVERT TO DECIMAL.
0544	75645	100400	DIV .+10	
	75646	000364		
0545	75647	001727	ALF,ALF	
0546	75650	040001	ADA 1	
0547	75651	040574	ADA ASC00	
0548	75652	073666	STA LOCR1=1	STORE IN BUFFER,
0549	75653	064326	LDB .-20	
0550	75654	017714	JSB LOCER	PRINT ERROR MESS
0551	75655	005103	OCT 5103	
0552	75656	040516	ASC 9,AN'T LOCK TRACK	
	75657	023524		
	75660	020114		
	75661	047503		
	75662	045440		
	75663	052122		
	75664	040503		
	75665	045440		
	75666	020040		
0553+				
0554	75667	064335	LOCER1 LDB .-13	
0555	75670	017714	JSB LOCER	
0556	75671	005116	OCT 5116	
0557	75672	047440	ASC 6,0 SUCH DRUM	
	75673	051525		
	75674	041510		
	75675	020104		
	75676	051125		
	75677	046440		
0558	75700	064327	LOCER2 LDB .-19	
0559	75701	017714	JSB LOCER	
0560	75702	005111	OCT 5111	
0561	75703	046114	ASC 9,LLEGAL PARAMETERS	
	75704	042507		
	75705	040514		
	75706	020120		
	75707	040522		
	75710	040515		
	75711	042524		
	75712	042522		
	75713	051440		
0562	75714	000000	LOCER NOP	ERROR PRINTER.
0563	75715	074044	STB LOCT	
0564	75716	060305	LDA T35B1	
0565	75717	070051	STA MOVED	
0566	75720	063714	LDA LOCER	
0567	75721	070050	STA MOVES	
0568	75722	005100	BRS	
0569	75723	016257	JSB MOVEW	
0570	75724	060044	LDA LOCT	
0571	75725	003004	CMA,INA	
0572	75726	064305	LDB T35B1	
0573	75727	026271	JMP LEND+2	

0574*

0575	75730	030006	LOCCL	DEF	DIREC+6
0576	75731	100040	LOCLL	LSL	16
0577	75732	061130	LOCST	DEF	TTY00+?DISC
0578	75733	000115	LOCDA	DEF	DADLC
0579	75734	177675	LOCCM	ABS	COM6=COMTE
0580	75735	072034	LOCM6	DEF	COM6
0581	75736	030000	LODIR	DEF	DIREC
0582	75737	031060	LOCDU	DEF	DIREU
0583	75740	072612	LOCUD	DEF	TBDAD
0584	75741	072727	LOCUI	DEF	TBIDT
0585	75742	177660	MM80	DEC	=80
0586	75743		\$LOC	EQU	*

0587*

0588	00030		LOCTC	EQU	LTEMP
0589	00031		LOCNT	EQU	LTEMP+1
0590	00032		LOCDI	EQU	LTEMP+2
0591	00033		LOCDP	EQU	LTEMP+3
0592	00036		LOCTP	EQU	LTEMP+6
0593	00037		LUCND	EQU	LTEMP+7
0594	00042		LOC0	EQU	LTEMP+10
0595	00043		LUCN	EQU	LTEMP+11
0596	00044		LOCT	EQU	LTEMP+12
0597	00046		LOCF	EQU	LTEMP+14
0598	00047		LOCL	EQU	LTEMP+15

0002* THE MUNLOCK COMMAND IS USED TO RESTORE TO THE SYSTEM ANY DISC
 0003* BLOCKS WHICH HAVE PREVIOUSLY BEEN MLOCKED. THE FORMAT FOR THE
 0004* COMMAND IS:

0005*

0006* MUNLOCK,FBLOCK[,LBLOCK]

0007*

0008* FBLOCK AND LBLOCK SPECIFY THE FIRST AND LAST BLOCKS TO BE
 0009* MUNLOCKED. IF LBLOCK IS NOT SPECIFIED IT IS ASSUMED TO BE
 0010* EQUAL TO FBLOCK.

0011*

0012	75000		ORG LIBRA	
0013	75000	017330	JSB MUNNO	GET FIRST BLOCK
0014	75001	027025	JMP MUN2	ILLEGAL FORMAT
0015	75002	050426	CPA .+54B	COMMA FOLLOWING?
0016	75003	027007	JMP MUN1	YES
0017	75004	050367	CPA .+15B	NO, CR?
0018	75005	027041	JMP MUN3	YES
0019	75006	026275	JMP LFRER	NO, ERROR
0020	75007		MUN1 EQU *	
0021	75007	104200	DLR MUNIN	SAVE FIRST
	75010	000030		
0022	75011	104400	DST MUNSB	BLOCK
	75012	000046		
0023	75013	017330	JSB MUNNO	GET LAST BLOCK
0024	75014	027025	JMP MUN2	ILLEGAL FORMAT
0025	75015	050367	CPA .+15B	CR FOLLOWS?
0026	75016	002001	RSS	YES
0027	75017	026275	JMP LFRER	NO, ERROR
0028	75020	064046	LDB MUNSB	COMPUTE
0029	75021	060047	LDA MUNSB+1	LAST BLOCK -
0030	75022	017377	JSB MUNTS	FIRST BLOCK
0031	75023	006003	SZB,RSS	DIFFERENCE VALID?
0032	75024	027046	JMP MUN4	YES
0033	75025		MUN2 EQU *	
0034	75025	064327	LDB .-19	NO,
0035	75026	017421	JSB MUNER	ERROR
0036	75027	005111	OCT 5111	
0037	75030	046114	ASC 9,LLEGAL	PARAMETERS
	75031	042507		
	75032	040514		
	75033	020120		
	75034	040522		
	75035	040515		
	75036	042524		
	75037	042522		
	75040	051440		
0038	75041		MUN3 EQU *	
0039	75041	104200	DLR MUNIN	SAVE FIRST
	75042	000030		
0040	75043	104400	DST MUNSB	BLOCK
	75044	000046		
0041	75045	002400	CLA	SET FOR ONE BLOCK
0042	75046		MUN4 EQU *	
0043	75046	002004	INA	SAVE
0044	75047	070032	STA MUNLN	LENGTH

0045	75050	060210	LDA MHAD	=> LAST WORD
0046	75051	040432	ADA .+48	
0047	75052	070033	STA MUNTP	OF DISC EQT
0048	75053	017411	JSB MUNDS	BLOCK TOO
0049	75054	006021	SSB,RSS	LARGE?
0050	75055	027025	JMP MUN2	YES
0051	75056		MUN5 EQU *	
0052	75056	060033	LDA MUNTP	NO, MOVE
0053	75057	040344	ADA .-6	TO NEXT DISC
0054	75060	070033	STA MUNTP	EQT ENTRY
0055	75061	017411	JSB MUNDS	BLOCK ON
0056	75062	006020	SSB	THIS DISC?
0057	75063	027056	JMP MUN5	NO
0058	75064	002004	INA	YES, SAVE
0059	75065	070037	STA MUNLA	LAST BLOCK
0060	75066	104200	DLT MUNSB	FIRST
	75067	000046		
0061	75070	104400	DST MUNIN	BLOCK
	75071	000030		
0062	75072	017411	JSB MUNDS	ON THIS
0063	75073	006120	CLE,SSB	DISC ALSO?
0064	75074	027025	JMP MUN2	NO
0065	75075	070036	STA MUNFA	YES, SAVE IT
0066	75076	040346	ADA .-4	BLOCKS
0067	75077	002041	SEZ,RSS	0-3 ARE
0068	75100	027025	JMP MUN2	ILLEGAL.
0069	75101	060033	LDA MUNTP	CHECK
0070	75102	040354	ADA .+2	FOR
0071	75103	164000	LDB A,I	DISC
0072	75104	164001	LDB B,I	
0073	75105	006002	SZB	PRESENT
0074	75106	027122	JMP MUN6	IT IS
0075	75107	064331	LDB .-17	ERROR
0076	75110	017421	JSB MUNER	
0077	75111	005116	OCT 5116	
0078	75112	047516	ASC 8,ONEXISTENT DISC	
	75113	042530		
	75114	044523		
	75115	052105		
	75116	047124		
	75117	020104		
	75120	044523		
	75121	041440		
0079	75122		MUN6 EQU *	
0080	75122	060762	LDA M256	BAD BLOCKS IS
0081	75123	070215	STA MWORD	256 WORDS LONG
0082	75124	104200	DLT MUNTP,I	
	75125	100033		
0083	75126	000065	CLE,ERA	
0084	75127	005540	ERB,CLE	
0085	75130	044355	ADB .+3	RESIDES ON BLOCK 3
0086	75131	002040	SEZ	
0087	75132	002004	INA	
0088	75133	104400	DST MUNSB	
	75134	000046		

0089	75135	063571	LDA MUNDA	READ
0090	75136	067572	LDB MUNBI	BAD BLOCKS
0091	75137	114217	JSB DISCZ,I	TABLE
0092	75140	026311	JMP DDERR	
0093	75141	116007	JSB FADTP,I	GET THIS DISC ADT
0094	75142	160045	LDA KILDF,I	LENGTH OF
0095	75143	070072	STA WORD	DISC ADT
0096	75144	160044	LDA KILD,I	READ
0097	75145	064566	LDB LIBDI	DISC
0098	75146	016231	JSB DRUML	ADT
0099	75147	026311	JMP DDERR	
0100	75150	065002	LDB LB192	=> FIRST ENTRY
0101	75151		EQU *	
0102	75151	160001	LDA B,I	GET ITEM
0103	75152	002003	SZA,RSS	FINISHED SEARCH?
0104	75153	027166	JMP MUN11	YES
0105	75154	003104	CMA,CLE,INA	NO, IS
0106	75155	040036	ADA MUNFA	THIS ENTRY
0107	75156	002003	SZA,RSS	EQUAL?
0108	75157	027171	JMP MUN12	YES
0109	75160	002041	SEZ,RSS	NO, GREATER
0110	75161	027325	JMP MUN18	YES
0111	75162	044354	ADB .+2	NO, FINISHED
0112	75163	057573	CPB MUNLZ	SEARCH?
0113	75164	002001	RSS	YES
0114	75165	027151	JMP MUN10	NO
0115	75166		EQU *	
0116	75166	017435	JSB MUNPB	CHECK PRECEEDING BLOCK
0117	75167	027273	JMP MUN17	ENTRIES COMBINED
0118	75170	026267	JMP LEND	NO WORK DONE
0119	75171		EQU *	
0120	75171	006004	INB	IS THIS
0121	75172	060032	LDA MUNLN	ENTRY
0122	75173	003100	CMA,CLE	COMPLETELY
0123	75174	140001	ADA B,I	ENCLOSED?
0124	75175	002041	SEZ,RSS	
0125	75176	027212	JMP MUN13	YES
0126	75177	002004	INA	NO, SAVE
0127	75200	170001	STA B,I	NEW LENGTH
0128	75201	044351	ADB .-1	SAVE NEW
0129	75202	060037	LDA MUNLA	STARTING
0130	75203	170001	STA B,I	ADDRESS
0131	75204	060036	LDA MUNFA	ADDRESS OF BLOCK
0132	75205	070040	STA MUNRA	TO BE RETURNED
0133	75206	060032	LDA MUNLN	LENGTH OF RETURNED
0134	75207	070043	STA MUNRL	BLOCK
0135	75210	017552	JSB MUNRS	RETURN BLOCK TO DISC ADT
0136	75211	027273	JMP MUN17	
0137	75212		EQU *	
0138	75212	160001	LDA B,I	LENGTH AND
0139	75213	070043	STA MUNRL	ADDRESS OF
0140	75214	044351	ADB .-1	BLOCK TO
0141	75215	160001	LDA B,I	RETURN TO
0142	75216	070040	STA MUNRA	DISC ADT
0143	75217	074041	STB MUNBR	SAVE (B)

0144	75220	074030	STB	MUNPP	DESTINATION POINTER
0145	75221	044354	ADB	.*+2	SOURCE POINTER
0146	75222		MUN14	EQU *	
0147	75222	057573	CPB	MUNLZ	
0148	75223	027233	JMP	MUN15	
0149	75224	160001	LDA	B,I	ELIMINATE
0150	75225	002003	SZA	RSS	
0151	75226	027233	JMP	MUN15	COMPLETELY
0152	75227	170030	STA	MUNPP,I	
0153	75230	034030	ISZ	MUNPP	ENCLOSED
0154	75231	006004	INB		
0155	75232	027222	JMP	MUN14	ENTRY
0156	75233		MUN15	EQU *	
0157	75233	002400	CLA		ZERO OUT
0158	75234	170030	STA	MUNPP,I	TWO WORDS
0159	75235	034030	ISZ	MUNPP	AFTER LAST
0160	75236	170030	STA	MUNPP,I	ENTRY
0161	75237	064041	LOB	MUNBR	RESTORE (B)
0162	75240	017552	JSB	MUNRS	RETURN BLOCK TO DISC ADT
0163*					
0164*	CHECK	SUCCEEDING	BLOCKS		
0165*					
0166	75241		MUN16	EQU *	
0167	75241	160001	LDA	B,I	ANY MORE
0168	75242	002003	SZA	RSS	ENTRIES?
0169	75243	027273	JMP	MUN17	NO
0170	75244	060037	LDA	MUNLA	YES,
0171	75245	003104	CMA	CLE,INA	OVERLAP
0172	75246	140001	ADA	B,I	NEXT
0173	75247	002040	SEZ		ENTRY?
0174	75250	027273	JMP	MUN17	NO
0175	75251	006004	INB		YES,
0176	75252	140001	ADA	B,I	COMPLETELY
0177	75253	002003	SZA	RSS	ENCLOSE IT?
0178	75254	027212	JMP	MUN13	YES
0179	75255	002041	SEZ	RSS	MAYBE
0180	75256	027212	JMP	MUN13	YES
0181	75257	070030	STA	MUNPP	NO, SAVE LENGTH
0182	75260	003004	CMA	INA	LENGTH OF
0183	75261	140001	ADA	B,I	RETURNED
0184	75262	070043	STA	MUNRL	BLOCK
0185	75263	060030	LDA	MUNPP	SAVE LENGTH OF
0186	75264	170001	STA	B,I	LOCKED BLOCK
0187	75265	044351	ADB	.-1	ADDRESS OF
0188	75266	160001	LDA	B,I	RETURNED
0189	75267	070040	STA	MUNRA	BLOCK
0190	75270	060037	LDA	MUNLA	SAVE NEW
0191	75271	170001	STA	B,I	STARTING BLOCK
0192	75272	017552	JSB	MUNRS	RETURN SPACE TO DISC ADT
0193*	WRITE	DISC ADT	AND	LOCKED	BLOCKS
0194*					
0195	75273		MUN17	EQU *	
0196	75273	060762	LDA	M256	LENGTH OF
0197	75274	070215	STA	MWORD	BAD BLOCKS
0198	75275	104200	DLD	MUNIP,I	COMPUTE

	75276	100033			
0199	75277	000065	CLE,ERA		
0200	75300	005540	ERB,CLE	ADDRESS	
0201	75301	044355	ADB .+3		
0202	75302	002040	SEZ	OF BLOCK	
0203	75303	002004	INA		
0204	75304	104400	DST MUNSB	THREE	
	75305	000046			
0205	75306	063571	LDA MUNDA	WRITE OUT	
0206	75307	065002	LDB L8192	LOCKED	
0207	75310	114217	JSB DISCZ,I	BLOCKS	
0208	75311	116020	JSB MDEDP,I		
0209	75312	160045	LDA KILDF,I	WRITE	
0210	75313	070072	STA WORD	OUT	
0211	75314	160044	LDA KILD,I	DISC	
0212	75315	064562	LDB LIBD	ADT	
0213	75316	016231	JSB DRUML	TRACK	
0214	75317	002001	RSS		
0215	75320	026267	JMP LEND		
0216	75321	002400	CLA		
0217	75322	170044	STA KILD,I	REMOVE	
0218	75323	170044	STA KILD,I	DISC ADT	
0219	75324	026267	JMP LEND		
0220	75325		MUN18 EQU *		
0221	75325	017435	JSB MUNPB	CHECK PRECEEDING BLOCK	
0222	75326	027241	JMP MUN16	GO CHECK	
0223	75327	027241	JMP MUN16	NEXT ENTRY	
0224*					
0225*	MUNNO SCANS THE INPUT STRING FOR AN INTEGER LESS THAN 2**19. IF				
0226*	FOUND IT RETURNS TO (P+2) WITH THE INTEGER IN MUNIN[0:1] AND				
0227*	THE FOLLOWING CHARACTER IN (A). ERRORS EXIT TO (P+1).				
0228*					
0229	75330	000000	MUNNO NOP		
0230	75331	007400	CCB	SET FLAG FOR	
0231	75332	074033	STB MUNTPT	NUMBER OCCURRENCE	
0232	75333	006400	CLB	INITIALIZE	
0233	75334	074030	STB MUNIN	TWO-DIGIT	
0234	75335	074031	STB MUNIN+1	RESULT	
0235	75336		MUNN1 EQU *		
0236	75336	016025	JSB T35CQ	GET A CHARACTER	
0237	75337	027374	JMP MUNN2	CR	
0238	75340	064000	LDB A		
0239	75341	044316	ADB M72B		
0240	75342	006021	SSB,RSS	DIGIT!	
0241	75343	027374	JMP MUNN2	NO	
0242	75344	044364	ADB .+10	MAYBE	
0243	75345	006020	SSB		
0244	75346	027374	JMP MUNN2	NO	
0245	75347	074033	STB MUNTPT	YES, SAVE IT	
0246	75350	060031	LDA MUNIN+1	GET PREVIOUS	
0247	75351	064030	LDB MUNIN	RESULT	
0248	75352	100022	ASL 2	MULTIPLY BY 4	
0249	75353	000040	CLE	ADD PREVIOUS	
0250	75354	040031	ADA MUNIN+1	RESULT,	
0251	75355	002040	SEZ	PRODUCING	

0252	75356	006004	INB	MULTIPLICATION
0253	75357	044030	ADB MUNIN	BY 5
0254	75360	100021	ASL 1	NOW 10*PREVIOUS RESULT
0255	75361	000040	CLE	ADD IN
0256	75362	040033	ADA MUNTP	
0257	75363	002040	SEZ	NEW DIGIT
0258	75364	006004	INB	
0259	75365	074030	STB MUNIN	SAVE NEW
0260	75366	070031	STA MUNIN+1	RESULT
0261	75367	060001	LDA B	TOO
0262	75370	010361	AND ,+7	
0263	75371	050001	CPA B	BIG?
0264	75372	027336	JMP MUNN1	NO
0265	75373	127330	JMP MUNNO, I	YES
0266	75374		MUNN2 EQU *	
0267	75374	034033	ISZ MUNTP	DID NUMBER OCCUR?
0268	75375	037330	ISZ MUNNO	YES
0269	75376	127330	JMP MUNNO, I	NO
0270*				
0271*	MUNTS SUBTRACTS THE TWO-WORD INTEGER INTEGER IN [(B),(A)] FROM MUN			
0272*	LEAVING THE RESULT IN [(B),(A)].			
0273*				
0274	75377	000000	MUNTS NOP	
0275	75400	003104	CMA, CLE, INA	NEGATE
0276	75401	007040	CMB, SEZ	
0277	75402	006004	INB	SUBTRAHEND
0278	75403	000040	CLE	
0279	75404	040031	ADA MUNIN+1	ADD IN
0280	75405	002040	SEZ	
0281	75406	006004	INB	MINUEND
0282	75407	044030	ADB MUNIN	
0283	75410	127377	JMP MUNTS, I	
0284*				
0285*	MUNDS TAKES THE DISC ADDRESS IN MUNIN(0;1) AND COMPUTES IT			
0286*	RELATIVE TO THE DISC WHOSE EQT ENTRY IS POINTED TO BY MUNTP,			
0287*	EXITING WITH THE RESULT IN [(B),(A)].			
0288*				
0289	75411	000000	MUNDS NOP	
0290	75412	104200	OLD MUNTP, I	GET FIRST SECTOR NUMBER
	75413	100033		
0291	75414	000065	CLE, ERA	CONVERT TO
0292	75415	005500	ERB	BLOCKS
0293	75416	101100	SWP	
0294	75417	017377	JSB MUNTS	COMPUTE RELATIVE ADDRESS
0295	75420	127411	JMP MUNDS, I	
0296*				
0297*	MUNER OUTPUTS AN ERROR MESSAGE TO THE CONSOLE			
0298*				
0299	75421	000000	MUNER NOP	
0300	75422	074033	STB MUNTP	
0301	75423	060305	LDA T35B1	MOVE
0302	75424	070051	STA MOVED	MESSAGE
0303	75425	063421	LDA MUNER	INTO
0304	75426	070050	STA MOVES	CONSOLE
0305	75427	005100	BRB	BUFFER

0306	75430	016257		JSB MOVEW	
0307	75431	060033		LDA MUNTP	
0308	75432	003004		CMA, INA	
0309	75433	064305		LDB T35B1	
0310	75434	026271		JMP LEND+2	OUTPUT IT
0311*					
0312*	MUNPB CHECKS THE PRECEEDING BLOCK TO SEE IF THE NEW ENTRY IS IN				
0313*	ITS RANGE, IF SO, IT MODIFIES THE PRECEEDING ENTRY, RETURNS THE				
0314*	APPROPRIATE SPACE TO THE DISC ADT, AND EXITS TO (P+1),				
0315*	OTHERWISE TO (P+2),				
0316*					
0317	75435	000000	MUNPB	NOP	
0318	75436	055002		CPB L8192	BEGINNING OF TABLE?
0319	75437	027452		JMP MUNP1	
0320	75440	044351		ADB .-1	NO, NEW
0321	75441	160001		LDA B, I	
0322	75442	070046		STA MUNSB	BLOCK IN
0323	75443	044351		ADB .-1	
0324	75444	140001		ADA B, I	RANGE OF
0325	75445	003100		CMA, CLE	
0326	75446	040036		ADA MUNFA	PRECEEDING ONE?
0327	75447	002041		SEZ, RSS	
0328	75450	027454		JMP MUNP2	YES
0329	75451	044354		ADB .+2	NO
0330	75452		MUNP1	EQU *	
0331	75452	037435		ISZ MUNPB	
0332	75453	127435		JMP MUNPB, I	
0333	75454		MUNP2	EQU *	
0334	75454	002007		INA, SZA, RSS	ADJACENT?
0335	75455	027451		JMP MUNP1-1	YES
0336	75456	003004		CMA, INA	NO, SAVE LENGTH
0337	75457	070043		STA MUNRL	OF RETURNED BLOCK
0338	75460	060036		LDA MUNFA	ADDRESS OF
0339	75461	070040		STA MUNRA	RETURNED BLOCK
0340	75462	160001		LDA B, I	COMPUTE
0341	75463	003004		CMA, INA	NEW
0342	75464	040036		ADA MUNFA	LENGTH
0343	75465	006004		INB	AND
0344	75466	170001		STA B, I	SAVE
0345	75467	044351		ADB .-1	IS THE
0346	75470	060037		LDA MUNLA	UNLOCKED
0347	75471	003100		CMA, CLE	PORTION
0348	75472	140001		ADA B, I	IN THE MIDDLE
0349	75473	040046		ADA MUNSB	OF THE PREVIOUS
0350	75474	002045		SEZ, INA, RSS	BLOCK?
0351	75475	027547		JMP MUNP6	NO
0352	75476	070046		STA MUNSB	YES
0353	75477	060032		LDA MUNLN	RESET RETURNED
0354	75500	070043		STA MUNRL	BLOCK LENGTH
0355	75501	044354		ADB .+2	SAVE
0356	75502	074041		STB MUNBR	(B)
0357	75503	067574		LDB MUNLY	TABLE
0358	75504	160001		LDA B, I	
0359	75505	002003		SZA, RSS	FULL
0360	75506	027526		JMP MUNP3	NO

0361	75507	064321	LDB	.-25	YES, OUTPUT
0362	75510	017421	JSB	MUNER	ERROR MESSAGE
0363	75511	005114	OCT	5114	
0364	75512	047503	ASC	12,0CKED	BLOCKS TABLE FULL
	75513	046505			
	75514	042040			
	75515	041114			
	75516	047503			
	75517	046523			
	75520	020124			
	75521	040502			
	75522	046105			
	75523	020106			
	75524	052514			
	75525	046040			
0365	75526		MUNP3	EQU *	
0366	75526	074030		STB MUNPP	SOURCE POINTER
0367	75527	044350		ADB .-2	DESTINATION POINTER
0368	75530		MUNP4	EQU *	
0369	75530	160001		LDA B,I	MAKE
0370	75531	170030		STA MUNPP,I	
0371	75532	054041		CPB MUNBR	ROOM
0372	75533	027541		JMP MUNP5	
0373	75534	044351		ADB .-1	FOR
0374	75535	003400		CCA	
0375	75536	040030		ADA MUNPP	NEW
0376	75537	070030		STA MUNPP	
0377	75540	027530		JMP MUNP4	ENTRY
0378	75541		MUNP5	EQU *	
0379	75541	060037		LDA MUNLA	SAVE ADDRESS
0380	75542	170001		STA B,I	OF NEW ENTRY
0381	75543	006004		INB	SAVE
0382	75544	060046		LDA MUNSB	LENGTH
0383	75545	170001		STA B,I	ALSO
0384	75546	006005		INB,RSS	
0385	75547		MUNP6	EQU *	
0386	75547	044354		ADB .+2	
0387	75550	017552		JSB MUNRS	RETURN SPACE TO DISC ADT
0388	75551	127435		JMP MUNPB,I	
0389*					
0390*	MUNRS	RETURNS			SPACE TO THE DISC ADT TRACK WHICH IS CURRENTLY IN
0391*		CORE.			
0392*					
0393	75552	000000	MUNRS	NOP	
0394	75553	074041		STB MUNBR	SAVE (B)
0395	75554	104200		OLD MUNTPI	COMPUTE
	75555	100033			
0396	75556	000065		CLE,ERA	
0397	75557	005540		ERB,CLE	DISC
0398	75560	044040		ADB MUNRA	
0399	75561	002040		SEZ	ADDRESS
0400	75562	002004		INA	
0401	75563	104400		DST MUNSB	
	75564	000046			
0402	75565	116011		JSB RADTP,I	RETURN SPACE

```

0403 75566 000000      NOP
0404 75567 064041      LDB MUNBR      RESTORE (B)
0405 75570 127552      JMP MUNRS,I
0406*
0407 00030      MUNIN EQU LTEMP      LTEMP+1 ALSO USED
0408 00046      MUNSB EQU LTEMP+14  LTEMP+15 ALSO USED
0409 00032      MUNLN EQU LTEMP+2
0410 00033      MUNT P EQU LTEMP+3
0411 00036      MUNFA EQU LTEMP+6
0412 00037      MUNLA EQU LTEMP+7
0413 00040      MUNRA EQU LTEMP+8
0414 00043      MUNRL EQU LTEMP+11
0415 00041      MUNBR EQU LTEMP+9
0416 00030      MUNPP EQU LTEMP
0417*
0418* ROUTINES CALLED USE 4,5,10,12, AND 13.
0419*
0420 75571 000046      MUNDA DEF MUNSB
0421 75572 121230      MUNBI DEF LIBUS+8192,I
0422 75573 021630      MUNLZ DEF LIBUS+8192+256
0423 75574 021627      MUNLY DEF LIBUS+8192+255
0424 75575      $MUN EQU *

```


0002* THE MLOCK COMMAND IS USED TO TELL THE SYSTEM TO STOP USING CERTAIN
 0003* DISC BLOCKS. THIS CAN BE DONE EITHER BECAUSE THE BLOCKS HAVE BEEN
 0004* FOUND FAULTY OR BECAUSE THEY HAVE INFORMATION ON THEM WHICH IS
 0005* UNRELATED TO TSB. THE FORMAT FOR THE COMMAND:

0006*
 0007* MLOCK=FBLOCK(,LBLOCK)

0008*
 0009* FBLOCK AND LBLOCK SPECIFY THE FIRST AND LAST BLOCKS TO BE MLOCKED.
 0010* IF LBLOCK IS NOT SPECIFIED IT IS ASSUMED TO BE EQUAL TO FBLOCK.

0011*
 0012* THE ACTION OF THE ROUTINE IS AS FOLLOWS:

- 0013* 1) INTERPRET AND VERIFY PARAMETERS
- 0014* 2) INSURE THAT THE SYSTEM IS NOT USING ANY OF THE
 0015* SPECIFIED BLOCKS
- 0016* 3) SEARCH THE DIRECTORY, BUILDING A TABLE WITH ONE
 0017* ENTRY FOR EACH FILE OR PROGRAM WHOSE DISC ADDRESS
 0018* IS IN THE RANGE OF THE SPECIFIED BLOCKS.
- 0019* 4) USE THIS TABLE TO SEARCH THE FUSS TABLE, INSURING
 0020* THAT NONE OF THE FILES ON THESE BLOCKS ARE ACTIVE
- 0021* 5) CALL OVERLAY

0022*
 0023 75000 ORG LIBRA
 0024 75000 017445 JSB MLKNO GET FIRST BLOCK
 0025 75001 027025 JMP MLK2 ILLEGAL FORMAT
 0026 75002 050426 CPA ,+54B COMMA FOLLOWING?
 0027 75003 027007 JMP MLK1 YES
 0028 75004 050367 CPA ,+15B NO, CR?
 0029 75005 027036 JMP MLK3 YES
 0030 75006 026275 JMP LFRER NO, ERROR
 0031 75007 MLK1 EQU *
 0032 75007 104200 DLD MLKIN SAVE FIRST
 75010 075764
 0033 75011 104400 DST MLKFB BLOCK
 75012 000046
 0034 75013 017445 JSB MLKNO GET LAST BLOCK
 0035 75014 027025 JMP MLK2 ILLEGAL FORMAT
 0036 75015 050367 CPA ,+15B CR FOLLOWS?
 0037 75016 002001 RSS YES
 0038 75017 026275 JMP LFRER NO, ERROR
 0039 75020 064046 LDB MLKFB COMPUTE
 0040 75021 060047 LDA MLKFB+1 LAST BLOCK =
 0041 75022 017514 JSB MLKTS FIRST BLOCK
 0042 75023 006003 SZB,RSS DIFFERENCE VALID?
 0043 75024 027043 JMP MLK4 YES
 0044 75025 MLK2 EQU *
 0045 75025 064334 LDB ,=14 NO,
 0046 75026 017536 JSB MLKER ERROR
 0047 75027 005102 OCT 5102
 0048 75030 040504 ASC 6,AD PARAMETER
 75031 020120
 75032 040522
 75033 040515
 75034 042524
 75035 042522
 0049 75036 MLK3 EQU *

0050	75036	104200		DLD MLKIN	SAVE FIRST
	75037	075764			
0051	75040	104400		DST MLKFB	BLOCK
	75041	000046			
0052	75042	002400		CLA	SET FOR ONE BLOCK
0053	75043		MLK4	EQU *	
0054	75043	002004		INA	SAVE
0055	75044	073766		STA MLKLN	LENGTH
0056	75045	060210		LDA MHAD	=> LAST WORD
0057	75046	040432		ADA ,+48	
0058	75047	070033		STA MLKLP	OF DISC EQT
0059	75050	104200		DLD MLKIN	SAVE ADDRESS
	75051	075764			
0060	75052	006104		CLE, INB	
0061	75053	002040		SEZ	OF LAST
0062	75054	002004		INA	
0063	75055	104400		DST MLKLB	BLOCK
	75056	075762			
0064	75057	017526		JSB MLKDS	BLOCK TOO
0065	75060	006021		SSB, RSS	LARGE?
0066	75061	027025		JMP MLK2	YES
0067	75062		MLK5	EQU *	
0068	75062	060033		LDA MLKLP	NO, MOVE
0069	75063	040344		ADA ,=6	TO NEXT DISC
0070	75064	070033		STA MLKLP	EQT ENTRY
0071	75065	017526		JSB MLKDS	BLOCK ON
0072	75066	006020		SSB	THIS DISC?
0073	75067	027062		JMP MLK5	NO
0074	75070	002004		INA	YES, SAVE
0075	75071	070031		STA MLKLA	LAST BLOCK
0076	75072	104200		DLD MLKFB	FIRST
	75073	000046			
0077	75074	104400		DST MLKIN	BLOCK
	75075	075764			
0078	75076	017526		JSB MLKDS	ON THIS
0079	75077	006120		CLE, SSB	DISC ALSO
0080	75100	027025		JMP MLK2	NO
0081	75101	070032		STA MLKFA	YES, SAVE IT
0082	75102	040346		ADA ,=4	BLOCKS
0083	75103	002041		SEZ, RSS	0-3 ARE
0084	75104	027025		JMP MLK2	ILLEGAL
0085	75105	060033		LDA MLKLP	CHECK
0086	75106	040354		ADA ,+2	FOR
0087	75107	164000		LDB A, I	DISC
0088	75110	164001		LDB B, I	
0089	75111	006002		SZB	PRESENT
0090	75112	027126		JMP MLK6	IT IS
0091	75113	064331		LDB ,=17	ERROR
0092	75114	017536		JSB MLKER	
0093	75115	005116		OCT 5116	
0094	75116	047516		ASC 8, ONEXISTENT DISC	
	75117	042530			
	75120	044523			
	75121	052105			
	75122	047124			

75123 020104
 75124 044523
 75125 041440

0095*

0096* CHECK SST AND DAT TO INSURE THAT NONE OF THE BLOCKS TO BE LOCKED
 0097* ARE BEING USED BY THE SYSTEM

0098*

0099	75126	MLK6	EQU *	
0100	75126		LDA M512	LENGTH OF
0101	75127		STA MWORD	BOOTSTRAP
0102	75130		LDB LDBSA	CORE ADDRESS
0103	75131		ADB BIT15	
0104	75132		LDA MLKD.	DISC ADDRESS OF 0,1
0105	75133		JSB DISCZ,I	READ BOOTSTRAP
0106	75134		JMP DDERR	
0107	75135		LDA LDBSA,I	NUMBER
0108	75136		ADA .-5	OF SYSTEM
0109	75137		STA MLKCT	SEGMENTS
0110	75140		LDB LDBSA	=> FIRST
0111	75141		ADB .+3	DISC
0112	75142		STB MLK8	ADDRESS
0113	75143	MLK7	EQU *	
0114	75143		CCB	PRINT MESSAGE ON ERROR
0115	75144		LDA .-2	DISTANCE FROM ADDR TO LENGTH
0116	75145		JSB MLKCK	CHECK THIS ADDRESS
0117	75146	MLK8	NOP	
0118	75147		LDA MLK8	UPDATE
0119	75150		ADA .+4	TO NEXT
0120	75151		STA MLK8	ADDRESS
0121	75152		ISZ MLKCT	
0122	75153		JMP MLK7	
0123	75154		LDA DATLN	LENGTH
0124	75155		STA MWORD	OF DAT
0125	75156		CCB	NUMBER
0126	75157		DIV .+3	OF DAT
0127	75160			
0128	75161		STA MLKCT	ENTRIES
0129	75162		INA	
0130	75163		STA MLKTC	
0131	75164		LDB LSTDA	
0132	75165		ADB .+2	
0133	75166		ULD B,I	DISC
0134	75167			
0135	75170		DST MLKIN	ADDRESS
0136	75171			
0137	75172		LDB LIBDI	CORE ADDRESS
0138	75173		LDA MLKIP	
0139	75174		JSB DISCZ,I	READ DAT
0140	75175		JMP DDERR	
0141	75176		LDA LIBD	FIRST
0142	75177		INA	DAT DISC
0143	75200		STA MLK10	ADDRESS
0144	75201		ADA .+2	=> SECOND ENTRY
0145	75202		LDB .+32	SET TO FULL
0146	75203		STB A,I	LENGTH

0144	75204	040355	ADA	+,3	
0145	75205	034030	ISZ	MLKTC	
0146	75206	027203	JMP	*,3	
0147	75207		MLK9	EQU	*
0148	75207	007400	CCB		PRINT MESSAGE ON ERROR
0149	75210	003400	CCA		DISTANCE FROM ADDR TO LENGTH
0150	75211	017552	JSB	MLKCK	CHECK THIS ADDRESS
0151	75212	000000	MLK10	NOP	
0152	75213	063212	LDA	MLK10	UPDATE
0153	75214	040355	ADA	+,3	TO NEXT
0154	75215	073212	STA	MLK10	DAT ENTRY
0155	75216	037761	ISZ	MLKCT	
0156	75217	027207	JMP	MLK9	
0157*					
0158**	SEARCH DIRECTORY FOR ENTRIES WHICH				**
0159**	LIE IN THE RANGE OF BLOCKS TO BE LOCKED				**
0160*					
0161*	READ EACH DIRECTORY TRACK AND CHECK FOR DISC ADDRESSES WHICH LIE				
0162*	IN THE RANGE OF THE BLOCKS TO BE LOCKED, FOR EACH SUCH ENTRY				
0163*	FOUND, ADD A 4-WORD ENTRY TO A TABLE CONSISTING OF:				
0164*	1) A POINTER TO THE DIREC ENTRY FOR THIS DIRECTORY TRACK				
0165*	2) A POINTER TO THIS ENTRY'S POSITION IN THE DIRECTORY				
0166*	3) THE TWO-WORD DISK ADDRESS OF THE FILE OR PROGRAM				
0167*					
0168	75220	063770	LDA	MLKRP	BUFFER FOR ENTRIES TO
0169	75221	073767	STA	MLKRD	RETURN TO DISC ADT
0170	75222	002400	CLA		INITIALIZE COUNT
0171	75223	070030	STA	MLKTC	OF TABLE ENTRIES
0172	75224	065002	LDB	L8192	➤ BEGINNING
0173	75225	074037	STB	MLKTP	OF TABLE BUFFER
0174	75226	067733	LOB	MLDIR	DIREC
0175	75227		MLK11	EQU	*
0176	75227	074036	STB	MLKDI	POINTER
0177	75230	160001	LDA	B,I	ANY ENTRIES
0178	75231	002002	SZA		ON THIS TRACK?
0179	75232	027237	JMP	MLK13	YES
0180	75233		MLK12	EQU	*
0181	75233	044361	ADB	+,7	NO, BUMP POINTER
0182	75234	057734	CPB	MLKDU	ALL FINISHED?
0183	75235	027345	JMP	MLK20	YES
0184	75236	027227	JMP	MLK11	NO
0185	75237		MLK13	EQU	*
0186	75237	070072	STA	WORD	FOR DRUM TRANSFER
0187	75240	007400	CCB		COMPUTE #
0188	75241	100400	DIV	+,12	OF ENTRIES
	75242	000366			
0189	75243	073761	STA	MLKCT	ON TRACK
0190	75244	064036	LDB	MLKDI	
0191	75245	044360	ADB	+,6	
0192	75246	160001	LDA	B,I	DRUM ADDRESS
0193	75247	064566	LDB	LIBDI	READ IN
0194	75250	016231	JSB	DRUML	DIRECTORY TRACK
0195	75251	026311	JMP	DDERR	
0196*					
0197	75252	064562	LDB	LIBD	INITIALIZE

0198	75253	044362		ADB ,+8	DIRECTORY
0199	75254		MLK14	EQU *	
0200	75254	077260		STB MLKDP	POINTER
0201	75255	006400		CLB	SKIP RETURN ON FOUND
0202	75256	060355		LDA ,+3	DISTANCE BETWEEN ADDR AND LENGTH
0203	75257	017552		JSB MLKCK	CHECK THIS ADDRESS
0204	75260	000000	MLKDP	NOP	
0205	75261	027324		JMP MLK15	NOT IN RANGE
0206	75262	027304		JMP MLK17	NO SPECIAL ENTRY FOUND
0207	75263	067260		LDB MLKDP	=> DISC ADDRESS
0208	75264	160001		LDA B,I	
0209	75265	173767		STA MLKRD,I	SAVE FIRST WORD
0210	75266	006004		INB	
0211	75267	037767		ISZ MLKRD	
0212	75270	160001		LDA B,I	
0213	75271	173767		STA MLKRD,I	SAVE SECOND WORD
0214	75272	037767		ISZ MLKRD	
0215	75273	044354		ADB ,+2	
0216	75274	160001		LDA B,I	GET LENGTH
0217	75275	002021		SSA,RSS	
0218	75276	027302		JMP ,+4	IT POSITIVE
0219	75277	001727		ALF,ALF	CONVERT
0220	75300	030762		IOR HIMSK	TO
0221	75301	003004		CMA,INA	BLOCKS
0222	75302	173767		STA MLKRD,I	SAVE THE LENGTH IN BLOCKS
0223	75303	037767		ISZ MLKRD	
0224	75304		MLK17	EQU *	
0225	75304	064036		LDB MLKDI	SAVE POINTER
0226	75305	174037		STB MLKTP,I	TO DIREC
0227	75306	034037		ISZ MLKTP	IN TABLE
0228	75307	067260		LDB MLKDP	SAVE POINTER TO
0229	75310	174037		STB MLKTP,I	DIRECTORY ALSO
0230	75311	034037		ISZ MLKTP	GET DISC
0231	75312	104200		DLD B,I	ADDRESS
	75313	100001			
0232	75314	104400		DST MLKTP,I	AND SAVE
	75315	100037			
0233	75316	064037		LDB MLKTP	ADVANCE TABLE
0234	75317	044354		ADB ,+2	POINTER
0235	75320	054530		CPB LULEN	OVERFLOW?
0236	75321	027332		JMP MLK16	YES
0237	75322	074037		STB MLKTP	NO
0238	75323	034030		ISZ MLKTC	BUMP COUNT OF TABLE ENTRIES
0239	75324		MLK15	EQU *	
0240	75324	067260		LDB MLKDP	BUMP DIRECTORY
0241	75325	044366		ADB ,+12	POINTER
0242	75326	037761		ISZ MLKCT	FINISHED THIS DIRECTORY TRACK?
0243	75327	027254		JMP MLK14	NO
0244	75330	064036		LDB MLKDI	YES, CHECK
0245	75331	027233		JMP MLK12	NEXT TRACK
0246	75332		MLK16	EQU *	
0247	75332	064330		LDB ,=18	TABLE OVERFLOW
0248	75333	017536		JSB MLKER	
0249	75334	005114		OCT 5114	
0250	75335	047503		ASC 8,UCK	FEWER BLOCKS

75336 045440
 75337 043105
 75340 053505
 75341 051040
 75342 041114
 75343 047503
 75344 045523

0251*
 0252* NOW COMPARE TABLE JUST BUILT WITH FUSS TABLE TO
 0253* DETERMINE IF THE TRACKS TO BE LOCKED CONTAIN ACTIVE FILES
 0254*

0255	75345	MLK20 EQU *	
0256	75345 060030	LDA MLKTC	SKIP CHECKING
0257	75346 003007	CMA, INA, SZA, RSS	FUSS IF NO
0258	75347 027723	JMP MLK30	TABLE ENTRIES
0259	75350 070030	STA MLKTC	
0260	75351 060732	LDA M2000	
0261	75352 070072	STA WORD	
0262	75353 001100	ARS	NUMBER OF FUSS
0263	75354 073761	STA MLKCT	TABLE ENTRIES
0264	75355 160540	LDA FUSS, I	READ
0265	75356 064566	LDB LIBDI	FUSS
0266	75357 016231	JSB DRJML	TABLE
0267	75360 026311	JMP DDERR	
0268	75361 064562	LDB LIBD	INITIALIZE
0269	75362 074037	STB MLKTP	FUSS POINTER
0270	75363	MLK21 EQU *	
0271	75363 104200	DLD MLKTP, I	GET FUSS ENTRY
	75364 100037		
0272	75365 030001	IOR B	CHECK
0273	75366 002003	SZA, RSS	FOR ZERO
0274	75367 027416	JMP MLK23-1	IT IS, SKIP IT
0275	75370 065002	LDB L8192	NON-ZERO, SET
0276	75371 044354	ADB .+2	TABLE POINTER IN (B)
0277	75372 060030	LDA MLKTC	NUMBER OF
0278	75373 070036	STA MLKDI	TABLE ENTRIES
0279	75374	MLK22 EQU *	
0280	75374 160001	LDA B, I	COMPARE
0281	75375 006004	INB	FIRST WORD
0282	75376 150037	CPA MLKTP, I	OF ENTRIES
0283	75377 027404	JMP .+5	
0284	75400 031036	IOR BIT15	
0285	75401 150036	CPA LOCTP, I	
0286	75402 002001	RSS	
0287	75403 027413	JMP MLK25	UNEQUAL
0288	75404 034037	ISZ MLKTP	EQUAL,
0289	75405 160001	LDA B, I	COMPARE
0290	75406 150037	CPA MLKTP, I	SECOND WORD
0291	75407 027423	JMP MLK24	EQUAL, FILE IN USE
0292	75410 003400	CCA	UNEQUAL, MOVE
0293	75411 040037	ADA MLKTP	POINTER BACK
0294	75412 070037	STA MLKTP	TO FIRST WORD
0295	75413	MLK25 EQU *	
0296	75413 044355	ADB .+3	BUMP TO NEXT TABLE ENTRY
0297	75414 034036	ISZ MLKDI	FINISHED TABLE?

0298	75415	027374	JMP	MLK22	NO
0299	75416	034037	ISZ	MLKTP	YES
0300	75417		MLK23	EQU *	
0301	75417	034037	ISZ	MLKTP	BUMP TO NEXT FUSS ENTRY
0302	75420	037761	ISZ	MLKCT	FINISHED FUSS
0303	75421	027363	JMP	MLK21	NO
0304	75422	027723	JMP	MLK30	YES
0305*					
0306	75423		MLK24	EQU *	
0307	75423	044347	ADB	.-3	GET POINTER
0308	75424	074037	STB	MLKTP	TO DIREC
0309	75425	164001	LDB	B,I	IN (B)
0310	75426	160001	LDA	B,I	TRACK
0311	75427	070072	STA	WORD	LENGTH
0312	75430	044360	ADB	.+6	
0313	75431	160001	LDA	B,I	READ
0314	75432	064566	LDB	LIBDI	DIRECTORY
0315	75433	016231	JSB	DRUML	TRACK
0316	75434	026311	JMP	ODERR	
0317	75435	060037	LDA	MLKTP	TO DRUM
0318	75436	002004	INA		TO DRUM
0319	75437	160000	LDA	A,I	ADDRESS FOR
0320	75440	073444	STA	MLK26	SUBROUTINE
0321	75441	007400	CCB		OUTPUT
0322	75442	060355	LDA	.+3	'CAN'T
0323	75443	017552	JSB	MLKCK	LOCK!
0324	75444	000000	MLK26	NOP	MESSAGE
0325*					
0326*	MLKNO SCANS THE INPUT STRING FOR AN INTEGER LESS THAN 2**19. IF				
0327*	FOUND IT RETURNS TO (P+2) WITH THE INTEGER IN MLKIN[0:1] AND				
0328*	THE FOLLOWING CHARACTER IN (A), ERRORS EXIT TO (P+2).				
0329*					
0330	75445	000000	MLKNO	NOP	
0331	75446	007400	CCB		SET FLAG FOR
0332	75447	074037	STB	MLKTP	NUMBER OCCURRENCE
0333	75450	006400	CLB		INITIALIZE
0334	75451	077764	STB	MLKIN	TWO-DIGIT
0335	75452	077765	STB	MLKIN+1	RESULT
0336	75453		MLKN1	EQU *	
0337	75453	016025	JSB	T35CQ	GET A CHARACTER
0338	75454	027511	JMP	MLKN2	CR
0339	75455	064000	LDB	A	
0340	75456	044316	ADB	M72B	
0341	75457	006021	SSB,	RSS	DIGIT?
0342	75460	027511	JMP	MLKN2	NO
0343	75461	044364	ADB	.+10	MAYBE
0344	75462	006020	SSB		
0345	75463	027511	JMP	MLKN2	NO
0346	75464	074037	STB	MLKTP	YES, SAVE IT
0347	75465	063765	LDA	MLKIN+1	GET PREVIOUS
0348	75466	067764	LDB	MLKIN	RESULT
0349	75467	100022	ASL	2	MULTIPLY BY 4
0350	75470	000040	CLE		ADD PREVIOUS
0351	75471	043765	ADA	MLKIN+1	RESULT,
0352	75472	002040	SEZ		PRODUCING

0353	75473	006004	INB	MULTIPLICATION
0354	75474	047764	ADB MLKIN	BY 5
0355	75475	100021	ASL 1	NOW 10*PREVIOUS RESULT
0356	75476	000040	CLE	ADD IN
0357	75477	040037	ADA MLKTP	
0358	75500	002040	SEZ	NEW DIGIT
0359	75501	006004	INB	
0360	75502	077764	STB MLKIN	SAVE NEW
0361	75503	073765	STA MLKIN+1	RESULT
0362	75504	060001	LDA B	TOO
0363	75505	010361	AND .+7	
0364	75506	050001	CPA B	BIG?
0365	75507	027453	JMP MLKN1	NO
0366	75510	127445	JMP MLKNO,I	YES
0367	75511		MLKN2 EQU *	
0368	75511	034037	ISZ MLKTP	DID NUMBER OCCUR?
0369	75512	037445	ISZ MLKNO	YES
0370	75513	127445	JMP MLKNO,I	NO
0371*				
0372*	MLKTS SUBTRACTS THE TWO-WORD INTEGER IN [(B),(A)] FROM MLKIN[0;1],			
0373*	LEAVING THE RESULT IN [(B),(A)].			
0374*				
0375	75514	000000	MLKTS NOP	
0376	75515	003104	CMA,CLE,INA	NEGATE
0377	75516	007040	CMB,SEZ	
0378	75517	006004	INB	SUBTRAHEND
0379	75520	000040	CLE	
0380	75521	043765	ADA MLKIN+1	ADD IN
0381	75522	002040	SEZ	
0382	75523	006004	INB	MINUEND
0383	75524	047764	ADB MLKIN	
0384	75525	127514	JMP MLKTS,I	
0385*				
0386*	MLKDS TAKES THE DISC ADDRESS IN MLKIN[0;1] AND COMPUTES IT			
0387*	RELATIVE TO THE DISC WHOSE EQT ENTRY IS POINTED TO BY MLKTP,			
0388*	EXITING WITH THE RESULT IN [(B),(A)].			
0389*				
0390	75526	000000	MLKDS NOP	
0391	75527	104200	DLD MLKLP,I	GET FIRST SECTOR NUMBER
		75530		
0392	75531	000065	CLE,ERA	CONVERT TO
0393	75532	005500	ERB	BLOCKS
0394	75533	101100	SWP	
0395	75534	017514	JSB MLKTS	COMPUTE RELATIVE ADDRESS
0396	75535	127526	JMP MLKDS,I	
0397*				
0398*	MLKER OUTPUTS AN ERROR MESSAGE TO THE CONSOLE			
0399*				
0400	75536	000000	MLKER NOP	
0401	75537	074037	STB MLKTP	
0402	75540	060305	LDA T35B1	MOVE
0403	75541	070051	STA MOVED	MESSAGE
0404	75542	063536	LDA MLKER	INTO
0405	75543	070050	STA MOVES	CONSOLE
0406	75544	005100	BRB	BUFFER


```

0407 75545 016257      JSB MOVEM
0408 75546 060037      LDA MLKTP
0409 75547 003004      CMA,INA
0410 75550 064305      LDB T35B1
0411 75551 026271      JMP LEND+2      OUTPUT IT
0412*
0413* MLKCK CHECKS WHETHER A GIVEN TABLE ENTRY IS IN THE RANGE OF THE
0414* BLOCK TO BE LOCKED UPON ENTRY (A) CONTAINS THE DISTANCE IN THE
0415* TABLE BETWEEN THE ADDRESS AND THE LENGTH AND JSB,I => THE DISC
0416* ADDRESS.
0417 75552 000000      MLKCK NOP
0418 75553 074040      STB MLKEX
0419 75554 070041      STA MLKTI      SAVE TABLE INCREMENT
0420 75555 167552      LDB MLKCK,I    => DISC
0421 75556 074043      STB MLKBR      ADDRESS
0422 75557 037552      ISZ MLKCK
0423 75560 104200      DLD MLKBR,I    GET DISC ADDRESS
          75561 100043
0424 75562 104400      DST MLKIN
          75563 075764
0425 75564 030001      IOR B          SKIP
0426 75565 002003      SZA,RSS       CHECK
0427 75566 127552      JMP MLKCK,I    IF ZERO
0428 75567 104200      DLD MLKFB     SUBTRACT FIRST
          75570 000046
0429 75571 017745      JSB MLKTI     BLOCK ADDRESS
0430 75572 002020      SSA          IN RANGE?
0431 75573 027606      JMP MLKC1     NO
0432 75574 104200      DLD MLKLB     YES, CHECK AGAINST
          75575 075762
0433 75576 017745      JSB MLKTI     LAST BLOCK
0434 75577 002021      SSA,RSS      IN RANGE?
0435 75600 127552      JMP MLKCK,I   NO
0436 75601 034040      ISZ MLKEX     YES, PRINT ERROR?
0437 75602 027651      JMP MLKC5     NO
0438 75603 063765      LDA MLKIN+1  YES, GO
0439 75604 067764      LDB MLKIN     OUTPUT
0440 75605 027615      JMP MLKC2     ERROR MESSAGE
0441 75606              MLKC1 EQU *
0442 75606 017657      JSB MLKEC     CHECK FOR MIDDLE OF ENTRY
0443 75607 000046      DEF MLKFB     OVERLAPPING FIRST BLOCK
0444 75610 127552      JMP MLKCK,I   IT DOESN'T
0445 75611 034040      ISZ MLKEX     ID DOES, PRINT ERROR?
0446 75612 027654      JMP MLKC4     NO
0447 75613 060047      LDA MLKFB+1  YES
0448 75614 064046      LDB MLKFB
0449 75615              MLKC2 EQU *
0450 75615 100400      DIV DVSR5     COMPUTE
          75616 001032
0451 75617 074032      STB MLKFA
0452 75620 067736      LDB MLKD3     FIRST PAIR
0453 75621 074031      STB MLKLA
0454 75622 017711      JSB MLKNM     OF DIGITS
0455 75623 060032      LDA MLKFA     COMPUTE
0456 75624 006400      CLB

```

0457	75625	100400	DIV	.100	SECOND PAIR
	75626	000437			
0458	75627	074032	STB	MLKFA	
0459	75630	017711	JSB	MLKNM	OF DIGITS
0460	75631	060032	LDA	MLKFA	COMPUTE THIRD
0461	75632	017711	JSB	MLKNM	PAIR OF DIGITS
0462	75633	064322	LDB	.-24	OUTPUT
0463	75634	017536	JSB	MLKER	MESSAGE
0464	75635	005103	OCT	5103	
0465	75636	040516	ASC	8,AN'T	LOCK BLOCK
	75637	023524			
	75640	020114			
	75641	047503			
	75642	045440			
	75643	041114			
	75644	047503			
	75645	045440			
0466	75646		MLKC3	EQU *	
0467	75646	000000		BSS 3	FOR BLOCK NUMBER
0468	75651		MLKC5	EQU *	
0469	75651	017657		JSB MLKEC	CHECK FOR MIDDLE OF ENTRY
0470	75652	075762		DEF MLKLB	IN RANGE OF LAST BLOCK
0471	75653	002001		RSS	IT ISN'T
0472	75654		MLKC4	EQU *	
0473	75654	037552		ISZ MLKCK	
0474	75655	037552		ISZ MLKCK	
0475	75656	127552		JMP MLKCK,I	
0476*					
0477*					
0478	75657	000000	MLKEC	NOP	
0479	75660	060043		LDA MLKBR	(A) =>
0480	75661	040041		ADA MLKTI	LENGTH
0481	75662	164000		LDB A,I	
0482	75663	006021		SSB,RSS	
0483	75664	027670		JMP **4	+ BLOCKS
0484	75665	003400		CCA	= WORDS
0485	75666	101110		RRR 8	CONVERT TO
0486	75667	007004		CMB,INB	+ BLOCKS
0487	75670	044351		ADB .-1	
0488	75671	160043		LDA MLKBR,I	COMPUTE
0489	75672	034043		ISZ MLKBR	
0490	75673	000040		CLE	FIRST
0491	75674	144043		ADB MLKBR,I	
0492	75675	002040		SEZ	UNUSED
0493	75676	002004		INA	
0494	75677	104400		DST MLKIN	BLOCK
	75700	075764			
0495	75701	163657		LDA MLKEC,I	
0496	75702	104200		DLA A,I	SUBTRACT FIRST
	75703	100000			
0497	75704	037657		ISZ MLKEC	
0498	75705	017745		JSB MLKTB	BLOCK ADDRESS
0499	75706	002021		SSA,RSS	IN RANGE?
0500	75707	037657		ISZ MLKEC	YES
0501	75710	127657		JMP MLKEC,I	NO

```

0502*
0503* MLKNM COMPUTES A NUMBER <100 TO ASCII AND SAVES IT FOR OUTPUTTING
0504*
0505 75711 000000 MLKNM NOP
0506 75712 006400 CLB
0507 75713 100400 DIV .+10
      75714 000364
0508 75715 001727 ALF,ALF
0509 75716 040001 ADA B
0510 75717 040574 ADA ASC00 CONVERT TO ASCII
0511 75720 170031 STA MLKLA,I
0512 75721 034031 ISZ MLKLA
0513 75722 127711 JMP MLKNM,I
0514*
0515* READ IN OVERLAY
0516*
0517 75723 MLK30 EQU *
0518 75723 063735 LDA MOLEN WORD COUNT FOR
0519 75724 070072 STA WORD MLOCK OVERLAY
0520 75725 060260 LDA LIB
0521 75726 002004 INA
0522 75727 160000 LDA A,I DRUM ADDRESS
0523 75730 064504 LDB #LIBI
0524 75731 027742 JMP MORG
0525*
0526 75732 000352 MLKD DEF
0527 75733 030000 MLDIR DEF DIREC
0528 75734 031060 MLKDU DEF DIREU
0529 75735 177036 MOLEN ABS LIBRA=MORG
0530 75736 075646 MLK03 DEF MLK03
0531*
0532 75742 MORG ORG LIBRA+512-30
0533 75742 EQU *
0534 75742 016231 JSB DRUML READ OVERLAY
0535 75743 116015 JSB SICKP,I
0536 75744 027000 JMP LIBRA EXECUTE IT
0537*
0538* MLKTR SUBTRACTS THE TWO-WORD INTEGER IN ((A),(B)) FROM MLKIN(0;1),
0539* LEAVING THE RESULT IN ((A),(B)).
0540*
0541 75745 000000 MLKTR NOP
0542 75746 007104 CMB,CLE,INB NEGATE
0543 75747 003040 CMA,SEZ
0544 75750 002004 INA SUBTRAHEND
0545 75751 000040 CLE
0546 75752 047765 ADB MLKIN+1 ADD IN
0547 75753 002040 SEZ
0548 75754 002004 INA MINUEND
0549 75755 043764 ADA MLKIN
0550 75756 127745 JMP MLKTR,I
0551*
0552 75757 000000 MLKPP BSS 1
0553 75760 000000 MLKND BSS 1
0554 75757 MLKXB EQU MLKPP
0555 75761 000000 MLKCT BSS 1

```

0556	75762	000000	MLKLB	BSS	2	
0557	75764	000000	MLKIN	BSS	2	
0558	75766	000000	MLKLN	BSS	1	
0559	75767	000000	MLKRD	BSS	1	
0560	75770	075771	MLKRP	DEF	**+1	
0561	75771	000000		BSS	6	
0562	75777	075764	MLKIP	DEF	MLKIN	
0563	76000		SML0	EQU	*	
0564*						
0565	00030		MLKTC	EQU	LTEMP	
0566	00031		MLKLA	EQU	LTEMP+1	
0567	00032		MLKFA	EQU	LTEMP+2	
0568	00033		MLKLP	EQU	LTEMP+3	
0569	00036		MLKDI	EQU	LTEMP+6	
0570	00037		MLKTP	EQU	LTEMP+7	
0571	00040		MLKEX	EQU	LTEMP+8	
0572	00041		MLKTI	EQU	LTEMP+9	
0573	00043		MLKBR	EQU	LTEMP+11	
0574	00046		MLKFB	EQU	LTEMP+14	15 ALSO USED.
0575*						
0576*	LTEMP + 4, 5, 10, 12, AND 13 ALSO USED.					

0002* THE MLOCK OVERLAY DOES ALL THE WORK FOR MLOCK. IT USES THE TABLE
 0003* BUILT BY MLOCK AND PROCEEDS AS FOLLOWS:

- 0004*
 0005* 1) UPDATE LOCKED BLOCKS TABLE.
 0006* 2) UPDATE THE DIRECTORY BY REMOVING ENTRIES WHOSE DISC
 0007* ADDRESSES LIE IN THE RANGE OF THE BLOCKS TO BE LOCKED.
 0008* 3) UPDATE THE ADT WITH DRUM SPACE RETURNED FROM SANCTIFIED
 0009* PROGRAMS AND FILES WHICH HAVE BEEN REMOVED.
 0010* 4) UPDATE THE IDT WITH SPACE RETURNED FROM DELETED PROGRAMS
 0011* AND FILES.
 0012* 5) UPDATE DISC ADT BY REMOVING ENTRIES WHICH ARE IN THE RANGE
 0013* OF THE BLOCKS TO BE LOCKED.
 0014*

0015* ISN'T THIS A RIDICULOUS AMOUNT OF THRASHING?
 0016*

0017	75000		ORG LIBRA	
0018	75000	060762	LDA M256	LENGTH OF
0019	75001	070215	STA MWORD	BAD BLOCKS
0020	75002	104200	ULD MLKLP, I	
		75003	100033	
0021	75004	000065	CLE, ERA	
0022	75005	005540	ERB, CLE	
0023	75006	044355	ADB, +3	RESIDES ON BLOCK 3
0024	75007	002040	SEZ	
0025	75010	002004	INA	
0026	75011	104400	DST MLKIN	
		75012	075764	
0027	75013	063777	LDA MLKIP	READ BAD
0028	75014	064566	LDB LIBDI	BLOCKS
0029	75015	114217	JSB DISCZ, I	TABLE
0030	75016	026311	JMP DDERR	

0031*
 0032** UPDATE LOCKED BLOCKS TABLE
 0033*

0034	75017	064562	LDB LIBD	=> FIRST ENTRY
0035	75020		MLK71 EQU *	
0036	75020	160001	LDA B, I	
0037	75021	002003	SZA, RSS	FINISHED SEARCH?
0038	75022	027154	JMP MLK81	YES, GO INSERT AT END
0039	75023	003104	CMA, CLE, INA	THIS
0040	75024	040032	ADA MLKFA	ENTRY
0041	75025	002003	SZA, RSS	EQUAL?
0042	75026	027043	JMP MLK73	YES
0043	75027	002041	SEZ, RSS	NO, GREATER?
0044	75030	027124	JMP MLK78	YES
0045	75031	044354	ADB, +2	NO, TABLE
0046	75032	057736	CPB MLKLZ	FULL?
0047	75033	002001	RSS	YES
0048	75034	027020	JMP MLK71	NO, LOOP
0049	75035	017556	JSB MLKPB	CHECK PRECEEDING BLOCK
0050	75036	027163	JMP MLK82	ENTRIES MERGED
0051	75037		MLK72 EQU *	
0052	75037	103100	CLF 0	
0053	75040	002400	CLA	
0054	75041	070260	STA LIB	NO ROUTINE IN CORE

0055	75042	126024	JMP MLFLA,I	OUTPUT TABLE FULL MESSAGE
0056	75043		MLK73 EQU *	
0057	75043	006004	INB	
0058	75044	063766	LDA MLKLN	IS THE
0059	75045	003104	CMA,CLE,INA	NEW
0060	75046	140001	ADA B,I	BLOCK
0061	75047	002040	SEZ	LONGER?
0062	75050	027547	JMP MLK99	NO
0063	75051	063766	LDA MLKLN	YES, RESET
0064	75052	170001	STA B,I	LENGTH
0065	75053	006004	INB	
0066	75054		MLK74 EQU *	
0067	75054	057736	CPB MLKLZ	END OF TABLE?
0068	75055	027163	JMP MLK82	YES
0069	75056	160001	LDA B,I	ALL ENTRIES
0070	75057	002003	SZA,RSS	FINISHED?
0071	75060	027163	JMP MLK82	YES
0072	75061	044350	ADB #-2	NO
0073	75062	160001	LDA B,I	DOES THIS
0074	75063	006004	INB	
0075	75064	140001	ADA B,I	ENTRY
0076	75065	003100	CMA,CLE	
0077	75066	006004	INB	OVERLAP THE
0078	75067	140001	ADA B,I	
0079	75070	006044	SEZ,INB	NEXT ONE?
0080	75071	027163	JMP MLK82	NO
0081	75072	140001	ADA B,I	YES, ENCLOSE
0082	75073	002045	SEZ,INA,RSS	THE ENTRY?
0083	75074	027101	JMP MLK75	YES
0084	75075	044350	ADB #-2	NEW LENGTH
0085	75076	140001	ADA B,I	AND SAVE
0086	75077	170001	STA B,I	
0087	75100	006005	INB,RSS	
0088	75101		MLK75 EQU *	
0089	75101	044351	ADB #-1	
0090	75102	074043	STB MLKBR	SAVE (B)
0091	75103	077757	STB MLKPP	DESTINATION POINTER
0092	75104	044354	ADB #+2	SOURCE POINTER
0093	75105		MLK76 EQU *	
0094	75105	057736	CPB MLKLZ	
0095	75106	027116	JMP MLK77	
0096	75107	160001	LDA B,I	MOVE
0097	75110	002003	SZA,RSS	
0098	75111	027116	JMP MLK77	TABLE,
0099	75112	173757	STA MLKPP,I	
0100	75113	037757	ISZ MLKPP	ELIMINATING
0101	75114	006004	INB	
0102	75115	027105	JMP MLK76	ONE ENTRY
0103	75116		MLK77 EQU *	
0104	75116	002400	CLA	
0105	75117	173757	STA MLKPP,I	ZERO TWO
0106	75120	037757	ISZ MLKPP	WORDS AFTER
0107	75121	173757	STA MLKPP,I	LAST ENTRY
0108	75122	064043	LDB MLKBR	RESTORE (B)
0109	75123	027054	JMP MLK74	GO CHECK NEXT ENTRY

0110	75124	MLK78	EQU *	
0111	75124		JSB MLKPB	CHECK PRECEEDING BLOCK
0112	75125		JMP MLK74	GO CHECK NEXT ENTRY
0113	75126		STB MLKBR	SAVE (B)
0114	75127		LDB MLKLY	TABLE
0115	75130		LDA B,I	
0116	75131		SZA	FULL?
0117	75132		JMP MLK72	YES
0118	75133		STB MLKPP	DESTINATION POINTER
0119	75134		ADB #-2	SOURCE POINTER
0120	75135	MLK79	EQU *	
0121	75135		LDA B,I	MOVE
0122	75136		STA MLKPP,I	
0123	75137		CPB MLKBR	TABLE,
0124	75140		JMP MLK80	
0125	75141		ADB #-1	MAKING
0126	75142		CCA	
0127	75143		ADA MLKPP	ROOM FOR
0128	75144		STA MLKPP	
0129	75145		JMP MLK79	NEW ENTRY
0130	75146	MLK80	EQU *	
0131	75146		LDA MLKFA	INSERT
0132	75147		STA B,I	
0133	75150		INB	NEW
0134	75151		LDA MLKLN	
0135	75152		STA B,I	ENTRY
0136	75153		JMP MLK74-1	GO CHECK NEXT ENTRY
0137	75154	MLK81	EQU *	
0138	75154		JSB MLKPB	CHECK PRECEEDING BLOCK
0139	75155		JMP MLK82	ENTRIES MERGED
0140	75156		LDA MLKFA	INSERT
0141	75157		STA B,I	
0142	75160		INB	NEW ENTRY
0143	75161		LDA MLKLN	
0144	75162		STA B,I	AT TABLE END
0145	75163	MLK82	EQU *	
0146	75163		LDA MLKIP	WRITE OUT
0147	75164		LDB LIBD	LOCKED BLOCKS
0148	75165		JSB DISCZ,I	TABLE
0149	75166		JSB MDEDP,I	
0150*				
0151*			*	
0152**	UPDATE DIRECTORY		**	
0153*			*	
0154*				
0155*	USING THE TABLE BUILT PREVIOUSLY, REMOVE EACH REFERENCED ENTRY.			
0156*	REPLACE THE FIRST TWO WORDS OF THE TABLE BY THE ID AND LENGTH IN			
0157*	+BLOCKS FOR USE IN UPDATING THE IDT. FOR SANCTIFIED ENTRIES,			
0158*	REPLACE THE THIRD AND FOURTH WORDS BY THE DRUM ADDRESS AND LENGTH			
0159*	IN +SECTORS FOR USE IN UPDATING THE ADT. SET THE THIRD WORD TO			
0160*	ZERO FOR NON-SANCTIFIED ENTRIES.			
0161	75167		LDA MLKTC	SKIP UPDATE
0162	75170		SZA,RSS	IF NO
0163	75171		JMP MLK59	ENTRIES
0164	75172		STA MLKCT	

0165	75173	065002	LDB L8192	POINTER TO
0166	75174	074037	STB MLKTP	FIRST ONE
0167	75175		MLK40 EQU *	
0168	75175	164037	LDB MLKTP, I	SAVE DIREC
0169	75176	074036	STB MLKDI	POINTER
0170	75177	160001	LDA B, I	WORD
0171	75200	070072	STA WORD	COUNT
0172	75201	003004	CMA, INA	COMPUTE END
0173	75202	040562	ADA LIBD	OF DIRECTORY
0174	75203	073760	STA MLKND	BUFFER
0175	75204	044360	ADB .+6	READ
0176	75205	160001	LDA B, I	
0177	75206	064566	LDB LIBDI	DIRECTORY
0178	75207	016231	JSB DRUML	
0179	75210	116017	JSB DEADP, I	
0180	75211	064562	LDB LIBD	INITIALIZE
0181	75212	074050	STB MOVES	MOVE
0182	75213	074051	STB MOVED	POINTERS
0183	75214		MLK41 EQU *	
0184	75214	060037	LDA MLKTP	
0185	75215	002004	INA	=> DIRECTORY ENTRY
0186	75216	164000	LDB A, I	
0187	75217	044342	ADB .-8	=> ID WORD
0188	75220	040351	ADA .-1	
0189	75221	070037	STA MLKTP	
0190	75222	160001	LDA B, I	SAVE ID
0191	75223	170037	STA MLKTP, I	IN TABLE
0192	75224	074043	STB MLKBR	SAVE POINTER FOR MOVE
0193	75225	034037	ISZ MLKTP	
0194	75226	044366	ADB .+11	
0195	75227	160001	LDA B, I	GET LENGTH
0196	75230	002021	SSA, RSS	CONVERT
0197	75231	027235	JMP **4	
0198	75232	001727	ALF, ALF	TO BLOCKS
0199	75233	030762	IOR HIMSK	
0200	75234	003004	CMA, INA	AND SAVE
0201	75235	170037	STA MLKTP, I	
0202	75236	034037	ISZ MLKTP	IN TABLE
0203	75237	044346	ADB .-4	
0204	75240	160001	LDA B, I	SAVE DRUM
0205	75241	170037	STA MLKTP, I	ADDRESS
0206	75242	034037	ISZ MLKTP	
0207	75243	002003	SZA, RSS	
0208	75244	027257	JMP MLK42+2	
0209	75245	044356	ADB .+4	
0210	75246	160001	LDA B, I	GET LENGTH AGAIN
0211	75247	002021	SSA, RSS	
0212	75250	027255	JMP MLK42	
0213	75251	001121	ARS, ARS	CONVERT
0214	75252	001121	ARS, ARS	
0215	75253	001121	ARS, ARS	TO SECTORS
0216	75254	003005	CMA, INA, RSS	
0217	75255		MLK42 EQU *	
0218	75255	001020	ALS, ALS	AND SAVE
0219	75256	170037	STA MLKTP, I	


```

0220 75257 034037      ISZ MLKTP
0221*
0222* MOVE PORTION OF DIRECTORY
0223*
0224 75260 064043      LDB MLKBR      COMPUTE
0225 75261 007004      CMB,INB        NUMBER
0226 75262 044050      ADB MOVES      OF WORDS
0227 75263 016257      JSB MOVEW
0228 75264 064043      LDB MLKBR      UPDATE
0229 75265 044366      ADB ,+12
0230 75266 074050      STB MOVES      POINTER
0231 75267 160036      LDA MLKDI,I    UPDATE
0232 75270 040366      ADA ,+12      DIRECTORY
0233 75271 170036      STA MLKDI,I    LENGTH
0234 75272 037761      ISZ MLKCT      FINISHED TABLE?
0235 75273 002001      RSS           NO
0236 75274 027300      JMP MLK43      YES
0237 75275 164037      LDB MLKTP,I    GET NEXT DIREC ENTRY FROM TABLE
0238 75276 054036      CPB MLKDI     SAME DIRECTORY TRACK?
0239 75277 027214      JMP MLK41      YES
0240 75300      MLK43 EQU *
0241 75300 067760      LDB MLKND      NO, MOVE END
0242 75301 007004      CMB,INB
0243 75302 044050      ADB MOVES      OF DIRECTORY
0244 75303 016257      JSB MOVEW
0245 75304 064036      LDB MLKDI
0246 75305 160001      LDA B,I
0247 75306 070072      STA WORD
0248 75307 006004      INB
0249 75310 074051      STB MOVED
0250 75311 044357      ADB ,+5
0251 75312 160001      LDA B,I      WRITE
0252 75313 064562      LDB LIBD      OUT
0253 75314 074050      STB MOVES
0254 75315 016231      JSB DRUML      DIRECTORY
0255 75316 116017      JSB DEADP,I
0256 75317 064346      LDB ,=4      RESET
0257 75320 016257      JSB MOVEW      DIREC
0258 75321 063761      LDA MLKCT     FINISHED
0259 75322 002002      SZA          TABLE?
0260 75323 027175      JMP MLK40     NO
0261*
0262** UPDATE ADT AND IDT
0263*
0264 75324 060030      LDA MLKTC     NUMBER OF
0265 75325 073761      STA MLKCT     TABLE ENTRIES
0266 75326 060113      LDA ADLEN     READ
0267 75327 070072      STA WORD
0268 75330 060112      LDA ADLOC     IN
0269 75331 064566      LDB LIBDI
0270 75332 016231      JSB DRUML     ADT
0271 75333 116017      JSB DEADP,I
0272 75334 065002      LDB L8192    => FIRST DRUM
0273 75335 044354      ADB ,+2      ADDRESS
0274 75336      MLK50 EQU *

```

0275	75336	074037	STB MLKTP	
0276	75337	160037	LDA MLKTP,I	
0277	75340	034037	ISZ MLKTP	
0278	75341	002003	SZA,RSS	
0279	75342	027347	JMP MLK51	
0280	75343	070044	STA KILD	SET ADDRESS WORD
0281	75344	160037	LDA MLKTP,I	
0282	75345	070045	STA KILDF	SET LENGTH WORD
0283	75346	116012	JSB RSFSP,I	RETURN SPACE TO ADT
0284	75347		MLK51 EQU *	
0285	75347	064037	LDB MLKTP	UPDATE TABLE
0286	75350	044355	ADB ,+3	POINTER
0287	75351	037761	ISZ MLKCT	FINISHED TABLE?
0288	75352	027336	JMP MLK50	NO
0289	75353	060113	LDA ADLEN	YES, WRITE
0290	75354	070072	STA WORD	
0291	75355	060112	LDA ADLOC	
0292	75356	064562	LDB LIBD	ADT TO
0293	75357	016231	JSB DRUML	DRUM
0294	75360	116017	JSB DEADP,I	
0295*				
0296**	UPDATE DISC ADT			
0297*				
0298	75361		MLK59 EQU *	
0299	75361	116007	JSB FADTP,I	GET THIS DISC ADT
0300	75362	166045	LDA KILDF,I	
0301	75363	070072	STA WORD	
0302	75364	160044	LDA KILD,I	READ
0303	75365	064566	LDB LIBDI	DISC
0304	75366	016231	JSB DRUML	ADT
0305	75367	116017	JSB DEADP,I	
0306	75370	104200	DLD MLKFB	COMPUTE
	75371	000046		
0307	75372	104400	DST MLKIN	THIS ENTRY
	75373	075764		
0308	75374		MLK57 EQU *	
0309	75374	067767	LDB MLKRD	GET POINTER TO SPECIAL TABLE
0310	75375	057770	CPB MLKRP	END OF TABLE?
0311	75376	027414	JMP MLK58	YES
0312	75377	044351	ADB ,=-1	
0313	75400	160001	LDA B,I	GET LENGTH
0314	75401	070043	STA MLKBR	
0315	75402	044351	ADB ,=-1	
0316	75403	160001	LDA B,I	SECOND WORD OF DISC ADDRESS
0317	75404	070047	STA MLKFB+1	
0318	75405	044351	ADB ,=-1	
0319	75406	160001	LDA B,I	FIRST WORD OF DISC ADDRESS
0320	75407	070046	STA MLKFB	
0321	75410	077767	STB MLKRD	TABLE POINTER
0322	75411	115011	JSB RADTP,I	RETURN SPACE TO DISC ADT
0323	75412	000000	NOP	
0324	75413	027374	JMP MLK57	
0325	75414		MLK58 EQU *	
0326	75414	104200	DLD MLKIN	RESTORE
	75415	075764		

0327	75416	104400	DST MLKFB	MLKFB
	75417	000046		
0328	75420	160045	LDA KILDF, I	COMPUTE
0329	75421	003004	CMA, INA	END OF
0330	75422	040562	ADA LIBD	TABLE
0331	75423	073760	STA MLKND	BUFFER
0332	75424	064562	LDB LIBD	INITIALIZE
0333	75425	074037	STB MLKTP	TABLE POINTER
0334	75426		MLK60 EQU *	
0335	75426	104200	DLD MLKTP, I	-STARTING
	75427	100037		
0336	75430	017745	JSB MLKTP	BLOCK
0337	75431	002003	SZA, RSS	
0338	75432	006002	SZB	EQUAL?
0339	75433	002001	RSS	NO
0340	75434	027450	JMP MLK61	YES
0341	75435	002020	SSA	GREATER?
0342	75436	027553	JMP MLK65	YES
0343	75437	064037	LDB MLKTP	UPDATE
0344	75440	044355	ADB .+3	TABLE
0345	75441	074037	STB MLKTP	POINTER
0346	75442	057760	CPB MLKND	END OF TABLE?
0347	75443	002001	RSS	YES
0348	75444	027426	JMP MLK60	NO
0349	75445	017611	JSB MLKPE	CHECK PRECEEDING ENTRY
0350	75446	027536	JMP MLK64	MERGED
0351	75447	027544	JMP MLK98	NO WORK DONE
0352	75450		MLK61 EQU *	
0353	75450	064037	LDB MLKTP	
0354	75451	044354	ADB .+2	
0355	75452	063766	LDA MLKLN	IS THIS
0356	75453	003100	CMA, CLE	ENTRY
0357	75454	140001	ADA B, I	COMPLETELY
0358	75455	002045	SEZ, INA, RSS	ENCLOSED?
0359	75456	027464	JMP MLK62	YES
0360	75457	170001	STA B, I	NEW LENGTH
0361	75460	027532	JMP MLK67	
0362	75461		MLK66 EQU *	
0363	75461	064037	LDB MLKTP	UPDATE
0364	75462	044350	ADB .-2	TABLE
0365	75463	074037	STB MLKTP	POINTER
0366	75464		MLK62 EQU *	
0367	75464	064037	LDB MLKTP	SET UP
0368	75465	074051	STB MOVED	POINTERS
0369	75466	044355	ADB .+3	FUR
0370	75467	074050	STB MOVES	MOVE
0371	75470	063760	LDA MLKND	COMPUTE
0372	75471	003004	CMA, INA	LENGTH
0373	75472	044000	ADB A	OF MOVE
0374	75473	016257	JSB MOVEW	ELIMINATE ENTRY
0375	75474	164045	LDB KILDF, I	UPDATE
0376	75475	044355	ADB .+3	DISC ADT
0377	75476	174045	STB KILDF, I	LENGTH
0378	75477	067760	LDB MLKND	UPDATE END
0379	75500	044347	ADB .-3	OF TABLE

0380	75501	077760	STB MLKND	POINTER
0381	75502		MLK63 EQU *	
0382	75502	064037	LDB MLKTP	END OF
0383	75503	057760	CPB MLKND	TABLE?
0384	75504	027536	JMP MLK64	YES
0385	75505	104200	DLB MLKTP, I	NO,
	75506	100037		
0386	75507	104400	DST MLKIN	OVERLAP
	75510	075764		
0387	75511	104200	DLB MLKLB	NEXT
	75512	075762		
0388	75513	017745	JSB MLKTP	ENTRY?
0389	75514	002021	SSA, RSS	
0390	75515	027536	JMP MLK64	NO
0391	75516	034037	ISZ MLKTP	YES,
0392	75517	034037	ISZ MLKTP	COMPLETELY
0393	75520	000040	CLE	ENCLOSE
0394	75521	144037	ADB MLKTP, I	IT?
0395	75522	006003	SZB, RSS	
0396	75523	027461	JMP MLK66	YES
0397	75524	002041	SEZ, RSS	MAYBE
0398	75525	027461	JMP MLK66	YES
0399	75526	174037	STB MLKTP, I	NO, SAVE LENGTH
0400	75527	064037	LDB MLKTP	
0401	75530	044350	ADB .-2	
0402	75531	074037	STB MLKTP	STARTING
0403	75532		MLK67 EQU *	
0404	75532	104200	DLB MLKLB	
	75533	075762		
0405	75534	104400	DST MLKTP, I	BLOCK
	75535	100037		
0406	75536		MLK64 EQU *	
0407	75536	160045	LDA KILDF, I	WRITE
0408	75537	070072	STA WORD	
0409	75540	160044	LDA KILD, I	DISC ADT
0410	75541	064562	LDB LIBD	
0411	75542	016231	JSB DRUML	TO DRUM
0412	75543	116017	JSB DEADP, I	
0413*				
0414	75544		MLK98 EQU *	
0415	75544	060030	LDA MLKTC	ANY TABLE ENTRIES
0416	75545	002002	SZA	
0417	75546	117740	JSB MLKUI, I	YES, UPDATE IDT
0418*				
0419	75547		MLK99 EQU *	
0420	75547	103100	CLF 0	
0421	75550	002400	CLA	
0422	75551	070260	STA LIB	
0423	75552	026267	JMP LEND	
0424	75553		MLK65 EQU *	
0425	75553	017611	JSB MLKPE	CHECK PRECEEDING ENTRY
0426	75554	027502	JMP MLK63	GO CHECK
0427	75555	027502	JMP MLK63	SUCCEEDING ENTRY
0428*				
0429*	MLKPB	CHECKS	THE PRECEEDING BLOCK	TO SEE IF THE NEW ENTRY IS IN

0430* ITS RANGE, IF SO, IT MODIFIES THE PRECEEDING ENTRY AND RETURNS
 0431* TO (P+1), OTHERWISE TO (P+2).

