

2000F (OPTION 200/205) TSB SYSTEM
(REV A)

BINARY TAPES	24337-60001
	24337-60002
	24337-60003
SOURCE TAPES	24337-80001
	24337-80002
	24337-80003
	24337-80004
	24337-80005
	24337-80006
	24337-80007
	24337-80008
	24337-80009
	24337-80010
	24337-80011
	24337-80012
	24337-80013
	24337-80014
	24337-80015
	24337-80016
	24337-80017
	24337-80018
	24337-80019
	24337-80020
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	24337-80032
	24337-80033
	24337-80034
	24337-80035
	24337-80036
	24337-80037
	24337-80038
	24337-80039
	24337-80040
	24337-80041
	24337-80042
	24337-80043
	24337-80044
	24337-80045

SOURCE TAPES
CONTINUED

24337-80046
24337-80047
24337-80048
24337-80049
24337-80050
24337-80051
24337-80052

SOURCE LISTING

24337-90001

0001

** NO ERRORS*

ASMB,A,B,L 2000F (OPTION 200/205) TSB SYSTEM

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0001          ASMB,A,B,L   2000F (OPTION 200/205) TSB SYSTEM
0002*                               VERSION A   8/1/73
0003 02002          ORG 2002B
0004*
0005* LINKAGE INFORMATION USED BY THE TSB LOADER AND THE
0006* MAG TAPE DUMP.
0007*
0008 02002 075000    DEF LIBRA      SYSTEM LIBRARY PROGRAM ORIGIN
0009 02003 072037    DEF COM6       => SYSTEM LIBRARY DISC ADDRESSES
0010 02004 000024    ABS TTY01=TTY00   LENGTH OF A TTY TABLE
0011 02005 057326    DEF TTY00+?DISC   ADDRESS OF USER DISC ADDRESS
0012 02006 057331    DEF TTY00+?ID     ADDRESS OF ID-NAME
0013 02007 001567    DEF LNAME        ADDRESS OF USER-DEPENDENT ITEMS
0014 02010 177224    ABS USER-PROGB=1 LENGTH OF SWAP AREA
0015 02011 001224    DEF USER        CORE ADDRESS OF SWAP AREA
0016 02012 070340    DEF TSB         SYSTEM STARTING ADDRESS
0017 02013 114732    JSB POWIN,I    TO GO INTO LOC 4.
0018 02014 031234    DEF GMGB       MESSAGE BUFFER GETTER
0019 02015 000075    ABS $SLPL=LIBRA NUMBER OF LIBRARY PROGRAMS

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0021	00000		A	EQU 0	A REGISTER ADDRESS
0022	00001		B	EQU 1	B REGISTER ADDRESS
0023	00000		DEATH	EQU 0	
0024	00017		FTEL	EQU 15	FILE TABLE ENTRY LENTH
0025	00002			ORG 2	
0026	00002	102002		HLT DEATH+2	FOR SYSTEM
0027	00003	024002		JMP +-1	PROTECTION
0028	00004	103004		HLT 4,C	CHANGED BY LOADER.
0029	00005	102005		HLT DEATH+5	PARITY ERROR
0030	00006	107706		CLC 6,C	
0031	00007	107707		CLC 7,C	
0032	00010	114734	CH1	JSB R14DR,I	COMMUNICATION FROM I/O PROCESSOR
0033	00011	102011	CH2	HLT DEATH+11B	
0034	00012	114756	?SC	JSB T35DR,I	CONSOLE LINK
0035	00013	107713		CLC 13B,C	
0036	00014	114630	CLOCK	JSB CLKDR,I	CLOCKLINK

0038*

0039** TEMPORARIES AND POINTERS

0040*

0041	00030			ORG 30B	
0042	00030	000000	LTEMP	BSS 16	TEMPS USED BY NONRESIDENT FUNCS.
0043	00050	000000	MOVES	BSS 1	SOURCE AND DESTINATION
0044	00051	000000	MOVED	BSS 1	FOR MOVEW ROUTINE.
0045	00052	000000	ID	BSS 1	USED FOR RESULTS OF GETID ROUTIN
0046	00053	000000	MID	BSS 1	
0047	00054	000000	T35CP	BSS 1	T35 BUFFER PNTR FOR LIBR. PROGS.
0048	00055	000000	T35LC	BSS 1	RESULT OF T35CH ROUTINE.
0049	00056	000000	PBPTR	BSS 1	POINTER TO END OF CURRENT PROGRA
0050	00057	000000	TIMER	BSS 1	POINTS TO CLOCK OF ACTIVE USER.
0051	00060	000000	SBHED	BSS 1	
0052	00061	000000	SCHL	BSS 1	
0053	00062	000000	TTQ	BSS 1	
0054	00063	000000	SCHID	BSS 1	
0055	00064	000000	SCHP	BSS 1	
0056	00065	000000	SCNT	BSS 1	
0057	00066	000000	SCHT	BSS 1	
0058	00067	000000	SCHPR	BSS 1	
0059	00070	000000	CMA	BSS 1	
0060	00071	000000	CMB	BSS 1	
0061	00072	000000	CME	BSS 1	
0062	00073	000000	SVCH2	BSS 1	
0063	00074	000000	TCNT	BSS 1	
0064	00075	000000	IDTAD	BSS 1	=> IDT DISC ADDRESS
0065	00076	000000	IDTLN	BSS 1	=> IDT TRACK LENGTH
0066	00077	000000	STDAP	BSS 1	SYSTEM TABLE DISC ADDRESS POINTR

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0068*
0069*****
0070*
0071*      BEGINNING OF EQUIPMENT TABLE
0072*
0073*      THE NEXT SECTION, ORIGINATED AT 1000, CONSTITUTES THE RESIDENT
0074*      INFORMATION ABOUT THE DISC RESIDENT TABLES. THESE TABLES ARE
0075*      INITIALIZED BY THE VARIOUS LOADERS AND THEIR CONTENTS ARE
0076*      WRITTEN ON DISC BY THE SLEEP ROUTINE.
0077*
0078 00100          ORG 1000
0079 00100 000000  IDEC  BSS 12      ID TABLE HEADERS
0080*                                     EACH 4 WORD ENTRY CONSISTS OF:
0081*                                     1) FIRST ID ON THE TRACK
0082*                                     2) DISC
0083*                                     3) ADDRESS
0084*                                     4) LENGTH IN WORDS
0085 00114 000000  NIDT  BSS 1      NUMBER OF ID TRACKS

0087 00115 000000  NDIRT BSS 1      NUMBER OF DIRECTORY TRACKS/DISC

0089 00116 000000  ADTAT BSS 24     ADT DISC ADDRESS TABLE
0090*                                     EACH 3 WORD ENTRY CONSISTS OF:
0091*                                     1) DISC
0092*                                     2) ADDRESS
0093*                                     3) LENGTH IN WORDS
0094 00120          ADTLN EQU ADTAT+2 POINTS TO LENGTH OF DISC 0

0096 00146 000000  DKTBL BSS 8      DISC SELECT CODE/UNIT NUMBER
0097 00156 000000  DADSL BSS 2      DISC ADDRESS OF SYSTEM LIBRARY
0098 00160 000000  DLNSL BSS 1      DISC LENGTH OF SYSTEM LIBRARY
0099 00161 000000  SYSID BSS 5      SYSTEM IDENTIFICATION
0100 00166 000000  MAGSC BSS 1      MAG TAPE SELECT CODE
0101 00167 000000  NPORT BSS 1      #NUMBER OF AVAILABLE PORTS
0102 00170 000000  YEAR  BSS 1      CURRENT YEAR = 0 TO 99
0103 00171 000000  DATIM BSS 2      TWO WORD ENTRY FOR TIME OF YEAR
0104*                                     1) HOUR OF YEAR
0105*                                     2) # OF 100MS UNITS IN HOUR
0106 00173 000000  HDATE BSS 1      LAST HIBERNATE DATE
0107 00174 000000  SLEPT BSS 1      0 SEZ SLEPT, -1 SEZ NO
0108*
0109*      END OF THE EQUIPMENT TABLE
0110*
0111*****
0112*
0113 00175 000000  LDBSA BSS 1      DISC BOOTSTRAP ADDRESS
0114 00176 000000  LSTDA BSS 1      LOADER SEGMENT TABLE ADDRESS
0115 00177 000000  MHAD  BSS 1      ADDRESS OF M. H. DISC TABLE
0116 00200 000000  GMBGP BSS 1      => MESSAGE BUFFER GETTER
0117 00201 000000  DISCA BSS 1      ADDRESS OF DISC DRIVER ENTRY
0118 00202 000000  DISCB BSS 1      DISC DRIVER INTERRUPT ENTRY ADDR
0119 00203 000000  MBUSY BSS 1      DISC DRIVER BUSY FLAG
0120 00204 000000  MWORD BSS 1      DISC REQUESTED WORD COUNT
0121 00205 000000  DREDP BSS 1      => DISC AUTO RESTART ROUTINE
0122*
0123*      END OF AREA THAT MUST CORRESPOND WITH THE LOADER

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0124*
0125*****
0126*
0127 00206 031060 DISCZ DEF ZDISC
0128*
0129*
0130** DISC ERROR ROUTINE POINTERS
0131*
0132 00207 061234 SICKP DEF SICK SYSTEM TRACK CAN'T BE READ
0133 00210 060524 PTZAP DEF JETPT SWAP TRACK CAN'T BE READ/WRITTEN
0134 00211 060647 SLVAG DEF SALVG SYSTEM TRACK CAN'T BE WRITTEN
0135 00212 061303 DEADP DEF DEAD SYSTEM TRACKS INCOMPATABLE
    
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0137*
0138**
0139*** MUERTO
0140**
0141*
0142* ALL SYSTEM HALTS CAN BE REFERENCED BY THE LABEL 'DEATH'. THE
0143* FOLLOWING IS A LIST OF THE HALTS AND THEIR MEANINGS AS WELL
0144* AS AN INDICATION OF POSSIBLE RECOVERY OR A MESSAGE OF DOOM.
0145*
0146* 2 - ERRONEOUS, NON-RECOVERABLE SYSTEM TRANSFER HAS OCCURRED
0147*
0148* 5 - A PARITY ERROR HAS OCCURRED. CHECK THE HARDWARE.
0149*
0150* 11B - UNEXPECTED INTERRUPT FROM THE PROCESSOR INTERCONNECT.
0151* TAKE A COLD DUMP OF THIS UNRECOVERABLE SYSTEM.
0152*
0153* 30B - DISC DRIVER IS BUSY. RECOVERY NOT POSSIBLE.
0154*
0155* 31B - DISC CALLED IS NOT PRESENT. NO WAY TO RECOVER.
0156*
0157* 32B - DISC ERROR WHILE WRITING A SYSTEM TRACK. SYSTEM
0158* TRACK HAS BEEN MOVED AND ALL TABLES HAVE BEEN
0159* UPDATED. RECOVERY IS POSSIBLE.
0160*
0161* 33B - DISC ERROR WHILE READING TRACK OR WRITING NON-
0162* ESSENTIAL TRACK. RECOVERY IS POSSIBLE.
0163*
0164* 34B - DISC ERROR CAUSING THE SYSTEM TABLES TO BE INCOMPAT-
0165* ABLE. RECOVERY IS OUT OF THE QUESTION.
0166*
0167* 35B - A DIRECTORY TRACK COULD NOT BE FOUND. RECOVERY IS
0168* IMPOSSIBLE.
0169*
0170* 36B - POWERFAIL HAS OCCURRED. CHECK RESTART SWITCH POSITION.
0171*
0172* 37B - BAD ADT DISC ADDRESS GENERATED. RECOVERY - NO WAY.
0173*
    
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0175*

0176** I/O PROCESSOR SEND DRIVER OPCODES

0177*

0178	00213	000000	OCR	OCT	000000	OUTPUT CHARACTER
0179	00214	020000	STE	OCT	020000	START TIMING ENTER
0180	00215	040000	GTC	OCT	040000	GET CHARACTER
0181	00216	060000	PHO	OCT	060000	PHONES TIME
0182	00217	100000	SPE	OCT	100000	BAUD RATE INFO
0183	00220	120000	SBP	OCT	120000	SAVE BUFFER POINTER
0184	00221	140000	RBP	OCT	140000	RESTORE BUFFER POINTER
0185	00220		FBP	EQU	SBP	FREE SAVED SPACE
0186	00222	160000	INI	OCT	160000	INITIALIZE SYSTEM
0187	00223	160001	UIR	OCT	160001	USER IS RUNNING
0188	00224	160002	UNR	OCT	160002	USER NOT RUNNING
0189	00225	160003	IWT	OCT	160003	INPUT WAIT
0190	00226	160004	HUU	OCT	160004	HANG USER UP
0191	00227	160005	ULO	OCT	160005	USER LOGGED ON
0192	00230	160006	ECO	OCT	160006	ECHO-ON
0193	00231	160007	ECF	OCT	160007	ECHO-OFF
0194	00232	160010	TPO	OCT	160010	TAPE MODE ON
0195	00233	160011	ILI	OCT	160011	ILLEGAL INPUT?
0196	00234	160012	NUC	OCT	160012	NEW USER CALLED
0197	00235	160013	KA0	OCT	160013	KILL ALL OUTPUT
0198	00236	160014	ALI	OCT	160014	ALLOW INPUT
0199	00237	160015	OWT	OCT	160015	OUTPUT WAIT
0200	00240	160016	IBF	OCT	160016	IS BUFFER FULL?
0201	00241	160017	PsC	OCT	160017	LINE PRINTER SELECT CODE
0202	00242	160020	LPR	OCT	160020	LINE PRINTER REQUEST
0203	00243	160021	LPD	OCT	160021	LINE PRINTER DISCONNECT
0204	00244	160022	LPS	OCT	160022	LINE PRINTER STATUS
0205	00245	160023	BKS	OCT	160023	BACKSPACE IN BUFFER
0206	00246	160024	CHS	OCT	160024	CHARACTER SIZE
0207	00247	160025	STP	OCT	160025	SUBTYPE INFO
0208	00250	160026	GRP	OCT	160026	GET RECEIVE PARAMETER
0209	00251	160027	ABT	OCT	160027	USER IS BEING ABORTED
0210	00252	160030	WTP	OCT	160030	WHAT TERMINAL TYPE?
0211*			KSN	OCT	160031	I/O PROCESSOR CORE DUMP

0213*

0214** SYSTEM STATUS VARIABLES

0215*

0216	00253	000000	PRIST	NOP	LP INDICATOR
0217	00254	000000	LFLAG	NOP	
0218	00255	000000	MAIN	NOP	INDICATES USER IN CORE, 0 IF NONE
0219	00256	000000	LIB	NOP	=> DISC ADDRESS OF LIBRARY
0220*					PROGRAM IN CORE, 0 IF NONE
0221	00257	000000	DIRWD	NOP	=> DISC ADDRESS OF DIRECTORY
0222*					TRACK IN CORE, 0 IF NONE
0223	00260	000000	HQDIS	NOP	= 0 UNLESS HEAD OF QUEUE
0224*					IS DISCONNECTED
0225*					
0226	24000		ULEN	EQU 10240	LENGTH OF USER AREA
0227	75000		LIBRA	EQU 75000B	SYSTEM LIBRARY PROGRAM ADDRESS

0229*

0230**

0231***

0232**

0233*

0234 00261 000000 T35FG NOP

0235*

0236 00262 000000 TIMEF NOP

0237*

0238 00263 000277 T35LN DEF T35LK

0239 00264 000000 LCHCR NOP

0240 00265 000266 READY DEF **1

0241 00266 005122 OCT 5122

0242 00267 042501 ASC 2,EADY

00270 042131

0243 00271 000272 MLINK DEF **1

0244 00272 000272 DEF *

0245 00273 077777 OCT 77777

0246 00273 INF EQU MLINK+2

0247*

0248** TTY TABLE ENTRY FOR TTY35

0249*

0250 00274 000000 T35CL NOP

0251 00275 000000 T35RS NOP

0252 00276 000000 T35ST NOP

0253 00277 000000 T35LK NOP

0254 00300 000000 T35PR NOP

0255*

0256 00301 171452 T35B2 ABS T35BF+T35BF CHAR POINTER TO TTY35 BUFFER

0257 00302 171562 T35ND ABS T35BF+T35BF+72 POINTS TO END OF BUFFER

0258 00303 074625 T35B1 DEF T35BF POINTS TO WORD ADDRESS OF BUFFER

0260 00047 MESLN EQU 39 LENGTH OF OPERATOR MESSAGES

0261 00352 MESBN EQU MESLN+MESLN+MESLN+MESLN+MESLN+MESLN

0262 00304 000000 MSQCT OCT 0 MESSAGE COUNTER

0263 00305 056572 MSQP1 DEF MSQHD+MESBN-MESLN

0264 00306 056267 MSQP3 DEF MSQHD

0265 00307 056641 MSQND DEF MSQHD+MESBN LIMITS

0266 00310 056267 MSQBG DEF MSQHD OF MESSAGE QUEUE

0268 00311 000000 T35F1 NOP

0269 00312 000000 T35F2 NOP

0270 00313 000000 T35F3 NOP

PSEUDO-FLAG; MUST BE 11
WORDS BEFORE T35CL
= 1 WHEN CURRENT PROGRAM
IS TIMED

LF=R

POINTS TO BASIC QUEUE ENTRY.
LINK TO HEAD OF QUEUE.
MAX. PRIORITY USED FOR Q INSERTS

PSEUDO CLOCK.
RESTART ADDRESS
STATUS
LINK
PRIORITY

SYSTEM
CONSOLE
FLAGS

0272*

0273** GENERAL USAGE CONSTANTS

0274*

0275

SUP

0276	00314	160010	M8184	DEC	-8184
0277	00315	177000	M512	DEC	-512
0278	00316	177400	M256	DEC	-256
0279	00317	177640	M96	OCT	-140
0280	00320	177700	D100	OCT	-100
0281	00321	177667	M73	DEC	-73
0282	00322	177706	D72	OCT	-72
0283	00322		M728	EQU	D72
0284	00323	177744		DEC	-28,-27,-26,-25,-24,-23,-22,-21
0285	00333	177754		DEC	-20,-19,-18,-17,-16,-15,-14,-13,-12,-11
0286	00345	177766		DEC	-10,-9,-8,-7,-6,-5,-4,-3,-2,-1
0287	00357	000000	.	DEC	0,1,2,3,4,5,6,7,8,9
0288	00371	000012		DEC	10,11,12,13,14,15,16,17,18,19
0289	00403	000024		DEC	20,21,22,23,24,25,26,27,28,29
0290	00415	000036		DEC	30,31,32,33,34,35,36,37,38,39
0291	00427	000050		DEC	40,41,42,43,44,45,46,47,48,49
0292	00441	000062		DEC	50,51
0293	00443	011610	.5000	DEC	5000
0294	00215		BIT14	EQU	GTC
0295	00360		XABOR	EQU	+.1
0296	00361		XINPT	EQU	+.2
0297	00362		XOUTW	EQU	+.3
0298	00363		XSYNT	EQU	+.4
0299	00355		XDISC	EQU	.-2
0300	00354		XENTO	EQU	.-3
0301	00353		XPUN	EQU	.-4
0302				UNS	

0304*

0305*

0306** LANGUAGE PROCESSOR CONSTANTS AND ADDRESSES

0307*

0308	00444	001577	DFILT	DEF	FLSTS
0309	00445	033027	SBJTB	DEF	#FSC
0310	00446	031731	SYNTA	DEF	SYNTAX
0311	00447	033463		DEF	#SBCK
0312	00450	177740	M32	DEC	=32
0313	00451	033304		DEF	#FRCR
0314	00452	000072	.58	DEC	58
0315	00453	033335		DEF	#FPOP
0316	00454	000073	B73	OCT	73
0317	00455	034131		DEF	#VROP
0318	00456	000074	D60	DEC	60
0319	00457	033603		DEF	#ARID
0320	00460	000077	B77	OCT	77
0321	00461	034506		DEF	#PGIN
0322	00462	000100	B100	OCT	100
0323	00463	034603		DEF	#TBSR
0324	00464	000105	E	OCT	105
0325	00465	034473		DEF	#GTPF
0326	00466	000110	.72	DEC	72
0327	00467	035214		DEF	#LPCK
0328	00470	000140	.140	OCT	140
0329	00471	034740		DEF	#RPCK
0330	00472	000144	.100	DEC	100
0331	00473	034716		DEF	#LTR
0332	00474	000177	B177	OCT	177
0333	00475	034730		DEF	#STOP
0334	00476	000200	B200	OCT	200
0335	00477	034210		DEF	#CRST
0336	00500	000377	B377	OCT	377
0337	00501	034752		DEF	#DGCK
0338	00502	000400	B400	OCT	400
0339	00503	034764		DEF	#LTCK
0340	00504	000777	B777	OCT	777
0341	00505	035205		DEF	#SBPU
0342	00506	001000	B1000	OCT	1000
0343	00507	034774		DEF	#SYCK
0344	00510	001130	D600	DEC	600
0345	00511	043627		DEF	#FINC
0346	00512	001777	B1777	OCT	1777
0347	00513	052717		DEF	#NMCK
0348	00514	002000	B2000	OCT	2000
0349	00515	053117		DEF	#MB10
0350	00516	003000	B3000	OCT	3000
0351	00517	053265		DEF	#DB10
0352	00520	004000	B4000	OCT	4000
0353	00521	053147		DEF	#NRML
0354	00522	020000	B20M	OCT	20000
0355	00523	053202		DEF	#PACK
0356	00524	030000	B30M	OCT	30000
0357	00525	052670		DEF	#OVFL
0358	00526	106240	D36K	ABS	30000+6000
0359	00527	034240		DEF	#DLPR

0360	00530	030060	ASC00	ASC	1,00
0361	00531	034421		DEF	#FDPS
0362	00532	020040	ASCBH	ASC	1,
0363	00533	036731		DEF	#SSYM
0364	00534	045000	COMOP	OCT	45000
0365	00535	037001		DEF	#ASYM
0366	00536	062000	DATOP	OCT	62000
0367	00537	036447		DEF	#DCMP
0368	00540	047000	DIMOP	OCT	47000
0369	00541	036573		DEF	#PNST
0370	00542	060000	ENDOP	OCT	60000
0371	00543	035173		DEF	#CUSP
0372	00544	070000	FILOP	OCT	70000
0373	00545	033607		DEF	#STRI
0374	00546	044000	IMGOP	OCT	44000
0375	00547	033635		DEF	#RSTO
0376	00550	100003	INTFL	OCT	100003
0377	00551	033647		DEF	#GTST
0378	00552	073000	LETOP	OCT	73000
0379	00553	042377		DEF	#FORM
0380	00554	012000	LBOP	OCT	12000
0381	00555	043547		DEF	#STST
0382	00556	013000	LPOP	OCT	13000
0383	00557	044006		DEF	#SBFX
0384	00560	022000	MULOP	OCT	22000
0385	00561	043426		DEF	#PSTR
0386	00562	055000	NXTOP	OCT	55000
0387	00563	044661		DEF	#OUCK
0388	00564	174003	OFOP	OCT	174003
0389	00565	044612		DEF	#TRST
0390	00566	100777	OPDMK	OCT	100777
0391	00567	043347		DEF	#CMPR
0392	00570	077000	OPMSK	OCT	77000
0393	00571	043330		DEF	#PCHK
0394	00572	100017	PDFFL	OCT	100017
0395	00573	042350		DEF	#FTCH
0396	00574	065000	PRTOP	OCT	65000
0397	00575	042020		DEF	#STDP
0398	00576	051000	REMOP	OCT	51000
0399	00577	042111		DEF	#FDAT
0400	00600	010000	RPOP	OCT	10000
0401	00601	043571		DEF	#FSCH
0402	00602	016000	SCOMM	OCT	16000
0403	00603	043747		DEF	#PSHS
0404	00604	043000	USEOP	OCT	43000
0405	00605	044721		DEF	#ARIN
0406	00606	075000	#LIB#	DEF	LIBRA
0407	00607	043650		DEF	#BNOP
0408	00610	175000	#LIBI	DEF	LIBRA, I
0409	00611	043643		DEF	#STTP
0410	00612	176000	M2000	OCT	176000
0411	00613	043657		DEF	#OPCK
0412	00614	074312	ABCK	DEF	ABCHK
0413	00615	043711		DEF	#RSCK
0414	00616	034400	ACC5A	DEF	ACC5S
0415	00617	044635		DEF	#FAD

0416	00620	034307	ACCSA	DEF	ACCST	
0417	00621	044647		DEF	#FSB	
0418	00622	053340	ANOT	DEF	NOT	
0419	00623	044675		DEF	#FMP	
0420	00624	053505	ATAB	DEF	TAB	
0421	00625	044707		DEF	#FDV	
0422	00626	053475	ATHEN	DEF	THEN	
0423	00627	044730		DEF	#FLUN	
0424	00630	070024	CLKDR	DEF	CLKIN	
0425	00631	044017		DEF	#IFIX	
0426	00632	070041	DCLC1	DEF	CLC1	
0427	00633	050010		DEF	#ENOT	
0428	00634	070045	DCLC2	DEF	CLC2	
0429	00635	050026		DEF	#NMOT	
0430	00636	070617	DEH	DEF	EH	
0431	00637	050345		DEF	#GTDG	
0432	00640	000030	DLTEM	DEF	LTEMP	
0433	00641	050436		DEF	#OTLN	
0434	00642	060524	DIT32	DEF	TTY32	
0435	00643	050416		DEF	#EDLM	
0436	00644	057324	DTTY0	DEF	TTY00	
0437	00645	042355		DEF	#STPT	
0438	00646	001703	ERS32	DEF	ERSEC+32	
0439	00647	051523		DEF	#EXP	
0440	00650	001643	ERSCA	DEF	ERSEC	
0441	00651	051647		DEF	#LOG	
0442	00652	041653	EXITA	DEF	EXIT	
0443	00653	051073		DEF	#CHEB	
0444	00654	001560	FCUCA	DEF	FCUC	
0445	00655	051146		DEF	#IENT	
0446	00656	042203	FDT4A	DEF	FDAT4	
0447	00657	051164		DEF	#PWR2	
0448	00660	033360	FOPBS	DEF	QUOTE-2	
0449	00661	042246		DEF	#INCL	
0450	00662	042622	FRET	DEF	FOR10	
0451	00663	050474		DEF	#GTCR	
0452	00664	001364	FSCHA	DEF	FSCH	
0453	00665	050466		DEF	#BKSP	
0454	00666	072041	FUSS	DEF	COM6+2	POINTER TO DISC ADDRESS OF FUSS
0455	00667	050450		DEF	#OTCR	
0456	00670	001650	IHB	DEF	HB	
0457	00671	050370		DEF	#OTIN	
0458	00672	003230	L1024	DEF	LIBUS+1024	
0459	00673	052614		DEF	#MCOT	
0460	00674	021230	L8192	DEF	LIBUS+8192	
0461	00675	052651		DEF	#OTST	
0462	00676	001230	LIBD	DEF	LIBUS	
0463	00677	042373		DEF	#SINI	
0464	00700	101230	LIBDI	DEF	LIBUS,I	
0465	00701	034516		DEF	#BLDI	
0466	00702	072231	LOGBG	DEF	LOGGR	POINTS TO BEGINNING OF LOGGR
0467	00703	047303		DEF	#RDIM	
0468	00704	072331	LOGND	DEF	LOGGR+64	POINTS TO END OF LOGGR
0469	00705	047252		DEF	#VCHK	
0470	00706	072330	LOGP1	DEF	LOGGR+63	POINTERS TO FIRST AND
0471	00707	045122		DEF	#SERR	

0472	00710	072330	LOGP2	DEF	LOGGR+63	LAST ENTRIES IN LOGGR
0473	00711	052677		DEF	#CHOU	
0474	00712	025230	LULEN	DEF	LIBUS+ULEN	
0475	00713	045112		DEF	#MOVE	
0476	00714	025063	LW97	DEF	USER+ULEN-97	
0477	00715	034550		DEF	#RECR	
0478	00716	025224	LWAUS	DEF	USER+ULEN	
0479	00717	034571		DEF	#FILR	
0480	00720	053317	MCBOP	DEF	MCBOS	
0481	00721	042043		DEF	#VLF1	
0482	00722	100001	ONEI	DEF	1,I	
0483	00723	044055		DEF	#RQST	
0484	00724	071623	OUTCH	DEF	#OUTC	
0485	00725	044324		DEF	#FILS	
0486	00726	002000	PBUFF	DEF	PROGB+1	
0487	00727	044442		DEF	#GTTY	
0488	00730	053516	PDFNS	DEF	PRDFS	
0489	00731	044505		DEF	#WRBU	
0490	00732	056653	POWIN	DEF	POW	
0491	00733	035043		DEF	#ALCO	
0492	00734	062025	R14DR	DEF	R14CM	
0493	00735	037056		DEF	#RSTP	
0494	00736	062000	S14SC	DEF	S14SH	
0495	00737	043636		DEF	#FENC	
0496	00740	071470	SCHEN	DEF	SCHEQ	
0497	00741	056000		DEF	#MTG1	
0498	00742	071444	SCHIN	DEF	SCHIQ	LINKAGE FOR INPUT REQUEST.
0499	00743	056010		DEF	#DTL1	
0500	00744	074152	SCHLB	DEF	SCHLQ	
0501	00745	056022		DEF	#RUND	
0502	00746	071724	SCOM1	DEF	COM1	
0503	00747	056064		DEF	#OTBL	
0504	00750	072025	SCOM5	DEF	COM5-1	
0505	00751	056072		DEF	#OTCL	
0506	00752	134213	STBAS	DEF	SYNTB-42B,I	
0507	00753	056103		DEF	#DSCH	
0508	00754	074460	T35CH	DEF	T35CQ	
0509	00755	056124		DEF	#MCHR	
0510	00756	057133	T35DR	DEF	?TT2	
0511	00757	056150		DEF	#EVEP	
0512	00760	057113	TTY35	DEF	?TT35	
0513	00761	033667		DEF	#USCK	
0514	00762	040031	XEC1A	DEF	XEC1	
0515	00763	035017		DEF	#PFSH	
0516	00764	037753	XEC3I	DEF	XEC3	
0517	00765	054006		DEF	#FRMT	
0518	00766	040055	XEC5I	DEF	XEC5	
0519	00767	041027		DEF	#EPRU	
0520	00770	154360	MAXSN	DEC	=10000	
0521	00771	035223		DEF	#SLCK	
0522	00772	000000	LOGCT	NOF		NUMBER OF ELEMENTS IN LOGGR
0523	00773	073307		DEF	#LCDL	
0524	00774	176550	MLIBD	ABS	=LIBUS	
0525	00775	043606		DEF	#FCUC	
0526	00776	154000	MULEN	ABS	=ULEN	
0527	00777	051743		DEF	#EDAB	

0528 01000 125000 PDFBS JMP PDFTB-1,I
 0529 00736 S14LP EQU S14SC

0530*

0531** FUNCTION EXECUTION ENTRY ADDRESSES

0532*

0533	01001	050523	PDFTB	DEF	ETAB
0534	01002	050610		DEF	ELIN
0535	01003	050553		DEF	ESPA
0536	01004	051273		DEF	ETAN
0537	01005	051411		DEF	EATN
0538	01006	051521		DEF	EEXP
0539	01007	051645		DEF	ELOG
0540	01010	050660		DEF	EABS
0541	01011	052010		DEF	ESQR
0542	01012	050663		DEF	EINT
0543	01013	050743		DEF	ERND
0544	01014	051016		DEF	ESGN
0545	01015	001023	LDVSR	DEF	DVSR
0546	01016	051027		DEF	ETYP
0547	01017	050677		DEF	ETIM
0548	01020	051204		DEF	ESIN
0549	01021	051202		DEF	ECOS
0550	01022	052076		DEF	EBRK

'LEN' IS DONE IN A SPECIAL WAY

0552	01023	023420	DVSR	DEC	10000
0553	01024	001750		DEC	1000
0554	01025	000144		DEC	100
0555	01026	000012		DEC	10
0556	01027	100000	MNEG	OCT	100000
0557	01030	000376		OCT	376
0558	01031	040000	HALF	DEC	0.5
	01032	000000			
0559	00320		M64	EQU	D100
0560	00316		HIMSK	EQU	M256
0561	00356		EOF	EQU	.-1
0562	00355		EOR	EQU	.-2
0563	01027		BIT15	EQU	MNEG
0564	00514		A000	EQU	B2000

0565*
 0566* THE FOLLOWING CONSTANTS ARE MASKS FOR THE BIT-FLAG WORD
 0567* IN EACH USER'S TTY TABLE

0568*

0569	00360	TERR	EQU	.+1	TAPE ERROR
0570	00361	CFLAG	EQU	.+2	COMPILE MODE
0571	00363	HFLAG	EQU	.+4	SHELLO IS RUNNING
0572	00367	TAPEF	EQU	.+8	USER IN TAPE MODE
0573	00377	UNABT	EQU	.+16	UNABLE TO ABORT
0574	00417	OUTWT	EQU	.+32	OUTPUT BUFFER FULL
0575	00462	COM14	EQU	B100	COMMUNICATION FROM 2114
0576	00476	ABTRY	EQU	B200	ABORT ATTEMPT
0577	00502	DFCHK	EQU	B400	CHECK FOR DIRTY FILES
0578	00506	CHNFG	EQU	B1000	CHAIN RUNNING
0579	00612	PUALT	EQU	M2000	PROGRAM UNALTERED
0580	00520	MBUST	EQU	B4000	MBUSY POSITIVE
0581	00600	PBFLG	EQU	RPOP	ABORT CAPABILITY DISABLED

"BREAK" COMMAND GIVEN

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0582 00522          CBFLG EQU B20M
0583*
0584**  ERROR JUMP TABLE
0585*
0586 01033 001472  SERRS DEF SERR
0587                                REP 35
0588 01034 001472          DEF SERR
0588 01035 001472          DEF SERR
0588 01036 001472          DEF SERR
0588 01037 001472          DEF SERR
0588 01040 001472          DEF SERR
0588 01041 001472          DEF SERR
0588 01042 001472          DEF SERR
0588 01043 001472          DEF SERR
0588 01044 001472          DEF SERR
0588 01045 001472          DEF SERR
0588 01046 001472          DEF SERR
0588 01047 001472          DEF SERR
0588 01050 001472          DEF SERR
0588 01051 001472          DEF SERR
0588 01052 001472          DEF SERR
0588 01053 001472          DEF SERR
0588 01054 001472          DEF SERR
0588 01055 001472          DEF SERR
0588 01056 001472          DEF SERR
0588 01057 001472          DEF SERR
0588 01060 001472          DEF SERR
0588 01061 001472          DEF SERR
0588 01062 001472          DEF SERR
0588 01063 001472          DEF SERR
0588 01064 001472          DEF SERR
0588 01065 001472          DEF SERR
0588 01066 001472          DEF SERR
0588 01067 001472          DEF SERR
0588 01070 001472          DEF SERR
0588 01071 001472          DEF SERR
0588 01072 001472          DEF SERR
0588 01073 001472          DEF SERR
0588 01074 001472          DEF SERR
0588 01075 001472          DEF SERR
0588 01076 001472          DEF SERR
0589 01077 001472  RERRS DEF SERR
0590                                REP 50
0591 01100 001472          DEF SERR
0591 01101 001472          DEF SERR
0591 01102 001472          DEF SERR
0591 01103 001472          DEF SERR
0591 01104 001472          DEF SERR
0591 01105 001472          DEF SERR
0591 01106 001472          DEF SERR
0591 01107 001472          DEF SERR
0591 01110 001472          DEF SERR
0591 01111 001472          DEF SERR
0591 01112 001472          DEF SERR
0591 01113 001472          DEF SERR
0591 01114 001472          DEF SERR

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0591	01115	001472		DEF	SERR
0591	01116	001472		DEF	SERR
0591	01117	001472		DEF	SERR
0591	01120	001472		DEF	SERR
0591	01121	001472		DEF	SERR
0591	01122	001472		DEF	SERR
0591	01123	001472		DEF	SERR
0591	01124	001472		DEF	SERR
0591	01125	001472		DEF	SERR
0591	01126	001472		DEF	SERR
0591	01127	001472		DEF	SERR
0591	01130	001472		DEF	SERR
0591	01131	001472		DEF	SERR
0591	01132	001472		DEF	SERR
0591	01133	001472		DEF	SERR
0591	01134	001472		DEF	SERR
0591	01135	001472		DEF	SERR
0591	01136	001472		DEF	SERR
0591	01137	001472		DEF	SERR
0591	01140	001472		DEF	SERR
0591	01141	001472		DEF	SERR
0591	01142	001472		DEF	SERR
0591	01143	001472		DEF	SERR
0591	01144	001472		DEF	SERR
0591	01145	001472		DEF	SERR
0591	01146	001472		DEF	SERR
0591	01147	001472		DEF	SERR
0591	01150	001472		DEF	SERR
0591	01151	001472		DEF	SERR
0591	01152	001472		DEF	SERR
0591	01153	001472		DEF	SERR
0591	01154	001472		DEF	SERR
0591	01155	001472		DEF	SERR
0591	01156	001472		DEF	SERR
0591	01157	001472		DEF	SERR
0591	01160	001472		DEF	SERR
0591	01161	001472		DEF	SERR
0592	01162	001472	FERRS	DEF	SERR
0593				REP	14
0594	01163	001472		DEF	SERR
0594	01164	001472		DEF	SERR
0594	01165	001472		DEF	SERR
0594	01166	001472		DEF	SERR
0594	01167	001472		DEF	SERR
0594	01170	001472		DEF	SERR
0594	01171	001472		DEF	SERR
0594	01172	001472		DEF	SERR
0594	01173	001472		DEF	SERR
0594	01174	001472		DEF	SERR
0594	01175	001472		DEF	SERR
0594	01176	001472		DEF	SERR
0594	01177	001472		DEF	SERR
0594	01200	001472		DEF	SERR
0595	01201	001472	WERRS	DEF	SERR
0596				REP	9
0597	01202	001472		DEF	SERR

0597	01203	001472	DEF	SERR
0597	01204	001472	DEF	SERR
0597	01205	001472	DEF	SERR
0597	01206	001472	DEF	SERR
0597	01207	001472	DEF	SERR
0597	01210	001472	DEF	SERR
0597	01211	001472	DEF	SERR
0597	01212	001472	DEF	SERR

0002	01213	001224	USE	DEF	USER	
0003	01214	101224	USEI	DEF	USER,I	
0004	01224			ORG	1224B	
0005	01224		USER	EQU	*	
0006	01224	005670	AREG	DEC	3000	SYSTEM LEVEL CODE
0007	01225	000310	BREG	DEC	200	FEATURE LEVEL CODE
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	124445		JMP	*-JTD,I	
0016	01232	000000	SBSCK	NOP		
0017	01233	124447		JMP	*-JTD,I	
0018	01234	000000	FRCUR	NOP		
0019	01235	124451		JMP	*-JTD,I	
0020	01236	000000	FPOP	NOP		
0021	01237	124453		JMP	*-JTD,I	
0022	01240	000000	VAROP	NOP		
0023	01241	124455		JMP	*-JTD,I	
0024	01242	000000	ARRID	NOP		
0025	01243	124457		JMP	*-JTD,I	
0026	01244	000000	PRGIN	NOP		
0027	01245	124461		JMP	*-JTD,I	
0028	01246	000000	TBSRH	NOP		
0029	01247	124463		JMP	*-JTD,I	
0030	01250	000000	GETPF	NOP		
0031	01251	124465		JMP	*-JTD,I	
0032	01252	000000	LPCK	NOP		
0033	01253	124467		JMP	*-JTD,I	
0034	01254	000000	RPCK	NOP		
0035	01255	124471		JMP	*-JTD,I	
0036	01256	000000	LTR	NOP		
0037	01257	124473		JMP	*-JTD,I	
0038	01260	000000	STROP	NOP		
0039	01261	124475		JMP	*-JTD,I	
0040	01262	000000	CHRST	NOP		
0041	01263	124477		JMP	*-JTD,I	
0042	01264	000000	DIGCK	NOP		
0043	01265	124501		JMP	*-JTD,I	
0044	01266	000000	LETCK	NOP		
0045	01267	124503		JMP	*-JTD,I	
0046	01270	000000	SBPUD	NOP		
0047	01271	124505		JMP	*-JTD,I	
0048	01272	000000	SYMCK	NOP		
0049	01273	124507		JMP	*-JTD,I	
0050	01274	000000	FINCH	NOP		
0051	01275	124511		JMP	*-JTD,I	
0052	01276	000000	NUMCK	NOP		
0053	01277	124513		JMP	*-JTD,I	
0054	01300	000000	MBY10	NOP		
0055	01301	124515		JMP	*-JTD,I	
0056	01302	000000	DBY10	NOP		
0057	01303	124517		JMP	*-JTD,I	