0432*

0433	75556	000000	MLKPB	NOP	
0434	75557	054562		CPB LIBD	BEGINNING OF TABLE?
0435	75560	027607		JMP MLKP1	YES
0436	75561	044351		ADB , -1	NO, NEW
0437	75562	160001		LVA B, I	
0438	75563	044351		ADB , -1	BLOCK IN
0439	75564	140001		ADA B, I	
0440	75565	003100		CMA, CLE	RANGE OF
0441	75566	040032		ADA MLKFA	
0442	75567	002040		SEZ	PRECEEDING ONE?
0443	75570	027606		JMP MLKP1-1	NO
0444	75571	160001		LDA B, I	YES, COMPUTE
0445	75572	003004		CMA, INA	
0446	75573	040031		ADA MLKLA	NEW LENGTH
0447	75574	006004		INB	
0448	75575	073757		STA MLKXB	
0449	75576	003104		CMA, CLE, INA	
0450	75577	140001		ADA B, I	BIGGER THAN
0451	75600	002040		SEZ	PREVIOUS LENGTH?
0452	75601	027604		JMP ++3	NO
0453	75602	063757		LDA MLKXB	YES, SAVE NEW
0454	75603	170001		STA B, I	LENGTH
0455	75604	006004		INB	RESTORE (B)
0456	75605	127556		JMP MLKPB, I	
0457	75606	044354		ADB , +2	RESTORE (B)
0458	75607		MLKP1	EWU *	
0459	75607	037556		ISZ MLKPB	
0460	75610	127556		JMP MLKPB, I	EXIT TO (P+2)

0461*

0462*

0463	75611	000000	MLKPE	NOP	
0464	75612	104200		DLD MLKFB	FOR SUBTRACT
		75613			
0465	75614	104400		DST MLKIN	ROUTINE
		75615			
0466	75616	060037		LDA MLKTP	BEGINNING
0467	75617	050562		CPA LIBD	OF TABLE?
0468	75620	027641		JMP MLKE1	YES
0469	75621	040351		ADA , -1	NO
0470	75622	164000		LDB A, I	SAVE
0471	75623	077757		STB MLKXB	LENGTH
0472	75624	040350		ADA , -2	SAVE
0473	75625	070037		STA MLKTP	POINTER
0474	75626	160037		LDA MLKTP, I	IS THE NEW
0475	75627	034037		ISZ MLKTP	
0476	75630	000040		CLE	BLOCK IN
0477	75631	144037		ADB MLKTP, I	
0478	75632	002040		SEZ	RANGE OF THE
0479	75633	002004		INA	
0480	75634	017745		JSB MLKTP	PRECEEDING ONE?
0481	75635	034037		ISZ MLKTP	
0482	75636	002020		SSA	

0483	75637	027643	JMP MLKE2	YES
0484	75640	034037	ISZ MLKTP	
0485	75641		MLKE1 EQU *	
0486	75641	037611	ISZ MLKPE	
0487	75642	127611	JMP MLKPE,I	
0488	75643		MLKE2 EQU *	
0489	75643	060037	LDA MLKTP	COMPUTE
0490	75644	040350	ADA ,=2	
0491	75645	104200	DLA A,I	NEW LENGTH
	75646	100000		
0492	75647	017745	JSB MLKTP	
0493	75650	174037	STB MLKTP,I	AND SAVE
0494	75651	064037	LDB MLKTP	
0495	75652	044350	ADB ,=2	
0496	75653	074037	STB MLKTP	
0497	75654	104200	DLA MLKTP,I	IS THE
	75655	100037		
0498	75656	000040	CLE	
0499	75657	047757	ADB MLKXB	UNLOCKED
0500	75660	002040	SEZ	
0501	75661	002004	INA	PORTION
0502	75662	104400	DST MLKIN	IN THE MIDDLE
	75663	075764		
0503	75664	104200	DLA MLKLB	
	75665	075762		
0504	75666	017745	JSB MLKTP	OF THE PREVIOUS
0505	75667	002003	SZA,RSS	
0506	75670	006002	SZB	BLOCK?
0507	75671	002001	RSS	
0508	75672	027732	JMP MLKE3	NO
0509	75673	002020	SSA	MAYBE
0510	75674	027732	JMP MLKE3	NO
0511	75675	077757	STB MLKXB	YES
0512	75676	067760	LDB MLKND	TABLE
0513	75677	057741	CPB ML819	FULL?
0514	75700	027732	JMP MLKE3	YES
0515	75701	074050	STB MOVES	
0516	75702	044355	ADB ,+3	SET UP
0517	75703	074051	STB MOVED	
0518	75704	077760	STB MLKND	FOR
0519	75705	044345	ADB ,=5	
0520	75706	007004	CMB,INB	MOVE
0521	75707	044037	ADB MLKTP	
0522	75710	016243	JSB MOVEB	MAKE ROOM FOR NEW ENTRY
0523	75711	164045	LDB KILDF,I	UPDATE
0524	75712	044347	ADB ,=3	DISC ADT
0525	75713	174045	STB KILDF,I	LENGTH
0526	75714	064037	LDB MLKTP	UPDATE
0527	75715	044355	ADB ,+3	TABLE
0528	75716	074037	STB MLKTP	POINTER
0529	75717	104200	DLA MLKLB	SAVE ADDRESS
	75720	075762		
0530	75721	104400	DST MLKTP,I	OF NEW ENTRY
	75722	100037		
0531	75723	064037	LDB MLKTP	SAVE

0532	75724	044354		ADB	.*+2	
0533	75725	063757		LDA	MLKXB	LENGTH
0534	75726	170001		STA	B,I	
0535	75727	006004		INB		ALSO
0536	75730	074037		STB	MLKTP	
0537	75731	127611		JMP	MLKPE,I	
0538	75732		MLKE3	EQU	*	
0539	75732	064037		LDB	MLKTP	RESTORE
0540	75733	044355		ADB	.*+3	TABLE
0541	75734	074037		STB	MLKTP	POINTER
0542	75735	127611		JMP	MLKPE,I	
0543	75736	001630	MLKLZ	DEF	LIBUS+256	
0544	75737	001627	MLKLY	DEF	LIBUS+255	
0545	75740	072727	MLKUI	DEF	TBIDT	
0546	75741	021226	ML819	DEF	LIBUS+8190	
0547	75742		\$\$MLU	EQU	*	

0002* THE COPY COMMAND IS USED TO COPY A PROGRAM OR FILE FROM ONE USER'S
 0003* LIBRARY TO ANOTHER USER'S LIBRARY. THE FORMAT IS:

0004*
 0005*
 0006*

COPY=OLDID, OLDNAME, NEWID, NEWNAME

0007	75000		ORG LIBRA	
0008	75000	060520	LDA DLTEM	
0009	75001	017512	JSB COPIN	GET OLD ID AND NAME
0010	75002	054426	CPB ,+54B	COMMA FOLLOWS?
0011	75003	002201	RSS	YES
0012	75004	026275	JMP LFRER	NO, ERROR
0013	75005	063742	LDA COPPT	
0014	75006	017512	JSB COPIN	GET NEW ID AND NAME
0015	75007	054367	CPB ,+15B	CR FOLLOWS?
0016	75010	002201	RSS	YES
0017	75011	026275	JMP LFRER	NO, ERROR
0018	75012	116005	JSB DLOKP,I	
0019	75013	027017	JMP COP00	
0020	75014	063714	LDA COPEG	"NO SUCH ENTRY"
0021	75015	064342	LDB COPFG	
0022	75016	027613	JMP COPII	
0023	75017		COP00 EQU *	
0024	75017	064035	LDB COPS	
0025	75020	044354	ADB ,+2	
0026	75021	063742	LDA COPPT	
0027	75022	040354	ADA ,+2	
0028	75023	070042	STA COPP	
0029	75024	160001	LDA B,I	MOVE
0030	75025	011036	AND BIT15	FILE
0031	75026	130042	IOR COPP,I	FLAG
0032	75027	170042	STA COPP,I	
0033	75030	006004	INB	
0034	75031	034042	ISZ COPP	
0035	75032	160001	LDA B,I	MOVE
0036	75033	011036	AND BIT15	SEMI-
0037	75034	130042	IOR COPP,I	COMPILED
0038	75035	170042	STA COPP,I	FLAG
0039	75036	006004	INB	
0040	75037	160001	LDA B,I	GET WORD FOUR
0041	75040	002201	SSA,RSS	CHECK FOR ILL-STORED PROGRAM
0042	75041	027045	JMP COP0	
0043	75042	063701	LDA COPEF	"ILL-STORED PROGRAM"
0044	75043	064340	LDB COPFF	
0045	75044	027613	JMP COPII	
0046	75045		COP0 EQU *	
0047	75045	070042	STA COPP	SAVE WORD 4
0048	75046	044355	ADB ,+3	
0049	75047	160001	LDA B,I	
0050	75050	072137	STA COPDR	DRUM ADDRESS
0051	75051	006004	INB	
0052	75052	160001	LDA B,I	FIRST WORD OF DISC ADDRESS
0053	75053	070043	STA COPDI	
0054	75054	006004	INB	
0055	75055	160001	LDA B,I	SECOND WORD OF DISC ADDRESS
0056	75056	070044	STA COPDI+1	

0057	75057	044354		ADB .+2	
0058	75060	160001		LDA B,I	
0059	75061	070040		STA COPWD	SAVE LENGTH
0060*					
0061	75062	002021		SSA,RSS	
0062	75063	027067		JMP **4	
0063	75064	001727		ALF,ALF	CONVERT
0064	75065	030762		IOR HIMSK	LENGTH
0065	75066	003004		CMA,INA	TO
0066	75067	072315		STA COPLN	BLOCKS
0067*					
0068	75070	163742		LDA COPPT,I	FIND WHAT
0069	75071	070052		STA ID	TRACK NEW
0070	75072	016376		JSB GTIL	ID IS ON
0071	75073	060076		LDA IDLNP	
0072	75074	164000		LDB A,I	LENGTH
0073	75075	006003		SZB,RSS	ZERO?
0074	75076	027124		JMP COP2	YES, ERROR
0075	75077	074072		STB WORD	NO, SAVE IT
0076	75100	007004		CMB,INB	SET POINTER
0077	75101	044562		ADB LIBD	TO LAST
0078	75102	074031		STB LTEMP+1	WORD +1
0079	75103	040351		ADA .-1	
0080	75104	160000		LDA A,I	DRUM ADDRESS
0081	75105	064566		LDB LIBDI	
0082	75106	016231		JSB DRUML	READ ID TRACK
0083	75107	116015		JSB SICKP,I	
0084*					
0085	75110	064562		LDB LIBD	
0086	75111		COP1	EQU *	
0087	75111	054031		CPB LTEMP+1	END OF TABLE?
0088	75112	027124		JMP COP2	YES
0089	75113	160001		LDA B,I	NO, GET CURRENT ID
0090	75114	003004		CMA,INA	
0091	75115	040052		ADA ID	
0092	75116	002003		SZA,RSS	EQUAL?
0093	75117	027127		JMP COP3	YES, FOUND THE ONE WE WANT
0094	75120	002020		SSA	NO, GREATER?
0095	75121	027124		JMP COP2	YES, ERROR
0096	75122	044362		ADB .+8	NO, MOVE TO NEXT ONE
0097	75123	027111		JMP COP1	
0098	75124		COP2	EQU *	
0099	75124	063635		LDA COPEB	"NO SUCH ID"
0100	75125	064344		LDB COPFB	
0101	75126	027613		JMP COPIL	
0102	75127		COP3	EQU *	
0103	75127	070045		STA COPDU	SET DRUM ADDRESS
0104	75130	044361		ADB .+7	
0105	75131	076132		STB COPF	SAVE POINTER TO ENTRY
0106	75132	160001		LDA B,I	GET TOTAL
0107	75133	042315		ADA COPLN	SPACE USED
0108	75134	003004		CMA,INA	
0109	75135	044351		ADB .-1	
0110	75136	000040		CLE	
0111	75137	140001		ADA B,I	

0112	75140	002040	SEZ	COMPARE WITH ALLOTMENT
0113	75141	027145	JMP COP4	OK
0114	75142	063644	LDA COPEC	"LIBRARY SPACE FULL"
0115	75143	064340	LDB COPFC	
0116	75144	027613	JMP COFIL	
0117	75145		COP4 EQU *	
0118	75145	060342	LDA ,=8	8 POSSIBLE DISC ADTS
0119	75146	072435	STA COPDF	
0120	75147		COP5 EQU *	
0121	75147	062010	LDA RKCYP	GET CYCLIC POINTER
0122	75150	002004	INA	AND ADVANCE
0123	75151	053752	CPA CPLNA	IT TO THE
0124	75152	063753	LDA CPLCA	NEXT ENTRY
0125	75153	072010	STA RKCYP	IN THE TABLE
0126	75154	040362	ADA ,+DADLN=DADLC	
0127	75155	072164	STA COPD	
0128	75156	162164	LDA COPD,I	
0129	75157	002003	SZA,RSS	IS THIS DISC AVAILABLE?
0130	75160	027205	JMP COP7	NO
0131	75161	070072	STA WORD	YES, SAVE LENGTH
0132	75162	162010	LDA RKCYP,I	GET DRUM ADDRESS
0133	75163	064566	LDB LIBDI	
0134	75164	016231	JSB DRUML	READ IT
0135	75165	027205	JMP COP7	
0136	75166	007400	CCB	COMPUTE
0137	75167	162164	LDA COPD,I	ENTRY
0138	75170	100400	DIV ,+3	COUNT
	75171	000355		
0139	75172	070041	STA COPC	
0140	75173	064562	LDB LIBD	
0141	75174	044354	ADB ,+2	=> LENGTH WORD
0142	75175		COP6 EQU *	
0143	75175	160001	LDA B,I	
0144	75176	003100	CMA,CLE	
0145	75177	042315	ADA COPLN	
0146	75200	002041	SEZ,RSS	ENTRY LARGE ENOUGH?
0147	75201	027215	JMP COP10	YES
0148	75202	044355	ADB ,+3	NO
0149	75203	034041	ISZ COPC	ANY LEFT?
0150	75204	027175	JMP COP6	YES
0151	75205		COP7 EQU *	
0152	75205	036435	ISZ COPDF	NO, ANY ADTS LEFT?
0153	75206	027147	JMP COP5	YES
0154*				
0155	75207		COP8 EQU *	
0156	75207	063657	LDA COPEL	"SYSTEM OVERLOAD"
0157	75210	064342	LDB COPFD	
0158	75211	027613	JMP COFIL	
0159*				
0160	75212		COP9 EQU *	
0161	75212	063670	LDA COPEE	"DUPLICATE ENTRY"
0162	75213	064342	LDB COPFE	
0163	75214	027613	JMP COFIL	
0164*				
0165	75215		COP10 EQU *	

0166	75215	062315	LDA COPLN	SAVE
0167	75216	003004	CMA,INA	NEGATIVE NUMBER
0168	75217	140001	ADA B,I	OF SECTORS LEFT
0169	75220	072435	STA COPDF	
0170	75221	044350	ADB .-2	SAVE LOCATION OF
0171	75222	074041	STB COPC	DISC ADT ENTRY
0172	75223	104200	DLD B,I	GET DISC ADDRESS
	75224	100001		
0173	75225	104400	DST COPDS	AND SAVE
	75226	000036		
0174*				
0175	75227	060520	LDA DLTEM	MOVE ID/NAME
0176	75230	070051	STA MOVED	TO LTEMP(0:3)
0177	75231	063742	LDA COPPT	
0178	75232	070050	STA MOVES	
0179	75233	064346	LDB .-4	
0180	75234	016257	JSB MOVEW	
0181	75235	116005	JSB DLOKP,I	SEARCH FOR ENTRY
0182	75236	027212	JMP COP9	FOUND, ERROR
0183*				
0184	75237	164034	LDB COPI,I	IF TRACK IS FULL, GO
0185	75240	054714	CPB M8184	DO OVERLAY SECTION
0186	75241	027735	JMP COP98	
0187*				
0188	75242	007000	CMB	MAKE
0189	75243	044562	ADB LIBD	
0190	75244	074050	STB MOVES	ROOM
0191	75245	044366	ADB .+12	
0192	75246	074051	STB MOVED	FUR NEW
0193	75247	007000	CMB	
0194	75250	044402	ADB .+24	DIRECTORY
0195	75251	044035	ADB COP8	
0196	75252	016243	JSB MOVEB	ENTRY
0197*				
0198	75253	060520	LDA DLTEM	MOVE
0199	75254	070050	STA MOVES	
0200	75255	060035	LDA COPS	ID/NAME
0201	75256	040366	ADA .+12	
0202	75257	070051	STA MOVED	INTO
0203	75260	064346	LDB .-4	
0204	75261	016257	JSB MOVEW	DIRECTORY
0205	75262	060042	LDA COPP	WORD 4
0206	75263	170051	STA MOVED,I	
0207	75264	016076	JSB DATE	LAST REFERENCE DATE
0208	75265	034051	ISZ MOVED	
0209	75266	170051	STA MOVED,I	
0210	75267	034051	ISZ MOVED	
0211	75270	060201	LDA DATIM	LAST CHANGE DATE
0212	75271	170051	STA MOVED,I	
0213	75272	034051	ISZ MOVED	
0214	75273	002400	CLA	DRUM ADDRESS
0215	75274	170051	STA MOVED,I	
0216	75275	034051	ISZ MOVED	
0217	75276	104200	DLD COPDS	DISC ADDRESS
	75277	000036		

0218	75300	104400	DST	MOVED, I	
	75301	100051			
0219	75302	064051	LDB	MOVED	
0220	75303	044355	ADB	,+3	
0221	75304	060040	LDA	COPWD	LENGTH
0222	75305	170001	STA	B, I	
0223*					
0224	75306	160034	LDA	COPI, I	ADJUST
0225	75307	040336	ADA	,=12	DIRECTORY
0226	75310	170034	STA	COPI, I	LENGTH
0227	75311	070072	STA	WORD	
0228	75312	060034	LDA	COPI	
0229	75313	002004	INA		
0230	75314	070051	STA	MOVED	
0231	75315	040357	ADA	,+5	
0232	75316	160000	LDA	A, I	
0233	75317	064562	LDB	LIBD	
0234	75320	074050	STB	MOVES	
0235	75321	016231	JSB	DRUML	WRITE DIRECTORY BACK
0236	75322	115017	JSB	DEADP, I	
0237*					
0238	75323	064346	LDB	,=4	RESET
0239	75324	016257	JSB	MOVEW	DIREC
0240*					
0241	75325		COP11	EGU *	
0242	75325	060076	LDA	IDLNP	
0243	75326	164000	LDB	A, I	
0244	75327	074072	STB	WORD	
0245	75330	040351	ADA	,=1	
0246	75331	160000	LDA	A, I	
0247	75332	064566	LDB	LIBDI	
0248	75333	015231	JSB	DRUML	READ IOT AGAIN
0249	75334	116017	JSB	DEADP, I	
0250*					
0251	75335	162132	LDA	COPF, I	UPDATE
0252	75336	042315	ADA	COPLN	DISC
0253	75337	172132	STA	COPF, I	USED
0254*					
0255	75340	160075	LDA	IDLCP, I	
0256	75341	064562	LDB	LIBD	
0257	75342	016231	JSB	DRUML	WRITE OUT IOT
0258	75343	116017	JSB	DEADP, I	
0259*					
0260	75344	162164	LDA	COPD, I	
0261	75345	070072	STA	WORD	
0262	75346	162010	LDA	RKCYP, I	
0263	75347	064566	LDB	LIBDI	
0264	75350	016231	JSB	DRUML	READ DISC ADT BACK
0265	75351	027373	JMP	COP14	CAN'T, GO ZAP IT
0266*					
0267	75352	062435	LDA	COPDF	
0268	75353	002002	SZA		ADT ENTRY COMPLETELY USED?
0269	75354	027377	JMP	COP15	NO
0270*					
0271	75355	064041	LDB	COPC	YES, REMOVE IT

0272	75356	074051	STB	MOVED	
0273	75357	044355	ADB	+.3	
0274	75360	074050	STB	MOVES	
0275	75361	044674	ADB	MLIBD	
0276	75362	044072	ADB	WORD	
0277	75363	016257	JSB	MOVEW	
0278*					
0279	75364	060355	LDA	+.3	
0280	75365	166164	LDB	COPD,I	
0281	75366	044000	ADB	A	
0282	75367	176164	STB	COPD,I	SHORTEN TABLE LENGTH
0283	75370	040072	ADA	WORD	
0284	75371	070072	STA	WORD	SHORTEN WORD COUNT
0285	75372	027412	JMP	COP16	
0286*					
0287	75373		COP14	EQU *	
0288	75373	002400		CLA	
0289	75374	172164		STA COPD,I	ZERO LENGTH
0290	75375	172010		STA RKCYP,I	ZERO ADDRESS
0291	75376	027416		JMP COP17	
0292*					
0293	75377		COP15	EQU *	
0294	75377	064041		LDB COPC	
0295	75400	044354		ADB	+.2
0296	75401	170001		STA B,I	UPDATE THE LENGTH
0297	75402	104200		DLD COPC,I	MOVE THE DISC ADDRESS
	75403	100041			
0298	75404	000040		CLE	
0299	75405	046315		ADB COPLN	BY LOPLN BLOCKS
0300	75406	002040		SEZ	
0301	75407	002004		INA	AND SAVE IT
0302	75410	104400		DST COPC,I	
	75411	100041			
0303*					
0304	75412		COP16	EQU *	
0305	75412	162010		LDA RKCYP,I	
0306	75413	064562		LDB LIBD	
0307	75414	016231		JSB DRUML	WRITE ADT BACK OUT
0308	75415	027373		JMP COP14	
0309*					
0310	75416		COP17	EQU *	
0311	75416	062137		LDA COPDR	GET DRUM ADDRESS
0312	75417	002003		SZA,RSS	ZERO?
0313	75420	027436		JMP COP20	YES
0314	75421	066315		LDB COPLN	NO,
0315	75422	005727		BLF,BLF	COMPUTE
0316	75423	007004		CMB,INB	LENGTH
0317	75424	074072		STB WORD	OF
0318	75425	074215		STB MWORD	TRANSFER
0319	75426	064566		LDB LIBDI	
0320	75427	016231		JSB DRUML	READ FROM DRUM
0321	75430	027611		JMP COPDE	FAILURE
0322	75431	063750		LDA COPAP	
0323	75432	064562		LDB LIBD	
0324	75433	114217		JSB DISCZ,I	WRITE TO DISC

0325	75434	027611	JMP COPDE	FAILURE
0326	75435	026267	JMP LEND	DONE
0327	75436		COP20 EQU *	
0328	75436	006400	CLB	
0329	75437	062315	LDA COPLN	
0330	75440	100400	DIV .+40	
	75441	000422		
0331	75442	003000	CMA	
0332	75443	070041	STA COPC	# OF 40 BLOCK READS + WRITES
0333	75444	074042	STB COPP	# OF BLOCKS IN LAST WRITE
0334	75445		COP21 EQU *	
0335	75445	034041	ISZ COPC	ANY 40 BLOCKERS LEFT?
0336	75446	027452	JMP COP22	YES
0337	75447	060042	LDA COPP	NO, READ AND
0338	75450	017475	JSB COPRW	WRITE LAST ONE
0339	75451	026267	JMP LEND	DONE
0340	75452		COP22 EQU *	
0341	75452	060422	LDA .+40	READ AND WRITE
0342	75453	017475	JSB COPRW	40 BLOCKS
0343	75454	104200	DLD COPDS	UPDATE
	75455	000036		
0344	75456	000040	CLE	
0345	75457	044422	ADB .+40	WRITE
0346	75460	002040	SEZ	
0347	75461	002004	INA	ADDRESS
0348	75462	104400	DST COPDS	UPDATE
	75463	000035		
0349	75464	104200	DLD COPDI	UPDATE
	75465	000043		
0350	75466	000040	CLE	
0351	75467	044422	ADB .+40	READ
0352	75470	002040	SEZ	
0353	75471	002004	INA	ADDRESS
0354	75472	104400	DST COPDI	
	75473	000043		
0355	75474	027445	JMP COP21	LOOP
0356*				
0357*	COPRW	READS AND WRITES		
0358*				
0359	75475	000000	COPRW NOP	
0360	75476	001727	ALF,ALF	COMPUTE
0361	75477	003004	CMA,INA	# OF
0362	75500	070215	STA MWORD	WORDS
0363	75501	063747	LDA COPIP	
0364	75502	064566	LDB LIBDI	
0365	75503	114217	JSB DISCZ,I	READ IT
0366	75504	027611	JMP COPDE	FAILURE
0367	75505	063750	LDA COPAP	
0368	75506	064562	LDB LIBD	
0369	75507	114217	JSB DISCZ,I	WRITE IT
0370	75510	027611	JMP COPDE	FAILURE
0371	75511	127475	JMP COPRW,I	
0372*				
0373*	COPIN	GETS AN ID AND NAME		
0374*				

0375	75512	000000	COPIN	NOP	
0376	75513	070042		STA COPP	⇒ WHERE TO PUT IT
0377	75514	016315		JSB GETID	GET THE ID
0378	75515	002001		RSS	YES
0379	75516	026275		JMP LFRER	CR CNNIT FOLLOW
0380	75517	050426		CPA ,+54B	COMMA FOLLOWS?
0381	75520	002401		CLA,RSS	
0382	75521	026275		JMP LFRER	NO
0383	75522	072132		STA COPF	SAY 1ST CHAR
0384	75523	060052		LDA ID	
0385	75524	170042		STA COPP,I	SAVE ID
0386	75525	060347		LDA ,=3	6 CHAR
0387	75526	070041		STA COPC	MAXIMUM
0388	75527		COPI1	EQU *	
0389	75527	017546		JSB COPR	GET LEFT CHAR
0390	75530	001727		ALF,ALF	
0391	75531	034042		ISZ COPP	
0392	75532	170042		STA COPP,I	SAVE IT
0393	75533	017546		JSB COPR	GET RIGHT CHAR
0394	75534	130042		IOR COPP,I	
0395	75535	170042		STA COPP,I	SAVE IT
0396	75536	034041		ISZ COPC	FINISHED 6 CHARS?
0397	75537	027527		JMP COPI1	NO
0398	75540	017546		JSB COPR	YES, NEXT MUST
0399	75541	050412		CPA ,+40B	BE A BLANK
0400	75542	127512		JMP COPIN,I	OK
0401	75543		COPI2	EQU *	
0402	75543	063625		LDA COPEA	"INVALID NAME"
0403	75544	064343		LDB COPFA	
0404	75545	027613		JMP COPI1	
0405*					
0406*	COPR FETCHES CHARACTERS FOR THE NAME				
0407*					
0408	75546	000000	COPR	NOP	
0409	75547	062132		LDA COPF	TEST TO RETURN BLANK
0410	75550	050412		CPA ,+40B	
0411	75551	127546		JMP COPR,I	
0412	75552		CUPR1	EQU *	
0413	75552	114572		JSB T35CH,I	GET A CHAR
0414	75553	027607		JMP COPR5	
0415	75554	064000		LDB A	
0416	75555	010730		AND ,140	SKIP CONTROL CHARACTERS
0417	75556	002002		SZA	
0418	75557	050730		CPA ,140	
0419	75560	027552		JMP COPR1	
0420	75561		COPR6	EQU *	
0421	75561	062132		LDA COPF	
0422	75562	002002		SZA	FIRST CHAR?
0423	75563	027577		JMP COPR2	NO
0424	75564	054426		CPB ,+54B	YES, COMMA?
0425	75565	026275		JMP LFRER	YES
0426	75566	054416		CPB ,+44B	NO, '5'?
0427	75567	027543		JMP COPI2	YES
0428	75570	054424		CPB ,+52B	NO, '1'?
0429	75571	027543		JMP COPI2	YES

0430	75572	054367	CPB	.,+15B	NO, CR?
0431	75573	026275	JMP	LFRER	
0432	75574		COPR3	EQU *	
0433	75574	060001	LDA	B	NO, RESTORE A
0434	75575	036132	ISZ	COPF	
0435	75576	127546	JMP	COPR, I	
0436	75577		COPR2	EQU *	
0437	75577	054426	CPB	.,+54B	COMMA?
0438	75600	027604	JMP	COPR4	YES
0439	75601	054367	CPB	.,+15B	CR?
0440	75602	002001	RSS		YES
0441	75603	027574	JMP	COPR3	NO
0442	75604		COPR4	EQU *	
0443	75604	060412	LDA	.,+40B	RETURN A BLANK
0444	75605	072132	STA	COPF	
0445	75606	127546	JMP	COPR, I	
0446	75607		COPR5	EQU *	
0447	75607	064000	LDB	A	
0448	75610	027561	JMP	COPR6	
0449	75611		COPDE	EQU *	
0450	75611	063725	LDA	COPEH	"UNSUCCESSFUL; KILL AND REPEAT"
0451	75612	064343	LDB	COPFH	
0452	75613		COFIL	EQU *	
0453	75613	070050	STA	MOVES	MOVE ERROR
0454	75614	060305	LDA	T35B1	
0455	75615	070051	STA	MOVED	MESSAGE TO
0456	75616	074030	STB	LTEMP	
0457	75617	016257	JSB	MOVEW	TTY BUFFER
0458	75620	060030	LDA	LTEMP	
0459	75621	001000	ALS		
0460	75622	003004	CMA, INA		
0461	75623	064305	LDB	T35B1	
0462	75624	026271	JMP	LEND+2	
0463	75625	075626	COPEA	DEF **1	
0464	75626	005111	OCT	5111	
0465	75627	047126	ASC	6, NVALID NAME	
		75630		040514	
		75631		044504	
		75632		020116	
		75633		040515	
		75634		042440	
0466	00343		COPFA	EQU .-++COPEA+1	
0467	75635	075636	COPEB	DEF **1	
0468	75636	005116	OCT	5116	
0469	75637	047440	ASC	5, 0 SUCH ID	
		75640		051525	
		75641		041510	
		75642		020111	
		75643		042040	
0470	00344		COPFB	EQU .-++COPEB+1	
0471	75644	075645	COPEC	DEF **1	
0472	75645	005114	OCT	5114	
0473	75646	044502	ASC	9, IBRARY SPACE FULL	
		75647		051101	
		75650		051131	

	75651	020123		
	75652	050101		
	75653	041503		
	75654	020106		
	75655	052514		
	75656	046040		
0474	00340		COPFC	EQU .-++COPEC+1
0475	75657	075660	COPEO	DEF ++1
0476	75660	005123		OCT 5123
0477	75661	054523		ASC 7, YSTEM OVERLOAD
	75662	052105		
	75663	046440		
	75664	047526		
	75665	042522		
	75666	046117		
	75667	040504		
0478	00342		COPFD	EQU .-++COPEO+1
0479	75670	075671	COPEE	DEF ++1
0480	75671	005104		OCT 5104
0481	75672	052520		ASC 7, UPLICATE ENTRY
	75673	046111		
	75674	041501		
	75675	052106		
	75676	020106		
	75677	047124		
	75700	051131		
0482	00342		COPFE	EQU .-++COPEE+1
0483	75701	075702	COPEF	DEF ++1
0484	75702	005111		OCT 5111
0485	75703	046114		ASC 9, LL=STORED PROGRAM
	75704	026523		
	75705	052117		
	75706	051105		
	75707	042040		
	75710	050122		
	75711	047507		
	75712	051101		
	75713	046440		
0486	00340		COPFF	EQU .-++COPEF+1
0487	75714	075715	COPEG	DEF ++1
0488	75715	005116		OCT 5116
0489	75716	047440		ASC 7, O SUCH ENTRY
	75717	051525		
	75720	041510		
	75721	020105		
	75722	047124		
	75723	051131		
	75724	020040		
0490	00342		COPFG	EQU .-++COPEG+1
0491	75725	075726	COPEH	DEF ++1
0492	75726	005125		OCT 5125
0493	75727	047123		ASC 6, NSUCCESSFUL
	75730	052503		
	75731	041505		
	75732	051523		

	75733	043125			
	75734	046040			
0494	00343		COPFH	EQU	.*+COPEH+1
0495	75735		COP98	EQU	*
0496	75735	063754		LDA	CM507 SET UP
0497	75736	070072		STA	WORD OVERLAY
0498	75737	163751		LDA	COPOV,I
0499	75740	064504		LDB	#LIBI
0500	75741	027773		JMP	COP99
0501*					
0502	75742	075743	COPPT	DEF	++1
0503	75743	000000		BSS	4
0504	75747	000043	COPIP	DEF	COPDI
0505	75750	000036	COPAP	DEF	COPDS
0506	75751	072044	COPOV	DEF	SAVO+COM6-COM3
0507	75752	000125	CPLNA	DEF	DADLN
0508	75753	000115	CPLCA	DEF	DADLC
0509	75754	177005	CM507	DEC	-507
0510	00034		COPI	EQU	LTEMP+4
0511	00035		COPS	EQU	LTEMP+5
0512	00036		COPDS	EQU	LTEMP+6 7 ALSO USED
0513	00040		COPWD	EQU	LTEMP+8
0514	00041		COPC	EQU	LTEMP+9
0515	00042		CUPP	EQU	LTEMP+10
0516	00043		COPDI	EQU	LTEMP+11 12 ALSO USED
0517	00045		COPDU	EQU	LTEMP+13
0518	74132		COPF	EQU	LOUT
0519	74137		COPDR	EQU	LTYPR
0520	74315		COPLN	EQU	GETID
0521	74164		COPD	EQU	LCHAR
0522	74435		COPDF	EQU	SCHLQ
0523*					
0524	75773			ORG	LIBRA+507
0525	75773		COP99	EQU	*
0526	75773	016231		JSB	DRUML CALL OVERLAY
0527	75774	116015		JSB	SICKP,I
0528	75775	027000		JMP	LIBRA
0529	75776	027325		JMP	COP11 NORMAL RETURN
0530	75777	027207		JMP	COP8 ERROR RETURN
0531	76000		SCOP	EQU	*

0002* THE BESTOW COMMAND IS USED TO TRANSFER PROGRAMS AND FILES FROM
 0003* ONE USER'S LIBRARY TO ANOTHER USER'S LIBRARY. THE FORMAT OF THE
 0004* COMMAND IS:

0005*

0006* BES = OLDID, NEWID [,NAME]

0007*

0008* IF NAME IS OMITTED, ALL PROGRAMS ARE TRANSFERRED EXCEPT FOR THOSE
 0009* WHOSE NAMES ALREADY EXIST IN NEWID'S LIBRARY.

0010*

0011	75000		ORG LIBRA	
0012	75000	016315	JSB GETID	GET OLDID
0013	75001	002001	RSS	
0014	75002	026275	JMP LFRER	CR IS ERROR
0015	75003	050426	CPA ,+54B	COMMA FOLLOWS?
0016	75004	002401	CLA,RSS	YES
0017	75005	026275	JMP LFRER	NO, ERROR
0018	75006	072137	STA BESDE	SET DUPLICATE ENTRY COUNTER
0019	75007	060052	LDA ID	SAVE
0020	75010	070030	STA LTEMP	
0021	75011	072132	STA BESOI	ID

0022*

0023	75012	016315	JSB GETID	GET NEWID
0024	75013	000000	NOP	
0025	75014	050367	CPA ,+15B	CR FOLLOWS?
0026	75015	027061	JMP BES3	YES
0027	75016	050425	CPA ,+54B	NO, COMMA?
0028	75017	002401	CLA,RSS	YES
0029	75020	026275	JMP LFRER	NO, ERROR
0030	75021	070043	STA BESF	
0031	75022	060520	LDA DLTEM	
0032	75023	070042	STA BESE	
0033	75024	060347	LDA ,=3	6 CHAR
0034	75025	070041	STA BESE	MAXIMUM

0035*

0036	75026		BES1 EQU *	
0037	75026	017504	JSB BE8R	GET LEFT CHAR
0038	75027	001727	ALF,ALF	
0039	75030	034042	ISZ BESE	
0040	75031	170042	STA BESE,I	SAVE IT
0041	75032	017504	JSB BE8R	GET RIGHT CHAR
0042	75033	130042	IOR BESE,I	
0043	75034	170042	STA BESE,I	SAVE IT
0044	75035	034041	ISZ BESE	FINISHED 6 CHARS?
0045	75036	027026	JMP BESE	NO
0046	75037	017504	JSB BE8R	YES, NEXT MUST
0047	75040	050412	CPA ,+40B	BE A BLANK
0048	75041	002001	RSS	OK
0049	75042	026275	JMP LFRER	
0050	75043	054367	CPB ,+15B	CR FOLLOWS?
0051	75044	003401	CCA,RSS	YES
0052	75045	026275	JMP LFRER	NO

0053*

0054	75046	072164	STA BESMF	SET MODE FLAG
0055	75047	116005	JSB DLOKP,I	SEARCH FOR ENTRY
0056	75050	027054	JMP BESE	FOUND

0057	75051	063552	LDA BESEA	"ENTRY NOT FOUND"
0058	75052	064342	LDB BESFA	
0059	75053	027146	JMP BESIL	
0060	75054		BES2 EQU *	
0061	75054	104200	DLD LTEMP+4	SAVE
	75055	000034		
0062	75056	072025	STA BESD4	DIRECTORY
0063	75057	076315	STB BESD5	POINTERS
0064	75060	027164	JMP BES10	
0065*				
0066	75061		BES3 EQU *	
0067	75061	002400	CLA	SET MODE
0068	75062	072164	STA BESMF	FLAG
0069	75063	070031	STA LTEMP+1	INITIALIZE
0070	75064	070032	STA LTEMP+2	
0071	75065	070033	STA LTEMP+3	NAME
0072*				
0073	75066		BES4 EQU *	
0074	75066	116005	JSB DLOKP,I	SEARCH FOR ENTRY
0075	75067	027160	JMP BES9	FOUND
0076	75070	064035	LDB LTEMP+5	
0077	75071	044366	ADB .+12	
0078	75072	074035	STB LTEMP+5	
0079	75073	164034	LDB LTEMP+4,I	NOT FOUND
0080	75074	007004	CMB,INB	DO WE POINT
0081	75075	044562	ADB LIBD	BEYOND THE
0082	75076	054035	CPB LTEMP+5	DIRECTORY?
0083	75077	002001	RSS	YES
0084	75100	027131	JMP BES6	NO
0085	75101	064034	LDB LTEMP+4	
0086	75102		BES5 EQU *	
0087	75102	044361	ADB .+7	=> NEXT DIREC ENTRY
0088	75103	057650	CPB BDIRU	LAST ONE?
0089	75104	027134	JMP BES7	YES
0090	75105	160001	LDA B,I	NO
0091	75106	002003	SZA,RSS	LENGTH ZERO?
0092	75107	027102	JMP BES5	YES
0093	75110	006004	INB	NO
0094	75111	160001	LDA B,I	GET FIRST ID ON TRACK
0095	75112	050030	CPA LTEMP	SAME AS THIS ONE?
0096	75113	002001	RSS	YES
0097	75114	027134	JMP BES7	NO
0098	75115	044351	ADB .-1	SAVE
0099	75116	076025	STB BESD4	DIREC
0100	75117	060562	LDA LIBD	POINTERS
0101	75120	072315	STA BESD5	
0102	75121	160001	LDA B,I	READ
0103	75122	070072	STA WORD	
0104	75123	044360	ADB .+6	NEW
0105	75124	160001	LDA B,I	
0106	75125	064566	LDB LIBDI	DIRECTORY
0107	75126	016231	JSB DRUML	
0108	75127	116015	JSB SICKP,I	TRACK
0109	75130	027164	JMP BES10	
0110*				

0111	75131	BES6	EQU *	
0112	75131		LDB LTEMP+5,I	OLDID THE SAME
0113	75132		CPB LTEMP	AS THIS ONE?
0114	75133		JMP BES9	YES
0115*				
0116	75134	BES7	EQU *	
0117	75134		CLA	FIRST TIME
0118	75135		CPA BESMF	THRU?
0119	75136		JMP BES8	YES
0120	75137	BES15	EQU *	
0121	75137		CPA BESDE	NO, ANY DUPLICATE ENTRIES?
0122	75140		JMP LEND	NO
0123	75141		LDA BESEB	"DUPLICATE ENTRY(IES)"
0124	75142		LDB BESFB	
0125	75143		JMP BESIL	
0126	75144	BES8	EQU *	
0127	75144		LDA BESEC	"NO ENTRIES FOR OLDID"
0128	75145		LDB BESFC	
0129	75146	BESIL	EQU *	
0130	75146		STA MOVES	MOVE MESSAGE
0131	75147		LDA T35B1	
0132	75150		STA MOVED	TO ITY
0133	75151		STB LTEMP	
0134	75152		JSB MOVEW	BUFFER
0135	75153		LDA LTEMP	
0136	75154		ALS	
0137	75155		CMA,INA	
0138	75156		LDB T35B1	
0139	75157		JMP LEND+2	
0140	75160	BES9	EQU *	
0141	75160		OLD LTEMP+4	SAVE
	75161			
0142	75162		STA BESD4	DIREC
0143	75163		STB BESD5	POINTERS
0144	75164	BES10	EQU *	
0145	75164		LDB BESD5	
0146	75165		ADB ,+11	
0147	75166		LDA B,I	GET LENGTH
0148	75167		STA BESWD	SAVE IT
0149	75170		SSA,RSS	
0150	75171		JMP **4	
0151	75172		ALF,ALF	CONVERT
0152	75173		IQR HIMSK	TO
0153	75174		CMA,INA	BLOCKS
0154	75175		STA BESLN	SAVE # OF BLOCKS
0155	75176		ADB ,=-10	MOVE
0156	75177		LDA B,I	
0157	75200		AND INF	
0158	75201		STA LTEMP+1	
0159	75202		INB	ID/NAME
0160	75203		LDA B,I	
0161	75204		STA LTEMP+2	
0162	75205		INB	INTO
0163	75206		LDA B,I	
0164	75207		STA LTEMP+3	

0165	75210	060052	LDA ID	LTEMP(0:3)
0166	75211	070030	STA LTEMP	
0167	75212	116005	JSB DLOKP,I	SEARCH FOR NEW ENTRY
0168	75213	027423	JMP BES13	FOUND, DUPLICATE
0169	75214	017440	JSB BESIS	GET TRACK FOR NEWID
0170	75215	044361	ADB .+7	
0171	75216	160001	LDA B,I	COMPUTE
0172	75217	040044	ADA BESLN	TOTAL
0173	75220	003004	CMA,INA	DISC
0174	75221	044351	ADB .-1	USED
0175	75222	000040	CLE	
0176	75223	140001	ADA B,I	
0177	75224	002040	SEZ	GREATER THAN ALLOTMENT?
0178	75225	027231	JMP BES11	NO
0179	75226	063623	LDA BESEE	"LIBRARY SPACE FULL"
0180	75227	064340	LDB BESFE	
0181	75230	027146	JMP BESIL	
0182	75231		BES11 EQU *	
0183	75231	006004	INB	UPDATE
0184	75232	160001	LDA B,I	DISC
0185	75233	040044	ADA BESLN	USED
0186	75234	170001	STA B,I	
0187	75235	017476	JSB BESIW	WRITE OUT ID TRACK
0188	75236	062132	LDA BESOI	
0189	75237	070052	STA ID	
0190	75240	017440	JSB BESIS	GET TRACK FOR OLDID
0191	75241	044361	ADB .+7	
0192	75242	060044	LDA BESLN	REDUCE
0193	75243	003004	CMA,INA	DISC
0194	75244	140001	ADA B,I	USED
0195	75245	170001	STA B,I	
0196	75246	017476	JSB BESIW	WRITE OUT ID TRACK
0197	75247	062025	LDA BESD4	READ
0198	75250	160000	LDB A,I	
0199	75251	074072	STB WORD	DIRECTORY
0200	75252	040360	ADA .+6	
0201	75253	160000	LDA A,I	FOR OLD
0202	75254	064566	LDB LIBDI	
0203	75255	016231	JSB DRUML	ENTRY
0204	75256	116015	JSB SICKP,I	
0205	75257	066315	LDB BESD5	
0206	75260	074051	STB MOVED	
0207	75261	044356	ADB .+4	
0208	75262	160001	LDA B,I	SAVE
0209	75263	070042	STA BESP	WORD 4
0210	75264	044355	ADB .+3	
0211	75265	160001	LDA B,I	SAVE DRUM
0212	75266	070045	STA BESDU	ADDRESS
0213	75267	006004	INB	
0214	75270	160001	LDA B,I	SAVE
0215	75271	070036	STA BESDS	
0216	75272	006004	INB	DISC
0217	75273	160001	LDA B,I	
0218	75274	070037	STA BESDS+1	ADDRESS
0219	75275	044355	ADB .+3	

0220	75276	074050	SIB MOVES	ELIMINATE
0221	75277	146025	ADB BESD4,I	
0222	75300	044674	ADB MLIBD	ENTRY
0223	75301	016257	JSB MOVEW	
0224	75302	066025	LDB BESD4	
0225	75303	160001	LDA B,I	UPDATE
0226	75304	040366	ADA .+12	TRACK
0227	75305	170001	STA B,I	LENGTH
0228	75306	070072	STA WORD	
0229	75307	006004	INB	
0230	75310	074051	STB MOVED	
0231	75311	044357	ADB .+5	
0232	75312	076435	STB BESRD	
0233	75313	160001	LDA B,I	
0234	75314	064562	LDB LIBD	
0235	75315	074050	STB MOVES	
0236	75316	016231	JSB DRUML	WRITE DIRECTORY TRACK
0237	75317	027416	JMP BES12	TRY TO SALVAGE
0238	75320	064346	LDB .-4	RESET
0239	75321	016257	JSB MOVEW	DIREC
0240	75322	060030	LDA LTEMP	RESET
0241	75323	070052	STA ID	ID
0242	75324	116005	JSB DLOKP,I	SEARCH FOR NEW ENTRY
0243	75325	000000	NOP	
0244	75326	164034	LDB LTEMP+4,I	IF TRACK IS FULL, GO
0245	75327	054714	CPB M8184	DO OVERLAY SECTION
0246	75330	027433	JMP BES98	
0247*				
0248	75331	007000	CMB	MAKE
0249	75332	044562	ADB LIBD	
0250	75333	074050	STB MOVES	ROOM
0251	75334	044366	ADB .+12	
0252	75335	074051	STB MOVED	FOR NEW
0253	75336	007000	CMB	
0254	75337	044402	ADB .+24	DIRECTORY
0255	75340	044035	ADB LTEMP+5	
0256	75341	016243	JSB MOVEB	ENTRY
0257*				
0258	75342	060520	LDA DLTEM	MOVE
0259	75343	070050	STA MOVES	
0260	75344	060035	LDA LTEMP+5	ID/NAME
0261	75345	040366	ADA .+12	
0262	75346	070051	STA MOVED	INTO
0263	75347	064346	LDB .-4	
0264	75350	016257	JSB MOVEW	DIRECTORY
0265	75351	060042	LDA BESP	WORD 4
0266	75352	170051	STA MOVED,I	
0267	75353	016076	JSB DATE	LAST REFERENCE DATE
0268	75354	034051	ISZ MOVED	
0269	75355	170051	STA MOVED,I	
0270	75356	034051	ISZ MOVED	
0271	75357	060201	LDA DATIM	LAST CHANGE DATE
0272	75360	170051	STA MOVED,I	
0273	75361	034051	ISZ MOVED	
0274	75362	060045	LDA BESDU	DRUM ADDRESS

0275	75363	170051	STA	MOVED,I	
0276	75364	034051	ISZ	MOVED	
0277	75365	104200	DLD	BESDS	DISC ADDRESS
	75366	000036			
0278	75367	104400	DST	MOVED,I	
	75370	100051			
0279	75371	064051	LDB	MOVED	
0280	75372	044355	ADB	.+3	
0281	75373	060040	LDA	BESWD	LENGTH
0282	75374	170001	STA	B,I	
0283*					
0284	75375	160034	LDA	LTEMP+4,I	UPDATE
0285	75376	040336	ADA	.-12	DIRECTORY
0286	75377	170034	STA	LTEMP+4,I	LENGTH
0287	75400	070072	STA	WORD	
0288	75401	060034	LDA	LTEMP+4	
0289	75402	002004	INA		
0290	75403	070051	STA	MOVED	
0291	75404	040357	ADA	.+5	
0292	75405	072435	STA	BESRD	
0293	75406	160000	LDA	A,I	
0294	75407	064562	LDB	LIBD	
0295	75410	074050	STB	MOVES	
0296	75411	016231	JSB	DRUML	W
0297	75412	027416	JMP	BES12	
0298	75413	064346	LDB	.-4	RESET
0299	75414	016257	JSB	MOVEW	DIREC
0300	75415	027424	JMP	BES13+1	
0301	75416		BES12	EQU *	
0302	75416	064346	LDB	.-4 =	RESET
0303	75417	016257	JSB	MOVEW	DIREC
0304	75420	064072	LDB	WORD	
0305	75421	062435	LDA	BESRD	
0306	75422	116016	JSB	SALVP,I	ATTEMPT TO SALVAGE
0307	75423		BES13	EQU *	
0308	75423	036137	ISZ	BESDE	BUMP DUPLICATE FLAG
0309	75424	062132	LDA	BESOI	RESET
0310	75425	070030	STA	LTEMP	OLDID
0311	75426	034033	ISZ	LTEMP+3	BUMP NAME FOR SEARCH
0312	75427	036164	ISZ	BESMF	MORE THAN ONE ENTRY?
0313	75430	027066	JMP	BES4	YES
0314	75431	002400	CLA		NO
0315	75432	027137	JMP	BES15	
0316*					
0317	75433		BES98	EQU *	
0318	75433	063647	LDA	BM507	SET UP OVERLAY
0319	75434	070072	STA	WORD	
0320	75435	163646	LDA	BESOV,I	
0321	75436	064504	LDB	#LIBI	
0322	75437	027773	JMP	BES99	
0323*					
0324*	BESIS	SEARCHES THE ID TABLE			
0325*					
0326	75440	000000	BESIS	NOP	
0327	75441	016370	JSB	GTIL	FIND OUT WHICH TRACK

0328	75442	060076	LDA IDLNP	
0329	75443	164000	LDB A,I	LENGTH
0330	75444	006003	SZB,RSS	ZERO?
0331	75445	027473	JMP BES12	YES
0332	75446	074072	STB WORD	NO, SAVE IT
0333	75447	007004	CMB,INB	GET POINTER
0334	75450	044562	ADB LIBD	TO LAST
0335	75451	074036	STB BESDS	WORD +1
0336	75452	040351	ADA .-1	
0337	75453	160000	LDA A,I	
0338	75454	064566	LDB LIBDI	
0339	75455	016231	JSB DRUML	HEAD ID TRACK
0340	75456	116015	JSB SICKP,I	
0341	75457	064562	LDB LIBD	
0342	75460		BES11 EQU *	
0343	75460	054036	CPB BESDS	END OF TABLE?
0344	75461	027473	JMP BES12	YES
0345	75462	160001	LDA B,I	NO, GET CURRENT ID
0346	75463	003004	CMA,INA	
0347	75464	040052	ADA ID	
0348	75465	002003	SZA,RSS	EQUAL?
0349	75466	127440	JMP BES1S,I	YES, FOUND THE ONE WE WANT
0350	75467	002020	SSA	NO, GREATER?
0351	75470	027473	JMP BES12	YES, ERROR
0352	75471	044362	ADB .+8	NO, MOVE TO NEXT ONE
0353	75472	027460	JMP BES11	
0354	75473		BES12 EQU *	
0355	75473	063613	LDA BESED	"NO SUCH NEWID"
0356	75474	064343	LDB BESFD	
0357	75475	027146	JMP BES1L	
0358*				
0359*	BESIW	WRITES	OUT THE ID TABLE	
0360*				
0361	75476	000000	BESIW NOP	
0362	75477	160075	LDA IDLCP,I	DRUM ADDRESS
0363	75500	064562	LDB LIBD	
0364	75501	016231	JSB DRUML	WRITE IT
0365	75502	116017	JSB DEADP,I	FAIL
0366	75503	127476	JMP BESIW,I	
0367*				
0368*	BESR	FETCHES	CHARACTERS FOR THE NAME	
0369*				
0370	75504	000000	BESR NOP	
0371	75505	060043	LDA BESF	THEST TO RETURN BLANK
0372	75506	050412	CPA .+40B	
0373	75507	127504	JMP BESR,I	
0374	75510		BESR1 EQU *	
0375	75510	114572	JSB T35CH,I	GET A CHAR
0376	75511	027545	JMP BESR4	CR
0377	75512	064000	LDB A	
0378	75513	010730	AND .140	SKIP CONTROL CHARACTERS
0379	75514	002002	SZA	
0380	75515	050730	CPA .140	
0381	75516	027510	JMP BESR1	
0382	75517		BESR5 EQU *	

0383	75517	060043	LDA	BESF	
0384	75520	002002	SZA		FIRST CHAR?
0385	75521	027535	JMP	BESR2	NO
0386	75522	054426	CPB	+.54B	YES, COMMA?
0387	75523	026275	JMP	LFRRER	YES
0388	75524	054416	CPB	+.44B	NO, 'S'?
0389	75525	027547	JMP	BESR6	YES
0390	75526	054424	CPB	+.52B	NO, 'A'?
0391	75527	027547	JMP	BESR6	YES
0392	75530	054367	CPB	+.15B	NO, CR?
0393	75531	026275	JMP	LFRRER	
0394	75532		BESR3	EQU *	
0395	75532	060001	LDA	B	NO, RESTORE A
0396	75533	034043	ISZ	BESF	
0397	75534	127504	JMP	BESR,I	
0398	75535		BESR2	EQU *	
0399	75535	054426	CPB	+.54B	COMMA?
0400	75536	027547	JMP	BESR6	YES, ERROR
0401	75537	054367	CPB	+.15B	NO, CR?
0402	75540	002001	RSS		YES
0403	75541	027532	JMP	BESR3	NO
0404	75542	060412	LDA	+.40B	RETURN A BLANK
0405	75543	070043	STA	BESF	
0406	75544	127504	JMP	BESR,I	
0407	75545		BESR4	EQU *	
0408	75545	064000	LDB	A	
0409	75546	027517	JMP	BESR5	
0410	75547		BESR6	EQU *	
0411	75547	063636	LDA	BESEF	"INVALID NAME"
0412	75550	064343	LDB	BESFF	
0413	75551	027146	JMP	BESIL	
0414	75552	075553	BESEA	DEF ++1	
0415	75553	005105	OCT	5105	
0416	75554	047124	ASC	7,NTRY NOT FOUND	
	75555	051131			
	75556	020116			
	75557	047524			
	75560	020106			
	75561	047525			
	75562	047104			
0417	00342		BESFA	EQU .-++BESEA+1	
0418	75563	075564	BESFB	DEF ++1	
0419	75564	005104	OCT	5104	
0420	75565	052520	ASC	10, UPLICATE ENTRY(IES)	
	75566	046111			
	75567	041501			
	75570	052105			
	75571	020106			
	75572	047124			
	75573	051131			
	75574	024111			
	75575	042523			
	75576	024440			
0421	00337		BESFB	EQU .-++BESEB+1	
0422	75577	075600	BESEC	DEF ++1	

0423	75600	005116	OCT	5116
0424	75601	047440	ASC	10,0 ENTRIES FOR OLDID
	75602	042516		
	75603	052122		
	75604	044505		
	75605	051440		
	75606	043117		
	75607	051040		
	75610	047514		
	75611	042111		
	75612	042040		
0425	00337		BESFC	EQU .-++BESEC+1
0426	75613	075614	BESED	DEF ++1
0427	75614	005116	OCT	5116
0428	75615	047440	ASC	6,0 SUCH NEWID
	75616	051525		
	75617	041510		
	75620	020116		
	75621	042527		
	75622	044504		
0429	00343		BESFD	EQU .-++BESED+1
0430	75623	075624	BESEE	DEF ++1
0431	75624	005114	OCT	5114
0432	75625	044502	ASC	9,IBRARY SPACE FULL
	75626	051101		
	75627	051131		
	75630	020123		
	75631	050101		
	75632	041505		
	75633	020106		
	75634	052514		
	75635	046040		
0433	00340		BESFE	EQU .-++BESEE+1
0434	75636	075637	BESFE	DEF ++1
0435	75637	005111	OCT	5111
0436	75640	047126	ASC	6,NVALID NAME
	75641	040514		
	75642	044504		
	75643	020115		
	75644	040515		
	75645	042440		
0437	00343		BESFF	EQU .-++BESFF+1
0438*				
0439	75646	072044	BESOV	DEF SAVO+COM6=COM3
0440	75647	177005	BM507	DEC =507
0441	75650	031060	BDIRU	DEF DIREU
0442*				
0443	00036		BESDS	EQU LTEMP+6
0444	00040		BESWD	EQU LTEMP+8
0445	00041		BESC	EQU LTEMP+9
0446	00042		BESP	EQU LTEMP+10
0447	00043		BESF	EQU LTEMP+11
0448	00044		BESLN	EQU LTEMP+12
0449	00045		BESDU	EQU LTEMP+13
0450	74025		BESD4	EQU T35C0

0451	74315	BESD5	EQU	GETID
0452	74132	BESOI	EQU	LOUT
0453	74137	BESDE	EQU	LTYPR
0454	74164	BESMF	EQU	LCHAR
0455	74435	BESRD	EQU	SCHLQ
0456*				
0457*				
0458	75773		ORG	LIBRA+507
0459	75773	BES99	EQU	*
0460	75773		JSB	DRUML
0461	75774		JSB	SICKP,1
0462	75775		JMP	LIBRA
0463	75776		JMP	BES13+1
0464	75777		HLT	41B
0465	76000	SBES	EQU	*

```

0467*
0468*           THIS ROUTINE IS USED TO COPY A FILE FROM THE
0469*           DISK ONTO THE DRUM.
0470*           THE PRIMARY PURPOSE IS TO PUT FREQUENTLY USED
0471*           FILES AND PROGRAMS ONTO FASTER ACCESS STORAGE.
0472*           FORMAT IS:  SAN=<ID>,<NAME>(CR)
0473*
0474 75000           ORG LIBRA
0475*
0476 75000 016315   JSB GETID           GET THE ID CODE IN QUESTION
0477 75001 002001   RSS
0478 75002 026275   JMP LFRER           FORMAT ERROR - - NO FILE NAME
0479 75003 050426   CPA ,+54B         COMMA?
0480 75004 002401   CLA,RSS
0481 75005 026275   JMP LFRER           NO, FORMAT ERROR
0482*
0483*           HAVE ID, NOW GET NAME
0484*
0485 75006 070055   STA T35LC
0486 75007 017257   JSB SANIP
0487 75010 070031   STA LTEMP+1
0488 75011 017257   JSB SANIP
0489 75012 070032   STA LTEMP+2
0490 75013 017257   JSB SANIP
0491 75014 070033   STA LTEMP+3
0492*
0493 75015 114572   JSB T35CH,I
0494 75016 002001   RSS
0495 75017 026275   JMP LFRER           NAMES ARE <= SIX CHARACTERS
0496 75020 060052   LDA ID             SAVE THE ID CODE
0497 75021 070030   STA LTEMP         FOR THE DLOOK ROUTINE
0498*
0499*           NOW SEARCH THE DIRECTORY FOR THIS ENTRY
0500*
0501 75022 116005   JSB DLOKP,I
0502 75023 027027   JMP SANC
0503*
0504 75024 063315   LDA SANEA         "ENTRY NOT PRESENT"
0505 75025 064341   LDB SANFA
0506 75026 027300   JMP SANIL
0507*
0508 75027           SANC EQU *
0509 75027 064035   LDB LTEMP+5      GET POINTER TO THE ENTRY
0510 75030 044365   ADB ,+11        => LENGTH WORD
0511 75031 160001   LDA B,I          A = LENGTH
0512 75032 070036   STA SANLA        SAVE LENGTH
0513 75033 002020   SSA
0514 75034 027042   JMP SANCA        PROGRAM
0515 75035 003004   CMA,INA
0516 75036 040412   ADA ,+32        32 IS LONGEST ALLOWABLE
0517 75037 002020   SSA
0518 75040 027270   JMP SANKB        "ENTRY TOO LONG"
0519 75041 027045   JMP SANCB
0520 75042           SANCA EQU *
0521 75042 043402   ADA SAN8K

```

```

0522 75043 002020 SSA PROGRAM TOO LONG CHECK
0523 75044 027270 JMP SANKB "ENTRY TOO LONG"
0524*
0525 75045 SANCB EQU *
0526 75045 064035 LDB LTEMP+5
0527 75046 044361 ADB ,+7 => DRUM ADDRESS
0528 75047 160001 LDA B,I
0529 75050 002002 SZA
0530 75051 027273 JMP SANKC "ENTRY ALREADY SANCTIFIED"
0531*
0532 75052 070215 STA MWORD
0533 75053 060035 LDA LTEMP+5 => DIRECTORY ENTRY
0534 75054 040362 ADA ,+8 => DISK ADDRESS
0535 75055 114212 JSB DISCA,I OVERLAP SEEK WITH DRUM DIDDLING
0536 75056 102030 HLT 30B
0537 75057 102031 HLT 31B
0538*
0539 75060 064035 LDB LTEMP+5
0540 75061 044354 ADB ,+2 => WORD TWO
0541 75062 160001 LDA B,I
0542 75063 002021 SSA,RSS BIT 15 SET SEZ FILE
0543 75064 027115 JMP SANCM PROGRAM, WON'T BE IN FUSS
0544*
0545* THE FUSS TABLE IS NOW SEARCHED TO SEE IF THIS
0546* FILE IS IN USE.
0547*
0548 75065 044360 ADB ,+6 => DISK ADDRESS
0549 75066 104200 DLD B,I
75067 100001
0550 75070 104400 DST SANLB SAVE DISK ADDRESS FOR SEARCH
75071 000037
0551 75072 060732 LDA M2000 LENGTH OF FUSS TABLE
0552 75073 070072 STA WORD READ
0553 75074 160540 LDA FUSS,I IN
0554 75075 064566 LDB LIBDI FUSS
0555 75076 016231 JSB DRUML TABLE
0556 75077 116015 JSB SICKP,I IT'S STUCK ON THE DRUM
0557*
0558 75100 064562 LDB LIBD => FIRST ENTRY OF FUSS
0559 75101 SANC C EQU *
0560 75101 160001 LDA B,I
0561 75102 006004 INB => SECOND WORD OF ENTRY
0562 75103 050037 CPA SANLB CHECK FOR FIRST WORD FOR MATCH
0563 75104 002001 RSS MATCH, MUST CHECK SECOND WORDS
0564 75105 027111 JMP SANC D NO MATCH
0565 75106 160001 LDA B,I LOAD SECOND WORD
0566 75107 050040 CPA SANLC SECOND WORD MATCH?
0567 75110 027276 JMP SANK D "FILE IN USE"
0568 75111 SANC D EQU *
0569 75111 006004 INB => NEXT ENTRY
0570 75112 054536 CPB L1024 TEST FOR SEARCH DONE
0571 75113 027115 JMP SANCM
0572 75114 027101 JMP SANCC NOT DONE, TEST NEXT ENTRY
0573*
0574* NOW READ IN THE ADT AND FIND ROOM ON THE DRUM