0058	01304	000000	NORML	NOP	
0059	01305	124521		JMP	*-JTD,I
0060	01306	000000	.PACK	NOP	
0061	01307	124523		JMP	*-JTD,I
0062	01310	000000	OVFLW	NOP	
0063	01311	124525		JMP	*-JTD,I
0064	01312	000000	DELPR	NOP	
0065	01313	124527		JMP	*-JTD,I
0066	01314	000000	FNDPS	NOP	
0067	01315	124531		JMP	*-JTD,I
0068	01316	000000	SSYMT	NOP	
0069	01317	124533		JMP	*-JTD,I
0070	01320	000000	ASYMT	NOP	
0071	01321	124535		JMP	*-JTD,I
0072	01322	000000	DCMPL	NOP	
0073	01323	124537		JMP	*-JTD,I
0074	01324	000000	PRNST	NOP	
0075	01325	124541		JMP	*-JTD,I
0076	01326	000000	CUSP	NOP	
0077	01327	124543		JMP	*-JTD,I
0078	01330	000000	STRID	NOP	
0079	01331	124545		JMP	*-JTD,I
0080	01332	000000	RSTOP	NOP	
0081	01333	124547		JMP	*-JTD,I
0082	01334	000000	GETST	NOP	
0083	01335	124551		JMP	*-JTD,I
0084	01336	000000	FORMX	NOP	
0085	01337	124553		JMP	*-JTD,I
0086	01340	000000	STSTR	NOP	
0087	01341	124555		JMP	*-JTD,I
0088	01342	000000	SBFIX	NOP	
0089	01343	124557		JMP	*-JTD,I
0090	01344	000000	PSTR	NOP	
0091	01345	124561		JMP	*-JTD,I
0092	01346	000000	OCHK	NOP	
0093	01347	124563		JMP	*-JTD,I
0094	01350	000000	TRSTR	NOP	
0095	01351	124565		JMP	*-JTD,I
0096	01352	000000	COMPR	NOP	
0097	01353	124567		JMP	*-JTD,I
0098	01354	000000	PCHK	NOP	
0099	01355	124571		JMP	*-JTD,I
0100	01356	000000	FETCH	NOP	
0101	01357	124573		JMP	*-JTD,I
0102	01360	000000	SETDP	NOP	
0103	01361	124575		JMP	*-JTD,I
0104	01362	000000	FDATA	NOP	
0105	01363	124577		JMP	*-JTD,I
0106	01364	000000	FSCH	NOP	
0107	01365	124601		JMP	*-JTD,I
0108	01366	000000	PSHST	NOP	
0109	01367	124603		JMP	*-JTD,I
0110	01370	000000	ARINV	NOP	
0111	01371	124605		JMP	*-JTD,I
0112	01372	000000	BINOP	NOP	
0113	01373	124607		JMP	*-JTD,I

0114	01374	000000	STTOP	NOP	
0115	01375	124611		JMP	*-JTD,I
0116	01376	000000	OPCHK	NOP	
0117	01377	124613		JMP	*-JTD,I
0118	01400	000000	RSCHK	NOP	
0119	01401	124615		JMP	*-JTD,I
0120	01402	000000	.FAD	NOP	
0121	01403	124617		JMP	*-JTD,I
0122	01404	000000	.FSB	NOP	
0123	01405	124621		JMP	*-JTD,I
0124	01406	000000	.FMP	NOP	
0125	01407	124623		JMP	*-JTD,I
0126	01410	000000	.FDV	NOP	
0127	01411	124625		JMP	*-JTD,I
0128	01412	000000	.FLUN	NOP	
0129	01413	124627		JMP	*-JTD,I
0130	01414	000000	IFIX	NOP	
0131	01415	124631		JMP	*-JTD,I
0132	01416	000000	ENOUT	NOP	
0133	01417	124633		JMP	*-JTD,I
0134	01420	000000	NUMOT	NOP	
0135	01421	124635		JMP	*-JTD,I
0136	01422	000000	GETDG	NOP	
0137	01423	124637		JMP	*-JTD,I
0138	01424	000000	OUTLN	NOP	
0139	01425	124641		JMP	*-JTD,I
0140	01426	000000	EDELM	NOP	
0141	01427	124643		JMP	*-JTD,I
0142	01430	000000	SETPT	NOP	
0143	01431	124645		JMP	*-JTD,I
0144	01432	000000	.EXP	NOP	
0145	01433	124647		JMP	*-JTD,I
0146	01434	000000	.LOG	NOP	
0147	01435	124651		JMP	*-JTD,I
0148	01436	000000	.CHEB	NOP	
0149	01437	124653		JMP	*-JTD,I
0150	01440	000000	.IENT	NOP	
0151	01441	124655		JMP	*-JTD,I
0152	01442	000000	.PWR2	NOP	
0153	01443	124657		JMP	*-JTD,I
0154	01444	000000	INCAL	NOP	
0155	01445	124661		JMP	*-JTD,I
0156	01446	000000	GETCR	NOP	
0157	01447	124663		JMP	*-JTD,I
0158	01450	000000	RCKSP	NOP	
0159	01451	124665		JMP	*-JTD,I
0160	01452	000000	OUTCR	NOP	
0161	01453	124667		JMP	*-JTD,I
0162	01454	000000	OUTIN	NOP	
0163	01455	124671		JMP	*-JTD,I
0164	01456	000000	MCOUT	NOP	
0165	01457	124673		JMP	*-JTD,I
0166	01460	000000	OUTST	NOP	
0167	01461	124675		JMP	*-JTD,I
0168	01462	000000	SINIT	NOP	
0169	01463	124677		JMP	*-JTD,I

0170	01464	000000	BLDIN	NOP	
0171	01465	124701		JMP	*-JTD,I
0172	01466	000000	REDIM	NOP	
0173	01467	124703		JMP	*-JTD,I
0174	01470	000000	VCHK	NOP	
0175	01471	124705		JMP	*-JTD,I
0176	01472	000000	SERR	NOP	
0177	01473	124707		JMP	*-JTD,I
0178	01474	000000	CHOUF	NOP	
0179	01475	124711		JMP	*-JTD,I
0180	01476	000000	MOVER	NOP	
0181	01477	124713		JMP	*-JTD,I
0182	01500	000000	RECRF	NOP	
0183	01501	124715		JMP	*-JTD,I
0184	01502	000000	FILRF	NOP	
0185	01503	124717		JMP	*-JTD,I
0186	01504	000000	VLFIL	NOP	
0187	01505	124721		JMP	*-JTD,I
0188	01506	000000	RQSTR	NOP	
0189	01507	124723		JMP	*-JTD,I
0190	01510	000000	FILST	NOP	
0191	01511	124725		JMP	*-JTD,I
0192	01512	000000	GTTYP	NOP	
0193	01513	124727		JMP	*-JTD,I
0194	01514	000000	WRBUF	NOP	
0195	01515	124731		JMP	*-JTD,I
0196	01516	000000	ALCOM	NOP	
0197	01517	124733		JMP	*-JTD,I
0198	01520	000000	RSTPT	NOP	
0199	01521	124735		JMP	*-JTD,I
0200	01522	000000	FENCH	NOP	
0201	01523	124737		JMP	*-JTD,I
0202	01524	000000	MTG1	NOP	
0203	01525	124741		JMP	*-JTD,I
0204	01526	000000	DTL1	NOP	
0205	01527	124743		JMP	*-JTD,I
0206	01530	000000	ROUND	NOP	
0207	01531	124745		JMP	*-JTD,I
0208	01532	000000	OUTBL	NOP	
0209	01533	124747		JMP	*-JTD,I
0210	01534	000000	OUTCL	NOP	
0211	01535	124751		JMP	*-JTD,I
0212	01536	000000	DSRCH	NOP	
0213	01537	124753		JMP	*-JTD,I
0214	01540	000000	MCHAR	NOP	
0215	01541	124755		JMP	*-JTD,I
0216	01542	000000	EVEXP	NOP	
0217	01543	124757		JMP	*-JTD,I
0218	01544	000000	USTCK	NOP	
0219	01545	124761		JMP	*-JTD,I
0220	01546	000000	PFSRH	NOP	
0221	01547	124763		JMP	*-JTD,I
0222	01550	000000	FRMAT	NOP	
0223	01551	124765		JMP	*-JTD,I
0224	01552	000000	EPRUS	NOP	
0225	01553	124767		JMP	*-JTD,I

0226	01554	000000	STLCK	NOP	
0227	01555	124771		JMP	*-JTD,I
0228	01556	000000	LCDLP	NOP	
0229	01557	124773		JMP	*-JTD,I
0230	01560	000000	FCUC	NOP	
0231	01561	124775		JMP	*-JTD,I
0232	01562	000000	EDABR	NOP	
0233	01563	124777		JMP	*-JTD,I
0234	00564		JTD	EQU	FSC=SBJT8+1
0235*					
0236**	GENERAL USAGE INFORMATION				
0237*					
0238	01564	000000	RNDX1	BSS	1
0239	01565	000000	RNDX2	BSS	1
0240	01566	000000	.LNUM	BSS	1
0241	01567	000000	LNAME	BSS	1
0242	01570	000000	CHRCT	BSS	1
0243	01571	000040	BLANK	OCT	40
0244	01572	000000	SBPTR	BSS	1
0245	01573	000000	SYMTB	BSS	1
0246	01574	000000	VALTB	BSS	1
0247	01575	002000	SPROG	DEF	PROGB+1
0248	01576	000000	VLFLG	BSS	1
0249	01577	000000	FLSTS	BSS	4
0250	01603	000000	FILPT	BSS	1
0251	01604	000000	FILCT	BSS	1
0252	01605	000000	USESN	BSS	1
0253	01606	000000	NUMPT	BSS	1
0254	01607	000000	ENOUF	NOP	
0255	01610	000000	ATIM	BSS	1
0256	01611	000000	TEMP	BSS	9
0257	01622	000000	XTEMP	BSS	2
0258	01624	000000	YTEMP	BSS	2
0259	01626	000000	UTEMP	BSS	2
0260	01630	000000	X2TMP	BSS	2
0261	01632	000000	ATMP	BSS	2
0262	01634	000000	BTMP	BSS	2
0263	01636	000000	DTMP	BSS	2
0264	01640	000000	BINO1	BSS	1
0265	01641	000000	BINO2	BSS	1
0266	01642	125372		JMP	BINOP,I
0267	01643	000000	ERSEC	BSS	64
0268	01743	000000	CC	BSS	1
0269	01744	000000	CC1	BSS	1
0270	01745	000000	CC2	BSS	1
0271	01746	000000	CONTR	BSS	1
0272	01747	000000	DP	BSS	1
0273	01750	000000	DPFLG	BSS	1
0274	01751	000000	EDSTA	BSS	1
0275	01752	000000	FFLAG	BSS	1
0276	01753	000000	EST	BSS	1
0277	01754	000000	FFLG	BSS	1
0278	01755	000000	FSP	BSS	1
0279	01756	000000	IFSS	BSS	1
0280	01757	000000	IFSTR	BSS	1
0281	01760	000000	NCH	BSS	1

30-BIT RANDOM
INTEGER.

0282	01761	000000	NUM1	BSS	1
0283	01762	000000	NUM2	BSS	1
0284	01763	000000	PC1	BSS	1
0285	01764	000000	PC2	BSS	1
0286	01765	000000	SAD	BSS	1
0287	01766	000000	SBD	BSS	1
0288	01767	000000	PMASK	BSS	1
0289	01770	000000	RETCO	BSS	1
0290	01771	000000	ASINP	BSS	1
0291	01772	050000	DEFOP	OCT	50000
0292	01773	054000	FOROP	OCT	54000
0293	01774	000000	REPCT	BSS	1
0294	02000		ORG	USER+554B	
0295	01777		PROGB	EQU	+-1
0296	01027		FLGBT	EQU	MNEG
0297	01420		GFLAG	EQU	NUMOT
0298	01643		PIINTG	EQU	ERSEC
0299	01266		SIGN	EQU	LETCK
0300	01316		MANT1	EQU	SSYMT
0301	01320		MANT2	EQU	ASYMT
0302	01322		EXP	EQU	DCMPL
0303	01324		EXPON	EQU	PRNST
0304	01336		FFLAG	EQU	FORMX
0305	01360		NMTMP	EQU	SETDP
0306	01362		NMPTR	EQU	FDATA
0307	01614		NUMBF	EQU	TEMP+3
0308	01356		DIGCT	EQU	FETCH
0309	01300		NT0	EQU	MBY10
0310	01310		OCTMP	EQU	OVFLW
0311	01400		LT0	EQU	RSCHK
0312	01426		LT1	EQU	EDELM
0313	01274		LT2	EQU	FINCH
0314	01430		LT3	EQU	SETPT
0315	01436		LT4	EQU	.CHEB
0316	01440		LT5	EQU	.IENT
0317	01442		LT6	EQU	.PWR2
0318	01432		LT7	EQU	.EXP
0319	01550		LT8	EQU	FRMAT
0320	01444		OT1	EQU	INCAL
0321	01450		OT3	EQU	BCKSP
0322	01374		DGCNT	EQU	STTOP
0323	01510		SOURC	EQU	FILST
0324	01512		DEST	EQU	GTTYP
0325	01476		TAP0	EQU	MOVER
0326	01472		TAP1	EQU	SERR
0327	01474		CU1	EQU	CHOUF
0328*					
0329**	SYNTAX INFORMATION TEMPORARIES				
0330*					
0331	01574		ERRCT	EQU	VALTB
0332	01616		SBUFA	EQU	TEMP+5
0333	01470		SYNTQ	EQU	VCHK
0334	01615		SSTAK	EQU	TEMP+4
0335	01402		MAXCR	EQU	.FAD
0336	01404		TABLE	EQU	.FSB
0337	01406		LNGTH	EQU	.FMP

0338	01410	SMBGN EQU	.FDV
0339	01432	SLENG EQU	.EXP
0340	01436	COUNT EQU	.CHEB
0341	01440	TBLPT EQU	.IENT
0342	01442	TSPTR EQU	.PWR2
0343	01306	SBT0 EQU	.PACK
0344	01412	CDFLG EQU	.FLUN
0345	01617	PFLAG EQU	TEMP+6

0346*

0347** COMPILE INFORMATION TEMPORARIES

0348*

0349	01234	FLINK EQU	FRCUR
0350	01502	FILTB EQU	FILRF
0351	01242	STEND EQU	ARRID
0352	01230	SPTR EQU	FSC
0353	01236	NSPTR EQU	FPOP
0354	01240	STYPE EQU	VAROP
0355	01611	STMP1 EQU	TEMP
0356	01612	STMP2 EQU	TEMP+1
0357	01611	VTMP1 EQU	TEMP
0358	01612	VTMP2 EQU	TEMP+1
0359	01613	VTMP3 EQU	TEMP+2
0360	01614	VTMP4 EQU	TEMP+3
0361	01615	VTMP5 EQU	TEMP+4
0362	01615	COMSN EQU	TEMP+4
0363	01616	STPTR EQU	TEMP+5
0364	01616	COMPT EQU	TEMP+5
0365	01617	STCT1 EQU	TEMP+6
0366	01613	STCT2 EQU	TEMP+2
0367	01614	STCT3 EQU	TEMP+3
0368	01617	DCFLG EQU	TEMP+6
0369	01550	INFST EQU	FRMAT

0370*

0371** EXECUTION INFORMATION TEMPORARIES

0372*

0373	01232	FCORE EQU	SBSCK
0374	01500	FCNTR EQU	RECRF
0375	01240	RTRNG EQU	VAROP
0376	01242	RTNST EQU	ARRID
0377	01246	FORQ EQU	TBSRH
0378	01250	FORST EQU	GETPF
0379	01330	TMPST EQU	STRID
0380	01332	OPDST EQU	RSTOP
0381	01464	OPTRQ EQU	BLDIN
0382	01334	PRGCT EQU	GETST
0383	01262	DCCNT EQU	CHRST
0384	01244	NXTDT EQU	PRGIN
0385	01611	TEMP1 EQU	TEMP
0386	01252	TEMP2 EQU	LPCK
0387	01254	TEMP3 EQU	RPCK
0388	01256	TEMP4 EQU	LTR
0389	01272	TEMP5 EQU	SYMCK
0390	01260	TEMP6 EQU	STROP
0391	01476	GIMP EQU	MOVER
0392	01426	FVT EQU	EDELM
0393	01420	EFN0 EQU	NUMOT

0394	01422	EFN1	EQU	GETDG
0395	01424	FFN2	EQU	OUTLN
0396	01366	EFN3	EQU	PSHST
0397	01456	INITF	EQU	MCOUT
0398	01420	IFCNT	EQU	NUMOT
0399	01420	RSPTR	EQU	NUMOT
0400	01476	MCNT	EQU	MOVER
0401	01354	INTMP	EQU	PCHK
0402	01550	STRLN	EQU	FRMAT
0403	01470	EOL	EQU	VCHK
0404	01456	EOPF	EQU	MCOUT
0405	01572	BS1	EQU	SBPTR
0406	01350	BS2	EQU	TRSTR
0407	01352	BS3	EQU	COMPR
0408	01312	MT0	EQU	DELPR
0409	01314	MT1	EQU	FNDPS
0410	01622	MT2	EQU	XTEMP
0411	01623	MT3	EQU	XTEMP+1
0412	01340	MOP	EQU	STSTR
0413	01364	MEXIT	EQU	FSCH
0414	01632	MMT0	EQU	ATMP
0415	01633	MMT1	EQU	ATMP+1
0416	01634	MMT2	EQU	BTMP
0417	01635	MMT3	EQU	BTMP+1
0418	01636	MMT4	EQU	DTMP
0419	01637	MMT5	EQU	DTMP+1
0420	01630	MMT6	EQU	X2TMP
0421	01631	MMT7	EQU	X2TMP+1
0422	01376	MMT8	EQU	OPCHK
0423	01514	ID0	EQU	WRBUF
0424	01362	ID1	EQU	FDATA
0425	01470	RD0	EQU	VCHK
0426	01400	VT0	EQU	RSCHK
0427	01622	SCALR	EQU	XTEMP
0428	01624	MAXE	EQU	YTEMP
0429	01626	TOL	EQU	UTEMP
0430	01344	PIVEL	EQU	PSTR
0431	01436	EST1	EQU	.CHEB
0432	01440	EST2	EQU	.IENT
0433	01442	EST3	EQU	.PWR2
0434	01616	A1	EQU	TEMP+5
0435	01617	A2	EQU	TEMP+6
0436	01620	C1	EQU	TEMP+7
0437	01402	FD0	EQU	.FAD
0438	01264	TT1	EQU	DIGCK
0439	01266	TT2	EQU	LETCK
0440	01614	TT3	EQU	TEMP+3
0441	01615	TT4	EQU	TEMP+4
0442	01644	RQ1	EQU	ERSEC+1
0443	01647	RQ2	EQU	ERSEC+4
0444	01645	RQ3	EQU	ERSEC+2
0445	01646	RQ4	EQU	ERSEC+3
0446	01650	RQ5	EQU	ERSEC+5
0447	01236	FBASE	EQU	FPOP
0448	01651	EORFL	EQU	ERSEC+6
0449	01234	FILE#	EQU	FRCUR

0450	01520	RCRD#	EQU	RSTPT	
0451	01514	VL0	EQU	WRBUF	
0452	01652	DADDR	EQU	ERSEC+7	
0453	01653	FILT	EQU	ERSEC+8	
0454	01400	MPT	EQU	RSCHK	
0455	01376	NQT	EQU	OPCHK	
0456	01406	TNULL	EQU	.FMP	
0457	01410	TPRME	EQU	.FDV	
0458	01466	PS0	EQU	REDIM	
0459	01462	PS1	EQU	SINIT	
0460	01432	CP0	EQU	.EXP	
0461	01344	CP1	EQU	PSTR	
0462	01402	TRFCH	EQU	.FAD	
0463	01404	TRS0	EQU	.FSB	
0464	01436	RT0	EQU	.CHER	
0465	01440	RT1	EQU	.IENT	
0466	01434	LBTMP	EQU	.LOG	
0467	01376	CTMP	EQU	OPCHK	
0468	01643	EC	EQU	ERSEC	
0469	01644	FST	EQU	ERSEC+1	
0470	01646	SFLG	EQU	ERSEC+3	
0471	01647	EXPW	EQU	ERSEC+4	
0472	01650	HB	EQU	ERSEC+5	46 WORD BUFFER
0473	01726	HBp	EQU	ERSEC+51	
0474	01727	LCH	EQU	ERSEC+52	
0475	01730	NAD	EQU	ERSEC+53	
0476	01731	NBD	EQU	ERSEC+54	
0477	01732	NBLK	EQU	ERSEC+55	
0478	01733	NHBW	EQU	ERSEC+56	
0479	01736	NUMW1	EQU	ERSEC+59	
0480	01737	NUMW2	EQU	ERSEC+60	
0481	01740	SNFLG	EQU	ERSEC+61	
0482	01741	TOTDG	EQU	ERSEC+62	
0483	01742	DCTR	EQU	ERSEC+63	
0484	01470	ELCNT	EQU	VCHK	
0485	01550	ORDNO	EQU	FRMAT	
0486	01554	ASBFP	EQU	STLCK	
0487	01466	ASTYP	EQU	REDIM	

0002*

0003**

0004*** DIREC TABLE

0005**

0006*

0007* DIREC IS A 560 WORD RESIDENT TABLE WHICH CONTAINS INFORMATION
 0008* ABOUT THE DIRECTORY. THE TABLE HAS 80 ENTRIES, ONE FOR EACH
 0009* POSSIBLE DIRECTORY TRACK. EACH ENTRY IS SEVEN WORDS LONG AND
 0010* HAS THE FOLLOWING STRUCTURE:

0011*

0012*

0013*

0014*

0015*

0016*

0017*

0018*

0019*

- 1) LENGTH IN WORDS
- 2) SAME AS FIRST
- 3) FOUR WORDS OF
- 4) DIRECTORY
- 5) TRACK
- 6) DISC
- 7) ADDRESS

0021 30000 ORG 30000B

0022 30000 000000 DIREC BSS 560

0024 31051 DIREL EQU *-7

0025 31060 DIREU EQU *

=> START OF LAST ENTRY

=> FIRST LOCATION BEYOND TABLE

0027* THIS ROUTINE CALLS THE REAL DISC DRIVER AND WAITS FOR THE
 0028* TRANSFER TO BE SUCCESSFULLY COMPLETED. THE CALLING SEQUENCE
 0029* TO THIS DRIVER IS AS FOLLOWS:

0030*
 0031* JSB DISCZ,I
 0032*
 0033* A REGISTER - MUST CONTAIN THE ADDRESS OF A DOUBLE
 0034* WORD CONTAINING THE DISC ADDRESS (BLOCK
 0035* NUMBER) OF THE FIRST RECORD OF THE TRANSFER.
 0036*
 0037* B REGISTER - BITS 14:0 - CORE ADDRESS AT WHICH THE
 0038* TRANSFER IS TO BEGIN,
 0039* BIT 15 - TRANSFER CODE
 0040* 1 = DISC READ
 0041* 0 = DISC WRITE
 0042*
 0043* MWORD - MUST CONTAIN THE NEGATIVE NUMBER OF WORDS
 0044* TO BE TRANSFERRED,
 0045*
 0046* MBUSY - SET TO -1 BY THE DISC DRIVER WHILE IT IS BUSY

0048	31060	000000	ZDISC	NOP	
0049	31061	070077		STA STDAP	SAVE POINTER
0050	31062	114201		JSB DISCA,I	CALL DISC DRIVER
0051	31063	102030		HLT DEATH+30B	DRIVER BUSY
0052	31064	102031		HLT DEATH+31B	DISC NOT PRESENT
0053	31065	060203		LDA MBUSY	WAIT FOR
0054	31066	002020		SSA	COMPLETION
0055	31067	027065		JMP *-2	
0056	31070	002003		SZA,RSS	IF NO ERRORS, ADVANCE
0057	31071	037060		ISZ ZDISC	RETURN ADDRESS
0058	31072	127060		JMP ZDISC,I	

```

0060*
0061**
0062***   DLOOK
0063**
0064*
0065*   DLOOK SEARCHES THE DIRECTORY FOR A PARTICULAR ENTRY.  THE
0066*   DESIRED ENTRY IS DEFINED BY LTEMP(0:3).
0067*
0068*   ENTRY IS FOUND:
0069*   THE APPROPRIATE DIRECTORY TRACK IS IN CORE
0070*   (LTEMP+4) = POINTER TO DIREC ENTRY
0071*   (LTEMP+5) = DIRECTORY MEMORY ADDRESS OF ENTRY
0072*   DLOOK RETURNS TO P+1
0073*
0074*   ENTRY IS NOT FOUND:
0075*   (LTEMP+4) = POINT AT THE LAST ENTRY
0076*   (LTEMP+5) = LESS THAN THE GIVEN ENTRY
0077*   DLOOK RETURNS TO P+2

0079 31073 000000 DLOOK NOP
0080 31074 067230          LDB DIRDL          SET LTEMP+4 TO POINT AT
0081 31075 074034 DLOK1  STB LTEMP+4          LAST DIRECTORY TRACK
0082 31076 160001          LDA B,I           TEST FOR
0083 31077 002002          SZA              EMPTY TRACK
0084 31100 027104          JMP DLOK3         NOT EMPTY
0085 31101 064034 DLOK2  LDB LTEMP+4          BUMP BACK TO
0086 31102 044350          ADB ,-7           NEXT TRACK
0087 31103 027075          JMP DLOK1

0089 31104 006004 DLOK3  INB              COMPARE THE FIRST
0090 31105 060640          LDA DLTEM         ENTRY ON THIS TRACK
0091 31106 017203          JSB DIRCM         TO THE DESIRED ENTRY
0092 31107 027101          JMP DLOK2         NOT ON THIS TRACK
0093 31110 000000          NOP              FOUND THE
0094 31111 160034          LDA LTEMP+4,I    RIGHT TRACK
0095 31112 003004          CMA,INA          SET UP INITIAL
0096 31113 040676          ADA LIBD         POINTER FOR
0097 31114 040343          ADA ,-12        TRACK SCAN
0098 31115 070035          STA LTEMP+5
0099 31116 060034          LDA LTEMP+4
0100 31117 040364          ADA ,+5          GET DIRECTORY DISC
0101 31120 050257          CPA DIRWD        ADDRESS POINTER
0102 31121 027137          JMP DLOK4        IS THIS TRACK ALREADY IN CORE?
0103 31122 060257          LDA DIRWD        YES
0104 31123 002003          SZA,RSS         NO - CHECK FOR ANY TRACK IN CORE
0105 31124 027130          JMP DLOKB        NONE, SO JUST READ IN NEW TRACK
0106 31125 064676          LDB LIBD         YES, WRITE PREVIOUS
0107 31126 114206          JSB DISCZ,I     TRACK OUT TO DISC
0108 31127 114211          JSB SLVAG,I     DISC ERROR

0110 31130 160034 DLOKB  LDA LTEMP+4,I    SET UP DIRECTORY TRACK
0111 31131 070204          STA MWORD        TRANSFER LENGTH
0112 31132 060034          LDA LTEMP+4     SET UP POINTER TO
0113 31133 040364          ADA ,+5         DISC ADDRESS
0114 31134 064700          LDB LIBDI
0115 31135 114206          JSB DISCZ,I     READ IN DIRECTORY TRACK

```

0116 31136 114207 JSB SICKP,I

0118* NOW SEARCH DIRECTORY FOR DESIRED ENTRY. A BINARY SEARCH IS USED,
 0119* WITH LTEMP(14:15) USED AS POINTERS TO THE FIRST AND LAST OF ALL
 0120* UNTESTED ENTRIES.

0121*

0122	31137	060676	DLOK4	LDA	LIBD	SET POINTER TO BEGINNING OF
0123	31140	070046		STA	LTEMP+14	DIRECTORY.
0124	31141	060640		LDA	DLTEM	TEST LAST ENTRY IN TRACK.
0125	31142	064035		LDB	LTEMP+5	
0126	31143	017203		JSB	DIRCM	
0127	31144	027147		JMP	DLOK5	LAST ENTRY TOO BIG--START CHOP.
0128	31145	037073		ISZ	DLOOK	TOO SMALL--IT'S THE ONE.
0129	31146	127073		JMP	DLOOK,I	LAST ENTRY IS IT.
0130*						
0131	31147	060035	DLOK5	LDA	LTEMP+5	SET END POINTER.
0132	31150	070047		STA	LTEMP+15	
0133	31151	060046		LDA	LTEMP+14	COMPUTE DIFFERENCE BETWEEN FIRST
0134	31152	003004	DLOK6	CMA,INA		AND LAST ENTRIES.
0135	31153	040047		ADA	LTEMP+15	
0136	31154	001100		ARS		DIVIDE BY TWO.
0137	31155	006400		CLB		ROUND TO A
0138	31156	100400		DIV	,+12	MULTIPLE
	31157	000373				
0139	31160	100200		MPY	,+12	OF TWELVE
	31161	000373				
0140	31162	040046		ADA	LTEMP+14	GET ADDRESS OF MIDDLE ENTRY.
0141	31163	070035		STA	LTEMP+5	SET INTO RESULT LOCATION.
0142	31164	064640		LDB	DLTEM	SETUP FOR JSB DIRCM.
0143	31165	050046		CPA	LTEMP+14	TEST FOR ONLY 2 ENTRIES LEFT.
0144	31166	027176		JMP	DLOK8	THERE ARE--WE'VE GOT THE RESULT.
0145*						
0146	31167	017203		JSB	DIRCM	TEST MIDWAY ENTRY.
0147	31170	027173		JMP	DLOK7	TOO SMALL--GO RESET LTEMP(14).
0148	31171	027147		JMP	DLOK5	TOO BIG--GO RESET LTEMP(15).
0149	31172	127073		JMP	DLOOK,I	EQUAL--RETURN.
0150*						
0151	31173	060035	DLOK7	LDA	LTEMP+5	RESET LTEMP(14).
0152	31174	070046		STA	LTEMP+14	
0153	31175	027152		JMP	DLOK6	
0154*						
0155	31176	050676	DLOK8	CPA	LIBD	IF LTEMP(14)<>LTEMP, WE KNOW
0156	31177	017203		JSB	DIRCM	IT'S LESS, SO WE SKIP TEST.
0157	31200	037073		ISZ	DLOOK	LESS THAN ENTRY.
0158	31201	000000		NOP		
0159	31202	127073		JMP	DLOOK,I	EQUAL TO ENTRY.

```

0161*
0162* DIRCM COMPARES THE 4 WORD ENTRIES POINTED TO BY A AND B.
0163* BIT 15 IS NOT USED. IT RETURNS AS FOLLOWS:
0164*     P+1: A<B
0165*     P+2: A>B
0166*     P+3 A=B
0167 31203 000000 DIRCM NOP
0168 31204 073232     STA DIRC2
0169 31205 060353     LDA , -4     SET COUNTER.
0170 31206 073231     STA DIRC1
0171 31207 077233     STB DIRC5
0172 31210 163233 DIRC3 LDA DIRC5, I     SUBTRACT WORD FROM B
0173 31211 001665     ELA, CLE, ERA     FROM WORD FROM A.
0174 31212 003004     CMA, INA
0175 31213 167232     LDB DIRC2, I
0176 31214 005665     ELB, CLE, ERB
0177 31215 040001     ADA 1
0178 31216 002002     SZA
0179 31217 027225     JMP DIRC4     TEST FOR EQUAL.
0180 31220 037233     ISZ DIRC5     NOT EQUAL-GO RETURN.
0181 31221 037232     ISZ DIRC2     BUMP
0182 31222 037231     ISZ DIRC1     POINTERS.
0183 31223 027210     JMP DIRC3     TEST FOR FINISHED.
0184 31224 037203     ISZ DIRCM     DOUBLE ISZ FOR EQUAL.
0185 31225 002021 DIRC4 SSA, RSS
0186 31226 037203     ISZ DIRCM     ONE ISZ IF A>B
0187 31227 127203     JMP DIRCM, I     NONE IF A<B.

0189 31230 031051 DIRDL DEF DIREL
0190 31231 000000 DIRC1 BSS 1
0191 31232 000000 DIRC2 BSS 1
0192 31233 000000 DIRC5 BSS 1

```

0194*

0195**

0196*** GET MESSAGE BUFFER

0197**

0198*

0199* THIS ROUTINE IS USED TO GET A MESSAGE BUFFER FOR THE DISC

0200* DRIVER. THE LINK TO IT IS PASSED IN THE LINKAGE AREA, AND

0201* IS STORED ON BASE PAGE BEFORE THE SYSTEM IS STARTED UP,

0202* PRIOR TO THAT TIME, THE LOADER USES ITS OWN VERSION.

0203*

0204	31234	000000	GMQB	NOP	
0205	31235	060304		LDA MSQCT	CHECK FOR MESSAGE BUFFERS ALL
0206	31236	050364		CPA .+5	BEING USED
0207	31237	127234		JMP GMQB,I	NO SKIP SEZ NO BUFFER
0208	31240	034304		ISZ MSQCT	INCREMENT COUNT
0209	31241	060306		LDA MSQP3	LOAD CURRENT POINTER
0210	31242	064306		LDB MSQP3	ADVANCE POINTER FOR
0211	31243	044426		ADB .+MESLN	NEXT MESSAGE
0212	31244	054307		CPB MSQND	CHECK FOR END OF QUEUE
0213	31245	064310		LDB MSQBG	IF END, START OVER
0214	31246	074306		STB MSQP3	
0215	31247	037234		ISZ GMQB	ADVANCE TO BUFFER PRESENT RETURN
0216	31250	127234		JMP GMQB,I	RETURN

```

0218 31701                                ORG 31701B
0219 31701 000151 .105 DEC 105
0220 31702 044737 TAPEA DEF TAPER
0221 31703 045437 SER7A DEF SERR7
0222 31704 153064 LW200 ABS -10240-USER+200
0223*
0224** CLEAN UP FOR NEW PROGRAM **
0225*
0226 31705 103100 CLNUP CLF 0
0227 31706 060361 LDA CFLAG SET
0228 31707 003000 CMA PROGRAM
0229 31710 110255 AND MAIN,I MODE TO
0230 31711 170255 STA MAIN,I 'UNCOMPILED'
0231 31712 102100 STF 0
0232 31713 064726 LDB PBUFF INSURE CORRECT
0233 31714 075575 STB SPROG START-OF--PROGRAM GETTING
0234 31715 006400 CLB INITIALIZE
0235 31716 075573 STB SYMTB ERROR FLAG
0236 31717 027743 JMP SYNT1
0237**
0238*** DELETE A PROGRAM STATEMENT ***
0239**
0240*
0241* THE STATEMENT REFERENCED BY THE SEQUENCE NUMBER IN
0242* (B) IS DELETED. EXIT TO EXECUTIVE.
0243*
0244 31720 060056 DELST LDA PBPTR LOAD SEARCH TERMINATION POINTER
0245 31721 015314 JSB FNDPS SEARCH FOR STATEMENT
0246 31722 124616 JMP ACC5A,I NOT
0247 31723 124616 JMP ACC5A,I FOUND
0248 31724 002400 CLA
0249 31725 006004 INB (B),I = STATEMENT LENGTH
0250 31726 164001 LDB 1,I LOAD LENGTH OF OLD STATEMENT
0251 31727 015312 JSB DELPR DELETE
0252 31730 124616 JMP ACC5A,I STATEMENT
0253*
0254* *****
0255****
0256*** CHECK SYNTAX OF STATEMENT ***
0257****
0258* *****
0259*
0260* PBPTR POINTS TO THE LAST WORD +1 OF THE PREVIOUS PROGRAM AND
0261* THUS ALSO POINTS TO THE FIRST WORD OF AVAILABLE USER SPACE,
0262* WHERE THE NEW STATEMENT WILL BE TRANSLATED. WHEN AN ERROR
0263* OCCURS UNDER 'TAPE' MODE, THE USER'S TERR BIT IN THE FIRST WORD
0264* OF HIS TTY TABLE IS SET AND HIS COPY OF ERRCT IS BUMPED. IF AN
0265* OUT-OF-STORAGE ERROR OCCURS IN 'TAPE' MODE, SYMTB IS SET TO 1
0266* AND ALL SUBSEQUENT PROGRAM MATERIAL IS REJECTED. IF UPON ENTRY
0267* THE PRIOR PROGRAM IS NULL, ALL FLAGS ARE SET TO NULL; IF THE
0268* PRIOR PROGRAM IS NOT NULL, IT IS PLACED IN 'SOURCE' MODE. SYNTAX
0269* WILL REJECT ADDITIONAL STATEMENTS IF FEWER THAN 200 WORDS OF
0270* USER SPACE ARE AVAILABLE BUT WILL ACCEPT STATEMENT DELETIONS IF
0271* IN 'KEY' MODE.
0272*
0273 31731 064056 SYNTx LDB PBPTR NULL

```

0274	31732	054726	CPB PBUFF	PROGRAM?
0275	31733	027705	JMP CLNUP	YES
0276	31734	060360	LDA TERR	NO, ERROR
0277	31735	110255	AND MAIN,I	FLAG
0278	31736	002003	SZA,RSS	SET?
0279	31737	027743	JMP SYNT1	NO
0280	31740	002400	CLA	YES, ERRORS
0281	31741	051574	CPA ERRCT	IMBEDDED IN CODE?
0282	31742	127702	JMP TAPEA,I	NO,FINISH ABORTED ERROR CLEANUP
0283	31743	015462	SYNT1 JSB SINIT	YES, PREPARE PROGRAM
0284	31744	015322	JSB DCMPL	FOR SYNTAX
0285	31745	006400	CLB	SET LINE NUMBER
0286	31746	174056	STB PBPTR,I	TO ZERO
0287	31747	060056	LDA PBPTR	SET SYNTAX POINTER TO FIRST
0288	31750	071572	STA SBPTR	AVAILABLE WORD OF USER SPACE
0289	31751	071616	STA SBUFA	SAVE POINTER TO SYNTAX BUFFER
0290	31752	043701	ADA ,105	AND TO
0291	31753	071615	STA SSTAK	SYNTAX STACK
0292	31754	071470	STA SYNT0	
0293	31755	006004	INB	DOES 'OUT OF STORAGE'
0294	31756	055573	CPB SYMTB	ERROR EXIST?
0295	31757	127703	JMP SER7A,I	YES
0296	31760	015446	JSB GETCR	NO, EMPTY RECORD?
0297	31761	124616	JMP ACC5A,I	YES
0298	31762	015450	JSB BCKSP	NO
0299*				*
0300**	DETERMINE SEQUENCE NUMBER			**
0301*				*
0302*				
0303*	A RECORD CONSISTING ONLY OF A SEQUENCE NUMBER WILL CAUSE THE			
0304*	DELETION OF A PREVIOUSLY ACCEPTED STATEMENT REFERENCED BY THAT			
0305*	SEQUENCE NUMBER.			
0306*				
0307	31763	015464	JSB BLDIN	RECORD
0308	31764	175572	STB SBPTR,I	SEQUENCE
0309	31765	035572	ISZ SBPTR	NUMBER
0310	31766	050374	CPA ,+15B	NULL STATEMENT?
0311	31767	027720	JMP DELST	YES
0312	31770	035572	ISZ SBPTR	NO, SKIP STATEMENT LENGTH WORD
0313	31771	171572	STA SBPTR,I	SAVE FIRST CHARACTER
0314	31772	060056	LDA PBPTR	ACCEPTABLE AMOUNT
0315	31773	043704	ADA LW200	OF USER SPACE
0316	31774	002021	SSA,RSS	REMAINING?
0317	31775	115033	JSB SERRS,I	NO
0318*				*
0319**	DETERMINE STATEMENT TYPE			**
0320*				*
0321	31776	060366	LDA ,+7	SET MAXIMUM
0322	31777	071402	STA MAXCR	SYMBOL LENGTH
0323	32000	063735	LDA STTYP	STATEMENT-TYPE NAMES
0324	32001	064326	LDB , -25	-(NUMBER OF STATEMENT TYPES)
0325	32002	015246	JSB TBSRH	FIND STATEMENT TYPE
0326	32003	060552	LDA LETOP	NO, ASSUME 'IMPLIED' LET
0327	32004	064346	LDB , -9	DISALLOW
0328	32005	077447	STB MSFLG	MULTIPLE STORE
0329	32006	064362	LDB ,+3	SET MAXCR TO MOST