```

0575*					
0576	75115		SANCM EQU *		
0577	75115	060036	LDA SANLA	GET THE LENGTH WORD	
0578	75116	002021	SSA, RSS	POSITIVE BLOCKS IF FILE	
0579	75117	027123	JMP SANCP		
0580	75120	007400	SANCO CCB	CONVERT	
0581	75121	101026	ASR 6	NEGATIVE WORDS	
0582	75122	003005	CMA, INA, RSS	TO SECTORS	
0583	75123	001020	SANCP ALS, ALS	CONVERT BLOCK CNT TO SECTOR CNT	
0584	75124	070037	STA SANLB		
0585	75125	060113	LDA ADLEN		
0586	75126	070072	STA WORD	READ	
0587	75127	060112	LDA ADLUC	IN	
0588	75130	064566	LDB LIBDI	THE	
0589	75131	016231	JSB DRUML	ADT	
0590	75132	116015	JSB SICKP, I	DRUM ERROR, DIE WITH CONSIDERATI	
0591*					
0592	75133	060113	LDA ADLEN	GET COUNT	
0593	75134	001100	ARS	OF ADT	
0594	75135	070040	STA SANLC	ENTRIES	
0595	75136	064562	LDB LIBD	▀> FIRST ENTRY	
0596	75137	006004	INB	▀> LENGTH OF THIS ENTRY	
0597	75140		SANCR EQU *		
0598	75140	060037	LDA SANLB	GET DESIRED LENGTH	
0599	75141	003004	CMA, INA		
0600	75142	140001	ADA B, I	ADD IN ENTRY LENGTH	
0601	75143	002021	SSA, RSS	SKIP IF TOO SHORT	
0602	75144	027153	JMP SANCT	ENTRY IS BIG ENOUGH	
0603	75145	044354	ADB .+2	ADVANCE TO NEXT ENTRY	
0604	75146	034040	ISZ SANLC	CHECK COUNT	
0605	75147	027140	JMP SANCR		
0606*					
0607	75150	063365	LDA SANE	"INSUFFICIENT DRUM SPACE"	
0608	75151	064336	LDB SANFE		
0609	75152	027300	JMP SANIL		
0610*					
0611	75153		SANCT EQU *		
0612	75153	070041	STA SANLD	SAVE THE LENGTH REMAINING IN THI	
0613	75154	170001	STA B, I		
0614	75155	044351	ADB .-1		
0615	75156	160001	LDA B, I	GET THE DRUM ADDRESS,	
0616	75157	070040	STA SANLC	SAVE A COPY,	
0617	75160	040037	ADA SANLB	AND UPDATE IT	
0618	75161	170001	STA B, I	IT	
0619	75162	060041	LDA SANLD	CHECK THE NEW LENGTH	
0620	75163	002002	SZA	SKIP IF ENTRY REMOVED	
0621	75164	027177	JMP SANCV		
0622	75165	074051	STB MOVED	SQUEEZE	
0623	75166	044354	ADB .+2	OUT	
0624	75167	074050	STB MOVES	THE	
0625	75170	044674	ADB MLIBD	OLD	
0626	75171	044072	ADB WORD	ENTRY	
0627	75172	016257	JSB MOVEW		
0628*					
0629	75173	060113	LDA ADLEN	UPDATE	

0630	75174	040354	ADA	.*+2	THE ADT AND
0631	75175	070113	STA	ADLEN	TRANSFER
0632	75176	070072	STA	WORD	LENGTH
0633	75177		SANCV	EQU *	
0634	75177	060112	LDA	ADLOC	WRITE OUT
0635	75200	064562	LDB	LIBD	THE UPDATED
0636	75201	016231	JSB	DRUML	ADT
0637	75202	116015	JSB	SICKP,I	
0638*					
0639	75203	160034	LDA	LTEMP+4,I	GET THE DIRECTORY TRACK LENGTH
0640	75204	070072	STA	WORD	
0641	75205	064034	LDB	LTEMP+4	=> DIREC ENTRY
0642	75206	044360	ADB	.*+6	=> DRUM ADDRESS OF DIR. TRACK
0643	75207	160001	LDA	B,I	
0644	75210	064566	LDB	LIBDI	READ BACK THE
0645	75211	016231	JSB	DRUML	DIRECTORY TRACK
0646	75212	116015	JSB	SICKP,I	DRUM ERROR
0647*					
0648	75213	064035	LDB	LTEMP+5	
0649	75214	044361	ADB	.*+7	=> DRUM ADDRESS
0650	75215	060040	LDA	SANLC	LOAD THE DRUM ADDRESS AND
0651	75216	170001	STA	B,I	MODIFY THE DIRECTORY
0652	75217	064034	LDB	LTEMP+4	
0653	75220	044360	ADB	.*+6	=> DRUM ADDRESS OF DIR. TRACK
0654	75221	160001	LDA	B,I	
0655	75222	064562	LDB	LIBD	WRITE OUT THE NEW
0656	75223	016231	JSB	DRUML	DIRECTORY TRACK
0657	75224	002001	RSS		
0658	75225	027232	JMP	SANDO	CONTINUE
0659	75226	060034	LDA	LTEMP+4	
0660	75227	164000	LDB	A,I	=LENGTH OF TRACK IN CORE
0661	75230	040360	ADA	.*+6	=> DRUM ADDRESS
0662	75231	116016	JSB	SALVP,I	SALVAGE TRACK
0663*					
0664	75232		SANDO	EQU *	
0665	75232	060037	LDA	SANLB	CONVERT PROGRAM LENGTH FROM
0666	75233	100026	ASL	6	SECTORS TO WORDS
0667	75234	003004	CMA	,INA	MAKE NEGATIVE FOR DRUM AND DISK
0668	75235	070215	STA	MWORD	SET DISK AND
0669	75236	070072	STA	WORD	DRUM TRANSFER LENGTHS
0670*					
0671	75237	060035	LDA	LTEMP+5	=> DIRECTORY ENTRY
0672	75240	040362	ADA	.*+8	=> DISK ADDRESS
0673	75241	064566	LDB	LIBDI	READ IN THE FILE OR PROGRAM
0674	75242	114212	JSB	DISCA,I	
0675	75243	027242	JMP	*=1	STILL BUSY DOING SEEK
0676	75244	102031	HLT	31B	
0677*					
0678	75245	060214	LDA	MBUSY	
0679	75246	002020	SSA		WAIT FOR TRANSFER TO BE COMPLETE
0680	75247	027245	JMP	*=2	
0681	75250	002002	SZA		
0682	75251	116015	JSB	SICKP,I	
0683*					
0684	75252	060040	LDA	SANLC	LOAD THE DRUM ADDRESS


```

0685 75253 064562      LDB LIBD
0686 75254 016231      JSB DRUML      COPY TO THE DRUM
0687 75255 116015      JSB SICKP,I
0688*
0689 75256 026267      JMP LEND
0690*
0691*      GET TWO CHARACTERS OF NAME
0692*
0693 75257 000000      SANIP NOP
0694 75260 114572      JSB T35CH,I   GET NEXT CHARACTER
0695 75261 060412      LDA ,+40B     RETURN BLANKS AT END
0696 75262 001727      ALF,ALF      TO LEFT HALF
0697 75263 070036      STA SANLA
0698 75264 114572      JSB T35CH,I   GET NEXT CHARACTER
0699 75265 060412      LDA ,+40B     RETURN BLANKS AT END
0700 75266 030036      IOR SANLA
0701 75267 127257      JMP SANIP,I   RETURN
0702*
0703*      ERROR MESSAGE PRINTER
0704*
0705 75270 063327      SANKB LDA SANEB
0706 75271 064342      LDB SANFB
0707 75272 027300      JMP SANIL
0708*
0709 75273 063340      SANKC LDA SANEC
0710 75274 064335      LDB SANFC
0711 75275 027300      JMP SANIL
0712*
0713 75276 063356      SANKD LDA SANED
0714 75277 064344      LDB SANFD
0715*
0716 75300      SANIL EQU *
0717 75300 070050      STA MOVES
0718 75301 060305      LDA T35B1    MOVE THE ERROR MESSAGE
0719 75302 070051      STA MOVED    INTO THE TTY
0720 75303 074030      STB LTEMP    BUFFER
0721 75304 016267      JSB MOVEW
0722 75305 060214      LDA MBUSY
0723 75306 002020      SSA
0724 75307 027305      JMP *-2      WAIT FOR
0725 75310 060030      LDA LTEMP    SEEK TO
0726 75311 001000      ALS         COMPLETE
0727 75312 003004      CMA,INA     AND PRINT
0728 75313 064305      LDB T35B1   THE MESSAGE
0729 75314 026271      JMP LEND+2
0730*
0731 75315 075316      SANEA DEF ++1
0732 75316 005105      OCT 5105
0733 75317 047124      ASC 8,NTRY  NOT PRESENT
75320 051131
75321 020115
75322 047524
75323 020120
75324 051105
75325 051505

```

0734	75326 047124		
0735*	00341		SANFA EQU .-++SANE+1
0736	75327 075330		SANEB DEF ++1
0737	75330 005105		OCT 5105
0738	75331 047124		ASC 7,NTRY TOO LONG
	75332 051131		
	75333 020124		
	75334 047517		
	75335 020114		
	75336 047516		
	75337 043440		
0739	00342		SANFB EQU .-++SANEB+1
0740*			
0741	75340 075341		SANEC DEF ++1
0742	75341 005105		OCT 5105
0743	75342 047124		ASC 12,NTRY ALREADY SANCTIFIED
	75343 051131		
	75344 020101		
	75345 046122		
	75346 042501		
	75347 042131		
	75350 020123		
	75351 040516		
	75352 041524		
	75353 044506		
	75354 044505		
	75355 042040		
0744	00335		SANFC EQU .-++SANEC+1
0745	75356 075357		SANED DEF ++1
0746	75357 005106		OCT 5106
0747	75360 044514		ASC 5,ILE IN USE
	75361 042440		
	75362 044516		
	75363 020125		
	75364 051505		
0748	00344		SANFD EQU .-++SANED+1
0749*			
0750	75365 075366		SANEE DEF ++1
0751	75366 005111		OCT 5111
0752	75367 047123		ASC 11,NSUFFICIENT DRUM SPACE
	75370 052506		
	75371 043111		
	75372 041511		
	75373 042516		
	75374 052040		
	75375 042122		
	75376 052515		
	75377 020123		
	75400 050101		
	75401 041505		
0753	00336		SANFE EQU .-++SANE+1
0754	00036		SANLA EQU LTEMP+6
0755	00037		SANLB EQU LTEMP+7
0756	00040		SANLC EQU LTEMP+8

0757	00041		SANLD	EQU	LTEMP+9
0758	75402	020000	SAN8K	DEC	8192
0759	75403		SSAN	EQU	*

```

0002*
0003*           THIS ROUTINE IS USED TO RESTORE FILES AND
0004*           PROGRAMS TO THEIR DISC AREAS.  THE DRUM SPACE
0005*           IS RESTORE TO THE ADT.
0006*           IF THE ENTRY IS A FILE, IT IS COPIED BACK TO
0007*           THE DISC.  IF THE ENTRY IS A PROGRAM, IT IS
0008*           NOT NECESSARY TO COPY IT BACK, SINCE THE DRUM
0009*           COPY CANNOT BE ALTERED.
0010*
0011*
0012 75000          ORG LIBRA
0013 75000 016315   JSB GETID          GET THE ID CODE
0014 75001 002001   RSS
0015 75002 026275   JMP LFRER          FORMAT ERROR
0016 75003 050426   CPA .+54B        COMMA?
0017 75004 002401   CLA,RSS         YES
0018 75005 026275   JMP LFRER          NO, ERROR
0019 75006 070055   STA T35LC
0020 75007 017215   JSB DESIP        GET THREE
0021 75010 070031   STA LTEMP+1
0022 75011 017215   JSB DESIP        WORDS OF
0023 75012 070032   STA LTEMP+2
0024 75013 017215   JSB DESIP        NAME
0025 75014 070033   STA LTEMP+3
0026*
0027 75015 114572   JSB T35CH,I     CR FOLLOWS?
0028 75016 002001   RSS            YES
0029 75017 026275   JMP LFRER          NO, ERROR
0030 75020 060052   LDA ID          SAVE ID
0031 75021 070030   STA LTEMP        FOR DLOOK
0032*
0033* SEARCH DIRECTORY FOR THIS ENTRY
0034*
0035 75022 116005   JSB DLOKP,I
0036 75023 027027   JMP DES1        FOUND
0037*
0038 75024 063244   LDA DESEA      "ENTRY NOT PRESENT"
0039 75025 064341   LDB DESFA
0040 75026 027200   JMP DESIL
0041*
0042 75027          DES1 EQU *
0043 75027 064035   LDB LTEMP+5
0044 75030 044361   ADB .+7
0045 75031 160001   LDA B,I        GET DRUM ADDRESS
0046 75032 002002   SZA            ZERO?
0047 75033 027037   JMP DES2        NO
0048 75034 063276   LDA DESEC      "ENTRY NOT SANCTIFIED"
0049 75035 064337   LDB DESFC
0050 75036 027200   JMP DESIL
0051 75037          DES2 EQU *
0052 75037 070044   STA KILD        SAVE DRUM ADDRESS
0053 75040 044356   ADB .+4
0054 75041 160001   LDA B,I        GET LENGTH
0055 75042 002021   SSA,RSS        FILE?
0056 75043 027056   JMP DES3        YES

```

0057	75044	001121	ARS,ARS	NO, CONVERT
0058	75045	001121	ARS,ARS	
0059	75046	001121	ARS,ARS	PROGRAM LENGTH
0060	75047	003004	CMA,INA	
0061	75050	070045	STA KILDF	TO SECTORS
0062	75051	044346	ADB ,=4	ZERO
0063	75052	002400	CLA	DRUM
0064	75053	170001	STA B,I	ADDRESS
0065	75054	017226	JSB DESDW	GO WRITE OUT DIRECTORY
0066	75055	027160	JMP DES7	
0067*				
0068	75056		DES3 EQU *	
0069	75056	001020	ALS,ALS	CONVERT FILE
0070	75057	070045	STA KILDF	LENGTH TO SECTORS
0071	75060	002400	CLA	SET UP
0072	75061	070215	STA MWORD	
0073	75062	044347	ADB ,=3	FOR EARLY
0074	75063	060001	LDA B	
0075	75064	114212	JSB DISCA,I	SEEK
0076	75065	102030	HLT 30B	
0077	75066	102031	HLT 31B	
0078*				
0079*	CHECK FUSS TABLE FOR FILE IN USE			
0080*				
0081	75067	104200	DLD B,I	SAVE DISC
	75070	100001		
0082	75071	104400	DST DESLB	ADDRESS
	75072	000040		
0083	75073	060732	LDA M2000	
0084	75074	070072	STA WORD	
0085	75075	001100	ARS	COUNT
0086	75076	070037	STA DESCT	OF ENTRIES
0087	75077	160540	LDA FUSS,I	READ
0088	75100	067322	LDB DESRA	FUSS
0089	75101	016231	JSB DRUML	TABLE
0090	75102	116015	JSB SICKP,I	
0091*				
0092	75103	065002	LDB L8192	•> FIRST ENTRY
0093	75104		DES4 EQU *	
0094	75104	160001	LDA B,I	
0095	75105	006004	INB	
0096	75106	050040	CPA DESLB	FIRST WORD MATCH
0097	75107	002001	RSS	YES
0098	75110	027114	JMP DES5	NO
0099	75111	160001	LDA B,I	
0100	75112	050041	CPA DESLB+1	SECOND WORD MATCH?
0101	75113	027176	JMP DESIL-2	YES, CAN'T DESECRATE
0102	75114		DES5 EQU *	
0103	75114	006004	INB	NO
0104	75115	034037	ISZ DESCT	FINISHED TABLE?
0105	75116	027104	JMP DES4	NO
0106*				
0107*	UPDATE DIRECTORY			
0108*				
0109	75117	064035	LDB LTEMP+5	

0110	75120	044361	ADB	.+7	
0111	75121	002400	CLA		ZERO DRUM
0112	75122	170001	STA	B,I	ADDRESS
0113	75123	006004	INB		
0114	75124	104200	DLU	B,I	SAVE DISC
	75125	100001			
0115	75126	104400	DST	DESLB	ADDRESS
	75127	000040			
0116	75130	017226	JSB	DESDW	WRITE OUT
0117	75131	060045	LDA	KILDF	CONVERT
0118	75132	001700	ALF		
0119	75133	001020	ALS,ALS		SECIORS
0120	75134	003004	CMA,INA		
0121	75135	070072	STA	WORD	TO WORDS
0122	75136	070215	STA	MWORD	
0123*					
0124*	COP FILE TO DISC				
0125*					
0126	75137	060044	LDA	KILD	READ
0127	75140	064566	LDB	LIBDI	FILES
0128	75141	016231	JSB	DRUML	
0129	75142	027155	JMP	DES6	
0130*					
0131	75143	063321	LDA	DESLP	WRITE
0132	75144	064562	LDB	LIBD	FILE
0133	75145	114212	JSB	DISCA,I	TO DISC
0134	75146	027145	JMP	*=1	WAIT FOR READY
0135	75147	102031	HLT	31B	
0136	75150	060214	LDA	MBSY	WAIT FOR
0137	75151	002020	SSA		TRANSFER
0138	75152	027150	JMP	*=2	COMPLETE
0139	75153	002003	SZA,RSS		SUCCESSFUL?
0140	75154	027160	JMP	DES7	YES
0141	75155		DES6	EQU *	
0142	75155	063256	LDA	DESEB	"BAD TRASFER, FILE DESTROYED"
0143	75156	064333	LDB	DESFB	
0144	75157	027200	JMP	DESIL	
0145*					
0146*	RETURN SPACE TO DRUM ADT				
0147*					
0148	75160		DES7	EQU *	
0149	75160	060113	LDA	ADLEN	READ
0150	75161	070072	STA	WORD	
0151	75162	060112	LDA	ADLOC	ADT TO
0152	75163	064566	LDB	LIBDI	
0153	75164	016231	JSB	DRUML	CORE
0154	75165	116015	JSB	SICKP,I	

0155*					
0156	75166	116012	JSB	RSFSP,I	RETURN SPACE TO ADT
0157*					
0158	75167	060113	LDA	ADLEN	WRITE
0159	75170	070072	STA	WORD	
0160	75171	060112	LDA	ADLOC	ADT TO
0161	75172	064562	LDB	LIBD	
0162	75173	016231	JSB	DRUML	DRUM

0163	75174	116015		JSB SICKP,I	
0164*					
0165	75175	026267		JMP LEND	
0166*					
0167	75176	063312		LDA DESED	"FILE IN USE
0168	75177	064344		LDB DESFD	
0169	75200		DESIL	EQU *	
0170	75200	070050		STA MOVES	MOVE ERROR
0171	75201	060305		LDA T35B1	
0172	75202	070051		STA MOVED	MESSAGE TO
0173	75203	074030		STB LTEMP	
0174	75204	016257		JSB MOVEW	TTY BUFFER
0175	75205	060214		LDA MBUSY	WAIT FOR
0176	75206	002020		SSA	ADVANCE SEEK
0177	75207	027205		JMP +=2	TO COMPLETE
0178	75210	060030		LDA LTEMP	
0179	75211	001000		ALS	
0180	75212	003004		CMA,INA	
0181	75213	064305		LDB T35B1	
0182	75214	026271		JMP LEND+2	
0183*					
0184*	GET TWO CHARACTERS OF NAME				
0185*					
0186	75215	000000	DESIP	NOP	
0187	75216	114572		JSB T35CH,I	GET NEXT CHARACTER
0188	75217	060412		LDA ,+40B	RETURN BLANKS AT END
0189	75220	001727		ALF,ALF	TO LEFT HALF
0190	75221	070036		STA DESLA	
0191	75222	114572		JSB T35CH,I	GET NEXT CHARACTER
0192	75223	060412		LDA ,+40B	RETURN BLANKS AT END
0193	75224	030036		IOR DESLA	
0194	75225	127215		JMP DESIP,I	
0195*					
0196*	WRITE OUT DIRECTORY				
0197*					
0198	75226	000000	DESDW	NOP	
0199	75227	064034		LDB LTEMP+4	
0200	75230	160001		LDA B,I	
0201	75231	070072		STA WORD	
0202	75232	044360		ADB ,+6	
0203	75233	160001		LDA B,I	DRUM ADDRESS
0204	75234	064562		LDB LIBD	CORE ADDRESS
0205	75235	016231		JSB DRUML	WRITE IT OUT
0206	75236	002001		RSS	ERROR
0207	75237	127226		JMP DESDW,I	
0208	75240	060034		LDA LTEMP+4	
0209	75241	164000		LDB A,I	=LENGTH OF TRACK
0210	75242	040360		ADA ,+6	=> DRUM ADDRESS
0211	75243	116016		JSB SALVP,I	ATTEMPT TO SALVAGE
0212*					
0213	75244	075245	DESEA	DEF +1	
0214	75245	005105		OCT 5105	
0215	75246	047124		ASC 0,NTRY NOT PRESENT	
	75247	051131			
	75250	020116			

	75251	047524		
	75252	020120		
	75253	051105		
	75254	051505		
	75255	047124		
0216	00341		DESFA	EQU .-++DESEA+1
0217	75256	075257	DESEB	DEF ++1
0218	75257	005102		OCT 5102
0219	75260	040504		ASC 14,AD TRANSFER, FILE DESTROYED
	75261	020124		
	75262	051101		
	75263	047123		
	75264	043105		
	75265	051054		
	75266	020106		
	75267	044514		
	75270	042440		
	75271	042105		
	75272	051524		
	75273	051117		
	75274	054505		
	75275	042040		
0220	00333		DESFB	EQU .-++DESEB+1
0221	75276	075277	DESEC	DEF ++1
0222	75277	005105		OCT 5105
0223	75300	047124		ASC 10,NTRY NOT SANCTIFIED
	75301	051131		
	75302	020116		
	75303	047524		
	75304	020123		
	75305	040516		
	75306	041524		
	75307	044506		
	75310	044505		
	75311	042040		
0224	00337		DESFC	EQU .-++DESEC+1
0225	75312	075313	DESED	DEF ++1
0226	75313	005106		OCT 5106
0227	75314	044514		ASC 5,ILE IN USE
	75315	042440		
	75316	044516		
	75317	020125		
	75320	051505		
0228	00344		DESFD	EQU .-++DESED+1
0229*				
0230	75321	000040	DESLP	DEF DESLB
0231	75322	121230	DESRA	DEF LIBUS+8192,I
0232*				
0233	00036		DESLA	EQU LTEMP+6
0234	00037		DESCT	EQU LTEMP+7
0235	00040		DESLB	EQU LTEMP+8 9 USED ALSO
0236	75323		SDS	EQU *

0238* THE PURGE COMMAND MAKES IT POSSIBLE TO REMOVE FROM THE LIBRARY
 0239* PROGRAMS WHICH HAVE NOT BEEN ACCESSED FOR SOME PERIOD OF TIME.
 0240* THE FORMAT FOR THE COMMAND IS AS FOLLOWS:
 0241*
 0242* PURGE=DAY/YEAR
 0243*
 0244* WHERE DAY IS AN INTEGER FROM 1 TO 366 AND YEAR IS AN INTEGER FROM
 0245* 0 TO 99. ALL PROGRAMS OR FILES WHICH HAVE NOT BEEN ACCESSED SINCE
 0246* THE SPECIFIED DATE ARE DELETED FROM THE LIBRARY.
 0247*
 0248* PURGE WILL REFUSE TO OPERATE IF THE SPECIFIED DATE IS BEYOND
 0249* TODAY'S DATE.
 0250*

0252	75000		ORG LIBRA	
0253	75000	104200	DLD PZ999	PREVENT HELLO PROGRAM
	75001	075460		
0254	75002	104400	DST LTEMP	FROM BEING PURGED.
	75003	000030		
0255	75004	104200	DLD PURHE+1	
	75005	075462		
0256	75006	104400	DST LTEMP+2	
	75007	000032		
0257	75010	116005	JSB DLOKP,I	SEARCH DIRECTORY FOR ENTRY
0258	75011	002001	RSS	
0259	75012	027032	JMP PUR2	
0260	75013	016076	JSB DATE	
0261	75014	064035	LDB LTEMP+5	
0262	75015	044357	ADB .+5	
0263	75016	170001	STA 1,I	
0264	75017	060034	LDA LTEMP+4	
0265	75020	040360	ADA .+6	
0266	75021	070037	STA PURP	
0267	75022	160000	LDA 0,I	
0268	75023	064562	LDB LIBD	
0269	75024	016231	JSB DRUML	
0270	75025	002001	RSS	
0271	75026	027032	JMP PUR2	
0272	75027	064072	LDB WORD	
0273	75030	060037	LDA PURP	
0274	75031	116016	JSB SALVP,I	
0275*				
0276*			INTERPRET DATE.	
0277*				
0278	75032	017074	PUR2 JSB PURNO	GET DAY OF YEAR.
0279	75033	177221	DEC =367	
0280	75034	050431	CPA .+57b	TEST FOR NONZERO AND SLASH FOL-
0281	75035	006003	SZB,RSS	LOWING.
0282	75036	027131	JMP PUR1	PARAMETER ERROR.
0283	75037	074040	STB PURDT	SAVE DATE.
0284	75040	017074	JSB PURNO	NOW GET THE YEAR.
0285	75041	177634	DEC =100	
0286	75042	050367	CPA .+15b	CHECK FOR RETURN FOLLOWING.

0287	75043	002401		CLA, RSS	
0288	75044	027131		JMP PUR1	
0289*					
0290	75045	101107		RRR 7	MERGE YEAR AND DATE.
0291	75046	030040		IOR PURDT	
0292	75047	070040		STA PURDT	
0293	75050	016076		JSB DATE	NOW GET TODAY'S DATE.
0294	75051	064040		LDB PURDT	MAKE SURE SPECIFIED DATE IS
0295	75052	007104		CMB, CLE, INB	<=TODAY'S DATE
0296	75053	040001		ADA 1	
0297	75054	002041		SEZ, RSS	
0298	75055	027131		JMP PUR1	
0299*					
0300*	THE NEXT STEP IS TO GUARANTEE THAT WE DON'T KILL ANY FILES CUR-				
0301*	RENTLY IN USE. TO DO THIS WE WILL CHECK THAT THE FUSS TABLE IS				
0302*	EMPTY.				
0303*					
0304	75056	060732		LDA M2000	INPUT FUSS
0305	75057	070072		STA WORD	TABLE.
0306	75060	160540		LDA FUSS, I	
0307	75061	064566		LDB LIBDI	
0308	75062	016231		JSB DRUML	
0309	75063	116015		JSB SICKP, I	
0310*					
0311	75064	064562		LDB LIBD	
0312	75065	054536	PUR4	CPB L1024	DONE?
0313	75066	027171		JMP PUR3	YES.
0314	75067	160001		LDA 1, I	
0315	75070	002002		SZA	
0316	75071	027144		JMP PUR7	
0317	75072	006004		INB	
0318	75073	027065		JMP PUR4	
0319*					
0320*	ROUTINE TO INPUT A NUMBER				
0321*					
0322	75074	000000	PURNO	NOP	
0323	75075	017116		JSB PURDG	GET A DIGIT
0324	75076	026275		JMP LFRER	ILLEGAL IF NONE.
0325	75077	074041	PURN1	STB PURN	SAVE PARTIAL RESULT.
0326	75100	147074		ADB PURNO, I	CHECK FOR OVERFLOW.
0327	75101	006021		SSB, RSS	
0328	75102	027131		JMP PUR1	
0329	75103	017116		JSB PURDG	GET NEXT DIGIT.
0330	75104	027113		JMP PURN2	END OF NUMBER.
0331	75105	060041		LDA PURN	MULTIPLY PREVIOUS RESULT BY 10.
0332	75106	001222		RAL, RAL	
0333	75107	040041		ADA PURN	
0334	75110	001200		RAL	
0335	75111	044000		ADB 0	ADD IN NEW VALUE
0336	75112	027077		JMP PURN1	LOOP
0337	75113	064041	PURN2	LDB PURN	RETURN NO.
0338	75114	037074		ISZ PURNO	
0339	75115	127074		JMP PURNO, I	
0340*					
0341*					

0342	75116	000000	PURDG	NOP	GET DECIMAL DIGIT
0343	75117	016025		JSB T35CQ	GET CHAR.
0344	75120	127116		JMP PURDG,I	NONE THERE.
0345	75121	064000		LDB 0	DO DIGIT TEST.
0346	75122	044316		ADB M72B	
0347	75123	006021		SSB,RSS	
0348	75124	127116		JMP PURDG,I	
0349	75125	044364		ADB ,+10	
0350	75126	006021		SSB,RSS	
0351	75127	037116		ISZ PURDG	
0352	75130	127116		JMP PURDG,I	
0353*					
0354*	ERROR	PRINT,			
0355*					
0356	75131	064330	PUR1	LDB ,=18	
0357	75132	017155		JSB PURER	
0358	75133	005111		OCT 5111	
0359	75134	046114		ASC 8,LLEGAL PARAMETER	
	75135	042507			
	75136	040514			
	75137	020120			
	75140	040522			
	75141	040515			
	75142	042524			
	75143	042522			
0360	75144	064337	PUR7	LDB ,=11	
0361	75145	017155		JSB PURER	
0362	75146	005102		OCT 5102	
0363	75147	052523		ASC 6,USY FILES	
	75150	054440			
	75151	043111			
	75152	046105			
	75153	051440			
	75154	020040			
0364	75155	000000	PURER	NOP	
0365	75156	074041		STB PURN	
0366	75157	060305		LDA T35B1	
0367	75160	070051		STA MOVED	
0368	75161	063155		LDA PURER	
0369	75162	070050		STA MOVES	
0370	75163	005100		BRS	
0371	75164	016257		JSB MOVEW	
0372	75165	060041		LDA PURN	
0373	75166	003004		CMA,INA	
0374	75167	064305		LDB T35B1	
0375	75170	026271		JMP LEND+2	
0376*					
0377*					
0378*	SEARCH	DIRECTORY			
0379*					
0380	75171		PUR3	EQU *	
0381	75171	002400		CLA	
0382	75172	070031		STA PURCT	
0383	75173	065002		LDB L8192	
0384	75174	074033		STB PURTP	

0385	75175	067452		LDB PUDIR	FIRST DIRECTORY TRACK
0386	75176		PUR11	EQU *	
0387	75176	074032		STB PURDI	
0388	75177	160001		LDA B,I	
0389	75200	002002		SZA	LENGTH ZERO?
0390	75201	027210		JMP PUR13	NO
0391	75202		PUR12	EQU *	
0392	75202	044361		ADB .+7	YES
0393	75203	057453		CPB PURDU	LAST ONE?
0394	75204	002001		RSS	YES
0395	75205	027176		JMP PUR11	NO
0396	75206	017362		JSB PURFX	FINISHE FIXUPS
0397	75207	026267		JMP LEND	
0398	75210		PUR13	EQU *	
0399	75210	070072		STA WORD	
0400	75211	003004		CMA,INA	
0401	75212	040562		ADA LIBD	
0402	75213	070036		STA PURND	END OF TABLE POINTER
0403	75214	044360		ADB .+6	
0404	75215	160001		LDA B,I	
0405	75216	064566		LDB LIBDI	READ DIRECTORY TRACK
0406	75217	016231		JSB DRUML	
0407	75220	116017		JSB DEADP,I	
0408	75221	064562		LDB LIBD	
0409	75222	074050		STB MOVES	
0410	75223	074051		STB MOVED	
0411	75224		PUR15	EQU *	
0412	75224	074037		STB PURP	TABLE POINTER
0413	75225	044357		ADB .+5	
0414	75226	060040		LDA PURDT	
0415	75227	003104		CMA,CLE,INA	
0416	75230	140001		ADA B,I	
0417	75231	002040		SEZ	THIS ENTRY TO BE DELETED?
0418	75232	027333		JMP PUR16	NO
0419	75233	044345		ADB .-5	YES
0420	75234	160001		LDA B,I	SAVE ID
0421	75235	170033		STA PURTP,I	
0422	75236	044365		ADB .+11	
0423	75237	034033		ISZ PURTP	
0424	75240	160001		LDA B,I	GET LENGTH
0425	75241	002021		SSA,RSS	
0426	75242	027246		JMP **4	
0427	75243	001727		ALF,ALF	
0428	75244	030762		IOR HIMSK	
0429	75245	003004		CMA,INA	
0430	75246	170033		STA PURTP,I	SAVE + BLOCKS
0431	75247	034033		ISZ PURTP	
0432	75250	044347		ADB .-3	
0433	75251	160001		LDA B,I	FIRST DISC WORD
0434	75252	170033		STA PURTP,I	
0435	75253	034033		ISZ PURTP	
0436	75254	006004		INB	
0437	75255	160001		LDA B,I	SECOND DISC WORD
0438	75256	170033		STA PURTP,I	
0439	75257	034033		ISZ PURTP	

0440	75260	044350	ADB	.-2	
0441	75261	160001	LOA	B,I	DRUM ADDRESS
0442	75262	170033	STA	PURTP,I	
0443	75263	034033	ISZ	PURTP	
0444*					
0445	75264	064037	LDB	PURP	MOVE
0446	75265	007004	CMB,INB		PORTION
0447	75266	044050	ADB	MOVES	OF
0448	75267	016257	JSB	MOVEW	DIRECTORY
0449	75270	064037	LDB	PURP	
0450	75271	044366	ADB	.+12	
0451	75272	074050	STB	MOVES	UPDATE POINTER
0452	75273	160032	LDA	PURDI,I	UPDATE
0453	75274	040366	ADA	.+12	DIRECTORY
0454	75275	170032	STA	PURDI,I	LENGTH
0455	75276	064031	LDB	PURCT	COUNT
0456	75277	006004	INB		OF TABLE
0457	75300	074031	STB	PURCT	ENTRIES
0458	75301	057454	CPB	P409	FULL?
0459	75302	002001	RSS		YES
0460	75303	027333	JMP	PUR16	NO
0461	75304	060050	LDA	MOVES	
0462	75305	073450	STA	PUKES	
0463	75306	060051	LDA	MOVED	
0464	75307	073451	STA	PUKED	
0465	75310	064562	LDB	LIBD	WRITE
0466	75311	060032	LDA	PURDI	OUT
0467	75312	040360	ADA	.+6	INTERIM
0468	75313	160000	LDA	A,I	DIRECTORY
0469	75314	016231	JSB	DRUML	
0470	75315	116017	JSB	DEADP,I	
0471	75316	017362	JSB	PURFX	CALL FIXUP ROUTINE
0472	75317	063450	LDA	PUKES	
0473	75320	070050	STA	MOVES	
0474	75321	063451	LDA	PUKED	
0475	75322	070051	STA	MOVED	
0476	75323	063455	LDA	K8192	
0477	75324	070072	STA	WORD	
0478	75325	060032	LDA	PURDI	
0479	75326	040360	ADA	.+6	
0480	75327	160000	LDA	A,I	
0481	75330	064566	LDB	LIBDI	
0482	75331	016231	JSB	DRUML	READ DIRECTORY BACK
0483	75332	116017	JSB	DEADP,I	
0484*					
0485	75333		PUR16	EQU *	
0486	75333	064037	LDB	PURP	
0487	75334	044366	ADB	.+12	
0488	75335	054036	CPB	PURND	FINISHED TRACK
0489	75336	002001	RSS		YES
0490	75337	027224	JMP	PUR15	NO
0491	75340	007004	CMB,INB		END
0492	75341	044050	ADB	MOVES	OF
0493	75342	016257	JSB	MOVEW	DIRECTORY
0494	75343	064032	LDB	PURDI	

0495	75344	160001	LDA B,I	
0496	75345	070072	STA WORD	
0497	75346	006004	INB	
0498	75347	074051	STB MOVED	
0499	75350	044357	ADB .+5	
0500	75351	160001	LDA B,I	
0501	75352	064562	LDB LIBD	
0502	75353	074050	STB MOVES	
0503	75354	016231	JSB DRUML	WRITE OUT DIRECTORY
0504	75355	116017	JSB DEADP,I	
0505	75356	064346	LDB .-4	RESET
0506	75357	016257	JSB MOVEW	DIREC
0507	75360	064032	LDB PURDI	GO DO
0508	75361	027202	JMP PUR12	NEXT TRACK
0509*				
0510*	RETURN SPACE TO IDI, ADT AND DISC ADT			
0511*				
0512	75362	000000	PURFX NOP	
0513	75363	060031	LDA PURCT	
0514	75364	003007	CMA,INA,SZA,RSS	
0515	75365	127362	JMP PURFX,I	NO WORK TO DO
0516	75366	070030	STA PURTC	
0517	75367	070031	STA PURCT	
0518	75370	060113	LDA ADLEN	
0519	75371	070072	STA WORD	
0520	75372	060112	LDA ADLOC	
0521	75373	064566	LDB LIBDI	
0522	75374	016231	JSB DRUML	READ ADT
0523	75375	116017	JSB DEADP,I	
0524	75376	065002	LDB LB192	
0525	75377	074050	STB MOVES	
0526	75400	074051	STB MOVED	
0527	75401	044356	ADB .+4	
0528	75402		PURF1 EQU *	
0529	75402	074033	STB PURTP	
0530	75403	160001	LDA B,I	GET DRUM ADDRESS
0531	75404	002003	SZA,RSS	ZERO?
0532	75405	027424	JMP PURF2	YES
0533	75406	070044	STA KILD	NO, SAVE IT
0534	75407	044347	ADB .-3	
0535	75410	160001	LDA B,I	
0536	75411	001020	ALS,ALS	
0537	75412	070045	STA KILDF	SAVE # OF SECTORS
0538	75413	064050	LDB MOVES	
0539	75414	077446	STB PURES	
0540	75415	064051	LDB MOVED	
0541	75416	077447	STB PURED	
0542	75417	116012	JSB RSFSP,I	RETURN SPACE TO ADT
0543	75420	067446	LDB PURES	
0544	75421	074050	STB MOVES	
0545	75422	067447	LDB PURED	
0546	75423	074051	STB MOVED	
0547	75424		PURF2 EQU *	
0548	75424	064346	LDB .-4	MOVE TABLE
0549	75425	016257	JSB MOVEW	TO DELETE

```

0550 75426 034050 ISZ MOVES
0551 75427 064033 LDB PURTP
0552 75430 044357 ADB ,+5
0553 75431 034031 ISZ PURCT
0554 75432 027402 JMP PURF1
0555 75433 060113 LDA ADLEN
0556 75434 070072 STA WORD
0557 75435 060112 LDA ADLOC
0558 75436 064562 LDB LIBD
0559 75437 016231 JSB DRUML
0560 75440 116017 JSB DEADP,I
0561 75441 117456 JSB PURUD,I
0562 75442 117457 JSB PURUI,I
0563 75443 065002 LDB LB192
0564 75444 074033 STB PURTP
0565 75445 127362 JMP PURFX,I
0566*
0567 00030 PURTC EQU LTEMP
0568 00031 PURCT EQU LTEMP+1
0569 00032 PURDI EQU LTEMP+2
0570 00033 PURTP EQU LTEMP+3
0571 00036 PURND EQU LTEMP+6
0572 00037 PURP EQU LTEMP+7
0573 00040 PURDT EQU LTEMP+8
0574 00041 PURN EQU LTEMP+9
0575 75446 000000 PURES BSS 1
0576 75447 000000 PURED BSS 1
0577 75450 000000 PUKES BSS 1
0578 75451 000000 PUKED BSS 1
0579 75452 030000 PU DIR DEF DIREC
0580 75453 031060 PURDU DEF DIREU
0581 75454 000631 P409 DEC 409
0582 75455 160000 K8192 DEC -8192
0583 75456 072612 PURUD DEF TBDAD
0584 75457 072727 PURUI DEF TBIDT
0585 75460 065747 PZ999 OCT 65747
0586 75461 044105 PURHE ASC 3,HELLO
75462 046114
75463 047440
0587 75464 SPUR EQU *
```

DRUM ADDRESS

BUMP
 POINTER
 TABLE DONE ?
 NO
 YES

WRITE OUT ADT

RETURN SPACE TO DISC ADT
 RETURN SPACE TO IDT

USER NUMBER Z999

0002* THE MAGTAPE COMMAND IS USED TO TELL THE SYSTEM OF THE EXISTENCE
 0003* OF A MAGTAPE UNIT. THE FORMAT IS:
 0004* MAGTAPE=SELECT CODE, TYPE
 0005* THE SELECT CODE SPECIFIED IS THE LOWER NUMBERED OF THE 2
 0006* CODES FOR THE TAPE. A CODE OF 0 INDICATES THAT NO TAPE EXISTS.

0008	75000		ORG LIBRA	
0009	75000	017036	JSB MAGDG	GET FIRST DIGIT.
0010	75001	001723	ALF,RAR	MULTIPLY BY 8 AND SAVE.
0011	75002	070030	STA LTEMP	
0012	75003	002003	SZA,RSS	
0013	75004	027033	JMP MAG1	
0014	75005	017036	JSB MAGDG	GET 2ND DIGIT.
0015	75006	040030	ADA LTEMP	COMPUTE #.
0016	75007	070030	STA LTEMP	
0017	75010	050734	CPA B77	ILLEGAL IF 77.
0018	75011	026275	JMP LFRER	
0019	75012	040333	ADA ,-17B	LESS THAN
0020	75013	002020	SSA	17 OCTAL?
0021	75014	026275	JMP LFRER	YES
0022	75015	016025	JSB T35CQ	NO, NEXT CHARACTER
0023	75016	027030	JMP MAG5	CR, MUST BE OLD STANDBY (3030)
0024	75017	050424	CPA ,+52B	ASTERISK?
0025	75020	002001	RSS	YES
0026	75021	026275	JMP LFRER	NO
0027	75022	016025	JSB T35CQ	YES, CARRIAGE RETURN FOLLOWS?
0028	75023	002001	RSS	YES
0029	75024	026275	JMP LFRER	NO
0030	75025	060030	LDA LTEMP	FLAG
0031	75026	031036	IOR BIT15	AS
0032	75027	002001	RSS	7970
0033	75030	060030	MAG5 LDA LTEMP	
0034	75031	070176	STA MAG5C	STORE IN SYSTEM LOCATION.
0035	75032	026267	JMP LEND	
0036	75033	016025	MAG1 JSB T35CQ	MORE CHARACTERS
0037	75034	027030	JMP MAG5	NO
0038	75035	026275	JMP LFRER	NO--ERROR
0039*				
0040	75036	000000	MAGDG NOP	GET AN OCTAL DIGIT.
0041	75037	016025	JSB T35CQ	
0042	75040	026275	JMP LFRER	FAIL IF NONE.
0043	75041	070001	STA 1	
0044	75042	010342	AND ,-8	TEST FOR OCTAL DIGIT.
0045	75043	050432	CPA ,+60B	
0046	75044	002001	RSS	
0047	75045	026275	JMP LFRER	FAIL.
0048	75046	020001	XOR 1	CONVERT TO BINARY.
0049	75047	127036	JMP MAGDG,I	RETURN.
0050	75050		SMAG EQU *	

0052* THE FORMAT FOR THE PHONES COMMAND IS:

0053*

0054* PHONES=TIME LIMIT

0055*

0056* TIME LIMIT REFERS TO THE NUMBER OF SECONDS ALLOWED A USER TO

0057* LOG ON, IT IS ORIGINALLY ASSUMED TO BE 120.

0058*

0059	75000		ORG LIBRA	
0060	75000	002400	CLA	INITIALIZE COUNT TO 0.
0061	75001	070030	PH06 STA LTEMP	
0062	75002	040762	ADA M256	TEST FOR
0063	75003	002021	SSA, RSS	TOO
0064	75004	026275	JMP LFRER	BIG
0065	75005	016025	JSB T35C0	GET A CHAR.
0066	75006	027023	JMP PH05	LAST CHAR.
0067	75007	040316	ADA M72B	TEST FOR DIGIT.
0068	75010	002021	SSA, RSS	
0069	75011	026275	JMP LFRER	
0070	75012	040364	ADA .+10	
0071	75013	002020	SSA	
0072	75014	026275	JMP LFRER	
0073	75015	064030	LDB LTEMP	MULTIPLY OLD VALUE BY 10 AND
0074	75016	005222	RBL, RBL	ADD IN NEW.
0075	75017	044030	ADB LTEMP	
0076	75020	005200	RBL	
0077	75021	040001	ADA 1	
0078	75022	027001	JMP PH06	
0079	75023	060030	PH05 LDA LTEMP	A=INPUT VALUE
0080	75024	002003	SZA, RSS	TEST FOR ZERO
0081	75025	026275	JMP LFRER	ERROR
0082	75026	030223	IOR PH0	SEND TIME LIMIT
0083	75027	114500	JSB S14SC, I	TO 2114
0084	75030	026267	JMP LEND	TERMINATE
0085	75031		SPHO EQU *	

0087* THE PRINTER COMMAND IS USED TO TELL THE SYSTEM OF THE EXISTANCE
 0088* OF A LINE PRINTER. THE FORMAT IS:
 0089* PRINTER=SELECT CODE[*] [*]
 0090* A CODE OF 0 INDICATES THAT NO PRINTER EXISTS.

0092	75000		ORG LIBRA	
0093	75000	017050	JSB PRIDG	GET FIRST DIGIT
0094	75001	001723	ALF,RAK	MULTIPLY BY 8
0095	75002	070030	STA LTEMP	AND SAVE
0096	75003	002003	SZA,RSS	TEST FOR ZERO
0097	75004	027036	JMP PRI1	YES
0098	75005	017050	JSB PRIDG	GET SECOND DIGIT
0099	75006	040030	ADA LTEMP	COMPUTE NUMBER
0100	75007	070030	STA LTEMP	
0101	75010	040334	ADA ,=-16B	LESS THAN
0102	75011	002020	SSA	OCTAL 167
0103	75012	026275	JMP LFRER	YES = ILLEGAL
0104	75013	040343	ADA ,=-7B	GREATER THAN
0105	75014	002021	SSA,RSS	OCTAL 247
0106	75015	026275	JMP LFRER	YES = ILLEGAL
0107	75016	016025	JSB T35CQ	GET NEXT CHARACTER
0108	75017	027041	JMP PRI2	CR = MUST BE 2778A
0109	75020	050424	CPA ,+52B	ASTERISK?
0110	75021	002001	RSS	YES
0111	75022	026275	JMP LFRER	NO = ERROR
0112	75023	060030	LDA LTEMP	FLAG
0113	75024	031036	IOR BIT15	AS
0114	75025	070030	STA LTEMP	2610A
0115	75026	016025	JSB T35CQ	GET NEXT CHARACTER
0116	75027	027041	JMP PRI2	CR
0117	75030	050424	CPA ,+52B	ASTERISK?
0118	75031	002001	RSS	YES
0119	75032	026275	JMP LFRER	NO = ERROR
0120	75033	060030	LDA LTEMP	FLAG
0121	75034	030222	IOR BIT14	AS
0122	75035	070030	STA LTEMP	2767A
0123	75036	016025	PRI1 JSB T35CQ	NEXT CHARACTER
0124	75037	002001	RSS	CARRIAGE RETURN?
0125	75040	026275	JMP LFRER	NO = ERROR
0126	75041	060030	PRI2 LDA LTEMP	
0127	75042	001727	ALF,ALF	MOVE TO BITS 12-8
0128	75043	030245	IOR P3C	TELL I/O
0129	75044	114500	JSB S14SC,I	PROCESSOR
0130	75045	002400	CLA	CLEAR THE LINE PRINTER
0131	75046	070255	STA PRIST	USER INDICATOR
0132	75047	026267	JMP LEND	TERMINATE
0133*				
0134	75050	000000	PRIDG NOP	GET OCTAL DIGIT
0135	75051	016025	JSB T35CQ	
0136	75052	026275	JMP LFRER	ERROR = NO INPUT
0137	75053	070001	STA 1	
0138	75054	010342	AND ,=8	TEST FOR OCTAL DIGIT
0139	75055	050432	CPA ,+60B	
0140	75056	002001	RSS	
0141	75057	026275	JMP LFRER	ERROR = NOT OCTAL

0142	75060	020001	XOR	1	CONVERT TO BINARY
0143	75061	127050	JMP	PRIDG,I	
0144	75062		SPRI	EQU *	

```

0146* THIS COMMAND IS USED TO CONFIGURE A PORT FOR A
0147* SPECIFIED SPEED & CHAR. SIZE.
0148*
0149* THE FORMAT FOR THIS OPERATORS COMMAND IS:
0150*
0151*     SPEED=BAUD RATE,CHAR. SIZE OR *,PORT#,PORT#,...,CR
0152* OR
0153*     SPEED=BAUD RATE,CHAR. SIZE OR *,ALL CR
0154*
0155 75000          ORG LIBRA
0156 75000 060177  LDA NPORT      SET UP LIMIT.
0157 75001 070032  STA SPDCN
0158 75002 063305  LDA PTABL      SET TABLE ADDRESS.
0159 75003 070034  STA TABPN
0160 75004 002400  CLA           ZERO OUT COUNTERS.
0161 75005 070031  STA SPDTM
0162 75006 070035  STA SPDOC
0163 75007 070030  STA SPDNR      ZERO OUT SPEED INDICATOR.
0164 75010 070036  STA SPDSZ      ZERO OUT CHAR. SIZE INDICATOR.
0165 75011 114572  JSB T35CH,I   GET 1ST DIGIT OF SPEED.
0166 75012 026275  JMP LFRER      CR, ERROR!
0167 75013          SPD01 EQU *
0168 75013 017176  JSB SPDDG      NO CR, DIGIT?
0169 75014 017232  JSB SPDCK      YES, COMPUTE SPEED INDICATOR.
0170*
0171 75015 114572  JSB T35CH,I   GET NEXT CHAR.
0172 75016 026275  JMP LFRER      CR, ERROR!
0173 75017 050426  CPA ,+54B      NO CR, COMMA?
0174 75020 002001  RSS
0175 75021 027013  JMP SPD01      NO.
0176 75022 060030  LDA SPDNR      YES, CHECK BAUD RATE.
0177 75023 043350  ADA BAUDL
0178 75024 002020  SSA           LESS THAN 5B?
0179 75025 026275  JMP LFRER      YES, ERROR!
0180 75026 060030  LDA SPDNR
0181 75027 043347  ADA BAUDH
0182 75030 002021  SSA,RSS       GREATER THAN 277B?
0183 75031 026275  JMP LFRER      YES, ERROR!
0184*
0185 75032 114572  JSB T35CH,I   NO, GET NEXT CHAR.
0186 75033 026275  JMP LFRER      CR, ERROR!
0187 75034 050424  CPA ,+52B      NO CR, ASTERIK?
0188 75035 002001  RSS
0189 75036 027044  JMP SPD14      NO.
0190 75037 114572  JSB T35CH,I   YES, GET NEXT CHAR.
0191 75040 026275  JMP LFRER      CR, ERROR!
0192 75041 050426  CPA ,+54B      NO CR, COMMA?
0193 75042 027061  JMP SPD03      YES.
0194 75043 026275  JMP LFRER      NO, ERROR!
0195 75044          SPD14 EQU *
0196 75044 017176  JSB SPDDG      DIGIT?
0197 75045 017242  JSB SPDCL      YES, COMPUTE CHAR. SIZE.
0198 75046 114572  JSB T35CH,I   GET NEXT CHAR.
0199 75047 026275  JMP LFRER      CR, ERROR!
0200 75050 050426  CPA ,+54B      NO CR, COMMA?

```

0201	75051	002001	RSS		
0202	75052	027044	JMP SPD14		NO.
0203	75053	060036	LDA SPDSZ		CHECK SPEED INDICATOR.
0204	75054	050354	CPA ,+2		=2?
0205	75055	027061	JMP SPD03		YES.
0206	75056	050353	CPA ,+1		NO. =1?
0207	75057	002001	RSS		YES.
0208	75060	026275	JMP LFRER		NO, ERROR!
0209	75061		SPD03 EQU *		
0210	75061	114572	JSB T35CH, I		GET NEXT CHAR.
0211	75062	026275	JMP LFRER		CR, ERROR!
0212	75063	053351	CPA SP, A		NO CR, =A?
0213	75064	027114	JMP SPD9		YES.
0214	75065		SPD16 EQU *		
0215	75065	017176	JSB SPDDG		NO, DIGIT?
0216	75066		SPD17 EQU *		
0217	75066	017252	JSB SPDSP		YES, COMPUTE PORT NR.
0218	75067	114572	JSB T35CH, I		GET NEXT CHAR.
0219	75070	027074	JMP SPD4		CR.
0220	75071	050426	CPA ,+54B		NO CR. COMMA?
0221	75072	002001	RSS		YES.
0222	75073	027065	JMP SPD16		NO.
0223	75074		SPD4 EQU *		
0224	75074	060031	LDA SPDTM		CHECK LIMIT.
0225	75075	040032	ADA SPDCN		
0226	75076	002021	SSA, RSS		GREATER THAN LIMIT?
0227	75077	026275	JMP LFRER		YES. ERROR!
0228*					
0229	75100	060031	LDA SPDTM		NO, PORT LOGGED ON?
0230	75101	017262	JSB SPD11		
0231	75102	060031	LDA SPDTM		NO, SET PORT# INTO TABLE.
0232	75103	017208	JSB SPSET		
0233	75104	060055	LDA T35LC		PICK UP LAST CHAR.
0234	75105	050367	CPA ,+15B		WAS IT A CR?
0235	75106	027216	JMP SPD10		YES, CONFIGURE PORT(S).
0236	75107	002400	CLA		NO.
0237	75110	070031	STA SPDTM		
0238	75111	114572	JSB T35CH, I		GET NEXT CHAR.
0239	75112	027216	JMP SPD10		CR.
0240	75113	027065	JMP SPD16		NO CR.
0241*					
0242	75114		SPD9 EQU *		
0243	75114	114572	JSB T35CH, I		GET NEXT CHAR.
0244	75115	026275	JMP LFRER		CR, ERROR!
0245	75116	053352	CPA SP, L		NO CR, =L?
0246	75117	002001	RSS		
0247	75120	026275	JMP LFRER		NO, ERROR!
0248	75121	114572	JSB T35CH, I		YES, GET NEXT CHAR.
0249	75122	026275	JMP LFRER		CR, ERROR!
0250	75123	053352	CPA SP, L		NO CR, =L?
0251	75124	002001	RSS		
0252	75125	026275	JMP LFRER		NO, ERROR!
0253	75126	114572	JSB T35CH, I		YES, GET NEXT CHAR.
0254	75127	002001	RSS		CR, START CONFIGURATION.
0255	75130	026275	JMP LFRER		NO CR, ERROR!

0256	75131	002400	CLA		
0257	75132	070035	STA SPDOC		
0258	75133		SPD18 EQU *		
0259	75133	017262	JSB SPD11		PORT LOGGED ON?
0260	75134	034032	ISZ SPDCN		NO. BUMP COUNTER.
0261	75135	002001	RSS		
0262	75136	027142	JMP SPD19		PORTS CHECKED.
0263	75137	034035	ISZ SPDOC		BUMP PORT NUMBER.
0264	75140	060035	LDA SPDOC		
0265	75141	027133	JMP SPD18		
0266	75142		SPD19 EQU *		
0267	75142	060177	LDA NPORT		SET UP COUNTER.
0268	75143	070032	STA SPDCN		
0269	75144	002400	CLA		SET UP FOR PORT#00.
0270	75145	070035	STA SPDOC		
0271	75146		SPD6 EQU *		
0272	75146	017155	JSB SPD7		CONFIGURE PORT.
0273	75147	034032	ISZ SPDCN		BUMP COUNTER.
0274	75150	002001	RSS		
0275	75151	026267	JMP LEND		DONE!
0276	75152	034035	ISZ SPDOC		NOT DONE.
0277	75153	060035	LDA SPDOC		
0278	75154	027146	JMP SPD6		TREAT NEXT PORT.
0279*					
0280	75155		SPD7 EQU *		
0281	75155	000000	NOP		PORT CONFIGURATION SUBROUTINE.
0282	75156	070033	STA SPDPO		SAVE PORT NR.
0283	75157	066773	LDB CHS		B= CHAR, SIZE OPCODE.
0284	75160	001727	ALF,ALF		ROTATE PORT NR.
0285	75161	030001	IOR B		MERGE PORT NR.
0286	75162	064036	LDB SPDSZ		B= CHAR, SIZE INDICATOR.
0287	75163	005722	BLF,RBL		ROTATE INTO POSITION.
0288	75164	030001	IOR B		MERGE CHAR, SIZE.
0289	75165	114500	JSB S149C,I		TELL 2114.
0290	75166	060033	LDA SPDPO		A=PORT NR.
0291	75167	066772	LDB SPE		B= SPEED OPCODE.
0292	75170	001727	ALF,ALF		ROTATE PORT NR.
0293	75171	030001	IOR B		MERGE PORT NR.
0294	75172	064030	LDB SPDNR		B= SPEED INDICATOR.
0295	75173	030001	IOR B		MERGE SPEED.
0296	75174	114500	JSB S149C,I		TELL 2114.
0297	75175	127155	JMP SPD7,I		RETURN.
0298*					
0299	75176		SPDDG EQU *		
0300	75176	000000	NOP		DETERMINES IF CHAR. IS A DIGIT.
0301	75177	040316	ADA M72B		
0302	75200	002021	SSA,RSS		DIGIT?
0303	75201	026275	JMP LFRER		NO. ERROR?
0304	75202	040364	ADA .+10		MAY BE.
0305	75203	002020	SSA		
0306	75204	026275	JMP LFRER		NOT A DIGIT. ERROR!
0307	75205	127176	JMP SPDDG,I		DIGIT, OK! EXIT!
0308*					
0309	75206		SPSET EQU *		
0310	75206	000000	NOP		SET PORT NR. INTO TABLE.

0311	75207	064034	LDB TABPN	GET POINTER,
0312	75210	057346	CPB PEND	TABLE LIMIT EXCEEDED?
0313	75211	026275	JMP LFRER	YES, ERROR!
0314	75212	170001	STA B,I	NO, SET PORT NR. INTO TABLE.
0315	75213	034035	ISZ SPDOC	BUMP COUNTER,
0316	75214	034034	ISZ TABPN	BUMP POINTER,
0317	75215	127206	JMP SPSET,I	EXIT,
0318*				
0319	75216		SPD10 EQU *	
0320	75216	060035	LDA SPDOC	SET UP COUNTER FOR NUMBER
0321	75217	003004	CMA,INA	OF PORTS
0322	75220	070035	STA SPDOC	TO BE CONFIGURED,
0323	75221	063305	LDA PTABL	SET UP TABLE POINTER,
0324	75222	070034	STA TABPN	
0325	75223		SPD13 EQU *	
0326	75223	160034	LDA TABPN,I	GET PORT NR.
0327	75224	017155	JSB SPD7	CONFIGURE PORT.
0328	75225	034035	ISZ SPDOC	BUMP COUNTER.
0329	75226	002001	RSS	
0330	75227	026267	JMP LEND	DONE!
0331	75230	034034	ISZ TABPN	NOT YET, BUMP POINTER,
0332	75231	027223	JMP SPD13	GO BACK,
0333*				
0334*				
0335	75232		SPDCK EQU *	
0336	75232	000000	NOP	
0337	75233	070033	STA SPDPO	SAVE (A).
0338	75234	060030	LDA SPDNR	UPDATE
0339	75235	100200	MPY .+10	
	75236	000364		
0340	75237	040033	ADA SPDPO	SPEED
0341	75240	070030	STA SPDNR	INDICATOR.
0342	75241	127232	JMP SPDCK,I	
0343*				
0344*				
0345	75242		SPDCL EQU *	
0346	75242	000000	NOP	
0347	75243	070033	STA SPDPO	SAVE (A).
0348	75244	060036	LDA SPDSZ	UPDATE
0349	75245	100200	MPY .+10	CHAR.
	75246	000364		
0350	75247	040033	ADA SPDPO	SIZE
0351	75250	070036	STA SPDSZ	INDICATOR.
0352	75251	127242	JMP SPDCL,I	
0353*				
0354*				
0355	75252		SPDSP EQU *	
0356	75252	000000	NOP	
0357	75253	070033	STA SPDPO	SAVE (A).
0358	75254	060031	LDA SPDTM	UPDATE
0359	75255	100200	MPY .+10	
	75256	000364		
0360	75257	040033	ADA SPDPO	PORT
0361	75260	070031	STA SPDTM	NUMBER.
0362	75261	127252	JMP SPDSP,I	

0363*

0364*

0365* ENTER WITH (A)*PORT NR.

0366*

```

0367 75262 000000 SPD11 NOP
0368 75263 100200 MPY .+TTY01=TTY00
      75264 000375
0369 75265 040546 ADA DTTY0 A=> ?FLAG
0370 75266 040356 ADA ,+?ID A=> ?ID
0371 75267 160000 LDA A,I A= ?ID
0372 75270 002003 SZA,RSS USER LOGGED ON?
0373 75271 127262 JMP SPD11,I NO.
0374 75272 060370 LDA ,+14 YES. GIVE ERROR MESSAGE.
0375 75273 067275 LDB SPD12
0376 75274 026271 JMP LEND+2
0377 75275 075276 SPD12 DEF ++1
0378 75276 005116 OCT 5116 LF=N
0379 75277 047440 ASC 6,0 CONF. DONE
      75300 041517
      75301 047106
      75302 027040
      75303 042117
      75304 047105

```

0380*

0381*

0382*

0383*

```

0384 75305 075306 PTABL DEF ++1
0385 75306 000000 BSS 32
0386 75346 075346 PEND DEF *
0387 00030 SPDNR EQU LTEMP
0388 00031 SPDTR EQU LTEMP+1
0389 00032 SPDCN EQU LTEMP+2
0390 00033 SPDPO EQU LTEMP+3
0391 00034 TABPN EQU LTEMP+4
0392 00035 SPDOC EQU LTEMP+5
0393 00036 SPDSZ EQU LTEMP+6
0394 75347 177500 BAUDH OCT =300
0395 75350 177773 BAUDL OCT =5
0396 75351 000101 SP.A OCT 101
0397 75352 000114 SP.L OCT 114
0398 75353 SSPE EQU *

```


0400*

0401* THIS COMMAND IS USED TO ENABLE THE ABORT CAPA-
 0402* BILITY WITH THE "BREAK" KEY DESPITE THE FACT
 0403* THAT THE ABORT CAPABILITY WAS DISABLED BY EVA-
 0404* LUATION OF THE BRK(0) FUNCTION.

0405*

0406* THE FORMAT OF THIS OPERATORS COMMAND IS;

0407*

BREAK=PORT NR

0408*

0409*

0410*

0411	75000		ORG LIBRA	
0412	75000	002400	CLA	CLEAR STORAGE OF
0413	75001	070031	STA BRKPN	PORT NR.
0414	75002	114572	JSB T35CH,I	GET 1ST DIGIT OF PORT NR.
0415	75003	026275	JMP LFRER	CR, ERROR?
0416	75004	017061	JSB BRKDG	NO CR, DIGIT?
0417	75005	017071	JSB BRKSP	YES, COMPUTE PORT NR.
0418	75006	114572	JSB T35CH,I	GET NEXT CHAR.
0419	75007	027015	JMP BREK1	CR.
0420	75010	017061	JSB BRKDG	NO CR, DIGIT?
0421	75011	017071	JSB BRKSP	YES, COMPUTE PORT NR.
0422	75012	114572	JSB T35CH,I	GET NEXT CHAR.
0423	75013	002001	RSS	CR.
0424	75014	026275	JMP LFRER	NO CR, ERROR!
0425	75015		BREK1 EQU *	
0426	75015	060031	LDA BRKPN	CHECK LIMIT.
0427	75016	064177	LDB NPORT	
0428	75017	040001	ADA B	
0429	75020	002021	SSA,RSS	PORT NR. > AVAILABLE PORTS?
0430	75021	026275	JMP LFRER	YES, ERROR!
0431	75022	060031	LDA BRKPN	NO, CHECK IF USER IS LOGGED ON.
0432	75023	100200	MPY .+TTY01-TTY00	
	75024	000375		
0433	75025	040546	ADA DTTY0	A=>?FLAG
0434	75026	040356	ADA .+?ID	A=> ?ID
0435	75027	160000	LDA A,I	A= ?ID
0436	75030	002003	SZA,RSS	USER LOGGED ON?
0437	75031	027043	JMP BREK2	NO, PRINT ERROR MESSAGE.
0438	75032	060031	LDA BRKPN	YES, SET CBFLG BIT.
0439	75033	100200	MPY .+TTY01-TTY00	
	75034	000375		
0440	75035	040546	ADA DTTY0	A=> ?FLAG
0441	75036	064000	LDB A	B=> ?FLAG
0442	75037	160000	LDA A,I	A= ?FLAG
0443	75040	030446	IOR CBFLG	SET CBFLG BIT,
0444	75041	170001	STA B,I	
0445	75042	026267	JMP LEND	DONE,
0446*				
0447	75043		BREK2 EQU *	
0448	75043	060376	LDA .+20	OUTPUT ERROR MESSAGE,
0449	75044	067046	LDB BREK3	
0450	75045	026271	JMP LEND+2	
0451	75046	075047	BREK3 DEF **1	
0452	75047	005125	OCT 5125	LF=U

0453 75050 051505 ASC 9,SER NOT LOGGED ON
 75051 051040
 75052 047117
 75053 052040
 75054 046117
 75055 043507
 75056 042504
 75057 020117
 75060 047040

0454*

0455*

0456 75061
 0457 75061 000000
 0458 75062 040316
 0459 75063 002021
 0460 75064 026275
 0461 75065 040364
 0462 75066 002020
 0463 75067 026275
 0464 75070 127061

BRKDG EQU *
 NOP
 ADA M72B
 SSA,RSS
 JMP LFRER
 ADA .+10
 SSA
 JMP LFRER
 JMP BRKDG,I

DETERMINES IF CHAR. IS A DIGIT.
 DIGIT?
 NO. ERROR!
 MAY BE.
 NOT A DIGIT! ERROR!
 DIGIT, OK! EXIT!

0465*

0466*

0467 75071
 0468 75071 000000
 0469 75072 070030
 0470 75073 060031
 0471 75074 100200
 75075 000364
 0472 75076 040030
 0473 75077 070031
 0474 75100 127071

BRKSP EQU *
 NOP
 STA BRKPO
 LDA BRKPN
 MPY .+10
 ADA BRKPO
 STA BRKPN
 JMP BRKSP,I

SAVE DIGIT.
 UPDATE
 PORT
 NUMBER.

0475*

0476*

0477 00030
 0478 00031
 0479 75101

BRKPO EQU LTEMP
 BRKPN EQU LTEMP+1
 SBRE EQU *

0481			SUP
0482	75000		ORG LIBRA
0483	75000	177771	DEC =7
0484	75001	047525	ASC 15,OUT OF STORAGE
0485	75020	177763	DEC =13
0486	75021	044514	ASC 15,ILLEGAL OR MISSING INTEGER
0487	75040	177763	DEC =13
0488	75041	042530	ASC 15,EXTRANEIOUS LIST DELIMITER
0489	75060	177762	DEC =14
0490	75061	046511	ASC 15,MISSING ASSIGNMENT OPERATOR
0491	75100	177761	DEC =15
0492	75101	041510	ASC 15,CHARACTERS AFTER STATEMENT END
0493	75120	177762	DEC =14
0494	75121	046511	ASC 15,MISSING OR ILLEGAL SUBSCRIPT
0495	75140	177761	DEC =15
0496	75141	046511	ASC 15,MISSING OR BAD LIST DELIMITER
0497	75160	177762	DEC =14
0498	75161	046511	ASC 15,MISSING OR BAD FUNCTION NAME
0499	75200	177761	DEC =15
0500	75201	046511	ASC 15,MISSING OR BAD SIMPLE VARIABLE
0501	75220	177764	DEC =12
0502	75221	046511	ASC 15,MISSING OR ILLEGAL 'OF'
0503	75240	177763	DEC =13
0504	75241	046511	ASC 15,MISSING OR ILLEGAL 'THEN'
0505	75260	177764	DEC =12
0506	75261	046511	ASC 15,MISSING OR ILLEGAL 'TO'
0507	75300	177763	DEC =13
0508	75301	046511	ASC 15,MISSING OR ILLEGAL 'STEP'
0509	75320	177762	DEC =14
0510	75321	046511	ASC 15,MISSING OR ILLEGAL DATA ITEM
0511	75340	177770	DEC =8
0512	75341	044514	ASC 15,ILLEGAL EXPONENT
0513	75360	177766	DEC =10
0514	75361	051511	ASC 15,SIGN WITHOUT NUMBER
0515	75400	177762	DEC =14
0516	75401	046511	ASC 15,MISSING RELATIONAL OPERATOR
0517	75420	177765	DEC =11
0518	75421	044514	ASC 15,ILLEGAL READ VARIABLE
0519	75440	177762	DEC =14
0520	75441	044514	ASC 15,ILLEGAL SYMBOL FOLLOWS 'MAT'
0521	75460	177761	DEC =15
0522	75461	046501	ASC 15,MATRIX CANNOT BE ON BOTH SIDES
0523	75500	177761	DEC =15
0524	75501	047117	ASC 15,NO '*' AFTER RIGHT PARENTHESIS
0525	75520	177761	DEC =15
0526	75521	047117	ASC 15,NO LEGAL BINARY OPERATOR FOUND
0527	75540	177764	DEC =12
0528	75541	046511	ASC 15,MISSING LEFT PARENTHESIS
0529	75560	177763	DEC =13
0530	75561	046511	ASC 15,MISSING RIGHT PARENTHESIS
0531	75600	177761	DEC =15
0532	75601	050101	ASC 15,PARAMETER NOT STRING VARIABLE
0533	75620	177765	DEC =11
0534	75621	052516	ASC 15,UNDECIPHERABLE OPERAND
0535	75640	177761	DEC =15

0536	75641	046511	ASC 15,MISSING OR BAD ARRAY VARIABLE
0537	75660	177761	DEC -15
0538	75661	051524	ASC 15,STRING VARIABLE NOT LEGAL HERE
0539	75700	177761	DEC -15
0540	75701	046511	ASC 15,MISSING OR BAD STRING OPERAND
0541	75720	177770	DEC -8
0542	75721	047117	ASC 15,NO CLOSING QUOTE
0543	75740	177762	DEC -14
0544	75741	033462	ASC 15,72 CHARACTERS MAX FOR STRING
0545	75760	177761	DEC -15
0546	75761	051524	ASC 15,STATEMENT HAS EXCESSIVE LENGTH
0548	75000		ORG LIBRA
0549	75000	177761	DEC -15
0550	75001	046511	ASC 15,MISSING OR BAD FILE REFERENCE
0551	75020	177762	DEC -14
0552	75021	023520	ASC 15,'PRINT' MUST PRECEDE 'USING'
0553	75040	177761	DEC -15
0554	75041	044514	ASC 15,ILLEGAL OPERAND AFTER 'USING'
0555	75060	177761	DEC -15
0556	75061	053101	ASC 15,VARIABLE MISSING OR WRONG TYPE
0557	75100	000017	DEC 15
0558	75101	052516	ASC 15,UNDEFINED STATEMENT REFERENCE
0559	75120	000015	DEC 13
0560	75121	047105	ASC 15,NEXT WITHOUT MATCHING FOR
0561	75140	000014	DEC 12
0562	75141	051501	ASC 15,SAME FOR=VARIABLE NESTED
0563	75160	000013	DEC 11
0564	75161	043125	ASC 15,FUNCTION DEFINED TWICE
0565	75200	000015	DEC 13
0566	75201	053101	ASC 15,VARIABLE DIMENSIONED TWICE
0567	75220	000014	DEC 12
0568	75221	046101	ASC 15,LAST STATEMENT NOT 'END'
0569	75240	177771	DEC -7
0570	75241	052516	ASC 15,UNMATCHED FOR
0571	75260	177767	DEC -9
0572	75261	052516	ASC 15,UNDEFINED FUNCTION
0573	75300	177770	DEC -8
0574	75301	040522	ASC 15,ARRAY TOO LARGE
0575	75320	177762	DEC -14
0576	75321	040522	ASC 15,ARRAY OF UNKNOWN DIMENSIONS
0577	75340	000007	DEC 7
0578	75341	047525	ASC 15,OUT OF STORAGE
0579	75360	000015	DEC 13
0580	75361	042111	ASC 15,DIMENSIONS NOT COMPATIBLE
0581	75400	177762	DEC -14
0582	75401	041510	ASC 15,CHARACTERS AFTER COMMAND END
0583	75420	177763	DEC -13
0584	75421	041101	ASC 15,BAD FORMAT OR ILLEGAL NAME
0585	75440	177763	DEC -13
0586	75441	046511	ASC 15,MISSING OR PROTECTED FILE
0587	75460	000013	DEC 11
0588	75461	043517	ASC 15,GOSUBS NESTED TEN DEEP
0589	75500	000015	DEC 13

0590	75501	051105	ASC 15,RETURN WITH NO PRIOR GOSUB
0591	75520	000014	DEC 12
0592	75521	051525	ASC 15,SUBSCRIPT OUT OF BOUNDS
0593	75540	000013	DEC 11
0594	75541	047105	ASC 15,NEGATIVE STRING LENGTH
0595	75560	000017	DEC 15
0596	75561	047117	ASC 15,NON-CONTIGUOUS STRING CREATED
0597	75600	000010	DEC 8
0598	75601	051524	ASC 15,STRING OVERFLOW
0599	75620	000006	DEC 6
0600	75621	047525	ASC 15,OUT OF DATA
0601	75640	000011	DEC 9
0602	75641	042101	ASC 15,DATA OF WRONG TYPE
0603	75660	000014	DEC 12
0604	75661	052516	ASC 15,UNDEFINED VALUE ACCESSED
0605	75700	000011	DEC 9
0606	75701	046501	ASC 15,MATRIX NOT SQUARE
0607	75720	000017	DEC 15
0608	75721	051105	ASC 15,REDIMENSIONED ARRAY TOO LARGE
0609	75740	000013	DEC 11
0610	75741	047105	ASC 15,NEARLY SINGULAR MATRIX
0611	75760	000014	DEC 12
0612	75761	046117	ASC 15,LOG OF NEGATIVE ARGUMENT
0614	75000		ORG LIBRA
0615	75000	000014	DEC 12
0616	75001	051521	ASC 15,SQR OF NEGATIVE ARGUMENT
0617	75020	000011	DEC 9
0618	75021	055105	ASC 15,ZERO TO ZERO POWER
0619	75040	000017	DEC 15
0620	75041	047105	ASC 15,NEGATIVE NUMBER TO REAL POWER
0621	75060	000017	DEC 15
0622	75061	040522	ASC 15,ARGUMENT OF SIN OR TAN TOO BIG
0623	75100	177761	DEC =15
0624	75101	047526	ASC 15,OVER/UNDERFLOWS - WARNING ONLY
0625	75120	177761	DEC =15
0626	75121	046101	ASC 15,LAST INPUT IGNORED, RETYPE IT
0627	75140	177763	DEC =13
0628	75141	052117	ASC 15,TOO MANY FILES STATEMENTS
0629	75160	000016	DEC 14
0630	75161	047117	ASC 15,NON-EXISTENT FILE REQUESTED
0631	75200	000017	DEC 15
0632	75201	053522	ASC 15,WRITE TRIED ON READ-ONLY FILE
0633	75220	000015	DEC 13
0634	75221	042516	ASC 15,END-OF-FILE/END OF RECORD
0635	75240	000012	DEC 10
0636	75241	051524	ASC 15,STATEMENT NOT IMAGE
0637	75260	000017	DEC 15
0638	75261	047117	ASC 15,NON-EXISTENT PROGRAM REQUESTED
0639	75300	000014	DEC 12
0640	75301	041510	ASC 15,CHAIN REQUEST IS A FILE
0641	75320	000016	DEC 14
0642	75321	050122	ASC 15,PROGRAM CHAINED IS TOO LARGE
0643	75340	177763	DEC =13

0644	75341	041517	ASC 15,COM STATEMENT OUT OF ORDER
0645	75360	000016	DEC 14
0646	75361	040522	ASC 15,ARGUMENT OF TIM OUT OF RANGE
0647	75400	000016	DEC 14
0648	75401	041101	ASC 15,BAD FORMAT STRING SUBSCRIPT
0649	75420	000007	DEC 7
0650	75421	041101	ASC 15,BAD FILE READ
0651	75440	000014	DEC 12
0652	75441	041101	ASC 15,BAD FILE WRITE DETECTED
0653	75460	000017	DEC 15
0654	75461	041501	ASC 15,CAN'T READ PROGRAM CHAINED TO
0655	75500	000017	DEC 15
0656	75501	044514	ASC 15,ILL-STORED PROGRAM CHAINED TO
0657	75520	177772	DEC -6
0658	75521	050122	ASC 15,PROGRAM BAD
0659	75540	000016	DEC 14
0660	75541	046511	ASC 15,MISSING FORMAT SPECIFICATION
0661	75560	000016	DEC 14
0662	75561	044514	ASC 15,ILLEGAL OR MISSING DELIMITER
0663	75600	000010	DEC 8
0664	75601	047117	ASC 15,NO CLOSING QUOTE
0665	75620	000017	DEC 15
0666	75621	041101	ASC 15,BAD CHARACTER AFTER REPLICATOR
0667	75640	000012	DEC 10
0668	75641	051105	ASC 15,REPLICATOR TOO LARGE
0669	75660	000010	DEC 8
0670	75661	051105	ASC 15,REPLICATOR ZERO
0671	75700	000014	DEC 12
0672	75701	046525	ASC 15,MULTIPLE DECIMAL POINTS
0673	75720	000015	DEC 13
0674	75721	041101	ASC 15,BAD FLOATING SPECIFICATION
0675	75740	000016	DEC 14
0676	75741	044514	ASC 15,ILLEGAL CHARACTER IN FORMAT
0677	75760	000015	DEC 13
0678	75761	044514	ASC 15,ILLEGAL FORMAT FOR STRING
0680	75000		ORG LIBRA
0681	75000	000015	DEC 13
0682	75001	046511	ASC 15,MISSING RIGHT PARENTHESIS
0683	75020	000011	DEC 9
0684	75021	046511	ASC 15,MISSING REPLICATOR
0685	75040	000016	DEC 14
0686	75041	052117	ASC 15,TOO MANY PARENTHESIS LEVELS
0687	75060	000014	DEC 12
0688	75061	046511	ASC 15,MISSING LEFT PARENTHESIS
0689	75100	000015	DEC 13
0690	75101	044514	ASC 15,ILLEGAL FORMAT FOR NUMBER
0691	75120	177762	DEC -14
0692	75121	041101	ASC 15,BAD INPUT, RETYPE FROM ITEM
0693	75140	000015	DEC 13
0694	75141	046117	ASC 15,LOG OF ZERO - WARNING ONLY
0695	75160	000017	DEC 15
0696	75161	055105	ASC 15,ZERO TO NEGATIVE POWER=WARNING
0697	75200	000017	DEC 15

0698	75201	042111	ASC 15, DIVIDE BY ZERO - WARNING ONLY
0699	75220	000016	DEC 14
0700	75221	042530	ASC 15, EXP OVERFLOW - WARNING ONLY
0701	75240	000014	DEC 12
0702	75241	047526	ASC 15, OVERFLOW - WARNING ONLY
0703	75260	000014	DEC 12
0704	75261	052516	ASC 15, UNDERFLOW - WARNING ONLY
0705	75300	177763	DEC =13
0706	75301	042530	ASC 15, EXTRA INPUT - WARNING ONLY
0707	75320	177770	DEC =8
0708	75321	051105	ASC 15, READ-ONLY FILES:
0709	75340	177775	DEC =3
0710	75341	011423	OCT 11423
0711	75342	005012	OCT 5012
0712	75343	025040	ASC 13,*

0714 00000
0715 00000 000000
0716

ORG 0
NOP
END

SIGNAL LOADER THAT WE'RE DONE.

** NO ERRORS*

CROSS-REFERENCE SYMBOL TABLE

#ALCO	0420/06	0434	
#ARID	0116/05	0259	
#ARIN	0095/16	0346	
#ASYM	0198/08	0306	
#BKSP	0389/19	0396	
#BLDI	0097/06	0408	0109/06
#BNOP	0386/14	0348	
#CHEB	0185/20	0386	
#CHOU	0025/22	0416	
#CMPR	0118/14	0332	
#CRST	0461/05	0276	
#CUSP	0517/06	0312	
#DB10	0317/22	0292	
#DCMP	0385/07	0308	
#DGCK	0326/06	0278	
#DLPR	0497/05	0300	
#DSCH	0352/25	0450	
#DTL1	0256/25	0442	
#EDAB	0070/21	0470	
#EDB1	0082/21	0076/21	
#EDLM	0329/19	0378	0334/19
#ENOT	0019/19	0370	
#EPRU	0121/11	0462	
#EVEP	0408/25	0454	
#EXP	0454/20	0382	
#FAD	0560/15	0356	
#FCUC	0318/14	0468	

CROSS-REFERENCE SYMBOL TABLE

#FDAT	0111/12	0340	
#FDPS	0017/06	0302	
#FDV	0040/16	0362	
#FENC	0358/14	0438	
#FILR	0159/06	0422	
#FILS	0297/15	0428	0367/15
#F INC	0344/14	0286	
#FLOT	0250/20	0328	
#FLUN	0133/16	0366	
#FMP	0005/16	0360	
#FORM	0335/12	0320	
#FPOP	0446/04	0255	
#FRCK	0415/04	0253	
#FRMT	0021/23	0460	
#FSB	0568/15	0358	
#FSC	0199/04	0249	
#FSCH	0298/14	0342	
#FTCH	0279/12	0336	
#GTCR	0403/19	0394	0416/19
#GTDG	0273/19	0374	
#GTPF	0062/06	0265	
#GTST	0180/05	0318	
#GTTY	0379/15	0430	
#IENT	0229/20	0388	
#IFIX	0043/15	0368	
#INCL	0208/12	0392	
#LCDL	0230/32	0466	

CROSS-REFERENCE SYMBOL TABLE

#LIB#	0277	0133/29	0529/29	0306/30	0563/42	0125/47	
#LIBI	0275 0499/56	0324/30 0321/57	0389/33	0347/36	0507/37	0596/44	0523/54
#LOG	0007/21	0384					
#LPCK	0547/06	0267					
#LTCK	0343/06	0280					
#LTEN	0034/30	0078/29	0083/29	0090/29	0093/29	0040/30	
#LTR	0269/06	0272					
#MB10	0191/22	0290					
#MCHR	0377/25	0452					
#MCOT	0573/21	0402					
#MOVE	0287/16	0418	0294/16				
#MTG1	0243/25	0440					
#NMCK	0057/22	0288					
#NMOT	0042/19	0372					
#NRML	0224/22	0294					
#OPCK	0403/14	0352					
#OTBL	0322/25	0446					
#OTCL	0331/25	0448					
#OTCR	0368/19	0398					
#OTIN	0300/19	0400					
#OTLN	0349/19	0376					
#OTST	0611/21	0404					
#OUTC	0474/30	0333	0487/30	0501/30	0519/30	0722/32	
#OVFL	0010/22	0298					
#PACK	0260/22	0296					
#PCHK	0094/14	0334					

CROSS-REFERENCE SYMBOL TABLE

#PFSH	0390/06	0458			
#PGIN	0081/06	0261			
#PNST	0017/08	0310			
#PSHS	0474/14	0344			
#PSTR	0185/14	0326			
#PWR2	0264/20	0390			
#RDIM	0321/18	0410			
#RECK	0134/06	0420			
#RPCK	0308/06	0269			
#RQST	0093/15	0426			
#RSCK	0437/14	0354			
#RSTO	0158/05	0316			
#RSTP	0254/08	0436	0268/08	0290/08	0303/08
#RUND	0278/25	0444			
#SBCK	0027/05	0251			
#SBFX	0020/15	0324			
#SBPU	0533/06	0282			
#SCR	0546/29	0105/31			
#SERR	0309/16	0414			
#SINI	0308/12	0406			
#SLCK	0560/06	0464			
#SSYM	0127/08	0304			
#STDP	0034/12	0338	0044/12		
#STOP	0293/06	0274			
#STPT	0291/12	0380			
#STRI	0128/05	0314			
#STST	0272/14	0322			

CROSS-REFERENCE SYMBOL TABLE

#STTP	0371/14	0350		
#SYCK	0362/06	0284		
#TAP	0004/30	0106/31		
#TAP1	0022/30	0015/30		
#TBSR	0185/06	0263		
#TRST	0515/15	0330	0533/15	
#UNPK	0538/15	0364		
#USCK	0205/05	0456		
#VCHK	0284/18	0412		
#VLFI	0062/12	0424		
#VROP	0399/05	0257		
#WRBU	0422/15	0432		
\$SMLO	0547/55	0061/34		
\$SSAV	0539/37	0017/34		
\$ANN	0655/48	0050/34		
\$APP	0452/38	0019/34		
\$ASN	0360/35	0013/34		
\$BES	0465/57	0063/34		
\$BRE	0479/59	0071/34		
\$BYE	0579/39	0021/34		
\$CAT	0248/41	0025/34	0026/34	0027/34
\$CHA	0160/49	0052/34		
\$CHN	0672/35	0014/34		
\$COP	0531/56	0062/34		
\$DEL	0530/43	0033/34		
\$DES	0236/58	0065/34		
\$DIR	0280/40	0044/34	0045/34	

CROSS-REFERENCE SYMBOL TABLE

SDIRS	0623/41	0028/34	0029/34
SECH	0096/45	0039/34	
SFLB	0559/34	0012/34	
SGET	0249/38	0018/34	
SHEL	0395/39	0020/34	
SKID	0466/51	0056/34	
SKIL	0845/39	0022/34	
SLEN	0052/45	0038/34	
SLOC	0586/52	0058/34	
SLPR	0252/45	0041/34	
SMAG	0050/59	0067/34	
SMES	0200/45	0040/34	
SMLO	0563/54	0060/34	
SMUN	0424/53	0059/34	
SNAM	0550/40	0024/34	
SNEW	0520/50	0055/34	
SOPE	0625/44	0037/34	
SPHO	0085/59	0068/34	
SPOR	0425/48	0048/34	
SPORS	0577/45	0042/34	
SPRI	0144/59	0069/34	
SPRO	0090/44	0035/34	0036/34
SPUR	0587/58	0066/34	
SREN	0471/40	0023/34	
SREP	0810/45	0043/34	
SREPs	0233/42	0030/34	
SRES	0816/48	0051/34	

CROSS-REFERENCE SYMBOL TABLE

\$ROS	0515/48	0049/34					
\$SAN	0759/57	0064/34					
\$SAV	0375/36	0015/34	0016/34				
\$SLE	0470/49	0053/34	0054/34				
\$SLPL	0074/34	0018	0009/34				
\$SPE	0398/59	0070/34					
\$STA	0266/47	0046/34	0047/34				
\$STAS	0713/42	0031/34	0032/34				
\$TIM	0621/43	0034/34					
\$UNL	0686/51	0057/34					
%ABOR	0233						
%DISC	0237	0567/28	0366/30	0190/49			
%ENTO	0238	0549/28					
%INPT	0234	0458/28	0348/30				
%OUTW	0235 0178/33	0070/27	0516/28	0527/28	0109/29	0203/30	0498/30
%PUN	0239	0461/27	0590/28				
%SYNT	0236 0141/29 0220/30	0073/27 0182/29 0297/30	0488/28 0325/29 0311/30	0490/28 0399/29 0243/32	0493/28 0521/29 0366/33	0500/28 0526/29 0337/39	0557/28 0197/30
.	0217	0233	0234	0235	0236	0237	0238
	0239	0502	0503	0510	0511	0512	0513
	0514	0515	0026/03	0036/03	0039/03	0053/03	0079/03
	0080/03	0114/03	0154/03	0159/03	0273/03	0284/03	0287/03
	0290/03	0292/03	0325/03	0349/03	0385/03	0401/03	0430/03
	0454/03	0457/03	0460/03	0493/03	0500/03	0537/03	0577/03
	0580/03	0585/03	0612/03	0644/03	0658/03	0669/03	0680/03
	0684/03	0688/03	0690/03	0720/03	0015/04	0018/04	0036/04
	0048/04	0061/04	0075/04	0077/04	0093/04	0109/04	0150/04
	0153/04	0155/04	0201/04	0217/04	0234/04	0251/04	0261/04
	0269/04	0273/04	0285/04	0289/04	0302/04	0307/04	0316/04
	0318/04	0323/04	0349/04	0355/04	0371/04	0375/04	0393/04
	0448/04	0027/05	0033/05	0041/05	0049/05	0058/05	0074/05
	0076/05	0128/05	0133/05	0143/05	0182/05	0206/05	0215/05
	0224/05	0238/05	0284/05	0316/05	0363/05	0402/05	0406/05
	0412/05	0428/05	0463/05	0482/05	0612/05	0624/05	0626/05
	0036/06	0062/06	0105/06	0137/06	0208/06	0211/06	0308/06

CROSS-REFERENCE SYMBOL TABLE

0330/06	0347/06	0364/06	0367/06	0375/06	0390/06	0450/06
0456/06	0467/06	0492/06	0547/06	0560/06	0004/07	0041/07
0085/07	0124/07	0130/07	0147/07	0166/07	0178/07	0195/07
0198/07	0204/07	0210/07	0227/07	0228/07	0232/07	0291/07
0312/07	0317/07	0320/07	0321/07	0350/07	0352/07	0362/07
0387/07	0410/07	0428/07	0446/07	0447/07	0450/07	0025/08
0046/08	0060/08	0109/08	0127/08	0135/08	0149/08	0158/08
0204/08	0208/08	0210/08	0219/08	0225/08	0239/08	0273/08
0278/08	0279/08	0293/08	0301/08	0304/08	0308/08	0319/08
0320/08	0322/08	0334/08	0345/08	0348/08	0415/08	0416/08
0420/08	0442/08	0445/08	0450/08	0004/09	0016/09	0025/09
0049/09	0065/09	0074/09	0086/09	0092/09	0094/09	0130/09
0155/09	0316/09	0326/09	0344/09	0346/09	0360/09	0359/09
0374/09	0376/09	0378/09	0381/09	0384/09	0422/09	0431/09
0434/09	0437/09	0440/09	0444/09	0068/10	0082/10	0084/10
0093/10	0100/10	0103/10	0110/10	0112/10	0131/10	0141/10
0147/10	0158/10	0165/10	0174/10	0175/10	0190/10	0194/10
0206/10	0229/10	0243/10	0246/10	0251/10	0261/10	0263/10
0269/10	0276/10	0283/10	0293/10	0297/10	0318/10	0338/10
0351/10	0356/10	0362/10	0378/10	0387/10	0061/11	0065/11
0069/11	0003/11	0004/11	0085/11	0086/11	0089/11	0098/11
0105/11	0140/11	0154/11	0163/11	0183/11	0197/11	0235/11
0260/11	0271/11	0285/11	0287/11	0296/11	0298/11	0309/11
0318/11	0321/11	0332/11	0389/11	0400/11	0413/11	0418/11
0428/11	0430/11	0439/11	0442/11	0450/11	0469/11	0471/11
0473/11	0475/11	0483/11	0487/11	0507/11	0515/11	0523/11
0534/11	0540/11	0542/11	0563/11	0578/11	0586/11	0597/11
0614/11	0618/11	0620/11	0036/12	0038/12	0043/12	0090/12
0154/12	0163/12	0165/12	0220/12	0222/12	0226/12	0235/12
0239/12	0292/12	0294/12	0296/12	0308/12	0358/12	0364/12
0365/12	0395/12	0397/12	0423/12	0430/12	0453/12	0454/12
0471/12	0025/13	0034/13	0052/13	0063/13	0068/13	0127/13
0170/13	0194/13	0209/13	0227/13	0255/13	0264/13	0278/13
0386/13	0401/13	0104/14	0124/14	0130/14	0140/14	0154/14
0191/14	0194/14	0201/14	0348/14	0417/14	0421/14	0426/14
0438/14	0446/14	0457/14	0460/14	0463/14	0475/14	0025/15
0048/15	0051/15	0054/15	0103/15	0110/15	0118/15	0137/15
0158/15	0173/15	0185/15	0187/15	0213/15	0237/15	0242/15
0255/15	0259/15	0271/15	0282/15	0299/15	0313/15	0320/15
0357/15	0396/15	0400/15	0402/15	0409/15	0410/15	0412/15
0423/15	0430/15	0434/15	0439/15	0452/15	0456/15	0468/15
0470/15	0471/15	0477/15	0520/15	0602/15	0606/15	0033/16
0098/16	0117/16	0181/16	0189/16	0207/16	0276/16	0327/16
0346/16	0367/16	0369/16	0375/16	0393/16	0403/16	0405/16
0463/16	0465/16	0469/16	0471/16	0493/16	0494/16	0498/16
0054/17	0056/17	0117/17	0155/17	0166/17	0168/17	0182/17
0184/17	0194/17	0196/17	0276/17	0340/17	0341/17	0383/17
0385/17	0409/17	0025/18	0060/18	0069/18	0075/18	0235/18
0344/18	0022/19	0049/19	0051/19	0064/19	0066/19	0082/19
0122/19	0130/19	0136/19	0143/19	0151/19	0156/19	0162/19
0166/19	0174/19	0176/19	0186/19	0209/19	0211/19	0223/19
0225/19	0235/19	0249/19	0253/19	0258/19	0259/19	0260/19
0300/19	0311/19	0319/19	0332/19	0336/19	0352/19	0354/19
0356/19	0377/19	0380/19	0417/19	0446/19	0500/19	0513/19

CROSS-REFERENCE SYMBOL TABLE

0018/20	0034/20	0047/20	0052/20	0104/20	0128/20	0161/20
0168/20	0179/20	0234/20	0250/20	0292/20	0313/20	0339/20
0345/20	0511/20	0109/21	0124/21	0171/21	0185/21	0195/21
0253/21	0259/21	0261/21	0274/21	0295/21	0308/21	0310/21
0313/21	0315/21	0344/21	0347/21	0357/21	0376/21	0378/21
0380/21	0401/21	0404/21	0419/21	0428/21	0432/21	0436/21
0437/21	0441/21	0444/21	0447/21	0471/21	0472/21	0474/21
0501/21	0507/21	0512/21	0547/21	0562/21	0580/21	0581/21
0586/21	0010/22	0026/22	0028/22	0065/22	0080/22	0107/22
0121/22	0123/22	0138/22	0195/22	0281/22	0320/22	0053/23
0055/23	0057/23	0074/23	0104/23	0122/23	0144/23	0163/23
0238/23	0248/23	0265/23	0282/23	0305/23	0307/23	0308/23
0309/23	0312/23	0314/23	0369/23	0370/23	0371/23	0374/23
0376/23	0398/23	0408/23	0420/23	0422/23	0449/23	0048/24
0051/24	0066/24	0077/24	0084/24	0089/24	0091/24	0116/24
0120/24	0125/24	0126/24	0127/24	0148/24	0157/24	0164/24
0168/24	0190/24	0192/24	0216/24	0224/24	0226/24	0252/24
0268/24	0273/24	0276/24	0289/24	0292/24	0295/24	0308/24
0004/25	0007/25	0009/25	0031/25	0033/25	0035/25	0039/25
0080/25	0112/25	0162/25	0165/25	0170/25	0181/25	0183/25
0192/25	0196/25	0201/25	0202/25	0203/25	0215/25	0218/25
0220/25	0227/25	0230/25	0279/25	0290/25	0294/25	0296/25
0298/25	0332/25	0334/25	0336/25	0356/25	0358/25	0360/25
0431/25	0456/25	0458/25	0082/26	0085/26	0170/26	0179/26
0192/26	0212/26	0219/26	0245/26	0277/26	0288/26	0360/26
0364/26	0366/26	0383/26	0387/26	0392/26	0410/26	0429/26
0463/26	0073/27	0073/27	0088/27	0143/27	0148/27	0153/27
0158/27	0160/27	0182/27	0457/27	0460/27	0463/27	0467/27
0476/27	0504/27	0511/27	0026/28	0051/28	0070/28	0209/28
0213/28	0256/28	0262/28	0270/28	0272/28	0274/28	0290/28
0292/28	0294/28	0372/28	0428/28	0466/28	0486/28	0490/28
0490/28	0493/28	0493/28	0500/28	0500/28	0504/28	0508/28
0539/28	0544/28	0548/28	0556/28	0557/28	0557/28	0566/28
0569/28	0583/28	0584/28	0588/28	0601/28	0658/28	0689/28
0010/29	0012/29	0034/29	0041/29	0052/29	0068/29	0074/29
0082/29	0095/29	0119/29	0130/29	0137/29	0141/29	0144/29
0168/29	0171/29	0180/29	0184/29	0201/29	0214/29	0257/29
0262/29	0267/29	0269/29	0271/29	0286/29	0288/29	0291/29
0294/29	0312/29	0321/29	0324/29	0325/29	0325/29	0327/29
0331/29	0334/29	0341/29	0363/29	0368/29	0370/29	0390/29
0395/29	0398/29	0418/29	0429/29	0440/29	0463/29	0489/29
0512/29	0523/29	0525/29	0526/29	0526/29	0531/29	0532/29
0554/29	0556/29	0016/30	0036/30	0047/30	0091/30	0099/30
0115/30	0130/30	0141/30	0197/30	0197/30	0217/30	0219/30
0221/30	0224/30	0235/30	0241/30	0255/30	0261/30	0266/30
0275/30	0276/30	0297/30	0297/30	0300/30	0302/30	0304/30
0308/30	0310/30	0312/30	0334/30	0338/30	0345/30	0347/30
0361/30	0365/30	0370/30	0384/30	0387/30	0389/30	0415/30
0419/30	0431/30	0433/30	0491/30	0495/30	0497/30	0502/30
0506/30	0521/30	0531/30	0132/31	0135/31	0145/31	0153/31
0157/31	0177/31	0183/31	0207/31	0218/31	0252/31	0297/31
0323/31	0335/31	0337/31	0354/31	0359/31	0365/31	0376/31
0378/31	0406/31	0409/31	0415/31	0419/31	0499/31	0531/31
0015/32	0035/32	0040/32	0047/32	0049/32	0067/32	0090/32

CROSS-REFERENCE SYMBOL TABLE

0094/32	0098/32	0100/32	0104/32	0107/32	0115/32	0134/32
0142/32	0153/32	0155/32	0157/32	0159/32	0163/32	0176/32
0178/32	0182/32	0185/32	0189/32	0191/32	0195/32	0197/32
0206/32	0208/32	0210/32	0218/32	0220/32	0223/32	0232/32
0237/32	0242/32	0245/32	0251/32	0260/32	0266/32	0271/32
0306/32	0328/32	0342/32	0354/32	0356/32	0364/32	0368/32
0372/32	0382/32	0388/32	0398/32	0412/32	0034/33	0045/33
0047/33	0057/33	0063/33	0076/33	0087/33	0099/33	0115/33
0120/33	0141/33	0150/33	0153/33	0161/33	0163/33	0182/33
0230/33	0237/33	0264/33	0269/33	0278/33	0313/33	0323/33
0337/33	0353/33	0361/33	0365/33	0368/33	0374/33	0398/33
0401/33	0404/33	0405/33	0407/33	0452/33	0453/33	0463/33
0481/33	0503/33	0509/33	0519/33	0531/33	0118/34	0121/34
0137/34	0143/34	0145/34	0147/34	0161/34	0172/34	0175/34
0185/34	0200/34	0210/34	0228/34	0260/34	0264/34	0268/34
0279/34	0287/34	0297/34	0303/34	0324/34	0340/34	0370/34
0391/34	0401/34	0402/34	0414/34	0416/34	0427/34	0441/34
0447/34	0449/34	0452/34	0462/34	0471/34	0482/34	0489/34
0498/34	0501/34	0519/34	0539/34	0025/35	0043/35	0045/35
0051/35	0064/35	0080/35	0085/35	0105/35	0125/35	0129/35
0133/35	0138/35	0147/35	0158/35	0168/35	0173/35	0190/35
0207/35	0210/35	0215/35	0219/35	0238/35	0256/35	0270/35
0275/35	0277/35	0281/35	0290/35	0298/35	0309/35	0315/35
0319/35	0376/35	0384/35	0388/35	0390/35	0393/35	0395/35
0401/35	0407/35	0419/35	0422/35	0431/35	0433/35	0453/35
0456/35	0482/35	0492/35	0500/35	0513/35	0516/35	0523/35
0550/35	0552/35	0561/35	0567/35	0590/35	0639/35	0653/35
0020/36	0022/36	0024/36	0031/36	0037/36	0073/36	0077/36
0083/36	0092/36	0100/36	0112/36	0115/36	0122/36	0130/36
0140/36	0152/36	0167/36	0183/36	0186/36	0193/36	0195/36
0212/36	0217/36	0223/36	0230/36	0235/36	0259/36	0265/36
0285/36	0317/36	0322/36	0334/36	0337/36	0392/36	0407/36
0412/36	0420/36	0436/36	0017/37	0019/37	0029/37	0035/37
0040/37	0047/37	0049/37	0053/37	0066/37	0069/37	0083/37
0088/37	0091/37	0111/37	0123/37	0147/37	0157/37	0180/37
0192/37	0195/37	0202/37	0213/37	0224/37	0228/37	0230/37
0275/37	0296/37	0317/37	0323/37	0324/37	0328/37	0336/37
0351/37	0353/37	0363/37	0380/37	0384/37	0393/37	0451/37
0458/37	0498/37	0013/38	0020/38	0024/38	0026/38	0031/38
0036/38	0039/38	0042/38	0074/38	0080/38	0087/38	0095/38
0100/38	0109/38	0122/38	0125/38	0132/38	0154/38	0163/38
0165/38	0175/38	0183/38	0206/38	0208/38	0219/38	0264/38
0271/38	0285/38	0293/38	0295/38	0298/38	0305/38	0312/38
0333/38	0335/38	0342/38	0412/38	0414/38	0424/38	0436/38
0445/38	0012/39	0042/39	0054/39	0086/39	0106/39	0122/39
0127/39	0137/39	0152/39	0171/39	0181/39	0186/39	0193/39
0196/39	0201/39	0215/39	0227/39	0245/39	0256/39	0259/39
0268/39	0272/39	0284/39	0291/39	0332/39	0336/39	0344/39
0352/39	0363/39	0406/39	0415/39	0420/39	0435/39	0454/39
0474/39	0488/39	0503/39	0519/39	0526/39	0530/39	0532/39
0535/39	0538/39	0543/39	0563/39	0594/39	0600/39	0603/39
0607/39	0620/39	0630/39	0641/39	0648/39	0659/39	0667/39
0681/39	0726/39	0734/39	0741/39	0747/39	0758/39	0764/39
0823/39	0826/39	0016/40	0022/40	0036/40	0042/40	0044/40

.....

CROSS-REFERENCE SYMBOL TABLE

0048/40	0050/40	0054/40	0056/40	0060/40	0164/40	0192/40
0209/40	0231/40	0241/40	0258/40	0261/40	0267/40	0273/40
0299/40	0314/40	0325/40	0349/40	0365/40	0370/40	0397/40
0436/40	0438/40	0478/40	0484/40	0501/40	0514/40	0523/40
0525/40	0529/40	0535/40	0538/40	0541/40	0013/41	0015/41
0018/41	0035/41	0039/41	0045/41	0049/41	0060/41	0068/41
0077/41	0087/41	0101/41	0104/41	0110/41	0113/41	0119/41
0122/41	0137/41	0141/41	0143/41	0145/41	0152/41	0154/41
0156/41	0166/41	0175/41	0178/41	0195/41	0205/41	0220/41
0227/41	0262/41	0275/41	0301/41	0305/41	0317/41	0327/41
0332/41	0354/41	0363/41	0371/41	0378/41	0396/41	0398/41
0405/41	0413/41	0427/41	0449/41	0454/41	0458/41	0460/41
0471/41	0484/41	0486/41	0494/41	0496/41	0500/41	0502/41
0509/41	0536/41	0545/41	0546/41	0548/41	0554/41	0561/41
0566/41	0568/41	0570/41	0576/41	0578/41	0582/41	0593/41
0595/41	0598/41	0633/41	0009/42	0013/42	0025/42	0034/42
0058/42	0062/42	0073/42	0095/42	0117/42	0121/42	0129/42
0134/42	0136/42	0142/42	0146/42	0148/42	0150/42	0152/42
0163/42	0171/42	0173/42	0175/42	0178/42	0187/42	0189/42
0192/42	0200/42	0202/42	0205/42	0215/42	0241/42	0245/42
0262/42	0268/42	0272/42	0277/42	0299/42	0301/42	0303/42
0312/42	0319/42	0331/42	0336/42	0339/42	0345/42	0353/42
0359/42	0361/42	0422/42	0432/42	0441/42	0456/42	0475/42
0484/42	0515/42	0529/42	0546/42	0548/42	0561/42	0603/42
0629/42	0638/42	0647/42	0674/42	0681/42	0683/42	0685/42
0693/42	0697/42	0705/42	0709/42	0011/43	0015/43	0034/43
0066/43	0075/43	0081/43	0090/43	0100/43	0109/43	0118/43
0122/43	0127/43	0158/43	0173/43	0177/43	0183/43	0196/43
0197/43	0206/43	0207/43	0216/43	0219/43	0229/43	0234/43
0243/43	0260/43	0268/43	0270/43	0275/43	0280/43	0296/43
0305/43	0307/43	0313/43	0330/43	0373/43	0394/43	0397/43
0399/43	0435/43	0438/43	0478/43	0483/43	0485/43	0506/43
0537/43	0542/43	0562/43	0568/43	0573/43	0598/43	0602/43
0608/43	0610/43	0013/44	0022/44	0031/44	0039/44	0043/44
0046/44	0049/44	0059/44	0072/44	0078/44	0086/44	0111/44
0116/44	0131/44	0133/44	0142/44	0154/44	0156/44	0158/44
0163/44	0166/44	0170/44	0183/44	0188/44	0205/44	0229/44
0239/44	0248/44	0256/44	0268/44	0271/44	0277/44	0284/44
0295/44	0315/44	0318/44	0325/44	0327/44	0343/44	0349/44
0355/44	0362/44	0367/44	0388/44	0394/44	0409/44	0428/44
0444/44	0455/44	0467/44	0468/44	0470/44	0487/44	0490/44
0504/44	0508/44	0512/44	0570/44	0585/44	0008/45	0013/45
0028/45	0030/45	0037/45	0039/45	0042/45	0047/45	0087/45
0112/45	0122/45	0126/45	0138/45	0154/45	0162/45	0174/45
0209/45	0234/45	0237/45	0270/45	0274/45	0298/45	0310/45
0357/45	0377/45	0400/45	0431/45	0434/45	0436/45	0447/45
0461/45	0487/45	0496/45	0520/45	0529/45	0549/45	0553/45
0561/45	0565/45	0618/45	0623/45	0642/45	0662/45	0678/45
0710/45	0724/45	0735/45	0748/45	0752/45	0765/45	0038/46
0040/46	0054/46	0062/46	0071/46	0087/46	0118/46	0123/46
0142/46	0203/46	0215/46	0216/46	0223/46	0226/46	0229/46
0230/46	0245/46	0265/46	0291/46	0313/46	0319/46	0322/46
0327/46	0350/46	0352/46	0354/46	0363/46	0370/46	0382/46
0387/46	0390/46	0396/46	0404/46	0410/46	0412/46	0470/46

CROSS-REFERENCE SYMBOL TABLE

0480/46	0486/46	0497/46	0015/47	0024/47	0055/47	0069/47
0083/47	0085/47	0104/47	0108/47	0194/47	0203/47	0211/47
0252/47	0272/47	0304/47	0313/47	0319/47	0328/47	0341/47
0350/47	0356/47	0360/47	0365/47	0396/47	0408/47	0412/47
0418/47	0434/47	0438/47	0439/47	0448/47	0449/47	0458/47
0461/47	0477/47	0482/47	0491/47	0507/47	0515/47	0517/47
0520/47	0523/47	0014/48	0023/48	0025/48	0031/48	0057/48
0098/48	0101/48	0103/48	0148/48	0159/48	0202/48	0210/48
0228/48	0247/48	0280/48	0292/48	0307/48	0332/48	0384/48
0392/48	0410/48	0435/48	0443/48	0448/48	0453/48	0464/48
0489/48	0500/48	0533/48	0539/48	0544/48	0549/48	0557/48
0573/48	0581/48	0583/48	0585/48	0596/48	0598/48	0603/48
0607/48	0609/48	0689/48	0719/48	0722/48	0738/48	0741/48
0754/48	0761/48	0769/48	0784/48	0793/48	0798/48	0811/48
0019/49	0036/49	0045/49	0047/49	0062/49	0071/49	0077/49
0087/49	0093/49	0098/49	0103/49	0138/49	0143/49	0152/49
0189/49	0192/49	0196/49	0213/49	0215/49	0217/49	0226/49
0228/49	0238/49	0253/49	0258/49	0266/49	0272/49	0282/49
0292/49	0326/49	0331/49	0340/49	0354/49	0364/49	0373/49
0388/49	0393/49	0395/49	0410/49	0447/49	0453/49	0456/49
0496/49	0017/50	0026/50	0045/50	0049/50	0056/50	0066/50
0081/50	0099/50	0106/50	0114/50	0149/50	0153/50	0162/50
0184/50	0188/50	0194/50	0205/50	0210/50	0212/50	0214/50
0218/50	0225/50	0229/50	0235/50	0237/50	0255/50	0300/50
0356/50	0358/50	0367/50	0371/50	0381/50	0443/50	0038/51
0056/51	0078/51	0086/51	0095/51	0110/51	0114/51	0127/51
0128/51	0130/51	0134/51	0147/51	0164/51	0167/51	0170/51
0223/51	0241/51	0249/51	0266/51	0274/51	0279/51	0283/51
0287/51	0297/51	0305/51	0312/51	0316/51	0351/51	0357/51
0362/51	0373/51	0449/51	0481/51	0494/51	0500/51	0575/51
0584/51	0640/51	0653/51	0663/51	0667/51	0037/52	0053/52
0061/52	0086/52	0098/52	0103/52	0158/52	0165/52	0168/52
0175/52	0181/52	0204/52	0211/52	0218/52	0248/52	0268/52
0278/52	0283/52	0310/52	0319/52	0386/52	0397/52	0401/52
0405/52	0410/52	0414/52	0417/52	0423/52	0433/52	0436/52
0455/52	0461/52	0504/52	0544/52	0549/52	0554/52	0558/52
0015/53	0017/53	0025/53	0034/53	0046/53	0053/53	0066/53
0070/53	0075/53	0085/53	0111/53	0128/53	0140/53	0145/53
0187/53	0201/53	0242/53	0262/53	0320/53	0323/53	0329/53
0345/53	0355/53	0361/53	0307/53	0373/53	0386/53	0026/54
0028/54	0036/54	0045/54	0057/54	0069/54	0082/54	0086/54
0091/54	0108/54	0111/54	0115/54	0119/54	0126/54	0131/54
0141/54	0142/54	0144/54	0153/54	0181/54	0188/54	0191/54
0198/54	0202/54	0215/54	0234/54	0241/54	0247/54	0276/54
0296/54	0307/54	0312/54	0322/54	0343/54	0363/54	0462/54
0487/54	0507/54	0526/54	0023/55	0045/55	0072/55	0084/55
0089/55	0092/55	0119/55	0125/55	0175/55	0187/55	0188/55
0194/55	0203/55	0209/55	0229/55	0232/55	0250/55	0256/55
0273/55	0286/55	0312/55	0315/55	0318/55	0344/55	0354/55
0364/55	0369/55	0376/55	0379/55	0401/55	0436/55	0438/55
0457/55	0469/55	0472/55	0490/55	0495/55	0516/55	0519/55
0524/55	0527/55	0532/55	0540/55	0010/56	0015/56	0025/56
0027/56	0048/56	0057/56	0079/56	0096/56	0104/56	0109/56
0118/56	0126/56	0138/56	0141/56	0148/56	0170/56	0179/56

CROSS-REFERENCE SYMBOL TABLE

.73	0008/12	0220/14					
.74	0006/19	0070/19					
.75	0007/19	0180/19					
.A	0006/23	0189/23	0362/23				
.CHEB	0150/02 0218/20	0317/02 0316/20	0344/02 0364/20	0436/02 0413/20	0471/02	0188/20	0217/20
.EXP	0146/02 0505/20	0320/02 0512/20	0343/02	0467/02	0364/13	0452/20	0502/20
.EXP1	0503/20	0468/20	0508/20				
.EXP2	0506/20	0458/20	0465/20				
.FAD	0120/02 0562/15 0289/20 0017/21	0339/02 0300/17 0298/20 0034/21	0444/02 0245/18 0336/20 0040/21	0469/02 0085/19 0346/20 0115/21	0180/10 0090/19 0476/20 0121/21	0319/13 0208/20 0486/20 0129/21	0561/15 0281/20 0496/20 0140/21
.FDy	0126/02 0007/16 0032/21	0342/02 0142/18 0119/21	0464/02 0373/20 0127/21	0337/13 0404/20	0402/13 0480/20	0041/16 0494/20	0083/16 0023/21
.FDy1	0081/16	0047/16					
.FDV2	0084/16	0044/16					
.FLUN	0130/02 0096/19	0348/02 0267/20	0349/02 0012/21	0045/15 0106/21	0541/15 0260/23	0553/15	0139/16
.FMP	0124/02 0006/16 0215/18 0310/20 0409/20 0042/21	0341/02 0036/16 0260/18 0318/20 0415/20 0113/21	0463/02 0298/17 0185/20 0333/20 0454/20 0138/21	0331/13 0044/18 0204/20 0358/20 0473/20	0362/13 0154/18 0215/20 0360/20 0484/20	0408/13 0167/18 0286/20 0366/20 0026/21	0416/13 0199/18 0296/20 0407/20 0036/21
.FSB	0122/02 0122/14 0219/18 0314/20 0488/20	0340/02 0563/15 0249/18 0349/20 0490/20	0470/02 0569/15 0267/18 0355/20 0021/21	0183/10 0032/15 0206/20 0362/20 0028/21	0325/13 0088/18 0213/20 0411/20 0038/21	0046/14 0137/18 0301/20 0432/20	0055/14 0203/18 0306/20 0470/20
.FSB1	0579/15	0573/15	0576/15				
.IENT	0152/02 0489/19	0318/02 0236/20	0345/02 0237/20	0437/02 0242/20	0472/02 0293/20	0430/19 0340/20	0456/19 0457/20
.LNUM	0242/02	0425/06	0030/08	0399/09	0233/16	0395/16	

.....

CROSS-REFERENCE SYMBOL TABLE

.LOG	0148/02	0473/02	0361/13	0005/21	0044/21	0048/21	
.LOG1	0045/21	0008/21					
.PACK	0060/02 0253/20	0347/02 0175/22	0631/15 0262/22	0035/16 0297/22	0082/16 0300/22	0021/20 0305/22	0103/20 0310/22
.PWR2	0154/02 0291/20	0319/02 0312/20	0346/02 0338/20	0438/02 0344/20	0269/20 0500/20	0276/20 0123/21	0277/20 0131/21
.X	0003/23	0187/23	0330/23	0357/23	0009/24	0109/24	
?ABP2	0007/33	0142/33					
?ADIN	0268	0030	0557/26				
?ATBL	0397 0486/51	0056/26 0043/52	0267/30	0273/42	0381/42	0323/46	0429/46
?CLOC	0254/27	0258/27	0180/29	0184/29	0401/33	0404/33	0452/33
?DISC	0234/27 0388/32 0264/47	0010 0063/33 0258/49	0238/27 0374/33 0079/52	0241/30 0024/36 0577/52	0261/30 0419/43	0251/32 0420/43	0271/32 0263/47
?FLAG	0212/27	0230/27	0467/27	0037/36	0415/39	0420/39	0013/45
?ID	0242/27 0267/29 0025/35 0436/38 0241/42 0442/48 0453/49	0011 0269/29 0393/35 0420/39 0013/44 0447/48 0038/51	0422/09 0260/32 0395/35 0594/39 0111/44 0452/48 0110/51	0026/22 0342/32 0401/35 0039/41 0487/44 0266/49 0127/51	0246/27 0398/32 0020/36 0275/41 0490/44 0282/49 0370/59	0463/27 0099/33 0022/36 0301/41 0270/45 0292/49 0434/59	0467/27 0210/34 0013/38 0009/42 0434/48 0447/49
?LINK	0267/27 0457/27 0361/30 0260/32 0353/33 0340/34 0013/38 0042/39 0415/39 0016/40 0178/41 0427/41 0178/42 0542/43 0087/45	0085/07 0566/28 0370/30 0266/32 0398/33 0025/35 0183/38 0054/39 0454/39 0022/40 0275/41 0576/41 0241/42 0013/44 0122/45	0350/07 0689/28 0384/30 0057/33 0452/33 0347/35 0206/38 0215/39 0543/39 0325/40 0301/41 0009/42 0561/42 0111/44 0209/45	0387/07 0012/29 0387/30 0076/33 0463/33 0393/35 0333/38 0227/39 0578/39 0478/40 0317/41 0025/42 0693/42 0455/44 0270/45	0422/09 0294/29 0521/30 0099/33 0503/33 0567/35 0412/38 0245/39 0594/39 0541/40 0327/41 0034/42 0705/42 0467/44 0549/45	0380/19 0331/29 0531/30 0120/33 0531/33 0590/35 0424/38 0332/39 0681/39 0039/41 0354/41 0058/42 0478/43 0487/44 0561/45	0271/27 0334/30 0232/32 0153/33 0210/34 0020/36 0436/38 0406/39 0823/39 0154/41 0396/41 0117/42 0483/43 0008/45 0134/51
?NAME	0246/27	0250/27	0489/29	0556/29	0445/38	0478/40	0541/40
?PLEV	0271/27	0276/27	0012/29	0171/29	0286/29	0288/29	0291/29

CROSS-REFERENCE SYMBOL TABLE

	0294/29	0321/29	0324/29	0370/29	0390/29	0395/29	0532/29
	0300/30	0302/30	0345/30	0347/30	0495/30	0497/30	0237/32
	0242/32	0361/33	0365/33	0404/33	0407/33	0467/44	0470/44
?PROG	0238/27	0242/27	0554/29	0556/29	0235/30	0241/30	0255/30
	0261/30	0245/32	0251/32	0266/32	0271/32	0382/32	0388/32
	0057/33	0063/33	0368/33	0374/33	0567/35	0590/35	0022/36
	0024/36	0037/36	0183/38	0208/38	0245/39	0016/40	0006/45
	0013/45	0253/49	0258/49				
?RSTR	0258/27	0262/27	0539/28	0544/28	0171/29	0327/29	0331/29
	0363/29	0368/29	0370/29	0395/29	0398/29	0525/29	0532/29
	0304/30	0308/30	0338/30	0502/30	0506/30	0407/33	0470/44
?RTIM	0276/27	0298/11	0280/27	0466/28	0327/41	0354/41	0396/41
	0576/41	0034/42	0058/42	0117/42	0178/42	0455/44	0490/44
?SC	0033	0365/26	0394/26	0468/26	0470/26	0052/27	0068/27
	0103/27	0108/27	0122/27	0140/27	0198/27	0190/28	0347/28
	0363/28	0364/28	0365/28	0205/29	0470/32	0515/32	0567/32
	0569/32	0570/32					
?STAT	0262/27	0350/07	0185/21	0026/22	0267/27	0460/27	0463/27
	0486/28	0504/28	0508/28	0548/28	0556/28	0566/28	0569/28
	0588/28	0501/28	0180/29	0269/29	0286/29	0288/29	0291/29
	0324/29	0327/29	0334/29	0368/29	0398/29	0523/29	0525/29
	0224/30	0300/30	0302/30	0304/30	0308/30	0345/30	0347/30
	0365/30	0387/30	0491/30	0495/30	0497/30	0502/30	0531/30
	0242/32	0245/32	0412/32	0365/33	0368/33	0398/33	0401/33
	0481/33	0336/39	0561/42	0607/48	0189/49	0192/49	0127/51
	0130/51						
?TBL	0085	0397					
?TEMP	0280/27	0154/41	0178/41	0427/41	0693/42	0705/42	0549/45
	0561/45						
?TIME	0250/27	0254/27	0378/39	0454/39	0542/43	0292/49	
?TNUM	0230/27	0494/16	0234/27	0476/27	0334/30	0338/30	0370/30
	0153/33	0340/34	0042/39	0054/39	0215/39	0406/39	0543/39
	0563/39	0681/39	0317/41	0025/42	0087/45	0122/45	0209/45
	0192/49	0196/49					
?TT2	0060/27	0200	0538/26	0552/26	0044/27	0110/27	0695/32
?TT35	0037/27	0289	0043/27	0056/27	0694/32		
A	0020	0031/06	0032/06	0275/07	0279/07	0402/09	0324/14
	0134/15	0139/15	0142/15	0200/15	0438/19	0024/23	0457/25
	0160/26	0163/26	0166/26	0175/26	0185/29	0329/29	0176/30
	0269/30	0277/30	0314/31	0338/31	0347/31	0353/31	0355/31
	0356/31	0379/31	0365/32	0491/32	0239/34	0261/34	0424/34
	0081/35	0106/35	0441/35	0267/36	0323/36	0085/37	0098/37

CROSS-REFERENCE SYMBOL TABLE

	0105/37	0112/37	0141/37	0148/37	0181/37	0189/37	0229/37
	0234/37	0350/37	0059/38	0650/39	0682/39	0080/40	0105/40
	0139/40	0154/40	0177/40	0182/40	0295/40	0298/40	0304/40
	0159/41	0182/41	0263/41	0634/41	0067/42	0082/42	0090/42
	0107/42	0165/42	0304/42	0322/42	0330/42	0340/42	0342/42
	0354/42	0356/42	0383/42	0476/42	0577/42	0239/43	0085/44
	0346/44	0396/44	0118/45	0123/45	0443/45	0612/45	0624/45
	0737/45	0751/45	0292/46	0355/46	0373/46	0381/46	0391/46
	0393/46	0405/46	0407/46	0431/46	0016/47	0138/47	0487/47
	0288/48	0605/48	0390/49	0306/50	0413/50	0424/50	0447/50
	0048/51	0317/51	0290/52	0071/53	0238/53	0087/54	0143/54
	0319/54	0339/54	0481/54	0496/54	0522/54	0186/55	0373/55
	0470/55	0491/55	0072/56	0080/56	0232/56	0243/56	0246/56
	0281/56	0415/56	0447/56	0198/57	0201/57	0293/57	0329/57
	0337/57	0377/57	0408/57	0660/57	0209/58	0468/58	0480/58
	0371/59	0435/59	0441/59	0442/59			
A, 10	0004/07	0066/09					
A000	0505	0425/09	0219/34	0360/34	0044/35	0231/35	0447/35
	0049/38	0258/41	0303/41	0011/42	0243/42	0272/45	0022/51
A1	0439/02	0538/15	0589/15	0592/15	0618/15	0622/15	0630/15
	0012/16	0024/16	0045/16	0085/16			
A2	0441/02	0550/15	0570/15	0580/15	0590/15	0591/15	0608/15
	0017/16	0025/16	0042/16	0054/16	0058/16	0063/16	
AAA	0053/21	0035/21					
AAAA	0516/20	0477/20					
ABCHK	0461/33	0299	0760/32	0472/33	0342/35	0610/35	0642/35
	0656/35						
ABCK	0299	0471/07	0303/09	0569/11	0475/16	0279/32	
ABR	0472/28	0434/28					
ABR1	0485/28	0480/28					
ABR2	0503/28	0492/28					
ABT	0158	0609/28					
ABTRY	0517	0482/28	0356/29	0405/32	0470/33		
ABUCD	0380/32	0113/31					
ACCSA	0293	0209/03	0210/03	0215/03	0260/03		
ACCS1	0586/05	0580/05	0593/05	0608/05			
ACCS2	0594/05	0574/05	0582/05				

CROSS-REFERENCE SYMBOL TABLE

ACCS3	0607/05	0615/05					
ACCS4	0616/05	0573/05					
ACCS5	0618/05	0293	0592/05				
ACCS6	0629/05	0567/05	0621/05				
ACCSA	0291	0326/03	0350/03	0411/03	0467/03	0538/03	0564/03
	0613/03	0641/03	0645/03	0659/03	0670/03	0685/03	0709/03
	0721/03	0724/03	0037/04	0049/04	0062/04	0076/04	0087/04
	0124/04	0154/04	0272/05	0287/05	0517/16		
ACCS7	0561/05	0291	0317/05				
ADB10	0429/26	0436/26					
ADLEN	0081	0027/28	0217/31	0219/31	0258/31	0259/31	0781/39
	0788/39	0056/43	0294/47	0379/51	0389/51	0405/51	0414/51
	0536/51	0544/51	0599/51	0600/51	0298/52	0324/52	0330/52
	0266/55	0289/55	0585/57	0592/57	0629/57	0631/57	0149/58
	0158/58	0518/58	0555/58				
ADLOC	0080	0029/28	0783/39	0790/39	0055/43	0293/47	0381/51
	0391/51	0407/51	0416/51	0546/51	0603/51	0121/52	0300/52
	0332/52	0268/55	0291/55	0587/57	0634/57	0151/58	0160/58
	0520/58	0557/58					
ADMU1	0585/15	0564/15	0601/15				
ADMU2	0602/15	0588/15					
ADMU3	0610/15	0636/15					
ADMU4	0630/15	0605/15	0620/15	0624/15	0628/15		
ADMU5	0633/15	0611/15					
AEND	0532/04	0477/03	0704/03				
ALC00	0446/06	0454/06					
ALC01	0424/06	0505/06					
ALC02	0455/06	0433/06	0502/06				
ALC03	0467/06	0458/06					
ALC04	0472/06	0469/06					
ALC05	0487/06	0481/06					
ALC06	0434/06	0504/06					

CROSS-REFERENCE SYMBOL TABLE

ALCO7	0493/06	0466/06	0471/06				
ALCOM	0198/02	0436/06	0449/06	0051/07	0048/36	0389/36	
ALI	0144	0632/05	0414/29				
ANN_A	0652/48	0528/48					
ANN_L	0653/48	0567/48	0570/48				
ANN1	0560/48	0540/48					
ANN2	0564/48	0529/48					
ANN3	0580/48	0563/48					
ANN4	0587/48	0593/48					
ANN5	0594/48	0591/48					
ANN6	0602/48	0619/48					
ANN7	0616/48	0611/48					
ANNC1	0628/48	0637/48	0650/48				
ANNC2	0645/48	0642/48					
ANNC3	0648/48	0644/48					
ANNCH	0622/48 0599/48	0582/48 0651/48	0584/48	0586/48	0592/48	0595/48	0597/48
ANNJM	0654/48	0600/48					
ANOT	0266	0335/04					
APP01	0278/38	0267/38					
APP02	0291/38	0281/38					
APP1	0346/38	0328/38					
APP10	0341/38	0316/38					
APP2	0394/38	0373/38	0380/38				
APP3	0433/38	0409/38					
APP5	0384/38	0377/38	0388/38				
APP6	0445/38	0440/38					

CROSS-REFERENCE SYMBOL TABLE

APP7	0359/38	0349/38					
APP8	0368/38	0358/38					
APP9	0421/38	0400/38	0405/38				
APPDP	0448/38	0354/38					
APPLS	0450/38	0297/38	0441/38				
APPS	0451/38	0384/38	0391/38				
APTR1	0006/07	0202/08					
APTR2	0005/07	0231/08					
ARBAS	0003/12	0435/12					
AREG	0006/02	0577/28	0196/29	0505/30			
ARG1	0058/14	0048/14					
ARG2	0049/14	0057/14					
ARIN1	0120/16	0105/16	0111/16				
ARIN2	0100/16	0097/16					
ARIN3	0122/16	0099/16					
ARINV	0110/02 0047/19	0381/11 0006/20	0133/13 0156/20	0121/16 0343/20	0125/16	0086/18	0265/18
ARRID	0024/02 0147/04	0356/02 0163/04	0381/02 0118/05	0033/04	0060/04	0074/04	0135/04
ARYAD	0538/04 0046/05	0399/03 0056/05	0400/03 0064/05	0410/03 0131/05	0090/04 0146/05	0032/05 0181/05	0034/05 0189/05
ASBFA	0624/11	0403/11	0445/11	0511/11			
ASBFP	0493/02 0092/35	0446/11 0333/35	0512/11	0517/11	0527/11	0530/11	0070/35
ASBUF	0356/35 0151/35 0218/35 0280/35	0039/35 0153/35 0233/35 0297/35	0047/35 0155/35 0235/35 0318/35	0098/35 0157/35 0237/35	0140/35 0159/35 0240/35	0146/35 0165/35 0255/35	0149/35 0206/35 0266/35
ASC00	0331 0198/41	0280/26 0129/45	0291/26 0768/45	0507/27 0248/46	0039/30 0492/48	0145/32 0547/52	0139/41 0510/54
ASC0B	0625/28	0076/29					

CROSS-REFERENCE SYMBOL TABLE

ASCB0	0278/46	0188/46					
ASCBA	0624/28	0069/29					
ASCB8	0327	0028/36	0614/39	0132/45	0718/45	0469/48	
ASCC	0242/41	0092/41					
ASCEB	0520/16	0325/16					
ASCF	0243/41	0099/41					
ASCFF	0623/28	0065/29					
ASCIN	0622/28	0063/29					
ASCP	0244/41	0108/41					
ASCS	0245/41	0117/41					
ASCSS	0279/46						
ASFBF	0358/35	0038/35					
ASFCB	0348/35	0053/35	0268/35	0269/35	0272/35	0273/35	0279/35
	0285/35	0288/35	0289/35	0291/35	0293/35	0294/35	0295/35
	0307/35	0308/35	0310/35	0312/35	0313/35	0314/35	0323/35
	0324/35	0326/35	0327/35	0328/35	0329/35	0331/35	0332/35
	0335/35	0337/35	0339/35				
ASGNA	0044/31	0121/31					
ASINP	0292/02	0071/07	0332/09	0402/11			
ASN1	0041/35						
ASN10	0227/35	0223/35					
ASN11	0237/35	0212/35	0232/35				
ASN12	0297/35	0284/35					
ASN13	0314/35	0296/35					
ASN14	0341/35	0123/35					
ASN2	0049/35						
ASN20	0087/35	0078/35					
ASN21	0092/35	0061/35					
ASN22	0098/35	0091/35					

CROSS-REFERENCE SYMBOL TABLE

ASN23	0111/35	0108/35						
ASN24	0113/35	0128/35	0137/35					
ASN25	0138/35	0132/35						
ASN26	0122/35	0116/35						
ASN28	0346/35							
ASN3	0114/35	0144/35						
ASN30	0248/35	0242/35						
ASN31	0252/35	0246/35						
ASN32	0254/35	0247/35						
ASN4	0124/35	0112/35						
ASN5	0147/35							
ASN50	0179/35							
ASN6	0205/35	0225/35						
ASN7	0209/35	0216/35						
ASN9	0218/35	0214/35						
ASNFS	0350/35	0197/35	0200/35	0258/35				
ASNIB	0121/31	0491/11						
ASNID	0351/35	0027/35	0031/35	0041/35	0062/35	0135/35	0161/35	
	0229/35	0244/35						
ASNIF	0357/35	0203/35	0228/35	0249/35				
ASNS	0358/05	0514/05						
ASNS4	0366/05							
ASNSP	0347/35	0188/35						
ASORD	0349/35	0050/35	0194/35					
ASSAV	0355/35	0059/35	0142/35	0320/35				
ASSCH	0354/35	0299/35	0303/35	0311/35				
ASSOP	0505/04	0316/03	0363/03	0523/03	0098/04	0391/04		
ASTEP	0540/04	0541/03						

CROSS-REFERENCE SYMBOL TABLE

ASTYP	0494/02	0417/11	0434/11	0042/35			
ASUFS	0353/35	0193/35	0209/35				
ASYMT	0070/02	0303/02	0301/07	0198/08	0203/08	0222/08	0232/08
ATAB	0279	0391/06	0479/21				
ATHEN	0459	0507/03					
ATIM	0257/02	0255/11	0263/11				
ATMP	0263/02 0264/15	0419/02 0459/15	0420/02 0461/15	0457/11 0201/20	0460/11 0207/20	0538/11 0214/20	0262/15
B	0021	0468/05	0029/06	0399/06	0401/06	0075/08	0345/09
	0347/09	0349/09	0400/09	0106/11	0108/11	0123/11	0129/11
	0134/11	0139/11	0141/11	0164/11	0167/11	0172/11	0179/11
	0184/11	0188/11	0192/11	0225/11	0406/11	0423/11	0347/14
	0361/14	0164/15	0175/15	0188/15	0238/15	0280/15	0314/15
	0397/15	0401/15	0403/15	0424/15	0429/15	0431/15	0435/15
	0472/15	0474/15	0478/15	0075/21	0081/21	0083/21	0186/21
	0188/21	0206/26	0235/26	0279/26	0290/26	0462/27	0466/27
	0468/27	0477/27	0506/27	0060/28	0071/28	0217/28	0227/28
	0283/28	0358/28	0477/28	0495/28	0498/28	0605/28	0606/28
	0608/28	0045/29	0186/29	0189/29	0309/29	0318/29	0319/29
	0323/29	0326/29	0330/29	0007/30	0182/30	0262/30	0296/30
	0301/30	0305/30	0309/30	0325/31	0326/31	0417/31	0463/31
	0500/31	0043/32	0044/32	0099/32	0114/32	0144/32	0233/32
	0240/32	0244/32	0247/32	0252/32	0254/32	0267/32	0272/32
	0302/32	0320/32	0323/32	0345/32	0346/32	0369/32	0374/32
	0384/32	0389/32	0391/32	0407/32	0408/32	0496/32	0064/33
	0306/33	0310/33	0314/33	0406/33	0409/33	0414/33	0242/34
	0280/34	0284/34	0294/34	0298/34	0304/34	0442/34	0454/34
	0459/34	0475/34	0477/34	0126/35	0130/35	0134/35	0139/35
	0396/35	0413/35	0427/35	0444/35	0483/35	0501/35	0505/35
	0514/35	0553/35	0556/35	0568/35	0592/35	0647/35	0648/35
	0117/36	0150/36	0154/36	0214/36	0237/36	0287/36	0318/36
	0320/36	0122/37	0124/37	0156/37	0158/37	0168/37	0212/37
	0214/37	0318/37	0382/37	0496/37	0062/38	0088/38	0110/38
	0114/38	0123/38	0166/38	0169/38	0184/38	0210/38	0299/38
	0302/38	0306/38	0375/38	0216/39	0230/39	0231/39	0269/39
	0285/39	0288/39	0292/39	0566/39	0567/39	0642/39	0645/39
	0649/39	0765/39	0072/40	0078/40	0098/40	0102/40	0137/40
	0152/40	0179/40	0543/40	0096/41	0105/41	0114/41	0276/41
	0279/41	0302/41	0328/41	0355/41	0372/41	0376/41	0379/41
	0397/41	0472/41	0479/41	0501/41	0010/42	0026/42	0035/42
	0059/42	0118/42	0179/42	0242/42	0305/42	0477/42	0549/42
	0562/42	0578/42	0026/43	0076/43	0110/43	0139/43	0254/43
	0257/43	0374/43	0398/43	0014/44	0073/44	0293/44	0411/44
	0423/44	0457/44	0460/44	0469/44	0472/44	0477/44	0488/44
	0491/44	0494/44	0497/44	0505/44	0509/44	0128/45	0190/45
	0191/45	0271/45	0637/45	0663/45	0190/46	0210/46	0218/46

CROSS-REFERENCE SYMBOL TABLE

	0227/46	0356/46	0017/47	0086/47	0119/47	0139/47	0314/47
	0351/47	0378/47	0435/47	0501/47	0504/47	0102/48	0608/48
	0643/48	0193/49	0254/49	0259/49	0271/49	0389/49	0396/49
	0111/50	0244/50	0324/50	0426/50	0446/50	0455/50	0041/51
	0051/51	0280/51	0284/51	0288/51	0425/51	0154/52	0169/52
	0185/52	0201/52	0252/52	0261/52	0280/52	0281/52	0284/52
	0381/52	0387/52	0398/52	0403/52	0406/52	0409/52	0415/52
	0419/52	0422/52	0451/52	0456/52	0072/53	0102/53	0123/53
	0127/53	0130/53	0138/53	0141/53	0149/53	0167/53	0172/53
	0176/53	0183/53	0186/53	0188/53	0191/53	0261/53	0263/53
	0321/53	0324/53	0340/53	0344/53	0348/53	0358/53	0369/53
	0380/53	0383/53	0088/54	0132/54	0177/54	0192/54	0208/54
	0212/54	0216/54	0231/54	0272/54	0280/54	0289/54	0309/54
	0310/54	0313/54	0362/54	0364/54	0425/54	0509/54	0036/55
	0060/55	0064/55	0069/55	0073/55	0075/55	0078/55	0081/55
	0085/55	0086/55	0096/55	0115/55	0121/55	0132/55	0135/55
	0141/55	0144/55	0170/55	0176/55	0190/55	0195/55	0204/55
	0210/55	0246/55	0251/55	0313/55	0316/55	0319/55	0357/55
	0360/55	0437/55	0439/55	0444/55	0450/55	0454/55	0534/55
	0029/56	0035/56	0040/56	0049/56	0052/56	0055/56	0058/56
	0089/56	0106/56	0111/56	0143/56	0168/56	0172/56	0222/56
	0296/56	0433/56	0090/57	0094/57	0102/57	0105/57	0147/57
	0156/57	0160/57	0163/57	0171/57	0176/57	0184/57	0186/57
	0194/57	0195/57	0208/57	0211/57	0214/57	0217/57	0225/57
	0227/57	0233/57	0282/57	0345/57	0395/57	0511/57	0528/57
	0541/57	0549/57	0560/57	0565/57	0600/57	0613/57	0615/57
	0618/57	0643/57	0651/57	0654/57	0045/58	0054/58	0064/58
	0074/58	0081/58	0094/58	0099/58	0112/58	0114/58	0200/58
	0203/58	0388/58	0404/58	0416/58	0420/58	0424/58	0433/58
	0437/58	0441/58	0495/58	0500/58	0530/58	0535/58	0285/59
	0288/59	0293/59	0295/59	0314/59	0428/59	0444/59	
B100	0457 0154/47	0516	0433/21	0064/26	0406/41	0122/42	0593/42
B1000	0229 0391/15	0519 0450/15	0099/08	0036/11	0453/11	0253/15	0335/15
B120	0092/21	0255/21	0268/21	0278/21			
B120K	0005/26	0118/27	0196/27				
B130K	0006/26	0120/27					
B133	0252/05	0291/04					
B140	0616/28	0435/30					
B160K	0007/26	0101/27					
B175	0684/51	0585/51					
B177	0225 0130/27	0199/06 0141/27	0373/06 0145/27	0369/19 0286/28	0400/21 0361/28	0263/22 0042/33	0229/26 0532/34

CROSS-REFERENCE SYMBOL TABLE

	0465/41 0370/48	0557/41	0316/43	0132/46	0154/46	0234/47	0034/48
B1777	0337 0125/42	0072/29 0016/44	0235/34 0693/45	0437/35 0092/46	0055/38 0475/48	0280/41 0027/51	0409/41 0044/51
B200	0226 0165/34	0517 0581/51	0284/22 0190/52	0290/22 0314/52	0368/26 0531/52	0131/27	0362/28
B2000	0345	0505	0520	0140/06	0032/11	0501/11	0085/12
B20M	0230	0523					
B3000	0347	0143/06	0034/11	0098/17			
B30M	0231	0079/21	0474/28	0603/28	0564/39		
B377	0227 0426/11 0162/14 0327/14 0231/20 0292/22 0168/32 0607/41 0511/45	0219/09 0142/12 0208/14 0258/15 0272/20 0033/23 0171/32 0610/41	0224/09 0192/12 0224/14 0455/15 0398/20 0382/25 0430/35 0046/42	0303/10 0408/12 0234/14 0119/16 0135/21 0075/27 0025/41 0049/42	0157/11 0417/12 0260/14 0428/16 0555/21 0465/28 0028/41 0617/42	0252/11 0434/12 0278/14 0435/16 0596/21 0414/30 0339/41 0620/42	0338/11 0070/13 0307/14 0280/19 0620/21 0476/30 0342/41 0508/45
B37TK	0638/32	0465/32					
B400	0228 0213/44	0518 0424/44	0103/16 0081/52	0490/19 0357/52	0495/19	0510/19	0180/34
B4000	0429	0521	0227/11	0068/12	0441/26	0039/28	
B40M	0004/16	0095/16					
B63	0091/21	0396/21					
B72	0222	0403/42	0451/46				
B73	0417	0614/03	0671/03	0027/04	0070/04	0144/06	
B77	0427 0257/26 0311/43 0542/52	0224/12 0270/30 0149/46 0017/59	0241/12 0286/37 0325/46	0038/17 0552/41 0375/46	0059/26 0275/42 0102/47	0066/26 0324/42 0029/48	0226/26 0009/43 0312/50
B776	0050/21	0047/21					
B777	0273 0452/41	0388/03 0121/46	0119/04	0437/05	0089/10	0155/10	0313/16
BASSU	0314/13	0310/13					

CROSS-REFERENCE SYMBOL TABLE

BAUDH	0394/59	0181/59					
BAUDL	0395/59	0177/59					
BB133	0255/05	0404/05					
BB776	0095/21	0012/22					
BBBB	0517/20	0479/20					
BCKSP	0160/02	0323/02	0261/03	0308/03	0484/03	0617/03	0674/03
	0714/03	0030/04	0083/04	0141/04	0226/05	0240/05	0268/05
	0324/05	0404/06	0038/07	0274/10	0320/10	0289/11	0237/12
	0515/16	0394/19	0257/21	0270/21			
BDIRU	0441/57	0088/57					
BES1	0036/57	0045/57					
BES10	0144/57	0064/57	0109/57				
BES11	0182/57	0178/57					
BES12	0301/57	0237/57	0297/57				
BES13	0307/57	0168/57	0300/57	0463/57			
BES15	0120/57	0315/57					
BES2	0060/57	0056/57					
BES3	0066/57	0026/57					
BES4	0073/57	0313/57					
BES5	0086/57	0092/57					
BES6	0111/57	0084/57					
BES7	0116/57	0089/57	0097/57				
BES8	0126/57	0119/57					
BES9	0140/57	0075/57	0114/57				
BES98	0317/57	0246/57					
BES99	0459/57	0322/57					
BESC	0445/57	0034/57	0044/57				
BESD4	0450/57	0062/57	0099/57	0142/57	0197/57	0221/57	0224/57
BESD5	0451/57	0063/57	0101/57	0143/57	0145/57	0205/57	

CROSS-REFERENCE SYMBOL TABLE

BESDE	0453/57	0018/57	0121/57	0308/57		
BESDS	0443/57	0215/57	0218/57	0277/57	0335/57	0343/57
BESDU	0449/57	0212/57	0274/57			
BESEA	0414/57	0057/57	0417/57			
BESEB	0418/57	0123/57	0421/57			
BESEC	0422/57	0127/57	0425/57			
BESED	0426/57	0355/57	0429/57			
BESEE	0430/57	0179/57	0433/57			
BESEF	0434/57	0411/57	0437/57			
BESF	0447/57	0030/57	0371/57	0383/57	0396/57	0405/57
BESFA	0417/57	0058/57				
BESFB	0421/57	0124/57				
BESFC	0425/57	0128/57				
BESFD	0429/57	0356/57				
BESFE	0433/57	0180/57				
BESFF	0437/57	0412/57				
BESI1	0342/57	0353/57				
BESI2	0354/57	0331/57	0344/57	0351/57		
BESIL	0129/57	0059/57	0125/57	0181/57	0357/57	0413/57
BESIS	0326/57	0169/57	0190/57	0349/57		
BESIW	0361/57	0187/57	0196/57	0366/57		
BESLN	0448/57	0154/57	0172/57	0185/57	0192/57	
BESMF	0454/57	0054/57	0068/57	0118/57	0312/57	
BESOI	0452/57	0021/57	0188/57	0309/57		
BESOV	0439/57	0320/57				
BESP	0446/57 0265/57	0032/57	0039/57	0040/57	0042/57	0043/57 0209/57