0330	32007	075402		STB MAXCR	COMMON VALUE
0331	32010	006400		CLB	TURN OFF
0332	32011	075617		STB PFLAG	'PARAMETER' MODE
0333	32012	101051		LSR 9	RIGHT JUSTIFY OPERATOR CODE
0334	32013	073453		STA SFLAG	TURN OFF STRING AND STORE MODES
0335	32014	073445		STA DFLAG	TURN ON 'SUBSCRIPT' MODE
0336	32015	040752		ADA STBAS	BRANCH TO
0337	32016	124000		JMP 0,I	SYNTAX ROUTINE
0338*					
0339***				**	
0340**	<LET STATEMENT>		SYNTAX	**	
0341***				**	
0342*					
0343	32017	060552	LET0	LDA LETOP	FAKE
0344	32020	171572		STA SBPTR,I	A
0345	32021	015450		JSB BCKSP	'LET'
0346	32022	065572	LETS	LDB SBPTR	ENABLE A
0347	32023	077453		STB SFLAG	STRING VARIABLE
0348	32024	037447		ISZ MSFLG	TURN ON 'MULTIPLE STORE' MODE
0349	32025	015230		JSB FSC	ANALYZE FORMULA
0350	32026	037453		ISZ SFLAG	STRING VARIABLE FOUND?
0351	32027	026035		JMP LET1	NO
0352	32030	015272		JSB SYMCK	YES, (B) IS LEFT AT -1
0353	32031	033415		DEF ASSOP=-1	DEMAND ASSIGNMENT OPERATOR
0354	32032	115036		JSB SERRS+3,I	NOT FOUND
0355	32033	015332		JSB RSTOP	RECORD A STRING OPERAND
0356	32034	026037		JMP EOST	DEMAND END OF STATEMENT
0357	32035	037453	LET1	ISZ SFLAG	DID A STORE OCCUR?
0358	32036	115036		JSB SERRS+3,I	NO
0359**				**	
0360***	CHECK FOR END OF STATEMENT			***	
0361**				**	
0362	32037	050374	EOST	CPA .+15B	END OF STATEMENT?
0363	32040	124620		JMP ACCSA,I	YES
0364	32041	115037		JSB SERRS+4,I	NO
0365*					
0366***				**	
0367**	<DIM STATEMENT>		SYNTAX	**	
0368***				**	
0369*					
0370	32042	002400	DIMS	CLA	FLAG AS DIM STATEMENT
0371*					
0372***				**	
0373**	<COM STATEMENT>		SYNTAX	**	
0374***				**	
0375*					
0376	32043	071412	COMS	STA CDFLG	FLAG AS COM STATEMENT
0377	32044	077445		STB DFLAG	TURN ON 'DIM' MODE ((B)=0)
0378	32045	061572		LDA SBPTR	ENABLE STRING
0379	32046	073453		STA SFLAG	VARIABLE
0380	32047	015240		JSB VAROP	SEEK VARIABLE OPERAND
0381	32050	115040		JSB SERRS+5,I	IMPROPER SUBSCRIPT
0382	32051	026055	COMS0	JMP COMS1	ARRAY OR STRING FOUND
0383	32052	006400		CLB	SIMPLE VARIABLE
0384	32053	055412		CPB CDFLG	'DIM'?
0385	32054	115040		JSB SERRS+5,I	YES--ERROR

0386	32055	050374	COMS1	CPA	,+15B	NO, CARRIAGE RETURN FOLLOWS?
0387	32056	124620		JMP	ACCSA,I	YES
0388	32057	007400		CCB		NO
0389	32060	015272		JSB	SYMCK	COMMA?
0390	32061	033363		DEF	COMMA=1	
0391	32062	115041		JSB	SERRS+6,I	NO
0392	32063	026045		JMP	COMS+2	YES
0393*						
0394***					**	
0395**	<DEF	STATEMENT>	SYNTAX	**		
0396***					**	
0397*						
0398	32064	015256	DEFS	JSB	LTR	FIRST TWO
0399	32065	115042		JSB	SERRS+7,I	
0400	32066	001727		ALF,	ALF	CHARACTERS
0401	32067	031612		IOR	TEMP+1	
0402	32070	053375		CPA	FN	'FN' ?
0403	32071	002001		RSS		YES
0404	32072	115042		JSB	SERRS+7,I	NO
0405	32073	015256		JSB	LTR	FOLLOWED BY A LETTER?
0406	32074	115042		JSB	SERRS+7,I	NO
0407	32075	061612		LDA	TEMP+1	YES,
0408	32076	064452		LDB	.5B	RECORD
0409	32077	015260		JSB	STROP	FUNCTION
0410	32100	061613		LDA	TEMP+2	RETRIEVE FOLLOWING CHARACTER
0411	32101	015252		JSB	LPCK	DEMAND LEFT PARENTHESIS
0412	32102	031027		IOR	FLGBT	SET FLAG FOR
0413	32103	171572		STA	SBPTR,I	FORMAL PARAMETER
0414	32104	015240		JSB	VAROP	DEMAND A SIMPLE VARIABLE
0415	32105	000000		NOP		NONE
0416	32106	115043		JSB	SERRS+8,I	FOUND
0417	32107	015254		JSB	RPCK	DEMAND A RIGHT PARENTHESIS
0418	32110	007400		CCB		ASSIGNMENT
0419	32111	015272		JSB	SYMCK	OPERATOR
0420	32112	033415		DEF	ASSOP=1	NEXT?
0421	32113	115036		JSB	SERRS+3,I	NO
0422	32114	060355		LDA	.=2	YES,
0423	32115	041572		ADA	SBPTR	ISOLATE
0424	32116	160000		LDA	0,I	AND SAVE
0425	32117	010504		AND	B777	FORMAL
0426	32120	071617		STA	PFLAG	PARAMETER
0427	32121	015230		JSB	FSC	FETCH DEFINING FORMULA
0428	32122	015270		JSB	SBPUO	RECORD END-OF-FORMULA OPERATOR
0429	32123	026037		JMP	EOST	DEMAND END OF STATEMENT
0430*						
0431***					**	
0432**	<IMAGE	STATEMENT>	SYNTAX	**		
0433***					**	
0434*						
0435	32124	065572	IMAGS	LDB	SBPTR	SAVE CURRENT
0436	32125	077457		STB	ARYAD	BUFFER POINTER
0437	32126	006400		CLB		
0438	32127	060374		LDA	,+15B	SET DELIMETER
0439	32130	015262		JSB	CHRST	RECORD STRING CONSTANT
0440	32131	000000		NOP		
0441	32132	061612		LDA	TEMP+1	LENGTH

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0442 32133 040321      ADA M73
0443 32134 002021      SSA,RSS                >72?
0444 32135 115072      JSB SERRS+31,I      YES
0445 32136 163457      LDA ARYAD,I        NO,
0446 32137 041612      ADA TEMP+1        RECORD
0447 32140 173457      STA ARYAD,I        LENGTH
0448 32141 124620      JMP ACCSA,I
0449*
0450***
0451** <GOTO STATEMENT> & <GOSUB STATEMENT> SYNTAX **
0452*** **
0453*
0454 32142 060220      GOTOS LDA SBP      SAVE
0455 32143 064255      LDB MAIN
0456 32144 006004      INB                BUFFER
0457 32145 130001      IOR 1,I
0458 32146 114736      JSB S14SC,I        POINTER
0459 32147 003400      CCA                SET INTCK MODE TO
0460 32150 071420      STA GFLAG          'EXIT ON ERROR'
0461 32151 015244      JSB PRGIN          SEEK SEQUENCE NUMBER
0462 32152 026212      JMP GOTO3          FOUND
0463 32153 007400      CCB                NOT FOUND
0464 32154 045572      GOTO1 ADB SBPTR    BACK UP
0465 32155 075572      STB SBPTR          SYNTAX POINTER
0466 32156 161572      LDA SBPTR,I        ERASE
0467 32157 010570      AND OPMSK          'INTEGER FOLLOWS'
0468 32160 171572      STA SBPTR,I        FLAG
0469 32161 060221      LDA RBP            RESTORE
0470 32162 064255      LDB MAIN
0471 32163 006004      INB                BUFFER
0472 32164 130001      IOR 1,I
0473 32165 114736      JSB S14SC,I        POINTER
0474 32166 015230      JSB FSC            SEEK FORMULA
0475 32167 050374      CPA +15B          END-OF-RECORD?
0476 32170 115044      JSB SERRS+9,I     YES
0477 32171 001727      ALF,ALF           NO, DO
0478 32172 071612      STA TEMP+1        NEXT
0479 32173 015446      JSB GETCR          TWO
0480 32174 115044      JSB SERRS+9,I     CHARACTERS
0481 32175 031612      IOR TEMP+1        FORM
0482 32176 053377      CPA OF            'OF' ?
0483 32177 002001      RSS                YES
0484 32200 115044      JSB SERRS+9,I     NO
0485 32201 060564      LDA OFOP          RECORD
0486 32202 171572      STA SBPTR,I        'OF' AND
0487 32203 015270      JSB SBPUD          ADVANCE POINTER
0488 32204 015464      GOTO2 JSB BLDIN    DEMAND A SEQUENCE NUMBER
0489 32205 175572      STB SBPTR,I        RECORD IT
0490 32206 015270      JSB SBPUD
0491 32207 050433      CPA +44           COMMA NEXT?
0492 32210 026204      JMP GOTO2          YES
0493 32211 026037      JMP FOST          NO, DEMAND END OF STATEMENT
0494 32212 050374      GOTO3 CPA +15B    END OF STATEMENT?
0495 32213 026217      JMP GOTO4          YES
0496 32214 071420      STA GFLAG          NO, RE-ENABLE BAD INTEGER ERROR
0497 32215 064355      LDB -2

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0498 32216 026154      JMP GOTO1
0499 32217 060220      GOTO4 LDA FBP          FREE
0500 32220 064255      LDB MAIN
0501 32221 006004      INB          SAVED
0502 32222 130001      IOR 1,I
0503 32223 114736      JSB S14SC,I   BUFFER SPACE
0504 32224 124620      JMP ACCSA,I   ACCEPT STATEMENT
0505*
0506***
0507** <IF STATEMENT> SYNTAX **
0508***
0509*
0510 32225 035572      IFS  ISZ SBPTR      FETCH NEXT
0511 32226 015446      JSB GETCR      CHARACTER
0512 32227 115072      JSB SERRS+31,I NONE FOUND
0513 32230 171572      STA SBPTR,I   FOUND, SAVE IT
0514 32231 063451      LDA AEND      LOOK
0515 32232 007400      CCB          FOR
0516 32233 015246      JSB TBSRH     'END'
0517 32234 026240      JMP IF0       NOT FOUND
0518 32235 015502      JSB FILRF     FOUND, GET FILE REFERENCE
0519 32236 115073      JSB SERRS+32,I NONE FOUND
0520 32237 026265      JMP IF1+1    FOUND
0521 32240 015450      IF0 JSB BCKSP     RESTORE
0522 32241 007400      CCB          TO
0523 32242 045572      ADB SBPTR    ENTRY
0524 32243 075572      STB SBPTR    STATUS
0525 32244 077453      STB SFLAG    ENABLE STRING VARIABLE
0526 32245 015230      JSB FSC      SEEK DECISION FORMULA
0527 32246 037453      ISZ SFLAG    STRING VARIABLE FOUND?
0528 32247 026265      JMP IF1+1    NO
0529 32250 071612      STA TEMP+1   YES, SAVE NEXT CHARACTER
0530 32251 064354      LDB .-3     MAXCR = 3 FROM FSC
0531 32252 171572      STA SBPTR,I  MULTICHAACTER
0532 32253 063736      LDA MCREL    RELATIONAL
0533 32254 015246      JSB TBSRH    OPERATOR?
0534 32255 002001      RSS         NO
0535 32256 026264      JMP IF1     YES
0536 32257 061612      LDA TEMP+1  RETRIEVE CHARACTER
0537 32260 064353      LDB .-4     SINGLE CHARACTER
0538 32261 015272      JSB SYMCK   RELATIONAL
0539 32262 033431      DEF RELOS-1 OPERATOR?
0540 32263 115053      JSB SERRS+16,I NO
0541 32264 015332      IF1 JSB RSTOP  YES, RECORD A STRING OPERAND
0542 32265 171572      STA SBPTR,I SAVE NEXT CHARACTER
0543 32266 035402      ISZ MAXCR   BUMP LIMIT TO FOUR CHARACTERS
0544 32267 060626      LDA ATHEN   LOOK
0545 32270 007400      CCB          FOR
0546 32271 015246      JSB TBSRH   'THEN'
0547 32272 115045      JSB SERRS+10,I NOT FOUND
0548 32273 015244      JSB PRGIN   DEMAND A SEQUENCE NUMBER
0549 32274 026037      JMP EOST    DEMAND END OF STATEMENT
0550*
0551***
0552** <FOR STATEMENT> SYNTAX **
0553***

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0554*
0555 32275 015240 FORS JSB VAROP SEEK A SIMPLE VARIABLE
0556 32276 000000 NOP NONE
0557 32277 115043 JSB SERRS+8,I FOUND
0558 32300 007400 CCB DEMAND AN
0559 32301 015272 JSB SYMCK ASSIGNMENT
0560 32302 033415 DEF ASSOP=1 OPERATOR
0561 32303 115036 JSB SERRS+3,I NOT FOUND
0562 32304 015230 JSB FSC RECORD INITIALIZATION FORMULA
0563 32305 001727 ALF,ALF DO
0564 32306 071612 STA TEMP+1 NEXT
0565 32307 015446 JSB GETCR TWO
0566 32310 115046 JSB SERRS+11,I CHARACTERS
0567 32311 031612 IOR TEMP+1 FORM
0568 32312 053376 CPA TO 'TO' ?
0569 32313 002001 RSS YES
0570 32314 115046 JSB SERRS+11,I NO
0571 32315 063740 LDA TOOP RECORD
0572 32316 171572 STA SBPTR,I 'TO'
0573 32317 015230 JSB FSC RECORD LIMIT FORMULA
0574 32320 050374 CPA ,+15B END OF STATEMENT?
0575 32321 124620 JMP ACCSA,I YES
0576 32322 171572 STA SBPTR,I NO, IS NEXT
0577 32323 035402 ISZ MAXCR
0578 32324 063461 LDA ASTEP SYMBOL
0579 32325 007400 CCB
0580 32326 015246 JSB TBSRH 'STEP' ?
0581 32327 115047 JSB SERRS+12,I NO
0582 32330 015230 JSB FSC YES, RECORD STEP SIZE
0583 32331 026037 JMP EOST DEMAND END OF STATEMENT
0584*
0585*** **
0586** <NEXT STATEMENT> SYNTAX **
0587*** **
0588*
0589 32332 015240 NEXTS JSB VAROP SEEK SIMPLE VARIABLE
0590 32333 000000 NOP NOT
0591 32334 115043 JSB SERRS+8,I FOUND
0592 32335 026037 JMP EOST DEMAND END OF STATEMENT
0593*
0594*** **
0595** <RETURN STATEMENT>, <END STATEMENT>, **
0596** AND <STOP STATEMENT> SYNTAX **
0597*** **
0598*
0599 32336 035572 ENDS ISZ SBPTR RECORD NULL OPERAND
0600 32337 015446 JSB GETCR END OF STATEMENT?
0601 32340 124620 JMP ACCSA,I YES
0602 32341 115037 JSB SERRS+4,I NO
0603*
0604*** **
0605** <DATA STATEMENT> SYNTAX **
0606*** **
0607*
0608 32342 015270 DATAS JSB SBPUD
0609 32343 002400 CLA INITIALIZE

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0610	32344	071266		STA SIGN	SIGN
0611	32345	015446		JSB GETCR	REQUEST A CHARACTER
0612	32346	115050		JSB SERRS+13,I	END-OF-INPUT CONDITION
0613	32347	006404		CLB,INB	
0614	32350	050432		CPA .+43	'+' ?
0615	32351	026400		JMP DATA4	YES
0616	32352	007400		CCB	NO
0617	32353	050434		CPA .+45	'=' ?
0618	32354	026400		JMP DATA4	YES
0619	32355	015276	DATA1	JSB NUMCK	NO, NUMBER?
0620	32356	026373		JMP DATA3	NO
0621	32357	115051		JSB SERRS+14,I	BAD EXPONENT
0622	32360	064354		LDB .-3	NUMBER,
0623	32361	045572		ADB SBPTR	MARK
0624	32362	160001		LDA 1,I	PREVIOUS
0625	32363	031027		IOR FLGBT	OPERATOR AS
0626	32364	170001		STA 1,I	NUMBER FOLLOWS
0627	32365	061612		LDA TEMP+1	RETRIEVE FOLLOWING CHARACTER
0628	32366	007400	DATA2	CCB	COMMA
0629	32367	015272		JSB SYMCK	
0630	32370	033363		DEF COMMA-1	NEXT?
0631	32371	026037		JMP EOST	NO, DEMAND END OF STATEMENT
0632	32372	026342		JMP DATAS	YES
0633	32373	055266	DATA3	CPB SIGN	SIGN FOUND? ((B) = 0)
0634	32374	002001		RSS	NO
0635	32375	115052		JSB SERRS+15,I	YES
0636	32376	015334		JSB GETST	DEMAND A STRING CONSTANT
0637	32377	026366		JMP DATA2	
0638	32400	075266	DATA4	STB SIGN	RECORD SIGN
0639	32401	015446		JSB GETCR	
0640	32402	115052		JSB SERRS+15,I	END-OF-INPUT CONDITION
0641	32403	026355		JMP DATA1	
0642*					
0643***				**	
0644**	<READ STATEMENT>			SYNTAX	**
0645***				**	
0646*					
0647	32404	015500	READS	JSB RECRF	READ FROM FILE?
0648	32405	026413		JMP READ1	NO
0649	32406	050374		CPA .+15B	YES, PSUEDO=RESTORE?
0650	32407	124620		JMP ACCSA,I	YES
0651	32410	050454		CPA 873	NO, ; ; ?
0652	32411	026414		JMP INPTS	YES
0653	32412	115041		JSB SERRS+6,I	NO
0654	32413	015450	READ1	JSB BCKSP	

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0656*
0657*** **
0658** <INPUT STATEMENT> SYNTAX **
0659*** **
0660*
0661 32414 065572 INPTS LDB SBPTR ENABLE STRING
0662 32415 077453 STB SFLAG VARIABLE
0663 32416 015240 JSB VAROP SEEK VARIABLE OPERAND
0664 32417 115054 JSB SERRS+17,I NONE FOUND
0665 32420 000000 NOP
0666 32421 007400 CCB
0667 32422 015272 JSB SYMCK COMMA?
0668 32423 033363 DEF COMMA=1
0669 32424 026037 JMP EOST NO, DEMAND END OF STATEMENT
0670 32425 026414 JMP INPTS YES
0671*
0672*** **
0673** <PRINT STATEMENT> SYNTAX **
0674*** **
0675*
0676 32426 015270 PRINS JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0677 32427 015446 JSB GETCR FETCH NEXT CHARACTER
0678 32430 124620 JMP ACCSA,I NONE FOUND
0679 32431 015544 JSB USTCK CHECK FOR USING STATEMENT
0680 32432 026460 JMP PRN01 NONE FOUND
0681 32433 050374 CPA ,+15B END OF STATEMENT?
0682 32434 124620 JMP ACCSA,I YES
0683 32435 007400 CCB NO,
0684 32436 015272 JSB SYMCK SEMI_COLON
0685 32437 033365 DEF SEMI=1 FOLLOWS?
0686 32440 115075 JSB SERRS+34,I NO
0687 32441 015270 PRN10 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0688 32442 015446 JSB GETCR FETCH NEXT CHARACTER
0689 32443 115041 JSB SERRS+6,I NONE FOUND
0690 32444 171572 STA SBPTR,I SAVE CHARACTER
0691 32445 015546 JSB PFSRH SEARCH FOR PRINT FUNCTION
0692 32446 026451 JMP PRN11 FOUND
0693 32447 077453 STB SFLAG ENABLE STRING VARIABLE
0694 32450 015230 JSB FSC LOOK FOR FORMULA
0695 32451 050374 PRN11 CPA ,+15B CARRIAGE RETURN FOLLOWS?
0696 32452 124620 JMP ACCSA,I YES
0697 32453 007400 CCB NO,
0698 32454 015272 JSB SYMCK COMMA?
0699 32455 033363 DEF COMMA=1
0700 32456 115041 JSB SERRS+6,I NO, ERROR
0701 32457 026441 JMP PRN10 YES
0702 32460 015500 PRN01 JSB RECRF WRITE ONTO FILE?
0703 32461 026471 JMP PRIN0-1 NO
0704 32462 007400 CCB YES, SET
0705 32463 075502 STB FILRF 'FILE' FLAG
0706 32464 050374 CPA ,+15B NULL WRITE?
0707 32465 124620 JMP ACCSA,I YES
0708 32466 050454 CPA B73 NO, '!' ?
0709 32467 026472 JMP PRIN0 YES
0710 32470 115041 JSB SERRS+6,I NO
0711 32471 015450 JSB BCKSP

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0712	32472	015270	PRIN0	JSB SBPUD	ADVANCE SYNTAX BUFFER POINTER
0713	32473	015446		JSB GETCR	MORE STATEMENT?
0714	32474	026552		JMP PRIN7	NO
0715	32475	007400		CCB	YES, ENABLE
0716	32476	075617		STB PFLAG	FORMULA AND TAB
0717	32477	050421		CPA .+42B	" ?
0718	32500	002001		RSS	YES
0719	32501	026520		JMP PRIN3	NO
0720	32502	015334	PRIN1	JSB GETST	RECORD A STRING CONSTANT
0721	32503	050374		CPA .+15B	END OF STATEMENT?
0722	32504	124620		JMP ACCSA, I	YES
0723	32505	007400		CCB	NO
0724	32506	075617		STB PFLAG	
0725	32507	050421	PRIN2	CPA .+42B	" ?
0726	32510	026502		JMP PRIN1	YES
0727	32511	064355		LDB .-2	NO
0728	32512	015272		JSB SYMCK	COMMA OR
0729	32513	033363		DEF COMMA=1	SEMICOLON?
0730	32514	006401		CLB, RSS	NO
0731	32515	026472		JMP PRIN0	YES
0732	32516	175572		STB SBPTR, I	ZERO NEXT WORD
0733	32517	015270		JSB SBPUD	
0734	32520	035617	PRIN3	ISZ PFLAG	FORMULA OR TAB PERMITTED?
0735	32521	115041		JSB SERRS+6, I	NO
0736	32522	171572		STA SBPTR, I	YES
0737	32523	007400		CCB	'FILE'
0738	32524	035502		ISZ FILRF	MODE?
0739	32525	026536		JMP PRIN4	NO
0740	32526	075502		STB FILRF	YES, SET FLAG AGAIN
0741	32527	063451		LDA AEND	
0742	32530	015246		JSB TBSRH	'END' ?
0743	32531	026541		JMP PRIN5	NO
0744	32532	015270		JSB SBPUD	YES
0745	32533	015446		JSB GETCR	FETCH NEXT
0746	32534	124620		JMP ACCSA, I	CHARACTER
0747	32535	026507		JMP PRIN2	
0748	32536	015546	PRIN4	JSB PFSRH	SEARCH FOR PRINT FUNCTION
0749	32537	026547		JMP PRIN6	FOUND
0750	32540	026545		JMP PRIN8	NOT FOUND
0751	32541	015450	PRIN5	JSB BCKSP	BACKUP
0752	32542	007400		CCB	TO POINT
0753	32543	045572		ADB SBPTR	FOLLOWING
0754	32544	075572		STB SBPTR	LAST OPERATOR
0755	32545	077453	PRIN8	STB SFLAG	ENABLE STRING VARIABLE
0756	32546	015230		JSB FSC	RECORD FORMULA
0757	32547	050374	PRIN6	CPA .+15B	END OF STATEMENT?
0758	32550	124620		JMP ACCSA, I	YES
0759	32551	026507		JMP PRIN2	NO
0760	32552	035502	PRIN7	ISZ FILRF	'FILE' MODE?
0761	32553	124620		JMP ACCSA, I	NO
0762	32554	115035		JSB SERRS+2, I	YES
0763*					

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0002*
0003***
0004** <MAT STATEMENT> SYNTAX **
0005***
0006*
0007 32555 015256 MATS JSB LTR FIRST TWO
0008 32556 115055 JSB SERRS+18,I CHARACTERS
0009 32557 015266 JSB LETCK LETTERS?
0010 32560 026677 JMP MATS3 NO
0011 32561 035572 ISZ SBPTR YES,
0012 32562 001727 ALF,ALF RETRIEVE
0013 32563 031612 IOR TEMP+1 FIRST CHARACTER
0014 32564 171572 STA SBPTR,I LOOK
0015 32565 060364 LDA .+5 FOR
0016 32566 071402 STA MAXCR 'INPUT',
0017 32567 063443 LDA MATIO 'READ',
0018 32570 064354 LDB .-3 OR
0019 32571 015246 JSB TBSRH 'PRINT'
0020 32572 115055 JSB SERRS+18,I NONE FOUND
0021 32573 050574 CPA PRTOP 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 015500 JSB RECRF NO, READ FROM FILE?
0026 32600 026604 JMP MATS1-3 NO
0027 32601 050454 CPA B73 YES, ',' ?
0028 32602 026605 JMP MATS1-2 YES
0029 32603 115041 JSB SERRS+6,I NO
0030 32604 015450 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 SBSCK RECORD SUBSCRIPT
0035 32611 000000 NOP IF PRESENT
0036 32612 050374 CPA .+15B END OF STATEMENT?
0037 32613 124620 JMP ACCSA,I YES
0038 32614 007400 CCB NO, DEMAND
0039 32615 015272 JSB SYMCK COMMA
0040 32616 033363 DEF COMMA=1
0041 32617 115041 JSB SERRS+6,I NOT FOUND
0042 32620 026607 JMP MATS1
0043 32621 015270 MATS2 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0044 32622 015446 JSB GETCR FETCH NEXT CHARACTER
0045 32623 115041 JSB SERRS+6,I NONE FOUND
0046 32624 015544 JSB USTCK CHECK FOR USING STATEMENT
0047 32625 026652 JMP MAT13 NONE FOUND
0048 32626 050374 CPA .+15B CARRIAGE RETURN ?
0049 32627 124620 JMP ACCSA,I YES
0050 32630 007400 CCB SEMI=
0051 32631 015272 JSB SYMCK COLON
0052 32632 033365 DEF SEMI=1 FOLLOWS?
0053 32633 115075 JSB SERRS+34,I NO
0054 32634 015270 MAT12 JSB SBPUD ADVANCE SYNTAX BUFFER POINTER
0055 32635 015446 JSB GETCR FETCH NEXT CHARACTER
0056 32636 115041 JSB SERRS+6,I NONE FOUND
0057 32637 171572 STA SBPTR,I SAVE CHARACTER

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0058	32640	015546		JSB PFSRH	SEARCH FOR PRINT FUNCTION
0059	32641	002001		RSS	FOUND
0060	32642	015242		JSB ARRID	RECORD AN ARRAY
0061	32643	050374		CPA .+15B	CARRIAGE RETURN FOLLOWS?
0062	32644	124620		JMP ACCSA,I	YES
0063	32645	007400		CCB	NO,
0064	32646	015272		JSB SYMCK	COMMA?
0065	32647	033363		DEF COMMA-1	
0066	32650	115041		JSB SERRS+6,I	NO, ERROR
0067	32651	026634		JMP MAT12	YES
0068	32652	015500	MAT13	JSB RECRF	WRITE ON FILE?
0069	32653	026671		JMP MAT11	NO
0070	32654	050454		CPA B73	YES, ',' ?
0071	32655	007401		CCB,RSS	YES
0072	32656	115041		JSB SERRS+6,I	NO
0073	32657	075502		STB FILRF	NOTE 'FILE' MODE
0074	32660	015242	MAT10	JSB ARRID	RECORD AN ARRAY
0075	32661	050374		CPA .+15B	END OF STATEMENT?
0076	32662	124620		JMP ACCSA,I	YES
0077	32663	064355		LDB .-2	NO, DEMAND
0078	32664	015272		JSB SYMCK	COMMA OR
0079	32665	033363		DEF COMMA-1	SEMICOLON
0080	32666	115041		JSB SERRS+6,I	NOT FOUND
0081	32667	015446		JSB GETCR	END OF STATEMENT?
0082	32670	026673		JMP ++3	YES
0083	32671	015450	MAT11	JSB BCKSP	NO
0084	32672	026660		JMP MAT10	
0085	32673	015270		JSB SBPUD	UPDATE POINTER
0086	32674	035502		ISZ FILRF	'FILE' MODE?
0087	32675	124620		JMP ACCSA,I	NO
0088	32676	115035		JSB SERRS+2,I	YES
0089	32677	065572	MATS3	LDB SBPTR	SAVE ADDRESS
0090	32700	077457		STB ARYAD	OF ARRAY OPERAND
0091	32701	061612		LDA TEMP+1	RECORD
0092	32702	171615		STA SSTAK,I	AND SAVE
0093	32703	064435		LDB .+46	THE ARRAY
0094	32704	015260		JSB STROP	IDENTIFIER
0095	32705	061613		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	115036		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	035572		ISZ SBPTR	YES,
0105	32717	001727		ALF,ALF	CONCATENATE
0106	32720	031612		IOR TEMP+1	LETTERS
0107	32721	171572		STA SBPTR,I	AND
0108	32722	063442		LDA MATFN	SEARCH FOR
0109	32723	064352		LDB .-5	AN ARRAY
0110	32724	015246		JSB TBSRH	FUNCTION
0111	32725	115042		JSB SERRS+7,I	NONE FOUND
0112	32726	001727		ALF,ALF	FOUND,
0113	32727	001723		ALF,RAR	CONVERT

0114	32730	030572		IOR PDFFL	TO OPERAND
0115	32731	007400		CCB	COMBINE
0116	32732	045572		ADB SBPTR	WITH
0117	32733	130001		IOR 1,I	OPERATOR
0118	32734	170001		STA 1,I	AND RECORD
0119	32735	010504		AND B777	'INV'
0120	32736	043744		ADA D577	OR
0121	32737	002021		SSA,RSS	'TRN' ?
0122	32740	026750		JMP MATS4	YES
0123	32741	015446		JSB GETCR	NO, END OF STATEMENT?
0124	32742	124620		JMP ACCSA,I	YES
0125	32743	006404		CLB,INB	NO, TURN ON
0126	32744	077445		STB DFLAG	'MATRIX SUBSCRIPT' MODE
0127	32745	015232		JSB SBSCK	DEMAND SUBSCRIPT
0128	32746	115040		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	171615		STA SSTAK,I	INTO SELF
0132	32752	015446		JSB GETCR	DEMAND
0133	32753	115061		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	065612		LDB TEMP+1	SAME SOURCE AND
0138	32760	155615		CPB SSTAK,I	DESTINATION ARRAYS?
0139	32761	115056		JSB SERRS+19,I	YES
0140	32762	026037		JMP EOST	NO, DEMAND END OF STATEMENT
0141	32763	015450	MATS5	JSB BCKSP	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	115057		JSB SERRS+20,I	NOT FOUND
0147	32771	015242		JSB ARRID	DEMAND ARRAY
0148	32772	026037		JMP EOST	DEMAND END OF STATEMENT
0149	32773	061612	MATS6	LDA TEMP+1	RECORD
0150	32774	064435		LDB ,+46	ARRAY
0151	32775	015260		JSB STROP	OPERAND
0152	32776	061613		LDA TEMP+2	END OF
0153	32777	050374		CPA ,+15B	STATEMENT?
0154	33000	124620		JMP ACCSA,I	YES
0155	33001	064354		LDB ,=3	NO, SEEK
0156	33002	015272		JSB SYMCK	'+', '-',
0157	33003	033417		DEF PLUS=1	OR '+'
0158	33004	115060		JSB SERRS+21,I	NOT FOUND
0159	33005	006400		CLB	SET '+' FLAG TO FALSE
0160	33006	050560		CPA MULOP	'+' ?
0161	33007	027022		JMP MATS9	YES
0162	33010	075617	MATS7	STB PFLAG	NO
0163	33011	015242		JSB ARRID	DEMAND ARRAY
0164	33012	071613		STA TEMP+2	SAVE CHARACTER
0165	33013	035617		ISZ PFLAG	'+' ?
0166	33014	027020		JMP MATS8	NO
0167	33015	061612		LDA TEMP+1	YES, DOES ARRAY
0168	33016	151615		CPA SSTAK,I	MATCH LEFT-HAND SIDE?
0169	33017	115056		JSB SERRS+19,I	YES

0170	33020	061613	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	061612		LDA TEMP+1	DOES ARRAY
0174	33024	151615		CPA SSTAK,I	MATCH LEFT-HAND SIDE?
0175	33025	115056		JSB SERRS+19,I	
0176	33026	027010		JMP MATS7	NO

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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 171615 STA SSTAK,I COUNT TO ZERO
0201 33031 060362 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 064353 LDB ,=4
0218 33043 171572 STA SBPTR,I SEARCH FOR
0219 33044 060720 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 061613 LDA TEMP+2
0228 33051 001727 ALF,ALF WERE
0229 33052 031612 IOR TEMP+1 TWO LETTERS
0230 33053 053375 CPA FN 'FN' ?
0231 33054 027104 JMP FSC4 YES
0232 33055 171572 STA SBPTR,I NO,
0233 33056 060730 LDA PDFNS PREDEFINED

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0234	33057	064340		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	030572		IOR	PDFFL	NAME
0240	33065	071612	FSC3	STA	TEMP+1	SAVE FUNCTION
0241	33066	007400		CCB		RETRIEVE
0242	33067	045572		ADB	SBPTR	PREVIOUS
0243	33070	075572		STB	SBPTR	OPERATOR=
0244	33071	160001		LDA	1,I	OPERAND
0245	33072	010570		AND	OPMSK	REPLACE
0246	33073	031612		IOR	TEMP+1	OPERAND
0247	33074	171572		STA	SBPTR,I	WITH FUNCTION
0248	33075	061612		LDA	TEMP+1	
0249	33076	053737		CPA	LENCN	'LEN' ?
0250	33077	027114		JMP	FSC0	YES
0251	33100	064346		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	015446	FSC4	JSB	GETCR	DOES
0256	33105	115042		JSB	SERRS+7,I	LETTER
0257	33106	015266		JSB	LETCK	FOLLOW?
0258	33107	115042		JSB	SERRS+7,I	NO
0259	33110	040320		ADA	D100	YES,
0260	33111	001700		ALF		BUILD
0261	33112	040376		ADA	.-+17B	FUNCTION
0262	33113	027065		JMP	FSC3	NAME
0263	33114	035572	FSC0	ISZ	SBPTR	MOVE TO CORRECT PROGRAM WORD
0264	33115	015446		JSB	GETCR	RECORD
0265	33116	115061		JSB	SERRS+22,I	LEFT
0266	33117	015252		JSB	LPCK	PARENTHESIS
0267	33120	015256		JSB	LTR	LETTER NEXT?
0268	33121	115063		JSB	SERRS+24,I	NO
0269	33122	050423		CPA	.-+44B	YES, FOLLOWED BY 'S' ?
0270	33123	002001		RSS		YES
0271	33124	115063		JSB	SERRS+24,I	NO
0272	33125	061612		LDA	TEMP+1	RECORD
0273	33126	064432		LDB	.-+53B	STRING
0274	33127	015260		JSB	STROP	VARIABLE
0275	33130	015446		JSB	GETCR	RECORD
0276	33131	115062		JSB	SERRS+23,I	RIGHT
0277	33132	015254		JSB	RPCK	PARENTHESIS
0278	33133	027162		JMP	FSC8	
0279*						*
0280**						**
0281*						*
0282	33134	060556	FSC5	LDA	LPOP	RECORD
0283	33135	171572		STA	SBPTR,I	A '(
0284	33136	135615		ISZ	SSTAK,I	COUNT IT
0285	33137	064346	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	050427		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 115051      JSB SERRS+14,I BAD EXPONENT
0301 33154 065572      LDB SBPTR   RETRIEVE
0302 33155 044354      ADB .-3     PRECEDING
0303 33156 160001      LDA 1,I     OPERATOR
0304 33157 031027      IOR FLGBT   SET FLAG TO SAY
0305 33160 170001      STA 1,I     NUMBER FOLLOWS
0306 33161 061612      LDA TEMP+1  RETRIEVE CHARACTER
0307 33162 064346      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 115064      JSB SERRS+25,I NO
0315 33167 067372      LDB UNMNC   YES LOAD UNARY MINUS OPCODE
0316 33170 050432      CPA .+43    '+' ?
0317 33171 027175      JMP ++4     YES
0318 33172 050434      CPA .+45    NO, '-' ?
0319 33173 027176      JMP ++3     YES
0320 33174 115064      JSB SERRS+25,I NO
0321 33175 067373      LDB UNPLC   CONVERT (B) TO UNARY '+' OPCODE
0322 33176 175572      STB SBPTR,I RECORD UNARY OPERATOR
0323 33177 064346      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 161572      LDA SBPTR,I YES
0333 33205 001727      ALF,ALF
0334 33206 171572      STA SBPTR,I
0335 33207 060622      LDA ANOT    SEEK
0336 33210 007400      CCB
0337 33211 015246      JSB TBSRH   'NOT'
0338 33212 027276      JMP FSC14=1 'NOT' NOT FOUND
0339 33213 171572      STA SBPTR,I FOUND
0340 33214 007400      CCB        ERASE
0341 33215 045572      ADB SBPTR
0342 33216 160001      LDA 1,I    SPURIOUS
0343 33217 010570      AND OPMSX
0344 33220 170001      STA 1,I    OPERAND
0345 33221 027177      JMP FSC10

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0346*
0347** CHECK FOR RIGHT PARENTHESIS **
0348*
0349 33222 064355 FSC12 LDB .-2      '))'
0350 33223 015272      JSB SYMCK      OR
0351 33224 033377      DEF RPARN=1    '))' ?
0352 33225 027277      JMP FSC14      NO
0353 33226 060600      LDA RPOP      YES,
0354 33227 171572      STA SBPTR,I   RECORD '))'
0355 33230 060430      LDA .+41      RETRIEVE '))'
0356 33231 007400      CCB          MATCHING
0357 33232 145615      ADB SSTAK,I   LEFT
0358 33233 006020      SSB          PARENTHESIS?
0359 33234 027277      JMP FSC14      NO
0360 33235 175615      STB SSTAK,I   YES
0361 33236 015270      JSB SBPUD     UPDATE POINTER
0362 33237 015446      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 050374      FSC13 CPA .+15B NO, END OF STATEMENT?
0372 33246 027277      JMP FSC14     YES
0373 33247 073455      STA UFLAG     NO, DISABLE UNARY OPERATORS
0374 33250 071612      STA TEMP+1    SAVE CHARACTER
0375 33251 064350      LDB .-7       SEARCH
0376 33252 171572      STA SBPTR,I   FOR A
0377 33253 060720      LDA MCBOP     MULTICHAACTER
0378 33254 015246      JSB TBSRH     BINARY OPERATOR
0379 33255 002001      RSS          NONE FOUND
0380 33256 027137      JMP FSC6      FOUND
0381 33257 061612      LDA TEMP+1    NO, RECOVER A CHARACTER
0382 33260 067447      LDB MSFLG     SINGLE
0383 33261 015272      JSB SYMCK     CHARACTER
0384 33262 033417      DEF PLUS=1    BINARY OPERATOR?
0385 33263 027267      JMP **4       NO
0386 33264 053742      CPA EXPOP     YES, '!' ?
0387 33265 027177      JMP FSC10     YES
0388 33266 027137      JMP FSC6      NO
0389 33267 007400      CCB          ASSIGNMENT
0390 33270 015272      JSB SYMCK
0391 33271 033415      DEF ASSOP=1   OPERATOR?
0392 33272 027222      JMP FSC12     NO
0393 33273 060355      LDA .-2       YES, SET FLAG
0394 33274 073453      STA SFLAG     TO SAY
0395 33275 027033      JMP FSC1      STORE OCCURRED

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0397*
0398** END OF FORMULA **
0399*
0400 33276 061613 LDA TEMP+2 RETRIEVE CHARACTER
0401 33277 006400 FSC14 CLB RECORD
0402 33300 175572 STB SBPTR,I END=OF=FORMULA
0403 33301 155615 CPB SSTAK,I ALL LEFT PARENTHESES MATCHED?
0404 33302 125230 JMP FSC,I YES
0405 33303 115062 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 035615 #FRCR ISZ SSTAK SAVE PREVIOUS '(' COUNT
0416 33305 045615 ADB SSTAK SUFFICIENT
0417 33306 007000 CMB USER
0418 33307 044716 ADB LWAUS SPACE
0419 33310 006020 SSB LEFT?
0420 33311 115033 JSB SERRS,I NO
0421 33312 067447 LDB MSFLG YES, SAVE
0422 33313 175615 STB SSTAK,I 'MULTIPLE STORE'
0423 33314 035615 ISZ SSTAK FLAG
0424 33315 067455 LDB UFLAG SAVE
0425 33316 175615 STB SSTAK,I 'UNARY OPERATOR'
0426 33317 035615 ISZ SSTAK FLAG
0427 33320 065240 LDB VAROP SAVE
0428 33321 175615 STB SSTAK,I VAROP
0429 33322 035615 ISZ SSTAK RETURN ADDRESS
0430 33323 065250 LDB GETPF SAVE
0431 33324 175615 STB SSTAK,I GETPF
0432 33325 035615 ISZ SSTAK RETURN ADDRESS
0433 33326 065230 LDB FSC SAVE
0434 33327 175615 STB SSTAK,I FSC
0435 33330 035615 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 071612 #FPOP STA TEMP+1 SAVE (A)
0447 33336 065615 LDB SSTAK RESET
0448 33337 044351 ADB .-6 SYNTAX STACK
0449 33340 075615 STB SSTAK POINTER
0450 33341 006004 INB RESTORE
0451 33342 160001 LDA 1,I 'MULTIPLE STORE'
0452 33343 073447 STA MSFLG FLAG

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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	061612	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	053573	MATFN	DEF MATFS	
0526	33443	053432	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	053421	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 TAAN OR EQUAL
0540	33461	053502	ASTEP	DEF STEP	
0541	33462	041011		OCT 41011	NOT

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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 064355 #SBCK 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 040355          ADA  .-2      ARRAY TO
0034  33472 173457          STA  ARYAD,I      SINGLE DIMENSION
0035  33473 060554          LDA  LBOP      RECORD
0036  33474 171572          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 064366          LDB  .+7      NO, SAVE FSC
0042  33502 015234          JSB  FRCUR      LOCAL VARIABLES
0043  33503 065232          LDB  SBSCK      SAVE
0044  33504 175615          STB  SSTAK,I      RETURN
0045  33505 035615          ISZ  SSTAK      ADDRESS
0046  33506 067457          LDB  ARYAD      SAVE ARRAY
0047  33507 175615          STB  SSTAK,I      REFERENCE
0048  33510 035615          ISZ  SSTAK      RESERVE SPACE FOR '(' COUNT
0049  33511 060346          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 045615          ADB  SSTAK
0054  33516 075615          STB  SSTAK      ARRAY
0055  33517 164001          LDB  1,I
0056  33520 077457          STB  ARYAD      REFERENCE
0057  33521 067445          LDB  DFLAG      'MATRIX SUBSCRIPT'
0058  33522 054361          CPB  .+2      MODE?