CROSS-REFERENCE SYMBOL TABLE

BESR	0370/57	0037/57	0041/57	0046/57	0373/57	0397/57	0406/57
BESR1	0374/57	0391/57					
BESR2	0398/57	0385/57					
BESR3	0394/57	0403/57					
BESR4	0407/57	0376/57					
BESR5	0382/57	0409/57					
BESR6	0410/57	0389/57	0391/57	0400/57			
BESRD	0455/57	0232/57	0292/57	0305/57			
BESWD	0444/57	0148/57	0201/57				
BFE	0526/28	0436/28					
BFL	0515/28	0435/28					
BIN01	0266/02 0418/13	0360/13 0094/14	0381/13 0387/14	0382/13 0392/14	0406/13	0414/13	0417/13
BIN02	0267/02 0070/14	0363/13 0079/14	0383/13 0095/14	0407/13 0390/14	0415/13	0419/13	0049/14
BIN0P	0112/02 0378/13 0388/14	0268/02 0045/14	0318/13 0054/14	0324/13 0066/14	0330/13 0075/14	0336/13 0121/14	0355/13 0386/14
BIT14	0232	0473/15	0303/32	0121/59			
BIT15	0504 0217/15 0527/19 0293/34 0579/35 0195/38 0326/39 0303/44 0284/54	0343/09 0315/15 0248/21 0397/34 0596/35 0224/38 0482/39 0071/48 0030/56	0107/11 0398/15 0089/27 0419/34 0319/36 0353/38 0701/39 0348/49 0036/56	0411/14 0432/15 0092/27 0164/35 0424/36 0363/38 0283/40 0407/49 0031/59	0123/15 0299/18 0054/28 0234/35 0110/37 0442/38 0482/40 0418/49 0113/59	0189/15 0452/19 0373/28 0243/35 0146/37 0081/39 0362/43 0256/52	0207/15 0483/19 0169/34 0316/35 0178/37 0319/39 0069/44 0103/54
BKs	0151	0392/19	0108/30	0443/30	0319/41	0027/42	
BKSPC	0008/26	0156/27					
BLANK	0245/02 0286/11 0024/24	0465/05 0347/11 0323/25	0483/05 0390/11 0385/25	0252/10 0309/12 0640/35	0322/10 0415/19 0393/36	0363/10 0475/19 0346/39	0282/11 0368/23
BLDI1	0110/06	0116/06	0119/06				

CROSS-REFERENCE SYMBOL TABLE

BLDI2	0114/06	0100/06	0102/06				
BLDIN	0172/02 0258/21	0386/02 0271/21	0270/03	0451/03	0085/06	0121/06	0039/07
BM507	0440/57	0318/57					
BREG	0007/02	0683/28	0197/29	0507/30			
BREK1	0425/59	0419/59					
BREK2	0447/59	0437/59					
BREK3	0451/59	0449/59					
BRKDG	0456/59	0416/59	0420/59	0464/59			
BRKPN	0478/59	0413/59	0426/59	0431/59	0438/59	0470/59	0473/59
BRKPO	0477/59	0469/59	0472/59				
BRKSP	0467/59	0417/59	0421/59	0474/59			
BS1	0410/02 0251/17 0288/17 0355/17 0005/18 0174/18	0169/17 0252/17 0294/17 0356/17 0006/18	0211/17 0253/17 0301/17 0361/17 0007/18	0223/17 0260/17 0302/17 0388/17 0022/18	0227/17 0265/17 0308/17 0392/17 0026/18	0230/17 0275/17 0309/17 0393/17 0050/18	0235/17 0279/17 0353/17 0411/17 0064/18
BS2	0411/02 0245/17 0295/17 0394/17 0008/18	0185/17 0249/17 0296/17 0399/17 0010/18	0222/17 0250/17 0297/17 0400/17 0062/18	0226/17 0261/17 0319/17 0405/17 0176/18	0228/17 0266/17 0321/17 0415/17 0274/18	0229/17 0267/17 0374/17 0417/17	0234/17 0289/17 0386/17 0004/18
BS3	0412/02 0248/17 0303/17 0063/18	0197/17 0268/17 0305/17 0104/18	0213/17 0278/17 0322/17 0112/18	0216/17 0280/17 0326/17 0246/18	0218/17 0290/17 0023/18 0250/18	0221/17 0291/17 0049/18	0247/17 0299/17 0054/18
BTMP	0264/02	0421/02	0422/02	0193/20	0194/20	0200/20	0203/20
BYBY	0541/39	0423/39					
BYE	0052/31	0474/29	0220/30	0311/30			
BYE1	0569/39	0514/39					
BYE2	0414/39	0409/39					
BYE3	0555/39	0551/39					
BYE4	0558/39	0554/39					

CROSS-REFERENCE SYMBOL TABLE

BYEID	0572/39	0424/39	0401/39	0517/39			
BYEM	0576/39	0539/39					
BYEPT	0575/39	0436/39	0497/39				
BYESP	0578/39	0433/39					
BYET	0574/39	0491/39	0495/39	0525/39	0528/39	0531/39	0534/39
BYETM	0573/39	0458/39	0460/39	0462/39	0463/39	0465/39	0466/39
	0470/39	0471/39	0486/39	0492/39	0506/39	0522/39	
C1	0440/02	0542/15	0593/15	0596/15	0603/15	0612/15	0014/16
	0016/16	0018/16	0052/16				
C2	0442/02	0554/15	0579/15	0594/15	0595/15	0609/15	0013/16
	0020/16	0023/16	0027/16	0060/16			
CARRD	0319/26	0168/26	0177/26	0204/26	0205/26	0222/26	0223/26
	0233/26	0234/26	0238/26	0239/26	0261/26	0269/26	0271/26
	0281/26	0282/26	0292/26	0293/26			
CARRS	0318/26	0180/26	0191/26	0211/26	0244/26	0250/26	0252/26
	0268/26	0270/26					
CARRY	0265/26	0181/26	0193/26	0213/26	0246/26	0267/26	0272/26
CAT	0056/31	0493/28					
CAT00	0017/41	0034/41					
CAT01	0022/41	0032/41					
CAT1	0038/41	0187/41	0257/41	0273/41			
CAT10	0061/41	0151/41	0226/41				
CAT11	0204/41	0063/41	0209/41				
CAT12	0072/41	0066/41	0260/41				
CAT13	0068/41	0218/41					
CAT15	0079/41	0086/41					
CAT2	0043/41	0041/41	0259/41				
CAT20	0094/41	0091/41					
CAT21	0102/41	0093/41					
CAT22	0059/41	0265/41					

CROSS-REFERENCE SYMBOL TABLE

CAT23	0077/41	0072/41					
CAT24	0188/41	0132/41	0134/41	0136/41	0138/41	0202/41	
CAT25	0198/41	0194/41					
CAT26	0199/41	0196/41					
CAT27	0197/41	0191/41					
CAT28	0227/41	0224/41					
CAT29	0180/41	0186/41					
CAT30	0158/41	0164/41					
CATC	0238/41	0078/41	0085/41				
CATI	0233/41	0054/41	0204/41	0206/41			
CATII	0247/41	0246/41					
CATJ	0235/41 0179/41	0016/41 0181/41	0033/41 0184/41	0048/41	0155/41	0160/41	0161/41
CATLN	0239/41	0189/41	0200/41				
CATN	0236/41 0176/41	0019/41 0185/41	0031/41	0046/41	0150/41	0157/41	0163/41
CATP	0234/41 0089/41 0148/41	0059/41 0095/41 0149/41	0061/41 0103/41 0261/41	0064/41 0112/41	0079/41 0121/41	0080/41 0123/41	0083/41 0127/41
CATQ	0237/41	0057/41	0062/41	0213/41			
CATS	0240/41	0021/41	0023/41	0027/41	0030/41		
CATTP	0246/41	0020/41					
CATZS	0241/41	0125/41	0192/41	0197/41			
CBFLG	0523	0228/39	0443/59				
CC	0270/02 0110/23 0339/24 0094/25 0365/25	0026/23 0111/23 0013/25 0105/25	0034/23 0113/23 0014/25 0117/25	0039/23 0116/23 0025/25 0125/25	0060/23 0126/23 0041/25 0127/25	0078/23 0127/23 0085/25 0137/25	0079/23 0324/24 0093/25 0363/25
CC1	0271/02	0042/23	0328/24	0053/25	0061/25	0116/25	0123/25
CC2	0272/02	0043/23	0065/25	0073/25	0084/25	0091/25	

CROSS-REFERENCE SYMBOL TABLE

CCC	0055/21	0029/21					
CCCC	0518/20	0483/20					
CDFLG	0349/02	0339/03	0347/03				
CFLAG	0511 0039/36	0190/03 0023/40	0083/07 0015/45	0385/07	0238/21	0504/33	0533/33
CH1	0031 0458/32	0458/26 0179/49	0426/28 0462/49	0451/28	0464/28	0581/28	0213/29
CH2	0032 0466/26 0408/28 0428/30 0578/32 0549/39 0423/45 0274/48	0410/19 0559/26 0204/29 0430/30 0579/32 0005/43 0425/45 0633/48	0412/19 0308/28 0211/29 0460/32 0611/32 0007/43 0098/47 0635/48	0363/26 0310/28 0457/29 0461/32 0633/32 0223/45 0100/47	0460/26 0404/28 0459/29 0462/32 0157/33 0225/45 0261/48	0461/26 0406/28 0011/30 0464/32 0159/33 0412/45 0263/48	0465/26 0407/28 0013/30 0570/32 0547/39 0414/45 0272/48
CHA#	0132/49	0105/49	0110/49	0153/49			
CHA1	0034/49	0039/49					
CHA10	0113/49	0076/49	0086/49	0092/49	0151/49		
CHA2	0041/49	0035/49					
CHA2E	0051/49	0041/49					
CHA3	0057/49	0038/49					
CHA4	0073/49	0089/49					
CHA5	0097/49	0063/49	0078/49	0088/49			
CHA6	0091/49	0083/49					
CHA7	0135/49	0154/49					
CHAC	0158/49	0072/49	0081/49				
CHAD	0159/49	0141/49	0145/49				
CHAI1	0157/49	0059/49	0069/49	0097/49			
CHAI0	0156/49 0074/49 0134/49	0058/49 0079/49 0142/49	0065/49 0080/49 0149/49	0066/49 0084/49	0067/49 0099/49	0068/49 0106/49	0070/49 0107/49
CHAN0	0392/35	0379/35					

CROSS-REFERENCE SYMBOL TABLE

CHAN2	0446/35	0432/35				
CHAN3	0451/35	0435/35				
CHAN4	0465/35	0423/35				
CHAN5	0474/35	0469/35				
CHAN6	0634/35	0629/35				
CHAN7	0655/35	0480/35	0489/35	0495/35	0545/35	0593/35
CHAN8	0638/35	0650/35				
CHAN9	0642/35	0623/35	0631/35			
CHANS	0292/05	0537/05				
CHEB1	0195/20	0211/20				
CHEB2	0212/20	0199/20				
CHLIB	0120/31	0015/12				
CHN00	0411/35	0415/35				
CHN01	0377/35	0391/35				
CHN10	0513/35	0503/35				
CHN11	0546/35	0535/35	0540/35			
CHN12	0594/35	0576/35				
CHN13	0599/35	0588/35				
CHN14	0490/35	0485/35				
CHN15	0589/35	0598/35				
CHN16	0651/35	0565/35				
CHN17	0405/35	0399/35				
CHN18	0537/35	0532/35				
CHN19	0541/35	0536/35				
CHNC	0667/35	0569/35	0591/35			
CHND	0669/35	0554/35	0574/35			
CHND1	0670/35	0557/35	0658/35			

CROSS-REFERENCE SYMBOL TABLE

CHNDP	0658/35	0580/35					
CHNFG	0519	0307/09	0483/16	0474/33	0618/35	0643/35	
CHNI	0666/35 0605/35	0394/35 0607/35	0405/35	0486/35	0599/35	0600/35	0604/35
CHNLN	0668/35	0525/35	0573/35				
CHNP	0664/35 0651/35	0373/35 0652/35	0400/35	0408/35	0414/35	0558/35	0560/35
CHNPD	0665/35	0481/35	0549/35				
CHOU1	0037/22	0030/22					
CHOUF	0180/02 0306/22	0331/02	0035/22	0036/22	0039/22	0040/22	0301/22
CHRCT	0244/02 0025/19 0378/19	0296/10 0067/19 0442/19	0077/11 0177/19 0470/19	0388/11 0329/19 0518/19	0216/12 0340/19 0460/21	0229/12 0350/19 0225/25	0414/16 0373/19 0339/25
CHRS1	0466/05	0479/05					
CHRS2	0476/05	0473/05					
CHRS3	0480/05	0467/05	0470/05				
CHRST	0040/02	0388/02	0402/03	0185/05	0286/05	0480/05	0484/05
CHS	0544/33	0283/59					
CLADR	0238/28	0192/28					
CLC0	0656/28	0651/28					
CLC1	0666/28 0716/32	0363	0657/28	0679/28	0164/29	0377/30	0511/30
CLC2	0671/28	0367	0163/29				
CLF0	0445/26	0406/26					
CLKDR	0264	0037	0564/26				
CLKED	0682/28	0555/26					
CLKIN	0648/28	0264	0541/26	0555/26	0670/28	0080/28	0715/32
CLN1	0207/28	0189/28	0220/28	0240/28			
CLN1P	0240/28	0200/28					

CROSS-REFERENCE SYMBOL TABLE

CLN2	0224/28	0210/28					
CLN3	0230/28	0226/28					
CLNB	0237/28	0183/28	0224/28				
CLNOT	0180/28	0085/28	0092/28	0122/28	0141/28	0161/28	0234/28
CLNUP	0189/03	0238/03					
CLOCK	0037 0203/29	0367/26	0388/26	0467/26	0669/28	0682/28	0202/29
CLTOG	0239/28	0194/28					
CM507	0509/56	0496/56					
CMA	0056	0420/28	0449/28				
CMB	0057	0421/28	0450/28				
CME	0058	0425/28	0445/28				
CMP00	0081/07	0067/07	0397/36				
CMP01	0122/07	0128/07					
CMP02	0129/07	0126/07					
CMP03	0147/07	0164/07					
CMP04	0169/07	0161/07					
CMP05	0186/07	0194/07					
CMP06	0198/07	0190/07					
CMP07	0205/07	0197/07					
CMP08	0208/07	0215/07					
CMP09	0216/07	0200/07	0214/07				
CMP10	0324/07	0277/07	0310/07	0453/07			
CMP11	0330/07	0172/07	0184/07				
CMP12	0339/07	0336/07					
CMP13	0370/07	0363/07					
CMP14	0060/07	0348/39					
CMP15	0044/07	0037/07					

CROSS-REFERENCE SYMBOL TABLE

CMP16	0078/07	0070/07					
CMP17	0344/07	0080/07					
CMP18	0360/07	0077/07					
CMP41	0274/07	0238/07					
CMP91	0308/07	0304/07					
CMPL0	0065/07	0023/12					
CMPL1	0181/07	0219/07					
CMPL2	0221/07	0202/07	0212/07				
CMPL3	0226/07	0174/07					
CMPL4	0259/07	0240/07					
CMPL5	0265/07	0262/07					
CMPL6	0281/07	0229/07					
CMPL7	0290/07	0106/08					
CMPL8	0295/07	0287/07					
CMPL9	0301/07	0231/07	0234/07				
CMPLE	0030/07	0109/31					
CMTBL	0432/28	0429/28					
COEF0	0384/20	0365/20					
COEF1	0438/20	0414/20					
COEF2	0324/20	0317/20					
COM1	0024/31	0407	0511/29	0537/29	0130/30	0025/31	
COM14	0516 0363/30	0462/28 0355/33	0506/28 0477/33	0533/28 0132/51	0546/28	0571/28	0259/29
COM2	0031/31 0620/28 0221/30	0352/07 0141/29 0297/30	0073/27 0325/29 0311/30	0490/28 0511/29 0312/30	0493/28 0526/29	0500/28 0197/30	0557/28 0220/30
COM3	0040/31 0118/31 0439/57	0490/28 0119/31	0557/28 0120/31	0526/29 0121/31	0537/29 0351/36	0221/30 0614/44	0312/30 0506/56

CROSS-REFERENCE SYMBOL TABLE

CUM4	0074/31	0130/30					
COM5	0105/31	0409	0635/28	0511/29	0537/29	0118/31	
COM6	0118/31	0008	0303	0626/28	0119/31	0120/31	0121/31
	0726/32	0351/36	0415/43	0614/44	0258/47	0128/52	0579/52
	0580/52	0506/56	0439/57				
COMCH	0045/31	0120/31					
COMFL	0043/31	0119/31					
COMMA	0479/04	0353/03	0593/03	0631/03	0662/03	0692/03	0040/04
	0065/04	0079/04	0097/05	0295/05	0320/05	0332/05	0339/05
	0361/05	0368/05	0375/05				
COMOP	0433	0432/06	0237/07	0303/07	0438/07	0038/08	0264/08
	0487/21						
COMP1	0124/14	0120/14					
COMP2	0135/14	0150/14					
COMP3	0139/14	0136/14					
COMP4	0142/14	0138/14					
COMP5	0145/14	0155/14	0164/14				
COMP6	0151/14	0143/14					
COMP7	0156/14	0153/14					
COMPR	0096/02	0412/02	0457/02	0005/14	0012/14	0017/14	0024/14
	0031/14	0038/14	0123/14	0149/14			
COMPT	0369/02	0405/08	0448/08	0451/08	0084/09	0101/09	0125/09
	0134/09	0135/09	0136/09	0137/09	0138/09	0139/09	0140/09
	0141/09	0151/09	0152/09	0158/09	0214/09	0217/09	0223/09
	0233/09	0238/09	0239/09				
COMS	0339/03	0355/03	0517/05				
COMS0	0345/03	0257/05					
COMS1	0349/03	0345/03					
COMSN	0367/02	0023/08	0040/08	0042/08			
COMTE	0123/31	0416/43	0259/47	0579/52			
CONTR	0273/02	0040/23	0063/23	0210/25			
COP0	0046/56	0042/56					

CROSS-REFERENCE SYMBOL TABLE

COP00	0023/56	0019/56					
COP1	0086/56	0097/56					
COP10	0165/56	0147/56					
COP11	0241/56	0529/56					
COP14	0287/56	0265/56	0308/56				
COP15	0293/56	0269/56					
COP16	0304/56	0285/56					
COP17	0310/56	0291/56					
COP2	0098/56	0074/56	0088/56	0095/56			
COP20	0327/56	0313/56					
COP21	0334/56	0355/56					
COP22	0340/56	0336/56					
COP3	0102/56	0093/56					
COP4	0117/56	0113/56					
COP5	0120/56	0153/56					
COP6	0142/56	0150/56					
COP7	0151/56	0130/56	0135/56				
COP8	0155/56	0530/56					
COP9	0160/56	0182/56					
COP98	0495/56	0186/56					
COP99	0525/56	0500/56					
COPAP	0505/56	0322/56	0367/56				
COPC	0514/56 0302/56	0139/56 0332/56	0149/56 0335/56	0171/56 0387/56	0271/56 0396/56	0294/56	0297/56
COPD	0521/56 0289/56	0127/56	0128/56	0137/56	0260/56	0280/56	0282/56
COPDE	0449/56	0321/56	0325/56	0366/56	0370/56		
COPDF	0522/56	0119/56	0152/56	0169/56	0267/56		

CROSS-REFERENCE SYMBOL TABLE

COPD1	0516/56	0053/56	0056/56	0349/56	0354/56	0504/56		
COPDR	0519/56	0050/56	0311/56					
COPDS	0512/56	0173/56	0217/56	0343/56	0348/56	0505/56		
COPDU	0517/56	0103/56						
COPEA	0463/56	0402/56	0466/56					
COPEB	0467/56	0099/56	0470/56					
COPEC	0471/56	0114/56	0474/56					
COPEO	0475/56	0156/56	0478/56					
COPEE	0479/56	0161/56	0482/56					
COPEF	0483/56	0043/56	0486/56					
COPEG	0487/56	0020/56	0490/56					
COPEH	0491/56	0450/56	0494/56					
COPF	0510/56 0434/56	0105/56 0444/56	0251/56	0253/56	0383/56	0409/56	0421/56	
COPFA	0466/56	0403/56						
COPFB	0470/56	0100/56						
COPFC	0474/56	0115/56						
COPFD	0478/56	0157/56						
COPFE	0482/56	0162/56						
COPFF	0486/56	0044/56						
COPFG	0490/56	0021/56						
COPFH	0494/56	0451/56						
COPI	0510/56	0184/56	0224/56	0226/56	0228/56			
COPI1	0388/56	0397/56						
COPI2	0401/56	0427/56	0429/56					
COPIL	0452/56 0404/56	0022/56	0045/56	0101/56	0116/56	0158/56	0163/56	
COPIN	0375/56	0009/56	0014/56	0400/56				

CROSS-REFERENCE SYMBOL TABLE

COPIP	0504/56	0363/56					
COPLN	0520/56 0314/56	0066/56 0329/56	0107/56	0145/56	0166/56	0252/56	0299/56
COPOV	0506/56	0498/56					
COPP	0515/56 0047/56 0392/56	0028/56 0205/56 0394/56	0031/56 0333/56 0395/56	0032/56 0337/56	0034/56 0376/56	0037/56 0385/56	0038/56 0391/56
COPPT	0502/56	0013/56	0026/56	0068/56	0177/56		
COPR	0408/56	0389/56	0393/56	0398/56	0411/56	0435/56	0445/56
COPR1	0412/56	0419/56					
COPR2	0436/56	0423/56					
COPR3	0432/56	0441/56					
COPR4	0442/56	0438/56					
COPR5	0446/56	0414/56					
COPR6	0420/56	0448/56					
COPRW	0359/56	0338/56	0342/56	0371/56			
COPS	0511/56	0024/56	0195/56	0200/56			
COPWD	0513/56	0059/56	0221/56				
CORE	0138/26	0045/26	0083/26	0105/26	0185/26	0492/26	
COUNT	0344/02	0204/06	0214/06	0362/06	0370/06		
CP0	0467/02	0129/14	0135/14				
CP1	0468/02	0132/14	0151/14	0156/14			
CPLCA	0508/56	0124/56					
CPLNA	0507/56	0123/56					
CRLF	0457/33	0758/32	0007/33	0117/45			
CSAV	0047/31	0352/07	0496/29				
CSAV1	0398/36	0386/36					
CSAV2	0401/36	0008/07					

CROSS-REFERENCE SYMBOL TABLE

CSAV3	0438/36	0443/36					
CSAV4	0418/36	0411/36					
CSVRT	0008/07	0353/07					
CTAPR	0036/31	0447/29					
CTEMP	0630/28	0649/28	0660/28	0668/28	0712/32		
CTMP	0474/02	0189/20	0195/20	0196/20	0197/20	0209/20	
CU1	0331/02	0518/06	0525/06				
CUS1A	0507/05	0486/06	0491/06				
CUSP	0076/02 0060/09	0497/06 0197/09	0526/06 0251/09	0128/08 0351/09	0205/08 0290/13	0443/08 0447/14	0019/09
CUSP1	0523/06	0507/06					
D	0005/23	0191/23	0016/24				
D100	0343	0500	0259/04	0293/06	0348/16		
D1111	0250/05	0190/05					
D133	0256/05	0344/06					
D36K	0403	0041/20	0128/32	0202/32	0368/39	0493/39	0359/49
D53	0259/05	0294/06					
D577	0251/05	0120/04					
D60	0419 0302/49	0088/29 0356/49	0071/39	0365/39	0464/39	0490/39	0552/43
D600	0252 0494/39	0043/20 0557/43	0130/32 0307/49	0204/32 0360/49	0076/39	0369/39	0469/39
D62	0093/21	0393/21					
D65	0006/17	0039/17					
D66	0004/12	0400/12					
D72	0210	0211	0327/06				
DADDR	0137/26 0493/26	0044/26 0686/32	0118/26	0217/26	0224/26	0228/26	0487/26
DADLC	0083 0414/43	0157/31 0256/44	0160/31 0616/44	0011/33 0257/47	0100/36 0313/47	0349/36 0108/52	0075/43 0578/52

CROSS-REFERENCE SYMBOL TABLE

	0126/56	0508/56					
DADLN	0084 0617/44	0157/31 0262/47	0100/36 0313/47	0350/36 0126/56	0075/43 0507/56	0418/43	0256/44
DADRR	0459/02	0307/15	0336/15	0345/15	0356/15		
DALCA	0616/44	0254/44					
DALNA	0617/44	0253/44					
DASCC	0274/46	0213/46					
DASCF	0275/46	0208/46					
DASCP	0276/46	0221/46					
DASCS	0277/46						
DATA1	0582/03	0604/03					
DATA2	0591/03	0600/03					
DATA3	0596/03	0583/03					
DATA4	0601/03	0578/03	0581/03				
DATAS	0571/03	0595/03	0530/05				
DATE	0084/33 0368/37 0293/58	0091/33 0161/38	0145/33 0291/38	0301/34 0332/44	0166/35 0207/56	0548/35 0267/57	0199/36 0260/58
DATIM	0092 0102/32 0203/36 0485/39 0498/49	0040/20 0127/32 0371/37 0547/43 0211/56	0045/20 0100/32 0066/39 0071/44 0271/57	0050/20 0201/32 0238/39 0335/44	0650/28 0373/32 0361/39 0297/49	0653/28 0085/33 0367/39 0299/49	0654/28 0083/35 0459/39 0351/49
DATLN	0105	0235/43	0377/43	0483/47	0081/48	0123/54	
DATOP	0377	0052/08	0040/12				
DBLNK	0623/11	0404/11	0518/11				
DBY10	0056/02 0262/25	0109/19	0116/19	0160/22	0319/22	0340/22	0249/25
DCCNT	0388/02 0151/12	0050/12 0174/20	0114/12	0120/12	0123/12	0135/12	0150/12
DCFLG	0373/02	0270/08	0294/08				
DCHAN	0139/26	0068/26					

CROSS-REFERENCE SYMBOL TABLE

DCLC1	0363 0474/16 0402/28 0071/33 0280/49	0458/07 0477/16 0412/28 0411/33	0473/07 0408/19 0264/32 0480/33	0302/09 0414/19 0278/32 0474/44	0305/09 0024/28 0281/32 0182/49	0568/11 0182/28 0411/32 0201/49	0571/11 0399/28 0066/33 0245/49
DCLC2	0367 0280/32	0472/07 0070/33	0304/09 0200/49	0570/11 0279/49	0476/16	0413/19	0409/28
DCMP1	0413/07	0423/07					
DCMP2	0428/07	0406/07					
DCMP3	0454/07	0397/07	0416/07	0444/07	0094/08		
DCMP4	0458/07	0390/07					
DCMP5	0471/07	0461/07	0463/07				
DCMP6	0441/07	0437/07					
DCMPL	0072/02 0296/07 0228/08 0021/39	0304/02 0325/07 0459/08 0448/43	0247/03 0337/07 0063/09	0523/06 0342/07 0168/09	0221/07 0474/07 0255/34	0249/07 0048/08 0045/36	0263/07 0064/08 0319/38
DCOM0	0257/05	0424/05					
DCOM6	0626/28	0316/30					
DCRLF	0314/26	0162/26	0260/26				
DCTR	0490/02	0277/24	0283/24	0290/24	0294/24	0303/24	0311/24
DDDD	0519/20	0487/20					
DDERL	0073/32	0240/33					
DDERR	0236/33 0287/52 0316/54	0033/47 0092/53 0030/55	0074/48 0099/53	0085/48 0106/54	0551/51 0137/54	0172/52 0195/54	0238/52 0267/54
DEAD	0138/28	0142/28	0426/32	0707/32	0019/33		
DEADA	0426/32	0026/32	0057/32	0064/32			
DEADM	0146/28	0140/28					
DEADP	0019/33 0161/37 0374/44 0320/51 0460/52	0108/33 0183/37 0328/50 0376/51 0179/55	0228/36 0218/37 0459/50 0384/51 0255/55	0243/36 0301/37 0101/51 0394/51 0271/55	0114/37 0463/37 0144/51 0410/51 0294/55	0127/37 0537/37 0198/51 0419/51 0305/55	0151/37 0360/44 0253/51 0390/52 0412/55

CROSS-REFERENCE SYMBOL TABLE

	0236/56	0249/56	0258/56	0365/57	0407/58	0470/58	0483/58
	0504/58	0523/58	0560/58				
DEATH	0022	0315/36					
DEFNN	0509/37	0075/37	0495/37	0497/37			
DEFOP	0293/02	0202/07					
DEFS	0361/03	0520/05					
DEH	0389	0147/29	0222/33	0203/49			
DEL2	0442/43	0439/43					
DEL3	0468/43	0461/43					
DEL4	0482/43	0470/43					
DEL6	0520/43	0505/43	0508/43				
DEL7	0498/43	0518/43					
DEL99	0528/43	0434/43	0460/43				
DELM	0525/43	0433/43	0443/43	0451/43			
DELMX	0529/43	0510/43					
DELN	0526/43	0437/43	0458/43				
DELMN	0496/43	0432/43	0436/43	0522/43			
DELP1	0500/05	0506/05					
DELP2	0507/05	0501/05					
DELPR	0064/02	0413/02	0214/03	0509/05	0585/05		
DELST	0207/03	0274/03					
DELT	0527/43	0499/43	0509/43	0513/43	0515/43	0520/43	
DEND	0094/26	0050/26					
DEND1	0095/26	0126/26					
DEND2	0090/26	0133/26					
DENRT	0595/28	0541/28					
DEQ1	0452/30	0457/30					
DEQ2	0458/30	0453/30					

CROSS-REFERENCE SYMBOL TABLE

DEQUE	0450/30 0721/32	0522/27 0161/51	0301/29	0353/29	0200/30	0456/30	0460/30
DES1	0042/58	0036/58					
DES2	0051/58	0047/58					
DES3	0068/58	0056/58					
DES4	0093/58	0105/58					
DES5	0102/58	0098/58					
DES6	0141/58	0129/58					
DES7	0148/58	0066/58	0140/58				
DESCT	0234/58	0086/58	0104/58				
DESDW	0198/58	0065/58	0116/58	0207/58			
DESEA	0213/58	0038/58	0216/58				
DESEB	0217/58	0142/58	0220/58				
DESEC	0221/58	0048/58	0224/58				
DESED	0225/58	0167/58	0228/58				
DESFA	0216/58	0039/58					
DESFb	0220/58	0143/58					
DESFC	0224/58	0049/58					
DESFD	0228/58	0168/58					
DESIL	0169/58	0040/58	0050/58	0101/58	0144/58		
DESIP	0186/58	0020/58	0022/58	0024/58	0194/58		
DESLA	0233/58	0190/58	0193/58				
DESLB	0235/58	0082/58	0096/58	0100/58	0115/58	0230/58	
DESLP	0230/58	0131/58					
DESRA	0231/58	0088/58					
DEST	0327/02 0453/06 0173/16 0289/16	0421/06 0494/06 0192/16 0290/16	0434/06 0495/06 0248/16	0442/06 0464/07 0258/16	0443/06 0469/07 0263/16	0447/06 0080/10 0273/16	0452/06 0083/10 0277/16

CROSS-REFERENCE SYMBOL TABLE

DFAIL	0140/26	0072/26	0130/26				
DFCHK	0518 0186/49	0366/09 0250/49	0313/29	0357/29	0234/32	0343/32	0397/35
DFCNT	0446/32	0295/32	0309/32	0315/32	0330/32	0352/32	
DFILT	0248	0020/08	0517/33	0124/34	0434/36		
DFLAG	0528/04 0057/05	0298/03 0066/05	0340/03 0072/05	0032/04 0073/05	0126/04 0086/05	0037/05	0039/05
DFNAM	0422/32	0296/32	0316/32				
DGCNT	0325/02	0301/19	0316/19				
DIGCK	0042/02 0335/06 0174/23	0445/02 0071/22	0409/05 0129/22	0101/06 0134/22	0329/06 0143/22	0332/06 0148/23	0334/06 0159/23
DIGCT	0310/02 0240/19	0123/19 0324/21	0133/19 0327/21	0187/19 0540/21	0204/19 0543/21	0208/19	0229/19
DIMOP	0365	0305/07	0436/07	0266/08	0485/21		
DIMS	0333/03	0519/05					
DINT	0079/26	0268	0047/26	0097/26	0535/26	0549/26	0684/32
DINT1	0086/26	0062/26					
DINT2	0123/26	0065/26					
DINT3	0125/26	0067/26					
DIR0S	0272/46	0125/46	0144/46				
DIR1	0266/46	0034/46					
DIR2	0051/46	0239/46					
DIR3	0080/46	0059/46	0209/46				
DIR4	0106/46	0090/46					
DIR5	0210/46	0207/46					
DIR6	0216/46	0209/46					
DIR7	0163/46	0140/46					
DIR8	0053/46	0294/46					

.....

CROSS-REFERENCE SYMBOL TABLE

DIR9	0085/46	0080/46					
DIRC1	0139/03	0115/03	0127/03				
DIRC2	0140/03	0113/03	0120/03	0126/03			
DIRC3	0117/03	0128/03					
DIRC4	0130/03	0124/03					
DIRC5	0141/03	0116/03	0117/03	0125/03			
DIRCM	0112/03 0132/03	0030/03 0520/37	0067/03	0087/03	0097/03	0129/03	0131/03
DIRCS	0520/37	0331/37	0343/37				
DIRDL	0135/03	0020/03					
DIREC	0004/03 0575/52	0679/32 0581/52	0517/37 0527/54	0412/43 0579/58	0255/47	0455/51	0096/52
DIREL	0005/03	0135/03	0518/37	0456/51			
DIREU	0006/03 0580/58	0519/37	0413/43	0256/47	0582/52	0528/54	0441/57
DIRFM	0250/46	0075/46					
DIRFX	0271/46	0100/46					
DIRMS	0270/46	0098/46					
DIRNI	0028/46	0022/46					
DIRNM	0243/46 0175/46	0103/46 0178/46	0127/46 0194/46	0133/46 0197/46	0150/46 0249/46	0160/46	0169/46
DIRS0	0273/45	0157/46					
DIRSO	0262/46	0251/46	0260/46	0265/46	0265/46		
DIRSP	0265/46	0255/46	0258/46				
DIRWA	0425/32	0333/32	0337/32	0366/32			
DIRWD	0133/03	0041/03	0043/03	0425/32	0009/33		
DIRWP	0009/33 0110/35	0254/34 0114/35	0262/34 0118/35	0313/34 0171/35	0509/34	0082/35	0107/35
DISCA	0108 0304/36 0133/58	0171/03 0116/38	0218/15 0197/38	0494/15 0355/38	0507/35 0535/57	0581/35 0674/57	0159/36 0075/58

CROSS-REFERENCE SYMBOL TABLE

DISCB 0109

DISCZ	0118	0321/39	0492/42	0364/43	0380/43	0440/44	0560/44
	0032/47	0073/48	0084/48	0408/49	0420/49	0091/53	0207/53
	0105/54	0136/54	0029/55	0148/55	0324/56	0365/56	0369/56

DKTBL 0086

DLCHR 0341/33 0255/33

DLK9A 0424/32 0340/32

DLK9P 0558/34 0318/34

DLK90 0352/35 0121/35 0177/35

DL010 0142/03 0054/03 0102/03

DLOK1 0028/03 0024/03

DLOK2 0025/03 0031/03

DLOK3 0021/03 0027/03

DLOK4 0063/03 0042/03

DLOK5 0072/03 0068/03 0089/03

DLOK6 0075/03 0094/03

DLOK7 0092/03 0088/03

DLOK8 0096/03 0085/03

DLOK9 0102/03 0048/03 0424/32 0558/34 0352/35

DLOKA 0423/32 0325/32

DLOKB 0049/03 0045/03

DLOKP	0008/33	0249/34	0076/35	0101/35	0478/35	0173/36	0313/36
	0071/38	0252/39	0627/39	0052/41	0359/41	0056/44	0305/44
	0500/44	0051/46	0018/56	0181/56	0055/57	0074/57	0167/57
	0242/57	0501/57	0035/58	0257/58			

DLOOK	0019/03	0069/03	0070/03	0090/03	0098/03	0100/03	0423/32
	0680/32	0008/33					

DLTEM	0287	0029/03	0065/03	0083/03	0410/35	0459/35	0165/36
	0190/36	0330/37	0342/37	0361/37	0017/38	0597/39	0173/41
	0573/41	0695/42	0707/42	0029/44	0114/44	0322/44	0551/45
	0563/45	0030/47	0072/48	0104/50	0365/50	0008/56	0175/56
	0198/56	0031/57	0258/57				

CROSS-REFERENCE SYMBOL TABLE

DMA	0030 0124/26 0612/32	0069/26 0359/26	0094/26 0603/32	0106/26 0605/32	0107/26 0607/32	0111/26 0608/32	0112/26 0610/32
DONEA	0007/07	0032/07	0057/07				
DP	0274/02 0102/23 0168/23 0022/25 0134/25	0028/23 0107/23 0172/23 0028/25 0352/25	0051/23 0131/23 0210/23 0087/25 0362/25	0068/23 0134/23 0214/23 0097/25 0364/25	0072/23 0139/23 0341/24 0102/25 0395/25	0077/23 0153/23 0001/25 0119/25	0082/23 0167/23 0017/25 0126/25
DPFLG	0275/02 0295/23	0064/22 0061/24	0066/22 0074/24	0152/22 0093/24	0085/23	0194/23	0220/23
DR.66	0316/26	0159/26					
DR8NM	0286/26	0251/26	0255/26	0258/26	0294/26		
DRA0S	0312/26	0221/26					
DRA1	0174/26	0158/26					
DRA2	0180/26	0171/26					
DRA3	0190/25	0187/26					
DRAB0	0311/26	0203/26					
DRAIL	0152/26	0093/26	0154/26	0262/26	0687/32		
DRANM	0275/26	0207/26	0227/26	0236/26	0283/26		
DRAS0	0313/26	0232/26					
DRATS	0143/26	0074/26	0091/26	0129/26	0247/25	0256/26	
DRBLS	0309/26	0165/26					
DRDF	0298/26	0297/26					
DRDFP	0297/26	0169/26					
DRDOT	0310/26	0237/26					
DRDR	0300/26	0299/26					
DRDRP	0299/26	0178/26					
DREDP	0112	0515/26					
DRIVE	0099/26	0061/26	0075/26	0101/26	0104/26	0131/26	

CROSS-REFERENCE SYMBOL TABLE

DRMER	0128/26	0063/26	0089/26				
DRRE	0302/26	0301/26					
DRREP	0301/26	0188/26					
DRSA	0306/26	0305/26					
DRSAP	0305/26	0210/26					
DRST	0308/26	0307/26					
DRSTP	0307/26	0243/26					
DRUM	0455 0326/30	0208/15 0187/33	0485/15 0364/38	0353/16 0027/50	0494/26	0244/30	0288/30
DRUML	0186/33	0136/03	0105/28	0416/32	0749/32	0068/33	0107/33
	0193/33	0195/33	0379/33	0390/33	0317/34	0336/34	0433/34
	0120/35	0176/35	0184/35	0262/35	0564/35	0597/35	0058/36
	0108/36	0227/36	0242/36	0250/36	0292/36	0325/36	0370/36
	0113/37	0126/37	0150/37	0160/37	0182/37	0217/37	0300/37
	0462/37	0536/37	0178/38	0225/38	0315/38	0021/39	0038/39
	0096/39	0114/39	0327/39	0429/39	0449/39	0513/39	0677/39
	0722/39	0752/39	0771/39	0785/39	0792/39	0807/39	0813/39
	0223/41	0381/41	0084/42	0109/42	0081/44	0264/44	0359/44
	0373/44	0379/44	0416/44	0620/44	0626/45	0682/45	0074/46
	0693/48	0731/48	0027/49	0118/49	0261/49	0320/49	0370/49
	0119/50	0327/50	0458/50	0067/51	0100/51	0143/51	0197/51
	0252/51	0319/51	0376/51	0383/51	0393/51	0409/51	0418/51
	0550/51	0605/51	0171/52	0237/52	0286/52	0302/52	0334/52
	0389/52	0459/52	0098/53	0213/53	0194/54	0266/54	0315/54
	0534/54	0178/55	0254/55	0270/55	0293/55	0304/55	0411/55
	0082/56	0134/56	0235/56	0248/56	0257/56	0264/56	0307/56
	0320/56	0526/56	0107/57	0203/57	0236/57	0296/57	0339/57
	0364/57	0460/57	0555/57	0589/57	0636/57	0645/57	0656/57
	0686/57	0089/58	0128/58	0153/58	0162/58	0205/58	0269/58
	0308/58	0406/58	0469/58	0482/58	0503/58	0522/58	0559/58
DRUMP	0416/32	0485/31	0494/31	0025/32	0056/32	0063/32	0256/32
	0274/32	0339/32	0393/32				
DRUMS	0106/28	0473/27	0491/27	0055/28	0076/28		
DRUMW	0136/03	0047/03	0057/03				
DRWR	0304/26	0303/26					
DRWRP	0303/26	0190/26					
DSAVE	0141/26	0081/26	0095/26				
DSCED	0134/26	0549/26	0573/26				

CROSS-REFERENCE SYMBOL TABLE

DSCH7	0421/32	0413/32					
DSCST	0054/26	0490/26	0573/26	0574/26			
DSEEA	0122/31	0009/15					
DSERR	0009/15	0341/16					
DSRCH	0214/02 0120/25	0047/23 0130/25	0083/23 0357/25	0132/23 0359/25	0018/25 0361/25	0088/25 0367/25	0098/25
DSTV2	0265/47	0080/48					
DSYID	0429/32	0092/32	0161/32				
DTAPR	0447/29	0481/29					
DTEMP	0142/26	0058/26	0114/26				
DTL1	0206/02	0404/23	0144/24	0241/24	0156/25	0260/25	
DTL10	0257/25	0265/25					
DTMP	0265/02	0423/02	0424/02	0191/20	0202/20	0210/20	0212/20
DTMTB	0057/20	0038/20					
DTRAX	0281	0573/42	0134/47	0656/51	0344/52		
DTT32	0311	0254/29	0197/49	0273/49			
DTTY0	0309 0281/49	0586/28 0446/49	0023/29 0037/51	0606/48 0109/51	0185/49 0369/59	0231/49 0433/59	0246/49 0440/59
DVSR8	0493 0524/41 0218/47	0486 0213/42 0011/48	0472/35 0655/42 0450/54	0131/41 0293/43	0133/41 0773/45	0135/41 0167/46	0507/41 0187/46
E	0415	0247/19	0116/22	0146/23	0190/25		
EABS	0005/20	0481					
EALCA	0349/36	0098/36					
EALNA	0350/36	0097/36					
EAND	0066/14	0154/13					
EAS00	0437/11	0432/11					
EAS01	0433/11	0429/11					
EAS02	0451/11	0419/11					

CROSS-REFERENCE SYMBOL TABLE

EASN	0399/11	0247/12					
EASN0	0405/11	0409/11					
EASN1	0467/11						
EASN2	0496/11						
EASN3	0536/11	0498/11	0503/11	0541/11	0543/11		
EASN4	0540/11	0493/11					
EASN5	0542/11	0492/11					
EATN	0396/20	0478					
EATN1	0406/20	0428/20					
EATN2	0427/20	0402/20					
EATN3	0429/20	0421/20					
EATN4	0431/20	0424/20	0426/20				
EBRK	0166/21	0491					
EBRK1	0192/21	0181/21					
EBRK2	0197/21	0191/21	0194/21				
EC	0475/02 0338/24	0021/23	0032/23	0041/23	0289/23	0350/23	0331/24
ECF	0139	0557/39	0070/45				
ECH1	0080/45	0069/45					
ECHAN	0014/12	0270/12					
ECHF	0094/45	0070/45	0075/45				
ECHN	0093/45	0068/45					
ECHO	0095/45	0063/45					
ECO	0138	0553/39	0080/45				
ECOS	0281/20	0490					
EDABR	0234/02	0599/11	0495/16	0085/21	0183/21	0196/21	
EDELM	0142/02	0314/02	0397/02	0018/11	0134/17	0331/19	0344/19
EDSTA	0276/02	0334/24	0427/25	0438/25	0476/25		

CROSS-REFERENCE SYMBOL TABLE

EEN10	0335/11	0307/11					
EEN13	0363/11	0354/11					
EEN14	0367/11	0352/11					
EEN15	0369/11	0371/11					
EEN16	0372/11	0368/11					
EEN17	0378/11	0315/11	0326/11	0329/11	0331/11	0334/11	
EEN18	0387/11	0279/11	0333/11	0362/11	0366/11	0370/11	0373/11
EENT3	0248/11	0222/11	0229/11				
EENT6	0280/11	0266/11					
EENT7	0324/11	0319/11					
EENT8	0327/11	0323/11					
EENT9	0332/11						
EENTR	0219/11	0271/12					
EEQL	0024/14	0152/13	0034/14	0085/14			
EEXP	0452/20	0479					
EFAD	0318/13	0144/13					
EFDV	0336/13	0147/13					
EFLAG	0277/02	0086/23	0227/23	0292/23	0057/24	0152/25	0300/25
EFMP	0330/13	0146/13					
EFN0	0398/02	0079/10	0086/10	0109/10	0116/10	0173/10	0184/10
EFN1	0399/02	0111/10	0121/10	0167/10	0181/10	0182/10	
EFN2	0400/02	0125/10	0176/10	0179/10	0185/10		
EFN3	0401/02	0130/10	0137/10				
EFOR	0088/10	0257/12					
EFOR0	0077/10	0099/10					
EFOR1	0096/10	0101/10					
EFOR2	0102/10	0097/10					

CROSS-REFERENCE SYMBOL TABLE

EFOR3	0121/10	0148/10	
EFOR4	0128/10	0136/10	0140/10
EFOR5	0105/10	0078/10	0087/10
EFOR6	0146/10	0119/10	
EFSB	0324/13	0145/13	
EGORE	0017/14	0159/13	
EGOS1	0061/10	0050/10	
EGOSB	0043/10	0259/12	
EGOTO	0037/10	0255/12	
EGTRT	0005/14	0149/13	
EH	0431/29	0389	
EHERR	0425/29	0383/29	0461/29
EIF	0023/10	0256/12	
EIF1	0016/10	0027/10	
EIN10	0272/10	0264/10	
EIN11	0289/10	0244/10	0247/10
EIN12	0293/10	0258/10	0003/17
EIN13	0300/10	0227/10	
EIN14	0312/10	0288/10	
EIN15	0354/10	0348/10	
EIN16	0349/10	0353/10	
EIN17	0321/10		
EIN18	0338/10	0346/10	
EIN19	0340/10	0352/10	0357/10
EIN20	0343/10	0329/10	
EIN21	0347/10	0327/10	
EINP0	0256/10	0004/17	

CROSS-REFERENCE SYMBOL TABLE

EINP1	0216/10	0005/17			
EINP2	0220/10	0262/10	0271/10	0275/10	
EINP3	0232/10	0223/10			
EINP4	0239/10	0235/10	0279/10	0287/10	
EINP5	0248/10	0292/10			
EINP6	0251/10	0339/10	0342/10	0350/10	0355/10
EINP7	0276/10	0249/10			
EINP8	0280/10	0250/10	0277/10	0291/10	0364/10
EINP9	0265/10	0260/10	0273/10		
EINPT	0214/10	0264/12			
EINT	0014/20	0483			
EINT1	0023/20	0016/20			
EIOR	0075/14	0155/13			
ELBRC	0169/13	0138/13			
ELCNT	0491/02	0034/17	0443/25	0466/25	0469/25
ELET	0007/10	0251/12	0272/12		
ELIN	0489/19	0475			
ELIN1	0507/19	0494/19			
ELIN2	0527/19	0506/19	0519/19		
ELIN3	0520/19	0512/19			
ELOG	0005/21	0480			
ELORE	0031/14	0160/13			
ELST	0012/14	0150/13			
EMAT	0025/17	0268/12			
EMAT1	0162/17	0028/17			
EMAT2	0175/17	0337/17			
EMAT3	0222/17	0189/17			

CROSS-REFERENCE SYMBOL TABLE

EMAT4	0260/17	0202/17					
EMAT5	0331/17	0179/17					
EMAT6	0339/17	0173/17					
EMAT7	0370/17	0360/17					
EMAT8	0378/17	0344/17					
EMAX	0045/14	0157/13					
EMIN	0054/14	0156/13					
ENDIN	0003/17	0157/17					
ENDOP	0375	0335/07	0024/10	0038/11			
ENDRM	0166 0052/26 0209/30 0070/50	0209/15 0090/26 0211/30	0220/15 0156/26 0189/33	0486/15 0474/26 0194/33	0504/15 0188/29 0351/38	0354/16 0159/30 0396/38	0360/16 0170/30 0422/38
END8	0562/03	0527/05	0528/05	0529/05			
ENDST	0520	0187/29	0172/30	0177/30			
ENEQL	0038/14	0151/13	0158/13	0008/14	0071/14	0080/14	
ENEX1	0161/10	0166/10					
ENEX2	0167/10	0164/10					
ENEX3	0183/10	0145/10					
ENEX4	0193/10	0188/10					
ENEXT	0154/10	0258/12					
ENOT	0084/14	0161/13					
ENOUF	0256/02	0331/09	0317/11	0330/11	0386/11	0037/22	
ENOUT	0134/02	0058/11	0136/17	0028/19			
ENTR1	0323/05	0312/05					
ENTR2	0328/05	0322/05					
ENTRS	0306/05	0538/05					
ENTRT	0265/11	0595/28					

CROSS-REFERENCE SYMBOL TABLE

ENTVR	0348/02						
EOF	0502	0250/15	0388/15	0447/15			
EOFOP	0417/22	0532/04					
EOL	0408/02 0074/11 0433/19	0008/10 0102/11 0459/19	0028/10 0411/11 0492/19	0017/11 0505/11 0416/25	0021/11 0094/13 0422/25	0046/11 0335/19 0483/25	0055/11 0338/19 0417/35
EOPF	0409/02	0024/19	0069/19	0179/19	0349/19	0351/19	
EOR	0503	0233/15	0248/15	0329/15	0355/15	0386/15	0445/15
EORFL	0455/02	0096/11	0159/12	0407/15	0153/20		
EOST	0325/03 0594/03	0319/03 0632/03	0392/03 0129/04	0456/03 0140/04	0512/03 0148/04	0546/03 0171/04	0555/03 0261/05
EOSTA	0261/05	0270/05	0296/05	0300/05	0346/05	0378/05	
EPR10	0093/11	0081/11	0088/11				
EPR11	0096/11	0039/11					
EPR12	0102/11	0029/11					
EPR13	0105/11	0011/11					
EPR11	0013/11	0033/11					
EPR12	0019/11	0012/11	0015/11	0035/11	0112/11		
EPR13	0022/11	0041/11					
EPR14	0027/11	0056/11	0059/11	0063/11	0095/11	0099/11	
EPR15	0045/11	0025/11					
EPR17	0060/11	0054/11	0072/11	0101/11			
EPR18	0064/11	0037/11	0050/11				
EPR19	0082/11	0094/11					
EPRIN	0006/11	0266/12					
EPRU1	0151/11	0137/11					
EPRU2	0172/11	0168/11					
EPRU3	0183/11	0171/11					
EPRU4	0191/11	0152/11					

CROSS-REFERENCE SYMBOL TABLE

EPUS	0226/02	0067/11	0126/11	0128/11	0133/11	0035/17		
EPWR	0349/13	0148/13						
EEA1	0383/10	0371/10	0393/10					
EEA2	0387/10	0375/10						
EEAD	0370/10	0386/10	0265/12					
EEG	0000/02	0687/28	0192/29					
ERN	0072/20	0484						
ERN1	0079/20	0074/20						
ERR	0521/16	0520/16						
ERRCT	0335/02 0512/16	0244/03 0514/16	0042/06	0043/06	0167/16	0212/16	0213/16	
ERg32	0371	0160/07	0192/07	0201/07	0224/40	0254/40	0264/40	
ERSCA	0307 0247/40	0137/07	0185/07	0214/15	0351/16	0377/16	0199/40	
ERSEC	0269/02 0452/02 0477/02 0484/02 0624/11	0307 0453/02 0478/02 0485/02	0371 0455/02 0479/02 0486/02	0300/02 0459/02 0480/02 0487/02	0449/02 0460/02 0481/02 0488/02	0450/02 0475/02 0482/02 0489/02	0451/02 0476/02 0483/02 0490/02	
ERSTR	0207/11	0267/12						
ERTRN	0202/10	0260/12						
ESCM1	0196/13	0175/13						
ESCM2	0209/13	0203/13						
ESMA	0189/13	0142/13						
ESGN	0124/20	0485						
ESIN	0286/20	0489						
ESIN1	0309/20	0304/20						
ESPA	0456/19	0476						
ESPA1	0475/19	0468/19	0478/19					
ESPA4	0483/19	0461/19	0463/19	0474/19				

CROSS-REFERENCE SYMBOL TABLE

ESQR	0101/21	0482				
ESQR1	0117/21	0142/21				
ESQR2	0134/21	0108/21				
EST	0278/02	0218/23	0337/23	0386/23	0095/24	0101/24
EST1	0436/02	0271/13	0297/13	0305/13		
EST2	0437/02	0282/13	0301/13			
EST3	0438/02	0287/13	0294/13			
ESTR	0245/13	0143/13				
ESTR1	0250/13	0263/13				
ESTR2	0258/13	0249/13				
ESTR3	0264/13	0260/13				
ESTR4	0303/13	0276/13	0280/13			
ESTR5	0308/13	0247/13				
ETAB	0430/19	0474				
ETAB1	0446/19	0449/19				
ETAB2	0441/19	0436/19				
ETAB4	0452/19	0440/19	0444/19			
ETAN	0333/20	0477				
ETAN1	0357/20	0377/20				
ETAN2	0376/20	0353/20				
ETAN3	0378/20	0371/20				
ETIM	0029/20	0488				
ETIM0	0040/20	0058/20				
ETIM1	0045/20	0059/20				
ETIM2	0050/20	0060/20				
ETIM3	0054/20	0044/20	0049/20	0001/20		
ETO	0538/28	0437/28				

CROSS-REFERENCE SYMBOL TABLE

ETYP	0145/20	0487						
ETYP1	0164/20	0171/20	0180/20					
ETYP2	0168/20	0175/20						
ETYP3	0173/20	0149/20						
EUMIN	0132/13	0141/13						
EVEX0	0412/25	0423/25						
EVEX3	0431/25	0420/25						
EVEX4	0440/25	0430/25	0481/25					
EVEX5	0443/25	0411/25						
EVEX6	0445/25	0486/25						
EVEX7	0468/25	0444/25						
EVEX8	0482/25	0453/25						
EVEX9	0475/25	0471/25						
EVEXP	0218/02 0447/25	0255/23 0451/25	0345/23 0480/25	0414/25	0429/25	0441/25	0442/25	
EXIT	0550/11	0315	0261/12	0262/12				
EXIT0	0564/11	0621/11						
EXIT1	0630/11	0572/11						
EXIT2	0610/11	0565/11						
EXIT3	0567/11	0007/07	0005/12	0379/39				
EXIT4	0589/11	0583/11						
EXIT7	0276/32	0236/32	0262/32					
EXITA	0315	0288/11	0236/12					
EXP	0304/02 0627/15 0104/19 0058/22 0231/22 0277/23 0153/25	0055/15 0007/16 0111/19 0077/22 0247/22 0286/23 0244/25	0062/15 0009/16 0274/19 0097/22 0248/22 0395/23 0257/25	0543/15 0050/16 0282/19 0108/22 0279/22 0139/24	0586/15 0051/16 0019/20 0194/22 0321/22 0141/24	0597/15 0098/19 0089/20 0196/22 0322/22 0238/24	0600/15 0101/19 0251/20 0210/22 0261/23 0149/25	

CROSS-REFERENCE SYMBOL TABLE

EXP2	0443/02 0610/15	0555/15 0055/16	0578/15 0065/16	0581/15 0079/16	0598/15	0599/15	0607/15
EXPON	0305/02 0154/19 0261/19 0161/22 0068/24 0145/24 0193/25 0261/25	0100/19 0158/19 0263/19 0164/22 0117/24 0151/24 0197/25 0264/25	0107/19 0192/19 0061/22 0166/22 0121/24 0208/24 0199/25 0303/25	0110/19 0216/19 0069/22 0393/23 0123/24 0237/24 0204/25	0115/19 0250/19 0073/22 0405/23 0128/24 0243/24 0206/25	0118/19 0254/19 0153/22 0411/23 0130/24 0151/25 0247/25	0121/19 0256/19 0159/22 0064/24 0137/24 0158/25 0256/25
EXPDP	0249/05	0386/04					
EXPW	0478/02	0287/23	0148/25				
EXT1	0605/11	0630/11					
EXT1A	0601/11	0584/11					
EXT3A	0005/12	0021/12					
F	0096/21	0449/21					
F0.0	0021/17	0020/17	0293/17				
F0.0A	0020/17	0373/17					
F1.0	0023/17	0022/17	0141/18	0257/18			
F1.0A	0022/17	0371/17					
FADBC	0136/31	0147/31					
FADBF	0150/31	0143/31					
FADBN	0148/31	0154/31					
FADDB	0426/31	0141/31	0293/31	0435/31			
FADT	0131/31	0159/31	0476/31	0510/31	0727/32	0010/33	
FADTP	0010/33	0799/39	0093/53	0299/55			
FALSE	0123/13	0007/14	0019/14	0026/14	0041/14	0069/14	0101/14
FBASE	0454/02 0610/11 0185/12 0125/15 0147/15 0174/15 0191/15 0275/15	0018/10 0613/11 0198/12 0126/15 0148/15 0179/15 0199/15 0278/15	0021/10 0153/12 0105/15 0127/15 0149/15 0180/15 0236/15 0279/15	0472/11 0168/12 0106/15 0128/15 0154/15 0181/15 0243/15 0281/15	0482/11 0169/12 0109/15 0130/15 0155/15 0182/15 0245/15 0283/15	0484/11 0170/12 0111/15 0133/15 0163/15 0184/15 0270/15 0298/15	0533/11 0184/12 0122/15 0138/15 0167/15 0186/15 0272/15 0303/15

CROSS-REFERENCE SYMBOL TABLE

	0312/15 0467/15	0326/15 0469/15	0380/15 0483/15	0395/15 0493/15	0422/15 0380/35	0440/15 0383/35	0442/15
FBP	0131	0462/03	0245/06				
FCNTR	0379/02 0556/11 0369/35	0329/09 0558/11 0371/35	0336/09 0564/11 0377/35	0363/09 0099/15 0263/49	0433/09 0102/15	0439/09 0448/16	0464/11 0395/32
FCORE	0378/02	0402/08	0257/09	0561/11	0374/35		
FCUC	0232/02	0467	0320/14	0333/14	0334/14		
FCUCA	0467	0449/11	0463/35				
FD0	0444/02	0059/16	0067/16	0074/16	0281/19	0290/19	
FDAT1	0123/12	0115/12					
FDAT2	0137/12	0131/12					
FDAT3	0153/12	0113/12					
FDAT4	0168/12	0469	0164/12				
FDAT5	0176/12	0162/12					
FDAT6	0187/12	0178/12					
FDATA	0104/02 0186/12	0308/02 0199/12	0429/02 0090/17	0381/10	0388/10	0136/12	0152/12
FDT4A	0469	0156/15	0363/15				
FDTTY	0580/28 0592/28	0456/28	0472/28	0515/28	0526/28	0538/28	0555/28
FENCA	0626/11	0348/11					
FENCH	0202/02	0626/11	0358/14	0362/14			
FERRA	0007/15	0227/16	0239/16	0398/16	0454/16	0479/16	
FERRS	0533 0115/23 0179/23 0349/23 0052/25	0007/15 0141/23 0182/23 0364/23 0067/25	0008/15 0154/23 0221/23 0111/24 0096/25	0062/23 0158/23 0228/23 0330/24 0107/25	0076/23 0169/23 0240/23 0011/25 0111/25	0081/23 0173/23 0257/23 0032/25	0103/23 0176/23 0332/23 0040/25
FETCH	0100/02 0451/11 0470/35	0310/02 0079/12	0029/10 0096/12	0051/10 0282/12	0115/10 0331/17	0120/10 0322/18	0248/11 0332/18
FFLAG	0306/02	0083/19	0093/19	0173/19	0175/19	0190/19	0214/19

CROSS-REFERENCE SYMBOL TABLE

	0242/19						
FFLG	0279/02	0009/11	0121/11	0434/19	0466/19	0409/25	
FILBF	0447/32	0737/32	0557/34	0509/37	0526/37		
FILBP	0557/34	0115/34					
FILCT	0253/02	0361/07	0026/08	0061/08	0516/33	0120/34	0432/36
FILE#	0456/02	0415/09	0013/11	0052/11	0070/11	0082/12	0091/12
	0111/12	0364/15	0377/15	0109/17	0146/20	0159/20	0160/20
	0165/20						
FILES	0278/05	0536/05					
FILIB	0119/31	0365/07					
FILOP	0383	0056/08	0516/21				
FILPT	0252/02	0021/08	0067/08	0068/08	0518/33	0523/33	0524/33
	0435/36	0439/36	0441/36				
FILRF	0186/02	0355/02	0481/03	0668/03	0701/03	0703/03	0723/03
	0073/04	0086/04	0134/06	0161/06	0165/06	0167/06	0168/06
FILS0	0355/15	0325/15					
FILS1	0360/15	0306/15					
FILS2	0318/15	0309/15					
FILS3	0321/15	0354/15					
FILS4	0331/15	0328/15					
FILS5	0340/15	0332/15					
FILS6	0347/15	0319/15					
FILS7	0312/15	0339/15	0346/15				
FILST	0192/02	0326/02	0062/11	0317/15	0118/17		
FILT	0460/02	0297/15	0308/15	0318/15	0331/15	0358/15	0359/15
FILTB	0355/02	0081/07	0348/07	0370/07	0402/07	0415/07	0443/07
	0093/08	0315/08	0409/08	0333/09	0470/11	0562/11	0104/15
	0298/32	0511/33	0437/34	0052/35	0375/35	0403/36	0406/36
	0419/35	0428/36					
FINCA	0627/11	0323/10					
FINCH	0050/02	0315/02	0627/11	0344/14	0350/14		

CROSS-REFERENCE SYMBOL TABLE

FLB5	0545/34	0141/34	0150/34	0166/34	0170/34
FLB1	0137/34	0194/34			
FLB10	0410/34	0361/34			
FLB11	0364/34	0405/34			
FLB12	0394/34	0387/34			
FLB13	0401/34	0382/34	0392/34		
FLB14	0376/34	0384/34			
FLB15	0413/34	0429/34			
FLB16	0440/34	0504/34			
FLB18	0385/34	0377/34			
FLB19	0379/34	0388/34			
FLB2	0165/34	0144/34			
FLB20	0470/34	0456/34			
FLB21	0488/34	0469/34			
FLB22	0169/34	0146/34			
FLB23	0244/34	0224/34			
FLB24	0232/34	0222/34			
FLB25	0149/34	0174/34			
FLB26	0186/34	0183/34			
FLB27	0220/34	0216/34			
FLB28	0306/34	0230/34			
FLB29	0319/34	0315/34			
FLB3	0151/34	0159/34			
FLB30	0390/34	0369/34			
FLB4	0185/34	0162/34			
FLB5	0147/34	0168/34			
FLB6	0214/34	0308/34			

CROSS-REFERENCE SYMBOL TABLE

FLB7	0258/34	0250/34					
FLB8	0252/34	0148/34	0163/34	0191/34	0267/34	0275/34	0329/34
FLB9	0277/34	0271/34					
FLBA	0126/34	0197/34					
FLBC1	0549/34 0404/34	0119/34 0411/34	0189/34 0428/34	0199/34	0202/34	0307/34	0322/34
FLBC2	0550/34	0138/34	0158/34	0203/34	0321/34	0410/34	0503/34
FLBCH	0518/34 0526/34	0142/34 0534/34	0153/34 0541/34	0157/34 0543/34	0167/34	0171/34	0522/34
FLBCM	0546/34	0140/34	0192/34	0520/34	0542/34		
FLBCP	0552/34	0135/34	0523/34	0527/34			
FLBFC	0555/34	0123/34	0196/34				
FLBFF	0556/34	0125/34	0127/34	0195/34			
FLBFP	0548/34 0470/34	0117/34 0491/34	0206/34 0493/34	0363/34 0495/34	0412/34 0500/34	0439/34 0502/34	0453/34
FLBFS	0554/34	0345/34	0421/34	0422/34	0425/34	0426/34	
FLBID	0553/34	0212/34	0217/34	0241/34	0273/34	0290/34	0358/34
FLBP	0551/34	0132/34	0525/34				
FLBUF	0547/34 0177/34 0229/34 0281/34 0299/34 0394/34	0116/34 0181/34 0234/34 0283/34 0300/34 0395/34	0152/34 0187/34 0243/34 0285/34 0365/34 0396/34	0154/34 0188/34 0245/34 0288/34 0367/34 0398/34	0155/34 0207/34 0246/34 0289/34 0371/34 0403/34	0156/34 0214/34 0277/34 0295/34 0375/34	0176/34 0227/34 0278/34 0296/34 0383/34
FLGBT	0298/02 0129/20	0375/03 0172/21	0588/03	0304/04	0443/05	0107/16	0352/16
FLINK	0354/02 0340/07	0170/07	0244/07	0251/07	0253/07	0269/07	0271/07
FLOAT	0092/02 0055/20	0241/11 0166/20	0274/11 0254/20	0300/11 0295/20	0459/11 0342/20	0537/11 0460/20	0071/13 0014/21
FLSTS	0251/02	0248					
FM0	0038/23	0031/23					

CROSS-REFERENCE SYMBOL TABLE

FM00	0087/24	0083/24					
FM01	0091/24	0086/24					
FM02	0109/24	0105/24					
FM03	0147/24	0152/24					
FM04	0175/24	0159/24					
FM10	0227/25	0217/25					
FM11	0031/25	0024/25					
FMAIN	0632/28	0690/28	0166/30	0181/30	0183/30	0186/30	0714/32
FMEND	0210/25	0037/23	0052/23	0256/23	0346/23	0333/24	0336/24
FMT0	0142/23	0106/23	0216/23				
FMT00	0122/25	0115/25					
FMT01	0074/23	0070/23					
FMT02	0046/24	0037/24					
FMT05	0366/23	0382/23					
FMT06	0009/24	0005/24					
FMT07	0030/24	0023/24					
FMT08	0217/23	0211/23					
FMT09	0328/24	0043/25					
FMT1	0060/23	0054/23	0056/23				
FMT10	0223/23	0190/23					
FMT11	0225/23						
FMT13	0227/23	0147/23					
FMT14	0230/23	0143/23					
FMT15	0238/23	0193/23					
FMT16	0112/23	0124/23					
FMT18	0241/23	0219/23					
FMT2	0047/23	0342/24					

CROSS-REFERENCE SYMBOL TABLE

FMT20	0324/23	0254/23	0340/23					
FMT21	0330/23	0326/23						
FMT24	0344/23	0247/23						
FMT25	0347/23	0250/23	0388/23					
FMT26	0357/23	0353/23						
FMT27	0362/23	0359/23						
FMT28	0383/23	0361/23						
FMT29	0379/23	0373/23						
FMT3	0084/23	0059/23	0037/25	0064/25	0076/25	0089/25	0121/25	
FMT30	0392/23	0298/23						
FMT31	0282/23	0264/23	0271/23	0274/23				
FMT32	0404/23	0397/23	0412/23					
FMT33	0413/23	0403/23						
FMT34	0436/23	0003/24	0097/24	0206/24	0318/24			
FMT35	0001/24	0446/23						
FMT36	0004/24	0439/23						
FMT37	0016/24	0011/24	0070/24					
FMT4	0104/23							
FMT40	0069/24	0029/24	0040/24	0059/24	0062/24			
FMT42	0098/24	0076/24	0079/24					
FMT43	0425/23	0418/23	0421/23					
FMT45	0136/24	0297/23						
FMT46	0302/23	0129/23	0135/23	0140/23	0320/23			
FMT47	0317/23	0311/23						
FMT5	0177/23	0160/23						
FMT50	0153/24	0174/24	0212/24	0225/24	0232/24			
FMT51	0183/24	0155/24						

CROSS-REFERENCE SYMBOL TABLE

FMT54	0195/24	0188/24	0191/24					
FMT55	0226/24	0215/24	0218/24	0222/24				
FMT56	0042/24	0032/24						
FMT57	0074/24	0018/24						
FMT58	0050/24	0041/24	0045/24					
FMT59	0094/24	0443/23	0451/23	0015/24	0053/24	0073/24		
FMT6	0187/23	0149/23						
FMT61	0207/24	0140/24	0143/24					
FMT62	0236/24	0294/23						
FMT67	0266/24	0250/24	0253/24					
FMT68	0281/24	0275/24						
FMT7	0201/23	0196/23						
FMT70	0287/24	0271/24						
FMT72	0304/24	0280/24	0286/24	0297/24	0312/24			
FMT76	0100/24	0115/24						
FMT78	0116/24	0102/24						
FMT8	0204/23	0188/23	0200/23	0222/23	0226/23	0229/23	0237/23	
FMT80	0144/25 0315/24	0426/23	0430/23	0196/24	0203/24	0257/24	0263/24	
FMT9	0220/23	0145/23						
FMT90	0322/24	0306/23	0338/23	0387/23	0096/24	0132/24	0209/25	
FMT91	0331/24	0129/25	0139/25					
FMT92	0001/25	0327/24	0104/25	0108/25	0136/25	0140/25		
FMT93	0012/25	0008/25	0044/25					
FMT94	0038/25	0016/25	0027/25	0034/25				
FMT95	0048/25	0239/23						
FMT96	0065/25	0055/25						
FMT97	0077/25	0005/25	0036/25					

CROSS-REFERENCE SYMBOL TABLE

FMT98	0109/25	0079/25						
FMT99	0090/25	0083/25						
FN	0488/04	0365/03	0230/04					
FNDP1	0020/06	0034/06						
FNDP2	0035/06	0026/06						
FNDP3	0052/06	0021/06	0028/06	0040/06	0045/06			
FNDPS	0066/02 0056/07	0414/02 0291/21	0208/03 0630/35	0572/05 0452/43	0052/06 0463/43	0053/06	0055/06	
FOJT	0138/13	0003/12						
FOPBS	0323	0406/12	0397/21					
FOPI	0381/20	0334/20						
FOR10	0046/13	0319						
FOR12	0060/13	0472/12	0075/13					
FOR13	0093/13	0396/12						
FOR14	0104/13 0338/13	0125/13 0365/13	0128/13 0399/13	0134/13 0404/13	0320/13 0050/14	0326/13 0062/14	0332/13 0105/14	
FORM0	0377/12	0372/12						
FORM1	0341/12	0428/12	0139/13	0208/13	0229/13			
FORM2	0388/12	0345/12	0369/12	0376/12	0451/12	0457/12	0056/13	
FORM3	0402/12	0390/12	0096/13					
FORM4	0416/12	0109/13	0140/13	0257/13	0312/13			
FORM5	0429/12	0421/12	0307/13					
FORM6	0445/12	0349/12						
FORM7	0452/12	0447/12						
FORM8	0004/13	0366/12						
FORMX	0084/02 0153/11 0506/11 0048/13	0306/02 0231/11 0279/12 0119/13	0009/10 0267/11 0476/12 0417/25	0106/10 0290/11 0478/12 0484/25	0224/10 0304/11 0010/13 0418/35	0372/10 0412/11 0012/13	0047/11 0455/11 0023/13	