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0059	33523	027567		JMP SBSC4	YES
0060	33524	007400	SBSC1	CCB	NO, SEEK
0061	33525	015272		JSB SYMCK	'SUBSCRIPT'
0062	33526	033413		DEF SCMM-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	054360		CPB ,+1	'MATRIX SUBSCRIPT' MODE?
0075	33543	015270		JSB SBPUD	YES
0076	33544	064355		LDB , -2	DEMAND
0077	33545	015272		JSB SYMCK	')' OR
0078	33546	033377		DEF RPARN-1	' '
0079	33547	115062		JSB SERRS+23,I	NOT FOUND
0080	33550	063374		LDA RBOP	RECORD
0081	33551	171572		STA SBPTR,I	' '
0082	33552	015270		JSB SBPUD	UPDATE POINTER
0083	33553	015446		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	045615		ADB SSTAK	RESTORE
0090	33562	075615		STB SSTAK	THE
0091	33563	165615		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	037453		ISZ SFLAG	STRING VARIABLE?
0102	33576	027524		JMP SBSC1	NO
0103	33577	044321		ADB M73	YES, DOES BOUND
0104	33600	006021		SSB,RSS	EXCEED 72?
0105	33601	115071		JSB SERRS+30,I	YES
0106	33602	027537		JMP SBSC3+1	NO

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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 115065          JSB SERRS+26,I  NONE FOUND
0118 33605 065242          LDB ARRID          SET
0119 33606 075330          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 050423 #STRI CPA ,+44B      'S' ?
0129 33610 027620          JMP STRI1          YES
0130 33611 061572          LDA SBPTR         NO, SET POINTER TO
0131 33612 073457          STA ARYAD         VARIABLE LOCATION
0132 33613 061612          LDA TEMP+1       RECORD
0133 33614 064435          LDB ,+56B        ARRAY
0134 33615 015260          JSB STROP        VARIABLE
0135 33616 061613          LDA TEMP+2       RETRIEVE FOLLOWING
0136 33617 125330          JMP STRID,I      CHARACTER
0137 33620 063453 STRI1 LDA SFLAG     STRING VARIABLE
0138 33621 051572          CPA SBPTR       PERMITTED?
0139 33622 003401          CCA,RSS        YES
0140 33623 115066          JSB SERRS+27,I  NO
0141 33624 073453          STA SFLAG       SET FLAG TO 'STRING OCCURRED'
0142 33625 061612          LDA TEMP+1     RECORD
0143 33626 064432          LDB ,+53B      STRING
0144 33627 015260          JSB STROP        VARIABLE
0145 33630 061615          LDA SSTAK      SET POINTER TO DUMMY
0146 33631 073457          STA ARYAD      VARIABLE LOCATION
0147 33632 015446          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 061572 #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 115067          JSB SERRS+28,I NO

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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 065572  #GTST LDB SBPTR      SAVE SYNTAX
0181 33650 077457          STB ARYAD        BUFFER POINTER
0182 33651 050421          CPA ,+42B        " ?
0183 33652 006401          CLB,RSS         YES, SET (B) = 0
0184 33653 115067          JSB SERRS+28,I  NO
0185 33654 015262          JSB CHRST        RECORD STRING CONSTANT
0186 33655 115070          JSB SERRS+29,I  NO CLOSING QUOTE
0187 33656 063362          LDA QUOTE        RECORD CHARACTER COUNT
0188 33657 041612          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         CHARACTERS?
0192 33663 115071          JSB SERRS+30,I  YES
0193 33664 015446          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 171572  #USCK STA SBPTR,I      (A) = NEXT CHARACTER
0206 33670 060364          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 035544          ISZ USTCK
0213 33677 015256          JSB LTR          NEXT CHARACTER LETTER?
0214 33700 027712          JMP USCK1        NO
0215 33701 050423          CPA ,+44B       YES, 'S' FOLLOWS?
0216 33702 002001          RSS            YES
0217 33703 115075          JSB SERRS+34,I  NO
0218 33704 065572          LDB SBPTR        ENABLE STRING
0219 33705 077453          STB SFLAG       VARIABLE

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0220	33706	015330		JSB STRID	STORE STRING
0221	33707	015232		JSB SBSCK	
0222	33710	000000		NOP	
0223	33711	125544		JMP USTCK,I	
0224	33712	050421	USCK1	CPA ,+42B	QUOTE?
0225	33713	027722		JMP USCK2	YES
0226	33714	015450		JSB BCKSP	SEARCH
0227	33715	007400		CCB	FOR
0228	33716	075420		STB GFLAG	STATEMENT
0229	33717	015244		JSB PRGIN	NUMBER
0230	33720	125544		JMP USTCK,I	FOUND ONE
0231	33721	115075		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	125544		JMP USTCK,I	
0235	33725	007400	USCK3	CCB	RESTORE
0236	33726	045572		ADB SBPTR	BUFFER
0237	33727	075572		STB SBPTR	POINTER
0238	33730	060362		LDA ,+3	RESET FOR
0239	33731	071402		STA MAXCR	3 CHARACTERS
0240	33732	015450		JSB BCKSP	RESTORE INPUT STRING
0241	33733	125544		JMP USTCK,I	

0243	33734	053347	USTMA	DEF	USTMT
0244	33735	053343	STTYP	DEF	STYPs
0245	33736	053332	MCREL	DEF	MRELS
0246	33737	100337	LENCN	OCT	100337
0247	33740	076000	TOOP	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


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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  EOSTA DEF EOST
0262***                    **
0263** <RESTORE STATEMENT> SYNTAX **
0264***                    **
0265*
0266 34007 015446  RSTRS JSB GETCR      END OF STATEMENT?
0267 34010 026014                JMP RSTR1        YES
0268 34011 015450                JSB BCKSP       NO, DEMAND
0269 34012 015244                JSB PRGIN       SEQUENCE NUMBER
0270 34013 126006                JMP EOSTA,I     DEMAND END OF STATEMENT
0271 34014 035572  RSTR1 ISZ SBPTR   RECORD DUMMY OPERAND
0272 34015 124620                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 060374  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 124620                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 007400                CCB          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 015446  ENTRS JSB GETCR      FETCH FIRST CHARACTER
0307 34035 115076                JSB SERR3+35,I NONE FOUND
0308 34036 035572                ISZ SBPTR
0309 34037 007400                CCB

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0310	34040	015272		JSB SYMCK	FIRST CHARACTER A '1'?
0311	34041	033367		DEF HATCH=1	
0312	34042	026055		JMP ENTR1	NO
0313	34043	015240		JSB VAROP	YES, SEEK SIMPLE VARIABLE
0314	34044	115076		JSB SERRS+35,I	NONE FOUND
0315	34045	000000		NOP	
0316	34046	050374		CPA .+15B	CR FOLLOWS?
0317	34047	026307		JMP ACCST	YES, ACCEPT STATMENT
0318	34050	007400		CCB	NO
0319	34051	015272		JSB SYMCK	COMMA?
0320	34052	033363		DEF COMMA=1	
0321	34053	115041		JSB SERRS+6,I	NO
0322	34054	026061		JMP ENTR2	
0323	34055		ENTR1	EQU *	
0324	34055	015450		JSB RCKSP	BACKUP ONE CHARACTER
0325	34056	007400		CCB	RESTORE
0326	34057	045572		AOB SBPTR	BUFFER
0327	34060	075572		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	115041		JSB SERRS+6,I	NO
0334	34066	015240		JSB VAROP	DEMAND A SIMPLE VARIABLE
0335	34067	115076		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	115041		JSB SERRS+6,I	NO
0341	34075	065572		LDB SBPTR	YES, ENABLE
0342	34076	176003		STB SFLGA,I	STRING VARIABLE
0343	34077	015240		JSB VAROP	SEEK VARIABLE OPERAND
0344	34100	115076		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	115074	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	115041		JSB SERRS+6,I	NOT A COMMA
0363	34111	007400		CCB	DISALLOW
0364	34112	176003		STB SFLGA,I	STRING VARIABLE
0365	34113	015230		JSB FSC	RECORD FORMULA

0366	34114	007400	CCB		
0367	34115	015272	JSB	SYMCK	RECORD
0368	34116	033363	DEF	COMMA=1	A COMMA
0369	34117	115041	JSB	SERRS+6,I	NOT A COMMA
0370	34120	015240	JSB	VAROP	SEEK A NUMERIC OPERAND
0371	34121	115076	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	EOSTA,I	DEMAND END_OF_STATEMENT

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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 050427 CPA .+50B 'C' ?
0403 34135 026155 JMP VAR04 YES
0404 34136 052000 CPA BB133 NO, 'B' ?
0405 34137 026155 JMP VAR04 YES
0406 34140 050423 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 061612 LDA TEMP+1 YES, LOAD LETTER,
0412 34146 044437 ADB .+48 RESTORE DIGIT,
0413 34147 075612 STB TEMP+1 AND RECORD
0414 34150 015260 JSB STROP SIMPLE VARIABLE
0415 34151 015446 JSB GETCR FETCH
0416 34152 000000 NOP AND SAVE
0417 34153 071613 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 115040 JSB SERRS+5,I YES==ERROR
0426 34164 125240 JMP VAROP,I NO==EXIT
0427 34165 061612 VAR01 LDA TEMP+1 RETRIEVE LETTER,
0428 34166 064436 LDB .+57B SET 'NO DIGIT',
0429 34167 015260 JSB STROP AND RECORD
0430 34170 061613 LDA TEMP+2 SIMPLE VARIABLE
0431 34171 006400 VAR02 CLB INSIDE A
0432 34172 055617 CPB PFLAG 'DEF' STATEMENT?
0433 34173 125240 JMP VAROP,I NO, EXIT VIA (P+3)
0434 34174 007400 CCB YES,
0435 34175 045572 ADB SBPTR ISOLATE

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0436	34176	160001		LDA 1,I	LATEST
0437	34177	010504		AND B777	OPERAND
0438	34200	051617		CPA PFLAG	IS IT THE PARAMETER?
0439	34201	026204		JMP **3	YES
0440	34202	061613	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	031027		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	075612	#CRST	STB TEMP+1	SET CHARACTER FLAG AND COUNTER
0462	34211	071613		STA TEMP+2	NOTE TERMINATOR CHARACTER
0463	34212	064371		LDB ,+10	IF (A) ≠ 0
0464	34213	002002		SZA	STOP BLANK
0465	34214	075571		STB BLANK	SUPPRESSION
0466	34215	015446	CHRS1	JSB GETCR	FETCH CHARACTER
0467	34216	026234		JMP CHRS3+1	NONE FOUND
0468	34217	060001		LDA B	ALLOW LOWER CASE
0469	34220	051613		CPA TEMP+2	TERMINATOR?
0470	34221	026233		JMP CHRS3	YES
0471	34222	065612		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	131572	CHRS2	IOR SBPTR,I	COMBINE WITH PREVIOUS CHARACTER
0477	34230	171572		STA SBPTR,I	
0478	34231	075612		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	064417		LDB ,+40B	RESTORE BLANK
0483	34236	075571		STB BLANK	SUPPRESSION
0484	34237	125262		JMP CHRST,I	

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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 041612 #DLPR ADA TEMP+1 COMPUTE INITIAL
0498 34241 071613 STA TEMP+2 DESTINATION ADDRESS
0499 34242 045612 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 171613 STA TEMP+2,I A WORD
0504 34247 035613 ISZ TEMP+2 BUMP
0505 34250 006004 INB POINTERS
0506 34251 026243 JMP DELP1
0507 34252 061613 DELP2 LDA TEMP+2 UPDATE
0508 34253 070056 STA PBPTR END-OF-PROGRAM
0509 34254 125312 JMP DELPR,I POINTER

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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 GOTO
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 READ
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 065616 ACCST LDB SBUFA
0562 34310 006004 INB
0563 34311 061616 LDA SBUFA COMPUTE
0564 34312 003004 CMA,INA STATEMENT
0565 34313 041572 ADA SBPTR LENGTH
0566 34314 002003 SZA,RSS UNPROCESSED STATEMENT?

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0567	34315	026413		JMP ACCS6	YES
0568	34316	170001		STA 1,I	NO, STORE LENGTH IN STATEMENT
0569	34317	071613		STA TEMP+2	SAVE IT
0570	34320	060056		LDA PBPTR	FIND STATEMENT'S
0571	34321	165616		LDB SBUFA, I	SEQUENTIAL
0572	34322	015314		JSB FNDPS	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	041613		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	061613		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	065616	ACCS1	LDB SBUFA	LOAD FIRST SOURCE ADDRESS
0587	34341	160001		LDA 1,I	TRANSFER
0588	34342	171612		STA TEMP+1, I	A WORD
0589	34343	035612		ISZ TEMP+1	ADVANCE DESTINATION
0590	34344	006004		INB	AND SOURCE ADDRESSES
0591	34345	055572		CPB SBPTR	DONE?
0592	34346	026400		JMP ACCS5	YES
0593	34347	026341		JMP ACCS1+1	NO
0594	34350	061613	ACCS2	LDA TEMP+2	LOAD SPACE REQUIREMENT
0595	34351	041616		ADA SBUFA	UPDATE POINTER
0596	34352	071616		STA SBUFA	TO NEW STATEMENT
0597	34353	041613		ADA TEMP+2	RESET
0598	34354	065572		LDB SBPTR	END OF STATEMENT
0599	34355	071572		STA SBPTR	POINTER
0600	34356	071613		STA TEMP+2	INITIALIZE DESTINATION ADDRESS
0601	34357	003000		CMA	USER
0602	34360	040716		ADA LW AUS	SPACE
0603	34361	002020		SSA	OVERFLOW?
0604	34362	115033		JSB SERRS, I	YES
0605	34363	061616		LDA SBUFA	NO, UPDATE POINTER
0606	34364	070056		STA PBPTR	TO END-OF-PROGRAM
0607	34365	055612	ACCS3	CPB TEMP+1	EVERYTHING MOVED?
0608	34366	026340		JMP ACCS1	YES
0609	34367	003400		CCA	NO, BACK UP
0610	34370	041613		ADA TEMP+2	SOURCE AND
0611	34371	071613		STA TEMP+2	DESTINATION
0612	34372	044356		ADB .-1	ADDRESSES
0613	34373	160001		LDA 1, I	TRANSFER
0614	34374	171613		STA TEMP+2, I	A WORD
0615	34375	026365		JMP ACCS3	
0616	34376	061572	ACCS4	LDA SBPTR	RESET POINTER TO
0617	34377	070056		STA PBPTR	LAST WORD+1 OF PROGRAM
0618	34400	060367	ACCS5	LDA TAPEF	TAPE
0619	34401	110255		AND MAIN, I	
0620	34402	002002		SZA	MODE?
0621	34403	026413		JMP ACCS6	YES
0622	34404	055573		LDB SYMTB	NO


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0623 34405 071573      STA SYMTB      RESET UNDER/OVERFLOW FLAG
0624 34406 054363      CPB .+4        UNDER/OVERFLOW ERROR(S)?
0625 34407 115137      JSB RERRS+32,I YES
0626 34410 060371      LDA .+12B     NO,
0627 34411 015452      JSB OUTCR     OUTPUT A
0628 34412 124740      JMP SCHEN,I   LINE FEED
0629 34413 064255      ACCS6 LDB MAIN ALLOW
0630 34414 006004      INB
0631 34415 160001      LDA 1,I      MORE
0632 34416 030236      IOR ALI
0633 34417 114735      JSB S14SC,I  INPUT
0634 34420 124740      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 075612      #FDPS STB TEMP+1  SAVE TEST SEQUENCE NUMBER
0018 34422 071614      STA TEMP+3     SAVE TERMINATION POINTER
0019 34423 064056      LDB PBPTR
0020 34424 054726      CPB PBUFF
0021 34425 026471      JMP FNDP4
0022 34426 065575      LDB SPROG     START WITH FIRST WORD OF PROGRAM
0023 34427 055614      FNDP1 CPB TEMP+3 PROGRAM EXHAUSTED?
0024 34430 026471      JMP FNDP3+2   YES, EXIT TO (P+1)
0025 34431 160001      LDA 1,I      NO, IS
0026 34432 003004      CMA,INA      PROGRAM
0027 34433 041612      ADA TEMP+1   SEQUENCE NUMBER
0028 34434 002003      SZA,RSS     THE SAME?
0029 34435 026446      JMP FNDP2    YES, EXIT TO (P+3)
0030 34436 002020      SSA        NO, GREATER?
0031 34437 026470      JMP FNDP3+1  YES, EXIT TO (P+2)
0032 34440 060001      LDA B       NO, CHECK
0033 34441 002004      INA        STATEMENT
0034 34442 160000      LDA A,I    LENGTH AND
0035 34443 044000      ADB A     SET (B) TO
0036 34444 015554      JSB STLCK  POINT TO NEXT
0037 34445 026427      JMP FNDP1  STATEMENT
0038 34446 060001      FNDP2 LDA 1   LOAD
0039 34447 040361      ADA .+2    STATEMENT
0040 34450 160000      LDA 0,I   ERROR
0041 34451 010570      AND OPMSK
0042 34452 002002      SZA      STATEMENT?
0043 34453 026467      JMP FNDP3  NO
0044 34454 003400      CCA      YES,

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0045 34455 041574      ADA ERRCT      DECREMENT
0046 34456 071574      STA ERRCT      ERROR COUNT
0047 34457 002002      SZA           ONLY ERROR?
0048 34460 026467      JMP FNDP3      NO
0049 34461 103100      CLF 0
0050 34462 060360      LDA TERR      YES--
0051 34463 003000      CMA           SET FLAG
0052 34464 110255      AND MAIN,I    TO SAY
0053 34465 170255      STA MAIN,I    'NO EMBEDDED ERRORS'
0054 34466 102100      STF 0
0055 34467 035314      FNDP3 ISZ FNDPS
0056 34470 035314      ISZ FNDPS
0057 34471 075612      FNDP4 STB TEMP+1  SAVE POINTER TO
0058 34472 125314      JMP FNDPS,I   FINAL STATEMENT SEEN
0059**
0060***  FETCH PARENTHESIZED FORMULA ***
0061**
0062*
0063*  AN END-OF-FORMULA OPERATOR FOLLOWS THE FORMULA
0064*
0065 34473 064364      #GTPF LDB ,+5      SAVE FSC
0066 34474 015234      JSB FRCUR      LOCAL VARIABLES
0067 34475 015270      JSB SBPUD      UPDATE POINTER
0068 34476 015446      JSB GETCR      RECORD
0069 34477 115061      JSB SERRS+22,I  LEFT
0070 34500 015252      JSB LPCK       PARENTHESIS
0071 34501 015230      JSB FSC        DEMAND FORMULA
0072 34502 015270      JSB SBPUD      RECORD END_OF_FORMULA OPERATOR
0073 34503 015254      JSB RPCK       RECORD RIGHT PARENTHESIS
0074 34504 015236      JSB FPOP       RESTORE FSC
0075 34505 125250      JMP GETPF,I    LOCAL VARIABLES
0076**
0077***  RECORD AN INTEGER ***
0078**
0079*
0080*  PRGIN FLAGS THE PREVIOUS OPERATOR TO SAY 'INTEGER FOLLOWS'.
0081*  STORE THE INTEGER AND EXIT WITH IT IN (B) AND THE FOLLOWING
0082*  CHARACTER IN (A).
0083*
0084 34506 161572      #PGIN LDA SBPTR,I  SET
0085 34507 030550      IOR INTFL     'INTEGER FOLLOWS'
0086 34510 171572      STA SBPTR,I   FLAG
0087 34511 015270      JSB SBPUD     ADVANCE POINTER
0088 34512 015464      JSB BLDIN     BUILD INTEGER
0089 34513 175572      STB SBPTR,I  RECORD INTEGER
0090 34514 015270      JSB SBPUD     ADVANCE POINTER
0091 34515 125244      JMP PRGIN,I

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0093**
0094*** BUILD AN INTEGER ***
0095**
0096*
0097* MISSING OR ILLEGAL INTEGER EXITS TO (P+2) OF PRGIN IF GFLAG = -1,
0098* ELSE TO ERROR. A LEGAL INTEGER IS NON-ZERO AND LESS THAN 10000.
0099*
0100 34516 002400 #BLDI CLA INITIALIZE TO
0101 34517 071643 STA PINTG ZERO INTEGER.
0102 34520 015446 JSB GETCR
0103 34521 026540 JMP BLDI2
0104 34522 015264 JSB DIGCK DIGIT?
0105 34523 026540 JMP BLDI2 NO
0106 34524 071644 STA PINTG+1 YES, SAVE IT
0107 34525 061643 LDA PINTG MULTIPLY PREVIOUS
0108 34526 100200 MPY ,+10 INTEGER BY 10
      34527 000371
0109 34530 000040 CLE ADD IN
0110 34531 041644 ADA PINTG+1 NEW DIGIT
0111 34532 006043 SEZ,SZB,RSS OVERFLOW?
0112 34533 026517 JMP #BLDI+1 NO
0113 34534 035420 BLDI1 ISZ GFLAG YES, RETURN ON ERROR?
0114 34535 115034 JSB SERRS+1,I NO
0115 34536 035244 ISZ PRGIN YES, EXIT TO
0116 34537 125244 JMP PRGIN,I (P+2) OF PRGIN
0117 34540 065643 BLDI2 LDB PINTG ZERO
0118 34541 006103 CLE,SZB,RSS INTEGER?
0119 34542 026534 JMP BLDI1 YES
0120 34543 044770 ADB MAXSN NO, INTEGER
0121 34544 002040 SEZ TOO LARGE?
0122 34545 026534 JMP BLDI1 YES
0123 34546 065643 LDB PINTG NO
0124 34547 125464 JMP BLDIN,I
0125**
0126*** SEEK RECORD REFERENCE ***
0127**
0128*
0129* IF THE NEXT CHARACTER IS NOT '#', RESTORE SBPTR AS UPON ENTRY
0130* AND EXIT TO (P+1) WITH THE CHARACTER IN (A). OTHERWISE CHECK
0131* CHARACTER RETURNED IN (A) FROM FILRF. IF IT IS A COMMA OR A
0132* SEMICOLON RECORD IT. EXIT TO (P+2) WITH THE CHARACTER IN (A)
0133* IF IT IS A SEMICOLON. IF A COMMA, PROCESS THE FOLLOWING RECORD
0134* REFERENCE AND EXIT TO (P+2) WITH CHARACTER FOLLOWING IT IN (A)
0135* (IF A SEMICOLON, RECORD IT BEFORE EXITING).
0136*
0137 34550 015502 #RECR JSB FILRF SEEK FILE REFERENCE
0138 34551 026565 JMP RECR1 NONE FOUND
0139 34552 035500 ISZ RECRF FOUND
0140 34553 050433 CPA ,+54B COMMA?
0141 34554 002001 RSS YES
0142 34555 026561 JMP RECR0 NO
0143 34556 064514 LDB B2000 RECORD
0144 34557 175572 STB SBPTR,I COMMA
0145 34560 015230 JSB FSC PROCESS RECORD REFERENCE
0146 34561 064516 RECR0 LDB B3000
0147 34562 050454 CPA B73 SEMICOLON?

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0148 34563 175572          STB SBPTR,I      YES
0149 34564 125500          JMP RECRF,I
0150 34565 007400 RECR1 CCB      RESTORE
0151 34566 045572          ADB SBPTR
0152 34567 075572          STB SBPTR      SBPTR
0153 34570 125500          JMP RECRF,I
0154**
0155***  SEEK FILE REFERENCE ***
0156**
0157*
0158*  IF THE NEXT CHARACTER IS NOT A '#' RETURN TO (P+1) WITH IT IN
0159*  (A). OTHERWISE RECORD THE FILE REFERENCE AND RETURN TO (P+2)
0160*  WITH THE FOLLOWING CHARACTER IN (A).
0161*
0162 34571 035572 #FILR ISZ SBPTR
0163 34572 015446          JSB GETCR      NEXT
0164 34573 125502          JMP FILRF,I
0165 34574 007400          CCB           CHARACTER
0166 34575 015272          JSB SYMCK
0167 34576 033367          DEF HATCH=1   A '#' ?
0168 34577 125502          JMP FILRF,I   NO
0169 34600 015230          JSB FSC       YES, PROCESS FILE REFERENCE
0170 34601 035502          ISZ FILRF
0171 34602 125502          JMP FILRF,I
0172**
0173***  SEARCH TABLE FOR MULTICHARACTER SYMBOL ***
0174**
0175*
0176*  UPON ENTRY (A) POINTS TO THE TABLE OF ACCEPTABLE
0177*  SYMBOLS, (B) CONTAINS THE NUMBER OF ENTRIES IN THE
0178*  TABLE (IN 2'S COMPLEMENT), MAXCR CONTAINS THE MAXIMUM
0179*  ACCEPTABLE NUMBER OF CHARACTERS IN THE SYMBOL, AND
0180*  SBPTR,I CONTAINS THE FIRST CHARACTER OF THE PROSPECTIVE
0181*  SYMBOL IN BITS 7-0 AND EITHER 0 OR THE SECOND CHARACTER
0182*  IN BITS 15-8. IF NO ACCEPTABLE SYMBOL IS FOUND, EXIT TO
0183*  (P+1) WITH THE HALVES OF SBPTR,I SWAPPED AND THE INPUT
0184*  STRING AS UPON ENTRY. ON SUCCESS EXIT TO (P+2) WITH
0185*  THE OPERATOR CODE IN BOTH (A) AND SBPTR,I; THE NEW INPUT
0186*  STRING BEGINS WITH THE CHARACTER FOLLOWING THE SYMBOL.
0187*
0188 34603 071404 #TBSR STA TABLE  SAVE TABLE ADDRESS
0189 34604 075406          STB LNTH      SAVE -(NUMBER OF ENTRIES)
0190 34605 060255          LDA MAIN     SAVE
0191 34606 002004          INA
0192 34607 160000          LDA 0,I      BUFFER
0193 34610 030220          IOR SBP
0194 34611 114736          JSB S14SC,I  POINTER
0195 34612 061572          LDA SBPTR    SAVE CURRENT
0196 34613 071410          STA SMBGN    SYNTAX BUFFER POINTER
0197 34614 002404          CLA,INA     COUNT FIRST CHARACTER
0198 34615 071432          STA SLENG    CF SYMBOL
0199 34616 161572          LDA SBPTR,I  LEFT JUSTIFY
0200 34617 001727          ALF,ALF     FIRST
0201 34620 171572          STA SBPTR,I  CHARACTER
0202 34621 010474          AND B177     TWO
0203 34622 002003          SZA,RSS     CHARACTERS?

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0204	34623	026642		JMP	TSRC4	NO
0205	34624	035432	TSRC1	ISZ	SLENG	COUNT NEW CHARACTER
0206	34625	065406		LDB	LNPTH	SET COUNTER
0207	34626	075436		STB	COUNT	FOR TABLE ENTRIES
0208	34627	061404		LDA	TABLE	SET POINTER
0209	34630	071440	TSRC2	STA	TBLPT	TO NEXT ENTRY
0210	34631	161440		LDA	TBLPT, I	TABLE ENTRY AND
0211	34632	010366		AND	,+7	CURRENT SYMBOL
0212	34633	051432		CPA	SLENG	OF SAME LENGTH?
0213	34634	026657		JMP	TSRC6	YES
0214	34635	040362	TSRC3	ADA	,+3	NO, UPDATE
0215	34636	001100		ARS		TABLE
0216	34637	041440		ADA	TBLPT	POINTER
0217	34640	035436		ISZ	COUNT	MORE ENTRIES?
0218	34641	026630		JMP	TSRC2	YES
0219	34642	015446	TSRC4	JSB	GETCR	NO, FETCH NEXT CHARACTER
0220	34643	026710		JMP	TSR10	NONE FOUND
0221	34644	065432		LDB	SLENG	SYMBOL ALREADY
0222	34645	055402		CPB	MAXCR	OF MAXIMUM LENGTH?
0223	34646	026710		JMP	TSR10	YES
0224	34647	006011		SLB, RSS		NO, EVEN-NUMBERED CHARACTER?
0225	34650	026654		JMP	TSRC5	NO
0226	34651	131572		IOR	SBPTR, I	YES, FILL LOWER HALF
0227	34652	171572		STA	SBPTR, I	OF LAST WORD OF SYMBOL
0228	34653	026624		JMP	TSRC1	
0229	34654	015270	TSRC5	JSB	SBPUD	ADVANCE SYMBOL POINTER
0230	34655	001727		ALF, ALF		STORE CHARACTER IN
0231	34656	026652		JMP	*-4	UPPER HALF OF WORD
0232	34657	065440	TSRC6	LDB	TBLPT	SET POINTER TO
0233	34660	075442		STB	TSPTR	SYMBOL IN TABLE
0234	34661	065410		LDB	SMBGN	SET (B) TO
0235	34662	026666		JMP	*+4	INPUT SYMBOL
0236	34663	055572	TSRC7	CPB	SBPTR	ALL OF SYMBOL MATCHED?
0237	34664	026674		JMP	TSRC8	YES
0238	34665	006004		INB		NO, ADVANCE
0239	34666	035442		ISZ	TSPTR	POINTERS
0240	34667	161442		LDA	TSPTR, I	COMPARE NEXT
0241	34670	150001		CPA	1, I	WORD OF SYMBOLS
0242	34671	026663		JMP	TSRC7	EQUAL
0243	34672	061432		LDA	SLENG	UNEQUAL, TRY
0244	34673	026635		JMP	TSRC3	NEXT TABLE SYMBOL
0245	34674	060255	TSRC8	LDA	MAIN	FREE
0246	34675	002004		INA		
0247	34676	160000		LDA	0, I	SAVED
0248	34677	030220		IOR	FBP	
0249	34700	114736		JSB	S14SC, I	BUFFER SPACE
0250	34701	161440		LDA	TBLPT, I	LOAD, ISOLATE
0251	34702	010570		AND	OPMSK	AND STORE
0252	34703	171410		STA	SMBGN, I	OPERATOR CODE
0253	34704	035246		ISZ	TBSRH	SET EXIT TO (P+2)
0254	34705	065410	TSRC9	LDB	SMBGN	CORRECT SYNTAX
0255	34706	075572		STB	SBPTR	BUFFER POINTER
0256	34707	125246		JMP	TBSRH, I	
0257	34710	060255	TSR10	LDA	MAIN	RESTORE
0258	34711	002004		INA		
0259	34712	160000		LDA	0, I	BUFFER

0260	34713	030221		IOR	RBP	
0261	34714	114736		JSB	S14Sc,I	POINTER
0262	34715	026705		JMP	TSRC9	
0263**				**		
0264***			FETCH A LETTER	***		
0265**				**		
0266*						
0267*			EXITS TO (P+1) IF NEXT CHARACTER NOT A LETTER,			
0268*			OTHERWISE STORES IT IN TEMP+1, STORES FOLLOWING			
0269*			CHARACTER IN TEMP+2, AND EXITS TO (P+2) WITH			
0270*			SECOND CHARACTER IN (B).			
0271*						
0272	34716	015446	#LTR	JSB	GETCR	FIRST
0273	34717	000000		NOP		CHARACTER
0274	34720	015266		JSB	LETCK	A LETTER?
0275	34721	125256		JMP	LTR,I	NO, EXIT WITH CHARACTER IN (A)
0276	34722	035256		ISZ	LTR	YES, SET RETURN ADDRESS TO (P+2)
0277	34723	071612		STA	TEMP+1	SAVE CHARACTER
0278	34724	015446		JSB	GETCR	SAVE
0279	34725	000000		NOP		SECOND
0280	34726	071613		STA	TEMP+2	CHARACTER
0281	34727	125256		JMP	LTR,I	

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0283**                               **
0284***  STORE AN OPERAND NAME  ***
0285**                               **
0286*
0287*  OPERANDS ARE STORED AS 9-BIT QUANTITIES.  BITS 8-4
0288*  HOLD A LETTER (1-32 OCTAL FOR A-Z).  BITS 3-0 INDICATE
0289*  THE TYPE OF OPERAND:  0 FOR A STRING, 1 AND 2 FOR
0290*  SINGLY AND DOUBLY SUBSCRIPTED VARIABLES, 3 FOR A
0291*  SUBSCRIPTED VARIABLE WITH DIMENSIONALITY NOT DEFINED
0292*  LOCALLY, 4 FOR A SINGLE-LETTER SIMPLE VARIABLE, 5-16
0293*  OCTAL FOR A LETTER-DIGIT SINGLE VARIABLE, AND 17 OCTAL
0294*  FOR A PROGRAMMER-DEFINED FUNCTION.
0295*
0296  34730 040320 #STOP ADA D100      LETTER = ASCII CODE = 100 OCTAL
0297  34731 046004      ADB D53      DIGIT = ASCII CODE = 53 OCTAL
0298  34732 001700      ALF          COMPLETE
0299  34733 030001      IOR 1        OPERAND
0300  34734 131572      IOR SBPTR,I  MERGE OPERATOR
0301  34735 171572      STA SBPTR,I  AND OPERAND
0302  34736 015270      JSB SBPUD   SET POINTER TO
0303  34737 125260      JMP STROP,I  FRESH WORD
0304**                               **
0305***  DEMAND A RIGHT PARENTHESIS ***
0306**                               **
0307*
0308*  IF (A) HOLDS ')', OR ')', RECORD A ')', AND EXIT
0309*  WITH THE FOLLOWING CHARACTER IN (A), ELSE ERROR.
0310*
0311  34740 064355 #RPCK LDB  -2      ') '
0312  34741 015272      JSB SYMCK      OR
0313  34742 033377      DEF RPARN-1    ') ' ?
0314  34743 115062      JSB SERRS+23,I NO
0315  34744 060600      LDA RPOP      YES, RECORD
0316  34745 171572      STA SBPTR,I  A ') '
0317  34746 015270      JSB SBPUD   RECORD A NULL OPERAND
0318  34747 015446      JSB GETCR   FETCH
0319  34750 000000      NOP          NEXT
0320  34751 125254      JMP RPCK,I  CHARACTER
0321**                               **
0322***  CHECK FOR A DIGIT  ***
0323**                               **
0324*
0325*  ENTER WITH CHARACTER IN (A).  IF NOT A DIGIT, EXIT
0326*  TO (P+1) WITH CHARACTER IN (A); ELSE EXIT TO (P+2)
0327*  WITH DIGIT (BINARY) IN (A) AND (B).
0328*
0329  34752 064000 #DGCK LDB  0      ASCII
0330  34753 044322      ADB D72      72B OR
0331  34754 006021      SSB,RSS      GREATER?
0332  34755 125264      JMP DIGCK,I  YES
0333  34756 044371      ADB  +12B    NO, ASCII 57B
0334  34757 006020      SSB          OR LESS?
0335  34760 125264      JMP DIGCK,I  YES
0336  34761 060001      LDA 1      NO, LOAD
0337  34762 035264      ISZ DIGCK  DIGIT
0338  34763 125264      JMP DIGCK,I  INTO (A)