CROSS-REFERENCE SYMBOL TABLE

FOROP	0294/02	0239/07					
FORQ	0382/02	0385/09	0096/10	0161/10			
FORS	0518/03	0524/05					
FORST	0383/02	0077/10	0081/10	0095/10	0102/10	0105/10	0107/10
	0143/10	0160/10	0160/10	0171/10	0189/10	0193/10	0173/12
	0291/12						
FPOP	0020/02	0358/02	0454/02	0465/04	0093/05	0071/06	
FRCUR	0018/02	0354/02	0456/02	0439/04	0042/05	0063/06	
FRET	0319	0453/19	0484/19	0528/19	0007/20	0022/20	0025/20
	0056/20	0106/20	0109/20	0126/20	0132/20	0167/20	0320/20
	0375/20	0379/20	0430/20	0434/20	0453/20	0006/21	0102/21
	0133/21	0199/21					
FRMAT	0224/02	0321/02	0374/02	0407/02	0492/02	0150/11	0190/11
	0201/11	0560/11	0449/16	0258/32			
FSC	0014/02	0236/02	0357/02	0312/03	0390/03	0437/03	0489/03
	0525/03	0536/03	0545/03	0657/03	0719/03	0370/04	0404/04
	0433/04	0462/04	0051/05	0068/05	0299/05	0329/05	0365/05
	0068/06	0142/06	0166/06				
FSC0	0263/04	0250/04					
FSC1	0203/04	0287/04	0395/04				
FSC10	0323/04	0345/04	0387/04				
FSC11	0330/04	0236/04					
FSC12	0349/04	0392/04					
FSC13	0371/04	0210/04	0212/04	0254/04	0309/04	0364/04	
FSC14	0401/04	0331/04	0338/04	0352/04	0359/04	0363/04	0372/04
FSC2	0208/04	0325/04					
FSC3	0240/04	0262/04					
FSC4	0255/04	0231/04					
FSC5	0282/04	0290/04	0292/04				
FSC6	0285/04	0222/04	0380/04	0388/04			
FSC7	0288/04	0209/04					
FSC8	0307/04	0278/04					

CROSS-REFERENCE SYMBOL TABLE

FSC9	0313/04	0299/04					
FgCH	0106/02 0310/14	0335 0367/23	0418/02	0082/11	0139/14	0300/14	0309/14
FgCHA	0335 0337/15	0335/10	0391/10	0360/11	0525/11	0292/13	0303/13
FSP	0280/02 0208/23 0328/23 0365/23 0080/24 0181/24	0098/23 0217/23 0329/23 0385/23 0094/24 0182/24	0120/23 0242/23 0336/23 0436/23 0098/24 0300/24	0121/23 0303/23 0339/23 0440/23 0100/24 0301/24	0185/23 0304/23 0351/23 0007/24 0103/24 0049/25	0186/23 0319/23 0355/23 0008/24 0106/24 0322/25	0206/23 0324/23 0356/23 0019/24 0108/24
FST	0476/02 0117/23 0166/23 0068/25	0049/23 0125/23 0167/23 0072/25	0064/23 0130/23 0207/23 0100/25	0065/23 0133/23 0209/23 0132/25	0099/23 0138/23 0020/25 0353/25	0109/23 0151/23 0056/25 0393/25	0112/23 0152/23 0060/25 0394/25
FTEL	0023 0051/35	0469/11 0384/35	0614/11	0103/15	0306/32	0324/34	0498/34
FUSCH	0560/34 0386/34	0374/34 0472/34	0376/34 0476/34	0378/34 0485/34	0379/34	0381/34	0385/34
FUSS	0303 0019/39 0195/51	0471/27 0036/39 0235/52	0489/27 0427/39 0264/54	0334/34 0447/39 0553/57	0431/34 0675/39 0087/58	0182/35 0720/39 0306/58	0260/35 0141/51
FVT	0397/02	0090/10	0138/10				

CROSS-REFERENCE SYMBOL TABLE

GET1	0042/38	0023/38	0052/38	0065/38			
GET10	0109/38	0098/38					
GET13	0161/38	0144/38	0149/38				
GET14	0054/38	0027/38					
GET15	0122/38	0112/38	0262/38				
GET16	0222/38	0192/38					
GET17	0227/38	0204/38					
GET18	0086/38	0072/38					
GET19	0074/38	0094/38					
GET2	0049/38	0025/38					
GET20	0205/38	0226/38					
GET21	0218/38	0179/38					
GET22	0080/38	0093/38					
GET25	0146/38	0141/38					
GET26	0150/38	0145/38					
GET3	0028/38	0038/38	0053/38	0066/38			
GET4	0068/38	0040/38					
GET9	0095/38	0090/38					
GETC	0243/38	0021/38	0037/38	0185/38	0209/38		
GETCH	0249/33	0258/33	0269/33	0273/33	0293/33	0334/33	
GETCR	0158/02	0259/03	0442/03	0474/03	0528/03	0563/03	0574/03
	0602/03	0640/03	0651/03	0676/03	0708/03	0044/04	0055/04
	0081/04	0123/04	0132/04	0255/04	0264/04	0275/04	0362/04
	0083/05	0147/05	0193/05	0266/05	0306/05	0415/05	0466/05
	0065/06	0099/06	0160/06	0216/06	0269/06	0275/06	0315/06
	0036/07	0239/10	0272/10	0290/10	0314/10	0340/10	0349/10
	0354/10	0283/11	0314/11	0325/11	0369/11	0372/11	0233/12
	0345/14	0359/14	0331/16	0516/16	0418/19	0424/19	0425/19
	0250/21	0266/21	0276/21	0284/21	0101/22	0119/22	0127/22
	0132/22	0141/22					
GETD	0246/38	0167/38	0190/38	0300/38	0347/38		

CROSS-REFERENCE SYMBOL TABLE

GETDG	0138/02 0167/24	0399/02 0307/24	0129/19 0164/25	0135/19 0278/25	0291/19	0407/23	0147/24
GETDI	0247/38	0170/38	0238/38	0303/38	0448/38		
GETDP	0238/38	0196/38					
GETI	0242/38 0235/38	0014/38	0091/38	0227/38	0228/38	0232/38	0233/38
GETI1	0250/33	0268/33	0288/33				
GETI2	0251/33	0270/33	0286/33				
GETI3	0252/33	0272/33	0281/33	0283/33			
GETI4	0272/33	0287/33					
GETID	0253/33 0592/45 0520/56	0752/32 0026/46 0012/57	0294/33 0682/48 0023/57	0295/33 0016/49 0451/57	0103/39 0014/50 0476/57	0321/41 0019/51 0013/58	0029/42 0377/56
GETLN	0244/38	0134/38	0189/38	0307/38	0321/38	0346/38	
GETP	0240/38 0174/38	0019/38 0218/38	0029/38 0220/38	0032/38 0309/38	0033/38 0311/38	0034/38 0341/38	0172/38 0343/38
GETPD	0241/38	0086/38	0162/38	0292/38	0304/38		
GETPF	0030/02 0402/06	0383/02	0142/04	0253/04	0430/04	0461/04	0072/06
GETS	0245/38	0070/38	0186/38				
GETST	0082/02	0387/02	0599/03	0683/03	0166/05	0195/05	0233/05
GFLAG	0299/02	0423/03	0459/03	0228/05	0110/06	0310/12	
GMQB	0152/03	0017	0155/03	0163/03	0164/03		
GMQBP	0107	0153/26	0499/27				
GOSOP	0465/40	0402/40					
GOTO1	0427/03	0461/03					
GOTO2	0451/03	0455/03					
GOTO3	0457/03	0425/03					
GOTO4	0462/03	0458/03					
GUTOP	0464/40	0400/40					

CROSS-REFERENCE SYMBOL TABLE

GOTOS	0417/03	0522/05	0526/05				
GTC	0126	0232	0403/19	0411/29	0426/30	0155/33	
GTFER	0334/33 0105/39 0198/39	0260/33 0108/39	0263/33 0173/39	0266/33 0176/39	0274/33 0180/39	0277/33 0183/39	0280/33 0195/39
GTIL	0301/33 0608/45	0417/32 0772/48	0753/32 0315/49	0102/33 0070/56	0292/33 0327/57	0330/33	0061/42
GTILP	0417/32	0020/32					
GTMP	0396/02	0044/10	0062/10				
GTSA	0303/33	0324/33					
GTSB	0319/33	0308/33	0312/33				
GTSC	0325/33	0318/33	0322/33				
GTTY1	0377/15	0408/15					
GTTY2	0393/15	0411/15					
GTTY3	0395/15	0383/15	0387/15				
GTTY4	0410/15	0389/15					
GTTY5	0412/15	0404/15					
GTTY6	0405/15	0399/15					
GTTYP	0194/02	0327/02	0097/11	0160/12	0394/15	0413/15	0163/20
HALF	0499 0039/21	0146/10	0126/13	0384/13	0400/13	0216/20	0497/20
HATCH	0483/04	0311/05	0164/06				
HB	0479/02	0447					
HBP	0480/02 0052/24 0173/24 0161/25 0187/25	0291/23 0054/24 0205/24 0166/25 0283/25	0399/23 0056/24 0227/24 0167/25 0299/25	0400/23 0149/24 0228/24 0177/25	0409/23 0150/24 0309/24 0170/25	0410/23 0158/24 0310/24 0180/25	0432/23 0169/24 0317/24 0185/25
HDATE	0096	0499/49					
HDBFA	0021/33	0597/45	0032/46	0299/46			
HDBUF	0081/32	0136/32	0733/32	0021/33			

CROSS-REFERENCE SYMBOL TABLE

HEL1	0103/39	0050/39					
HEL10	0204/39	0097/39					
HEL12	0305/39	0300/39					
HEL13	0311/39	0303/39					
HEL2	0120/39	0125/39					
HEL3	0130/39	0164/39					
HEL3A	0210/39	0170/39					
HEL3B	0212/39	0200/39					
HEL3C	0141/39	0133/39	0135/39				
HEL3D	0156/39	0148/39	0150/39				
HEL3F	0174/39	0168/39					
HEL3G	0143/39	0139/39					
HEL3H	0158/39	0154/39					
HEL3I	0177/39	0191/39					
HEL4	0256/39	0271/39	0275/39	0304/39	0308/39	0322/39	0328/39
HEL6	0267/39	0253/39					
HEL7	0047/39	0015/39					
HEL7A	0062/39	0057/39					
HEL8	0324/39	0316/39					
HEL9	0329/39	0323/39					
HELC	0390/39	0128/39	0163/39	0293/39	0313/39		
HELDI	0393/39	0289/39	0380/39				
HELDP	0380/39	0320/39					
HEL F	0201/39	0121/39	0162/39				
HEL G	0259/39	0224/39					
HELGT	0392/39	0145/39	0159/39	0366/39	0370/39		
HELH	0425/33	0260/39					

CROSS-REFERENCE SYMBOL TABLE

HELID	0387/39	0014/39	0048/39	0080/39	0099/39	0242/39
HELK	0422/33	0202/39				
HELLO	0051/31	0446/29	0470/29			
HELM	0382/39	0249/39				
HELOG	0350/39	0082/39	0237/39	0377/39		
HELP	0391/39 0314/39	0129/39	0130/39	0160/39	0219/39	0220/39 0286/39
HELPT	0386/39	0013/39	0024/39	0373/39		
HELRT	0379/39	0342/39				
HELST	0378/39	0010/39				
HELTM	0389/39 0077/39	0055/39 0078/39	0007/39 0089/39	0069/39	0070/39	0072/39 0073/39
HELTP	0388/39	0009/39	0062/39	0239/39		
HFLAG	0512	0075/11	0030/30	0334/39		
HFLG	0383/39	0131/39	0140/39	0146/39	0155/39	0166/39
HI	0446/29	0438/29				
HI6	0344/35	0029/35				
HI8	0345/35					
HIBA	0497/49	0480/49				
HIBR1	0493/49	0482/49	0496/49	0496/49		
HIBS1	0496/49	0486/49	0489/49			
HIMSK	0501 0064/56	0187/27 0152/57	0402/43 0428/58	0106/48	0439/48	0220/54 0199/55
HLT4C	0464/49	0427/49				
HM28	0431/32					
HMASK	0003/19	0276/19				
HQDIS	0167	0564/28	0355/30	0359/30		
HTEMP	0385/39	0184/39	0187/39			
HTEST	0536/30	0347/29	0385/30	0540/30	0540/30	0724/32

CROSS-REFERENCE SYMBOL TABLE

HTYPE	0384/39	0185/39	0188/39	0192/39			
HUU	0136	0561/39	0235/49				
HVL	0456/28	0433/28					
IBF	0146	0306/28	0631/48				
ID	0042	0019/32	0101/33	0111/33	0289/33	0316/33	0119/39
	0236/39	0240/39	0313/41	0325/41	0021/42	0032/42	0060/42
	0092/42	0586/45	0595/45	0601/45	0639/45	0020/46	0030/46
	0670/48	0697/48	0733/48	0033/49	0314/49	0028/50	0021/51
	0042/51	0052/51	0075/51	0112/51	0348/51	0369/51	0398/51
	0069/56	0091/56	0384/56	0019/57	0165/57	0189/57	0241/57
	0347/57	0496/57	0030/58				
ID0	0428/02	0342/17	0359/17	0365/17	0372/17	0406/17	0048/18
	0066/18	0068/18	0070/18	0102/18	0110/18	0178/18	0255/18
ID1	0429/02	0354/17	0362/17	0367/17	0106/18	0159/18	0208/18
	0253/18	0256/18					
IDEC	0075	0331/33	0332/33	0232/42	0417/43	0794/45	0261/47
	0807/48	0206/50	0207/50	0208/50	0490/50	0492/50	0494/50
	0510/50	0511/50	0512/50	0513/50	0514/50	0114/52	0116/52
	0118/52						
IDEC L	0332/33	0302/33					
IDEC M	0331/33	0321/33					
IDLCP	0062	0023/32	0054/32	0061/32	0105/33	0304/33	0320/33
	0327/33	0240/36	0094/39	0112/39	0204/39	0511/39	0569/39
	0767/39	0769/39	0371/44	0691/48	0729/48	0740/48	0742/48
	0745/48	0750/48	0025/49	0116/49	0122/49	0318/49	0368/49
	0434/49	0024/50	0110/50	0117/50	0122/50	0065/51	0098/51
	0255/56	0362/57					
IDLNP	0063	0021/32	0027/32	0103/33	0329/33	0110/39	0064/42
	0609/45	0686/48	0727/48	0737/48	0739/48	0751/48	0023/49
	0030/49	0114/49	0123/49	0316/49	0022/50	0076/50	0091/50
	0113/50	0115/50	0123/50	0343/50	0063/51	0072/51	0089/51
	0094/51	0096/51	0071/56	0242/56	0328/57		
IDN	0253/18	0017/17					
IDNA	0017/17	0368/17					
IEN T1	0237/20	0233/20					
IF0	0484/03	0480/03					
IF1	0504/03	0483/03	0491/03	0498/03			

CROSS-REFERENCE SYMBOL TABLE

IFCNT	0403/02	0220/10	0238/10	0266/10	0281/10	0313/10	0230/12
IFIX	0132/02 0055/19	0249/11 0015/20	0351/13 0029/20	0020/15 0239/20	0053/15	0064/15	0065/15
IFIX1	0058/15	0063/15					
IFIX2	0062/15	0057/15					
IFIX3	0066/15	0047/15	0072/15				
IFOP	0466/40	0404/40					
IFS	0473/03	0523/05					
IFSS	0281/02	0249/09	0097/23	0241/23	0302/23	0050/25	
IFSTR	0282/02 0118/25	0417/16	0027/23	0340/24	0058/25	0070/25	0086/25
IHB	0447 0316/24	0290/23 0150/25	0431/23 0176/25	0050/24 0292/25	0065/24	0156/24	0204/24
ILFER	0337/33 0523/43 0218/44 0072/45 0305/45 0489/45	0547/40 0145/44 0222/44 0074/45 0321/45	0322/41 0155/44 0226/44 0077/45 0324/45	0030/42 0107/44 0575/44 0084/45 0326/45	0440/43 0190/44 0062/45 0171/45 0329/45	0445/43 0204/44 0065/45 0229/45 0332/45	0512/43 0207/44 0067/45 0289/45 0486/45
ILI	0141	0455/29					
IMAGS	0398/03	0516/05					
IMGOP	0437	0054/08	0143/11	0518/21			
INCAL	0156/02	0322/02	0219/10	0237/10	0312/10	0238/12	
INCHR	0662/35						
INCL1	0224/12	0219/12	0243/12				
INCL2	0239/12	0215/12	0234/12				
INF	0181 0013/22	0098/12 0349/41	0103/14 0044/40	0431/19 0157/57	0457/19	0107/20	0510/20
INFST	0374/02	0218/07	0422/07	0086/00			
INI	0132	0007/26	0209/20				
INITF	0402/02	0216/10	0222/10				

CROSS-REFERENCE SYMBOL TABLE

INPOP	0248/05	0023/04					
INPTS	0624/03	0615/03	0633/03	0531/05			
INSEQ	0434/33	0636/28	0755/32	0416/33	0455/33	0479/44	
INSGA	0636/28	0015/29					
INTFL	0391	0082/06	0049/10	0423/40	0434/40		
INTMP	0406/02 0345/11	0234/10 0355/11	0286/10 0374/11	0310/10	0330/10	0337/10	0358/10
INV	0019/18	0408/17					
INV1	0042/18	0039/18					
INV10	0159/18	0147/18					
INV11	0164/18	0173/18					
INV12	0170/18	0166/18					
INV13	0180/18	0231/18					
INV14	0194/15	0207/18					
INV15	0208/18	0190/18					
INV16	0212/18	0227/18					
INV17	0222/18	0214/18					
INV18	0228/18	0241/18					
INV19	0238/18	0182/18	0186/18				
INV2	0058/18	0055/18					
INV3	0068/18	0233/18					
INV4	0076/18	0067/18					
INV5	0083/18	0100/18					
INV6	0097/18	0092/18					
INV7	0114/18	0135/18					
INV8	0136/18	0109/18					
INV9	0151/18	0158/18					
INVL	0353/17	0057/18					

CROSS-REFERENCE SYMBOL TABLE

INWRD	0661/35	0477/35	0570/35				
IOSTS	0424/22	0526/04					
IPWR	0374/13	0354/13					
IPWR1	0388/13	0420/13					
IPWR2	0392/13	0413/13					
IPWR3	0400/13	0396/13					
IPWR4	0405/13	0390/13					
IPWR5	0414/13	0393/13					
ITEMP	0006/12	0208/12	0213/12				
IWT	0135	0231/12	0329/10	0614/40			
JDEQU	0522/27	0458/27					
JET1	0512/27	0517/27					
JET2	0518/27	0500/27					
JETMS	0525/27	0509/27					
JETNO	0529/27	0508/27					
JETPA	0633/28	0214/30					
JETPP	0016/33	0077/33					
JETPT	0465/27	0520/27	0633/28	0700/32	0016/33		
JETT1	0523/27 0510/27	0486/27 0512/27	0459/27 0514/27	0475/27	0479/27	0493/27	0502/27
JETT2	0524/27	0482/27	0486/27	0486/27	0501/27	0513/27	0515/27
JTD	0236/02 0027/02 0041/02 0055/02 0069/02 0083/02 0097/02 0111/02 0125/02 0139/02 0153/02 0167/02	0015/02 0029/02 0043/02 0057/02 0071/02 0085/02 0099/02 0113/02 0127/02 0141/02 0155/02 0169/02	0017/02 0031/02 0045/02 0059/02 0073/02 0087/02 0101/02 0115/02 0129/02 0143/02 0157/02 0171/02	0019/02 0033/02 0047/02 0061/02 0075/02 0089/02 0103/02 0117/02 0131/02 0145/02 0159/02 0173/02	0021/02 0035/02 0049/02 0063/02 0077/02 0091/02 0105/02 0119/02 0133/02 0147/02 0161/02 0175/02	0023/02 0037/02 0051/02 0065/02 0079/02 0093/02 0107/02 0121/02 0135/02 0149/02 0163/02 0177/02	0025/02 0039/02 0053/02 0067/02 0081/02 0095/02 0109/02 0123/02 0137/02 0151/02 0165/02 0179/02

CROSS-REFERENCE SYMBOL TABLE

	0181/02	0183/02	0185/02	0187/02	0189/02	0191/02	0193/02
	0195/02	0197/02	0199/02	0201/02	0203/02	0205/02	0207/02
	0209/02	0211/02	0213/02	0215/02	0217/02	0219/02	0221/02
	0223/02	0225/02	0227/02	0229/02	0231/02	0233/02	0235/02
K1	0382/20	0290/20	0302/20	0315/20	0337/20	0350/20	0363/20
	0372/20	0403/20	0412/20				
K2	0383/20	0186/20	0305/20	0354/20	0361/20	0410/20	
K8192	0582/58	0476/58					
KAO	0143	0310/29	0194/49				
KDIR0	0455/51	0221/51					
KDIRL	0456/51	0209/51					
KID1	0220/51	0399/51					
KID10	0378/51	0338/51					
KID11	0360/51	0349/51					
KID12	0368/51	0353/51					
KID13	0363/51	0358/51					
KID18	0400/51	0333/51					
KID2	0237/51	0219/51					
KID31	0163/51	0023/51					
KID32	0166/51	0077/51					
KID33	0076/51	0081/51					
KID34	0111/51	0116/51					
KID35	0123/51	0113/51					
KID36	0195/51	0118/51					
KID37	0114/51	0159/51					
KID38	0146/51	0138/51					
KID4	0210/51	0224/51					
KID6	0330/51	0259/51	0296/51				
KID7	0255/51	0299/51					

CROSS-REFERENCE SYMBOL TABLE

KIDB	0294/51	0261/51					
KIDAA	0059/51	0031/51					
KIDAD	0039/51	0058/51					
KIDAF	0054/51	0043/51					
KIDAN	0169/51	0053/51					
KIDAZ	0171/51	0165/51	0168/51				
KIDB	0465/51	0123/51	0158/51				
KIDC	0464/51 0178/51	0036/51	0057/51	0106/51	0115/51	0146/51	0172/51
KIDE	0303/51	0271/51					
KIDEQ	0161/51	0135/51					
KIDI	0458/51 0315/51	0210/51 0336/51	0212/51 0360/51	0220/51 0372/51	0248/51	0273/51	0275/51
KIDM1	0184/51	0163/51					
KIDM2	0187/51	0166/51					
KIDM3	0190/51	0169/51					
KIDP	0457/51 0421/51	0040/51 0450/51	0049/51	0055/51	0150/51	0153/51	0154/51
KIDP1	0460/51 0304/51 0448/51	0243/51 0350/51	0255/51 0424/51	0265/51 0426/51	0278/51 0438/51	0294/51 0440/51	0298/51 0446/51
KIDP2	0461/51	0269/51	0307/51	0345/51	0356/51	0371/51	
KIDP3	0462/51	0242/51	0310/51	0354/51			
KIDP4	0463/51 0289/51	0245/51 0290/51	0267/51 0291/51	0281/51	0282/51	0285/51	0286/51
KIDRE	0211/51	0326/51					
KIDRR	0404/51	0324/51	0385/51	0452/51			
KIDRS	0423/51	0451/51					
KIDRT	0436/51	0432/51					
KIDRV	0439/51	0428/51					

CROSS-REFERENCE SYMBOL TABLE

KIDRW	0447/51	0442/51					
KIDT	0459/51 0397/51	0108/51	0117/51	0137/51	0213/51	0347/51	0370/51
KIL1	0602/39	0612/39					
KIL10	0639/39	0628/39					
KIL11	0661/39	0654/39					
KIL12	0180/31	0176/31					
KIL13	0172/31	0178/31					
KIL14	0234/31	0188/31					
KIL15	0225/31	0194/31					
KIL17	0246/31	0240/31					
KIL18	0733/39	0665/39	0670/39				
KIL19	0726/39	0716/39					
KIL2	0619/39	0615/39					
KIL3	0626/39	0617/39	0724/39				
KILAD	0698/39	0711/39					
KILAE	0705/39	0717/39					
KILAF	0713/39	0700/39	0703/39				
KILAJ	0718/39	0709/39					
KILB	0798/39	0776/39	0786/39				
KILBR	0208/51	0119/51					
KILC	0839/39 0601/39 0706/39	0286/31 0611/39 0708/39	0290/31 0674/39 0714/39	0377/31 0696/39 0715/39	0381/31 0699/39	0391/31 0702/39	0392/31 0704/39
KILCD	0288/31	0298/31					
KILCF	0300/31	0295/31					
KILCG	0372/31	0291/31	0312/31	0316/31			
KILCN	0399/31	0375/31	0386/31	0389/31			
KILCP	0422/31	0334/31	0345/31	0349/31	0368/31	0393/31	

CROSS-REFERENCE SYMBOL TABLE

KILCS	0815/39	0808/39	0810/39	0834/39			
KILD	0841/39	0133/31	0146/31	0151/31	0156/31	0172/31	0187/31
	0191/31	0213/31	0227/31	0237/31	0479/31	0481/31	0511/31
	0523/31	0643/39	0774/39	0803/39	0811/39	0832/39	0429/51
	0096/53	0211/53	0217/53	0218/53	0280/55	0302/55	0409/55
	0052/58	0126/58	0533/58				
KILDF	0842/39	0137/31	0138/31	0144/31	0158/31	0192/31	0214/31
	0226/31	0235/31	0238/31	0364/31	0366/31	0418/31	0420/31
	0477/31	0524/31	0652/39	0658/39	0686/39	0688/39	0689/39
	0801/39	0833/39	0437/51	0094/53	0209/53	0282/55	0300/55
	0328/55	0375/55	0377/55	0407/55	0523/55	0525/55	0061/58
	0070/58	0117/58	0537/58				
KILDI	0843/39	0305/31	0320/31	0384/31	0387/31	0412/31	0431/31
	0434/31	0472/31	0509/31	0646/39	0697/39	0710/39	
KILDN	0831/39	0814/39					
KILN	0840/39	0280/31	0307/31	0324/31	0390/31	0416/31	0464/31
	0501/31	0662/39	0762/39				
KILP	0836/39	0180/31	0193/31	0211/31	0215/31	0225/31	0228/31
	0239/31	0246/31	0248/31	0289/31	0292/31	0296/31	0310/31
	0313/31	0321/31	0322/31	0332/31	0343/31	0346/31	0357/31
	0373/31	0410/31	0413/31	0414/31	0599/39	0605/39	0608/39
	0609/39	0610/39	0736/39	0740/39	0742/39	0744/39	0755/39
KILPC	0160/31	0155/31					
KILPD	0837/39	0336/31	0340/31	0639/39	0647/39	0666/39	0733/39
KILRC	0826/39	0753/39	0772/39				
KILRD	0835/39	0748/39	0768/39	0829/39			
KILTS	0838/39	0592/39	0664/39	0817/39			
L1024	0301	0380/34	0211/35	0707/39	0570/57	0312/58	
L2E	0520/20	0455/20					
L8192	0465	0053/28	0057/28	0460/31	0014/32	0050/32	0244/51
	0268/51	0422/51	0149/52	0247/52	0376/52	0100/53	0206/53
	0318/53	0172/54	0275/54	0165/55	0272/55	0092/58	0383/58
	0524/58	0563/58					
LBOP	0353	0035/05	0375/12	0067/17			
LBAC	0495/04	0029/05	0549/06				
LBTMP	0473/02	0445/19	0448/19	0014/20	0017/20	0020/20	0024/20

CROSS-REFERENCE SYMBOL TABLE

	0145/20	0154/20	0229/20	0238/20	0351/20	0369/20	0399/20
	0418/20	0459/20	0462/20	0498/20	0501/20	0506/20	0110/21
	0132/21	0134/21					
LCALL	0004/19	0197/19					
LCD	0209/32	0261/32	0313/32	0348/32	0399/32	0734/32	0663/35
	0461/49						
LCD1	0302/32	0308/32					
LCD2	0352/32	0305/32					
LCD3	0306/32	0359/32					
LCD5	0363/32	0326/32					
LCD6	0320/32	0331/32					
LCD7	0327/32	0371/32	0375/32				
LCD9	0341/32	0293/32	0311/32	0335/32			
LCDBS	0446/32	0300/32	0317/32	0327/32	0329/32	0353/32	0358/32
LCDFC	0443/32	0290/32	0307/32				
LCDID	0444/32	0291/32	0318/32	0341/32			
LCDLP	0230/02	0566/11	0450/16	0282/32			
LCDP	0663/35	0402/35					
LCH	0481/02	0006/25	0038/25				
LCHAR	0148/33	0748/32	0151/33	0164/33	0169/33	0170/33	0341/33
	0022/38	0030/38	0035/38	0051/38	0064/38	0134/39	0149/39
	0169/39	0175/39	0189/39	0602/39	0606/39	0616/39	0344/40
	0362/40	0513/40	0314/41	0022/42	0500/43	0033/44	0038/44
	0042/44	0144/44	0181/44	0200/44	0061/45	0066/45	0073/45
	0082/45	0142/45	0149/45	0288/45	0296/45	0314/45	0320/45
	0325/45	0330/45	0521/56	0454/57			
LCHCR	0174	0307/30	0149/33	0160/33	0309/45		
LCHR1	0152/33	0162/33	0196/45				
LCHR2	0162/33	0141/45	0159/45	0170/45			
LDBSA	0103	0267/43	0361/43	0514/47	0070/48	0406/49	0102/54
	0107/54	0110/54					
LDRUM	0042/26	0455	0046/26	0683/32			

CROSS-REFERENCE SYMBOL TABLE

LDVSR	0486	0302/19					
LE2	0052/21	0043/21					
LEN1	0020/45	0012/45	0017/45				
LEN2	0036/45	0046/45					
LEN2A	0434/32	0069/32					
LENCN	0246/05	0249/04					
LEND	0221/33	0434/32	0232/33	0239/33	0653/45	0088/46	0261/46
	0526/47	0229/48	0465/48	0620/48	0714/48	0735/48	0744/48
	0120/49	0492/49	0121/50	0497/50	0222/51	0401/51	0607/51
	0682/51	0374/52	0471/52	0573/52	0118/53	0215/53	0219/53
	0310/53	0411/54	0423/55	0326/56	0339/56	0462/56	0122/57
	0139/57	0689/57	0729/57	0165/58	0182/58	0375/58	0397/58
	0035/59	0084/59	0132/59	0275/59	0330/59	0376/59	0445/59
	0450/59						
LENDR	0224/33	0050/49	0142/50	0182/51			
LENT	0469/40	0329/40					
LET0	0306/03	0539/05					
LET1	0320/03	0314/03					
LETCK	0044/02	0301/02	0446/02	0009/04	0102/04	0211/04	0257/04
	0271/06	0346/06	0349/06	0350/06			
LETOP	0421	0289/03	0306/03	0390/21			
LETS	0309/03	0518/05					
LFLAG	0163	0374/30	0380/30	0217/45	0232/45		
LFRDF	0233/33	0231/33	0338/33				
LFREK	0230/33	0336/33	0593/45	0027/46	0139/48	0156/48	0170/48
	0173/48	0175/48	0178/48	0181/48	0331/48	0334/48	0527/48
	0532/48	0535/48	0538/48	0543/48	0546/48	0554/48	0556/48
	0559/48	0566/48	0569/48	0572/48	0575/48	0573/48	0766/48
	0774/48	0777/48	0786/48	0792/48	0795/48	0803/48	0018/49
	0021/49	0061/49	0095/49	0102/49	0109/49	0111/49	0137/49
	0140/49	0148/49	0016/50	0019/50	0048/50	0051/50	0058/50
	0068/50	0169/50	0174/50	0177/50	0187/50	0193/50	0020/51
	0483/51	0502/51	0615/51	0039/52	0063/52	0479/52	0019/53
	0027/53	0030/54	0038/54	0012/56	0017/56	0379/56	0382/56
	0425/56	0431/56	0014/57	0017/57	0029/57	0049/57	0052/57
	0387/57	0393/57	0478/57	0481/57	0495/57	0015/58	0018/58
	0029/58	0324/58	0018/59	0021/59	0026/59	0029/59	0038/59
	0042/59	0047/59	0064/59	0069/59	0072/59	0081/59	0103/59

CROSS-REFERENCE SYMBOL TABLE

	0100/59	0111/59	0119/59	0125/59	0136/59	0141/59	0166/59
	0172/59	0179/59	0183/59	0186/59	0191/59	0194/59	0199/59
	0208/59	0211/59	0227/59	0244/59	0247/59	0249/59	0252/59
	0255/59	0303/59	0306/59	0313/59	0415/59	0424/59	0430/59
	0460/59	0463/59					
LFSPA	0436/32	0084/32					
LIA1	0313	0060/26	0271/30				
LIB	0165	0317/30	0319/30	0383/33	0385/33	0506/37	0496/50
	0520/54	0054/55	0422/55				
LIBD	0321	0035/03	0046/03	0063/03	0096/03	0481/27	0490/27
	0075/28	0171/31	0181/31	0205/31	0285/31	0287/31	0333/31
	0374/31	0404/31	0493/31	0029/32	0033/32	0055/32	0062/32
	0338/32	0110/33	0316/34	0344/34	0373/34	0432/34	0119/35
	0175/35	0192/35	0205/35	0261/35	0563/35	0114/36	0181/36
	0225/36	0241/36	0291/36	0324/36	0325/37	0348/37	0448/37
	0460/37	0480/37	0177/38	0314/38	0026/39	0037/39	0095/39
	0118/39	0120/39	0439/39	0448/39	0512/39	0685/39	0695/39
	0721/39	0750/39	0770/39	0791/39	0812/39	0056/41	0212/41
	0225/41	0384/41	0078/42	0086/42	0103/42	0111/42	0472/42
	0218/43	0238/43	0253/43	0324/43	0080/44	0270/44	0313/44
	0357/44	0372/44	0415/44	0421/44	0439/44	0559/44	0630/45
	0632/45	0685/45	0077/46	0012/47	0460/47	0486/47	0500/47
	0042/48	0696/48	0730/48	0032/49	0034/49	0117/49	0323/49
	0369/49	0078/50	0082/50	0097/50	0102/50	0118/50	0346/50
	0354/50	0444/50	0456/50	0477/50	0074/51	0076/51	0099/51
	0149/51	0196/51	0240/51	0295/51	0318/51	0368/51	0392/51
	0417/51	0555/51	0604/51	0174/52	0239/52	0304/52	0329/52
	0333/52	0384/52	0391/52	0457/52	0212/53	0138/54	0197/54
	0268/54	0034/55	0147/55	0173/55	0180/55	0252/55	0292/55
	0330/55	0332/55	0410/55	0434/55	0467/55	0077/56	0085/56
	0140/56	0189/56	0233/56	0256/56	0306/56	0323/56	0368/56
	0081/57	0100/57	0234/57	0249/57	0294/57	0334/57	0341/57
	0363/57	0558/57	0595/57	0635/57	0655/57	0685/57	0132/58
	0161/58	0204/58	0268/58	0311/58	0401/58	0400/58	0465/58
	0501/58	0558/58					
LIBDI	0325	0056/03	0472/27	0484/31	0024/32	0106/33	0335/34
	0183/35	0107/36	0249/36	0298/37	0020/39	0113/39	0428/39
	0676/39	0784/39	0806/39	0222/41	0380/41	0083/42	0108/42
	0491/42	0379/43	0263/44	0378/44	0625/45	0681/45	0073/46
	0031/47	0083/48	0692/48	0026/49	0319/49	0025/50	0325/50
	0066/51	0142/51	0251/51	0382/51	0408/51	0547/51	0170/52
	0236/52	0285/52	0301/52	0388/52	0097/53	0134/54	0193/54
	0265/54	0314/54	0028/55	0177/55	0269/55	0303/55	0081/56
	0133/56	0247/56	0263/56	0319/56	0364/56	0106/57	0202/57
	0338/57	0554/57	0588/57	0644/57	0673/57	0127/58	0152/58
	0307/58	0405/58	0481/58	0521/58			
LIBER	0339/33	0084/36	0132/36	0142/36	0329/36	0339/36	0414/36
	0044/38	0076/38	0082/38	0102/38	0156/38	0214/38	0273/38

CROSS-REFERENCE SYMBOL TABLE

	0287/38	0337/38	0416/38	0428/38	0203/39	0258/39	0261/39
	0621/39	0632/39	0728/39	0331/40	0372/40	0506/40	0531/40
	0229/41	0307/41	0584/41	0015/42	0247/42	0505/42	0487/43
	0024/44	0051/44	0061/44	0135/44	0172/44	0240/44	0286/44
	0579/44	0587/44	0049/45	0176/45	0236/45	0239/45	0276/45
LIBPB	0547/33	0500/33	0500/33	0528/35	0137/38	0324/38	0433/38
	0296/39						
LIBRA	0173	0007	0018	0275	0277	0763/32	0764/32
	0384/33	0392/33	0008/34	0009/34	0012/34	0013/34	0014/34
	0015/34	0016/34	0017/34	0018/34	0019/34	0020/34	0021/34
	0022/34	0023/34	0024/34	0025/34	0026/34	0027/34	0028/34
	0029/34	0030/34	0031/34	0032/34	0033/34	0034/34	0035/34
	0036/34	0037/34	0038/34	0039/34	0040/34	0041/34	0042/34
	0043/34	0044/34	0045/34	0046/34	0047/34	0048/34	0049/34
	0050/34	0051/34	0052/34	0053/34	0054/34	0055/34	0056/34
	0057/34	0058/34	0059/34	0060/34	0061/34	0062/34	0063/34
	0064/34	0065/34	0066/34	0067/34	0068/34	0069/34	0070/34
	0071/34	0083/34	0088/34	0113/34	0023/35	0368/35	0017/36
	0368/36	0372/36	0381/36	0011/37	0514/37	0534/37	0538/37
	0010/38	0260/38	0007/39	0404/39	0589/39	0014/40	0475/40
	0007/41	0255/41	0271/41	0299/41	0629/41	0007/42	0239/42
	0602/42	0002/43	0431/43	0535/43	0010/44	0094/44	0109/44
	0619/44	0622/44	0005/45	0060/45	0110/45	0207/45	0268/45
	0584/45	0017/46	0287/46	0298/46	0162/47	0268/47	0130/48
	0430/48	0525/48	0667/48	0014/49	0173/49	0476/49	0010/50
	0018/51	0478/51	0034/52	0012/53	0023/54	0529/54	0532/54
	0536/54	0017/55	0007/56	0524/56	0520/56	0011/57	0458/57
	0462/57	0474/57	0012/58	0252/58	0000/59	0059/59	0092/59
	0155/59	0411/59	0482/59	0548/59	0614/59	0680/59	
LIBSC	0548/33	0495/33	0518/35	0530/35	0127/38	0139/38	0279/39
	0298/39						
LIBSP	0549/33	0536/33	0522/35	0527/35	0578/35	0595/35	0131/38
	0136/38	0194/38	0223/38	0283/39	0295/39	0318/39	0325/39
LIBUS	0010/02	0295	0301	0321	0325	0395	0465
	0422/32	0644/32	0645/32	0516/37	0600/42	0260/47	0108/50
	0421/53	0422/53	0423/53	0543/55	0544/55	0546/55	0231/58
LINEA	0523/16	0390/16					
LIS	0032/31	0498/29					
LIS10	0471/21	0004/19	0459/21				
LIS11	0482/21	0473/21	0503/21				
LIS12	0507/21	0395/21					
LIS13	0528/21	0515/21	0517/21				

CROSS-REFERENCE SYMBOL TABLE

LIS14	0553/21	0402/21					
LIS15	0535/21	0336/21	0340/21				
LIS16	0547/21	0232/21	0292/21				
LIS17	0562/21	0557/21					
LIS18	0522/21	0519/21					
LISCM	0264/21	0254/21					
LISCP	0281/21	0256/21	0269/21				
LISCO	0287/21	0251/21	0275/21				
LISCR	0289/21	0260/21					
LISCU	0312/21	0305/21					
LISPF	0346/21	0350/21					
LISPM	0353/21	0343/21					
LIST	0226/21	0224/21	0110/31				
LIST0	0427/21	0418/21					
LIST2	0334/21	0322/21	0382/21				
LIST3	0369/21 0481/21	0366/21 0486/21	0416/21 0488/21	0438/21 0497/21	0443/21 0526/21	0446/21 0531/21	0470/21 0564/21
LIST4	0386/21	0371/21	0500/21				
LIST5	0409/21	0389/21	0391/21	0521/21			
LIST6	0430/21	0453/21	0476/21				
LIST7	0447/21	0440/21					
LIST8	0449/21	0429/21					
LIST9	0457/21	0413/21					
LLEND	0182/33 0819/39 0194/42 0519/44 0378/45	0357/33 0825/39 0282/43 0554/44	0311/36 0019/40 0480/43 0562/44	0237/38 0327/40 0575/43 0091/45	0447/38 0502/40 0083/44 0166/45	0568/39 0070/41 0502/44 0218/45	0805/39 0399/41 0507/44 0233/45
LNAME	0243/02	0012	0318/09	0300/21	0025/22		
LNTH	0341/02	0186/06	0203/06				

CROSS-REFERENCE SYMBOL TABLE

LOC10	0152/52	0161/52						
LOC11	0157/52	0215/52						
LOC12	0162/52	0156/52						
LOC13	0176/52	0213/52						
LOC15	0209/52	0180/52	0182/52	0187/52	0192/52			
LOC16	0217/52	0206/52						
LOC20	0226/52	0160/52						
LOC21	0241/52	0275/52						
LOC22	0251/52	0270/52						
LOC23	0272/52	0246/52						
LOC24	0277/52	0263/52						
LOC25	0267/52	0259/52						
LOC3	0305/52	0311/52						
LOC30	0297/52	0229/52	0276/52					
LOC4	0313/52	0320/52						
LOC40	0378/52	0465/52						
LOC41	0394/52	0444/52						
LOC42	0413/52	0400/52						
LOC43	0445/52	0441/52						
LOC44	0438/52	0412/52						
LOC5	0340/52	0358/52						
LOCAD	0108/52	0106/52	0109/52	0111/52				
LOCCM	0579/52	0123/52						
LOCDD	0594/52	0042/52	0051/52	0059/52				
LOCDA	0578/52	0105/52						
LOCDDG	0497/52	0478/52	0484/52	0499/52	0503/52	0506/52	0507/52	
LOCDDI	0590/52	0153/52	0167/52	0194/52	0214/52	0250/52	0269/52	

CROSS-REFERENCE SYMBOL TABLE

	0380/52	0435/52	0437/52	0443/52	0450/52		
LOC DL	0575/52	0093/52					
LOC DP	0591/52 0432/52	0177/52	0178/52	0197/52	0210/52	0418/52	0428/52
LOC DT	0096/52	0094/52	0097/52	0099/52	0101/52		
LOC DU	0582/52	0159/52					
LOC ER	0562/52	0219/52	0550/52	0555/52	0559/52	0566/52	
LOC F	0597/52	0052/52	0066/52	0183/52	0305/52	0339/52	0524/52
LOC F1	0030/32	0052/32					
LOC FB	0017/32	0065/32					
LOC FG	0032/32	0038/32					
LOC FR	0060/32	0034/32					
LOC L	0598/52	0060/52	0189/52	0313/52	0355/52	0530/52	
LOC LL	0576/52	0346/52					
LOC M6	0580/52	0125/52					
LOC N	0595/52	0480/52	0486/52	0488/52	0492/52		
LOC N1	0480/52	0491/52					
LOC N2	0492/52	0485/52					
LOC ND	0593/52	0385/52	0446/52				
LOC NO	0477/52	0035/52	0048/52	0056/52	0481/52	0493/52	0494/52
LOC NT	0589/52 0124/52 0352/52	0075/52 0130/52 0353/52	0088/52 0166/52 0375/52	0092/52 0212/52 0439/52	0100/52 0234/52 0463/52	0104/52 0274/52	0110/52 0345/52
LOC R1	0554/52	0040/52	0548/52				
LOC R2	0558/52	0068/52	0483/52				
LOC SL	0128/52	0126/52	0129/52	0131/52			
LOC ST	0577/52	0076/52					
LOC SW	0079/52	0077/52	0080/52	0085/52	0087/52	0089/52	
LOC T	0596/52	0340/52	0354/52	0563/52	0570/52		

CROSS-REFERENCE SYMBOL TABLE

LOCTC	0588/52 0331/51 0227/52	0456/31 0334/51 0230/52	0009/32 0420/51 0249/52	0247/51 0082/52 0372/52	0292/51 0084/52	0321/51 0148/52	0323/51 0208/52
LOCTP	0592/52 0203/52 0262/52 0377/52 0416/52	0150/52 0207/52 0265/52 0379/52 0421/52	0195/52 0240/52 0266/52 0395/52 0424/52	0196/52 0242/52 0271/52 0396/52 0442/52	0198/52 0254/52 0273/52 0404/52 0285/54	0199/52 0257/52 0279/52 0408/52	0202/52 0260/52 0288/52 0411/52
LOCTS	0518/52 0117/52 0528/52	0078/52 0120/52 0533/52	0083/52 0127/52 0538/52	0095/52 0292/52	0107/52 0519/52	0113/52 0520/52	0115/52 0523/52
LOCUD	0583/52	0469/52					
LOCUI	0584/52	0470/52					
LODIR	0581/52	0151/52					
LOGBF	0100/29 0094/29	0066/29	0070/29	0077/29	0079/29	0084/29	0091/29
LOGBG	0357	0060/29	0357/39	0479/39	0345/49		
LOGCT	0339 0499/39	0051/29 0339/49	0056/29 0366/49	0190/30 0378/49	0351/39	0375/39	0473/39
LOGGR	0124/31	0341	0351	0357	0359		
LOGND	0359	0059/29	0356/39	0478/39	0344/49		
LOGP1	0341 0085/29	0057/29 0089/29	0061/29 0092/29	0062/29	0071/29	0080/29	0081/29
LOGP2	0351 0480/39 0350/49	0354/39 0483/39 0365/49	0359/39 0484/39	0360/39 0498/39	0371/39 0342/49	0374/39 0346/49	0476/39 0349/49
LOGR2	0099/29	0096/29					
LOUT	0118/33 0520/39 0036/41 0111/41 0199/41 0488/41 0562/41 0611/41 0147/42 0188/42 0278/42 0516/42	0435/32 0527/39 0050/41 0120/41 0340/41 0495/41 0567/41 0047/42 0149/42 0190/42 0313/42 0618/42	0745/32 0533/39 0069/41 0140/41 0343/41 0497/41 0569/41 0050/42 0151/42 0193/42 0320/42 0621/42	0122/33 0536/39 0082/41 0142/41 0407/41 0510/41 0571/41 0123/42 0153/42 0203/42 0337/42 0648/42	0129/33 0014/41 0084/41 0144/41 0414/41 0547/41 0596/41 0130/42 0172/42 0206/42 0404/42 0675/42	0134/33 0026/41 0088/41 0146/41 0459/41 0549/41 0599/41 0137/42 0174/42 0216/42 0423/42 0682/42	0163/33 0029/41 0102/41 0167/41 0461/41 0555/41 0608/41 0143/42 0176/42 0264/42 0442/42 0684/42

CROSS-REFERENCE SYMBOL TABLE

	0686/42	0014/43	0019/43	0261/43	0297/43	0308/43	0314/43
	0395/43	0574/43	0599/43	0609/43	0029/45	0040/45	0043/45
	0401/45	0432/45	0435/45	0437/45	0509/45	0512/45	0530/45
	0518/56	0452/57					
LOUTA	0435/32	0154/32	0156/32	0158/32	0160/32	0169/32	0172/32
	0177/32	0179/32	0190/32	0192/32	0196/32	0198/32	0207/32
	0209/32	0211/32	0221/32	0224/32			
LPCK	0032/02	0391/02	0374/03	0134/04	0266/04	0067/06	0553/06
LPD	0149	0053/30	0058/39	0410/39	0208/49		
LPM1	0242/45	0235/45					
LPM2	0246/45	0238/45					
LPOP	0355	0282/04	0551/06				
LPR	0148	0221/45					
LPR1	0220/45	0213/45					
LPR2	0234/45	0216/45					
LPR3	0237/45	0227/45					
LPS	0150	0003/43	0096/47				
LPSTK	0636/32	0459/32					
LSD	0461/49	0267/49					
LSTDA	0104	0372/43	0433/47	0412/49	0130/54		
LT0	0313/02	0227/21	0321/21	0373/21	0537/21		
LT1	0314/02	0319/09	0573/11	0585/11	0326/16	0368/16	0371/16
	0378/16	0391/16	0419/16	0426/16	0434/16	0437/16	0301/21
	0330/21	0334/21	0337/21	0355/21	0359/21	0360/21	0362/21
	0367/21	0369/21	0386/21	0409/21	0462/21	0464/21	0465/21
	0482/21	0490/21	0494/21	0509/21	0554/21	0614/21	0616/21
	0619/21						
LT2	0315/02	0325/09	0590/11	0324/16	0386/16	0307/21	0365/21
	0370/21	0463/21	0466/21	0483/21	0495/21	0523/21	0529/21
	0615/21						
LT3	0316/02	0314/16	0336/16	0340/16	0343/16	0373/16	0499/16
	0234/21	0265/21	0288/21	0294/21	0329/21	0411/21	0415/21
	0423/21	0430/21	0435/21	0477/21	0589/21	0599/21	
LT4	0317/02	0484/21	0498/21	0513/21	0574/21	0577/21	0611/21
	0623/21						

CROSS-REFERENCE SYMBOL TABLE

LT5	0318/02 0242/16 0478/16	0401/11 0316/16 0240/21	0408/11 0362/16 0417/21	0516/11 0397/16 0489/21	0521/11 0399/16	0229/16 0407/16	0241/16 0453/16
LT6	0319/02 0335/21	0231/16	0338/16	0383/16	0388/16	0247/21	0290/21
LT7	0320/02	0249/21	0273/21	0338/21			
LT8	0321/02	0229/21	0283/21	0342/21	0345/21	0349/21	0352/21
LTEMP	0039 0038/03 0074/03 0083/32 0110/32 0125/32 0170/32 0219/32 0249/33 0244/34 0302/34 0548/34 0555/34 0063/35 0087/35 0104/35 0349/35 0487/35 0666/35 0333/36 0362/36 0054/38 0234/38 0246/38 0032/39 0388/39 0442/39 0613/39 0842/39 0453/40 0460/40 0487/40 0498/40 0011/41 0235/41 0278/41 0345/41 0365/41 0412/41 0436/41 0448/41 0487/41	0287 0050/03 0076/03 0085/32 0113/32 0126/32 0173/32 0222/32 0250/33 0247/34 0346/34 0549/34 0556/34 0066/35 0088/35 0124/35 0350/35 0515/35 0667/35 0356/36 0363/36 0061/38 0240/38 0247/38 0248/39 0389/39 0443/39 0836/39 0843/39 0454/40 0461/40 0490/40 0499/40 0012/41 0236/41 0284/41 0350/41 0370/41 0415/41 0437/41 0450/41 0489/41	0021/03 0052/03 0081/03 0087/32 0116/32 0132/32 0174/32 0319/32 0251/33 0259/34 0349/34 0550/34 0030/35 0069/35 0089/35 0162/35 0351/35 0601/35 0668/35 0357/36 0364/36 0063/38 0241/38 0439/38 0250/39 0390/39 0572/39 0837/39 0448/40 0455/40 0462/40 0492/40 0521/40 0043/41 0237/41 0333/41 0351/41 0375/41 0428/41 0438/41 0451/41 0499/41	0022/03 0064/03 0082/03 0088/32 0119/32 0133/32 0183/32 0321/32 0252/33 0263/34 0350/34 0551/34 0032/35 0072/35 0090/35 0167/35 0406/35 0602/35 0669/35 0358/36 0423/36 0092/38 0242/38 0450/38 0267/39 0391/39 0573/39 0838/39 0449/40 0456/40 0479/40 0493/40 0522/40 0065/41 0238/41 0335/41 0352/41 0385/41 0431/41 0440/41 0455/41 0503/41	0025/03 0066/03 0084/03 0097/32 0121/32 0162/32 0186/32 0324/32 0547/33 0272/34 0545/34 0552/34 0036/35 0075/35 0094/35 0172/35 0436/35 0606/35 0670/35 0359/36 0425/36 0124/38 0243/38 0451/38 0290/39 0392/39 0574/39 0839/39 0450/40 0457/40 0480/40 0494/40 0539/40 0216/41 0337/41 0356/41 0394/41 0432/41 0441/41 0457/41 0508/41	0033/03 0072/03 0092/03 0101/32 0122/32 0164/32 0188/32 0363/32 0548/33 0286/34 0546/34 0553/34 0037/35 0079/35 0097/35 0245/35 0443/35 0664/35 0316/36 0360/36 0016/38 0229/38 0244/38 0027/39 0386/39 0393/39 0575/39 0840/39 0451/40 0458/40 0483/40 0495/40 0545/40 0233/41 0341/41 0362/41 0400/41 0433/41 0442/41 0462/41 0511/41	0037/03 0073/03 0093/03 0105/32 0123/32 0166/32 0199/32 0367/32 0549/33 0291/34 0547/34 0554/34 0046/35 0084/35 0099/35 0348/35 0448/35 0665/35 0321/36 0361/36 0050/38 0230/38 0245/38 0031/39 0387/39 0440/39 0596/39 0841/39 0452/40 0459/40 0485/40 0497/40 0010/41 0234/41 0344/41 0364/41 0408/41 0435/41 0443/41 0470/41 0514/41

CROSS-REFERENCE SYMBOL TABLE

0516/41	0521/41	0522/41	0523/41	0525/41	0527/41	0530/41
0532/41	0535/41	0537/41	0538/41	0543/41	0550/41	0556/41
0560/41	0563/41	0594/41	0597/41	0605/41	0609/41	0632/41
0040/42	0042/42	0044/42	0048/42	0051/42	0052/42	0063/42
0066/42	0079/42	0081/42	0088/42	0098/42	0104/42	0106/42
0114/42	0115/42	0124/42	0128/42	0131/42	0133/42	0135/42
0138/42	0140/42	0141/42	0144/42	0154/42	0156/42	0160/42
0164/42	0168/42	0183/42	0201/42	0204/42	0214/42	0217/42
0220/42	0222/42	0269/42	0271/42	0279/42	0296/42	0298/42
0308/42	0314/42	0321/42	0329/42	0338/42	0352/42	0367/42
0376/42	0377/42	0379/42	0382/42	0388/42	0398/42	0401/42
0409/42	0411/42	0425/42	0427/42	0431/42	0446/42	0454/42
0458/42	0468/42	0471/42	0473/42	0474/42	0481/42	0487/42
0497/42	0500/42	0503/42	0507/42	0509/42	0511/42	0514/42
0517/42	0519/42	0526/42	0527/42	0528/42	0542/42	0545/42
0552/42	0571/42	0574/42	0579/42	0588/42	0590/42	0591/42
0596/42	0646/42	0649/42	0656/42	0658/42	0661/42	0663/42
0712/42	0008/43	0012/43	0016/43	0035/43	0037/43	0039/43
0040/43	0043/43	0046/43	0047/43	0048/43	0067/43	0070/43
0071/43	0074/43	0078/43	0082/43	0084/43	0089/43	0101/43
0104/43	0105/43	0108/43	0112/43	0119/43	0121/43	0126/43
0135/43	0138/43	0141/43	0143/43	0146/43	0159/43	0162/43
0163/43	0167/43	0174/43	0176/43	0182/43	0217/43	0223/43
0230/43	0233/43	0242/43	0255/43	0262/43	0269/43	0288/43
0290/43	0303/43	0309/43	0315/43	0323/43	0329/43	0331/43
0339/43	0340/43	0360/43	0375/43	0388/43	0391/43	0396/43
0400/43	0408/43	0525/43	0526/43	0527/43	0617/43	0618/43
0619/43	0620/43	0015/44	0066/44	0075/44	0084/44	0088/44
0089/44	0113/44	0302/44	0304/44	0308/44	0319/44	0324/44
0348/44	0350/44	0352/44	0459/44	0463/44	0489/44	0495/44
0498/44	0503/44	0604/44	0605/44	0606/44	0608/44	0609/44
0610/44	0611/44	0010/45	0020/45	0026/45	0031/45	0032/45
0035/45	0038/45	0041/45	0044/45	0045/45	0081/45	0089/45
0251/45	0282/45	0283/45	0284/45	0356/45	0360/45	0364/45
0372/45	0376/45	0380/45	0384/45	0392/45	0402/45	0408/45
0419/45	0450/45	0452/45	0476/45	0479/45	0528/45	0531/45
0573/45	0574/45	0575/45	0576/45	0797/45	0798/45	0799/45
0800/45	0045/46	0046/46	0047/46	0049/46	0053/46	0055/46
0056/46	0061/46	0068/46	0078/46	0085/46	0089/46	0096/46
0110/46	0111/46	0113/46	0114/46	0117/46	0119/46	0120/46
0129/46	0136/46	0137/46	0138/46	0147/46	0153/46	0163/46
0164/46	0165/46	0166/46	0181/46	0182/46	0183/46	0202/46
0225/46	0236/46	0238/46	0290/46	0320/46	0321/46	0329/46
0359/46	0372/46	0380/46	0389/46	0403/46	0436/46	0446/46
0459/46	0475/46	0479/46	0491/46	0008/47	0027/47	0047/47
0054/47	0057/47	0059/47	0066/47	0067/47	0079/47	0089/47
0101/47	0105/47	0109/47	0219/47	0221/47	0224/47	0226/47
0233/47	0242/47	0273/47	0275/47	0277/47	0278/47	0281/47
0284/47	0285/47	0286/47	0305/47	0316/47	0320/47	0327/47
0342/47	0353/47	0357/47	0364/47	0374/47	0377/47	0380/47
0382/47	0385/47	0397/47	0405/47	0409/47	0417/47	0459/47
0474/47	0478/47	0490/47	0502/47	0509/47	0006/48	0008/48
0021/48	0027/48	0033/48	0041/48	0044/48	0045/48	0056/48
0058/48	0069/48	0092/48	0112/48	0418/48	0421/48	0422/48

CROSS-REFERENCE SYMBOL TABLE

	0423/48	0424/48	0507/48	0508/48	0510/48	0511/48	0536/48
	0547/48	0548/48	0550/48	0551/48	0562/48	0577/48	0579/48
	0604/48	0512/48	0617/48	0618/48	0623/48	0624/48	0625/48
	0626/48	0627/48	0629/48	0638/48	0646/48	0648/48	0649/48
	0813/48	0814/48	0815/48	0156/49	0157/49	0158/49	0159/49
	0234/49	0239/49	0248/49	0249/49	0265/49	0269/49	0284/49
	0288/49	0301/49	0303/49	0304/49	0308/49	0309/49	0313/49
	0322/49	0334/49	0347/49	0352/49	0357/49	0358/49	0361/49
	0363/49	0372/49	0374/49	0443/49	0445/49	0451/49	0452/49
	0455/49	0457/49	0029/50	0036/50	0038/50	0040/50	0054/50
	0061/50	0063/50	0064/50	0135/50	0137/50	0505/50	0506/50
	0507/50	0508/50	0509/50	0457/51	0458/51	0459/51	0460/51
	0461/51	0462/51	0463/51	0464/51	0465/51	0687/51	0588/52
	0589/52	0590/52	0591/52	0592/52	0593/52	0594/52	0595/52
	0596/52	0597/52	0598/52	0407/53	0408/53	0409/53	0410/53
	0411/53	0412/53	0413/53	0414/53	0415/53	0416/53	0565/54
	0566/54	0567/54	0568/54	0569/54	0570/54	0571/54	0572/54
	0573/54	0574/54	0078/56	0087/56	0456/56	0458/56	0510/56
	0511/56	0512/56	0513/56	0514/56	0515/56	0516/56	0517/56
	0020/57	0061/57	0069/57	0070/57	0071/57	0076/57	0078/57
	0079/57	0082/57	0085/57	0095/57	0112/57	0113/57	0133/57
	0135/57	0141/57	0158/57	0161/57	0164/57	0166/57	0240/57
	0244/57	0255/57	0260/57	0284/57	0286/57	0288/57	0310/57
	0311/57	0443/57	0444/57	0445/57	0446/57	0447/57	0448/57
	0449/57	0487/57	0489/57	0491/57	0497/57	0509/57	0526/57
	0533/57	0539/57	0639/57	0641/57	0648/57	0652/57	0659/57
	0671/57	0720/57	0725/57	0754/57	0755/57	0756/57	0757/57
	0021/58	0023/58	0025/58	0031/58	0043/58	0109/58	0173/58
	0178/58	0199/58	0208/58	0233/58	0234/58	0235/58	0254/58
	0256/58	0261/58	0264/58	0567/58	0568/58	0569/58	0570/58
	0571/58	0572/58	0573/58	0574/58	0011/59	0015/59	0016/59
	0030/59	0033/59	0061/59	0073/59	0075/59	0079/59	0095/59
	0099/59	0100/59	0112/59	0114/59	0120/59	0122/59	0126/59
	0387/59	0388/59	0389/59	0390/59	0391/59	0392/59	0393/59
	0477/59	0478/59					
LTR	0036/02	0393/02	0361/03	0368/03	0007/04	0100/04	0267/04
	0116/05	0213/05	0399/05	0272/06	0273/06	0278/06	
LTP1	0145/33	0125/33	0130/33	0136/33			
LTP2	0146/33	0126/33	0127/33	0133/33	0135/33		
LTP3	0127/33	0137/33					
LTYPE	0139/33	0747/32	0144/33	0339/33	0540/39		
LTYPR	0124/33	0746/32	0132/33	0138/33	0140/33	0143/33	0539/43
	0564/43	0612/43	0519/56	0453/57			
LULEN	0295	0109/37	0144/37	0167/37	0177/37	0216/37	0270/51
	0205/52	0235/54					
LW200	0185/03	0278/03					

CROSS-REFERENCE SYMBOL TABLE

LW97	0379	0538/35	0147/38	0326/38	0306/39		
LWAUS	0250 0198/16 0142/38	0418/04 0201/16 0301/39	0602/05 0028/18	0520/06 0032/18	0185/09 0327/34	0299/12 0533/35	0477/14 0409/36
M1000	0010/19	0063/19					
M103	0260/05	0563/06					
M10K	0598/44	0430/44					
M124	0514/20	0463/20					
M128	0451	0140/43	0379/47				
M133.	0003/33	0261/33					
M133B	0619/28	0125/30					
M2000	0425 0230/35 0050/51	0424/09 0442/35 0139/51	0469/27 0060/38 0231/52	0240/34 0017/39 0260/54	0332/34 0425/39 0551/57	0359/34 0672/39 0083/58	0180/35 0277/41 0304/58
M256	0449 0449/15 0488/42	0501 0527/15 0028/47	0209/09 0102/16 0080/53	0273/11 0498/19 0196/53	0255/14 0507/19 0018/55	0252/15 0108/20 0062/59	0390/15 0287/22
M32	0212 0437/30 0055/36 0283/49	0330/14 0253/32 0212/38 0444/49	0422/19 0390/32 0426/38 0035/51	0389/25 0167/33 0030/39 0105/51	0484/27 0376/33 0441/39 0151/51	0030/28 0347/34 0687/39	0263/30 0537/34 0233/49
M36K	0621/26	0652/28					
M40	0601/44	0419/44	0434/44				
M41B	0618/28	0112/30					
M46	0007/23	0302/24					
M512	0439	0320/30	0387/33	0356/43	0065/48	0403/49	0100/54
M60B	0617/28	0096/30					
M64	0500	0110/26	0287/37	0423/37	0220/44	0313/50	0417/50
M682	0512/37	0043/37					
M683	0513/37	0045/37					
M71B	0094/21	0282/21					

CROSS-REFERENCE SYMBOL TABLE

M72	0007/12	0217/12					
M72B	0211 0503/43 0790/48 0346/58	0323/21 0185/44 0135/49 0067/59	0351/21 0202/44 0159/50 0301/59	0539/21 0484/45 0637/51 0458/59	0275/33 0329/48 0501/52	0170/39 0530/48 0239/53	0346/40 0541/48 0340/54
M73	0441	0405/03	0103/05	0180/23			
M74	0629/11	0078/11					
M80	0510/37	0491/37					
M8184	0411	0177/36	0117/37	0153/37	0309/44	0185/56	0245/57
M8190	0430/32	0401/31					
M8192	0432/32	0202/31					
M96	0453 0535/34	0328/14	0420/19	0387/25	0071/26	0435/30	0165/33
MADD	0245/18	0014/17					
MADDA	0014/17	0207/17					
MAG1	0036/59	0013/59					
MAG5	0033/59	0023/59	0037/59				
MAGDG	0040/59	0009/59	0014/59	0049/59			
MAGSC	0089	0259/42	0261/42	0310/46	0312/46	0478/49	0034/59
MAIN	0164 0619/05 0045/07 0369/09 0579/11 0444/16 0404/19 0225/30 0402/32 0413/38	0192/03 0529/05 0047/07 0237/11 0592/11 0446/16 0167/21 0227/30 0410/32 0425/38	0193/03 0049/06 0060/07 0256/11 0598/11 0458/16 0178/21 0230/30 0535/33 0446/38	0240/03 0050/06 0306/09 0297/11 0209/12 0506/16 0239/21 0254/30 0615/35 0824/39	0418/03 0187/06 0312/09 0552/11 0253/16 0508/16 0032/22 0313/30 0645/35 0326/40	0433/03 0242/06 0313/09 0554/11 0254/16 0510/16 0465/27 0381/32 0207/38 0479/43	0463/03 0254/06 0368/09 0574/11 0320/16 0389/19 0552/29 0397/32 0334/38 0484/43
MANT1	0302/02 0205/22 0258/23	0095/19 0212/22 0262/23	0287/19 0232/22 0268/23	0059/22 0244/22 0279/23	0092/22 0249/22 0145/25	0168/22 0317/22	0191/22 0332/22
MANT2	0303/02 0202/22 0147/25	0097/19 0213/22	0288/19 0233/22	0060/22 0323/22	0088/22 0331/22	0169/22 0335/22	0197/22 0284/23
MAT10	0074/04	0084/04					

CROSS-REFERENCE SYMBOL TABLE

MAT11	0083/04	0069/04					
MAT12	0054/04	0067/04					
MAT13	0068/04	0047/04					
MATFN	0525/04	0108/04					
MATFS	0521/22	0525/04					
MATIU	0526/04	0017/04					
MATOP	0009/07	0072/08					
MATS	0007/04	0535/05					
MATS1	0033/04	0024/04	0026/04	0028/04	0042/04		
MATS2	0043/04	0022/04					
MATS3	0089/04	0010/04					
MATS4	0130/04	0122/04					
MATS5	0141/04	0101/04					
MATS6	0149/04	0103/04					
MATS7	0162/04	0176/04					
MATS8	0170/04	0166/04					
MATS9	0172/04	0161/04					
MAXCR	0339/02 0207/05	0285/03 0239/05	0293/03 0219/06	0506/03	0540/03	0016/04	0202/04
MAXE	0433/02 0094/18 0217/18	0035/18 0136/18 0220/18	0036/18 0144/18 0268/18	0043/18 0155/18 0273/18	0079/18 0168/18	0080/18 0201/18	0089/18 0204/18
MAXFX	0031/19	0086/19					
MAXSN	0413	0117/06	0171/40				
MB	0054/21	0031/21					
MBUST	0521	0190/29	0175/30	0178/30			
MBUSY	0110 0542/35 0282/38 0175/58	0174/03 0584/35 0329/38	0221/15 0137/36 0361/38	0497/15 0307/36 0401/38	0191/29 0151/38 0678/57	0160/30 0200/38 0722/57	0173/30 0268/38 0136/58

CROSS-REFERENCE SYMBOL TABLE

MESS2	0144/45	0151/45					
MESS4	0153/45	0147/45	0150/45				
MESWK	0196/45	0158/45	0169/45				
MEXIT	0418/02	0163/17	0256/17	0040/18	0056/18		
MHAD	0106 0084/47	0134/31 0387/49	0302/42 0045/53	0469/42 0056/54	0547/42	0353/46	0009/47
MID	0043	0291/33	0085/50	0215/51	0257/51		
MINFX	0030/19	0091/19					
MINP1	0005/17	0083/17					
MINP2	0004/17	0085/17					
MI01	0046/17	0154/17					
MI02	0098/17	0066/17					
MI03	0128/17	0111/17					
MI04	0117/17	0122/17					
MI05	0132/17	0140/17					
MI06	0135/17	0131/17					
MI07	0149/17	0628/11	0096/17	0123/17			
MI08	0130/17	0145/17					
MI09	0089/17	0077/17	0095/17				
MI0EN	0628/11	0255/10					
ML819	0546/55	0513/55					
MLDIR	0527/54	0174/54					
MLFLA	0024/33	0055/55					
MLIBD	0395 0390/44 0625/57	0254/31 0645/45	0361/31 0057/46	0261/36 0088/51	0338/37 0323/52	0737/39 0275/56	0366/41 0222/57
MLINK	0178 0561/28 0333/30 0508/30 0056/33	0181 0688/28 0360/30 0509/30 0075/33	0084/07 0008/29 0369/30 0520/30 0098/33	0349/07 0014/29 0381/30 0530/30 0119/33	0386/07 0165/29 0386/30 0231/32 0152/33	0421/09 0187/30 0451/30 0259/32 0254/33	0379/19 0188/30 0455/30 0265/32 0352/33

CROSS-REFERENCE SYMBOL TABLE

	0397/33	0413/33	0415/33	0440/33	0462/33	0502/33	0530/33
	0209/34	0339/34	0024/35	0187/35	0392/35	0566/35	0589/35
	0019/36	0382/36	0012/38	0182/38	0205/38	0261/38	0332/38
	0411/38	0423/38	0435/38	0008/39	0041/39	0053/39	0214/39
	0226/39	0244/39	0331/39	0405/39	0414/39	0432/39	0453/39
	0542/39	0593/39	0680/39	0822/39	0015/40	0021/40	0324/40
	0477/40	0540/40	0030/41	0153/41	0177/41	0274/41	0300/41
	0316/41	0326/41	0353/41	0395/41	0426/41	0575/41	0630/41
	0008/42	0024/42	0033/42	0057/42	0116/42	0177/42	0240/42
	0560/42	0692/42	0704/42	0477/43	0482/43	0541/43	0012/44
	0095/44	0110/44	0454/44	0466/44	0476/44	0478/44	0486/44
	0007/45	0086/45	0121/45	0208/45	0269/45	0548/45	0560/45
	0183/49						
MLK1	0031/54	0027/54					
MLK10	0151/54	0140/54	0152/54	0154/54			
MLK11	0175/54	0184/54					
MLK12	0180/54	0245/54					
MLK13	0185/54	0179/54					
MLK14	0199/54	0243/54					
MLK15	0239/54	0205/54					
MLK16	0246/54	0236/54					
MLK17	0224/54	0206/54					
MLK2	0044/54	0025/54	0035/54	0066/54	0080/54	0084/54	
MLK20	0255/54	0183/54					
MLK21	0270/54	0303/54					
MLK22	0279/54	0298/54					
MLK23	0300/54	0274/54					
MLK24	0306/54	0291/54					
MLK25	0295/54	0287/54					
MLK26	0324/54	0320/54					
MLK3	0049/54	0029/54					
MLK30	0517/54	0258/54	0304/54				
MLK4	0053/54	0043/54					

●●●●●●

CROSS-REFERENCE SYMBOL TABLE

MLK40	0167/55	0260/55		
MLK41	0183/55	0239/55		
MLK42	0217/55	0208/55	0212/55	
MLK43	0240/55	0236/55		
MLK5	0067/54	0073/54		
MLK50	0274/55	0288/55		
MLK51	0284/55	0279/55		
MLK57	0308/55	0324/55		
MLK58	0325/55	0311/55		
MLK59	0298/55	0163/55		
MLK6	0099/54	0090/54		
MLK60	0334/55	0348/55		
MLK61	0352/55	0340/55		
MLK62	0366/55	0359/55		
MLK63	0381/55	0426/55	0427/55	
MLK64	0406/55	0350/55	0384/55	0390/55
MLK65	0424/55	0342/55		
MLK66	0362/55	0396/55	0398/55	
MLK67	0403/55	0361/55		
MLK7	0113/54	0122/54		
MLK71	0035/55	0048/55		
MLK72	0051/55	0117/55		
MLK73	0056/55	0042/55		
MLK74	0066/55	0109/55	0112/55	0136/55
MLK75	0088/55	0083/55		
MLK76	0093/55	0102/55		
MLK77	0103/55	0095/55	0098/55	