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0339**
0340*** CHECK FOR A LETTER ***
0341**
0342*
0343* ENTER WITH CHARACTER IN (A). EXIT TO (P+2) IF A
0344* LETTER, ELSE EXIT TO (P+1). (A) IS NOT CHANGED.
0345*
0346 34764 064000 #LETCK LDB 0 ASCII
0347 34765 046001 ADB D133 133B OR
0348 34766 006021 SSB,RSS GREATER?
0349 34767 125266 JMP LETCK,I YES
0350 34770 044411 ADB ,+32B NO, ASCII 101B
0351 34771 006021 SSB,RSS OR GREATER?
0352 34772 035266 ISZ LETCK YES
0353 34773 125266 JMP LETCK,I NO
0354**
0355*** CHECK FOR SINGLE-CHARACTER OPERATORS ***
0356**
0357*
0358* ENTER WITH CHARACTER IN (A) AND NUMBER OF ACCEPTABLE
0359* OPERATORS IN (B) IN 2'S COMPLEMENT. (P+1)+2 POINTS
0360* TO THE LIST OF ACCEPTABLE OPERATORS. ON A MATCH
0361* EXIT TO (P+3) AFTER RECORDING THE OPERATOR CODE,
0362* WHICH REMAINS IN (A). ON NO MATCH EXIT TO (P+2)
0363* WITH THE CHARACTER IN (A).
0364*
0365 34774 075436 #SYCK STB COUNT SAVE COUNT OF POSSIBLE MATCHES
0366 34775 001727 ALF,ALF POSITION
0367 34776 030417 IOR ,+32 CHARACTER
0368 34777 165272 LDB SYMCK,I LOAD
0369 35000 035272 ISZ SYMCK STARTING
0370 35001 044361 SYMC1 ADB ,+2 TABLE ENTRY
0371 35002 150001 CPA 1,I MATCH?
0372 35003 027011 JMP SYMC2 YES
0373 35004 035436 ISZ COUNT NO, POSSIBILITIES LEFT?
0374 35005 027001 JMP SYMC1 YES
0375 35006 001727 ALF,ALF NO,
0376 35007 010474 AND B177 RESTORE
0377 35010 125272 JMP SYMCK,I CHARACTER
0378 35011 044356 SYMC2 ADB ,-1 FETCH
0379 35012 160001 LDA 1,I AND
0380 35013 010570 AND OPMSK STORE
0381 35014 171572 STA SBPTR,I OPERATOR
0382 35015 035272 ISZ SYMCK CODE
0383 35016 125272 JMP SYMCK,I

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0385**
0386*** SEARCH FOR PRINT FUNCTIONS ***
0387**
0388*
0389* SEARCH THE INPUT STRING FOR A 'TAB', 'LIN' OR 'SPA' FUNCTION.
0390* IF FOUND, RECORD IT AND EXIT TO (P+1), OTHERWISE RESTORE THE
0391* INPUT STRING AND SYNTAX BUFFER POINTER AND EXIT TO (P+2).
0392*
0393 35017 064354 #PFSH LDB ,-3      3 POSSIBLE FUNCTIONS
0394 35020 060624      LDA ATAB      SEARCH
0395 35021 015246      JSB TBSRH      FOR THEM
0396 35022 027035      JMP PFSH1      NONE FOUND
0397 35023 007400      CCB          BACKUP
0398 35024 045572      ADB SBPTR      BUFFER
0399 35025 075572      STB SBPTR      POINTER
0400 35026 001727      ALF,ALF      CONSTRUCT
0401 35027 001723      ALF,RAR
0402 35030 130001      IOR B,I        FUNCTION
0403 35031 030572      IOR PDFFL
0404 35032 170001      STA B,I        OPERAND
0405 35033 015250      JSB GETPF      FETCH PARENTHESIZED FORMULA
0406 35034 125546      JMP PFSRH,I
0407 35035 015450      PFSH1 JSB BCKSP      BACKUP
0408 35036 007400      CCB          TO POINT
0409 35037 045572      ADB SBPTR      FOLLOWING
0410 35040 075572      STB SBPTR      LAST OPERATOR
0411 35041 035546      ISZ PFSRH     EXIT TO
0412 35042 125546      JMP PFSRH,I   (P+2)

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0414**
0415***  ALLOCATE COM STORAGE  ***
0416**
0417*
0418*  THE BEGINNING OF THE PROGRAM IS SCANNED FOR <COM STATEMENTS>.  THE
0419*  AMOUNT OF COM STORAGE NEEDED IS COMPUTED.  A POINTER (SPROG) TO
0420*  THE START OF THE PROGRAM IS CREATED AND THE PROGRAM IS SHIFTED TO
0421*  HIGHER CORE TO ALLOW FOR THE COM STORAGE.
0422*
0423  35043 006400 #ALCO CLB          SAY NO COMMON
0424  35044 075512          STB DEST          ALLOCATED YET,
0425  35045 064726          LDB PBUFF
0426  35046 075616          STB STPTR          POINTER TO FIRST STATEMENT
0427  35047 161616  ALC01 LDA STPTR,I      SAVE STATEMENT
0428  35050 071566          STA .LNUM          NUMBER
0429  35051 035616          ISZ STPTR
0430  35052 145616          ADB STPTR,I
0431  35053 075236          STB NSPTR          POINTER TO NEXT STATEMENT
0432  35054 035616          ISZ STPTR
0433  35055 161616          LDA STPTR,I      EXTRACT
0434  35056 010570          AND OPMSK          OPERATOR
0435  35057 050534          CPA COMOP          COM STATEMENT?
0436  35060 027106          JMP ALC02          YES
0437  35061 061512  ALC06 LDA DEST          GET TOTAL COMMON ALLOCATED
0438  35062 002003          SZA,RSS          EXIT IF THERE WERE
0439  35063 125516          JMP ALCOM,I      NO COM STATEMENTS
0440  35064 040726          ADA PBUFF          PROGRAM BEGINNING MOVES BY
0441  35065 071575          STA SPROG          AMOUNT OF COMMON ALLOCATED.
0442  35066 007400          CCB
0443  35067 044056          ADB PBPTR          POINTER TO FIRST
0444  35070 060001          LDA 1             WORD TO BE MOVED
0445  35071 041512          ADA DEST          POINTER TO
0446  35072 071512          STA DEST          FIRST DESTINATION
0447  35073 002004          INA             LOCATION
0448  35074 070056          STA PBPTR          RESET END OF
0449  35075 160001  ALC00 LDA 1,I          PROGRAM POINTER.
0450  35076 171512          STA DEST,I      MOVE A
0451  35077 054726          CPB PBUFF          WORD
0452  35100 125516          JMP ALCOM,I      DONE?
0453  35101 044356          ADB .-1          EXIT
0454  35102 003400          CCA             NO--BUMP
0455  35103 041512          ADA DEST          POINTERS
0456  35104 071512          STA DEST
0457  35105 027075          JMP ALC00          AND LOOP
0458  35106 161616  ALC02 LDA STPTR,I      EXTRACT
0459  35107 010376          AND .+17B          OPERAND
0460  35110 002002          SZA             STRING?
0461  35111 027122          JMP ALC03          NO
0462  35112 035616          ISZ STPTR          YES--
0463  35113 035616          ISZ STPTR          EXTRACT
0464  35114 161616          LDA STPTR,I      LENGTH
0465  35115 002004          INA             COMPUTE
0466  35116 001100          ARS             STORAGE
0467  35117 002004          INA             REQUIRED
0468  35120 035616          ISZ STPTR          BUMP PAST RIGHT BRACKET
0469  35121 027156          JMP ALC07+1

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0470	35122	040353	ALCO3	ADA	.-4	
0471	35123	002020		SSA		SIMPLE VARIABLE?
0472	35124	027127		JMP	ALCO4	NO
0473	35125	002404		CLA,INA		YES-- ALLOW TWO WORDS
0474	35126	027155		JMP	ALCO7	
0475	35127	035616	ALCO4	ISZ	STPTR	MUST BE ARRAY
0476	35130	035616		ISZ	STPTR	
0477	35131	165616		LDB	STPTR,I	EXTRACT LENGTH
0478	35132	035616		ISZ	STPTR	
0479	35133	161616		LDA	STPTR,I	GET NEXT
0480	35134	010570		AND	OPMSK	OPERATOR
0481	35135	050602		CPA	SCOMM	SUBSCRIPT COMMA?
0482	35136	027141		JMP	++3	YES
0483	35137	060001		LDA	1	NO
0484	35140	027150		JMP	ALCO5+1	
0485	35141	060001		LDA	1	COMPUTE
0486	35142	035616		ISZ	STPTR	ARRAY
0487	35143	100200		MPY	STPTR,I	SIZE
	35144	101616				
0488	35145	006002		SZB		TOO BIG?
0489	35146	127172		JMP	CUS1A,I	YES
0490	35147	035616	ALCO5	ISZ	STPTR	BUMP PAST
0491	35150	000066		CLE,ELA		
0492	35151	002061		SEZ,SSA,RSS		TOO BIG?
0493	35152	000035		SLA,ERA		NO
0494	35153	127172		JMP	CUS1A,I	YES
0495	35154	040361		ADA	.-+2	ALLOW 4 WORDS FOR DIMENSIONS
0496	35155	001000	ALCO7	ALS		DOUBLE EVERYTHING
0497	35156	041512		ADA	DEST	UPDATE
0498	35157	071512		STA	DEST	POINTER
0499	35160	040472		ADA	.100	
0500	35161	015326		JSB	CUSP	CHECK FOR STORAGE OVERFLOW
0501	35162	035616		ISZ	STPTR	
0502	35163	065616		LDB	STPTR	
0503	35164	055236		CPB	NSPTR	END OF STATEMENT
0504	35165	002001		RSS		YES
0505	35166	027106		JMP	ALCO2	NO
0506	35167	054056		CPB	PBPTR	END OF PROGRAM?
0507	35170	027061		JMP	ALCO6	YES
0508	35171	027047		JMP	ALCO1	NO
0509*						
0510	35172	035201		CUS1A	DEF CUSP1	
0511**						**
0512***				INSURE	SPACE FOR NEW ENTRY	***
0513**						**
0514*						
0515*				A CHECK IS MADE THAT THE UNUSED	USER SPACE IS AT	
0516*				LEAST AS LARGE AS THE NUMBER OF	WORDS SPECIFIED BY	
0517*				(A). EXIT TO ERROR IF NOT SO.	(B) IS NOT CHANGED.	
0518*				ON NORMAL EXIT (A) CONTAINS ITS	ENTRY VALUE + (PBPTR).	
0519*						
0520	35173	040056	#CUSP	ADA	PBPTR	AT LEAST
0521	35174	071474		STA	CU1	(A) WORDS
0522	35175	003000		CMA		OF AVAILABLE
0523	35176	040716		ADA	LWAUS	USER
0524	35177	002021		SSA,RSS		SPACE?

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0525 35200 027203          JMP ++3          YES
0526 35201 015322  CUSP1 JSB DCMPL          NO, DECOMPILE
0527 35202 115111          JSB RERRS+10,I  OUT OF STORAGE
0528 35203 061474          LDA CUI          RETURN WITH NEW
0529 35204 125326          JMP CUSP,I      VALUE OF PBPTR
0530**
0531***  ADVANCE SYNTAX BUFFER POINTER  ***
0532**
0533*
0534*  (A) AND (B) REMAIN AS UPON ENTRY
0535*
0536 35205 071306  #SBPU STA SBT0          SAVE (A)
0537 35206 035572          ISZ SBPTR        ADVANCE POINTER
0538 35207 061572          LDA SBPTR        BUFFER
0539 35210 051470          CPA SYNTQ        OVERFLOW?
0540 35211 115072          JSB SERRS+31,I  YES
0541 35212 061306          LDA SBT0         NO, RETRIEVE (A)
0542 35213 125270          JMP SBPUD,I
0543**
0544***  DEMAND A LEFT PARENTHESIS  ***
0545**
0546*
0547*  INSIST CHARACTER IN (A) BE '(' OR '['. RECORD IT
0548*  AS A '('.
0549*
0550 35214 064355  #LPCK LDB  ,-2          '('
0551 35215 015272          JSB SYMCK        OR
0552 35216 033403          DEF LBRAC-1     '[' ?
0553 35217 115061          JSB SERRS+22,I  NO
0554 35220 060556          LDA LPOP        YES, RECORD
0555 35221 171572          STA SBPTR,I    A '('
0556 35222 125252          JMP LPCK,I
0557**
0558***  STATEMENT LENGTH CHECKER  ***
0559**
0560*
0561*  CHECK THAT (A) (THE STATEMENT LENGTH) IS BETWEEN 3 AND 105.
0562*  IF NOT, EXIT TO ERROR.
0563 35223 040354  #SLCK ADA  ,-3
0564 35224 002020          SSA
0565 35225 115160          JSB RERRS+49,I  TOO SMALL
0566 35226 042005          ADA M103
0567 35227 002020          SSA
0568 35230 125554          JMP STLCK,I    OK
0569 35231 115160          JSB RERRS+49,I  TOO BIG

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0002 36000                                ORG 36000B
0003 36000 000371  A.10  DEF  .+10
0004 36001 037024  APTR2 DEF SYMT7
0005 36002 037015  APTR1 DEF SYMT6
0006 36003 041673  DONEA DEF EXIT3
0007 36004 075045  CSVRT DEF CSAV2
0008 36005 067000  MATOP OCT 67000
0009*
0010* *****
0011***                                     **
0012**  'COMPILE' THE PROGRAM **
0013***                                     **
0014* *****
0015*
0016*
0017* SYMTB=0 IMPLIES THE PROGRAM IS IN 'SOURCE'; ALL OPERANDS ARE IN
0018* SYMBOLIC FORM. SYMTB#0 AND SPTR=0 IMPLIES THE PROGRAM IS 'SEMI-
0019* COMPILED'; VARIABLE OPERANDS ARE POINTERS TO A SYMBOL TABLE AND
0020* STATEMENT REFERENCES ARE REPLACED BY ABSOLUTE POINTERS.
0021* SYMTB = SPTR IMPLIES THE PROGRAM IS 'COMPILED': THE SYMBOL TABLE
0022* ENTRIES CONTAIN POINTERS TO A VALUE TABLE OR IN THE CASE OF
0023* FUNCTIONS TO THE DEFINING FORMULA, AND A TABLE IS BUILT
0024* CONTAINING INFORMATION FOR EACH FILE IN THE PROGRAM. BEFORE
0025* BUILDING THE SYMBOL TABLE, THE INTERPRETER'S PROGRAM COUNTER
0026* IS SET TO THE STATEMENT REFERENCED BY THE 'RUN' COMMAND (THE
0027* LOWEST NUMBERED STATEMENT IS THE DEFAULT CHOICE).
0028*
0029 36006 064726  CMPLE LDB PBUFF          NULL
0030 36007 054056  CPB PBPTR            PROGRAM?
0031 36010 126003  JMP DONEA,I          YES
0032 36011 006404  CLB,INB             INITIALIZE
0033 36012 075334  STB PRGCT           PROGRAM COUNTER
0034 36013 015462  JSB SINIT           SIMPLE
0035 36014 015446  JSB GETCR           'RUN' ?
0036 36015 026024  JMP CMP15           YES
0037 36016 015450  JSB BCKSP           NO
0038 36017 015464  JSB BLDIN           DEMAND AN INTEGER
0039 36020 075334  STB PRGCT           SAVE STARTING STATEMENT NUMBER
0040 36021 050374  CPA .+15B           END OF RECORD?
0041 36022 002001  RSS                 YES
0042 36023 115113  JSB RERRS+12,I     NO
0043 36024 103100  CMP15 CLF 0
0044 36025 160255  LDA MAIN,I         DON'T
0045 36026 030377  IOR UNABT          ALLOW
0046 36027 170255  STA MAIN,I         ABORTS
0047 36030 102100  STF 0
0048 36031 064726  LDB PBUFF
0049 36032 055575  CPB SPROG          NO, COM STORAGE ALLOCATED?
0050 36033 015516  JSB ALCOM          NO--DO IT
0051 36034 061573  LDA SYMTB          GET SYMBOL TABLE POINTER
0052 36035 002003  SZA,RSS            IS PROGRAM COMPILED ?
0053 36036 060056  LDA PBPTR          NO, USE PBPTR
0054 36037 065334  LDB PRGCT          GET STARTING STATEMENT NUMBER
0055 36040 015314  JSB FNDPS          SEEK REFERENCED STATEMENT
0056 36041 126003  JMP DONEA,I        NOT WITHIN PROGRAM
0057 36042 000000  NOP                SET

```

0058	36043	075334		STB PRGCT	PROGRAM COUNTER
0059	36044	060255	CMP14	LDA MAIN	TELL 2114
0060	36045	002004		INA	
0061	36046	160000		LDA 0,I	THAT USER
0062	36047	030223		IOR UIR	
0063	36050	114736		JSB S14LP,I	IS RUNNING
0064	36051	061573	CMPLO	LDA SYMTB	PROGRAM
0065	36052	002003		SZA,RSS	UNCOMPILED?
0066	36053	026070		JMP CMP00	YES
0067	36054	051230		CPA SPTR	NO, COMPILED?
0068	36055	002001		RSS	YES
0069	36056	026066		JMP CMP16	NO, MUST BE SEMI-COMPILED
0070	36057	065771		LDB ASINP	
0071	36060	006003		SZB,RSS	ASSIGN STATEMENT SEEN?
0072	36061	027220		JMP VALUE	NO
0073	36062	015520		JSB RSTPT	YES, FAKE SEMI-COMPILED PROGRAM
0074	36063	061573		LDA SYMTB	
0075	36064	071230		STA SPTR	
0076	36065	026433		JMP CMP18	
0077	36066		CMP16	EQU *	
0078	36066	071230		STA SPTR	
0079	36067	026422		JMP CMP17	
0080	36070	071502	CMP00	STA FILTB	
0081	36071	103100		CLF 0	
0082	36072	060361		LDA CFLAG	SET
0083	36073	064272		LDB MLINK+1	
0084	36074	044341		ADB , -?LINK	PROGRAM MODE
0085	36075	130001		IOR 1,I	
0086	36076	170001		STA 1,I	TO 'COMPILED'
0087	36077	102100		STF 0	

```

0089**
0090*** BUILD THE SYMBOL TABLE ***
0091**
0092*
0093* THE PROGRAM IS EXAMINED STATEMENT BY STATEMENT. ALL
0094* VARIABLE OPERANDS ARE REPLACED BY POINTERS (RELATIVE
0095* TO THE START OF THE SYMBOL TABLE) TO TWO WORD ENTRIES.
0096* SYMBOL TABLE ENTRIES KEEP THE SYMBOL IN THE FIRST WORD
0097* AND INFORMATION IN THE SECOND. FOR FUNCTIONS THE
0098* SECOND WORD CONTAINS A POINTER TO THE DEFINING FORMULA
0099* (0 BEFORE FINDING THE <DEF STATEMENT>). FOR SIMPLE
0100* VARIABLES THE SECOND WORD IS USED TO FORM A LINKED LIST
0101* OF UNMATCHED FOR-VARIABLES (OTHERWISE IT IS 0) WITH
0102* FLINK POINTING TO THE INNERMOST NESTED FOR-VARIABLE.
0103* IF THE SIMPLE VARIABLE APPEARS IN A <COM STATEMENT>
0104* THE SECOND WORD IS SET TO -1. FOR ARRAY AND STRING
0105* VARIABLES THE SECOND WORD IS 0 UNLESS THE VARIABLE
0106* APPEARS IN A <DIM STATEMENT>, IN WHICH CASE IT
0107* POINTS TO THE DIMENSIONS IN THE CODE, OR IT APPEARS
0108* IN A <COM STATEMENT>, IN WHICH CASE IT IS THE
0109* NEGATION OF A POINTER TO THE DIMENSIONS.
0110* PROGRAM INTEGERS ARE REPLACED BY A POINTER TO THE
0111* STATEMENT THEY REFERENCE. ON EXIT TO VALUE OR DCMPL,
0112* SPTR POINTS TO THE FIRST WORD NOT PROCESSED.
0113*
0114 36100 064056          LDB PBPTR          CREATE POINTER
0115 36101 075573          STB SYMTB           TO SYMBOL TABLE
0116*
0117* COUNT NUMBER OF STATEMENTS IN PROGRAM
0118*
0119 36102 002404          CLA,INA           INITIALIZE STATEMENT COUNTER
0120 36103 065575          LDB SPROG
0121 36104 006004      CMP01 INB             MOVE TO
0122 36105 144001          ADB 1,I             NEXT
0123 36106 044356          ADB -1             STATEMENT
0124 36107 054056          CPB PBPTR          DONE?
0125 36110 026113          JMP CMP02          YES
0126 36111 002004          INA             NO--BUMP COUNTER
0127 36112 026104          JMP CMP01
0128 36113 006400      CMP02 CLB             DIVIDE # OF STATEMENTS
0129 36114 100400          DIV ,+32          INTO 32 PARTS
0130 36115 000417
0131 36116 007000          CMB             SET B=-1-# OF OVERSIZE GROUPS,
0132 36117 002003          SZA,RSS          BUT IF <32 STATEMENTS USE -#
0133 36120 006004          INB
0134 36121 002004          INA             SET A TO SIZE OF LARGER GROUP
0135 36122 071617          STA STCT1        SET COUNTER
0136 36123 075613          STB STCT2
0137 36124 064650          LDB ERSCA        SET POINTER TO TABLE
0138 36125 075606          STB NUMPT

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0139*
0140* BUILD A TABLE OF 64 WORDS. THE FIRST 32 CONTAIN THE SEQUENCE
0141* NUMBERS OF STATEMENTS WHICH DIVIDE THE PROGRAM INTO 32 ALMOST
0142* EQUAL PARTS. THE SECOND 32 WORDS ARE THE ABSOLUTE ADDRESSES
0143* OF THESE STATEMENTS
0144*
0145 36126 061575      LDA SPROG
0146 36127 044417    CMP03 ADB .+32
0147 36130 170001    STA 1,I           SET ABSOLUTE ADDRESS INTO TABLE
0148 36131 164000    LDB 0,I           SET SEQUENCE # INTO TABLE
0149 36132 175606    STB NUMPT,I
0150 36133 035606    ISZ NUMPT        BUMP POINTERS
0151 36134 035613    ISZ STCT2       TEST FOR ANY MORE
0152 36135 006401    CLB,RSS        OVERSIZE GROUPS
0153 36136 007400    CCB            COMPUTE SIZE OF NEXT GROUP
0154 36137 045617    ADB STCT1
0155 36140 075617    STB STCT1
0156 36141 007000    CMB
0157 36142 075614    STB STCT3
0158 36143 065606    LDB NUMPT       TEST FOR DONE
0159 36144 054646    CPB ERS32
0160 36145 026154    JMP CMP04
0161 36146 035614    ISZ STCT3       COMPUTE FIRST STATEMENT
0162 36147 002005    INA,RSS        IN NEXT GROUP
0163 36150 026127    JMP CMP03
0164 36151 140000    ADA 0,I
0165 36152 040356    ADA .-1
0166 36153 026146    JMP +-5
0167*
0168 36154 002404    CMP04 CLA,INA
0169 36155 071234    STA FLINK       SET FOR-QUEUE TO EMPTY
0170 36156 015324    JSB PRNST       INITIALIZE
0171 36157 036404    DEF CMP11       COMPILATION
0172 36160 002041    SEZ,RSS        WAS FLAG BIT SET?
0173 36161 026237    JMP CMPL3      NO
0174*
0175** PROCESS NON-VARIABLE OPERAND **
0176*
0177 36162 040353    ADA .-4
0178 36163 002021    SSA,RSS
0179 36164 026702    JMP PRNST2
0180 36165 035230    CMPL1 ISZ SPTR
0181 36166 065230    LDB SPTR
0182 36167 055236    CPB NSPTR
0183 36170 026404    JMP CMP11
0184 36171 064650    LDB ERSCA
0185 36172 160001    CMP05 LDA 1,I
0186 36173 003000    CMA
0187 36174 141230    ADA SPTR,I
0188 36175 002024    SSA,INA
0189 36176 026206    JMP CMP06
0190 36177 006004    INB
0191 36200 054646    CPB ERS32
0192 36201 002001    RSS
0193 36202 026172    JMP CMP05
0194 36203 044416    ADB .+31

```

PROGRAM
 INTEGER?
 NO, MUST BE A PARAMETER
 YES, MOVE
 TO NEXT WORD
 STATEMENT FINISHED?
 YES
 BEGIN SEARCH FOR REFERENCED STMT
 FIRST STATEMENT => SOUGHT STATE, ?
 FOUND ONE
 TEST FOR DONE

0195	36204	061573		LDA SYMTB	STATEMENT IS IN LAST GROUP
0196	36205	026215		JMP CMP07	
0197	36206	044417	CMP06	ADB ,+32	B=> FIRST STATEMENT IN GROUP
0198	36207	002003		SZA,RSS	TEST FOR FOUND
0199	36210	026230		JMP CMP09	
0200	36211	054646		CPB ER932	TEST FOR NOT THERE
0201	36212	026235		JMP CMPL2	ERROR
0202	36213	160001		LDA 1,I	SET A=> FIRST WORD BEYOND GROUP
0203	36214	044356		ADB , -1	
0204	36215	164001	CMP07	LDB 1,I	
0205	36216	071617		STA STCT1	SAVE END TEST
0206	36217	161230		LDA SPTR,I	GET SEQUENCE NUMBER
0207	36220	006004	CMP08	INB	BUMP STATEMENT POINTER
0208	36221	144001		ADB 1,I	
0209	36222	044356		ADB , -1	
0210	36223	055617		CPB STCT1	TEST FOR DONE
0211	36224	026235		JMP CMPL2	LABEL NOT FOUND--ERROR
0212	36225	150001		CPA 1,I	TEST FOR FOUND
0213	36226	026231		JMP CMP09+1	
0214	36227	026220		JMP CMP08	
0215	36230	164001	CMP09	LDB 1,I	
0216	36231	175230		STB SPTR,I	FOUND--REPLACE INTERFER
0217	36232	035550		ISZ INFST	IN 'USING' STATEMENT?
0218	36233	026165		JMP CMPL1	NO
0219	36234	026702		JMP PRNS2	YES
0220	36235	015322	CMPL2	JSB DCMPL	DECOMPILE
0221	36236	115077		JSB RERRS,I	NON-EXISTENT STATEMENT NUMBER
0222*					*
0223**	PROCESS VARIABLE OPERAND				**
0224*					*
0225	36237	071611	CMPL3	STA STMP1	SAVE SYMBOL
0226	36240	010376		AND ,+17B	
0227	36241	050376		CPA ,+17B	FUNCTION?
0228	36242	026326		JMP CMPL6	YES
0229	36243	002003		SZA,RSS	NO, STRING VARIABLE?
0230	36244	026347		JMP CMPL9-3	YES
0231	36245	040353		ADA , -4	NO,
0232	36246	002020		SSA	ARRAY?
0233	36247	026352		JMP CMPL9	YES
0234	36250	015316		JSB SSYM	NO, COMPILE
0235	36251	035230		ISZ SPTR	SIMPLE VARIABLE
0236	36252	054534		CPB COMOP	'COM'?
0237	36253	026317		JMP CMP41	YES
0238	36254	055773		CPB FOROP	NO, FOR-VARIABLE OF 'FOR'?
0239	36255	026300		JMP CMPL4	YES
0240	36256	054562		CPB NXTOP	NO, FOR-VARIABLE OF 'NEXT' ?
0241	36257	002001		RSS	YES
0242	36260	026703		JMP PRNS2+1	NO
0243	36261	065234		LDB FLINK	
0244	36262	006020		SSB	MAKE
0245	36263	007004		CMB,INB	POSITIVE
0246	36264	055612		CPB STMP2	MATCH LATEST <FOR STATEMENT> ?
0247	36265	026270		JMP ++3	YES
0248	36266	015322		JSB DCMPL	NO, DECOMPILE
0249	36267	115100		JSB RERRS+1,I	NEXT NOT PRECEDED BY PROPER FOR
0250	36270	065234		LDB FLINK	

0251	36271	161612		LDA STMP2,I	REMOVE
0252	36272	071234		STA FLINK	VARIABLE
0253	36273	006020		SSB	WAS VARIABLE IN COMMON?
0254	36274	007401		CCB,RSS	NO
0255	36275	006400		CLB	NO
0256	36276	175612		STB STMP2,I	RESET AS SIMPLE VARIABLE
0257	36277	026703		JMP PRNS2+1	
0258	36300	161612	CMPL4	LDA STMP2,I	LOAD SECOND WORD OF TABLE ENTRY
0259	36301	002002		SZA	ALREADY IN FOR=QUEUE?
0260	36302	002007		INA,SZA,RSS	COMMON VARIABLE
0261	36303	026306		JMP CMPL5	
0262	36304	015322		JSB DCMPL	DECOMPILE
0263	36305	115101		JSB RRRS+2,I	NESTED "FOR'S" WITH SAME VARIABLE
0264	36306	065612	CMPL5	LDB STMP2	
0265	36307	161612		LDA STMP2,I	WAS VARIABLE
0266	36310	002020		SSA	IN COMMON?
0267	36311	007004		CMB,INB	YES
0268	36312	061234		LDA FLINK	ADD
0269	36313	171612		STA STMP2,I	TO
0270	36314	075234		STB FLINK	FOR=QUEUE
0271	36315	035240		ISZ STYPE	DESTROY STATEMENT TYPE
0272	36316	026703		JMP PRNS2+1	
0273	36317	061612	CMP41	LDA STMP2	
0274	36320	164000		LDB A,I	GET POINTER
0275	36321	006002		SZB	ALREADY IN COMMON?
0276	36322	026402		JMP CMP10+1	
0277	36323	007400		CCB	FLAG VARIABLE AS
0278	36324	174000		STB A,I	CONTAINED IN COMMON
0279	36325	026703		JMP PRNS2+1	
0280	36326	015316	CMPL6	JSB SSYM	COMPILE FUNCTION NAME
0281	36327	055772		CPB DEFOP	FUNCTION DEFINITION?
0282	36330	002001		RSS	YES
0283	36331	026702		JMP PRNS2	NO
0284	36332	165612		LDB STMP2,I	PREVIOUSLY
0285	36333	006002		SZB	DEFINED?
0286	36334	026344		JMP CMPL8	YES
0287	36335	061612		LDA STMP2	NO
0288	36336	035240		ISZ STYPE	DESTROY STATEMENT TYPE
0289	36337	065230	CMPL7	LDB SPTR	ADVANCE
0290	36340	044362		ADB ,+3	PROGRAM
0291	36341	075230		STB SPTR	POINTER
0292	36342	174000		STB 0,I	SAVE
0293	36343	026703		JMP PRNS2+1	POINTER
0294	36344	035230	CMPL8	ISZ SPTR	
0295	36345	015322		JSB DCMPL	DECOMPILE
0296	36346	115102		JSB RRRS+3,I	FUNCTION DEFINED TWICE
0297	36347	015316		JSB SSYM	COMPILE STRING VARIABLE
0298	36350	035611		ISZ STMP1	SET TO 'SINGLY SUBSCRIPTED'
0299	36351	002001		RSS	PROCESS POSSIBLE DECLARATION
0300	36352	015320	CMPL9	JSB ASYMT	COMPILE ARRAY VARIABLE
0301	36353	002300		CCE	SET 'COM' FLAG
0302	36354	054534		CPB COMOP	'COM'?
0303	36355	026361		JMP CMP91	YES
0304	36356	054540		CPB DIMOP	NO, 'DIM'?
0305	36357	002101		CLE,RSS	YES-->SET 'DIM' FLAG
0306	36360	026702		JMP PRNS2	

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0307 36361 165612 CMP91 LDB STMP2,I WAS VARIABLE
0308 36362 006002 SZB PREVIOUSLY DIMENSIONED?
0309 36363 026401 JMP CMP10 YES
0310 36364 065230 LDB SPTR NO, SAVE POINTER
0311 36365 044361 ADB .+2 TO DIMENSIONS
0312 36366 002040 SEZ DIMENSIONED IN 'COM' ?
0313 36367 007004 CMB,INB YES--FLAG IT
0314 36370 175612 STB STMP2,I NO
0315 36371 065230 LDB SPTR RESTORE
0316 36372 044361 ADB .+2 POINTER
0317 36373 061611 LDA STMP1 RETRIEVE SYMBOL
0318 36374 002011 SLA,RSS ADVANCE
0319 36375 044361 ADB .+2 POINTER
0320 36376 044361 ADB .+2 PAST
0321 36377 075230 STB SPTR ONE OR TWO
0322 36400 026704 JMP PRNS2+2
0323 36401 035230 CMP10 ISZ SPTR
0324 36402 015322 JSB DCMPL DECOMPILE
0325 36403 115103 JSB RERRS+4,I VARIABLE DEFINED TWICE
0326*
0327** PROCESS END OF STATEMENT **
0328*
0329 36404 055573 CMP11 CPB SYMTB END OF PROGRAM?
0330 36405 002001 RSS YES
0331 36406 026606 JMP PRNS1 NO
0332 36407 075230 STB SPTR INSURE CORRECT SETTING FOR SPTR
0333 36410 061240 LDA STYPE LAST STATEMENT
0334 36411 050542 CPA ENDOP AN 'END' ?
0335 36412 026415 JMP CMP12 YES
0336 36413 015322 JSB DCMPL NO, DECOMPILE
0337 36414 115104 JSB RERRS+5,I MISSING 'END'
0338 36415 002404 CMP12 CLA,INA
0339 36416 051234 CPA FLINK ALL FORS MATCHED?
0340 36417 026422 JMP **+3 YES
0341 36420 015322 JSB DCMPL DECOMPILE
0342 36421 115105 JSB RERRS+6,I 'FOR' WITHOUT 'NEXT'
0343 36422 CMP17 EQU *
0344 36422 002400 CLA
0345 36423 071576 STA VLFLG MUST RUN VALUE.
0346 36424 064056 LDB PBPTR SET POINTER TO
0347 36425 075502 STB FILTB END OF SYMBOL TABLE.
0348 36426 060272 LDA MLINK+1 IS CSAVE
0349 36427 040356 ADA .+?STAT=?LINK
0350 36430 160000 LDA 0,I RUNNING
0351 36431 050401 CPA .+5+CSAV=COM2
0352 36432 126004 JMP CSVRT,I YES--EXIT TO IT
0353*
0354* FILCT = -5 AT THIS POINT UNLESS THE PROGRAM CONTAINS A
0355* <FILES STATEMENT>, THE CALL TO SCHLB,I LEAVES VALTB =
0356* FILTB+7*(NUMBER OF FILES REQUESTED). IF NO <FILES STATEMENT>
0357* APPEARS, VALTB = FILTB.
0358*
0359 36433 CMP18 EQU *
0360 36433 061604 LDA FILCT ANY <FILES
0361 36434 050352 CPA .-5 STATEMENTS?
0362 36435 026444 JMP CMP13 NO

```

0363	36436	114744		JSB SCHLB,I	REQUEST FILE TABLE
0364	36437	072045		DEF FILIB	
0365	36440	115114		JSB RERRS+13,I	BAD FORMAT OR ILLEGAL NAME
0366	36441	115115		JSB RERRS+14,I	MISSING OR PROTECTED FILE
0367	36442	115111		JSB RERRS+10,I	OUT OF STORAGE
0368	36443	027222		JMP VALUE+2	SUCCESSFUL REQUEST
0369	36444	065502	CMP13	LDB FILTB	SET VALUE TABLE
0370	36445	075574		STB VALTB	POINTER,
0371	36446	027222		JMP VALUE+2	

```

0373** **
0374*** DECOMPILE ALL OR PART OF PROGRAM ***
0375** **
0376*
0377* IF CFLAG[I] = 0 PROGRAM IS IN SOURCE, EXIT IMMEDIATELY;
0378* ELSE SET CFLAG[I] = 0 AND DECOMPILE PROGRAM. SPTR POINTS
0379* INITIALLY TO LAST WORD+1 OF COMPILED PROGRAM. ABSOLUTE
0380* ADDRESSES ARE REPLACED BY THE SEQUENCE NUMBERS TO WHICH
0381* THEY POINT. VARIABLE OPERAND POINTERS ARE REPLACED BY
0382* THEIR SYMBOL. PBPTR IS SET TO LAST WORD+1 OF PROGRAM.
0383*
0384 36447 060361 #DCMP LDA CFLAG PROGRAM
0385 36450 064272 LDB MLINK+1
0386 36451 044341 ADB .-?LINK
0387 36452 110001 AND 1,I COMPILED?
0388 36453 002003 SZA,RSS
0389 36454 026552 JMP DCMP4 NO
0390 36455 103100 CLF 0 YES
0391 36456 120001 XOR 1,I SET PROGRAM MODE
0392 36457 170001 STA 1,I TO 'UNCOMPILED'
0393 36460 102100 STF 0
0394 36461 060056 LDA PBPTR NULL
0395 36462 050726 CPA PBUFF PROGRAM?
0396 36463 026550 JMP DCMP3+2 YES
0397 36464 061230 LDA SPTR SPTR=0 TO FLAG
0398 36465 002003 SZA,RSS SEMI-COMPILED ?
0399 36466 061573 LDA SYMTB YES==RESET IT TO CORRECT VALUE
0400 36467 071230 STA SPTR SET TERMINATION
0401 36470 071502 STA FILTB ADDRESS
0402 36471 015324 JSB PRNST INITIALIZE
0403 36472 036606 DEF PRNS1 DECOMPIATION
0404 36473 006441 CLB,SEZ,RSS WAS FLAG BIT SET?
0405 36474 026514 JMP DCMP2 NO
0406* *
0407** PROCESS NON-VARIABLE OPERAND **
0408* *
0409 36475 040353 ADA .-4 PROGRAM
0410 36476 002021 SSA,RSS INTEGER?
0411 36477 026702 JMP PRNS2 NO
0412 36500 035230 DCMP1 ISZ SPTR YES, MOVE TO
0413 36501 065230 LDB SPTR NEXT WORD
0414 36502 055502 CPB FILTB DONE?
0415 36503 026546 JMP DCMP3 YES
0416 36504 055236 CPB NSPTR NO, STATEMENT DONE?
0417 36505 026607 JMP PRNS1+1 YES
0418 36506 161230 LDA SPTR,I NO, REPLACE
0419 36507 160000 LDA 0,I ABSOLUTE ADDRESS
0420 36510 171230 STA SPTR,I WITH SEQUENCE NUMBER
0421 36511 035550 ISZ INFST IN <USING STATEMENT>?
0422 36512 026500 JMP DCMP1 NO
0423 36513 026702 JMP PRNS2 YES
0424* *
0425** PROCESS VARIABLE OPERAND **
0426* *
0427 36514 040356 DCMP2 ADA .-1 COMPUTE
0428 36515 101117 RRR 15 SYMBOL TABLE

```

			ADDRESS
0429	36516	045573	ADB SYMTB
0430	36517	161230	LDA SPTR,I
0431	36520	010570	AND OPMSK
0432	36521	130001	IOR 1,I
0433	36522	171230	STA SPTR,I
0434	36523	065240	LDB STYPE
0435	36524	054540	CPB DIMOP
0436	36525	026531	JMP DCMP6
0437	36526	054534	CPB COMOP
0438	36527	002001	RSS
0439	36530	026702	JMP PRNS2
0440	36531	065230	DCMP6 LDB SPTR
0441	36532	006004	INB
0442	36533	055502	CPB FILTB
0443	36534	026546	JMP DCMP3
0444	36535	006004	INB
0445	36536	010376	AND .+17B
0446	36537	040353	ADA .-4
0447	36540	002021	SSA,RSS
0448	36541	026702	JMP PRNS2
0449	36542	040363	ADA .+4
0450	36543	002003	SZA,RSS
0451	36544	002004	INA
0452	36545	026374	JMP CMP10=5
0453	36546	061573	DCMP3 LDA SYMTB
0454	36547	070056	STA PBPTR
0455	36550	002400	CLA
0456	36551	071573	STA SYMTB
0457	36552	170632	DCMP4 STA DCLC1,I
0458	36553	064726	LDB PBUFF
0459	36554	055575	CPB SPROG
0460	36555	026567	JMP DCMP5
0461	36556	054056	CPB PBPTR
0462	36557	026567	JMP DCMP5
0463	36560	075512	STB DEST
0464	36561	061575	LDA SPROG
0465	36562	075575	STB SPROG
0466	36563	064056	LDB PBPTR
0467	36564	015476	JSB MOVER
0468	36565	065512	LDB DEST
0469	36566	074056	STB PBPTR
0470	36567	114614	DCMP5 JSB ABCK,I
0471	36570	160634	LDA DCLC2,I
0472	36571	170632	STA DCLC1,I
0473	36572	125322	JMP DCMP1,I

EXTRACT
OPERATOR
REPLACE OPERATOR=
OPERAND PAIR IN CODE

'DIM' ?
YES
NO, 'COM' ?
YES
NO

DONE?
YES
NO
STRING
SIMPLE
VARIABLE?
YES
NO, STRING
VARIABLE?
YES, SET TO SINGLE SUBSCRIPT MOD

SET ACTIVE USER AREA POINTER
TO LAST WORD+1 OF PROGRAM
ZERO
POINTER
BLOCK CLOCK

COMMON ALLOCATED?
NO
YES, NULL PROGRAM?
YES
NO
SET UP
POINTERS
FOR MOVE
REMOVE COMMON AREA
RESET END-OF-
PROGRAM POINTER
ABORT ATTEMPT DURING COMPILE?
NO--UNBLOCK
CLOCK

```

0475**
0476*** PROCESS NEXT STATEMENT OF PROGRAM ***
0477**
0478*
0479* USED BY CMPL AND DCML TO SCAN THROUGH THE PROGRAM.
0480* A 'JSB PRNST' INITIALIZES THE SCAN: (P+1) IS A POINTER
0481* TO THE CODE FOR HANDLING THE END-OF-STATEMENT CONDITION;
0482* .LNUM HOLDS THE SEQUENCE NUMBER OF THE STATEMENT BEING
0483* PROCESSED; SPTR POINTS TO THE WORD OF THE PROGRAM BEING
0484* PROCESSED. PRNST HANDLES <REM STATEMENT>, <DATA STATEMENT>,
0485* STRING CONSTANTS, NULL OPERANDS, NUMERICAL CONSTANTS, AND
0486* <FILES STATEMENT>. OTHER CASES EXIT TO (P+2). PRNST IS
0487* RE-ENTERED DIRECTLY, LEAVING THE INITIALIZED EXIT ADDRESSES
0488* UNCHANGED THROUGHOUT PROCESSING OF THE PROGRAM.
0489*
0490 36573 161324 #PNST LDA PRNST,I SET POINTER TO
0491 36574 071242 STA STEND END-OF-STATEMENT
0492 36575 035324 ISZ PRNST PROCESSING ROUTINE
0493 36576 060444 LDA DFILT INITIALIZE POINTER TO
0494 36577 071603 STA FILPT <FILES STATEMENT> TABLE
0495 36600 002400 CLA INITIALIZE
0496 36601 071615 STA COMSN COM FLAG
0497 36602 071605 STA USESN AND USING FLAG
0498 36603 060352 LDA .-5 INITIALIZE <FILES
0499 36604 071604 STA FILCT STATEMENT> COUNTER
0500 36605 065575 LDB SPROG INITIAL PROGRAM POINTER
0501 36606 075230 PRNS1 STB SPTR SET PROGRAM POINTER TO STATEMENT
0502 36607 161230 LDA SPTR,I SAVE STATEMENT
0503 36610 071566 STA .LNUM SEQUENCE NUMBER
0504 36611 035230 ISZ SPTR COMPUTE
0505 36612 145230 ADB SPTR,I LENGTH
0506 36613 075236 STB NSPTR SAVE POINTER TO NEXT STATEMENT
0507 36614 035230 ISZ SPTR EXTRACT
0508 36615 161230 LDA SPTR,I STATEMENT
0509 36616 010570 AND OPMSK TYPE
0510 36617 071240 STA STYPE SAVE IT
0511 36620 050534 CPA COMOP 'COM' ?
0512 36621 026624 JMP ++3 YES
0513 36622 075615 STB COMSN NO--CLEAR COM FLAG.
0514 36623 026634 JMP PRNS4
0515 36624 065615 LDB COMSN NON-COM
0516 36625 006003 SZB,RSS STATEMENT SEEN?
0517 36626 026703 JMP PRNS2+1 NO
0518 36627 065230 LDB SPTR YES, RESET
0519 36630 044355 ADB .-2 STATEMENT
0520 36631 075230 STB SPTR POINTER
0521 36632 015322 JSB DCML ERROR
0522 36633 115151 JSB RERRS+42,I 'COM' OUT OF ORDER
0523 36634 050576 PRNS4 CPA REMOP 'REM' ?
0524 36635 026704 JMP PRNS2+2 YES
0525 36636 050536 CPA DATOP NO, DATA?
0526 36637 026704 JMP PRNS2+2 YES
0527 36640 050546 CPA IMGOP NO, IMAGE?
0528 36641 026704 JMP PRNS2+2 YES
0529 36642 050544 CPA FILOP NO, <FILES STATEMENT> ?
0530 36643 002001 RSS YES

```

0531	36644	026661		JMP PRNS5	NO
0532	36645	065230		LDB SPTR	
0533	36646	044355		ADB ,=2	
0534	36647	035604		ISZ FILCT	TOO MANY <FILES STATEMENTS>?
0535	36650	026654		JMP **4	NO
0536	36651	075230		STB SPTR	YES--RESET STATEMENT POINTER
0537	36652	015322		JSB DCMPL	
0538	36653	115141		JSB RERRS+34,I	EXTRA <FILES STATEMENT>
0539	36654	006004		INB	
0540	36655	175603		STB FILPT,I	SAVE POINTER TO <FILES STATEMENT
0541	36656	035603		ISZ FILPT	
0542	36657	065236		LDB NSPTR	SKIP OVER REST
0543	36660	026704		JMP PRNS2+2	OF STATEMENT
0544	36661	065230	PRNS5	LDB SPTR	
0545	36662	052005		CPA MATOP	'MAT' STATEMENT?
0546	36663	006005		INB,RSS	YES, BUMP TO NEXT WORD
0547	36664	026667		JMP **3	NO
0548	36665	160001		LDA B,I	EXTRACT
0549	36666	010570		AND OPMSK	OPERATOR
0550	36667	050574		CPA PRTOP	'PRINT' STATEMENT?
0551	36670	006005		INB,RSS	YES, BUMP TO NEXT WORD
0552	36671	026700		JMP PRNS6	NO
0553	36672	160001		LDA 1,I	EXTRACT
0554	36673	010570		AND OPMSK	OPERATOR
0555	36674	050604		CPA USEOP	'USING' STATEMENT?
0556	36675	003401		CCA,RSS	YES, SET (A)
0557	36676	002001		RSS	NO
0558	36677	071605		STA USESN	SET 'USING SEEN' FLAG
0559	36700	071550	PRNS6	STA INFST	SET INTEGER FOLLOWS FLAG
0560	36701	002001		RSS	
0561*					*
0562**	PROCESS NEXT WORD	OF STATEMENT			**
0563*					*
0564	36702	035230	PRNS2	ISZ SPTR	MOVE TO
0565	36703	065230		LDB SPTR	NEXT WORD
0566	36704	055502		CPB FILTB	DECOMPILE FINISHED?
0567	36705	026546		JMP DCMP3	YES
0568	36706	055236		CPB NSPTR	NO, STATEMENT FINISHED?
0569	36707	125242		JMP STEND,I	YES
0570	36710	161230		LDA SPTR,I	NO, ISOLATE
0571	36711	010570		AND OPMSK	OPERATOR
0572	36712	050506		CPA B1000	" ?
0573	36713	026723		JMP PRNS3	YES
0574	36714	121230		XOR SPTR,I	NO, GET OPERAND
0575	36715	002003		SZA,RSS	NULL OPERAND?
0576	36716	026702		JMP PRNS2	YES
0577	36717	001265		RAL,CLE,ERA	NO, PUT FLAG BIT IN (E)
0578	36720	002003		SZA,RSS	NUMBER?
0579	36721	026337		JMP CMPL7	YES
0580	36722	125324		JMP PRNST,I	NO
0581	36723	121230	PRNS3	XOR SPTR,I	EXTRACT LENGTH
0582	36724	040362		ADA ,+3	COMPUTE
0583	36725	001100		ARS	POINTER
0584	36726	041230		ADA SPTR	TO CLOSING
0585	36727	071230		STA SPTR	QUOTE
0586	36730	026703		JMP PRNS2+1	


```

0587**                                     **
0588***  'COMPILE' A SYMBOL  ***
0589**                                     **
0590*
0591*  ENTER WITH A SYMBOLIC NAME IN STMP1 AND SEARCH THE
0592*  SYMBOL TABLE FOR A MATCHING ENTRY.  IF NO ENTRY IS
0593*  FOUND, APPEND A NEW TWO WORD ENTRY WITH THE SYMBOL
0594*  IN THE FIRST WORD AND 0 IN THE SECOND.  THE SYMBOL IN
0595*  THE PROGRAM IS REPLACED WITH THE ORDINAL NUMBER OF
0596*  ITS SYMBOL TABLE ENTRY.  EXIT WITH THE NEW PROGRAM
0597*  WORD IN (A), A POINTER TO THE SECOND WORD OF THE
0598*  TABLE ENTRY IN STMP2, AND THE STATEMENT TYPE IN (B).
0599*
0600  36731 060363 #SSYM LDA +4          INSURE SPACE
0601  36732 015326      JSB CUSP          FOR NEW ENTRY
0602  36733 061611      LDA STMP1        RETRIEVE SYMBOL
0603  36734 065573      LDB SYMTB
0604  36735 054056      SYMT1 CPB PBPTR   SYMBOL TABLE EXHAUSTED?
0605  36736 026755      JMP SYMT3      YES
0606  36737 150001      CPA 1,I         NO, IS NEXT SYMBOL A MATCH?
0607  36740 026765      JMP SYMT5      YES
0608  36741 044361      ADB +2         NO, MOVE
0609  36742 026735      JMP SYMT1        TO NEXT ENTRY
0610*
0611**  HANDLE UNMATCHED ARRAY SYMBOL **
0612*
0613  36743 051611      SYMT2 CPA STMP1   "DON'T KNOW" SYMBOL?
0614  36744 002001      RSS            YES
0615  36745 026755      JMP SYMT3      NO, MAKE NORMAL TABLE ENTRY
0616  36746 034056      ISZ PBPTR      ALLOCATE SPACE
0617  36747 034056      ISZ PBPTR      FOR NEW ENTRY
0618  36750 061612      LDA STMP2      WAS A SINGLE OR DOUBLE
0619  36751 002006      INA,SZA        SUBSCRIBED ENTRY FOUND?
0620  36752 026760      JMP SYMT4      YES, INCLUDE POINTER IN ENTRY
0621  36753 170001      STA 1,I       NO, SAVE SPACE FOR LATER ENTRY
0622  36754 044361      ADB +2         WITH NUMBER OF DIMENSIONS
0623*
0624**  CREATE A NEW TABLE ENTRY **
0625*
0626  36755 034056      SYMT3 ISZ PBPTR   ALLOCATE SPACE
0627  36756 034056      ISZ PBPTR      FOR NEW ENTRY
0628  36757 002400      CLA            INITIALIZE
0629  36760 006004      SYMT4 INB          SECOND
0630  36761 170001      STA 1,I       WORD
0631  36762 044356      ADB -1         PUT SYMBOL
0632  36763 061611      LDA STMP1      IN FIRST
0633  36764 170001      STA 1,I       WORD
0634*
0635**  'COMPILE' PROGRAM WORD **
0636*
0637  36765 006004      SYMT5 INB          COMPUTE
0638  36766 075612      STB STMP2
0639  36767 007000      CMB          RELATIVE
0640  36770 045573      ADB SYMTB
0641  36771 007004      CMB,INB      ADDRESS
0642  36772 005100      BRS

```

0643	36773	161230	LDA SPTR,I	REPLACE SYMBOL
0644	36774	010570	AND OPMSK	IN PROGRAM
0645	36775	030001	IOR 1	WITH RELATIVE
0646	36776	171230	STA SPTR,I	ADDRESS
0647	36777	065240	LDB STYPE	LOAD STATEMENT TYPE
0648	37000	125316	JMP SSYM,T,I	

```

0001**
0002*** PROCESS ARRAY SYMBOL ***
0003**
0004*
0005* ENTER WITH AN ARRAY NAME IN STMP1. IF A MATCHING
0006* SYMBOL TABLE ENTRY EXISTS, PROCEED AS IN SSYM. ELSE IF
0007* THE ARRAY IS SINGLY OR DOUBLY SUBSCRIPTED (LAST FOUR
0008* BITS OF NAME ARE 0001 OR 0010): EXIT IS TO ERROR ON
0009* FINDING A CONFLICTING ENTRY; ON FINDING ONLY A "DON'T
0010* KNOW" ENTRY (LAST FOUR BITS 0011), PROCEED AS IN SSYM,
0011* PLACING THE APPROPRIATE ENTRY IN THE TWO WORDS ABOVE
0012* THE "DON'T KNOW" ENTRY AND SETTING A POINTER TO ITS
0013* SECOND WORD INTO THE SECOND WORD OF THE "DON'T KNOW"
0014* ENTRY. IF THE SYMBOL IS AN UNMATCHED "DON'T KNOW"
0015* ARRAY NAME, APPEND A SYMBOL TABLE ENTRY; IF A SINGLY
0016* OR DOUBLY SUBSCRIPTED VERSION OF THE ARRAY HAS BEEN
0017* PREVIOUSLY FOUND, PLACE A POINTER TO THE SECOND WORD
0018* OF THE PREVIOUS ENTRY INTO THE SECOND WORD OF THE NEW
0019* "DON'T KNOW" ENTRY; OTHERWISE LEAVE TWO WORDS ABOVE
0020* THE NEW ENTRY.
0021*
0022 37001 061320 #ASYM LDA ASYMT SET RETURN
0023 37002 071316 STA SSYM ADDRESS
0024 37003 003400 CCA SET MATCH
0025 37004 071612 STA STMP2 FLAG FALSE
0026 37005 062002 LDA APTR1 INITIALIZE
0027 37006 071320 STA ASYMT SEARCH LOOP
0028 37007 060363 LDA .+4 INSURE SPACE
0029 37010 015326 JSB CUSP FOR NEW ENTRY
0030 37011 065573 LDB SYMTB
0031 37012 061611 LDA STMP1 RETRIEVE SYMBOL
0032 37013 030362 IOR .+3 SET ARRAY SYMBOL
0033 37014 027027 JMP SYMT7+3 TO "DON'T KNOW"
0034 37015 040355 SYMT6 ADA .-2 MATCH AS
0035 37016 150001 CPA 1,I 'SINGLE SUBSCRIPT'?
0036 37017 027032 JMP SYMT8 YES
0037 37020 002004 INA NO, MATCH AS
0038 37021 150001 CPA 1,I 'DOUBLE SUBSCRIPT'?
0039 37022 027032 JMP SYMT8 YES
0040 37023 002004 INA NO, MATCH AS
0041 37024 150001 SYMT7 CPA 1,I "DON'T KNOW"?
0042 37025 027046 JMP SYMT9 YES
0043 37026 044361 ADB .+2 NO, MORE SYMBOL
0044 37027 054056 CPB PBPTR TABLE ENTRIES?
0045 37030 026743 JMP SYMT2 NO
0046 37031 125320 JMP ASYMT,I YES
0047 37032 051611 SYMT8 CPA STMP1 DOES ENTRY MATCH SYMBOL?
0048 37033 026765 JMP SYMT5 YES
0049 37034 030362 IOR .+3 NO, IS SYMBOL OF
0050 37035 051611 CPA STMP1 TYPE "DON'T KNOW"?
0051 37036 027041 JMP .+3 YES
0052 37037 015322 JSB DCMPL NO, DECOMPILE
0053 37040 115112 JSB RRRS+11,I SUBSCRIPT CONFLICT
0054 37041 075612 STB STMP2 SAVE POINTER TO ENTRY
0055 37042 066001 LDB APTR2 CONTINUE SEARCH
0056 37043 075320 STB ASYMT FOR POSSIBLE

```

0057	37044	065612		LDB STMP2	"DON'T KNOW"
0058	37045	027026		JMP SYMT7+2	ENTRY
0059	37046	051611	SYMT9	CPA STMP1	DOES ENTRY MATCH SYMBOL?
0060	37047	026765		JMP SYMT5	YES
0061	37050	006004		INB	NO, NEW ENTRY TO BE MADE
0062	37051	060001		LDA 1	SET POINTER TO
0063	37052	044355		ADB , -2	NEW ENTRY INTO
0064	37053	174000		STB 0, I	"DON'T KNOW" ENTRY
0065	37054	002400		CLA	MAKE NEW
0066	37055	026761		JMP SYMT4+1	ENTRY
0067**					**
0068***				RESTORE SYMBOL TABLE POINTERS	***
0069**					**
0070*					
0071*				USED BY CSAVE TO RESTORE THE SYMBOL TABLE TO ITS APPEARANCE	
0072*				BEFORE VALUE HAS BEEN RUN, I.E. THE POINTERS TO DIM AND COM	
0073*				STATEMENTS ARE PLACED IN THE SECOND WORD OF ARRAY AND STRING	
0074*				ENTRIES IN THE SYMBOL TABLE, 'DON'T KNOW' ENTRIES ARE LINKED	
0075*				TO THE CORRESPONDING KNOWN ONE AND THE SECOND WORD OF DEFAULT	
0076*				ENTRIES IS SET TO ZERO.	
0077*					
0078	37056	065575	#RSTP	LDB SPROG	INITIALIZE PROGRAM
0079	37057	075230		STB SPTR	POINTER
0080	37060	055573		CPB SYMTB	FINISHED PROGRAM SCAN?
0081	37061	027146		JMP RSTP5	YES
0082	37062	035230		ISZ SPTR	NO--COMPUTE
0083	37063	145230		ADB SPTR, I	NEXT STATEMENT
0084	37064	075236		STB NSPTR	POINTER
0085	37065	035230		ISZ SPTR	
0086	37066	161230		LDA SPTR, I	EXTRACT
0087	37067	010570		AND OPMSK	OPERATOR
0088	37070	050534		CPA COMOP	'COM'?
0089	37071	027076		JMP RSTP1+1	YES
0090	37072	050540		CPA DIMOP	NO, 'DIM'?
0091	37073	002001		RSS	YES
0092	37074	027057		JMP #RSTP+1	NO
0093	37075	006400	RSTP1	CLB	
0094	37076	075617		STB DCFLG	SET COM-DIM FLAG
0095	37077	161230	RSTP2	LDA SPTR, I	COMPUTE
0096	37100	010566		AND OPDMK	POINTER
0097	37101	040356		ADA , -1	INTO
0098	37102	001000		ALS	SYMBOL
0099	37103	041573		ADA SYMTB	TABLE
0100	37104	071611		STA STMP1	
0101	37105	160000		LDA 0, I	EXTRACT
0102	37106	010376		AND , +17B	SYMBOL
0103	37107	040353		ADA , -4	SIMPLE
0104	37110	002020		SSA	VARIABLE?
0105	37111	027124		JMP RSTP4	NO
0106	37112	003400		CCA	YES
0107	37113	065611		LDB STMP1	FLAG
0108	37114	006004		INB	AS 'IN
0109	37115	170001		STA 1, I	COMMON'
0110	37116	065230		LDB SPTR	UPDATE
0111	37117	006004	RSTP3	INB	STATEMENT
0112	37120	075230		STB SPTR	POINTER

0113	37121	055236		CPB NSPTR	END OF STATEMENT?
0114	37122	027057		JMP #RSTP+1	YES
0115	37123	027077		JMP RSTP2	NO
0116	37124	065230	RSTP4	LDB SPTR	SET POINTER
0117	37125	044361		ADB .+2	TO DIMENSION
0118	37126	061617		LDA DCFLG	
0119	37127	002002		SZA	'COM'?
0120	37130	007004		CMB,INB	YES--COMPLEMENT POINTER
0121	37131	061611		LDA STMP1	STORE
0122	37132	002004		INA	IN SYMBOL
0123	37133	174000		STB 0,I	TABLE
0124	37134	065230		LDB SPTR	FINISHED
0125	37135	044363		ADB .+4	
0126	37136	055236		CPB NSPTR	STATEMENT?
0127	37137	027057		JMP #RSTP+1	YES
0128	37140	044356		ADB .-1	NO, TWO-
0129	37141	160001		LDA 1,I	
0130	37142	010570		AND OPMSK	DIMENSIONAL?
0131	37143	050602		CPA SCOMM	
0132	37144	044361		ADB .+2	YES--BUMP PAST SECOND DIMENSION
0133	37145	027117		JMP RSTP3	NO
0134*					
0135*	SCAN SYMBOL TABLE FOR 'DON'T KNOW' ENTRIES AND				
0136*	DEFAULT DIMENSION ENTRIES				
0137*					
0138	37146	065573	RSTP5	LDB SYMTB	INITIALIZE TABLE POINTER
0139	37147	055502		CPB FILTB	FINISHED SYMBOL TABLE SCAN?
0140	37150	027214		JMP RSTP9	YES
0141	37151	075611		STB STMP1	NO--SAVE POINTER
0142	37152	160001		LDA 1,I	DON'T
0143	37153	010376		AND .+17B	KNOW
0144	37154	050362		CPA .+3	ENTRY?
0145	37155	027174		JMP RSTP7	YES
0146	37156	040354		ADA .-3	NO, STRING
0147	37157	002021		SSA,RSS	OR ARRAY?
0148	37160	027171		JMP RSTP6	NO
0149	37161	006004		INB	YES
0150	37162	160001		LDA 1,I	DEFAULT
0151	37163	003004		CMA,INA	
0152	37164	041573		ADA SYMTB	DIMENSIONS?
0153	37165	002021		SSA,RSS	
0154	37166	027171		JMP RSTP6	NO
0155	37167	002400		CLA	YES--STORE A ZERO
0156	37170	170001		STA 1,I	IN SYMBOL TABLE
0157	37171	065611	RSTP6	LDB STMP1	BUMP TO
0158	37172	044361		ADB .+2	NEXT SYMBOL
0159	37173	027147		JMP RSTP5+1	
0160*					
0161*	PROCESS 'DON'T KNOW' ENTRY				
0162*					
0163	37174	075612	RSTP7	STB STMP2	
0164	37175	065573		LDB SYMTB	IS THERE
0165	37176	003400		CCA	A MATCHING
0166	37177	141612		ADA STMP2,I	TWO-DIMENSIONAL
0167	37200	150001		CPA 1,I	ENTRY?
0168	37201	027207		JMP RSTP8	YES

0169	37202	040356		ADA	.-1	NO, MATCHING ONE-
0170	37203	150001		CPA	1,I	DIMENSIONAL ENTRY?
0171	37204	027207		JMP	RSTP8	YES
0172	37205	044361		ADB	.+2	NO--BUMP TO
0173	37206	027176		JMP	RSTP7+2	NEXT SYMBOL
0174	37207	006004	RSTP8	INB		LINK 'DON'T
0175	37210	061611		LDA	STMP1	KNOW' ENTRY
0176	37211	002004		INA		WITH MATCHING
0177	37212	174000		STB	0,I	KNOWN ONE
0178	37213	027171		JMP	RSTP6	
0179	37214	002400	RSTP9	CLA		SET STORAGE
0180	37215	071576		STA	VLFLG	UNALLOCATED FLAG
0181	37216	074056		STB	PBPTR	RESET END-OF-PROGRAM POINTER
0182	37217	125520		JMP	RSTPT,I	

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0184**
0185*** BUILD THE VALUE TABLE ***
0186**
0187*
0188* IF NO VALUE TABLE EXISTS, ONE IS BUILT FROM THE SYMBOL
0189* TABLE AND INITIALIZED; IF IT ALREADY EXISTS, IT IS
0190* INITIALIZED. IN BUILDING THE VALUE TABLE, EACH ENTRY
0191* IN THE SYMBOL TABLE IS CHECKED; FOR FUNCTIONS THE
0192* EXISTENCE OF A DEFINING FORMULA IS CHECKED; FOR SIMPLE
0193* VARIABLES TWO WORDS ARE ALLOCATED AND SET TO 'UNDEFINED'
0194* AND A POINTER TO THEM IS PLACED IN THE SECOND WORD OF
0195* THE SYMBOL TABLE ENTRY; FOR ARRAYS FOUR WORDS ARE
0196* ALLOCATED FOR THE DECLARED AND DYNAMIC DIMENSIONS,
0197* THE DIMENSIONS ARE INITIALIZED EITHER FROM A
0198* <DIM STATEMENT> IN THE PROGRAM OR THE DEFAULT
0199* DIMENSIONS, ARRAY SPACE IS ALLOCATED AT TWO WORDS PER
0200* ARRAY ELEMENT CONTIGUOUS WITH THE DIMENSIONS, THE
0201* ELEMENTS ARE INITIALIZED TO 'UNDEFINED,' AND A
0202* POINTER TO THE FIRST ELEMENT IS PLACED IN THE SECOND
0203* WORD OF THE SYMBOL TABLE ENTRY; FOR STRINGS FOLLOW THE
0204* PATTERN FOR ARRAYS WITH ONE WORD HOLDING THE PHYSICAL
0205* DIMENSION IN BITS 15-8 AND THE DYNAMIC DIMENSION IN
0206* BITS 7-0 (DIMENSION HERE MEANS LENGTH AS NUMBER OF
0207* CHARACTERS), STRING SPACE IS ALLOCATED ONE WORD PER
0208* TWO CHARACTERS, AND THE DYNAMIC LENGTH IS INITIALIZED
0209* TO ZERO. FOR "DON'T KNOW" ARRAY ENTRIES, THE SECOND
0210* WORD OF THE SYMBOL TABLE ENTRY IS COPIED FROM THE
0211* ASSOCIATED SINGLY OR DOUBLY SUBSCRIPTED ENTRY (OR
0212* EXIT TO ERROR IF NONE EXISTS).
0213* FOR VARIABLES WHICH HAVE BEEN DECLARED IN A <COM
0214* STATEMENT>, STORAGE IS ALLOCATED IN THE COMMON AREA
0215* WHICH RESIDES AHEAD OF THE PROGRAM. FOR ARRAYS AND
0216* STRINGS, THIS AREA IS LEFT UNDISTURBED IF THE DIMENSIONS
0217* DECLARED IN THE <COM STATEMENT> MATCH THOSE FOUND IN
0218* THE COMMON AREA, AND THE DYNAMIC DIMENSIONS ARE CONSISTENT
0219* IF A VALUE TABLE ALREADY EXISTS, VARIABLES IN COMMON ARE
0220* LEFT UNTOUCHED, VALUES OF SIMPLE VARIABLES AND ARRAY
0221* ELEMENTS ARE SET TO 'UNDEFINED' AND DYNAMIC ARRAY
0222* DIMENSIONS ARE SET TO DECLARED DIMENSIONS; THE DYNAMIC
0223* LENGTHS OF STRINGS ARE SET TO ZERO. EXIT TO XEC IF
0224* PROCESSING IS SATISFACTORILY COMPLETED.
0225*
0226 37220 065232 VALUE LDB FCORE INSURE CORRECT
0227 37221 074056 STB PBPTR SETTING FOR PBPTR
0228 37222 064726 LDB PBUFF INITIALIZE
0229 37223 075616 STB COMPT COMMON POINTER
0230 37224 065573 LDB SYMTB SET (B) TO
0231 37225 002001 RSS SYMBOL TABLE
0232 37226 006004 VALU1 INB SYMBOL TABLE
0233 37227 055502 CPB FILTB EXHAUSTED?
0234 37230 027661 JMP VAL99 YES
0235 37231 160001 LDA 1,I NO, LOAD SYMBOL
0236 37232 006004 INB POINT (B) TO VALUE TABLE POINTER
0237 37233 002003 SZA,RSS NULL SYMBOL?
0238 37234 027554 JMP VAL14 YES
0239 37235 010376 AND .+17B NO

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0240	37236	050376		CPA .+17B	FUNCTION?
0241	37237	027300		JMP VALU4	YES
0242	37240	002003		SZA,RSS	NO, STRING VARIABLE?
0243	37241	027556		JMP VAL15	YES
0244	37242	040353		ADA .-4	NO,
0245	37243	002020		SSA	ARRAY?
0246	37244	027305		JMP VALU5	YES
0247*					*
0248**	INITIALIZE	SIMPLE VARIABLE			**
0249*					*
0250	37245	061576		LDA VLFLG	SIMPLE VARIABLE
0251	37246	002003		SZA,RSS	STORAGE ALLOCATED?
0252	37247	027262		JMP VALU3	NO
0253	37250	160001		LDA 1,I	YES
0254	37251	003004		CMA,INA	VARIABLE
0255	37252	040001		ADA 1	IN
0256	37253	002021		SSA,RSS	COMMON?
0257	37254	027226		JMP VALU1	YES
0258	37255	160001		LDA 1,I	NO
0259	37256	071611	VALU2	STA VTMP1	SAVE POINTER TO VALUE
0260	37257	003400		CCA	SET
0261	37260	171611		STA VTMP1,I	VALUE TO
0262	37261	027226		JMP VALU1	UNDEFINED
0263	37262	160001	VALU3	LDA 1,I	VARIABLE
0264	37263	002020		SSA	IN COMMON?
0265	37264	027273		JMP VAL31	YES
0266	37265	060361		LDA .+2	NO--ALLOCATE
0267	37266	015326		JSB CUSP	STORAGE
0268	37267	070056		STA PBPTR	FOR VALUE
0269	37270	040355		ADA .-2	PUT VALUE POINTER
0270	37271	170001		STA 1,I	INTO SYMBOL TABLE
0271	37272	027256		JMP VALU2	
0272	37273	061616	VAL31	LDA COMPT	ALLOCATE STORAGE
0273	37274	170001		STA 1,I	IN COMMON
0274	37275	040361		ADA .+2	UPDATE COMMON
0275	37276	071616		STA COMPT	POINTER
0276	37277	027226		JMP VALU1	
0277*					*
0278**	CHECK FUNCTION				**
0279*					*
0280	37300	160001	VALU4	LDA 1,I	WAS FUNCTION
0281	37301	002002		SZA	DEFINED?
0282	37302	027226		JMP VALU1	YES
0283	37303	015322		JSB DCMP	NO, DECOMPILE
0284	37304	115106		JSB RRRS+7,I	UNDEFINED FUNCTION
0285*					*
0286**	INITIALIZE	ARRAY			**
0287*					*
0288	37305	050356	VALU5	CPA .-1	IS ARRAY TYPE "DON'T KNOW" ?
0289	37306	027545		JMP VAL13	YES
0290	37307	075611		STB VTMP1	NO, SAVE POINTER TO SYMBOL TABLE
0291	37310	002004		INA	SAVE INFORMATION ON
0292	37311	071612		STA VTMP2	NUMBER OF DIMENSIONS
0293	37312	061576		LDA VLFLG	STORAGE
0294	37313	002002		SZA	ALLOCATED?
0295	37314	027405		JMP VAL12	YES

0296	37315	160001	LDA 1,I	NO
0297	37316	002020	SSA	IN COMMON?
0298	37317	027421	JMP VAL51	YES
0299	37320	165611	LDB VTMP1,I	NO, LOAD POINTER TO DIMENSIONS
0300	37321	060056	LDA PBPTR	SET POINTER TO
0301	37322	071613	STA VTMP3	DIMENSION ENTRY
0302	37323	060363	LDA .+4	ALLOCATE
0303	37324	015326	JSB CUSP	SPACE
0304	37325	070056	STA PBPTR	FOR ENTRY
0305	37326	171611	STA VTMP1,I	SYMBOL TABLE POINTER TO ARRAY
0306	37327	006003	SZB,RSS	DEFAULT DIMENSIONS?
0307	37330	027402	JMP VAL11	YES
0308	37331	160001	LDA 1,I	NO, LOAD ROW DIMENSION
0309	37332	044361	ADB .+2	BUMP POINTER
0310	37333	035612	VALU6 ISZ VTMP2	TWO DIMENSIONAL?
0311	37334	006405	CLB,INB,RSS	NO, SET COLUMN DIMENSION TO 1
0312	37335	164001	LDB 1,I	YES, LOAD COLUMN DIMENSION
0313	37336	171613	STA VTMP3,I	PUT
0314	37337	035613	ISZ VTMP3	DECLARED DIMENSIONS
0315	37340	175613	STB VTMP3,I	IN VALUE TABLE
0316	37341	035613	VALU7 ISZ VTMP3	PUT
0317	37342	171613	STA VTMP3,I	DYNAMIC DIMENSIONS
0318	37343	035613	ISZ VTMP3	IN
0319	37344	175613	STB VTMP3,I	VALUE TABLE
0320	37345	100200	MPY VTMP3,I	COMPUTE NUMBER OF ARRAY ELEMENTS
	37346	101613		
0321	37347	006003	SZB,RSS	TOO
0322	37350	002020	SSA	LARGE?
0323	37351	027400	JMP VAL10	YES
0324	37352	071614	STA VTMP4	SAVE POSITIVE
0325	37353	003004	CMA,INA	AND NEGATIVE
0326	37354	071612	STA VTMP2	COUNT
0327	37355	065613	LDB VTMP3	HAS
0328	37356	006004	INB	ARRAY BEEN
0329	37357	054056	CPB PBPTR	ALLOCATED?
0330	37360	027370	JMP VALU9	NO
0331	37361	003400	VALU8 CCA	INITIALIZE
0332	37362	170001	STA 1,I	ARRAY ELEMENT
0333	37363	044361	ADB .+2	TO 'UNDEFINED'
0334	37364	035612	ISZ VTMP2	DONE?
0335	37365	027361	JMP VALU8	NO
0336	37366	065611	LDB VTMP1	YES
0337	37367	027226	JMP VALU1	
0338	37370		VALU9 EQU *	
0339	37370	040443	ADA .5000	ARRAY
0340	37371	002020	SSA	TOO LARGE?
0341	37372	027400	JMP VAL10	YES
0342	37373	061614	LDA VTMP4	NO
0343	37374	001000	ALS	ALLOCATE
0344	37375	015326	JSB CUSP	SPACE
0345	37376	070056	STA PBPTR	FOR ARRAY
0346	37377	027361	JMP VALU8	
0347	37400	015322	VAL10 JSB DCMP1	DECOMPILE
0348	37401	115107	JSB RERRS+8,I	ARRAY TOO LARGE
0349	37402	060371	VAL11 LDA .+10	LOAD (A) WITH 10
0350	37403	066000	LDB A.10	LOAD (B) WITH

0351	37404	027333		JMP VALU6	ADDRESS OF 10
0352	37405	160001	VAL12	LDA 1,I	IS ARRAY
0353	37406	003004		CMA,INA	
0354	37407	040001		ADA 1	IN COMMON?
0355	37410	002021		SSA,RSS	
0356	37411	027226		JMP VALU1	YES
0357	37412	161611		LDA VTMP1,I	NO--LOAD
0358	37413	040353		ADA .-4	
0359	37414	071613		STA VTMP3	DECLARED
0360	37415	161613		LDA VTMP3,I	
0361	37416	035613		ISZ VTMP3	DIMENSIONS
0362	37417	165613		LDB VTMP3,I	
0363	37420	027341		JMP VALU7	
0364	37421	165611	VAL51	LDB VTMP1,I	SET
0365	37422	007004		CMB,INB	DIMENSION
0366	37423	075615		STB VTMP5	POINTER
0367	37424	175611		STB VTMP1,I	POSITIVE
0368	37425	061616		LDA COMPT	SET
0369	37426	071613		STA VTMP3	POINTER
0370	37427	040363		ADA .+4	IN SYMBOL
0371	37430	171611		STA VTMP1,I	TABLE
0372	37431	160001		LDA 1,I	PHYSICAL ROW DIMENSION
0373	37432	151613		CPA VTMP3,I	SAME AS DECLARED DIMENSION?
0374	37433	002001		RSS	YES
0375	37434	027503		JMP VAL52	NO
0376	37435	044361		ADB .+2	B=> SECOND DIMENSION
0377	37436	061612		LDA VTMP2	TWO
0378	37437	050355		CPA .-2	DIMENSIONAL?
0379	37440	006405		CLB,INB,RSS	NO--SET COLUMN DIMENSION TO 1
0380	37441	164001		LDB 1,I	YES--LOAD COLUMN DIMENSION
0381	37442	035613		ISZ VTMP3	PHYSICAL COLUMN DIMENSION
0382	37443	155613		CPB VTMP3,I	SAME AS DECLARED DIMENSION
0383	37444	002001		RSS	YES
0384	37445	027503		JMP VAL52	NO
0385	37446	161616		LDA COMPT,I	COMPUTE SIZE OF
0386	37447	100200		MPY VTMP3,I	ARRAY AS DECLARED
		37450			
0387	37451	006003		SZB,RSS	TOO
0388	37452	002020		SSA	LARGE?
0389	37453	027503		JMP VAL52	YES
0390	37454	071614		STA VTMP4	NO--SAVE SIZE
0391	37455	040443		ADA .5000	TOO
0392	37456	002020		SSA	LARGE?
0393	37457	027503		JMP VAL52	YES
0394	37460	035613		ISZ VTMP3	NO
0395	37461	161613		LDA VTMP3,I	COMPUTE SIZE
0396	37462	035613		ISZ VTMP3	AS SPECIFIED BY
0397	37463	100200		MPY VTMP3,I	DYNAMIC DIMENSIONS
		37464			
0398	37465	006003		SZB,RSS	TOO
0399	37466	002020		SSA	LARGE?
0400	37467	027503		JMP VAL52	YES
0401	37470	003007		CMA,INA,SZA,RSS	
0402	37471	027503		JMP VAL52	CHEESE IT! DYNAMIC DIM = 0
0403	37472	041614		ADA VTMP4	DYNAMIC SIZE
0404	37473	002020		SSA	> DECLARED SIZE