CROSS-REFERENCE SYMBOL TABLE

MLK78	0110/55	0044/55					
MLK79	0120/55	0129/55					
MLK8	0117/54	0112/54	0118/54	0120/54			
MLK80	0130/55	0124/55					
MLK81	0137/55	0038/55					
MLK82	0145/55	0050/55	0068/55	0071/55	0080/55	0139/55	
MLK9	0147/54	0156/54					
MLK98	0414/55	0351/55					
MLK99	0419/55	0062/55					
MLKBR	0573/54 0090/55 0314/55	0421/54 0108/55	0423/54 0113/55	0479/54 0123/55	0488/54 0192/55	0489/54 0224/55	0491/54 0228/55
MLKC1	0441/54	0431/54					
MLKC2	0449/54	0440/54					
MLKC3	0466/54	0530/54					
MLKC4	0472/54	0446/54					
MLKC5	0468/54	0437/54					
MLKCK	0417/54 0427/54	0116/54 0435/54	0150/54 0444/54	0203/54 0473/54	0323/54 0474/54	0420/54 0475/54	0422/54
MLKCT	0555/54 0263/54	0109/54 0302/54	0121/54 0164/55	0127/54 0234/55	0155/54 0258/55	0189/54 0265/55	0242/54 0287/55
MLKD.	0526/54	0104/54					
MLKD3	0530/54	0452/54					
MLKDI	0569/54 0169/55	0176/54 0231/55	0190/54 0233/55	0225/54 0238/55	0244/54 0245/55	0278/54	0297/54
MLKDP	0204/54	0200/54	0207/54	0228/54	0240/54		
MLKDS	0390/54	0064/54	0071/54	0078/54	0396/54		
MLKDU	0528/54	0182/54					
MLKE1	0485/55	0468/55					
MLKE2	0488/55	0483/55					

CROSS-REFERENCE SYMBOL TABLE

MLKE3	0538/55	0508/55	0510/55	0514/55			
MLKEC	0478/54	0442/54	0469/54	0495/54	0497/54	0500/54	0501/54
MLKER	0400/54	0046/54	0092/54	0248/54	0404/54	0463/54	
MLKEX	0571/54	0418/54	0436/54	0445/54			
MLKFA	0567/54 0131/55	0081/54 0140/55	0451/54 0441/55	0455/54	0458/54	0460/54	0040/55
MLKFB	0574/54 0443/54 0464/55	0033/54 0447/54	0039/54 0448/54	0040/54 0306/55	0051/54 0317/55	0076/54 0320/55	0428/54 0327/55
MLKFL	0066/32	0024/33					
MLKIN	0557/54 0335/54 0380/54 0549/54 0502/55	0032/54 0347/54 0383/54 0562/54	0050/54 0348/54 0424/54 0026/55	0059/54 0351/54 0438/54 0307/55	0077/54 0354/54 0439/54 0326/55	0133/54 0360/54 0494/54 0386/55	0334/54 0361/54 0546/54 0465/55
MLKIP	0562/54	0135/54	0027/55	0146/55			
MLKLA	0566/54	0075/54	0453/54	0511/54	0512/54	0446/55	
MLKLB	0556/54 0529/55	0063/54	0432/54	0470/54	0387/55	0404/55	0503/55
MLKLN	0558/54	0055/54	0058/55	0063/55	0134/55	0143/55	0355/55
MLKLP	0568/54	0058/54	0068/54	0070/54	0085/54	0391/54	0020/55
MLKLY	0544/55	0114/55					
MLKLZ	0543/55	0046/55	0067/55	0094/55			
MLKN1	0336/54	0365/54					
MLKN2	0367/54	0338/54	0342/54	0345/54			
MLKND	0553/54 0380/55	0174/55 0383/55	0241/55 0512/55	0331/55 0518/55	0346/55	0371/55	0378/55
MLKNM	0505/54	0454/54	0459/54	0461/54	0513/54		
MLKNO	0330/54	0024/54	0034/54	0366/54	0369/54	0370/54	
MLKP1	0458/55	0435/55	0443/55				
MLKPB	0433/55	0049/55	0111/55	0138/55	0456/55	0459/55	0460/55

000000

CROSS-REFERENCE SYMBOL TABLE

MLKPE	0463/55	0349/55	0425/55	0486/55	0487/55	0537/55	0542/55
MLKPP	0552/54 0107/55	0554/54 0118/55	0091/55 0122/55	0099/55 0127/55	0100/55 0128/55	0105/55	0106/55
MLKRD	0559/54 0223/54	0169/54 0309/55	0209/54 0321/55	0211/54	0213/54	0214/54	0222/54
MLKRP	0560/54	0168/54	0310/55				
MLKTC	0565/54 0277/54	0129/54 0161/55	0145/54 0264/55	0171/54 0415/55	0238/54	0256/54	0259/54
MLKTI	0572/54	0419/54	0480/54				
MLKTP	0570/54 0233/54 0293/54 0346/54 0184/55 0206/55 0281/55 0363/55 0394/55 0474/55 0494/55 0531/55	0173/54 0237/54 0294/54 0357/54 0189/55 0219/55 0285/55 0365/55 0399/55 0475/55 0496/55 0536/55	0226/54 0269/54 0299/54 0368/54 0191/55 0220/55 0333/55 0367/55 0400/55 0477/55 0497/55 0539/55	0227/54 0271/54 0301/54 0401/54 0193/55 0237/55 0335/55 0382/55 0402/55 0481/55 0521/55 0541/55	0229/54 0282/54 0308/54 0408/54 0201/55 0275/55 0343/55 0385/55 0405/55 0484/55 0526/55	0230/54 0288/54 0317/54 0166/55 0202/55 0276/55 0345/55 0391/55 0466/55 0489/55 0528/55	0232/54 0290/54 0332/54 0168/55 0205/55 0277/55 0353/55 0392/55 0473/55 0493/55 0530/55
MLKTS	0375/54	0041/54	0384/54	0395/54			
MLKTH	0541/54 0480/55	0429/54 0492/55	0433/54 0504/55	0498/54	0550/54	0336/55	0388/55
MLKUI	0545/55	0417/55					
MLKXB	0554/54	0448/55	0453/55	0471/55	0499/55	0511/55	0533/55
MLOOP	0245/17	0255/17	0376/17	0041/18			
MLOP1	0247/17	0247/18	0251/18				
MLOP2	0249/17	0012/17	0262/18				
MLOP3	0251/17	0013/17	0254/18	0258/18			
MLP2A	0012/17	0174/17	0275/18				
MLP3A	0013/17	0370/17					
MM4	0323/20	0297/20					
MM72	0008/19	0437/19					
MM74	0009/19	0341/19					

CROSS-REFERENCE SYMBOL TABLE

MM80	0585/52	0091/52					
MMT0	0419/02 0210/18	0264/17	0316/17	0403/17	0013/18	0071/18	0161/18
MMT1	0420/02 0188/18	0271/17 0232/18	0310/17	0397/17	0413/17	0081/18	0145/18
MMT2	0421/02 0072/18	0272/17 0134/18	0306/17 0162/18	0311/17 0230/18	0398/17	0414/17	0011/18
MMT3	0422/02 0098/18	0283/17 0229/18	0314/17 0239/18	0390/17	0404/17	0009/18	0074/18
MMT4	0423/02 0096/18	0284/17 0107/18	0312/17 0211/18	0315/17 0226/18	0410/17	0416/17	0077/18
MMT5	0424/02 0117/18 0191/18	0287/17 0126/18 0206/18	0304/17 0127/18	0082/18 0148/18	0099/18 0157/18	0105/18 0163/18	0114/18 0172/18
MMT6	0425/02 0113/18 0152/18 0171/18 0224/18	0274/17 0116/18 0153/18 0193/18 0225/18	0320/17 0119/18 0156/18 0194/18	0083/18 0128/18 0160/18 0195/18	0084/18 0129/18 0164/18 0200/18	0095/18 0150/18 0169/18 0209/18	0097/18 0151/18 0170/18 0212/18
MMT7	0426/02 0131/18	0277/17 0183/18	0323/17 0184/18	0103/18 0196/18	0120/18 0197/18	0123/18 0202/18	0130/18 0205/18
MMT8	0427/02 0133/18	0292/17 0180/18	0325/17 0228/18	0111/18	0122/18	0125/18	0132/18
MNEG	0497	0504	0298/02	0046/21	0015/22	0295/22	0298/22
MOLEN	0529/54	0518/54					
MOP	0417/02	0175/17	0210/17	0246/17	0375/17	0038/18	
MORG	0533/54	0524/54	0529/54				
MOVEB	0197/33 0320/44	0418/32 0360/50	0750/32 0522/55	0199/33 0196/56	0208/33 0256/57	0188/36	0357/37
MOVED	0041 0201/33 0194/36 0207/36 0352/37 0373/37 0640/39 0469/43 0334/44	0208/31 0203/33 0198/36 0208/36 0360/37 0375/37 0746/39 0475/43 0336/44	0251/31 0204/33 0200/36 0210/36 0366/37 0376/37 0757/39 0316/44 0337/44	0358/31 0214/33 0201/36 0211/36 0367/37 0378/37 0574/41 0326/44 0339/44	0407/31 0216/33 0202/36 0222/36 0369/37 0379/37 0694/42 0330/44 0340/44	0091/32 0166/36 0204/36 0258/36 0370/37 0447/37 0708/42 0331/44 0342/44	0297/32 0184/36 0205/36 0169/37 0372/37 0481/37 0455/43 0333/44 0344/44

CROSS-REFERENCE SYMBOL TABLE

	0354/44	0387/44	0550/45	0564/45	0603/45	0037/46	0254/46
	0707/48	0044/49	0485/49	0098/50	0134/50	0357/50	0364/50
	0478/50	0085/51	0175/51	0306/51	0363/51	0556/51	0566/51
	0586/51	0587/51	0588/51	0677/51	0312/52	0327/52	0393/52
	0454/52	0565/52	0302/53	0403/54	0182/55	0249/55	0368/55
	0517/55	0176/56	0192/56	0202/56	0206/56	0208/56	0209/56
	0210/56	0212/56	0213/56	0215/56	0216/56	0218/56	0219/56
	0230/56	0272/56	0455/56	0132/57	0206/57	0230/57	0252/57
	0262/57	0256/57	0268/57	0269/57	0270/57	0272/57	0273/57
	0275/57	0276/57	0278/57	0279/57	0290/57	0622/57	0719/57
	0172/58	0367/58	0410/58	0463/58	0475/58	0498/58	0526/58
	0540/58	0546/58					
MOVER	0182/02	0328/02	0396/02	0405/02	0468/07	0085/10	0194/16
	0220/16	0272/16	0293/16				
MOVES	0040	0206/31	0253/31	0360/31	0405/31	0093/32	0355/32
	0200/33	0206/33	0207/33	0213/33	0215/33	0021/36	0026/36
	0182/36	0191/36	0226/36	0260/36	0145/37	0165/37	0354/37
	0362/37	0450/37	0403/37	0735/39	0751/39	0577/41	0696/42
	0706/42	0459/43	0466/43	0468/43	0314/44	0323/44	0358/44
	0389/44	0552/45	0562/45	0605/45	0035/46	0252/46	0705/48
	0042/49	0483/49	0100/50	0105/50	0132/50	0359/50	0362/50
	0366/50	0480/50	0087/51	0173/51	0308/51	0346/51	0352/51
	0559/51	0567/51	0572/51	0675/51	0321/52	0392/52	0430/52
	0434/52	0448/52	0458/52	0567/52	0304/53	0405/54	0181/55
	0226/55	0230/55	0243/55	0253/55	0370/55	0515/55	0178/56
	0190/56	0199/56	0234/56	0274/56	0453/56	0130/57	0220/57
	0235/57	0250/57	0259/57	0295/57	0624/57	0717/57	0170/58
	0369/58	0409/58	0447/58	0451/58	0461/58	0473/58	0492/58
	0502/58	0525/58	0538/58	0544/58	0550/58		
MOVEW	0210/33	0419/32	0751/32	0212/33	0217/33	0160/36	0196/36
	0231/36	0263/36	0170/37	0364/37	0452/37	0484/37	0738/39
	0759/39	0827/39	0579/41	0698/42	0710/42	0474/43	0328/44
	0363/44	0392/44	0554/45	0566/45	0607/45	0039/46	0257/46
	0710/48	0046/49	0488/49	0103/50	0107/50	0136/50	0368/50
	0481/50	0090/51	0177/51	0313/51	0364/51	0576/51	0678/51
	0325/52	0431/52	0449/52	0462/52	0569/52	0306/53	0407/54
	0227/55	0244/55	0257/55	0374/55	0180/56	0204/56	0239/56
	0277/56	0457/56	0134/57	0223/57	0239/57	0264/57	0299/57
	0303/57	0627/57	0721/57	0174/58	0371/58	0448/58	0493/58
	0506/58	0549/58					
MOVFB	0418/32	0212/31	0411/31				
MOVFW	0419/32	0256/31	0363/31	0095/32	0357/32		
MP2	0437/20	0431/20					
MPR1	0293/17	0327/17					
MPR2	0295/17	0307/17					

CROSS-REFERENCE SYMBOL TABLE

MPR3	0319/17	0313/17					
MPR4	0325/17	0317/17					
MPT	0461/02	0196/14	0213/14	0216/14	0228/14		
MRELS	0365/22	0245/05					
MSFLG	0530/04 0382/04	0291/03 0421/04	0311/03 0452/04	0252/04 0050/05	0286/04	0308/04	0324/04
MSQBG	0198	0161/03	0215/28	0043/29	0164/45		
MSQCT	0194 0111/45	0153/03 0160/45	0156/03	0208/28	0211/28	0033/29	0039/29
MSQHD	0490/25	0195	0196	0197	0198		
MSQND	0197	0160/03	0214/28	0042/29	0163/45		
MSQP1	0195	0212/28	0216/28	0040/29	0044/29		
MSQP2	0198/45 0185/45	0120/45 0192/45	0130/45	0131/45	0133/45	0134/45	0137/45
MSQP3	0196 0165/45	0157/03	0158/03	0162/03	0115/45	0157/45	0161/45
MSSCT	0197/45	0139/45	0146/45	0156/45	0193/45		
MSUB	0249/18	0015/17					
MSUBA	0015/17	0209/17					
MT0	0413/02 0153/17	0042/17	0081/17	0084/17	0106/17	0115/17	0144/17
MT1	0414/02	0040/17	0064/17	0076/17	0156/17		
MT2	0415/02	0130/17	0139/17				
MT3	0416/02	0129/17	0143/17				
MTG1	0204/02	0207/24	0240/24	0155/25	0248/25	0250/25	
MTOPR	0467/40	0406/40					
MULEN	0463	0280/30					
MULOP	0361	0160/04	0201/17				
MUN1	0020/53	0016/53					
MUN10	0101/53	0114/53					

CROSS-REFERENCE SYMBOL TABLE

MUN11	0115/53	0104/53					
MUN12	0119/53	0108/53					
MUN13	0137/53	0125/53	0178/53	0180/53			
MUN14	0146/53	0155/53					
MUN15	0156/53	0148/53	0151/53				
MUN16	0166/53	0222/53	0223/53				
MUN17	0195/53	0117/53	0136/53	0169/53	0174/53		
MUN18	0220/53	0110/53					
MUN2	0033/53	0014/53	0024/53	0050/53	0064/53	0068/53	
MUN3	0038/53	0018/53					
MUN4	0042/53	0032/53					
MUN5	0051/53	0057/53					
MUN6	0079/53	0074/53					
MUNBI	0421/53	0090/53					
MUNBR	0415/53	0143/53	0161/53	0356/53	0371/53	0394/53	0404/53
MUNDA	0420/53	0089/53	0205/53				
MUNDS	0289/53	0048/53	0055/53	0062/53	0295/53		
MUNER	0299/53	0035/53	0076/53	0303/53	0362/53		
MUNFA	0411/53	0065/53	0106/53	0131/53	0326/53	0338/53	0342/53
MUNIN	0407/53	0021/53	0039/53	0061/53	0233/53	0234/53	0246/53
	0247/53	0250/53	0253/53	0259/53	0260/53	0279/53	0282/53
MUNLA	0412/53	0059/53	0129/53	0170/53	0190/53	0346/53	0379/53
MUNLN	0409/53	0044/53	0121/53	0133/53	0353/53		
MUNLY	0423/53	0357/53					
MUNLZ	0422/53	0112/53	0147/53				
MUNN1	0235/53	0264/53					
MUNN2	0266/53	0237/53	0241/53	0244/53			

CROSS-REFERENCE SYMBOL TABLE

MUNNU	0229/53	0013/53	0023/53	0265/53	0268/53	0269/53	
MUNP1	0330/53	0319/53	0335/53				
MUNP2	0333/53	0328/53					
MUNP3	0365/53	0360/53					
MUNP4	0368/53	0377/53					
MUNP5	0378/53	0372/53					
MUNP6	0385/53	0351/53					
MUNPB	0317/53	0116/53	0221/53	0331/53	0332/53	0388/53	
MUNPP	0416/53 0181/53	0144/53 0185/53	0152/53 0366/53	0153/53 0370/53	0158/53 0375/53	0159/53 0376/53	0160/53
MUNRA	0413/53	0132/53	0142/53	0189/53	0339/53	0398/53	
MUNRL	0414/53	0134/53	0139/53	0184/53	0337/53	0354/53	
MUNRS	0393/53	0135/53	0162/53	0192/53	0387/53	0405/53	
MUNSB	0408/53 0204/53	0022/53 0322/53	0028/53 0349/53	0029/53 0352/53	0040/53 0382/53	0060/53 0401/53	0088/53 0420/53
MUNTP	0410/53 0231/53 0395/53	0047/53 0245/53	0052/53 0256/53	0054/53 0267/53	0069/53 0290/53	0082/53 0300/53	0198/53 0307/53
MUNTS	0274/53	0030/53	0283/53	0294/53			
MVEND	0330/02	0287/16	0292/16				
MWORD	0111 0113/38 0431/44 0081/53 0532/57	0215/15 0193/38 0557/44 0197/53 0668/57	0490/15 0350/38 0029/47 0101/54 0072/58	0504/35 0317/39 0066/48 0124/54 0122/58	0577/35 0489/42 0082/48 0019/55	0157/36 0357/43 0404/49 0318/56	0297/36 0378/43 0415/49 0362/56
N	0097/21	0451/21					
N1024	0499/50	0219/50	0230/50				
N1025	0500/50	0221/50	0232/50				
N8192	0501/50	0092/50					
NAD	0482/02	0093/23	0138/24	0160/24	0165/24	0199/24	0209/24
NAM27	0510/40	0504/40					

CROSS-REFERENCE SYMBOL TABLE

NAMBL	0549/40	0542/40					
NAME1	0488/40	0496/40					
NAME2	0535/40	0527/40					
NAMER	0512/40	0488/40	0491/40	0500/40	0519/40	0537/40	
NAMFL	0543/40	0546/40					
NBD	0483/02	0094/23	0146/24	0183/24			
NBLK	0484/02	0427/23	0021/24	0027/24	0028/24	0030/24	0034/24
	0197/24	0279/24	0285/24	0293/24	0171/25	0307/25	0310/25
NCH	0283/02	0149/11	0170/11	0177/11	0200/11	0420/16	0422/16
	0430/16	0438/16	0029/23	0035/23	0061/23	0080/23	0114/23
	0128/23	0325/24	0015/25	0026/25	0042/25	0095/25	0106/25
	0128/25	0138/25	0366/25				
NDIRT	0082						
NEWI#	0154/50	0053/50	0060/50	0178/50	0180/50		
NEWI2	0126/50	0211/50	0222/50	0233/50			
NEWI4	0053/50	0046/50					
NEWI5	0090/50	0083/50					
NEWI6	0129/50	0087/50					
NEWI7	0080/50	0089/50					
NEWI8	0132/50	0128/50					
NEWIA	0146/50	0126/50	0149/50				
NEWIB	0149/50	0127/50					
NEWIE	0150/50	0129/50	0153/50				
NEWIF	0153/50	0130/50					
NEWIP	0181/50	0035/50	0037/50	0039/50	0185/50	0189/50	0197/50
NEWIT	0519/50	0156/50	0165/50	0170/50	0179/50	0191/50	0196/50
NEWIZ	0179/50	0158/50	0161/50	0164/50			
NEXTS	0552/03	0525/05					
NHBN	0485/02	0402/23	0406/23	0414/23			

CROSS-REFERENCE SYMBOL TABLE

NIDC2	0513/50	0379/50					
NIDC3	0514/50	0294/50					
NIDT	0079	0209/50					
NMBFA	0005/19	0124/19	0149/19	0230/19			
NM010	0164/19	0168/19					
NM011	0174/19	0160/19	0171/19				
NM012	0204/19	0212/19					
NM013	0225/19	0228/19					
NM014	0230/19	0200/19	0215/19	0218/19			
NM015	0233/19	0241/19					
NM016	0209/19	0195/19	0199/19				
NMPTR	0308/02 0231/19	0125/19 0237/19	0131/19 0238/19	0132/19	0142/19	0163/19	0188/19
NMTMP	0307/02 0219/19	0161/19 0227/19	0164/19 0233/19	0169/19	0194/19	0196/19	0206/19
NORM1	0233/22	0250/22					
NORM2	0235/22	0230/22	0239/22	0241/22			
NORML	0058/02	0209/19	0099/22	0234/22	0260/22	0339/22	
NOT	0374/22	0266					
NPORT	0090 0074/52	0254/28 0156/59	0206/29 0267/59	0286/45 0427/59	0136/48	0552/48	0576/48
NQT	0462/02	0214/14	0236/14	0256/14	0262/14		
NSPTR	0358/02 0095/08	0428/06 0260/08	0500/06 0289/08	0183/07 0302/08	0417/07	0033/08	0069/08
NT0	0311/02	0224/22	0227/22				
NT232	0502/50	0289/50					
NUC	0142	0044/39					
NUM1	0284/02 0184/24 0287/24	0088/23 0210/24	0201/23 0230/24	0203/23 0231/24	0230/23 0244/24	0251/23 0255/24	0413/23 0258/24

CROSS-REFERENCE SYMBOL TABLE

NUM11	0146/22	0133/22	0135/22	0142/22			
NUM12	0151/22	0102/22	0118/22				
NUM13	0164/22	0157/22					
NUM14	0168/22	0155/22	0163/22				
NUM15	0175/22	0171/22					
NUM16	0182/22	0120/22	0128/22	0130/22	0145/22		
NUM2	0285/02 0171/24	0089/23 0172/24	0197/23 0175/24	0199/23 0213/24	0231/23 0245/24	0252/23 0266/24	0153/24
NUMBF	0309/02 0076/19	0005/19 0084/19	0042/19 0089/19	0048/19 0094/19	0053/19	0054/19	0062/19
NUMC1	0065/22	0103/22					
NUMC2	0071/22	0067/22					
NUMC3	0085/22	0106/22					
NUMC4	0099/22	0070/22	0094/22	0111/22			
NUMC5	0104/22	0086/22					
NUMC6	0107/22	0079/22					
NUMC7	0112/22	0072/22					
NUMC8	0127/22	0122/22					
NUMC9	0129/22	0125/22					
NUMCK	0052/02 0182/22	0582/03 0183/22	0298/04	0248/10	0327/11	0115/22	0181/22
NUM00	0103/19	0108/19					
NUM01	0054/19	0044/19					
NUM02	0082/19	0056/19	0058/19				
NUM03	0094/19	0088/19					
NUM04	0111/19	0119/19					
NUM05	0120/19	0102/19	0114/19				
NUM06	0129/19	0134/19					
NUM07	0143/19	0153/19					

CROSS-REFERENCE SYMBOL TABLE

NUM08	0154/19	0150/19					
NUM09	0157/19	0138/19	0148/19				
NUM0T	0136/02 0198/19	0299/02 0243/19	0398/02 0265/19	0403/02 0469/21	0404/02	0020/19	0078/19
NUMPT	0255/02	0138/07	0150/07	0151/07	0159/07		
NUMW1	0486/02	0259/23	0280/23	0144/25			
NUMW2	0487/02	0285/23	0146/25				
NWS	0517/50 0372/50	0288/50 0411/50	0326/50 0474/50	0332/50 0475/50	0333/50	0355/50	0370/50
NWS10	0377/50	0285/50					
NWS11	0399/50	0291/50	0295/50	0316/50			
NWS12	0420/50	0407/50					
NWS13	0408/50	0427/50					
NWS14	0432/50	0415/50	0419/50				
NWS15	0401/50	0465/50					
NWS16	0488/50	0380/50					
NWS17	0469/50	0435/50					
NWS18	0450/50	0440/50					
NWS5	0253/50	0246/50					
NWS7	0281/50	0386/50	0471/50	0482/50			
NWS8	0287/50	0303/50	0341/50	0345/50	0350/50	0373/50	
NWS9	0305/50	0299/50					
NWS9A	0314/50	0310/50					
NWSB	0507/50 0463/50	0238/50	0247/50	0412/50	0416/50	0437/50	0460/50
NWSID	0510/50	0242/50					
NWSK1	0511/50	0293/50	0296/50	0301/50	0323/50	0342/50	0406/50
NWSK2	0516/50	0297/50	0302/50	0319/50	0336/50	0337/50	0423/50

CROSS-REFERENCE SYMBOL TABLE

NWSL1	0512/50	0378/50	0382/50	0405/50	0442/50	0454/50	
NWSL2	0515/50 0462/50	0282/50	0384/50	0403/50	0421/50	0438/50	0461/50
NWSNN	0503/50	0248/50	0263/50	0489/50	0491/50	0493/50	
NWSP	0508/50 0404/50	0241/50	0254/50	0256/50	0264/50	0284/50	0385/50
NWSS	0506/50 0457/50	0236/50 0464/50	0249/50 0470/50	0250/50 0472/50	0402/50 0479/50	0409/50	0445/50
NWST	0509/50	0215/50	0226/50	0257/50			
NWSTG	0510/50	0339/50	0353/50				
NWSU	0202/50	0093/50					
NWSV	0505/50	0203/50	0348/50				
NWSW	0224/50	0213/50					
NWTA	0234/50	0223/50					
NWTB	0243/50	0258/50					
NXTDT	0389/02 0134/12 0176/20	0051/12 0137/12	0117/12 0138/12	0124/12 0139/12	0125/12 0148/12	0132/12 0149/12	0133/12 0169/20
NXTOP	0373	0241/07	0134/10				
OCR	0124	0315/28	0405/30	0645/40			
OCTMP	0312/02	0368/19	0376/19				
OF	0490/04	0445/03					
OFOP	0405	0448/03	0441/40				
OM193	0600/44	0224/44					
OM31	0602/44	0577/44					
OM507	0599/44	0593/44					
ONEI	0385	0142/29	0221/33	0202/49			
OP17P	0613/44	0471/44					
OPCH1	0418/14	0410/14					
OPCH2	0420/14	0428/14					

CROSS-REFERENCE SYMBOL TABLE

OPCH3	0425/14	0405/14	0419/14				
OPCHK	0116/02 0189/13 0485/25	0427/02 0261/13	0462/02 0186/14	0474/02 0371/14	0051/11 0389/14	0461/11 0423/14	0280/12 0421/25
OPDMK	0399 0062/13 0449/25	0272/08 0026/17	0048/10 0046/17	0023/11 0177/17	0193/11 0191/17	0220/11 0380/17	0343/12 0410/21
OPDST	0385/02 0048/11 0291/11 0295/12 0015/13 0050/13 0224/13 0058/14 0403/14	0225/10 0232/11 0294/11 0346/12 0024/13 0074/13 0225/13 0059/14 0420/14	0228/10 0234/11 0296/11 0347/12 0026/13 0104/13 0250/13 0060/14 0422/14	0230/10 0236/11 0305/11 0384/12 0027/13 0105/13 0254/13 0118/14 0459/14	0373/10 0268/11 0308/11 0477/12 0028/13 0108/13 0256/13 0272/14 0461/14	0377/10 0270/11 0310/11 0011/13 0030/13 0169/13 0258/13 0273/14 0418/25	0379/10 0272/11 0456/11 0013/13 0047/13 0201/13 0349/13 0276/14
OPE	0068/31	0297/30					
OPE1	0120/44	0128/44					
OPE10	0413/44	0400/44					
OPE11	0365/44	0623/44					
OPE12	0283/44	0624/44					
OPE13	0551/44	0436/44					
OPE14	0564/44	0380/44	0417/44				
OPE15	0419/44	0522/44	0567/44				
OPE16	0170/44	0157/44	0159/44				
OPE17	0486/44	0613/44					
OPE18	0520/44	0515/44					
OPE19	0535/44	0528/44					
OPE2	0179/44	0132/44	0194/44				
OPE3	0215/44	0201/44					
OPE4	0247/44	0236/44					
OPE4A	0250/44	0282/44					
OPE5	0291/44	0276/44					

CROSS-REFERENCE SYMBOL TABLE

OPE50	0198/44	0184/44	0211/44				
OPE51	0213/44	0182/44					
OPE52	0433/44	0450/44					
OPE6	0272/44	0279/44					
OPE6A	0280/44	0260/44	0265/44				
OPE7	0239/44						
OPE8	0584/44	0306/44					
OPE9	0402/44	0384/44					
OPE98	0592/44	0310/44					
OPEC	0608/44 0296/44 0429/44 0572/44	0117/44 0386/44 0449/44	0127/44 0402/44 0462/44	0191/44 0407/44 0464/44	0208/44 0408/44 0511/44	0269/44 0420/44 0525/44	0278/44 0425/44 0529/44
OPEDA	0611/44 0510/44	0298/44 0516/44	0341/44 0544/44	0442/44 0547/44	0447/44 0615/44	0456/44	0492/44
OPEDE	0576/44	0441/44	0561/44				
OPEDF	0605/44	0249/44	0281/44	0294/44	0382/44	0410/44	
OPEDI	0615/44	0438/44	0558/44				
OPEDS	0539/44	0526/44	0533/44	0548/44			
OPEDU	0610/44	0300/44					
OPEF	0604/44 0192/44 0404/44	0119/44 0215/44 0433/44	0141/44 0234/44 0437/44	0151/44 0274/44 0521/44	0161/44 0291/44 0552/44	0167/44 0345/44	0180/44 0368/44
OPELN	0609/44 0565/44	0257/44	0258/44	0267/44	0375/44	0395/44	0397/44
OPEOR	0620/44	0597/44					
OPEOV	0614/44	0595/44					
OPEP	0606/44 0209/44	0115/44 0214/44	0122/44 0219/44	0123/44 0329/44	0125/44 0513/44	0126/44 0530/44	0199/44
OPER	0140/44	0120/44	0124/44	0130/44	0143/44	0162/44	0168/44
OPER1	0144/44	0150/44					

CROSS-REFERENCE SYMBOL TABLE

OPER2	0163/44	0153/44					
OPER3	0160/44	0165/44					
OPERC	0524/44	0514/44	0517/44	0535/44	0536/44		
OPESB	0569/44	0193/44	0210/44	0574/44			
OPMSK	0387	0430/03	0245/04	0343/04	0038/06	0248/06	0377/06
	0431/06	0477/06	0432/07	0036/08	0076/08	0081/08	0098/08
	0171/08	0263/08	0306/08	0411/09	0133/10	0031/11	0130/11
	0142/11	0226/11	0500/11	0039/12	0067/12	0074/12	0084/12
	0374/12	0392/12	0184/16	0063/17	0200/17	0387/21	0573/21
	0576/21	0395/40	0411/40	0418/40			
OPTRQ	0386/02	0297/12	0302/12	0456/12	0014/13	0016/13	0029/13
	0441/14	0462/14	0464/14				
ORDNO	0492/02	0454/11	0462/11	0468/11	0049/35		
OT1	0322/02	0303/19	0307/19	0315/19			
OT3	0323/02	0308/19	0314/19				
OT4	0324/02	0305/19	0309/19	0312/19			
OTCRA	0374/19	0370/19					
UTST1	0614/21	0624/21					
UTST2	0619/21	0613/21					
OUTBL	0210/02	0333/23	0360/23	0012/24	0112/24	0178/24	0299/24
	0327/25						
OUTC1	0491/30	0481/30	0532/30				
OUTCH	0333	0381/19	0420/29	0072/30	0121/33	0454/49	
OUTCL	0212/02	0441/16	0522/19	0012/25	0159/25	0208/25	0213/25
	0340/25						
OUTCR	0162/02	0627/05	0317/09	0375/09	0377/09	0379/09	0432/09
	0438/09	0443/09	0445/09	0270/10	0284/10	0298/10	0090/11
	0092/11	0261/11	0392/11	0221/12	0223/12	0225/12	0227/12
	0240/12	0242/12	0366/16	0370/16	0404/16	0406/16	0429/16
	0436/16	0464/16	0466/16	0470/16	0472/16	0023/19	0075/19
	0185/19	0226/19	0239/19	0248/19	0255/19	0262/19	0264/19
	0313/19	0320/19	0337/19	0353/19	0355/19	0357/19	0382/19
	0447/19	0476/19	0501/19	0514/19	0516/19	0296/21	0311/21
	0314/21	0316/21	0326/21	0348/21	0358/21	0377/21	0379/21
	0381/21	0405/21	0434/21	0445/21	0450/21	0452/21	0502/21
	0508/21	0520/21	0527/21	0542/21	0548/21	0553/21	0563/21

CROSS-REFERENCE SYMBOL TABLE

	0594/21	0598/21	0618/21	0622/21	0313/23	0315/23	0318/23
	0375/23	0377/23	0380/23	0448/23	0025/24	0047/24	0055/24
	0088/24	0092/24	0099/24	0122/24	0129/24	0131/24	0175/25
	0179/25	0182/25	0186/25	0191/25	0198/25	0205/25	0207/25
	0219/25	0221/25	0223/25	0231/25	0324/25	0333/25	0335/25
	0337/25						
OUTI1	0306/19	0317/19					
OUTI2	0314/19	0310/19					
OUTIN	0164/02	0268/10	0282/10	0396/16	0077/19	0321/19	0356/21
	0368/21	0493/21					
OUTLN	0140/02	0400/02	0080/11	0103/11	0141/17	0142/17	0072/19
	0182/19	0343/19	0358/19	0451/19	0482/19		
OUTM1	0628/28	0477/30	0484/30	0504/30	0711/32		
OUTST	0168/02	0327/09	0591/11	0328/16	0387/16	0394/16	0309/21
	0525/21	0530/21	0561/21	0590/21	0591/21	0592/21	0595/21
	0625/21						
OUTWT	0515	0519/28	0530/28	0303/29	0479/30	0523/30	0416/39
OVFLW	0062/02	0312/02	0443/02	0086/16	0016/22	0309/22	
OWT	0145	0527/30					
P409	0581/58	0458/58					
P8192	0305	0535/51					
PACK1	0275/22	0272/22					
PACK3	0301/22	0286/22					
PACK4	0306/22	0289/22	0299/22				
PBFLG	0522	0074/21	0078/21	0168/21	0475/28		
PBPTR	0046	0207/03	0236/03	0249/03	0250/03	0277/03	0500/05
	0508/05	0570/05	0606/05	0617/05	0440/06	0445/06	0503/06
	0517/06	0031/07	0054/07	0115/07	0125/07	0347/07	0395/07
	0455/07	0462/07	0467/07	0470/07	0131/08	0143/08	0144/08
	0153/08	0154/08	0220/08	0357/08	0403/08	0444/08	0016/09
	0020/09	0045/09	0061/09	0182/09	0187/09	0198/09	0248/09
	0252/09	0256/09	0352/09	0380/09	0303/12	0337/12	0416/12
	0427/12	0429/12	0431/12	0432/12	0475/12	0480/12	0007/13
	0009/13	0020/13	0022/13	0031/13	0033/13	0035/13	0036/13
	0051/13	0053/13	0193/13	0195/13	0270/13	0291/13	0306/13
	0308/13	0309/13	0311/13	0445/14	0448/14	0474/14	0480/14
	0481/14	0170/16	0195/16	0203/16	0245/16	0249/16	0271/16
	0274/16	0497/16	0033/18	0236/18	0231/21	0236/21	0553/29

CROSS-REFERENCE SYMBOL TABLE

	0237/30	0256/30	0246/32	0383/32	0059/33	0369/33	0501/33
	0510/33	0325/34	0505/34	0622/35	0626/35	0049/36	0323/38
	0352/38	0362/38	0370/38	0378/38	0407/38	0434/38	0341/39
	0025/40	0259/40	0387/40	0450/43	0457/43	0472/43	0476/43
PBUFF	0401	0195/03	0237/03	0422/06	0437/06	0448/06	0030/07
	0049/07	0396/07	0459/07	0404/08	0172/16	0230/21	0551/29
	0032/36	0047/36	0388/36	0280/38	0243/39	0018/40	0011/45
PC1	0286/02	0044/23	0063/25	0109/25	0113/25		
PC2	0287/02	0045/23	0075/25	0077/25	0081/25		
PCHK	0098/02	0406/02	0357/13	0380/13	0108/14		
PCHK1	0106/14	0097/14					
PDFBS	0431	0473/12					
PDFFL	0393	0114/04	0239/04	0400/06	0427/21		
PDFNS	0443	0233/04					
PDFTB	0474	0431					
PEND	0386/59	0312/59					
PFLAG	0350/02	0295/03	0389/03	0679/03	0687/03	0697/03	0162/04
	0165/04	0432/05	0438/05				
PFSH1	0404/06	0393/06					
PFSRH	0222/02	0654/03	0711/03	0058/04	0403/06	0408/06	0409/06
PH0	0127	0082/59					
PH05	0079/59	0066/59					
PH06	0061/59	0078/59					
PIBY2	0436/20	0282/20	0425/20				
PINTG	0300/02	0098/06	0103/06	0104/06	0107/06	0114/06	0120/06
	0147/20	0164/20					
PIVEL	0435/02	0073/18	0076/18	0101/18	0108/18	0143/18	0149/18
	0181/18	0192/18					
PKCNT	0660/35	0475/35	0627/35				
PLUS	0507/04	0157/04	0384/04				
PMASK	0290/02	0156/12	0180/12	0182/12	0241/15	0267/15	0301/15
	0341/15	0343/15	0438/15	0464/15			

CROSS-REFERENCE SYMBOL TABLE

POFFP	0576/26	0513/26					
POR,A	0419/48	0140/48					
POR,L	0420/48	0171/48	0176/48				
POR0	0144/48						
POR11	0279/48	0276/48					
POR13	0142/48	0150/48	0165/48				
POR2	0152/48	0147/48					
POR22	0226/48	0211/48	0242/48				
POR3	0168/48	0141/48					
POR4	0193/48	0160/48	0164/48	0187/48			
POR5	0208/48	0224/48					
POR6	0246/48	0220/48	0238/48	0278/48	0282/48		
POR7	0222/48	0219/48					
POR8	0240/48	0237/48					
POR9	0183/48	0191/48					
PORC1	0421/48 0317/48	0135/48 0409/48	0153/48 0412/48	0162/48	0184/48	0189/48	0287/48
PORC2	0422/48	0408/48	0411/48				
PORCN	0418/48	0137/48	0154/48	0185/48			
PORDG	0328/48	0143/48	0335/48				
PORI1	0300/48	0305/48					
PORI2	0306/48	0302/48					
PORI3	0310/48	0315/48					
PORI4	0316/48	0312/48					
PORI5	0324/48	0321/48					
PORIN	0286/48	0157/48	0188/48	0326/48			
PORS1	0540/33	0132/48	0213/48	0217/48	0296/48	0322/48	

CROSS-REFERENCE SYMBOL TABLE

PORS2	0541/33	0133/48	0231/48	0235/48	0298/48	0325/48	
PORSP	0406/48	0145/48	0413/48				
PORTL	0542/33 0257/48	0134/48 0268/48	0209/48	0223/48	0227/48	0241/48	0252/48
POW	0325/26	0254	0341/26	0352/26	0689/32		
POW1	0380/26	0327/26	0568/26	0569/26			
POW14	0457/26	0411/26					
POW2	0375/26	0339/26	0347/26				
POW27	0500/26						
POW28	0574/26	0480/26					
POW29	0491/26	0482/26	0485/26				
POW31	0573/26	0483/26					
POW4	0399/26	0413/26					
POW40	0517/26	0569/26					
POW5	0419/26	0403/26					
POW50	0512/26	0486/26	0498/26	0516/26			
POW52	0497/26	0476/26					
POW6	0409/26	0428/26	0432/26	0451/26			
POWAB	0522/26	0351/26	0508/26				
POWCL	0446/26	0444/26					
POWD1	0568/26	0342/26					
POWD2	0569/26	0345/26					
POWEO	0523/26	0349/26	0504/26				
POWF	0526/26	0390/26	0399/26	0401/26			
POWFF	0519/26 0691/32	0336/26	0338/26	0471/26	0489/26	0502/26	0576/26
POWFL	0525/26	0369/26	0389/26	0462/26			
POWI	0520/26 0424/26	0331/26 0437/26	0350/26 0438/26	0386/26 0448/26	0405/26 0449/26	0409/26	0412/26

CROSS-REFERENCE SYMBOL TABLE

POWIN	0254	0016						
POWJ	0521/26	0384/26	0420/26	0450/26				
POWND	0510/26	0373/26						
POWP	0524/26	0353/26	0479/26	0511/26	0514/26	0534/26		
POWST	0442/26	0440/26						
POWSW	0527/26	0355/26	0381/26	0692/32				
POWTB	0529/26	0419/26	0423/26					
POX1	0539/26	0567/26						
POX2	0553/26	0571/26						
POX3	0566/26	0575/26						
PRCCN	0423/48	0294/48	0299/48	0309/48				
PRDFS	0473/22	0443						
PREG	0009/02	0681/28	0174/29	0199/29				
PRGCT	0387/02	0034/07	0040/07	0055/07	0059/07	0397/09	0407/09	
	0058/10	0064/10	0113/10	0118/10	0126/10	0127/10	0142/10	
	0257/10	0384/10	0028/11	0110/11	0127/11	0246/11	0497/11	
	0064/12	0172/12	0371/12	0389/12	0060/17	0151/17	0188/17	
	0350/17	0413/25	0425/25	0436/25	0446/25	0473/25	0468/35	
	0636/35	0391/36	0343/39					
PRGIN	0026/02	0389/02	0424/03	0511/03	0070/05	0100/05	0229/05	
	0269/05	0088/06	0112/06	0113/06				
PRI1	0123/59	0097/59						
PRI2	0126/59	0108/59	0116/59					
PRIDG	0134/59	0093/59	0098/59	0143/59				
PRIN0	0675/03	0666/03	0672/03	0694/03				
PRIN1	0683/03	0689/03						
PRIN2	0688/03	0710/03	0722/03					
PRIN3	0697/03	0682/03						
PRIN4	0711/03	0702/03						
PRIN5	0714/03	0706/03						

CROSS-REFERENCE SYMBOL TABLE

PRIN6	0720/03	0712/03					
PRIN7	0723/03	0677/03					
PRIN8	0718/03	0713/03					
PRINS	0639/03	0533/05					
PRIST	0162	0258/11	0581/11	0588/11	0211/12	0460/16	0468/16
	0338/29	0427/29	0046/30	0371/30	0055/39	0061/39	0407/39
	0413/39	0023/43	0211/45	0231/45	0116/47	0640/48	0131/59
PRITY	0251/45	0210/45	0214/45	0220/45	0230/45		
PRN01	0665/03	0643/03					
PRN10	0650/03	0664/03					
PRN11	0658/03	0655/03					
PRNS1	0028/08	0332/07	0404/07	0418/07			
PRNS2	0091/08	0180/07	0220/07	0243/07	0258/07	0273/07	0280/07
	0284/07	0294/07	0307/07	0323/07	0412/07	0424/07	0440/07
	0449/07	0044/08	0051/08	0053/08	0055/08	0070/08	0103/08
	0113/08						
PRNS3	0108/08	0100/08					
PRNS4	0050/08	0041/08					
PRNS5	0071/08	0058/08					
PRNS6	0086/08	0079/08					
PRNS1	0074/02	0305/02	0171/07	0403/07	0017/08	0019/08	0107/08
PRO1	0029/44	0020/44					
PRO2	0049/44	0034/44					
PRO20	0390/48	0253/48	0395/48	0403/48			
PRO3	0035/44	0045/44					
PRO30	0399/48	0264/48	0404/48				
PRO4	0056/44	0047/44					
PRO6	0066/44	0057/44					
PRO7	0069/44	0096/44					

CROSS-REFERENCE SYMBOL TABLE

PROC	0089/44	0030/44	0036/44	0037/44	0040/44	0041/44	
PROCH	0368/48	0248/48	0281/48	0360/48	0362/48	0379/48	0385/48
PROD	0088/44	0032/44	0044/44				
PRODG	0383/48	0277/48	0386/48	0393/48	0394/48	0402/48	
PROGB	0297/02	0013	0401	0249/02			
PROPR	0342/48	0221/48	0239/48	0343/48			
PROST	0355/48 0361/48	0196/48 0363/48	0249/48 0364/48	0254/48	0265/48	0356/48	0358/48
PRTOP	0381	0021/04	0077/08	0124/11	0075/12	0413/40	
PS0	0465/02	0185/14	0205/14	0226/14	0232/14	0238/14	0245/14
PS1	0466/02 0252/14	0328/10	0347/10	0353/11	0367/11	0187/14	0210/14
PSC	0147	0128/59					
PSHST	0108/02 0482/14	0401/02	0335/12	0426/12	0474/12	0005/13	0008/13
PSTR	0090/02 0343/11 0249/14	0435/02 0414/11 0258/14	0468/02 0500/11 0265/14	0308/10 0265/13 0432/25	0390/10 0269/13 0420/35	0066/11 0125/14	0155/11 0131/14
PSTR1	0210/14	0206/14					
PSTR2	0214/14	0203/14	0209/14				
PSTR3	0245/14	0230/14					
PSTR4	0248/14	0244/14					
PSTR5	0250/14	0239/14					
PSTR6	0254/14	0264/14					
PSTR7	0259/14	0253/14					
PTABL	0384/59	0158/59	0323/59				
PUDIR	0579/58	0385/58					
PUKED	0578/58	0464/58	0474/58				
PUKES	0577/58	0462/58	0472/58				
PUN	0033/31	0500/29					

CROSS-REFERENCE SYMBOL TABLE

PUNCH	0225/21	0111/31					
PUR1	0356/58	0282/58	0288/58	0298/58	0328/58		
PUR11	0386/58	0395/58					
PUR12	0391/58	0508/58					
PUR13	0398/58	0390/58					
PUR15	0411/58	0490/58					
PUR16	0485/58	0418/58	0460/58				
PUR2	0278/58	0259/58	0271/58				
PUR3	0380/58	0313/58					
PUR4	0312/58	0318/58					
PUR7	0360/58	0316/58					
PURCT	0568/58	0382/58	0455/58	0457/58	0513/58	0517/58	0553/58
PURDG	0342/58	0323/58	0329/58	0344/58	0348/58	0351/58	0352/58
PURDI	0569/58 0507/58	0387/58	0452/58	0454/58	0466/58	0478/58	0494/58
PURDI	0573/58	0283/58	0291/58	0292/58	0294/58	0414/58	
PURDU	0580/58	0393/58					
PURED	0576/58	0541/58	0545/58				
PURER	0364/58	0357/58	0361/58	0368/58			
PURES	0575/58	0539/58	0543/58				
PURF1	0528/58	0554/58					
PURF2	0547/58	0532/58					
PURFX	0512/58	0396/58	0471/58	0515/58	0565/58		
PURHE	0586/58	0255/58					
PURN	0574/58	0325/58	0331/58	0333/58	0337/58	0365/58	0372/58
PURN1	0325/58	0336/58					
PURN2	0337/58	0330/58					

CROSS-REFERENCE SYMBOL TABLE

PURND	0571/58	0402/58	0488/58				
PURNO	0322/58	0278/58	0284/58	0326/58	0338/58	0339/58	
PURP	0572/58	0266/58	0273/58	0412/58	0445/58	0449/58	0486/58
PURTC	0567/58	0516/58					
PURTP	0570/58	0384/58	0421/58	0423/58	0430/58	0431/58	0434/58
	0435/58	0438/58	0439/58	0442/58	0443/58	0529/58	0551/58
	0564/58						
PURUD	0583/58	0561/58					
PURUI	0584/58	0562/58					
PWR2A	0276/20	0265/20					
PZ99	0585/58	0253/58					

CROSS-REFERENCE SYMBOL TABLE

QUOTE	0477/04	0323	0187/06				
R14CM	0419/28	0258	0536/26	0537/26	0550/26	0452/28	0710/32
R14DR	0258	0031	0558/26				
R14ED	0593/28	0550/26					
R14RT	0445/28 0489/28 0543/28	0439/28 0497/28 0551/28	0440/28 0502/28 0565/28	0460/28 0511/28 0573/28	0468/28 0517/28 0591/28	0476/28 0521/28	0484/28 0535/28
R22	0051/21	0018/21	0022/21				
RADT	0279/31 0730/32	0282/31 0013/33	0402/31	0423/31	0424/31	0487/31	0517/31
RADTP	0013/33	0809/39	0402/53	0322/55			
RBOP	0487/04	0080/05					
RBP	0130	0432/03	0257/06	0532/11			
RCRD#	0457/02	0088/12	0158/12	0361/15			
RDO	0430/02	0327/18	0337/18	0342/18	0350/18		
RDIOT	0097/33 0501/39	0744/32 0761/39	0114/33 0566/43	0146/33 0228/44	0072/36 0366/44	0234/36	0084/39
RDIM1	0335/18	0331/18					
RDPJP	0420/32	0257/32	0275/32	0394/32			
RDPRG	0055/33 0404/35 0211/38	0743/32 0572/35 0318/38	0072/33 0655/35 0312/39	0252/34 0035/36 0820/39	0436/34 0295/36 0020/40	0122/35 0068/38 0447/43	0265/35 0188/38 0006/45
RDPRJ	0074/33	0420/32	0069/33	0380/33	0059/36		
READ1	0617/03	0611/03					
READS	0610/03	0532/05					
READY	0175	0215/29	0257/39				
RECR0	0143/06	0139/06					
RECR1	0147/06	0135/06					
RECRF	0184/02 0146/06	0379/02 0150/06	0610/03	0665/03	0025/04	0068/04	0136/06

CROSS-REFERENCE SYMBOL TABLE

REDIM	0174/02	0324/02	0465/02	0494/02	0068/17	0352/17	0354/18
RELOS	0517/04	0502/03					
REMOP	0369	0050/08	0514/21				
REMS	0284/05	0521/05					
REN0	0332/40	0330/40					
REN1	0130/40	0040/40	0043/40	0049/40			
REN10	0292/40	0300/40					
REN11	0309/40						
REN12	0316/40	0323/40					
REN13	0324/40	0109/40	0311/40	0317/40			
REN14	0239/40	0226/40					
REN15	0209/40	0229/40					
REN16	0271/40	0278/40					
REN17	0282/40	0265/40	0275/40				
REN18	0280/40	0263/40					
REN2	0145/40	0136/40					
REN20	0069/40	0081/40					
REN21	0082/40	0071/40	0076/40				
REN22	0089/40	0055/40					
REN23	0095/40	0106/40					
REN24	0107/40	0097/40	0101/40				
REN25	0149/40	0156/40					
REN26	0160/40	0151/40					
REN27	0134/40	0141/40					
REN28	0301/40	0294/40					
REN29	0121/40	0112/40					
REN3	0187/40	0176/40	0181/40				

CROSS-REFERENCE SYMBOL TABLE

REN4	0244/40	0285/40					
REN5	0261/40	0252/40					
REN6	0268/40	0260/40					
REN7	0248/40	0256/40					
REN8	0284/40	0277/40					
REN9	0289/40	0189/40	0245/40				
RENBA	0455/40 0122/40	0034/40 0148/40	0053/40 0290/40	0090/40	0092/40	0099/40	0110/40
RENC	0451/40	0026/40	0187/40	0309/40			
RENC1	0458/40	0197/40	0218/40	0219/40	0269/40	0274/40	
RENC2	0459/40	0198/40	0215/40				
RENC3	0460/40	0221/40	0227/40				
RENE	0456/40 0175/40	0029/40 0180/40	0070/40 0302/40	0096/40	0108/40	0135/40	0163/40
RENF1	0370/40	0046/40	0052/40	0058/40	0062/40	0126/40	0355/40
RENF2	0328/40	0120/40	0168/40	0173/40	0186/40		
RENL	0448/40 0147/40 0356/40	0068/40 0155/40 0358/40	0077/40 0161/40 0361/40	0083/40 0170/40 0366/40	0094/40 0184/40	0104/40 0343/40	0118/40 0352/40
RENLA	0461/40 0162/40	0035/40 0174/40	0059/40 0293/40	0074/40	0084/40	0124/40	0150/40
RENM	0449/40	0037/40	0041/40	0116/40	0169/40	0291/40	
RENN	0450/40	0038/40	0047/40	0165/40	0296/40		
RENNS	0457/40	0132/40	0140/40	0191/40			
RENP	0452/40 0318/40	0242/40 0322/40	0250/40 0377/40	0270/40 0382/40	0282/40 0430/40	0284/40 0437/40	0315/40
RENG	0453/40 0393/40 0428/40	0240/40 0394/40 0431/40	0313/40 0409/40 0435/40	0378/40 0410/40 0445/40	0386/40 0416/40	0391/40 0417/40	0392/40 0422/40
RENR	0454/40	0379/40	0390/40	0427/40			
RENS1	0384/40	0432/40	0440/40	0443/40			

CROSS-REFERENCE SYMBOL TABLE

RENS2	0387/40	0381/40	0383/40	0415/40	0421/40	0425/40	0446/40
RENS3	0434/40	0401/40	0403/40	0405/40	0447/40		
RENS4	0437/40	0444/40					
RENS5	0445/40	0399/40					
RENS6	0412/40	0408/40					
RENSK	0376/40	0244/40	0316/40	0384/40	0385/40	0388/40	
RENSN	0462/40	0200/40	0212/40	0213/40	0223/40		
RENU1	0346/40	0364/40					
RENU2	0365/40	0348/40	0351/40				
RENUM	0341/40 0369/40	0039/40	0045/40	0051/40	0057/40	0345/40	0367/40
REP1	0655/45	0649/45	0744/45	0760/45			
REP2	0652/45	0755/45					
REP29	0806/45	0606/45					
REP3	0757/45	0727/45					
REP4	0692/45	0761/45					
REP56	0808/45	0741/45	0757/45				
REP57	0807/45	0648/45	0651/45				
REPAB	0610/45	0619/45					
REPAF	0620/45	0614/45					
REPBO	0805/45	0774/45					
REPBK	0797/45 0708/45 0775/45	0631/45 0719/45 0776/45	0635/45 0720/45 0702/45	0659/45 0721/45 0783/45	0703/45 0742/45 0786/45	0704/45 0749/45 0787/45	0707/45 0758/45
REPC	0295/02 0521/19 0164/23 0327/23 0069/24 0306/24	0465/19 0523/19 0165/23 0335/23 0072/24 0062/25	0477/19 0526/19 0177/23 0354/23 0107/24 0074/25	0480/19 0096/23 0198/23 0381/23 0114/24 0325/25	0499/19 0150/23 0202/23 0384/23 0177/24	0502/19 0161/23 0205/23 0006/24 0180/24	0505/19 0162/23 0244/23 0014/24 0298/24
REPET	0731/45	0740/45					

CROSS-REFERENCE SYMBOL TABLE

REPEV	0747/45	0734/45					
REPFX	0804/45	0702/45					
REPHD	0790/45	0604/45					
REPID	0798/45 0698/45 0722/45	0668/45 0709/45	0676/45 0711/45	0677/45 0712/45	0684/45 0714/45	0686/45 0715/45	0692/45 0716/45
REPK	0800/45	0664/45	0672/45	0780/45	0784/45		
REPLN	0796/45 0738/45	0596/45	0600/45	0647/45	0667/45	0723/45	0725/45
REPMS	0803/45	0700/45					
REPND	0802/45	0743/45	0759/45				
REPNI	0594/45	0588/45					
REPNM	0763/45	0706/45	0769/45	0781/45	0785/45		
REPNT	0660/45	0745/45					
REPPT	0795/45 0736/45	0611/45	0622/45	0634/45	0661/45	0665/45	0732/45
REPS	0650/45	0617/45					
REPSC	0633/45	0643/45					
REPSE	0644/45	0641/45					
REPSG	0615/45	0636/45					
REPSL	0809/45	0750/45					
REPT	0799/45	0696/45	0705/45				
REPTR	0771/45	0713/45	0717/45	0788/45			
REPTT	0801/45	0753/45					
RERRA	0000/15	0315/16					
RERRS	0530 0250/07 0367/07 0169/09 0187/11 0122/12 0214/13 0251/14	0625/05 0264/07 0368/07 0186/09 0016/12 0129/12 0219/13 0413/14	0524/06 0297/07 0049/08 0070/10 0017/12 0167/12 0359/13 0416/14	0562/06 0326/07 0065/08 0204/10 0018/12 0171/12 0099/14 0479/14	0566/06 0338/07 0229/08 0145/11 0019/12 0301/12 0218/14 0006/15	0043/07 0343/07 0460/08 0176/11 0020/12 0192/13 0222/14 0007/15	0222/07 0366/07 0064/09 0182/11 0081/12 0199/13 0246/14 0101/15

CROSS-REFERENCE SYMBOL TABLE

	0108/15	0116/15	0229/15	0505/15	0256/16	0215/17	0220/17
	0225/17	0232/17	0263/17	0270/17	0282/17	0364/17	0396/17
	0402/17	0031/18	0140/18	0301/18	0304/18	0324/18	0334/18
	0341/18	0362/18	0030/20	0032/20	0037/20	0158/20	0294/20
	0341/20	0010/21	0104/21	0263/21	0267/21	0277/21	0280/21
	0286/21						
RES1	0685/48	0748/48	0780/48	0789/48			
RES2	0784/48	0683/48					
RES3	0788/48	0802/48					
RES4	0754/48	0699/48					
RES42	0756/48	0762/48					
RES5	0701/48	0720/48					
RES51	0716/48	0702/48					
RES6	0726/48	0759/48					
RES61	0736/48	0747/48					
RES62	0749/48	0732/48					
RESC	0813/48	0690/48	0701/48	0757/48			
RESCA	0805/48	0675/48					
RESCL	0806/48	0767/48	0775/48				
RESD	0815/48	0796/48	0799/48				
RESEK	0808/48	0704/48	0713/48	0811/48	0811/48		
RESES	0811/48	0708/48	0711/48				
RESLE	0807/48	0743/48					
RESOP	0463/40	0398/40					
REST	0814/48	0671/48	0723/48	0755/48	0797/48	0800/48	
RESX1	0764/48	0676/48					
RESX2	0771/48	0768/48					
RESX3	0778/48	0776/48					
RESXE	0678/48	0770/48					
RETAD	0238/16	0224/16					

CROSS-REFERENCE SYMBOL TABLE

RETCU	0291/02	0489/11	0494/11	0495/11	0530/11		
RIDCL	0794/45	0616/45	0733/45				
RKCYP	0011/33 0251/44 0125/56	0095/36 0255/44 0132/56	0099/36 0262/44 0262/56	0106/36 0377/44 0290/56	0248/36 0414/44 0305/56	0274/36 0566/44	0290/36 0121/56
RNDA1	0112/20	0084/20					
RNDA2	0113/20	0081/20	0091/20				
RNDC1	0114/20	0086/20					
RNDC2	0115/20	0092/20					
RNDX1	0240/02 0100/20	0077/20	0080/20	0082/20	0085/20	0087/20	0098/20
RNDX2	0241/02	0078/20	0083/20	0090/20	0096/20		
ROND1	0284/25	0295/25					
ROND2	0306/25	0302/25					
ROS	0080/31	0073/27	0197/30				
ROS1	0469/48	0503/48					
ROS2	0472/48	0468/48					
ROS3	0494/48	0474/48					
ROS4	0497/48	0493/48					
ROSC	0508/48	0465/48	0502/48				
ROSDU	0514/48	0494/48					
ROSFX	0513/48	0484/48					
ROSID	0510/48	0467/48	0472/48	0480/48	0499/48	0501/48	
ROSLB	0509/48	0431/48					
ROSMS	0512/48	0482/48					
ROSP	0507/48 0496/48	0463/48 0497/48	0470/48 0498/48	0471/48	0485/48	0486/48	0495/48
ROST	0511/48	0478/48	0487/48				
ROSTB	0460/48	0433/48	0441/48	0446/48	0451/48	0466/48	0504/48

CROSS-REFERENCE SYMBOL TABLE

	0505/48						
ROUND	0208/02 0305/25	0428/23 0309/25	0201/24 0311/25	0313/24	0172/25	0281/25	0289/25
RPARN	0491/04	0351/04	0078/05	0310/06			
RPCK	0034/02	0392/02	0300/03	0136/04	0277/04	0070/06	0317/06
RPOP	0349	0522	0353/04	0312/06			
RQ1	0449/02	0090/15	0114/15	0195/15	0230/15		
RQ2	0450/02	0093/15	0117/15	0120/15	0168/15	0204/15	0274/15
RQ3	0451/02 0244/15	0480/11 0441/15	0611/11 0484/15	0183/15 0491/15	0206/15 0381/35	0216/15	0234/15
RQ4	0452/02	0172/15	0276/15				
RQ5	0453/02	0178/15	0197/15				
RQS10	0224/15	0212/15					
RQS11	0245/15	0256/15	0265/15				
RQS12	0263/15	0269/15					
RQS13	0270/15	0246/15	0249/15	0251/15			
RQS14	0273/15	0232/15	0235/15	0240/15			
RQS15	0194/15	0190/15					
RQST2	0147/15	0121/15					
RQST3	0230/15	0192/15					
RQST4	0233/15	0196/15					
RQST5	0236/15	0226/15					
RQST6	0146/15	0124/15					
RQST7	0150/15	0145/15					
RQST8	0213/15	0203/15					
RQST9	0281/15	0119/15					
RQSTR	0190/02	0094/12	0284/15	0366/15	0378/15	0162/20	
RSCH1	0450/14	0458/14					

CROSS-REFERENCE SYMBOL TABLE

RSCH2	0459/14	0453/14					
RSCHK	0118/02 0285/14	0313/02 0372/14	0431/02 0443/14	0461/02 0466/14	0378/12	0018/13	0060/13
RSFAE	0190/31	0182/31					
RSFS	0170/31 0014/33	0203/31	0220/31	0229/31	0242/31	0260/31	0729/32
RSFSP	0014/33	0787/39	0438/51	0283/55	0156/58	0542/58	
RSPTR	0404/02	0293/11	0378/11	0379/11	0380/11	0382/11	0384/11
RST01	0165/05	0161/05					
RSTOP	0080/02 0358/05	0385/02 0377/05	0318/03	0504/03	0164/05	0167/05	0292/05
RSTP1	0269/08	0265/08					
RSTP2	0271/08	0291/08					
RSTP3	0287/08	0309/08					
RSTP4	0292/08	0281/08					
RSTP5	0314/08	0257/08	0335/08				
RSTP6	0333/08	0324/08	0330/08	0354/08			
RSTP7	0339/08	0321/08	0349/08				
RSTP8	0350/08	0344/08	0347/08				
RSTP9	0355/08	0316/08					
RSTPT	0200/02	0074/07	0358/08	0400/36			
RSTR1	0271/05	0267/05					
RSTRS	0266/05	0534/05					
RT0	0471/02	0444/14	0465/14				
RT1	0472/02	0449/14	0451/14	0455/14	0456/14		
RTNST	0381/02 0067/10	0330/09 0202/10	0383/09 0207/10	0427/09	0430/09	0065/10	0066/10
RTRNG	0380/02	0382/09	0420/09	0446/09	0069/10	0203/10	
RVRSL	0003/26	0199/27					

CROSS-REFERENCE SYMBOL TABLE

S	0004/23	0142/23	0437/23				
S14LP	0271	0064/07	0596/11	0492/16	0393/19	0486/30	0528/30
S14SC	0270	0271	0421/03	0436/03	0466/03	0633/05	0191/06
	0246/06	0258/06	0409/19	0307/28	0317/28	0610/28	0210/29
	0311/29	0412/29	0415/29	0456/29	0009/30	0030/30	0054/30
	0109/30	0336/30	0427/30	0444/30	0156/33	0045/39	0059/39
	0217/39	0235/39	0411/39	0546/39	0559/39	0562/39	0320/41
	0028/42	0004/43	0090/45	0222/45	0411/45	0422/45	0097/47
	0260/48	0271/48	0615/48	0632/48	0647/48	0195/49	0209/49
	0237/49	0083/59	0129/59	0289/59	0296/59		
S14SH	0395/28	0270	0415/28	0709/32			
S8184	0515/37	0102/37					
SA1	0144/21	0139/21					
SA2	0145/21	0114/21					
SAD	0288/02	0091/23	0236/23	0416/23	0186/24	0219/24	0248/24
SAL1	0036/28	0067/28					
SAL2	0090/28	0038/28	0056/28	0077/28			
SAL3	0045/28	0042/28					
SAL4	0059/28	0066/28					
SAL5	0070/28	0063/28					
SALCP	0097/28	0022/28	0083/28	0703/32			
SALDA	0100/28	0031/28	0050/28	0052/28	0072/28	0082/28	
SALEC	0102/28	0049/28	0065/28	0704/32			
SALFA	0110/28	0091/28					
SALSU	0106/28	0094/28					
SALTL	0098/28	0025/28	0032/28	0073/28			
SALTS	0101/28	0035/28	0061/28				
SALVA	0428/32						
SALVG	0021/28	0137/03	0086/28	0093/28	0428/32	0701/32	0018/33
SALVP	0018/33	0654/35	0336/36	0221/38	0344/38	0206/39	0571/39
	0830/39	0087/44	0752/48	0124/49	0436/49	0124/50	0306/57
	0662/57	0211/58	0274/58				

CROSS-REFERENCE SYMBOL TABLE

SALVW	0137/03	0104/03			
SALWL	0099/28	0028/28	0036/28	0043/28	0046/28
SAM2K	0104/28	0045/28			
SANBK	0758/57	0521/57			
SANCC	0508/57	0502/57			
SANCA	0520/57	0514/57			
SANCB	0525/57	0519/57			
SANCC	0559/57	0572/57			
SANCD	0568/57	0564/57			
SANCM	0576/57	0543/57	0571/57		
SANCO	0580/57				
SANCP	0583/57	0579/57			
SANCR	0597/57	0605/57			
SANCT	0611/57	0602/57			
SANCV	0633/57	0621/57			
SANDD	0664/57	0658/57			
SANEA	0731/57	0504/57	0734/57		
SANEB	0736/57	0705/57	0739/57		
SANEC	0741/57	0709/57	0744/57		
SANED	0745/57	0713/57	0748/57		
SANEE	0750/57	0607/57	0753/57		
SANFA	0734/57	0505/57			
SANFB	0739/57	0706/57			
SANFC	0744/57	0710/57			
SANFD	0748/57	0714/57			
SANFE	0753/57	0608/57			
SANIL	0716/57	0506/57	0609/57	0707/57	0711/57

CROSS-REFERENCE SYMBOL TABLE

SANIP	0693/57	0486/57	0488/57	0490/57	0701/57		
SANKB	0705/57	0518/57	0523/57				
SANKC	0709/57	0530/57					
SANKD	0713/57	0567/57					
SANLA	0754/57	0512/57	0577/57	0697/57	0700/57		
SANLB	0755/57	0550/57	0562/57	0584/57	0598/57	0617/57	0665/57
SANLC	0756/57	0566/57	0594/57	0604/57	0616/57	0650/57	0684/57
SANLD	0757/57	0612/57	0619/57				
SAV0	0040/36	0304/36					
SAV10	0169/36	0422/36					
SAV11	0172/36	0169/36					
SAV12	0137/36	0174/36					
SAV21	0233/36	0373/36					
SAV23	0129/36	0374/36					
SAV24	0298/36	0427/36					
SAV25	0301/36	0298/36					
SAV3	0337/36	0029/36					
SAV30	0272/36	0251/36	0293/36				
SAV31	0295/36	0275/36					
SAV32	0333/36	0326/36					
SAV4	0338/36	0033/36					
SAV5	0046/36	0041/36	0042/36				
SAV50	0060/36	0405/36					
SAV51	0062/36	0060/36					
SAV6	0091/36	0081/36					
SAV7	0147/36	0121/36					
SAV9	0083/36						

CROSS-REFERENCE SYMBOL TABLE

SAV98	0343/36	0178/36					
SAV99	0369/36	0348/36					
SAVBA	0094/36	0127/36					
SAVBD	0116/36	0124/36					
SAVBF	0125/36	0104/36	0109/36				
SAVC	0360/36 0284/36	0113/36	0123/36	0153/36	0257/36	0278/36	0283/36
SAVCF	0277/36	0255/36					
SAVCG	0289/36	0271/36					
SAVD	0362/36 0246/36	0025/36 0266/36	0054/36 0268/36	0056/36 0273/36	0101/36	0102/36	0111/36
SAVDF	0363/36	0093/36	0126/36	0151/36	0253/36	0286/36	
SAVDP	0352/36	0158/36	0302/36				
SAVDS	0358/36	0155/36	0209/36	0352/36	0377/37		
SAVDU	0364/36	0164/36	0374/37				
SAVE	0046/31	0494/29					
SAVI	0356/36	0176/36	0216/36	0218/36	0220/36		
SAVLN	0365/36	0068/36	0075/36	0119/36	0148/36	0236/36	0280/36
SAVO	0048/31	0351/36	0614/44	0506/56	0439/57		
SAVOV	0351/36	0346/36					
SAVP	0361/36 0197/36	0023/36 0303/36	0030/36 0365/37	0036/36	0050/36	0062/36	0070/36
SAVS	0357/36	0187/36	0192/36				
SAVWD	0359/36	0065/36	0213/36	0296/36	0381/37		
SB1	0146/21	0141/21					
SB2	0147/21	0116/21					
SBD	0289/02 0220/24	0090/23 0247/24	0233/23	0234/23	0415/23	0444/23	0185/24
SBFIX	0088/02	0052/10	0452/11	0080/12	0097/12	0191/13	0198/13

CROSS-REFERENCE SYMBOL TABLE

	0021/15 0471/35	0023/15	0027/15	0028/15	0323/18	0333/18	0157/20
SBHED	0049	0116/29	0128/29	0378/29	0406/30	0418/30	
SBJTB	0249	0236/02					
SBP	0129	0131	0417/03	0190/06	0345/28		
SBPTR	0246/02 0307/03 0428/03 0486/03 0586/03 0011/04 0218/04 0301/04 0376/04 0180/05 0326/05 0591/05 0141/06 0198/06 0313/06 0535/06 0233/11 0277/11 0199/14 0072/17 0107/17 0326/18 0349/18 0464/25	0410/02 0309/03 0429/03 0487/03 0624/03 0014/04 0232/04 0322/04 0402/04 0205/05 0327/05 0598/05 0145/06 0223/06 0378/06 0552/06 0242/11 0292/11 0340/15 0091/17 0108/17 0328/18 0176/22 0477/25	0251/03 0341/03 0431/03 0494/03 0653/03 0057/04 0242/04 0332/04 0036/05 0218/05 0341/05 0599/05 0148/06 0224/06 0395/06 0231/10 0243/11 0301/11 0502/16 0092/17 0119/17 0336/18 0178/22 0478/25	0271/03 0376/03 0449/03 0505/03 0695/03 0089/04 0243/04 0334/04 0081/05 0236/05 0435/05 0616/05 0149/06 0233/06 0396/06 0360/10 0244/11 0302/11 0057/17 0093/17 0120/17 0338/18 0459/25 0479/25	0272/03 0386/03 0452/03 0535/03 0699/03 0104/04 0247/04 0339/04 0130/05 0237/05 0476/05 0081/06 0159/06 0252/06 0406/06 0376/10 0269/11 0303/11 0069/17 0101/17 0135/17 0343/18 0461/25	0275/03 0398/03 0473/03 0539/03 0716/03 0107/04 0263/04 0341/04 0138/05 0271/05 0477/05 0083/06 0192/06 0297/06 0407/06 0382/10 0275/11 0311/11 0070/17 0103/17 0137/17 0347/18 0462/25	0276/03 0427/03 0476/03 0562/03 0717/03 0116/04 0283/04 0354/04 0158/05 0308/05 0565/05 0086/06 0196/06 0298/06 0534/06 0060/11 0276/11 0376/11 0071/17 0104/17 0138/17 0348/18 0463/25
SBPUD	0046/02 0675/03 0361/04 0064/06 0539/06	0391/03 0696/03 0075/05 0069/06 0177/22	0450/03 0707/03 0082/05 0084/06 0179/22	0453/03 0043/04 0165/05 0087/06	0571/03 0054/04 0232/05 0226/06	0639/03 0085/04 0474/05 0299/06	0650/03 0288/04 0481/05 0314/06
SBSC1	0060/05	0099/05	0102/05				
SBSC3	0070/05	0063/05	0067/05	0098/05	0106/05		
SBSC4	0095/05	0059/05					
SBSC5	0100/05	0040/05					
SBSCK	0016/02 0087/05	0378/02 0092/05	0034/04 0094/05	0127/04 0221/05	0030/05 0420/05	0031/05	0043/05
SBT0	0347/02	0533/06	0538/06				
SBUFA	0336/02	0252/03	0561/05	0563/05	0571/05	0586/05	0595/05