0405	37474	027503	JMP VAL52	YES
0406	37475	161611	LDA VTMP1,I	= COMPT+4
0407	37476	041614	ADA VTMP4	
0408	37477	041614	ADA VTMP4	UPDATE
0409	37500	071616	STA COMPT	COMMON POINTER
0410	37501	065611	LDB VTMP1	RESTORE (B)
0411	37502	027226	JMP VALU1	
0412	37503	065615	VAL52 LDB VTMP5	=> ROW DIMENSION
0413	37504	160001	LDA 1,I	
0414	37505	044361	ADB .+2	=> COLUMN DIMENSION
0415	37506	035612	ISZ VTMP2	TWO-DIMENSIONAL?
0416	37507	006405	CLB,INB,RSS	NO--LOAD DEFAULT DIMENSION
0417	37510	164001	LDB 1,I	PUT
0418	37511	171616	STA COMPT,I	DECLARED
0419	37512	035616	ISZ COMPT	DIMENSIONS IN
0420	37513	175616	STB COMPT,I	COMMON AREA
0421	37514	035616	ISZ COMPT	PUT
0422	37515	171616	STA COMPT,I	DYNAMIC
0423	37516	035616	ISZ COMPT	DIMENSIONS IN
0424	37517	175616	STB COMPT,I	COMMON AREA
0425	37520	100200	MPY COMPT,I	COMPUTE NUMBER OF ARRAY ELEMENTS
		37521		
0426	37522	006003	SZB,RSS	TOO
0427	37523	002020	SSA	LARGE?
0428	37524	027400	JMP VAL10	YES
0429	37525	003004	CMA,INA	NO--SAVE COMPLEMENT
0430	37526	071612	STA VTMP2	OF NUMBER OF ELEMENTS
0431	37527	003004	CMA,INA	ARRAY
0432	37530	040443	ADA .5000	TOO
0433	37531	002020	SSA	LARGE?
0434	37532	027400	JMP VAL10	YES
0435	37533	035616	ISZ COMPT	NO
0436	37534	065616	LDB COMPT	INITIALIZE
0437	37535	003400	CCA	ALL
0438	37536	170001	VAL53 STA 1,I	ELEMENTS
0439	37537	044361	ADB .+2	TO
0440	37540	035612	ISZ VTMP2	UNDEFINED
0441	37541	027536	JMP VAL53	
0442	37542	075616	STB COMPT	UPDATE COMMON POINTER
0443	37543	065611	LDB VTMP1	RESTORE (B)
0444	37544	027226	JMP VALU1	
0445	37545	061576	VAL13 LDA VLFLG	STORAGE
0446	37546	002002	SZA	ALLOCATED?
0447	37547	027226	JMP VALU1	YES
0448	37550	160001	LDA 1,I	NO, GET
0449	37551	160000	LDA 0,I	AND STORE
0450	37552	170001	STA 1,I	POINTER TO
0451	37553	027226	JMP VALU1	VALUE TABLE
0452	37554	015322	VAL14 JSB DCMP	DECOMPILE
0453	37555	115110	JSB RERRS+9,I	NUMBER OF DIMENSIONS NOT KNOWN

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0455*
0456** INITIALIZE STRING VARIABLE **
0457*
0458 37556 075611 VAL15 STB VTMP1      SAVE (B)
0459 37557 061576      LDA VLFLG      STORAGE
0460 37560 002002      SZA            ALLOCATED?
0461 37561 027611      JMP VAL17      YES
0462 37562 160001      LDA 1,I       NO
0463 37563 002020      SSA            IN COMMON?
0464 37564 027624      JMP VAL18      YES
0465 37565 165611      LDB VTMP1,I   NO, SAVE LENGTH POINTER
0466 37566 060056      LDA PBPTR     SET POINTER TO
0467 37567 071613      STA VTMP3     LENGTH ENTRY
0468 37570 002004      INA           MORE
0469 37571 050716      CPA LWAUS     USER SPACE?
0470 37572 115111      JSB RERRS+10,I NO
0471 37573 070056      STA PBPTR     YES, SET POINTER TO STRING
0472 37574 171611      STA VTMP1,I   INTO SYMBOL TABLE ENTRY
0473 37575 006003      SZB,RSS       DEFAULT LENGTH?
0474 37576 002405      CLA,INA,RSS   YES, SET (A) = 1
0475 37577 160001      LDA 1,I       NO, LOAD DECLARED LENGTH
0476 37600 001727      ALF,ALF       STORE PHYSICAL LENGTH
0477 37601 171613      STA VTMP3,I   ALONG WITH ZERO
0478 37602 001727      ALF,ALF       LOGICAL LENGTH
0479 37603 002004      INA           ALLOCATE
0480 37604 001100      ARS           SPACE
0481 37605 015326      JSB CUSP      FOR
0482 37606 070056      STA PBPTR     STRING
0483 37607 065611 VAL16 LDB VTMP1   RESTORE
0484 37610 027226      JMP VALU1     (B)
0485 37611 160001 VAL17 LDA 1,I
0486 37612 003004      CMA,INA      STRING
0487 37613 040001      ADA 1        IN
0488 37614 002021      SSA,RSS     COMMON?
0489 37615 027226      JMP VALU1    YES
0490 37616 007400      CCB         NO==RESET
0491 37617 145611      ADB VTMP1,I LOGICAL LENGTH
0492 37620 160001      LDA 1,I
0493 37621 010316      AND M256    TO ZERO
0494 37622 170001      STA 1,I
0495 37623 027607      JMP VAL16
0496 37624 003004 VAL18 CMA,INA
0497 37625 071613      STA VTMP3   SET POINTER POSITIVE
0498 37626 061616      LDA COMPT  => DIMENSION INFORMATION
0499 37627 002004      INA        SET VALUE
0500 37630 170001      STA 1,I    POINTER IN
0501 37631 161616      LDA COMPT,I EXTRACT PHYSICAL
0502 37632 001727      ALF,ALF    LENGTH FROM
0503 37633 010500      AND B377   COMMON AREA
0504 37634 151613      CPA VTMP3,I SAME AS DECLARED LENGTH?
0505 37635 002001      RSS       YES
0506 37636 027647      JMP VAL20  NO
0507 37637 161616      LDA COMPT,I LOGICAL
0508 37640 010500      AND B377
0509 37641 003004      CMA,INA    LENGTH <=
0510 37642 141613      ADA VTMP3,I

```

0511	37643	002020	SSA	PHYSICAL LENGTH?
0512	37644	027647	JMP VAL20	NO
0513	37645	161613	LDA VTMP3,I	LOAD PHYSICAL LENGTH
0514	37646	027653	JMP VAL19	
0515	37647	161613	VAL20 LDA VTMP3,I	RESET PHYSICAL LENGTH TO
0516	37650	001727	ALF,ALF	DECLARED LENGTH AND
0517	37651	171616	STA COMPT,I	LOGICAL LENGTH TO ZERO
0518	37652	001727	ALF,ALF	
0519	37653	002004	VAL19 INA	UPDATE
0520	37654	001100	ARS	
0521	37655	002004	INA	COMMON
0522	37656	041616	ADA COMPT	
0523	37657	071616	STA COMPT	POINTER
0524	37660	027226	JMP VALU1	
0525	37661		VAL99 EQU *	
0526	37661	061576	LDA VLFLG	HAS STORAGE
0527	37662	002002	SZA	BEEN ALLOCATED?
0528	37663	027674	JMP VAL98	YES
0529	37664	061605	LDA USESN	NO, ANY 'PRINT
0530	37665	002003	SZA,RSS	USING' STATEMENTS?
0531	37666	027674	JMP VAL98	NO
0532	37667	060056	LDA PBPTR	YES,
0533	37670	071756	STA IFSS	ALLOCATE
0534	37671	060466	LDA .72	SPACE FOR
0535	37672	015326	JSB CUSP	FORMAT
0536	37673	070056	STA PBPTR	STACK
0537	37674		VAL98 EQU *	
0538	37674	002404	CLA,INA	SAY STORAGE
0539	37675	071576	STA VLFLG	ALLOCATED
0540	37676	060056	LDA PBPTR	POINTER TO END
0541	37677	071232	STA FCORE	OF FIXED TABLES

```

0543*
0544* *****
0545****
0546*** EXECUTE THE PROGRAM ***
0547****
0548* *****
0549*
0550*
0551* THE CORE-RESIDENT FILE BUFFERS FOLLOW THE VALUE TABLE: ONE
0552* RECORD-SIZED BLOCK OF CORE IS ALLOCATED FOR EACH FILE REQUESTED
0553* IN THE <FILES STATEMENT>. FIVE STACKS EXIST DURING EXECUTION:
0554* SINCE STACK POINTERS ARE ASSUMED TO REFERENCE THE TOPMOST
0555* ENTRY IN THEIR STACK THEY ARE INITIALLY SET ONE ENTRY BELOW
0556* THE PHYSICAL START OF THE STACK; THUS THE FIRST ENTRY ADVANCES
0557* A STACK POINTER TO THE FIRST WORD OF ITS STACK SPACE. GOSUBS
0558* QUEUE THEIR RETURN ADDRESSES IN THE RETURN STACK, WHICH HAS A
0559* FIXED LENGTH OF NINE WORDS ALLOCATED IMMEDIATELY FOLLOWING
0560* THE FILE BUFFERS. THE FOR-STACK (SIX-WORD ENTRIES) CONTAINS
0561* ALL INFORMATION PERTAINING TO ACTIVE FOR-NEXT LOOPS; INITIALLY
0562* EMPTY, ITS CORE SPACE IS ALLOCATED DYNAMICALLY AS NEEDED. THE
0563* TEMPORARY STACK HOLDS INTERMEDIATE RESULTS DURING FORMULA
0564* EVALUATION; IT IS INITIALIZED TO HOLD TEN TEMPORARIES AND
0565* EXPANDS DYNAMICALLY AS NECESSARY. THE OPERAND AND OPERATOR
0566* STACKS FOLLOW WITH THEIR ONE-WORD ENTRIES OCCUPYING ALTERNATE
0567* LOCATIONS, EXPANDING INTO FREE USER SPACE ON A DEMAND BASIS.
0568* THE TOP OF THE OPERATOR STACK, ALWAYS AT LEAST ONE WORD AHEAD
0569* OF THE OPERAND STACK, IS PBPTR SO THAT ALL ACTIVE USER SPACE
0570* IS KEPT WITHIN THE SWAP REGION. SINCE ALL STACKS EXCEPT THE
0571* RETURN STACK EXPAND DYNAMICALLY, STATIC AND DYNAMIC NESTING
0572* OF FORMULAS AND FOR-NEXT LOOPS IS FREELY PERMITTED UP TO
0573* THE EXHAUSTION OF USER SPACE.
0574*
0575**
0576*** INITIALIZE EXECUTION ***
0577**
0578*
0579* PRINT THE PROGRAM NAME. INITIALIZE FILE STATUS INFORMATION
0580* IN THE FILE TABLE AND NOTIFY USER OF ANY REQUESTED FILES
0581* WHICH ARE READ-ONLY. ALLOCATE A 64 WORD BUFFER FOR EACH FILE.
0582* ALLOCATE RUN-TIME STACKS, INITIALIZE POINTERS TO THE DATA BLOCK,
0583* AND MOVE TO A FRESH TELETYPE LINE.
0584*
0585 37700 002400          CLA
0586 37701 170632          STA DCLC1,I          CLOCK
0587 37702 114614          JSB ABCK,I          ABORT ATTEMPT DURING COMPILE?
0588 37703 160634          LDA DCLC2,I          NO--UNBLOCK
0589 37704 170632          STA DCLC1,I          CLOCK
0590 37705 160255          LDA MAIN,I
0591 37706 010506          AND CHNFG
0592 37707 071252          STA TEMP2          SAVE CHAIN FLAG
0593 37710 002003          SZA,RSS          WAS THIS PROGRAM CHAINED TO?
0594 37711 027717          JMP XEC01          NO
0595 37712 103100          CLF 0           YES
0596 37713 120255          XOR MAIN,I          CLEAR
0597 37714 170255          STA MAIN,I          CHAIN FLAG
0598 37715 102100          STF 0

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0599	37716	027734		JMP XEC0	DON'T PRINT NAME
0600	37717	060371	XEC01	LDA ,+12B	ECHO
0601	37720	015452		JSB OUTCR	LINE FEED
0602	37721	061567		LDA LNAME	
0603	37722	071426		STA LT1	
0604	37723	040360		ADA ,+?NAME-?ID	
0605	37724	160000		LDA A,I	REMOVE RUN-ONLY
0606	37725	010273		AND INF	BIT AND CHECK FOR
0607	37726	002003		SZA,RSS	NULL PROGRAM NAME
0608	37727	027734		JMP XEC0	YES
0609	37730	006400		CLB	NO
0610	37731	075274		STB LT2	OUTPUT
0611	37732	060354		LOA , -3	PROGRAM
0612	37733	015460		JSB OUTST	NAME
0613	37734	002400	XEC0	CLA	ZERO
0614	37735	071500		STA FCNTR	FILE COUNTER
0615	37736	071242		STA RTNST	AND MESSAGE FLAG
0616	37737	071607		STA ENOUF	TURN OFF OVER/UNDERFLOW
0617	37740	071771		STA ASINP	SET NO ASSIGN PROCESSED
0618	37741	065502		LDB FILTB	LOAD ADDRESS OF FILE TABLE
0619	37742	055574	XEC2	CPB VALTB	DONE?
0620	37743	027777		JMP XEC4	YES
0621	37744	035500		ISZ FCNTR	NO, COUNT FILE
0622	37745	061252		LDA TEMP2	
0623	37746	002002		SZA	WAS THIS PROGRAM CHAINED TO?
0624	37747	027753		JMP XEC3	YES
0625	37750	160001		LDA 1,I	READ
0626	37751	002020		SSA	ONLY?
0627	37752	124766		JMP XEC5I,I	YES
0628	37753	061027	XEC3	LDA BIT15	NO
0629	37754	044363		ADB ,+4	SET NULL
0630	37755	170001		STA B,I	RECORD ADDRESS
0631	37756	044354		ADB , -3	GET RECORD
0632	37757	160001		LDA B,I	SIZE AND
0633	37760	001423		ALR,RAR	CLEAR BITS 14 AND 15
0634	37761	170001		STA B,I	AND STICK BACK IN FILE TABLE
0635	37762	044366		ADB ,+7	ALLOCATE
0636	37763	015326		JSB CUSP	BUFFER FOR
0637	37764	070056		STA PBPTR	THE FILE
0638	37765	170001		STA 1,I	SET
0639	37766	006004		INB	'RECORD FULL'
0640	37767	170001		STA 1,I	CONDITION
0641	37770	006004		INB	SET
0642	37771	002400		CLA	'NO EOF EXIT'
0643	37772	170001		STA 1,I	CONDITION
0644	37773	044363		ADB ,+4	POINT TO MASK
0645	37774	170001		STA 1,I	CLEAR PROTECT MASK
0646	37775	006004		INB	POINT TO NEXT ENTRY
0647	37776	027742		JMP XEC2	
0648	37777	061500	XEC4	LDA FCNTR	ARE THERE
0649	40000	002003		SZA,RSS	ANY FILES?
0650	40001	026007		JMP XEC9	NO
0651	40002	060502		LDA DFCHK	YES, SET
0652	40003	103100		CLF 0	POSSIBLE DIRTY
0653	40004	130255		IOR MAIN,I	FILES BIT IN
0654	40005	170255		STA MAIN,I	TTY TABLE

0655	40006	102100		STF 0	
0656	40007	061252	XEC9	LDA TEMP2	
0657	40010	002002		SZA	WAS THIS PROGRAM CHAINED TO?
0658	40011	026020		JMP XEC8	YES
0659	40012	060374		LDA .+15B	NO, OUTPUT A
0660	40013	015452		JSB OUTCR	CARRIAGE RETURN
0661	40014	060371		LDA .+12B	AND
0662	40015	015452		JSB OUTCR	TWO
0663	40016	060371		LDA .+12B	LINE FEEDS.
0664	40017	015452		JSB OUTCR	
0665	40020	064056	XEC8	LDB PBPTR	
0666	40021	044356		ADB .-1	SET POINTERS TO
0667	40022	075240		STB RTRNG	TOP AND BOTTOM
0668	40023	075242		STB RTNST	OF RETURN STACK
0669	40024	044363		ADB .+4	SET
0670	40025	075246		STB FORG	EXECUTION
0671	40026	015430		JSB SETPT	POINTERS
0672	40027	065575		LDB SPROG	SET POINTERS TO
0673	40030	015360		JSB SETDP	FIRST <DATA STATEMENT>
0674*				*	
0675**	EXECUTE STATEMENT			**	
0676*				*	
0677*					
0678*	SAVE SEQUENCE NUMBER FOR POSSIBLE USE BY ERROR ROUTINE.				
0679*	ADVANCE PROGRAM COUNTER TO NEXT STATEMENT AND BRANCH TO				
0680*	CODE FOR EXECUTION OF CURRENT STATEMENT.				
0681*					
0682	40031	065334	XEC1	LDB PRGCT	SAVE CURRENT
0683	40032	160001		LDA 1,I	SEQUENCE
0684	40033	071566		STA .LNUM	NUMBER
0685	40034	060001		LDA B	
0686	40035	002004		INA	CHECK
0687	40036	160000		LDA A,I	STATEMENT
0688	40037	015554		JSB STLCK	LENGTH
0689	40040	060001		LDA 1	COMPUTE
0690	40041	002004		INA	ADDRESS
0691	40042	144000		ADB 0,I	OF NEXT
0692	40043	075334		STB PRGCT	STATEMENT
0693	40044	002004		INA	SET INTRA-
0694	40045	071611		STA TEMP1	STATEMENT POINTER
0695	40046	161611		LDA TEMP1,I	COMPUTE
0696	40047	010570		AND OPMSK	BRANCH
0697	40050	001727		ALF,ALF	ADDRESS
0698	40051	001300		RAR	FOR CURRENT
0699	40052	043766		ADA XECBR	STATEMENT TYPE
0700	40053	071234		STA FILE#	SET 'NO FILE' FLAG
0701	40054	124000		JMP 0,I	BRANCH TO APPROPRIATE ROUTINE
0702*				*	
0703**	OUTPUT READ-ONLY WARNING			**	
0704*				*	
0705	40055	075240	XEC5	STB RTRNG	SAVE (B)
0706	40056	064272		LDB MLINK+1	
0707	40057	044346		ADB .+?ID=?LINK	
0708	40060	160001		LDA 1,I	GET ID
0709	40061	010612		AND M2000	IS IT
0710	40062	050514		CPA A000	AN 'A'?

0711	40063	026107		JMP XEC7	YES
0712	40064	035242		ISZ RTNST	NO, FIRST TIME THROUGH?
0713	40065	115211		JSB WERRS+8,I	YES, EMIT MESSAGE
0714	40066	003400		CCA	SET FLAG FOR
0715	40067	071242		STA RTNST	MESSAGE SUPPRESSION
0716	40070	060422		LDA .+43B	OUTPUT
0717	40071	015452		JSB OUTCR	A '#'
0718	40072	061500		LDA FCNTR	OUTPUT
0719	40073	040345		ADA .-10	
0720	40074	002020		SSA	FILE #>9?
0721	40075	026103		JMP XEC6	NO
0722	40076	060440		LDA .+61B	YES
0723	40077	015452		JSB OUTCR	OUTPUT A '1'
0724	40100	061500		LDA FCNTR	OUTPUT
0725	40101	040425		ADA .+46B	SECOND
0726	40102	002001		RSS	DIGIT
0727	40103	040452	XEC6	ADA .58	OUTPUT SINGLE DIGIT
0728	40104	015452		JSB OUTCR	
0729	40105	060417		LDA .+40B	OUTPUT
0730	40106	015452		JSB OUTCR	BLANK
0731	40107	065240	XEC7	LDB RTRNQ	RETRIEVE (B)
0732	40110	124764		JMP XEC3I,I	

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0002*
0003*** **
0004** EXECUTE <LET STATEMENT> **
0005*** **
0006*
0007 40111 002404 ELET CLA,INA ALLOW STRING CONSTANT
0008 40112 071470 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 035611 EIF1 ISZ TEMP1 EVALUATE
0017 40116 015504 JSB VLFIL FILE REQUEST
0018 40117 035236 ISZ FBASE TRANSFER
0019 40120 035611 ISZ TEMP1 EOF LABEL
0020 40121 165611 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
0024 40125 101611
0024 40126 054542 CPB ENDOP
0025 40127 002020 SSA OPERATOR?
0026 40130 002405 CLA,INA,RSS NO
0027 40131 026115 JMP EIF1 YES
0028 40132 071470 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 075476 STB GTMP 'GOSUB' MODE
0045 40141 065611 LDB TEMP1 COMPUTE SIMPLE BRANCH
0046 40142 006004 INB 'ADDRESS' ADDRESS
0047 40143 161611 LDA TEMP1,I SIMPLE
0048 40144 010566 AND OPDMK BRANCH
0049 40145 050550 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 045611 ADB TEMP1 COMPUTE
0055 40153 006004 INB 'ADDRESS'
0056 40154 060001 LDA 1 ADDRESS

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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	035476		ISZ GTMP		<GOTO STATEMENT> ?
0063	40163	026032		JMP XEC1+1		YES
0064	40164	061334		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	040345		ADA .-10		10
0069	40171	051240		CPA RTRNQ		DEEP?
0070	40172	115116		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	071420		STA EFN0		NO, SAVE (A)
0080	40177	075512		STB DEST		SET DESTINATION ADDRESS
0081	40200	065250		LDB FORST		COMPUTE MOVE
0082	40201	044365		ADB .+6		TERMINATION ADDRESS
0083	40202	061512		LDA DEST		COMPUTE
0084	40203	040365		ADA .+6		SOURCE ADDRESS
0085	40204	015476		JSB MOVER		DELETE FOR=TABLE ENTRY
0086	40205	061420		LDA EFN0		RETRIEVE (A)
0087	40206	026230		JMP EFOR5		
0088	40207	161611	EFOR	LDA TEMP1,I		EXTRACT
0089	40210	010504		AND B777		AND SAVE THE
0090	40211	071426		STA FVT		FOR=VARIABLE
0091	40212	001000		ALS		COMPUTE
0092	40213	041573		ADA SYMTB		ADDRESS
0093	40214	040356		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	044351		ADB .-6		NO, CHECK
0101	40224	026217		JMP EFOR1		LOWER ENTRY
0102	40225	065250	EFOR2	LDB FORST		MOVE TO SPACE
0103	40226	044365		ADB .+6		FOR ENTRY
0104	40227	015430		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	071420		STA EFN0		LIMIT VALUE
0110	40235	040361		ADA .+2		AND
0111	40236	071422		STA EFN1		STEP SIZE
0112	40237	040361		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	101420			
0117	40245	061611		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	101422			
0122	40253	006400		CLB	SET SIGN FLAG
0123	40254	002020		SSA	TO -1 FOR
0124	40255	007400		CCB	NEGATIVE STEP SIZE,
0125	40256	075424		STB EFN2	0 FOR POSITIVE STEP SIZE
0126	40257	035334		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	044356		ADB .-1	COMPUTE POINTER
0132	40265	144001		ADB 1,I	TO ITS SUCCESSOR
0133	40266	010570		AND OPMSK	<NEXT
0134	40267	050562		CPA NXTOP	STATEMENT> ?
0135	40270	002001		RSS	YES
0136	40271	026261		JMP EFOR4	NO
0137	40272	021366		XOR EFN3	SAME
0138	40273	051426		CPA FVT	FOR-VARIABLE?
0139	40274	002001		RSS	YES
0140	40275	026261		JMP EFOR4	NO
0141	40276	044356		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	061031	EFOR6	LDA HALF	LOAD
0147	40305	064361		LDB .+2	DEFAULT
0148	40306	026251		JMP EFOR3	OF 1.0
0149*					
0150***				**	
0151**	EXECUTE	<NEXT STATEMENT>		**	
0152***				**	
0153*					
0154	40307	161611	ENEXT	LDA TEMP1,I	EXTRACT
0155	40310	010504		AND B777	FOR-VARIABLE
0156	40311	001000		ALS	COMPUTE
0157	40312	041573		ADA SYMTB	ADDRESS
0158	40313	040356		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	044351		ADB .-6	NO,CHECK

0166	40323	026316		JMP ENEX1	LOWER ENTRY
0167	40324	071422	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	015430		JSB SETPT	NO, RESET
0171	40330	065250		LDB FORST	EXECUTION POINTERS
0172	40331	006004		INB	SAVE ADDRESS
0173	40332	075420		STB EFN0	OF LIMIT VALUE
0174	40333	044361		ADB .+2	
0175	40334	060355		LDA .-2	SET SIGN FLAG TO SAY
0176	40335	071424		STA EFN2	POSITIVE STEP SIZE
0177	40336	104200		DLD 1,I	LOAD STEP SIZE
		40337			
0178	40340	002020		SSA	POSITIVE?
0179	40341	035424		ISZ EFN2	NO, RESET SIGN FLAG
0180	40342	015402		JSB .FAD	ADD STEP SIZE
0181	40343	101422		DEF EFN1,I	TO VALUE OF FOR-VARIABLE
0182	40344	104400		DST EFN1,I	SAVE NEW VALUE
		40345			
0183	40346	015404	ENEX3	JSB .FSB	SUBTRACT
0184	40347	101420		DEF EFN0,I	LIMIT VALUE
0185	40350	035424		ISZ EFN2	IF STEP SIZE POSITIVE,
0186	40351	001600		ELA	INVERT SIGN OF RESULT
0187	40352	002020		SSA	LIMIT VALUE EXCEEDED?
0188	40353	026360		JMP ENEX4	YES
0189	40354	061250		LDA FORST	NO, LOAD ADDRESS
0190	40355	040364		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	044351		ADB .-6	ENTRY FROM
0195	40362	015430		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 RTRNQ	EMPTY?
0204	40366	115117		JSB RERRS+16,I	YES
0205	40367	164000		LDB 0,I	NO, POP
0206	40370	040356		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	071476		STA MCNT	MATRIX INPUT COUNTER
0216	40375	071456	EINP1	STA INITF	SAVE ADDRESS FLAG
0217	40376	002400		CLA	REQUEST
0218	40377	071470		STA SYNTQ	FIRST
0219	40400	015444		JSB INCAL	INPUT RECORD

0220	40401	035420	EINP2	ISZ	IFCNT	COUNT INPUT QUANTITY
0221	40402	003400		CCA		MATRIX
0222	40403	051456		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	040355		ADA	.-2	UNSTACK
0230	40413	071332		STA	OPDST	ADDRESS
0231	40414	075572		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	015444		JSB	INCAL	
0238	40423	035420		ISZ	IFCNT	FETCH
0239	40424	015446	EINP4	JSB	GETCR	FIRST
0240	40425	026422		JMP	*-3	CHARACTER
0241	40426	007400		CCB		TURN OFF
0242	40427	075472		STB	SERR	OVER/UNDERFLOW FLAG
0243	40430	050434		CPA	+.45	'-1' ?
0244	40431	026506		JMP	EIN11	YES
0245	40432	006404		CLB,INB		NO
0246	40433	050432		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	064417	EINP6	LDB	+.40B	TURN ON
0252	40441	075571		STB	BLANK	BLANK SUPPRESSION
0253	40442	035476		ISZ	MCNT	MATRIX COMPLETED?
0254	40443	002001		RSS		NO
0255	40444	127771		JMP	MIDEN,I	YES
0256	40445	065611	EINP0	LDB	TEMP1	<INPUT STATEMENT>
0257	40446	055334		CPB	PRGCT	SATISFIED?
0258	40447	026512		JMP	EIN12	YES
0259	40450	035472		ISZ	SERR	DID OVER/UNDERFLOW OCCUR?
0260	40451	026456		JMP	EINP9	YES
0261	40452	050374		CPA	+.15B	NO, END OF INPUT RECORD?
0262	40453	026400		JMP	EINP2-1	YES
0263	40454	050433		CPA	+.54B	NO, COMMA NEXT?
0264	40455	026465		JMP	EIN10	YES
0265	40456	115201	EINP9	JSB	WERRS,I	NO
0266	40457	065420		LDB	IFCNT	OUTPUT NEXT
0267	40460	006004		INB		ITEM
0268	40461	015454		JSB	OUTIN	NUMBER
0269	40462	060374		LDA	+.15B	OUTPUT
0270	40463	015452		JSB	OUTCR	CARRIAGE RETURN
0271	40464	026400		JMP	EINP2-1	
0272	40465	015446	EIN10	JSB	GETCR	END OF INPUT RECORD?
0273	40466	026456		JMP	EINP9	YES
0274	40467	015450		JSB	BCKSP	NO
0275	40470	026401		JMP	EINP2	

0276	40471	050421	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	115201	EINP8	JSB	WERRS,I	YES
0281	40476	065420		LDB	IFCNT	OUTPUT
0282	40477	015454		JSB	OUTIN	ITEM NUMBER
0283	40500	060374		LDA	+.15B	OUTPUT
0284	40501	015452		JSB	OUTCR	CARRIAGE RETURN
0285	40502	006400		CLB		NUMBER
0286	40503	055354		CPB	INTMP	REQUESTED?
0287	40504	026421		JMP	EINP4-3	YES
0288	40505	026535		JMP	EIN14	NO
0289	40506	075266	EIN11	STB	SIGN	SAVE SIGN
0290	40507	015446		JSB	GETCR	
0291	40510	026475		JMP	EINP8	OUT-OF-DATA ERROR
0292	40511	026435		JMP	EINP5	
0293	40512	050374	EIN12	CPA	+.15B	END OF RECORD?
0294	40513	002401		CLA	RSS	YES
0295	40514	115210		JSB	WERRS+7,I	NO
0296	40515	071570		STA	CHRCT	ZERO CHARACTER COUNT
0297	40516	060371		LDA	+.12B	OUTPUT A
0298	40517	015452		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	010500		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	015444	EIN14	JSB	INCAL	FETCH
0313	40536	035420		ISZ	IFCNT	FIRST
0314	40537	015446		JSB	GETCR	CHARACTER
0315	40540	026535		JMP	*-3	
0316	40541	007400		CCB		TURN OFF
0317	40542	075472		STB	SERR	OVER/UNDERFLOW FLAG
0318	40543	050421		CPA	+.42B	" ?
0319	40544	002001		RSS		YES
0320	40545	015450		JSB	BCKSP	NO, STRING BEGINS HERE
0321	40546	006400		CLB		TURN OFF
0322	40547	075571		STB	BLANK	BLANK SUPPRESSION
0323	40550	063770		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	055462		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	060664		LDA FSCHA	WITH BLANKS
0336	40565	015350		JSB TRSTR	
0337	40566	061354		LDA INTMP	RESTORE (A)
0338	40567	050374	EIN18	CPA .+15B	TRANSFER ENDED BY END-OF-INPUT?
0339	40570	026440		JMP EINP6	YES
0340	40571	015446	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	055462	EIN21	CPB PS1	LENGTH OF TRANSFER SPECIFIED?
0348	40601	026607		JMP EIN15	NO
0349	40602	015446	EIN16	JSB GETCR	YES
0350	40603	026440		JMP EINP6	IMPLIED CLOSING QUOTE
0351	40604	050421		CPA .+42B	" ?
0352	40605	026571		JMP EIN19	YES
0353	40606	026602		JMP EIN16	NO, LOOK FOR " OR END-OF-INPUT
0354	40607	015446	EIN15	JSB GETCR	END-OF-INPUT NEXT?
0355	40610	026440		JMP EINP6	YES
0356	40611	050421		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	061572		LDA SBPTR	DESTINATION STRING
0361	40616	071272		STA TEMP5	PARAMETERS
0362	40617	060417		LDA .+40B	SET TO
0363	40620	071571		STA BLANK	SKIP BLANKS
0364	40621	026475		JMP EINP8	
0365*					
0366***				**	
0367**	EXECUTE	<READ STATEMENT>		**	
0368***				**	
0369*					
0370	40622	015504	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	071572		STA SBPTR	NO, SAVE AND
0377	40631	061332		LDA OPDST	UNSTACK
0378	40632	040355		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	101572			
0383	40640	061611	EREAD1	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	064361	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	060664		LDA	FSCHA	
0392	40651	015350		JSB	TRSTR	TRANSFER STRING
0393	40652	026640		JMP	EREA1	
0394*						
0395***						**
0396**	EXECUTE	<PRINT STATEMENT>				**
0397***						**
0398*						
0399	40653	002404	EPRIN	CLA,INA		FLAG AS 'PRINT'
0400	40654	015552		JSB	EPRUS	CHECK FOR USING STATEMENT
0401	40655	002400		CLA		FLAG AS
0402	40656	071754		STA	FFLG	NON-FORMATTED
0403	40657	015504		JSB	VLFIL	VALIDATE FILE REQUEST
0404	40660	027017		JMP	EPR13	
0405	40661	026671		JMP	EPR12+1	NO FILE REQUEST FOUND
0406	40662	061234	EPRI1	LDA	FILE#	FILE
0407	40663	002021		SSA,RSS		MODE?
0408	40664	026670		JMP	EPRI2	YES
0409	40665	002400		CLA		NO, EXECUTE COMMA
0410	40666	051470		CPA	EOL	UNLESS PRECEDED BY
0411	40667	015426		JSB	EDELM	A 'TAB' (EOL = 1)
0412	40670	003401	EPRI2	CCA,RSS		TURN OFF 'END-OF-LINE' FLAG
0413	40671	002400		CLA		TURN ON
0414	40672	071470		STA	EOL	'END-OF-LINE' FLAG
0415	40673	161611	EPRI3	LDA	TEMP1,I	EXTRACT
0416	40674	010566		AND	OPDMK	NEXT OPERAND
0417	40675	002002		SZA		NULL?
0418	40676	026722		JMP	EPRI5	NO, BEGINS FORMULA
0419	40677	035611		ISZ	TEMP1	YES
0420	40700	065611	EPRI4	LDB	TEMP1	STATEMENT
0421	40701	055334		CPB	PRGCT	FINISHED?
0422	40702	027014		JMP	EPRI2	YES
0423	40703	161611		LDA	TEMP1,I	NO, EXTRACT
0424	40704	010570		AND	OPMSK	NEXT OPERATOR
0425	40705	050514		CPA	B2000	COMMA?
0426	40706	026662		JMP	EPRI1	YES
0427	40707	050516		CPA	B3000	NO, SEMICOLON?
0428	40710	026670		JMP	EPRI2	YES
0429	40711	050506		CPA	B1000	NO, " ?
0430	40712	026746		JMP	EPRI8	YES
0431	40713	050542		CPA	ENDOP	NO, 'END' ?
0432	40714	027006		JMP	EPRI1	YES
0433	40715	002003		SZA,RSS		NO, NULL?
0434	40716	026673		JMP	EPRI3	YES
0435	40717	003400		CCA		NO, MUST BE FORMULA
0436	40720	041611		ADA	TEMP1	RESET TO PRIOR
0437	40721	071611		STA	TEMP1	NULL OPERAND
0438	40722	003400	EPRI5	CCA		TURN OFF
0439	40723	071470		STA	EOL	'TAB' FLAG
0440	40724	015336		JSB	FORMX	EVALUATE FORMULA
0441	40725	165332		LDB	OPDST,I	IS IT A
0442	40726	006020		SSB		STRING VARIABLE?