CROSS-REFERENCE SYMBOL TABLE

	0596/05	0605/05					
SCALR	0432/02 0124/18	0332/17 0187/18	0087/18 0198/18	0093/18 0216/18	0115/18 0261/18	0118/18 0266/18	0121/18 0272/18
SCH1	0252/29 0421/29 0245/30 0481/44	0695/28 0432/29 0289/30	0017/29 0445/29 0327/30	0261/29 0021/30 0512/30	0273/29 0162/30 0079/33	0348/29 0189/30 0418/33	0416/29 0215/30 0486/33
SCH11	0436/29	0384/29					
SCH12	0521/29	0508/29					
SCH13	0538/29	0528/29					
SCH14	0532/29	0542/29					
SCH15	0152/29	0027/29	0048/29	0098/29	0106/29	0112/29	
SCH16	0104/29	0029/29	0053/29				
SCH17	0142/29	0122/29					
SCH18	0144/29	0123/29	0124/29				
SCH19	0141/29	0135/29					
SCH2	0441/33	0448/33					
SCH20	0418/29	0408/29	0517/29	0548/29	0031/30	0107/31	
SCH21	0097/29	0148/29					
SCH22	0448/29	0439/29					
SCH23	0136/29	0110/29					
SCH24	0469/29	0452/29					
SCH25	0440/29	0393/29					
SCH26	0489/29	0479/29	0483/29				
SCH27	0485/29	0471/29	0473/29	0475/29			
SCH28	0505/29	0492/29					
SCH29	0512/29	0495/29	0497/29	0499/29	0501/29	0503/29	
SCH3	0015/29	0140/29	0295/29	0332/29	0402/29	0536/29	
SCH30	0404/29	0381/29					

CROSS-REFERENCE SYMBOL TABLE

SCH4	0368/29	0277/29					
SCH5	0025/29	0281/29					
SCH51	0287/29	0371/29					
SCH52	0050/29	0035/29					
SCH6	0376/29	0280/29					
SCH61	0529/29	0364/29					
SCH7	0299/29	0279/29	0421/32				
SCH75	0333/29	0316/29					
SCH78	0346/29						
SCH8	0352/29	0278/29					
SCH9	0389/29	0382/29					
SCHAR	0405/30 0422/30	0093/30 0439/30	0123/30 0440/30	0139/30 0445/30	0416/30 0720/32	0420/30	0421/30
SCHB1	0419/33	0403/33					
SCHBL	0396/33	0256/34	0510/34	0343/35	0641/35	0657/35	
SCHED	0677/28	0671/28					
SCHEN	0283 0549/21	0628/05 0184/33	0634/05 0226/33	0600/11 0340/33	0451/16	0538/21	0545/21
SCHEQ	0354/30	0283					
SCHID	0052	0268/29	0392/29	0436/29			
SCHIN	0285	0264/11	0232/12	0330/16			
SCHIQ	0331/30	0285	0339/30				
SCHL	0050	0118/29	0435/33	0449/33	0450/33		
SCHLB	0297	0364/07	0490/11	0014/12			
SCHLQ	0350/33 0205/34 0253/35 0637/35	0297 0320/34 0488/35 0522/56	0754/32 0331/34 0490/35 0455/57	0381/33 0113/35 0491/35	0382/33 0145/35 0496/35	0408/33 0179/35 0547/35	0421/33 0251/35 0608/35
SCHQ0	0514/30	0516/30	0723/32	0023/33			
SCHQ0	0023/33	0168/41	0330/41	0347/41	0572/41	0037/42	0054/42

CROSS-REFERENCE SYMBOL TABLE

	0180/42	0253/42	0282/42	0294/42	0365/42	0437/42	0451/42
	0466/42	0539/42	0065/43	0093/43	0116/43	0157/43	0171/43
	0199/43	0214/43	0227/43	0251/43	0273/43	0278/43	0363/45
	0369/45	0389/45					
SCHP	0053	0120/29	0379/29	0469/29	0482/29	0493/29	0505/29
	0102/30	0118/30	0122/30	0138/30	0144/30	0441/33	0451/33
SCHPR	0055	0439/33	0446/33				
SCHQ1	0369/30	0357/30					
SCHQ2	0379/30	0376/30					
SCHQ3	0381/30	0373/30					
SCHR1	0423/30	0408/30	0432/30				
SCHR2	0441/30	0434/30					
SCHS1	0022/29	0255/29					
SCHSQ	0518/30	0599/42					
SCLPR	0044/30	0339/29	0428/29	0055/30	0378/30		
SCMMA	0503/04	0062/05					
SCNT	0054	0092/30	0119/30				
SCOM	0090/30	0121/29	0380/29	0094/30	0095/30	0098/30	0104/30
	0110/30	0111/30	0114/30	0117/30	0124/30	0134/30	0137/30
	0145/30	0718/32					
SCOM1	0407	0128/30					
SCOM5	0409	0133/30					
SCOMA	0128/30	0121/30					
SCOMB	0113/30	0126/30					
SCOMC	0137/30	0132/30					
SCOMD	0131/30	0136/30					
SCOME	0111/30	0101/30					
SCOMM	0435	0478/06	0307/08				
SCR	0025/31	0472/29					
SCRAT	0550/29	0547/29	0560/29	0545/30			

CROSS-REFERENCE SYMBOL TABLE

SDIR0	0517/37	0013/37	0052/37	0200/37	0222/37	0254/37	0493/37
SDIRL	0518/37	0033/37	0067/37	0081/37	0391/37		
SDIRU	0519/37	0269/37					
SEMI	0481/04	0548/03	0052/04				
SEMI1	0508/33	0497/33					
SEMI2	0521/33	0526/33					
SEMI3	0534/33	0507/33					
SEMIC	0493/33	0761/32	0539/33	0609/35	0236/38	0329/39	
SER1	0355/25	0368/25					
SER10	0425/16	0439/16					
SER11	0433/16	0424/16					
SER12	0440/16	0432/16					
SER13	0442/16	0409/16					
SER5A	0469/16	0457/16	0462/16				
SER7A	0184/03	0258/03					
SERR	0178/02	0527	0529	0530	0532	0533	0535
	0536	0538	0329/02	0330/02	0242/10	0259/10	0317/10
	0225/16	0310/16	0415/16				
SERR1	0336/16	0237/16	0310/16				
SERR2	0373/16	0482/16	0496/16				
SERR3	0397/16	0389/16					
SERR4	0405/16	0332/16					
SERR5	0453/16	0364/16					
SERR6	0497/16	0322/16					
SERR7	0516/16	0184/03					
SERR8	0414/16	0402/16					
SERR9	0416/16	0412/16					
SERRA	0005/15	0312/16					

CROSS-REFERENCE SYMBOL TABLE

SERRB	0362/16	0358/16					
SERRS	0527	0280/03	0317/03	0321/03	0327/03	0344/03	0348/03
	0354/03	0362/03	0367/03	0369/03	0379/03	0384/03	0407/03
	0439/03	0443/03	0447/03	0475/03	0482/03	0503/03	0510/03
	0520/03	0524/03	0529/03	0533/03	0544/03	0554/03	0565/03
	0575/03	0584/03	0598/03	0603/03	0616/03	0627/03	0649/03
	0652/03	0663/03	0673/03	0698/03	0725/03	0808/04	0820/04
	0829/04	0841/04	0845/04	0853/04	0856/04	0866/04	0872/04
	0880/04	0888/04	0899/04	0111/04	0128/04	0133/04	0139/04
	0146/04	0158/04	0169/04	0175/04	0256/04	0258/04	0265/04
	0268/04	0271/04	0276/04	0300/04	0314/04	0320/04	0405/04
	0420/04	0079/05	0105/05	0117/05	0140/05	0163/05	0184/05
	0186/05	0192/05	0217/05	0231/05	0307/05	0314/05	0321/05
	0333/05	0335/05	0340/05	0344/05	0352/05	0362/05	0369/05
	0371/05	0425/05	0604/05	0666/06	0111/06	0311/06	0537/06
	0550/06	0805/15	0806/15				
SETD1	0045/12	0041/12					
SETD2	0049/12	0035/12					
SETDP	0102/02	0307/02	0388/09	0212/11	0052/12	0118/12	0172/20
SETPT	0144/02	0316/02	0386/09	0104/10	0170/10	0195/10	0174/12
	0304/12						
SFC7	0570/26						
SFLAG	0534/04	0297/03	0310/03	0313/03	0320/03	0342/03	0488/03
	0490/03	0625/03	0656/03	0718/03	0369/04	0394/04	0437/04
	0438/04	0463/04	0101/05	0137/05	0141/05	0159/05	0162/05
	0219/05	0258/05					
SFLG	0477/02	0046/23	0223/23	0225/23	0245/23	0323/24	0092/25
	0124/25						
SFLGA	0258/05	0298/05	0342/05	0364/05			
SICK	0119/28	0138/03	0010/15	0474/27	0492/27	0123/28	0634/28
	0427/32	0706/32	0017/33				
SICKA	0427/32						
SICKL	0010/15	0361/16					
SICKM	0127/28	0121/28					
SICKP	0017/33	0391/33	0337/34	0434/34	0185/35	0263/35	0371/36
	0022/39	0039/39	0115/39	0430/39	0450/39	0678/39	0723/39
	0793/39	0085/42	0110/42	0621/44	0627/45	0683/45	0694/48
	0028/49	0321/49	0409/49	0421/49	0074/50	0068/51	0606/51
	0303/52	0335/52	0535/54	0083/56	0527/56	0108/57	0204/57
	0340/57	0461/57	0556/57	0590/57	0637/57	0646/57	0682/57

CROSS-REFERENCE SYMBOL TABLE

	0687/57	0090/58	0154/58	0163/58	0309/58		
SICKW	0138/03	0058/03					
SICKZ	0634/28	0213/30					
SIGN	0301/02	0573/03	0596/03	0601/03	0297/04	0233/10	0236/10
	0278/10	0289/10	0313/11	0324/11	0052/19	0073/19	0183/19
	0461/21	0170/22	0266/23	0283/23	0419/23	0447/23	0046/24
	0087/24	0189/24	0223/24	0251/24	0174/25		
SINIT	0170/02	0466/02	0246/03	0035/07	0311/12	0235/21	
SLE0	0235/49	0240/49					
SLE1	0186/49	0199/49					
SLE2	0285/49	0375/49					
SLE3	0373/49	0287/49					
SLE4	0414/49	0425/49					
SLE5	0389/49	0394/49					
SLE6	0434/49	0371/49					
SLE7	0247/49	0275/49					
SLE8	0268/49	0252/49	0262/49				
SLEBA	0468/49	0402/49	0463/49				
SLEBD	0463/49	0405/49					
SLEC1	0448/49	0458/49					
SLEC2	0456/49	0450/49					
SLECA	0432/49	0431/49					
SLECH	0442/49	0214/49	0216/49	0218/49	0222/49	0225/49	0227/49
	0229/49	0459/49					
SLECT	0466/49	0411/49	0424/49				
SLEHI	0430/49	0500/49					
SLENG	0343/02	0195/06	0202/06	0209/06	0218/06	0240/06	
SLEPT	0097						
SLERE	0177/49	0175/49					

.....

CROSS-REFERENCE SYMBOL TABLE

SLEST	0462/49	0178/49					
SLETP	0467/49 0423/49	0413/49	0414/49	0416/49	0417/49	0419/49	0422/49
SM31	0354/36	0327/36					
SM504	0511/37	0504/37					
SM507	0353/36	0344/36					
SMAIN	0631/28	0163/30	0208/30	0234/30	0253/30	0323/30	0713/32
SMBGN	0342/02	0193/06	0231/06	0249/06	0251/06		
SMSK	0004/15	0114/16	0138/16				
SMULA	0016/17	0336/17					
SMULT	0260/18	0016/17					
SNFLG	0488/02 0038/24	0092/23 0043/24	0424/23 0049/24	0441/23 0081/24	0450/23 0090/24	0002/24 0194/24	0036/24 0265/24
SOURC	0326/02 0269/16	0174/16 0275/16	0187/16	0188/16	0210/16	0218/16	0267/16
SP.A	0396/59	0212/59					
SP.L	0397/59	0245/59	0250/59				
SPD01	0167/59	0175/59					
SPD03	0209/59	0193/59	0205/59				
SPD10	0319/59	0235/59	0239/59				
SPD11	0367/59	0230/59	0259/59	0373/59			
SPD12	0377/59	0375/59					
SPD13	0325/59	0332/59					
SPD14	0195/59	0189/59	0202/59				
SPD16	0214/59	0222/59	0240/59				
SPD17	0216/59						
SPD18	0258/59	0265/59					
SPD19	0266/59	0262/59					
SPD4	0223/59	0219/59					

CROSS-REFERENCE SYMBOL TABLE

SPD6	0271/59	0278/59						
SPD7	0280/59	0272/59	0297/59	0327/59				
SPD9	0242/59	0213/59						
SPDCK	0335/59	0169/59	0342/59					
SPDCL	0345/59	0197/59	0352/59					
SPDCN	0389/59	0157/59	0225/59	0260/59	0268/59	0273/59		
SPDDG	0299/59	0168/59	0196/59	0215/59	0307/59			
SPDNR	0387/59	0163/59	0176/59	0180/59	0294/59	0338/59	0341/59	
SPDOC	0392/59	0162/59	0257/59	0263/59	0264/59	0270/59	0276/59	
	0277/59	0315/59	0320/59	0322/59	0328/59			
SPDPO	0390/59	0282/59	0290/59	0337/59	0340/59	0347/59	0350/59	
	0357/59	0360/59						
SPDSP	0355/59	0217/59	0362/59					
SPDSZ	0393/59	0164/59	0203/59	0286/59	0348/59	0351/59		
SPDTM	0388/59	0161/59	0224/59	0229/59	0231/59	0237/59	0358/59	
	0361/59							
SPE	0543/33	0291/59						
SPROG	0249/02	0196/03	0019/06	0438/06	0050/07	0121/07	0146/07	
	0460/07	0465/07	0466/07	0027/08	0254/08	0387/09	0209/11	
	0537/33	0476/35	0621/35	0635/35	0046/36	0064/36	0069/36	
	0387/36	0390/36	0069/38	0368/38	0379/38	0382/38	0340/39	
	0033/40	0067/40	0093/40	0111/40	0133/40	0208/40	0239/40	
	0312/40	0022/45						
SPS2	0424/48	0369/48	0378/48					
SPSET	0309/59	0232/59	0317/59					
SPSP	0437/32	0086/32	0096/32	0120/32				
SPTR	0357/02	0068/07	0076/07	0079/07	0181/07	0182/07	0188/07	
	0207/07	0217/07	0236/07	0290/07	0292/07	0295/07	0311/07	
	0316/07	0322/07	0324/07	0333/07	0398/07	0401/07	0413/07	
	0414/07	0419/07	0421/07	0431/07	0434/07	0441/07	0028/08	
	0029/08	0031/08	0032/08	0034/08	0035/08	0046/08	0047/08	
	0059/08	0063/08	0071/08	0091/08	0092/08	0097/08	0101/08	
	0108/08	0111/08	0112/08	0170/08	0173/08	0255/08	0258/08	
	0259/08	0261/08	0262/08	0271/08	0286/08	0288/08	0292/08	
	0300/08	0171/16	0216/16	0219/16	0232/16	0234/16	0235/16	

CROSS-REFERENCE SYMBOL TABLE

	0243/10 0402/36	0244/16 0437/36	0265/16 0442/36	0266/16	0520/33	0525/33	0398/36
SSTAK	0338/02 0200/04 0422/04 0432/04 0047/05 0145/05	0254/03 0284/04 0423/04 0434/04 0048/05	0092/04 0357/04 0425/04 0435/04 0053/05	0131/04 0360/04 0426/04 0447/04 0054/05	0138/04 0403/04 0428/04 0449/04 0089/05	0168/04 0415/04 0429/04 0044/05 0090/05	0174/04 0416/04 0431/04 0045/05 0091/05
SSYMT	0068/02	0302/02	0235/07	0281/07	0298/07	0175/08	0199/08
ST.63	0160/47	0488/46					
STA	0063/31	0500/28					
STA20	0192/47 0225/47	0458/46 0227/47	0474/46 0251/47	0489/46 0030/48	0121/47	0197/47	0220/47
STA30	0247/47	0254/47	0510/47	0013/48	0035/48	0108/48	
STA60	0217/47 0506/47	0399/46 0051/48	0413/46 0097/48	0048/47	0062/47	0228/47	0470/47
STAA1	0043/48	0059/48					
STAA2	0055/48	0049/48					
STABF	0428/33 0206/48	0302/46 0347/48	0171/47 0349/48	0173/47 0371/48	0235/47 0377/48	0241/47	0195/48
STABR	0064/48	0432/47	0075/48	0093/48			
STACH	0232/47 0471/46 0212/47 0099/48	0315/46 0487/46 0243/47	0328/46 0056/47 0253/47	0364/46 0107/47 0508/47	0371/46 0112/47 0015/48	0388/46 0184/47 0026/48	0452/46 0186/47 0032/48
STAD1	0321/46	0330/46					
STAD6	0255/47	0343/47					
STADA	0040/48	0440/47	0450/47	0060/48			
STADC	0257/47	0306/47					
STADG	0210/47 0205/47	0366/46 0213/47	0383/46 0250/47	0450/46 0012/48	0195/47 0024/48	0196/47	0204/47
STADI	0348/46	0416/46					
STADJ	0307/47	0326/47					
STADK	0321/47	0311/47	0317/47				

CROSS-REFERENCE SYMBOL TABLE

STADL	0262/47	0324/47					
STADR	0079/48	0437/47	0447/47	0457/47	0479/47	0499/47	0086/48
STADS	0020/48	0383/47	0404/47	0007/48	0036/48		
STADU	0256/47	0361/47					
STADX	0344/47	0363/47					
STADY	0358/47	0348/47	0354/47				
STADID	0261/47	0274/47					
STAIQ	0283/47	0280/47					
STAIR	0276/47	0287/47					
STALL	0005/48	0282/47	0295/47	0315/47	0352/47	0016/48	
STALT	0417/46	0351/46	0358/46				
STALV	0010/47	0088/47					
STALX	0081/47	0019/47	0039/47				
STALY	0020/47	0080/47					
STALZ	0036/47	0075/47					
STANE	0376/47	0389/47					
STANG	0384/47	0381/47					
STAOC	0201/47	0311/46	0326/46	0376/46	0103/47	0206/47	
STAPL	0076/47	0071/47					
STAPR	0166/47	0331/46	0340/46	0345/46	0414/46	0422/46	0483/46
	0493/46	0006/47	0077/47	0091/47	0122/47	0126/47	0167/47
	0288/47	0303/47	0318/47	0330/47	0340/47	0355/47	0367/47
	0394/47	0407/47	0420/47	0431/47	0441/47	0446/47	0451/47
	0456/47	0476/47	0493/47	0498/47	0519/47	0522/47	0525/47
STAPZ	0064/47	0053/47					
STAQV	0260/47	0035/47					
STASI	0094/48	0113/48					
STASS	0091/48	0518/47	0521/47	0524/47	0114/48		
STAST	0179/47	0306/46	0316/46	0333/46	0341/46	0360/46	0367/46

.....

CROSS-REFERENCE SYMBOL TABLE

	0377/46	0384/46	0400/46	0418/46	0454/46	0002/47	0072/47
	0092/47	0113/47	0180/47	0182/47	0185/47	0187/47	0188/47
	0269/47	0289/47	0299/47	0336/47	0369/47	0390/47	0424/47
	0442/47	0452/47	0471/47	0494/47	0511/47	0052/48	0109/48
STASW	0263/47	0398/47					
STASX	0399/47	0415/47					
STASY	0410/47	0406/47					
STASZ	0416/47	0403/47					
STATB	0258/47	0375/47					
STATE	0259/47	0387/47					
STATX	0462/47	0489/47					
STATY	0480/47	0468/47	0475/47				
STATZ	0131/47	0438/46	0462/46	0467/46	0142/47	0143/47	
STAUS	0264/47	0413/47					
STAV1	0004/33	0739/32	0347/46	0349/46	0365/46	0415/46	0424/46
	0457/46	0473/46	0011/47	0014/47	0021/47	0040/47	0082/47
	0135/47	0152/47	0157/47	0308/47	0309/47	0312/47	0322/47
	0345/47	0346/47	0349/47	0359/47	0400/47	0401/47	0411/47
	0463/47	0464/47	0481/47	0516/47	0095/48	0100/48	0104/48
STAV2	0005/33	0740/32	0427/46	0013/47	0037/47	0043/47	0049/47
	0051/47	0068/47	0140/47	0149/47	0151/47	0265/47	0436/47
STAV3	0006/33	0741/32	0425/46	0430/46	0449/46	0495/46	0499/46
	0132/47						
STBAS	0445	0299/03					
STC0	0572/26	0439/26					
STCT1	0370/02	0135/07	0155/07	0156/07	0206/07	0211/07	
STCT2	0371/02	0136/07	0152/07				
STCT3	0372/02	0158/07	0162/07				
STE	0125	0262/11					
STEND	0356/02	0018/08	0096/08				
STEP	0458/22	0540/04					
STF0	0443/26	0372/26					

CROSS-REFERENCE SYMBOL TABLE

STL10	0001/47	0498/46					
STLBP	0148/47	0441/46	0460/46	0465/46	0477/46	0156/47	0158/47
STLCK	0228/02	0493/02	0033/06	0565/06	0403/09	0361/21	
STLE	0521/37	0264/37					
STLP	0122/47	0118/47					
STLT0	0428/46	0500/46					
STLT1	0434/46	0484/46					
STLT2	0444/46	0440/46					
STLT3	0453/46	0448/46					
STLT4	0464/46	0469/46					
STLT5	0437/46	0443/46	0482/46				
STLT6	0490/46	0442/46	0461/46	0478/46			
STLT7	0494/46	0433/46					
STLT8	0476/46	0463/46					
STLT9	0485/46	0466/46					
STMP1	0360/02 0207/08 0317/08	0226/07 0223/08 0333/08	0299/07 0226/08 0351/08	0318/07 0235/08	0129/08 0276/08	0140/08 0283/08	0159/08 0297/08
STMP2	0361/02 0270/07 0165/08	0247/07 0274/07 0201/08	0252/07 0285/07 0230/08	0257/07 0288/07 0233/08	0259/07 0308/07 0339/08	0265/07 0315/07 0342/08	0266/07 0145/08
STP	0545/33	0213/39					
STPTR	0368/02 0455/06 0474/06 0499/06	0423/06 0459/06 0475/06	0424/06 0460/06 0476/06	0426/06 0461/06 0483/06	0427/06 0465/06 0484/06	0429/06 0472/06 0487/06	0430/06 0473/06 0498/06
STRI1	0137/05	0129/05					
STRID	0078/02	0384/02	0119/05	0136/05	0149/05	0220/05	0419/05
STRLN	0407/02	0161/11	0180/11	0185/11			
STROP	0038/02 0144/05	0395/02 0414/05	0372/03 0429/05	0094/04 0300/06	0151/04	0274/04	0134/05

CROSS-REFERENCE SYMBOL TABLE

STSTR	0006/02	0417/02	0064/11	0095/13	0288/14		
STTOP	0114/02 0374/14	0325/02 0391/14	0479/12	0038/13	0132/13	0197/13	0084/14
STTYP	0244/05	0286/03					
STYPE	0359/02	0272/07	0289/07	0334/07	0435/07	0037/08	0174/08
STYPS	0380/22	0244/05					
SUP	0524/37 0383/37	0263/37 0385/37	0299/37 0417/37	0305/37 0477/37	0306/37 0478/37	0321/37 0492/37	0349/37 0499/37
SUP1	0018/37	0036/37					
SUP10	0390/37	0261/37					
SUP11	0408/37	0266/37	0270/37	0289/37			
SUP12	0426/37	0414/37					
SUP13	0415/37	0432/37					
SUP14	0436/37	0421/37	0425/37				
SUP15	0409/37	0469/37					
SUP16	0490/37	0392/37					
SUP17	0473/37	0438/37					
SUP18	0455/37	0443/37					
SUP2	0032/37	0021/37	0024/37				
SUP20	0084/37	0089/37					
SUP21	0090/37	0087/37					
SUP22	0097/37	0204/37					
SUP23	0132/37	0104/37					
SUP24	0185/37	0130/37					
SUP25	0188/37	0193/37					
SUP26	0194/37	0191/37					
SUP27	0198/37	0100/37	0119/37				
SUP28	0205/37	0201/37					

CROSS-REFERENCE SYMBOL TABLE

SUP29	0221/37	0232/37	0235/37				
SUP3	0503/37	0046/37					
SUP30	0226/37	0209/37					
SUP31	0250/37	0223/37					
SUP32	0333/37	0344/37					
SUP33	0346/37	0340/37					
SUP4	0054/37	0071/37					
SUP5	0065/37	0056/37					
SUP6	0075/37	0068/37					
SUP7	0258/37	0398/37	0474/37	0485/37			
SUP8	0263/37	0278/37	0314/37	0332/37	0386/37		
SUP9	0280/37	0274/37					
SUPB	0525/37 0440/37	0031/37 0464/37	0042/37 0467/37	0050/37	0057/37	0418/37	0422/37
SUPES	0533/37	0137/37	0149/37	0335/37	0356/37	0359/37	
SUPEX	0532/37 0337/37	0140/37 0341/37	0172/37	0320/37	0326/37	0329/37	0334/37
SUPK1	0528/37 0268/37	0082/37 0271/37	0096/37 0276/37	0179/37 0295/37	0199/37 0413/37	0203/37	0255/37
SUPK2	0529/37 0143/37 0277/37	0094/37 0166/37 0292/37	0101/37 0175/37 0309/37	0107/37 0176/37 0310/37	0108/37 0207/37 0420/37	0116/37 0252/37	0129/37 0272/37
SUPL1	0530/37 0220/37 0457/37	0092/37 0227/37	0121/37 0256/37	0155/37 0390/37	0187/37 0394/37	0196/37 0412/37	0211/37 0445/37
SUPL2	0531/37 0441/37	0253/37 0465/37	0258/37 0466/37	0315/37	0396/37	0410/37	0426/37
SUPLL	0494/37	0500/37					
SUPP	0526/37	0065/37	0070/37	0076/37	0260/37	0397/37	0411/37
SUPR	0538/37	0502/37					
SUPR1	0514/37	0501/37					

CROSS-REFERENCE SYMBOL TABLE

SUPRR	0535/37	0508/37					
SUPS	0523/37	0025/37	0026/37	0027/37	0030/37	0038/37	0039/37
	0048/37	0059/37	0060/37	0062/37	0064/37	0409/37	0415/37
	0449/37	0461/37	0468/37	0473/37	0475/37	0482/37	
SUPTG	0527/37	0312/37	0347/37				
SUSP	0508/30	0202/21	0344/30	0350/30	0368/30	0390/30	0393/30
	0494/30	0181/33					
SUSPN	0202/21	0189/21					
SUSPP	0181/33	0180/33					
SVBC2	0594/28	0398/28	0413/28				
SVCH2	0060	0459/26	0397/28				
SWAP1	0251/30	0229/30					
SWAP2	0252/30	0315/30					
SWAP3	0295/30	0223/30					
SWAP4	0216/30	0194/30	0199/30				
SWAP5	0207/30	0165/30					
SWAP6	0303/30	0299/30					
SWAP7	0187/30	0168/30	0210/30				
SWAPR	0150/30	0016/29	0152/29	0205/30	0226/30	0318/30	0719/32
SYBIT	0383/28	0202/28	0346/28				
SYC1	0348/28	0367/28	0378/28				
SYC2	0370/28	0351/28					
SYC3	0347/28	0203/28					
SYCBA	0382/28	0197/28	0344/28	0355/28	0356/28	0377/28	
SYCCC	0381/28	0199/28	0342/28	0348/28	0353/28	0354/28	0374/28
SYCCL	0384/28	0375/28					
SYCON	0341/28	0201/28	0219/28	0229/28	0231/28	0232/28	0233/28
	0371/28						
SYMC1	0367/06	0371/06					

CROSS-REFERENCE SYMBOL TABLE

SYMC2	0375/06	0369/06					
SYMCK	0048/02	0394/02	0315/03	0352/03	0382/03	0501/03	0522/03
	0592/03	0630/03	0647/03	0661/03	0691/03	0039/04	0051/04
	0064/04	0078/04	0097/04	0144/04	0156/04	0350/04	0383/04
	0390/04	0028/05	0061/05	0077/05	0096/05	0294/05	0310/05
	0319/05	0331/05	0338/05	0360/05	0367/05	0374/05	0163/06
	0309/06	0365/06	0366/06	0374/06	0379/06	0380/06	0548/06
SYMT1	0131/08	0136/08					
SYMT2	0140/08	0221/08					
SYMT3	0153/08	0132/08	0142/08				
SYMT4	0156/08	0147/08	0242/08				
SYMT5	0164/08	0134/08	0224/08	0236/08			
SYMT6	0210/08	0006/07					
SYMT7	0217/08	0005/07	0209/08	0234/08			
SYMT8	0223/08	0212/08	0215/08				
SYMT9	0235/08	0218/08					
SYMTB	0247/02	0198/03	0257/03	0622/05	0623/05	0052/07	0065/07
	0075/07	0116/07	0196/07	0330/07	0400/07	0430/07	0454/07
	0457/07	0130/08	0167/08	0206/08	0256/08	0275/08	0314/08
	0328/08	0340/08	0406/08	0092/10	0157/10	0034/12	0360/12
	0065/13	0169/16	0504/16	0053/17	0165/17	0181/17	0193/17
	0382/17	0170/20	0246/21	0421/21	0034/22	0455/25	0499/33
	0513/33	0624/35	0395/36	0429/36	0028/40	0018/45	
SYNT1	0246/03	0199/03	0242/03				
SYNTA	0250	0396/29					
SYNTB	0514/05	0445					
SYNTC	0337/02	0255/03	0536/06	0218/10			
SYNTAX	0236/03	0250					
SYSID	0088	0429/32					
T35B1	0191	0169/27	0185/27	0082/32	0089/32	0135/32	0602/45
	0652/45	0655/45	0658/45	0036/46	0041/46	0231/46	0253/46
	0174/47	0203/48	0350/48	0436/48	0444/48	0449/48	0454/48
	0461/48	0706/48	0043/49	0048/49	0484/49	0491/49	0133/50
	0140/50	0174/51	0180/51	0676/51	0681/51	0554/52	0572/52
	0301/53	0309/53	0402/54	0410/54	0454/56	0461/56	0131/57

CROSS-REFERENCE SYMBOL TABLE

	0138/57	0718/57	0728/57	0171/58	0181/58	0366/58	0374/58
T35B2	0189 0345/48	0115/29 0348/48	0301/46	0169/47	0172/47	0194/48	0205/48
T35BF	0456/33 0795/45 0095/46 0115/46 0161/46 0179/46 0200/46 0440/48	0189 0796/45 0099/46 0126/46 0168/46 0189/46 0224/46	0189 0801/45 0101/46 0128/46 0170/46 0193/46 0234/46	0190 0802/45 0106/46 0134/46 0171/46 0195/46 0235/46	0190 0031/46 0107/46 0145/46 0174/46 0196/46 0237/46	0191 0048/46 0108/46 0151/46 0176/46 0198/46 0432/48	0757/32 0086/46 0112/46 0158/46 0177/46 0199/46 0438/48
T35C0	0036/33	0049/33	0654/48				
T35C1	0048/33	0589/48	0601/48	0181/49			
T35CH	0329 0163/48 0565/48 0779/48 0101/49 0413/56 0191/58 0218/59 0422/59	0257/33 0169/48 0568/48 0785/48 0108/49 0375/57 0165/59 0238/59	0335/33 0174/48 0571/48 0788/48 0150/49 0493/57 0171/59 0243/59	0587/45 0179/48 0590/48 0060/49 0047/50 0694/57 0185/59 0248/59	0021/46 0526/48 0672/48 0075/49 0157/50 0698/57 0190/59 0253/59	0138/48 0537/48 0765/48 0085/49 0186/50 0027/58 0198/59 0414/59	0146/48 0555/48 0773/48 0091/49 0192/50 0187/58 0210/59 0418/59
T35CL	0183						
T35CP	0044 0025/46	0129/29 0679/48	0037/33 0680/48	0044/33	0590/45	0591/45	0024/46
T35C0	0032/33 0365/36 0343/58 0115/59	0329 0220/49 0022/59 0123/59	0742/32 0634/51 0027/59 0135/59	0035/33 0498/52 0036/59	0046/33 0236/53 0041/59	0050/33 0337/54 0065/59	0051/33 0450/57 0107/59
T35DR	0260	0033	0560/26				
T35F1	0202 0191/30	0042/27 0381/49	0065/27	0100/27	0192/27	0187/28	0026/29
T35F2	0203	0078/27	0136/27	0159/27	0104/29	0146/29	0225/33
T35F3	0204	0047/27	0161/27	0028/29			
T35FG	0168						
T35LC	0045 0055/50	0131/29 0065/50	0033/33 0183/50	0043/33 0485/57	0158/48 0019/58	0034/50 0233/59	0044/50
T35LK	0186	0188	0184/49				

CROSS-REFERENCE SYMBOL TABLE

T35LN	0188	0139/29	0192/30	0382/30	0256/33		
T35ND	0190	0117/29					
T35PR	0187	0071/27	0108/29	0138/29	0202/30	0177/33	
T35RS	0184	0134/29	0175/33				
T35SP	0171/33 0300/46 0445/48	0174/33 0168/47 0450/48	0598/45 0175/47	0656/45 0204/48	0033/46 0344/48	0042/46 0351/48	0232/46 0437/48
T35ST	0185 0204/30	0069/27 0176/33	0079/27 0179/33	0107/29 0124/47	0136/29	0195/30	0201/30
TAB	0464/22	0279					
TABLE	0340/02	0185/06	0205/06				
TABPN	0391/59	0159/59	0311/59	0316/59	0324/59	0326/59	0331/59
TADR	0013/26 0238/28	0040/27	0091/27	0094/27	0117/27	0126/27	0195/27
TAP0	0328/02	0196/16	0205/16	0206/16	0209/16	0264/16	0268/16
TAP1	0329/02	0261/16	0270/16				
TAPE1	0178/16	0186/16	0215/16				
TAPE2	0195/16	0191/16	0260/16	0278/16			
TAPE3	0224/16	0217/16					
TAPE4	0230/16	0247/16					
TAPE5	0248/16	0168/16					
TAPE6	0258/16	0193/16					
TAPE7	0261/16	0199/16	0202/16				
TAPEA	0183/03	0245/03					
TAPEF	0513 0024/30	0618/05	0319/16	0031/22	0405/29	0450/29	0464/29
TAPER	0166/16	0183/03	0114/31				
TB12C	0633/32	0609/32					
TB130	0634/32	0469/32	0514/32				
TB160	0635/32	0606/32					

CROSS-REFERENCE SYMBOL TABLE

TBDAD	0454/31	0459/31	0529/31	0731/32	0015/33	0583/52	0583/58
TBDAP	0015/33	0325/51	0396/51				
TBDBA	0462/31	0532/31					
TBDBB	0455/31	0496/31					
TBDBC	0489/31	0508/31	0514/31	0519/31			
TBDBE	0497/31	0491/31					
TBDBU	0526/31	0471/31	0483/31				
TBDBY	0521/31	0486/31	0495/31				
TBDT1	0440/32 0039/32	0457/31 0041/32	0490/31 0046/32	0527/31 0048/32	0016/32 0736/32	0018/32	0031/32
TBDT2	0441/32 0516/31	0466/31 0530/31	0467/31	0475/31	0498/31	0503/31	0504/31
TBDT3	0442/32	0480/31	0492/31	0512/31			
TBDT	0008/32	0011/32	0058/32	0732/32	0584/52	0545/55	0584/58
TBITS	0004/26	0391/26	0469/26	0102/27	0121/27	0197/27	0383/28
TBLPT	0345/02	0206/06	0207/06	0213/06	0229/06	0247/06	
TBSRH	0028/02 0705/03 0210/05	0382/02 0019/04 0250/06	0288/03 0110/04 0253/06	0479/03 0220/04 0392/06	0496/03 0235/04	0509/03 0337/04	0543/03 0378/04
TBT15	0632/32	0604/32					
TCNT	0061 0165/27	0039/27 0173/27	0081/27 0179/27	0090/27 0183/27	0099/27 0194/27	0115/27 0198/28	0116/27
TCR02	0333/28	0299/28	0316/28				
TCR03	0334/28	0301/28	0319/28				
TCR04	0335/28	0303/28	0304/28	0313/28	0318/28		
TCR1	0260/28	0252/28					
TCR2	0265/28	0258/28					
TCR3	0277/28	0288/28					
TCR4	0290/28	0279/28					

CROSS-REFERENCE SYMBOL TABLE

TCR5	0304/28	0312/28	0320/28				
TCRBA	0332/28	0268/28	0280/28	0281/28			
TCRCC	0331/28	0266/28	0277/28				
TCRIR	0249/28	0494/27	0185/28	0296/28			
TCR01	0298/28 0295/28	0271/28 0321/28	0273/28	0275/28	0287/28	0291/28	0293/28
TCRPC	0330/28	0255/28	0261/28	0300/28			
TCRPT	0329/28	0250/28	0253/28	0302/28			
TCRPU	0324/28	0263/28					
TCRSD	0326/28	0257/28					
TDNUM	0140/32	0111/32	0118/32	0124/32	0131/32	0146/32	
TEMP	0258/02 0362/02 0369/02 0440/02 0373/03 0527/03 0137/04 0227/04 0374/04 0142/05 0440/05 0498/05 0583/05 0610/05 0054/06 0085/22 0136/22 0180/22	0309/02 0363/02 0370/02 0441/02 0404/03 0530/03 0149/04 0229/04 0381/04 0188/05 0461/05 0499/05 0588/05 0611/05 0274/06 0100/22 0137/22 0226/22	0336/02 0364/02 0371/02 0442/02 0409/03 0590/03 0152/04 0240/04 0400/04 0411/05 0462/05 0503/05 0589/05 0614/05 0277/06 0109/22 0139/22 0235/22	0338/02 0365/02 0372/02 0447/02 0441/03 0013/04 0164/04 0246/04 0446/04 0413/05 0469/05 0504/05 0594/05 0017/06 0062/22 0113/22 0140/22 0245/22	0350/02 0366/02 0373/02 0448/02 0444/03 0091/04 0167/04 0248/04 0464/04 0417/05 0471/05 0507/05 0597/05 0018/06 0075/22 0114/22 0146/22 0276/22	0360/02 0367/02 0390/02 0364/03 0492/03 0095/04 0170/04 0272/04 0132/05 0427/05 0478/05 0569/05 0600/05 0020/06 0082/22 0126/22 0147/22 0294/22	0361/02 0368/02 0439/02 0370/03 0499/03 0106/04 0173/04 0306/04 0135/05 0430/05 0497/05 0578/05 0607/05 0024/06 0083/22 0131/22 0151/22 0308/22
TEMP1	0390/02 0045/10 0383/10 0109/11 0207/11 0496/11 0370/12 0019/13 0277/14 0058/17 0190/17 0379/17 0445/25	0409/09 0047/10 0022/11 0122/11 0208/11 0062/12 0373/12 0021/13 0283/14 0149/17 0199/17 0321/18 0448/25	0410/09 0054/10 0026/11 0135/11 0211/11 0073/12 0388/12 0032/13 0284/14 0150/17 0333/17 0329/18 0467/25	0016/10 0088/10 0027/11 0146/11 0219/11 0078/12 0391/12 0054/13 0025/17 0170/17 0334/17 0353/18 0472/25	0019/10 0117/10 0030/11 0147/11 0223/11 0083/12 0448/12 0055/13 0032/17 0171/17 0335/17 0412/25 0467/35	0020/10 0154/10 0043/11 0196/11 0230/11 0341/12 0449/12 0061/13 0036/17 0176/17 0348/17 0424/25	0023/10 0256/10 0044/11 0198/11 0245/11 0342/12 0450/12 0274/14 0045/17 0187/17 0378/17 0435/25

CROSS-REFERENCE SYMBOL TABLE

TEMP2	0391/02 0452/12	0308/09 0468/12	0337/09 0245/13	0371/09	0409/12	0419/12	0422/12
TEMP3	0392/02	0412/12	0425/12	0248/13	0252/13	0262/13	
TEMP4	0393/02 0190/12 0266/13 0332/14	0067/11 0377/12 0272/13 0433/25	0415/11 0382/12 0300/13 0421/35	0421/11 0196/13 0126/14 0425/35	0435/11 0206/13 0302/14 0449/35	0509/11 0217/13 0308/14	0141/12 0222/13 0322/14
TEMP5	0394/02 0157/12 0302/13 0349/15	0361/10 0161/12 0157/14 0522/15	0377/11 0215/13 0163/14 0532/15	0448/11 0221/13 0189/14 0462/35	0514/11 0274/13 0197/14	0116/12 0281/13 0198/14	0119/12 0285/13 0248/14
TEMP6	0395/02 0251/13 0257/14	0343/10 0253/13 0259/14	0345/10 0192/14 0043/15	0156/11 0207/14 0056/15	0189/11 0223/14 0066/15	0363/11 0231/14 0023/20	0365/11 0254/14
TENTH	0090/21	0325/22	0333/22				
TERR	0510	0239/03	0047/06	0251/16	0507/16	0477/29	0485/29
THEN	0454/22	0459					
THNOP	0468/40	0433/40					
TIM1	0577/43	0538/43					
TIM2	0580/43	0563/43					
TIM3	0582/43	0611/43					
TIMDV	0620/43	0592/43	0594/43	0600/43	0603/43		
TIMEF	0170 0339/39	0692/28	0177/29	0183/29	0241/32	0363/33	0400/33
TIMER	0048	0694/28	0181/29				
TIMES	0511/04	0145/04					
TIMN	0617/43	0595/43	0606/43				
TIMNM	0619/43	0590/43	0596/43				
TIMP1	0608/43	0589/43					
TIMP2	0600/43	0597/43					
TIMP3	0610/43	0605/43					
TIMP4	0593/43	0607/43					

CROSS-REFERENCE SYMBOL TABLE

TIMPR	0587/43	0560/43	0571/43	0614/43			
TIMT	0618/43 0558/43	0546/43 0559/43	0548/43 0570/43	0550/43	0551/43	0553/43	0554/43
TIMXK	0616/43	0591/43					
TK	0523/32	0475/32	0487/32	0519/32	0547/32		
TK1	0617/32 0542/32	0509/32	0517/32	0525/32	0531/32	0536/32	0538/32
TK1WD	0489/32	0483/32					
TK2	0618/32	0510/32	0518/32	0527/32	0543/32		
TK3	0619/32	0530/32	0539/32				
TK4	0620/32	0590/32	0595/32				
TK5	0621/32	0558/32	0581/32				
TK6	0622/32	0557/32	0566/32	0573/32			
TKA	0528/32	0545/32					
TKB	0533/32	0540/32					
TKCO	0556/32 0594/32	0494/32	0535/32	0551/32	0553/32	0582/32	0588/32
TKCOL	0572/32	0565/32					
TKCRL	0549/32	0471/32	0498/32	0516/32	0541/32	0546/32	0554/32
TKCRN	0580/32	0571/32					
TKDLN	0499/32	0488/32					
TKDLP	0481/32	0500/32					
TKDON	0501/32	0490/32	0520/32				
TKLP	0640/32	0466/32	0511/32	0563/32			
TKOTK	0637/32	0575/32					
TKTBL	0642/32	0479/32					
TKTBP	0641/32	0480/32	0481/32	0484/32	0485/32	0495/32	0499/32
TKWB	0591/32	0596/32					
TKWO	0584/32	0492/32	0497/32	0532/32	0537/32	0597/32	

CROSS-REFERENCE SYMBOL TABLE

TM5	0624/32	0589/32					
TM8	0623/32	0524/32	0529/32				
TMPST	0384/02 0017/13 0107/13 0133/14 0437/14	0305/10 0037/13 0200/13 0134/14 0439/14	0162/11 0046/13 0204/13 0193/14 0452/14	0340/11 0049/13 0212/13 0287/14 0024/18	0293/12 0072/13 0220/13 0418/14 0052/18	0381/12 0073/13 0226/13 0425/14 0059/18	0006/13 0106/13 0228/13 0427/14 0234/18
TNULL	0463/02 0075/11 0375/11 0219/14	0309/10 0093/11 0444/11 0240/14	0326/10 0344/11 0524/11 0333/15	0333/10 0351/11 0286/13 0351/15	0334/10 0358/11 0295/13 0516/15	0344/10 0359/11 0128/14 0456/35	0359/10 0364/11 0142/14
TO	0489/04	0531/03					
TOG	0012/26	0046/27	0087/27	0124/27	0129/27	0239/28	
TOL	0434/02	0046/18	0138/18				
TOLC	0019/17	0045/18					
TOUP	0247/05	0534/03					
TOPI	0322/20	0287/20					
TOTDG	0489/02 0168/25	0246/24 0184/25	0260/24 0188/25	0261/24	0272/24	0281/24	0163/25
TP12	0626/32	0552/32					
TP15	0627/32	0550/32					
TP21H	0631/32	0473/32					
TP377	0630/32	0562/32					
TP40	0628/32	0493/32	0534/32				
TP6	0625/32	0592/32					
TP60	0629/32	0585/32					
TP0	0140	0029/30					
TPRME	0464/02 0436/11 0277/13 0321/14	0306/10 0438/11 0296/13 0434/25	0332/10 0443/11 0127/14 0439/25	0068/11 0510/11 0211/14 0424/35	0341/11 0144/12 0298/14 0450/35	0357/11 0194/12 0301/14 0452/35	0420/11 0267/13 0318/14 0457/35
TRAX	0087	0281					

CROSS-REFERENCE SYMBOL TABLE

TRFCH	0469/02	0515/15	0519/15				
TRN	0004/18	0412/17	0012/18				
TRN1	0413/17	0014/18					
TRNFP	0637/28	0336/29					
TRNOF	0600/28	0611/28	0637/28				
TRS0	0470/02	0521/15	0528/15				
TRSTR	0094/02	0411/02	0324/10	0336/10	0392/10	0349/11	0361/11
	0450/11	0526/11	0293/13	0304/13	0346/14	0349/14	0360/14
	0338/15	0518/15	0464/35				
TRUE	0126/13	0020/14	0027/14	0033/14	0040/14	0078/14	0107/14
TSB	0201/29	0015					
TSPTR	0346/02	0230/06	0236/06	0237/06			
TSR10	0254/06	0217/06	0220/06				
TSRC1	0202/06	0225/06					
TSRC2	0206/06	0215/06					
TSRC3	0211/06	0241/06					
TSRC4	0216/06	0201/06					
TSRC5	0226/06	0222/06					
TSRC6	0229/06	0210/06					
TSRC7	0233/06	0239/06					
TSRC8	0242/06	0234/06					
TSRC9	0251/06	0259/06					
TT1	0445/02	0374/13	0394/13				
TT10	0104/27	0139/27	0144/27	0146/27	0149/27	0167/27	0175/27
	0181/27						
TT11	0192/27	0154/27					
TT12	0179/27	0157/27					
TT15	0130/27	0200/27					
TT16	0174/27	0188/27					

CROSS-REFERENCE SYMBOL TABLE

TT17	0136/27	0067/27					
TT18	0081/27	0054/27	0076/27	0095/27			
TT2	0446/02	0377/13	0388/13	0391/13	0405/13	0412/13	
TT3	0447/02	0385/13	0397/13	0403/13	0409/13	0410/13	
TT4	0448/02	0387/13	0398/13	0411/13			
TT5	0114/27	0084/27					
TT6	0099/27	0086/27					
TT8	0103/27	0132/27					
TTA	0009/26	0061/27	0106/27				
TTB	0010/26	0062/27	0107/27				
TTE	0011/26	0064/27	0104/27				
TTQ	0051 0404/29 0022/30	0266/29 0419/29 0071/30	0302/29 0425/29 0105/30	0340/29 0448/29 0423/30	0346/29 0522/29 0403/32	0354/29 0546/29	0389/29 0005/30
TTXCP	0201/27	0093/27					
TTY00	0284/27 0257/29 0435/39 0500/48 0056/51 0439/59	0009 0262/29 0578/39 0603/48 0114/51	0010 0697/32 0177/43 0196/49 0079/52	0011 0190/35 0419/43 0238/49 0086/52	0309 0347/35 0263/47 0272/49 0577/52	0584/28 0012/39 0412/47 0373/49 0368/59	0627/28 0378/39 0434/48 0456/49 0432/59
TTY01	0289/27 0435/39 0272/49 0432/59	0009 0177/43 0373/49 0439/59	0584/28 0412/47 0456/49	0257/29 0500/48 0056/51	0262/29 0603/48 0114/51	0190/35 0196/49 0086/52	0012/39 0238/49 0368/59
TTY02	0294/27						
TTY03	0299/27						
TTY04	0304/27						
TTY05	0309/27						
TTY06	0314/27						
TTY07	0319/27						
TTY08	0324/27	0442/48					

CROSS-REFERENCE SYMBOL TABLE

TTY09	0329/27						
TTY10	0334/27						
TTY11	0339/27						
TTY12	0344/27						
TTY13	0349/27						
TTY14	0354/27						
TTY15	0359/27						
TTY16	0364/27	0447/48					
TTY17	0369/27						
TTY18	0374/27						
TTY19	0379/27						
TTY20	0384/27						
TTY21	0389/27						
TTY22	0394/27						
TTY23	0399/27						
TTY24	0404/27	0452/48					
TTY25	0409/27						
TTY26	0414/27						
TTY27	0419/27						
TTY28	0424/27						
TTY29	0429/27						
TTY30	0434/27						
TTY31	0439/27						
TTY32	0443/27	0311	0698/32	0420/43	0264/47		
TTY35	0289	0047/29	0097/29	0216/29	0172/33	0223/33	0049/49
	0204/49	0141/50	0101/51				
TTYCK	0627/28	0024/29	0253/29	0258/29			

CROSS-REFERENCE SYMBOL TABLE

TTYED	0200/27	0552/26					
TWOSP	0659/35	0409/35					
TYPE	0063/30 0065/30	0342/29 0070/30	0430/29 0075/30	0441/29 0717/32	0513/29	0017/30	0048/30
TYPEL	0065/30	0074/30					
TYPET	0076/30 0286/30	0064/30	0066/30	0073/30	0268/30	0283/30	0285/30
UCDAB	0035/31	0325/29					
UDHDA	0618/41	0334/41					
UDI10	0478/41	0475/41					
UDI11	0485/41	0477/41	0481/41				
UDI12	0565/41	0540/41					
UDI13	0581/41	0382/41					
UDIHD	0613/41	0618/41					
UDINM	0591/41 0531/41	0416/41 0533/41	0456/41 0553/41	0466/41 0564/41	0515/41 0600/41	0517/41	0526/41
UDIOW	0604/41 0446/41	0421/41 0469/41	0423/41 0520/41	0430/41 0542/41	0434/41 0612/41	0439/41	0444/41
UDIR1	0311/41	0304/41					
UDIR2	0323/41	0315/41					
UDIR3	0336/41	0346/41					
UDIR4	0358/41	0580/41					
UDIR5	0361/41	0636/41					
UDIR6	0387/41	0368/41	0631/41				
UDIR7	0393/41	0388/41					
UDIR8	0419/41	0401/41					
UDIR9	0425/41	0417/41					
UDIRC	0621/41	0482/41					
UDIRF	0620/41	0476/41					

CROSS-REFERENCE SYMBOL TABLE

UDIRP	0622/41	0492/41					
UDISS	0619/41 0541/41	0420/41	0422/41	0429/41	0445/41	0468/41	0519/41
UDL14	0712/42	0490/42	0363/43	0376/43			
UFLAG	0536/04	0204/04	0313/04	0330/04	0373/04	0424/04	0455/04
UHDB1	0165/32	0175/32					
UHDBA	0022/33	0329/41	0036/42	0252/42			
UHDBF	0152/32	0212/32	0022/33				
UHU	0555/28	0438/28					
UHU1	0567/28	0559/28	0563/28				
UIR	0133	0063/07					
ULEN	0172 0502/50	0256	0295	0379	0463	0516/37	0521/37
ULO	0137	0234/39					
UNABT	0514 0404/32	0046/07 0359/33	0553/11 0464/33	0445/16 0617/35	0478/28	0317/29	0355/29
UNL1	0663/51	0489/51					
UNL10	0590/51	0563/51	0568/51				
UNL11	0569/51	0577/51					
UNL4	0667/51	0507/51	0619/51				
UNL5	0524/51	0532/51					
UNL6	0534/51	0530/51					
UNL9	0560/51	0594/51					
UNLBT	0660/51	0654/51					
UNLCN	0692/51 0557/51	0523/51 0558/51	0527/51 0596/51	0538/51	0542/51	0548/51	0549/51
UNLD	0688/51	0485/51	0509/51	0514/51			
UNLDG	0633/51	0614/51	0620/51	0635/51	0639/51	0642/51	0643/51
UNLER	0671/51	0664/51	0668/51	0674/51			

CROSS-REFERENCE SYMBOL TABLE

UNLF	0689/51 0579/51	0493/51 0590/51	0505/51 0593/51	0511/51	0512/51	0560/51	0569/51
UNLFT	0649/51	0525/51	0561/51	0658/51			
UNLL	0690/51	0503/51	0516/51	0517/51	0529/51	0591/51	
UNLN	0693/51	0616/51	0622/51	0624/51	0628/51		
UNLN2	0628/51	0621/51					
UNLN3	0616/51	0627/51					
UNLNO	0613/51	0479/51	0491/51	0498/51	0617/51	0629/51	0630/51
UNLT	0691/51	0513/51	0524/51	0528/51	0531/51	0672/51	0679/51
UNMNC	0485/04	0315/04					
UNNRM	0003/15	0109/16	0112/16				
UNPAK	0128/02 0040/16	0544/15	0545/15	0556/15	0560/15	0568/15	0005/16
UNPLC	0486/04	0321/04					
UNR	0134	0595/11	0491/16				
UPCCN	0576/45	0449/45	0453/45	0463/45			
UPD2D	0518/45	0403/45	0523/45	0541/45			
UPD3D	0537/45	0415/45	0542/45				
UPDDG	0527/45	0428/45	0521/45	0522/45	0532/45	0540/45	
UP0.A	0571/45	0290/45					
UP0.L	0572/45	0322/45	0327/45				
UP00	0280/45	0273/45					
UP01	0294/45						
UP012	0430/45	0427/45					
UP013	0433/45	0429/45					
UP014	0375/45	0358/45	0393/45				
UP015	0292/45	0300/45	0316/45				
UP016	0371/45	0366/45					

CROSS-REFERENCE SYMBOL TABLE

UP017	0391/45	0386/45					
UP018	0334/45	0342/45					
UP03	0301/45	0297/45					
UP04	0319/45	0291/45					
UP05	0344/45	0311/45	0315/45	0338/45			
UP06	0355/45	0373/45					
UP07	0396/45	0367/45	0387/45	0438/45			
UP09	0404/45						
UPOC1	0574/45 0471/45	0285/45 0495/45	0302/45 0498/45	0313/45	0335/45	0340/45	0442/45
UPOC2	0575/45	0494/45	0497/45				
UPOCN	0573/45	0287/45	0303/45	0336/45			
UPODG	0483/45	0293/45	0490/45				
UPOIN	0441/45	0306/45	0339/45	0480/45			
UPON1	0454/45	0459/45					
UPON2	0460/45	0456/45					
UPON3	0464/45	0469/45					
UPON4	0470/45	0466/45					
UPON5	0478/45	0475/45					
UPOPR	0503/45 0510/45	0345/45 0513/45	0397/45 0514/45	0405/45	0416/45	0504/45	0506/45
UPOSP	0493/45	0295/45	0499/45				
UPTRV	0559/45	0354/45	0370/45	0390/45	0567/45		
UPTSV	0547/45	0352/45	0368/45	0388/45	0555/45		
URDCL	0232/42	0071/42	0161/42				
URE10	0159/42	0167/42					
URE11	0100/42	0169/42					
URE12	0182/42	0158/42					

CROSS-REFERENCE SYMBOL TABLE

URE13	0170/42	0185/42					
URE14	0186/42	0162/42					
URE15	0191/42	0072/42					
URE21	0070/42	0099/42					
URE22	0056/42	0181/42					
URE25	0097/42	0089/42					
URE30	0231/42	0039/42					
URENM	0198/42	0132/42	0207/42	0221/42	0223/42		
UREP1	0019/42	0012/42					
UREP2	0031/42	0023/42					
UREP3	0043/42	0053/42					
UREP4	0065/42	0074/42					
UREP5	0075/42	0069/42					
UREP6	0087/42	0096/42					
UREP9	0113/42	0094/42	0184/42				
URETR	0211/42	0139/42	0145/42	0224/42			
URHDA	0225/42	0041/42					
URPHD	0226/42	0225/42					
US,63	0598/42	0443/42					
USCK1	0224/05	0214/05					
USCK2	0232/05	0225/05					
USCK3	0235/05	0211/05					
USE	0002/02 0386/32 0256/49	0239/30 0392/32	0259/30 0061/33	0287/30 0372/33	0249/32 0378/33	0255/32 0052/36	0269/32 0057/36
USEI	0003/02	0243/30	0273/32	0067/33	0260/49		
USEOP	0461	0082/08	0131/11	0499/21	0419/40		
USER	0005/02 0296/02	0013 0185/03	0014	0256	0379	0002/02	0003/02

CROSS-REFERENCE SYMBOL TABLE

USE9N	0254/02	0024/08	0085/08	0245/09	0529/33	0445/36		
USINS	0352/05	0515/05						
UST10	0405/42	0400/42						
UST11	0410/42	0421/42						
UST12	0428/42	0415/42						
UST13	0440/42	0418/42						
UST14	0445/42	0394/42	0413/42	0430/42				
UST15	0453/42	0385/42	0448/42					
UST16	0460/42	0457/42						
UST17	0470/42	0551/42						
UST18	0480/42	0543/42						
UST19	0496/42	0535/42						
UST20	0524/42	0513/42						
UST21	0536/42	0531/42						
UST22	0544/42	0479/42	0499/42					
UST20	0627/42 0664/42	0410/42 0673/42	0426/42 0028/43	0444/42 0312/43	0632/42	0657/42	0662/42	
UST30	0038/43	0049/43						
UST31	0045/43	0042/43						
UST32	0069/43	0088/43						
UST33	0083/43	0073/43	0079/43					
UST34	0103/43	0125/43						
UST35	0120/43	0107/43	0113/43					
UST36	0145/43	0142/43						
UST37	0161/43	0180/43						
UST38	0175/43	0168/43						
UST39	0181/43	0165/43						

CROSS-REFERENCE SYMBOL TABLE

UST30	0669/42	0676/42	0263/43	0295/43	0317/43	0404/43	
UST40	0220/43	0241/43					
UST41	0232/43	0222/43	0224/43				
UST50	0137/43	0150/43					
UST60	0654/42 0346/43	0348/42 0393/43	0362/42	0508/42	0522/42	0665/42	0259/43
USTA0	0251/42	0244/42					
USTA1	0270/42	0280/42					
USTA2	0029/43	0025/43					
USTA4	0297/42	0368/42					
USTA5	0369/42	0300/42	0307/42				
USTA6	0380/42	0459/42					
USTA7	0386/42	0439/42					
USTA8	0389/42	0395/42	0434/42				
USTA9	0396/42	0392/42					
USTBP	0587/42	0393/42	0412/42	0417/42	0429/42	0595/42	0597/42
USTBR	0355/43	0366/43	0371/43	0389/43			
USTCK	0220/02 0241/05	0642/03	0046/04	0212/05	0223/05	0230/05	0234/05
USTD1	0325/43	0332/43					
USTD2	0328/43						
USTD6	0412/43	0102/43					
USTDA	0322/43	0198/43	0208/43	0334/43			
USTDC	0414/43	0068/43					
USTDG	0645/42 0640/42	0315/42 0650/42	0332/42 0672/42	0402/42 0294/43	0630/42 0306/43	0631/42	0639/42
USTDL	0418/43	0086/43					
USTDR	0370/43	0195/43	0205/43	0215/43	0231/43	0252/43	0382/43
USTDS	0302/43	0144/43	0166/43	0209/43	0318/43		

CROSS-REFERENCE SYMBOL TABLE

USTDU	0413/43	0123/43					
USTER	0603/42	0493/42	0365/43	0381/43			
USTID	0417/43	0036/43					
USTLL	0287/43	0044/43	0057/43	0077/43	0111/43	0298/43	
USTMA	0243/05	0209/05					
USTMT	0382/22	0243/05					
USTQC	0636/42	0260/42	0276/42	0325/42	0641/42	0010/43	
USTQV	0600/42	0495/42					
USTRV	0703/42 0172/43	0366/42 0228/43	0438/42 0274/43	0452/42 0279/43	0540/42	0711/42	0117/43
USTS1	0390/43	0409/43					
USTS0	0599/42	0565/42					
USTSR	0338/43	0221/43	0326/43	0344/43	0350/43	0351/43	
USTSS	0387/43	0271/43	0276/43	0281/43	0411/43		
USTST	0612/42 0333/42 0613/42 0051/43 0209/43	0255/42 0349/42 0615/42 0060/43 0246/43	0265/42 0370/42 0619/42 0095/43 0264/43	0283/42 0406/42 0622/42 0130/43 0347/43	0309/42 0461/42 0623/42 0152/43 0405/43	0316/42 0532/42 0020/43 0187/43	0326/42 0555/42 0030/43 0200/43
USTSV	0691/42 0170/43	0364/42 0226/43	0436/42 0272/43	0450/42 0277/43	0538/42	0699/42	0115/43
USTSW	0419/43	0160/43					
USTTB	0415/43	0136/43					
USTTE	0416/43	0148/43					
USTTZ	0570/42	0390/42	0414/42	0419/42	0581/42	0582/42	
USTUS	0420/43	0178/43					
UTDNM	0216/32	0187/32	0194/32	0200/32	0205/32	0225/32	
UTEMP	0261/02 0019/21	0434/02 0024/21	0406/20 0025/21	0408/20 0027/21	0416/20 0037/21	0475/20	0485/20
VAL10	0063/09	0039/09	0057/09	0144/09	0150/09		

CROSS-REFERENCE SYMBOL TABLE

VAL11	0065/09	0023/09						
VAL12	0068/09	0011/09						
VAL13	0161/09	0005/09						
VAL14	0168/09	0414/08						
VAL15	0174/09	0419/08						
VAL16	0199/09	0211/09						
VAL17	0201/09	0177/09						
VAL18	0212/09	0180/09						
VAL19	0235/09	0230/09						
VAL20	0231/09	0222/09	0228/09					
VAL31	0448/08	0441/08						
VAL51	0080/09	0014/09						
VAL52	0128/09 0121/09	0091/09	0100/09	0105/09	0109/09	0116/09	0118/09	
VAL53	0154/09	0157/09						
VAL98	0253/09	0244/09	0247/09					
VAL99	0241/09	0410/08						
VALTB	0248/02 0445/34 0467/34 0488/34	0335/02 0451/34 0468/34 0490/34	0371/07 0457/34 0481/34 0492/34	0334/09 0461/34 0483/34 0494/34	0438/34 0463/34 0484/34 0496/34	0443/34 0464/34 0486/34 0497/34	0444/34 0466/34 0487/34 0499/34	
VALU1	0408/08 0127/09	0433/08 0160/09	0438/08 0163/09	0452/08 0167/09	0458/08 0200/09	0053/09 0205/09	0072/09 0240/09	
VALU2	0435/08	0447/08						
VALU3	0439/08	0428/08						
VALU4	0456/08	0417/08						
VALU5	0004/09	0422/08						
VALU6	0026/09	0067/09						
VALU7	0032/09	0079/09						
VALU8	0047/09	0051/09	0062/09					

CROSS-REFERENCE SYMBOL TABLE

VALU9	0054/09	0046/09					
VALUE	0402/08	0073/07	0369/07	0372/07			
VAR01	0427/05	0410/05					
VAR02	0431/05	0418/05					
VAR03	0440/05	0445/05					
VAR04	0419/05	0403/05	0405/05	0407/05			
VAR0P	0022/02	0359/02	0380/02	0343/03	0377/03	0518/03	0552/03
	0626/03	0208/04	0427/04	0458/04	0160/05	0313/05	0334/05
	0343/05	0370/05	0400/05	0401/05	0408/05	0422/05	0423/05
	0426/05	0433/05	0441/05				
VCHK	0176/02	0337/02	0408/02	0430/02	0491/02	0102/17	0186/17
	0198/17	0387/17	0293/18	0460/25			
VCHK1	0291/18	0305/18	0307/18				
VCHK2	0306/18	0298/18					
VL0	0458/02	0077/12	0092/12				
VLF10	0070/12	0065/12					
VLF11	0072/12	0069/12					
VLF12	0088/12	0099/12					
VLF13	0096/12	0086/12					
VLF1L	0188/02	0017/10	0370/10	0010/11	0070/12	0071/12	0095/12
	0043/17						
VFLG	0250/02	0346/07	0356/08	0426/08	0009/09	0161/09	0175/09
	0242/09	0255/09					
VT0	0431/02	0175/18	0218/18	0221/18	0222/18	0223/18	0238/18
	0240/18	0286/18	0287/18	0288/18	0290/18	0291/18	
VTMP1	0362/02	0435/08	0437/08	0006/09	0015/09	0021/09	0052/09
	0073/09	0080/09	0083/09	0087/09	0122/09	0126/09	0159/09
	0174/09	0181/09	0188/09	0199/09	0207/09		
VTMP2	0363/02	0008/09	0026/09	0042/09	0050/09	0093/09	0131/09
	0146/09	0156/09					
VTMP3	0364/02	0017/09	0029/09	0030/09	0031/09	0032/09	0033/09
	0034/09	0035/09	0036/09	0043/09	0075/09	0076/09	0077/09
	0078/09	0085/09	0089/09	0097/09	0098/09	0102/09	0110/09

CROSS-REFERENCE SYMBOL TABLE

	0111/09 0220/09	0112/09 0229/09	0113/09 0231/09	0183/09	0193/09	0213/09	0220/09
VTMP4	0365/02	0040/09	0058/09	0106/09	0119/09	0123/09	0124/09
VTMP5	0366/02	0082/09	0128/09				
WCS	0155	0421/45	0270/48				
WERRA	0008/15	0226/16	0400/16	0410/16	0455/16	0480/16	
WERRS	0536 0102/14 0307/22	0428/09 0008/15	0265/10 0084/16	0280/10 0122/16	0295/10 0509/20	0259/11 0045/21	0212/12 0302/22
WORD	0059 0108/26 0282/30 0400/31 0062/33 0594/35 0270/36 0174/37 0303/37 0359/38 0570/39 0210/41 0376/44 0646/45 0257/49 0311/50 0140/51 0415/51 0331/52 0311/54 0408/55 0283/56 0287/57 0632/57 0201/58 0556/58	0051/03 0197/26 0321/30 0421/31 0104/33 0053/36 0335/36 0210/37 0307/37 0018/39 0673/39 0377/41 0391/44 0680/45 0317/49 0318/50 0238/51 0545/51 0382/52 0519/54 0075/56 0284/56 0304/57 0640/57 0272/58	0103/03 0470/27 0201/31 0478/31 0373/33 0105/36 0345/36 0215/37 0436/37 0111/39 0743/39 0076/42 0398/44 0070/46 0435/49 0330/50 0276/51 0602/51 0452/52 0171/55 0131/56 0317/56 0319/57 0669/57 0305/58	0205/15 0047/28 0255/31 0022/32 0388/33 0219/36 0106/37 0267/37 0505/37 0116/39 0782/39 0101/42 0399/44 0687/48 0023/50 0334/50 0339/51 0163/52 0095/53 0247/55 0227/56 0497/56 0332/57 0084/58 0399/58	0482/15 0074/28 0283/31 0250/32 0333/34 0247/36 0120/37 0282/37 0173/38 0205/39 0789/39 0077/44 0594/44 0728/48 0116/50 0433/50 0380/51 0232/52 0210/53 0267/55 0244/56 0103/57 0552/57 0121/58 0477/58	0350/16 0240/30 0362/31 0270/32 0181/35 0262/36 0142/37 0285/37 0222/38 0324/39 0802/39 0261/44 0621/45 0024/49 0292/50 0064/51 0390/51 0282/52 0186/54 0290/55 0261/56 0199/57 0586/57 0150/58 0496/58	0049/26 0260/30 0367/31 0387/32 0559/35 0269/36 0154/37 0291/37 0310/38 0426/39 0828/39 0351/44 0628/45 0115/49 0308/50 0097/51 0406/51 0299/52 0261/54 0301/55 0276/56 0228/57 0626/57 0159/58 0519/58
WRBU1	0490/15	0481/15					
WRBU2	0500/15	0489/15					
WRBU4	0442/15	0453/15	0462/15				
WRBU5	0460/15	0466/15					
WRBU6	0467/15	0443/15	0446/15	0448/15			
WRBU7	0471/15	0437/15					

CROSS-REFERENCE SYMBOL TABLE

WRBUF	0196/02 0433/15	0428/02 0502/15	0458/02 0382/35	0481/11	0612/11	0193/15	0427/15
WSP	0546/33	0410/45	0259/48				
WTP	0156	0008/30	0545/39				
X	0629/28	0656/28	0659/28				
X2056	0516/37	0125/37	0159/37	0163/37			
X2TMP	0262/02 0274/20	0425/02 0275/20	0426/02	0187/20	0205/20	0266/20	0268/20
XCOM5	0635/28	0328/29					
XCRLF	0680/42 0465/42 0064/43 0156/43 0245/43	0281/42 0537/42 0080/43 0169/43 0250/43	0293/42 0554/42 0092/43 0185/43 0333/43	0363/42 0687/42 0099/43 0194/43 0410/43	0374/42 0029/43 0114/43 0204/43	0435/42 0050/43 0129/43 0213/43	0449/42 0059/43 0151/43 0225/43
XEC	0301/09						
XEC0	0328/09	0315/09	0323/09				
XEC01	0316/09	0310/09					
XEC1	0397/09 0063/10 0385/10 0393/11 0253/12	0317 0071/10 0104/11 0466/11 0254/12	0010/10 0162/10 0111/11 0539/11 0263/12	0022/10 0192/10 0159/11 0248/12 0269/12	0031/10 0196/10 0174/11 0249/12	0053/10 0208/10 0213/11 0250/12	0060/10 0299/10 0247/11 0252/12
XEC1A	0317 0237/18	0175/12 0214/25	0048/17 0226/25	0158/17 0229/25	0162/17 0232/25	0318/17	0015/18
XEC2	0334/09	0362/09					
XEC3	0343/09	0241	0339/09				
XEC3I	0241	0447/09					
XEC4	0363/09	0335/09					
XEC5	0420/09	0242					
XEC5I	0242	0342/09					
XEC6	0442/09	0436/09					
XEC7	0446/09	0426/09					
XEC8	0380/09	0373/09					

CROSS-REFERENCE SYMBOL TABLE

XEC9	0371/09	0365/09					
XECBR	0625/11	0414/09					
XECTB	0247/12	0625/11					
XPNCH	0223/21	0112/31					
XPUN	0034/31	0502/29					
XTEMP	0259/02	0415/02	0416/02	0432/02	0288/20	0299/20	0300/20
	0307/20	0308/20	0309/20	0311/20	0319/20	0335/20	0347/20
	0348/20	0356/20	0376/20	0396/20	0405/20	0422/20	0427/20
	0456/20	0469/20	0472/20	0474/20	0489/20	0493/20	0011/21
	0013/21	0016/21	0020/21	0030/21	0033/21	0105/21	0111/21
	0112/21	0118/21	0126/21	0136/21	0137/21	0166/21	0179/21
YEAR	0091	0054/20	0117/32	0193/32	0089/33		
YTEMP	0260/02	0433/02	0357/20	0359/20	0367/20	0368/20	0374/20
	0378/20	0417/20	0429/20	0433/20	0461/20	0471/20	0478/20
	0481/20	0482/20	0491/20	0492/20	0495/20	0015/21	0041/21
	0117/21	0120/21	0122/21	0125/21	0128/21	0130/21	0176/21
	0198/21						
Z999	0381/39	0247/39					
ZDISC	0169/03	0118	0178/03	0179/03	0682/32		
ZERSL	0438/32	0109/42					