0443	40727	026747		JMP EPRI8+1	YES
0444	40730	015376		JSB OPCHK	NO, UNSTACK VALUE ADDRESS
0445	40731	061234		LDA FILE#	TO BE WRITTEN
0446	40732	002021		SSA,RSS	ON A FILE?
0447	40733	026742		JMP EPRI7	YES
0448	40734	035470		ISZ EOL	NO, A 'TAB' ?
0449	40735	026700		JMP EPRI4	YES (EOL = 1 NOW)
0450	40736	104200		OLD 1,I	NO, OUTPUT
	40737	100001			
0451	40740	015416		JSB ENOUT	A NUMBER
0452	40741	026700		JMP EPRI4	
0453	40742	075572	EPR17	STB SBPTR	SAVE VALUE ADDRESS
0454	40743	064355		LDB .-2	WRITE NUMBER
0455	40744	015510		JSB FILST	ON FILE
0456	40745	026700		JMP EPRI4	
0457	40746	015340	EPR18	JSB STSTR	STACK STRING CONSTANT
0458	40747	060355		LDA .-2	PREPARE
0459	40750	015344		JSB PSTR	PRINT
0460	40751	071256		STA TEMP4	STRING
0461	40752	075410		STB TPRME	
0462	40753	064354		LDB .-3	PRESET TO WRITE ON FILE
0463	40754	061234		LDA FILE#	TO BE WRITTEN
0464	40755	002021		SSA,RSS	ON A FILE?
0465	40756	026744		JMP EPRI7+2	YES
0466	40757	002400		CLA	NO, TURN ON
0467	40760	071470		STA EOL	'END-OF-LINE' FLAG
0468	40761	061406		LDA TNULL	ENOUGH
0469	40762	003004		CMA,INA	SPACE
0470	40763	041570		ADA CHRCT	ON
0471	40764	043772		ADA M74	CURRENT
0472	40765	002021		SSA,RSS	LINE?
0473	40766	015424		JSB OUTLN	NO
0474	40767	027003		JMP EPRI0	YES
0475	40770	015364	EPR19	JSB FSCH	FETCH
0476	40771	060417		LDA .+40B	CHARACTER
0477	40772	050375		CPA .+16B	PSUEDO LINE FEED?
0478	40773	060371		LDA .+12B	YES
0479	40774	050376		CPA .+17B	PSUEDO CARRIAGE RETURN?
0480	40775	002001		RSS	YES
0481	40776	027002		JMP EPRI0-1	NO
0482	40777	060374		LDA .+15B	OUTPUT
0483	41000	015452		JSB OUTCR	CARRIAGE RETURN
0484	41001	002400		CLA	AND A NULL
0485	41002	015452		JSB OUTCR	OUTPUT CHARACTER
0486	41003	035406	EPR10	ISZ TNULL	MORE STRING?
0487	41004	026770		JMP EPRI9	YES
0488	41005	026700		JMP EPRI4	NO
0489	41006	071651	EPR11	STA EORFL	FILE
0490	41007	015512		JSB GTTYP	
0491	41010	050362		CPA .+3	FULL?
0492	41011	026677		JMP EPRI4-1	YES
0493	41012	007400		CCB	NO, WRITE
0494	41013	026744		JMP EPRI7+2	END-OF-FILE
0495	41014	035470	EPR12	ISZ EOL	'END-OF-LINE' FLAG SET?
0496	41015	015424		JSB OUTLN	YES
0497	41016	026031		JMP XEC1	NO

0498	41017	044347	EPR13	ADB .-8	SET BUFFER
0499	41020	160001		LDA B,I	DIR-
0500	41021	031027		IOR BIT15	TY
0501	41022	170001		STA B,I	BIT
0502	41023	065611		LDB TEMP1	NULL
0503	41024	055334		CPB PRGCT	PRINT?
0504	41025	026031		JMP XEC1	YES
0505	41026	026670		JMP EPR12	NO
0001*					
0002**					**
0003**				EXECUTE <PRINT USING STATEMENT>	**
0004**					**
0005*					
0006*				EXIT TO (P+1) IF NO USING OPERATOR FOUND, OTHERWISE PREPARE	
0007*				FORMAT SPECIFICATION STRING AND CALL FORMATTED OUTPUT ROUTINE.	
0008*					
0009	41027	071754	#EPRU	STA FFLG	SAVE FORMAT FLAG
0010	41030	065611		LDB TEMP1	
0011	41031	160001		LDA B,I	
0012	41032	050574		CPA PRTOP	NULL OPERAND?
0013	41033	006005		INB,RSS	YES
0014	41034	125552		JMP EPRUS,I	NO, CAN'T BE USING STATEMENT
0015	41035	055334		CPB PRGCT	END OF STATEMENT?
0016	41036	125552		JMP EPRUS,I	YES
0017	41037	160001		LDA B,I	NO, 'USING'
0018	41040	010570		AND OPMSK	OPERATOR
0019	41041	050604		CPA USEOP	NEXT?
0020	41042	002001		RSS	YES
0021	41043	125552		JMP EPRUS,I	NO, EXIT
0022	41044	120001		XOR B,I	GET OPERAND
0023	41045	075611		STB TEMP1	SAVE POINTER
0024	41046	002021		SSA,RSS	INTEGER FOLLOWS?
0025	41047	027065		JMP EPRU1	NO
0026	41050	006004		INB	
0027	41051	164001		LDB B,I	GET ADDRESS OF IMAGE STATEMENT
0028	41052	044361		ADB .+2	=> LENGTH WORD
0029	41053	160001		LDA B,I	
0030	41054	010570		AND OPMSK	GET OPERATOR
0031	41055	050546		CPA IMGOP	IMAGE?
0032	41056	002001		RSS	YES
0033	41057	115145		JSB RERRS+38,I	NO, ERROR
0034	41060	035611		ISZ TEMP1	BUMP TO POINT
0035	41061	035611		ISZ TEMP1	TO FIRST OPERAND
0036	41062	002400		CLA	
0037	41063	071760		STA NCH	
0038	41064	015550		JSB FRMAT	CALL FORMATTER
0039	41065	002003	EPRU1	SZA,RSS	NULL OPERAND?
0040	41066	027135		JMP EPRU4	YES
0041	41067	015336		JSB FORMX	NO, FETCH
0042	41070	060355		LDA .-2	STRING
0043	41071	015344		JSB PSTR	OPERAND
0044	41072	161260		LDA TEMP6,I	GET
0045	41073	010500		AND B377	LENGTH
0046	41074	002003		SZA,RSS	NULL STRING?
0047	41075	026031		JMP XEC1	YES
0048	41076	003004		CMA,INA	NO, SAVE

0049	41077	071550		STA STRLN	=LENGTH
0050	41100	065330		LDB TMPST	
0051	41101	044361		ADB .+2	
0052	41102	160001		LDA B,I	GET FIRST SUBSCRIPT
0053	41103	003004		CMA,INA	NEGATE IT
0054	41104	006004		INB	
0055	41105	134001		ISZ B,I	SECOND SUBSCRIPT EXIST?
0056	41106	027112		JMP EPRU2	YES
0057	41107	002400		CLA	NO, SET
0058	41110	071760		STA NCH	CHARACTER COUNT
0059	41111	027125		JMP EPRU3	
0060	41112	140001	EPRU2	ADA B,I	COMPUTE DIFFERENCE
0061	41113	002003		SZA,RSS	NULL STRING?
0062	41114	026031		JMP XEC1	YES
0063	41115	002020		SSA	NO, NEGATIVE?
0064	41116	115153		JSB RERRS+44,I	YES
0065	41117	071760		STA NCH	NO, SAVE DIFFERENCE
0066	41120	003400		CCA	
0067	41121	140001		ADA B,I	SECOND
0068	41122	041550		ADA STRLN	SUBSCRIPT
0069	41123	002021		SSA,RSS	VALID?
0070	41124	115153		JSB RERRS+44,I	NO
0071	41125	044356	EPRU3	ADB .-1	YES
0072	41126	160001		LDA B,I	FIRST
0073	41127	041550		ADA STRLN	SUBSCRIPT
0074	41130	002021		SSA,RSS	VALID?
0075	41131	115153		JSB RERRS+44,I	NO
0076	41132	160001		LDA B,I	YES, LOAD IT
0077	41133	065260		LDB TEMP6	=> FIRST WORD OF STRING
0078	41134	015550		JSB FRMAT	CALL FORMATTER
0079	41135	006004	EPRU4	INB	=> 1ST WORD OF STRING
0080	41136	160001		LDA B,I	UPDATE
0081	41137	010566		AND OPDMK	
0082	41140	002004		INA	INTRA=
0083	41141	001100		ARS	
0084	41142	041611		ADA TEMP1	STATEMENT
0085	41143	040361		ADA .+2	
0086	41144	071611		STA TEMP1	POINTER
0087	41145	002400		CLA	
0088	41146	071760		STA NCH	
0089	41147	015550		JSB FRMAT	CALL FORMATTER
0090*					
0091***					**
0092**	EXECUTE	<RESTORE STATEMENT>			**
0093***					**
0094*					
0095	41150	161611	ERSTR	LDA TEMP1,I	LOAD FLAG WORD
0096	41151	035611		ISZ TEMP1	ADVANCE STATEMENT POINTER
0097	41152	065575		LDB SPROG	SET (B) TO START OF PROGRAM
0098	41153	002020		SSA	'LABELLED RESTORE'
0099	41154	165611		LDB TEMP1,I	YES, RESET (B) TO STATEMENT
0100	41155	015360		JSB SETDP	SET DATA POINTERS
0101	41156	026031		JMP XEC1	
0102*					
0103***					**
0104**	EXECUTE	<ENTER STATEMENT>			**

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0105***                                     ***
0106*
0107 41157 161611 EENTR LDA TEMP1,I      => FIRST OPERATOR
0108 41160 010566      AND OPDMK
0109 41161 002002      SZA          IS '#' PRESENT?
0110 41162 027214      JMP EENT3     NO
0111 41163 065611      LDB TEMP1
0112 41164 006004      INB
0113 41165 160001      LDA B,I      GET NEXT OPERATOR
0114 41166 010570      AND OPMSK
0115 41167 050520      CPA B4000   '#'?
0116 41170 002001      RSS          YES
0117 41171 027214      JMP EENT3     NO
0118 41172 075611      STB TEMP1
0119 41173 015336      JSB FORMX   EVALUATE ADDRESS
0120 41174 165332      LDB OPDST,I
0121 41175 075572      STB SBPTR   => SYMBOL
0122 41176 061332      LDA OPDST   UNSTACK
0123 41177 040355      ADA .-2
0124 41200 071332      STA OPDST   ADDRESS
0125 41201 064255      LDB MAIN
0126 41202 006004      INB          => USERS TTY # IN TELETYPE TABLE
0127 41203 160001      LDA 1,I     GET TTY # AND
0128 41204 001727      ALF,ALF    RIGHT JUSTIFY
0129 41205 105120      OCT 105120  CONVERT TO FLOATING POINT
0130 41206 171572      STA SBPTR,I STORE
0131 41207 035572      ISZ SBPTR   TTY
0132 41210 175572      STB SBPTR,I NUMBER
0133 41211 061611      LDA TEMP1   ENTER STATEMENT
0134 41212 051334      CPA PRGCT   FINISHED?
0135 41213 026031      JMP XEC1    YES
0136 41214 015356      EENT3 JSB FETCH NO--FETCH ALLOWED TIME
0137 41215 015414      JSB IFIX    CONVERT
0138 41216 000000      NOP        TO
0139 41217 060001      LDA 1      SECONDS
0140 41220 010500      AND B377   MASK TO 8 BITS
0141 41221 002003      SZA,RSS    IF 0, SET
0142 41222 002004      INA        TO 1
0143 41223 071610      STA ATIM
0144 41224 060255      LDA MAIN   DOES THIS USER
0145 41225 002004      INA        HAVE THE
0146 41226 050253      CPA PRIST   LINE PRINTER?
0147 41227 115212      JSB WERRS+9,I YES - RELEASE IT
0148 41230 060400      LDA .+21B  OUTPUT
0149 41231 015452      JSB OUTCR   AN X-ON
0150 41232 060214      LDA STE    START
0151 41233 031610      IOR ATIM   ENTER
0152 41234 114742      JSB SCHIN,I TIMING
0153 41235      ENTRT EQU *
0154 41235 027253      JMP EENT6   INPUT ENTERED
0155 41236 015336      JSB FORMX   TIMEOUT OCCURED
0156 41237 165332      LDB OPDST,I => RESPONSE
0157 41240 075572      STB SBPTR   TIME
0158 41241 061332      LDA OPDST   UNSTACK
0159 41242 040355      ADA .-2
0160 41243 071332      STA OPDST   ADDRESS

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0161	41244	060316	LDA M256	SET
0162	41245	105120	OCT 105120	RESPONSE
0163	41246	171572	STA SBPTR,I	TIME
0164	41247	035572	ISZ SBPTR	TO
0165	41250	175572	STB SBPTR,I	-256
0166	41251	127252	JMP ++1,I	
0167	41252	041425	DEF EEN18	
0168	41253		EENT6 EQU *	
0169	41253	006400	CLB	DON'T SUPPRESS
0170	41254	075571	STB BLANK	BLANKS
0171	41255	015446	JSB GETCR	FIRST
0172	41256	000000	NOP	CHARACTER A
0173	41257	064417	LDB .+40B	SUPPRESS
0174	41260	075571	STB BLANK	BLANKS
0175	41261	050362	CPA .+3	CONTROL C?
0176	41262	124652	JMP EXITA,I	YES
0177	41263	015450	JSB BCKSP	NO
0178	41264	015336	JSB FORMX	EVALUATE ADDRESS
0179	41265	165332	LDB OPDST,I	
0180	41266	075572	STB SBPTR	=> RESPONSE TIME
0181	41267	075420	STB RSPTR	
0182	41270	061332	LDA OPDST	UNSTACK
0183	41271	040355	ADA .-2	
0184	41272	071332	STA OPDST	ADDRESS
0185	41273	064255	LDB MAIN	
0186	41274	044377	ADB .+?RTIM	GET RESPONSE
0187	41275	160001	LDA 1,I	TIME
0188	41276	105120	OCT 105120	
0189	41277	171572	STA SBPTR,I	STORE
0190	41300	035572	ISZ SBPTR	IT
0191	41301	175572	STB SBPTR,I	
0192	41302	015336	JSB FORMX	EVALUATE ADDRESS
0193	41303	165332	LDB OPDST,I	IS IT A
0194	41304	006020	SSB	STRING VARIABLE?
0195	41305	027341	JMP EEN10	YES
0196	41306	061332	LDA OPDST	NO,
0197	41307	040355	ADA .-2	UNSTACK
0198	41310	071332	STA OPDST	ADDRESS
0199	41311	075572	STB SBPTR	SAVE DESTINATION ADDRESS
0200	41312	002400	CLA	SET SIGN
0201	41313	071266	STA SIGN	TO POSITIVE
0202	41314	015446	JSB GETCR	FETCH FIRST CHARACTER
0203	41315	027414	JMP EEN17	NONE FOUND--ERROR
0204	41316	007400	CCB	TURN OFF
0205	41317	075607	STB ENOUF	OVER/UNDERFLOW FLAG
0206	41320	050434	CPA .+55B	!-!?
0207	41321	027326	JMP EENT7	YES
0208	41322	006404	CLB,INB	NO
0209	41323	050432	CPA .+53B	!+!?
0210	41324	002001	RSS	YES
0211	41325	027331	JMP EENT8	NO
0212	41326	075266	EENT7 STB SIGN	SET SIGN
0213	41327	015446	JSB GETCR	GET NEXT CHARACTER
0214	41330	027414	JMP EEN17	NONE FOUND
0215	41331	015276	EENT8 JSB NUMCK	NUMBER?
0216	41332	000000	NOP	NO--ERROR

0217	41333	027414		JMP EEN17	BAD EXPONENT--ERROR
0218	41334	035607		ISZ ENOUF	DID OVER/UNDERFLOW OCCUR?
0219	41335	027414		JMP EEN17	YES--ERROR
0220	41336	050374		CPA .+15B	NO, CARRIAGE RETURN FOLLOWS?
0221	41337	027425		JMP EEN18	YES
0222	41340	027414		JMP EEN17	NO--ERROR
0223	41341	007000	EEN10	CMB	EXTRACT
0224	41342	160001		LDA 1,I	PHYSICAL
0225	41343	001727		ALF,ALF	LENGTH OF
0226	41344	010500		AND B377	DESTINATION STRING
0227	41345	003000		CMA	SET IT AS END
0228	41346	141330		ADA TMPST,I	OF UNSPECIFIED
0229	41347	071410		STA TPRME	DESTINATION STRING
0230	41350	003400		CCA	PREPARE
0231	41351	015344		JSB PSTR	DESTINATION STRING
0232	41352	065406		LDB TNULL	SAVE LENGTH
0233	41353	075354		STB INTMP	ALLOWANCE
0234	41354	006400		CLB	TURN OFF
0235	41355	075571		STB BLANK	BLANK SUPPRESSION
0236	41356	063767		LDA FENCA	POINT TO ENTER CHAR ROUTINE
0237	41357	015350		JSB TRSTR	TRANSFER STRING
0238	41360	006400		CLB	ALL REQUESTED
0239	41361	055406		CPB TNULL	CHARACTERS TRANSFERRED?
0240	41362	027401		JMP EEN14	YES
0241	41363	055462		CPB PS1	NO, TRANSFER LENGTH SPECIFIED?
0242	41364	027375		JMP EEN13	NO
0243	41365	071354		STA INTMP	YES--SAVE (A)
0244	41366	003400		CCA	FINISH
0245	41367	071410		STA TPRME	
0246	41370	041406		ADA TNULL	TRANSFER
0247	41371	071406		STA TNULL	
0248	41372	060664		LDA FSCHA	WITH BLANKS
0249	41373	015350		JSB TRSTR	
0250	41374	027425		JMP EEN18	
0251	41375	165260	EEN13	LDB TEMP6,I	SET LOGICAL
0252	41376	045406		ADB TNULL	TO ACTUAL
0253	41377	175260		STB TEMP6,I	STRING LENGTH
0254	41400	027425		JMP EEN18	
0255	41401	055462	EEN14	CPB PS1	LENGTH OF TRANSFER SPECIFIED?
0256	41402	027406		JMP EEN16	NO
0257	41403	015446	EEN15	JSB GETCR	YES
0258	41404	027425		JMP EEN18	CARRIAGE RETURN
0259	41405	027403		JMP EEN15	LOOK FOR CARRIAGE RETURN
0260	41406	015446	EEN16	JSB GETCR	END-OF-INPUT NEXT?
0261	41407	027425		JMP EEN18	YES
0262	41410	061354		LDA INTMP	NO--DESTINATION STRING EXCEEDED
0263	41411	071406		STA TNULL	RESTORE
0264	41412	061572		LDA SBPTR	DESTINATION STRING
0265	41413	071272		STA TEMP5	PARAMETERS
0266	41414	161420	EEN17	LDA RSPTR,I	TAKE
0267	41415	035420		ISZ RSPTR	ARITHMETIC
0268	41416	165420		LDB RSPTR,I	INVERSE OF
0269	41417	015370		JSB ARINV	RESPONSE TIME
0270	41420	175420		STB RSPTR,I	STORE
0271	41421	007400		CCB	IN
0272	41422	045420		ADB RSPTR	VALUE

0273	41423	170001		STA 1,I	TABLE
0274	41424	075607		STB ENOUF	CLEAR OVER/UNDERFLOW FLAG
0275	41425	002400	EEN18	CLA	ZERO CHARACTER
0276	41426	071570		STA CHRCT	COUNTER
0277	41427	060417		LDA .+40B	RESTORE
0278	41430	071571		STA BLANK	BLANK SUPPRESSION
0279	41431	002400		CLA	OUTPUT A
0280	41432	015452		JSB OUTCR	NULL.
0281	41433	026031		JMP XEC1	
0282*					
0283***					**
0284**	EXECUTE	<ASSIGN STATEMENT>			**
0285***					**
0286*					
0287	41434		EASN	EQU *	
0288	41434	060354		LDA .-3	
0289	41435	071440		STA LT5	
0290	41436	071771		STA ASINP	SET FLAG TO SAY ASSIGN OCCURRED
0291	41437	067765		LDB ASBFA	
0292	41440	063764		LDA DBLNK	
0293	41441		EASN0	EQU *	
0294	41441	170001		STA B,I	BLANK OUT 3 WORDS
0295	41442	006004		INB	
0296	41443	035440		ISZ LT5	
0297	41444	027441		JMP EASN0	
0298	41445	002404		CLA,INA	ALLOW STRING
0299	41446	071470		STA EOL	CONSTANT
0300	41447	015336		JSB FORMX	EVALUATE STRING
0301	41450	060355		LDA .-2	
0302	41451	015344		JSB PSTR	PREPARE STRING OPERAND
0303	41452	071256		STA TEMP4	SAVE SOURCE POINTER
0304	41453	002400		CLA	INITIALIZE TO
0305	41454	071466		STA ASTYP	LOCAL LIBRARY
0306	41455	054356		CPB .-1	NULL STRING?
0307	41456	027514		JMP EASN02	YES
0308	41457	075410		STB TPRME	SAVE STRING LENGTH
0309	41460	065256		LDB TEMP4	GET FIRST
0310	41461	004065		CLE,ERB	
0311	41462	160001		LDA B,I	CHARACTER
0312	41463	002041		SEZ,RSS	
0313	41464	001727		ALF,ALF	OF STRING
0314	41465	010500		AND B377	
0315	41466	006404		CLB,INB	SET FOR PUBLIC LIBRARY
0316	41467	050423		CPA .+44B	'S'?
0317	41470	027474		JMP EASN01	YES
0318	41471	050431		CPA .+52B	NO, '1'?
0319	41472	006005		INB,RSS	YES, SET FOR GROUP LIBRARY
0320	41473	027477		JMP EASN00	NO
0321	41474		EASN01	EQU *	
0322	41474	075466		STB ASTYP	SAVE LIBRARY TYPE
0323	41475	035256		ISZ TEMP4	BUMP SOURCE POINTER
0324	41476	035410		ISZ TPRME	BUMP LENGTH
0325	41477		EASN00	EQU *	
0326	41477	061410		LDA TPRME	
0327	41500	040366		ADA .+7	
0328	41501	002020		SSA	LENGTH > 6?

0329	41502	002400	CLA	YES, SET TO 6
0330	41503	040350	ADA .-7	NO
0331	41504	071410	STA TPRME	
0332	41505	071406	STA TNULL	
0333	41506	063765	LDA ASBFA	POINTER TO
0334	41507	071554	STA ASBFP	NAME BUFFER
0335	41510	001000	ALS	
0336	41511	071272	STA TEMP5	DESTINATION STRING POINTER
0337	41512	060654	LDA FCUCA	UPPER CASE CHARACTERS ONLY
0338	41513	015350	JSB TRSTR	MOVE NAME
0339	41514	015356	EAS02 JSB FETCH	EVALUATE NUMERIC OPERAND
0340	41515	015342	JSB SBFIX	ROUND TO INTEGER
0341	41516	064506	LDB B1000	
0342	41517	075550	STB ORDNO	SAVE SPECIFIED ORDINAL NUMBER
0343	41520	015336	JSB FORMX	LEAVE NEXT VARIABLE ON TOP OF ST
0344	41521	161332	LDA OPDST, I	SAVE ADDRESS OF USER VARIABLE
0345	41522	071633	STA ATMP+1	
0346	41523	060363	LDA .+4	DEFAULT
0347	41524	105120	OCT 105120	RETURN CODE
0348	41525	104400	DST ATMP+1, I	TO NON-EXISTENT FILE
		41526		
0349	41527	015376	JSB OPCHK	UNSTACK VALUE ADDRESS
0350	41530	061550	LDA ORDNO	DOES
0351	41531	003000	CMA	REQUESTED
0352	41532	041500	ADA FCNTR	FILE
0353	41533	003021	CMA, SSA, RSS	EXIST?
0354	41534	026031	JMP XEC1	NO, DONE
0355	41535	006400	CLB	
0356	41536	061550	LDA ORDNO	LOCATE
0357	41537	100200	MPY .+FTEL	CORRECT
		41540		
0358	41541	041502	ADA FILTB	FCB
0359	41542	040364	ADA .+5	
0360	41543	071236	STA FBASE	DISC ADDRESS AND SAVE IT
0361	41544	040362	ADA .+3	
0362	41545	164000	LDB 0, I	GET CURRENT BUFFER ADDRESS
0363	41546	040350	ADA .-7	
0364	41547	160000	LDA 0, I	
0365	41550	001423	ALR, RAR	CLEAR BITS 15 AND 14
0366	41551	003004	CMA, INA	
0367	41552	040001	ADA 1	
0368	41553	071645	STA RQ3	
0369	41554	015514	JSB WRBUF	WRITE OUT RECORD
0370	41555	061236	LDA FBASE	RESTORE
0371	41556	040352	ADA .-5	FCB
0372	41557	071236	STA FBASE	POINTER
0373	41560	006400	CLB	
0374	41561	174000	STB 0, I	INITIALIZE
0375	41562	040375	ADA .+14	
0376	41563	174000	STB 0, I	INITIALIZE PROTECTMASK TO 0
0377	41564	075770	STB RETCD	INITIALIZE RETURN CODE
0378	41565	114744	JSB SCHLB, I	CALL IN
0379	41566	072047	DEF ASNIB	ASSIGN OVERLAY
0380	41567	027646	JMP EASN4	FILE RECORD SIZE TOO LARGE
0381	41570	035770	ISZ RETCD	FILE DOESN'T EXIST OR PROTECTED
0382	41571	035770	ISZ RETCD	'READ ONLY' - GROUP OR A000

0383	41572	035770	ISZ RETCD	'READ ONLY' - FILE IN USE
0384	41573	061611	LDA TEMP1	
0385	41574	051334	CPA PRGCT	END OF STATEMENT ?
0386	41575	027644	JMP EASN3	YES
0387	41576	160000	LDA 0,I	TEST FOR A COMMA
0388	41577	010570	AND OPMSK	
0389	41600	050514	CPA B2000	COMMA FOLLOWING?
0390	41601	002001	RSS	
0391	41602	027644	JMP EASN3	NO
0392	41603	002404	CLA,INA	ALLOW
0393	41604	071470	STA EOL	STRING CONSTANT
0394	41605	015336	JSB FORMX	YES, EVALUATE STRING OPERAND
0395	41606	060355	LDA .-2	PREPARE
0396	41607	015344	JSB PSTR	SOURCE
0397	41610	071256	STA TEMP4	STRING
0398	41611	075410	STB TPRME	
0399	41612	063765	LDA ASBFA	
0400	41613	071554	STA ASBFP	GET CHARACTER
0401	41614	001000	ALS	POINTER TO
0402	41615	071272	STA TEMP5	PASSWORD BUFFER
0403	41616	060354	LDA .-3	
0404	41617	071440	STA LT5	
0405	41620	065554	LDB ASBFP	
0406	41621	063764	LDA DBLNK	
0407	41622	170001	STA 1,I	FILL PASSWORD
0408	41623	006004	INB	BUFFER WITH
0409	41624	035440	ISZ LT5	BLANKS
0410	41625	027622	JMP *-3	
0411	41626	060350	LDA .-7	SET LENGTH (IN CHARACTERS)
0412	41627	071406	STA TNULL	OF PASSWORD BUFFER
0413	41630	060664	LDA FSCHA	
0414	41631	015350	JSB TRSTR	MOVE PASSWORD TO BUFFER
0415	41632	061554	LDA ASBFP	
0416	41633	002004	INA	
0417	41634	104200	OLD 0,I	
	41635	100000		
0418	41636	141554	ADA ASBFP,I	ADD WORD1 AND WORD2
0419	41637	020001	XOR 1	EXCLUSIVE OR = WORD3
0420	41640	030221	IOR RBP	INCLUSIVE OR BITS 14 AND 15
0421	41641	065236	LDB FBASE	
0422	41642	044375	ADB .+14	
0423	41643	170001	STA 1,I	STORE PROTECTMASK IN FCB
0424*				
0425	41644	061770	EASN3 LDA RETCD	A = RETURN CODE
0426	41645	002001	RSS	
0427	41646	060364	EASN4 LDA .+5	
0428	41647	105120	OCT 105120	FLOAT RETURN CODE AND
0429	41650	104400	DST ATMP+1,I	STORE IN USER VARIABLE
	41651	101633		
0430	41652	026031	JMP XEC1	DONE

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0432*
0433*** **
0434** COMPLETE EXECUTION **
0435*** **
0436*
0437 41653          EXIT FOU *
0438 41653 103100   CLF 0
0439 41654 160255   LDA MAIN,I       INHIBIT
0440 41655 030377   IOR UNABT
0441 41656 170255   STA MAIN,I       ABORTS
0442 41657 102100   STF 0
0443 41660 061500   LDA FCNTR        SET COUNTER TO
0444 41661 003000   CMA              1'S COMPLEMENT OF
0445 41662 071500   STA FCNTR        NUMBER OF FILES
0446 41663 002004   INA              SAVE 2'S COMPLEMENT FOR
0447 41664 071550   STA FRMAT        LCD'S FILE COUNT
0448 41665 061232   LDA FCORE        LOAD FIRST BUFFER ADDRESS
0449 41666 065502   LDB FILTB        LOAD POINTER TO
0450 41667 044364   ADB .+5          FIRST DISC ADDRESS (LOW WORD)
0451 41670 035500   EXIT0 ISZ FCNTR  MORE FILES?
0452 41671 027750   JMP EXIT2        YES
0453 41672 015556   JSB LCDLP        UPDATE LAST CHANGE DATE
0454 41673 006400   EXIT3 CLB        OUTPUT
0455 41674 174632   STB DCLC1,I
0456 41675 114614   JSB ABCK,I
0457 41676 160634   LDA DCLC2,I
0458 41677 170632   STA DCLC1,I
0459 41700 063773   LDA EXIT1
0460 41701 071426   STA LT1          COMPLETION
0461 41702 160255   LDA MAIN,I
0462 41703 010363   AND HFLAG
0463 41704 002002   SZA              MESSAGE UNLESS
0464 41705 003401   CCA,RSS          SHELL0 PROGRAM
0465 41706 060353   LDA .-4
0466 41707 064255   LDB MAIN         DOES USER
0467 41710 006004   INB              HAVE LP?
0468 41711 054253   CPB PRIST
0469 41712 002001   RSS
0470 41713 027721   JMP EXIT4        NO.
0471 41714 063735   LDA EXT1A        YES,
0472 41715 071426   STA LT1          RELEASE IT AND
0473 41716 060345   LDA .-10         PRINT MESSAGE
0474 41717 006400   CLB
0475 41720 074253   STB PRIST
0476 41721 006400   EXIT4 CLB
0477 41722 075274   STB LT2
0478 41723 015460   JSB OUTST
0479 41724 060255   LDA MAIN         TELL 2114
0480 41725 002004   INA
0481 41726 160000   LDA 0,I         THAT USER IS
0482 41727 030224   IOR UNR
0483 41730 114736   JSB S14LP,I     FINISHED RUNNING
0484 41731 060363   LDA .+4         CLEAR PBFLG AND CBFLG
0485 41732 064255   LDB MAIN
0486 41733 015562   JSB EDABR
0487 41734 124740   JMP SCHEN,I     BITS.

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0488	41735	041735	EXT1A	DEF *	
0489	41736	011423		OCT 11423	
0490	41737	006412		OCT 6412	
0491	41740	046120		ASC 3,LP FRE	
	41741	020106			
	41742	051105			
0492	41743		EXT1	EQU *	
0493	41743	042412		OCT 42412	
0494	41744	006412		OCT 6412	
0495	41745	042117		ASC 2,DONE	
	41746	047105			
0496	41747	006412		OCT 6412	
0497	41750	075236	EXIT2	STB FBASE	WRITE
0498	41751	071645		STA RQ3	OUT
0499	41752	015514		JSB WRBUF	RECORD
0500	41753	065236		LDB FBASE	GET RECORD
0501	41754	044372		ADB .+FTEL-4	SIZE OF NEXT FILE
0502	41755	160001		LDA 1,I	
0503	41756	001423		ALR,RAR	CLEAR BITS 14 AND 15
0504	41757	003004		CMA,INA	
0505	41760	044366		ADB .+7	GET END OF FILE BUFFER
0506	41761	140001		ADA 1,I	COMPUTE FILE BUFFER STARTING ADD
0507	41762	044354		ADB .-3	POINT B TO FIRST DISC ADDRESS
0508	41763	027670		JMP EXIT0	
0510	41764	020040	DBLNK	OCT 20040	
0511	41765	001737	ASBFA	DEF ERSEC+60	
0512	41766	142254	XECBR	DEF XECTB-428,I	
0513	41767	001522	FENCA	DEF FENCH	
0514	41770	001274	FINCA	DEF FINCH	
0515	41771	046174	MIOEN	DEF MIO7	
0516	41772	177666	M74	DEC -74	
0517	41773	041743	EXIT1	DEF EXT1	

```

0002 42000                ORG 42000B
0003 42000 142672  ARBAS DEF FOJT=12B,I
0004 42001 177712  D66   OCT  =66
0005 42002 041673  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 114744  ECHAN JSB SCHLB,I   CALL SYSTEM TO EXECUTE DISC ROUT
0015 42007 072051                DEF CHLIB
0016 42010 115146                JSB RERRS+39,I
0017 42011 115157                JSB RERRS+48,I
0018 42012 115147                JSB RERRS+40,I
0019 42013 115150                JSB RERRS+41,I
0020 42014 115156                JSB RERRS+47,I
0021 42015 115161                JSB RERRS+50,I   BAD LINE NUMBER
0022 42016 126017                JMP  ++1,I       GO COMPILE IT
0023 42017 036051                DEF CMLP0
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 055573  #STDP CPB SYMTB   PROGRAM EXHAUSTED?
0035 42021 026037                JMP SETD2         YES, SET 'OUT OF DATA' CONDITION
0036 42022 044361                ADB  .+2         NO,
0037 42023 160001                LDA  1,I         STATEMENT
0038 42024 044356                ADB  .-1         OF
0039 42025 010570                AND  OPMSK       TYPE
0040 42026 050536                CPA  DATOP      'DATA'?
0041 42027 026033                JMP  SETD1       YES
0042 42030 144001                ADB  1,I         NO, COMPUTE
0043 42031 044356                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;

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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 065611 #VLFI LDB TEMP1 IS
0063 42044 006004 INB
0064 42045 055334 CPB PRGCT NEXT
0065 42046 026053 JMP VLFI0
0066 42047 160001 LDA 1,I OPERATOR
0067 42050 010570 AND OPMSK
0068 42051 050520 CPA B4000 A '#' ?
0069 42052 026055 JMP VLFI1 YES
0070 42053 035504 VLFI0 ISZ VLFIL NO, EXIT
0071 42054 125504 JMP VLFIL,I TO (P+2)
0072 42055 007400 VLFI1 CCB SET
0073 42056 161611 LDA TEMP1,I VL0 = 0
0074 42057 010570 AND OPMSK FOR
0075 42060 050574 CPA PRTOP 'PRINT',
0076 42061 006400 CLB ELSE
0077 42062 075514 STB VL0 VL0 = -1
0078 42063 035611 ISZ TEMP1 EVALUATE
0079 42064 015356 JSB FETCH FILE REFERENCE
0080 42065 015342 JSB SBFIX 15-BIT INTEGER?
0081 42066 115142 JSB RRRS+35,I NO
0082 42067 075234 STB FILE# YES, SAVE IT
0083 42070 161611 LDA TEMP1,I NEXT
0084 42071 010570 AND OPMSK OPERATOR
0085 42072 050514 CPA B2000 A COMMA?
0086 42073 026105 JMP VLFI3 YES
0087 42074 007400 CCB NO, USE NULL RECORD
0088 42075 075520 VLFI2 STB RCRD#
0089 42076 006020 SSB NULL RECORD?
0090 42077 064355 LDB ,-2 YES, DO NOT ADJUST FILE POINTER
0091 42100 061234 LDA FILE#
0092 42101 035514 ISZ VL0 WRITE REQUEST?
0093 42102 003000 CMA YES
0094 42103 015506 JSB RQSTR VALIDATE FILE/RECORD REQUEST
0095 42104 125504 JMP VLFIL,I
0096 42105 015356 VLFI3 JSB FETCH EVALUATE RECORD REFERENCE
0097 42106 015342 JSB SBFIX 15-BIT INTEGER?
0098 42107 064273 LDB INF NO, LOAD IMPOSSIBLE RECORD
0099 42110 026075 JMP VLFI2 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

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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	115124		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	115125		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	010500		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	040364		ADA .+5	
0155	42166	160000		LDA 0,I	PROTECT
0156	42167	071767		STA PMASK	MASK
0157	42170	075272		STB TEMP5	SAVE DATA REQUEST TYPE
0158	42171	065520		LDB RCRD#	GET TYPE
0159	42172	075651		STB EORFL	OF NEXT ITEM
0160	42173	015512		JSB GTTYP	IN FILE
0161	42174	051272		CPA TEMP5	MATCHING TYPES?
0162	42175	026213		JMP FDAT5	YES
0163	42176	050363		CPA .+4	NO, END-OF-RECORD?
0164	42177	026203		JMP FDAT4	YES
0165	42200	050362		CPA .+3	NO, END-OF-FILE?
0166	42201	002001		RSS	YES
0167	42202	115125		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	115144	JSB RERRS+37,I	YES, UNPROTECTED EOF/EOR
0172	42207	075334	STB PRGCT	NO
0173	42210	065250	LDB FORST	CLEAN UP
0174	42211	015430	JSB SETPT	EXECUTION STACKS
0175	42212	124762	JMP XEC1A,I	
0176	42213	165236	FDAT5 LDB FBASE,I	LOAD DATA ADDRESS
0177	42214	002011	SLA,RSS	STRING?
0178	42215	026231	JMP FDATA6	YES
0179	42216	104200	DLD 1,I	NO, LOAD NUMBER
		42217	100001	
0180	42220	002003	SZA,RSS	ZEROS ARE
0181	42221	026226	JMP FDATA7	NOT MASKED
0182	42222	021767	XOR PMASK	MASK
0183	42223	101100	SWP	
0184	42224	021767	XOR PMASK	DATA
0185	42225	101100	SWP	
0186	42226	135236	FDAT7 ISZ FBASE,I	ADJUST RECORD POINTER
0187	42227	135236	ISZ FBASE,I	PAST DATA
0188	42230	125362	JMP FDATA,I	
0189	42231	160001	FDAT6 LDA 1,I	LOAD STRING HEADER
0190	42232	006004	INB	SET
0191	42233	005000	BLS	SOURCE
0192	42234	075256	STB TEMP4	ADDRESS
0193	42235	005100	BRS	
0194	42236	010500	AND B377	SET
0195	42237	003000	CMA	TRANSFER
0196	42240	071410	STA TPRME	LENGTH
0197	42241	003004	CMA,INA	ADJUST
0198	42242	001100	ARS	RECORD POINTER
0199	42243	044000	ADB 0	PAST
0200	42244	175236	STB FBASE,I	STRING
0201	42245	125362	JMP FDATA,I	


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0203**
0204*** REQUEST AN INPUT RECORD ***
0205**
0206*
0207* SERVICES REQUESTS FOR TELETYPE INPUT. IF (A) = 0 EMIT A '?'
0208* AND 'X-ON' ELSE EMIT A LINE FEED, TWO '?', AND AN 'X-ON'.
0209*
0210 42246 072003 #INCL STA ITEMP SAVE FLAG
0211 42247 060255 LDA MAIN DOES THIS USER
0212 42250 002004 INA HAVE THE
0213 42251 050253 CPA PRIST LINE PRINTER?
0214 42252 115212 JSB WERRS+9,I YES = RELEASE IT
0215 42253 062003 LDA ITEMP RESTORE FLAG
0216 42254 002002 SZA INITIAL REQUEST?
0217 42255 026305 JMP INCL2 NO
0218 42256 061570 LDA CHRCT YES
0219 42257 042004 ADA M72 LINE
0220 42260 002020 SSA FULL?
0221 42261 026266 JMP INCL1 NO
0222 42262 060374 LDA .+15B YES, OUTPUT
0223 42263 015452 JSB OUTCR CARRIAGE RETURN
0224 42264 060371 LDA .+12B AND
0225 42265 015452 JSB OUTCR LINE FEED
0226 42266 060460 INCL1 LDA B77 OUTPUT
0227 42267 015452 JSB OUTCR '?'
0228 42270 060400 LDA .+21B OUTPUT
0229 42271 015452 JSB OUTCR AN X-ON
0230 42272 002400 CLA RESET
0231 42273 071570 STA CHRCT OUTPUT CHARACTER COUNTER
0232 42274 071420 STA IFCNT AND INPUT ITEM COUNTER
0233 42275 060225 LDA IWT
0234 42276 114742 JSB SCHIN,I REQUEST INPUT RECORD
0235 42277 015446 JSB GETCR FIRST
0236 42300 026305 JMP INCL2 CHARACTER A
0237 42301 050362 CPA .+3 'CONTROL C' ?
0238 42302 124652 JMP EXITA,I YES, TERMINATE EXECUTION
0239 42303 015450 JSB BCKSP NO, RETURN
0240 42304 125444 JMP INCAL,I TO CALLER
0241 42305 060255 INCL2 LDA MAIN IF USER
0242 42306 002004 INA HAS THE
0243 42307 050253 CPA PRIST LINE PRINTER,
0244 42310 115212 JSB WERRS+9,I RELEASE IT
0245 42311 060371 LDA .+12B OUTPUT A
0246 42312 015452 JSB OUTCR LINE FEED
0247 42313 060460 LDA B77 AND
0248 42314 015452 JSB OUTCR A '?'
0249 42315 026266 JMP INCL1
0250**
0251*** EXECUTION BRANCH TABLE ***
0252**
0253 42316 041434 XECTB DEF EASN ASSIGN
0254 42317 040031 DEF XEC1 USING
0255 42320 040031 DEF XEC1 IMAGE
0256 42321 040031 DEF XEC1 COM
0257 42322 040111 DEF ELET LET
0258 42323 040031 DEF XEC1 DIM

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0259	42324	040031	DEF XEC1	DEF
0260	42325	040031	DEF XEC1	REM
0261	42326	040136	DEF EGOTO	GOTO
0262	42327	040124	DEF EIF	IF
0263	42330	040207	DEF EFOR	FOR
0264	42331	040307	DEF ENEXT	NEXT
0265	42332	040137	DEF EGOSB	GOSUB
0266	42333	040364	DEF ERTRN	RETURN
0267	42334	041653	DEF EXIT	END
0268	42335	041653	DEF EXIT	STOP
0269	42336	040031	DEF XEC1	DATA
0270	42337	040373	DEF EINPT	INPUT
0271	42340	040622	DEF EREAD	READ
0272	42341	040653	DEF EPRIN	PRINT
0273	42342	041150	DEF FRSTR	RESTORE
0274	42343	046023	DEF EMAT	MAT
0275	42344	040031	DEF XEC1	FILES
0276	42345	042006	DEF ECHAN	CHAIN
0277	42346	041157	DEF EENTR	ENTER
0278	42347	040111	DEF ELET	'IMPLIED' LET
0279**			**	
0280***	FETCH FORMULA VALUE		***	
0281**			**	
0282*				
0283*	RETURN WITH THE RESULT IN (A) AND (B)			
0284*				
0285	42350	015336	#FTCH JSB FORMX	EVALUATE FORMULA
0286	42351	015376	JSB OPCHK	UNSTACK ADDRESS
0287	42352	104200	DLD 1,I	LOAD RESULT
	42353	100001		
0288	42354	125356	JMP FETCH,I	
0289**			**	
0290***	SET EXECUTION POINTERS		***	
0291**			**	
0292*				
0293*	SETS POINTERS TO THOSE STACKS WHOSE LOCATION MAY CHANGE			
0294*	DURING EXECUTION, USUALLY DUE TO INITIATION OR COMPLETION			
0295*	OF FOR=LOOPS.			
0296*				
0297	42355	075250	#STPT STB FORST	SET TOP OF FOR=STACK
0298	42356	044363	ADB .+4	SET POINTER TO TOP
0299	42357	075330	STB TMPST	OF TEMPORARY STACK
0300	42360	044403	ADB .+20	SET POINTER TO TOP
0301	42361	075332	STB OPDST	OF OPERAND STACK
0302	42362	044362	ADB .+3	SET POINTER TO BOTTOM
0303	42363	075464	STB OPTRQ	OF OPERATOR STACK
0304	42364	007000	CMB	OUT
0305	42365	044716	ADB LWAUS	OF
0306	42366	006020	SSB	STORAGE?
0307	42367	115111	JSB RERRS+10,I	YES
0308	42370	065464	LDB OPTRQ	NO, SET POINTER TO TOP
0309	42371	074056	STB PBPTR	OF OPERATOR STACK
0310	42372	125430	JMP SETPT,I	
0311**			**	
0312***	INITIALIZE FOR PROGRAM MODIFICATION		***	
0313**			**	

0314 42373 060417 #SINI LDA .+40B
0315 42374 071571 STA BLANK
0316 42375 071420 STA GFLAG
0317 42376 125462 JMP SINIT,I

TURN ON
BLANK SUPPRESSION
TURN OFF INTEGER ERROR-SUPPRESS

```

0319**                               **
0320***  EVALUATE A FORMULA  ***
0321**                               **
0322*
0323*  ENTER WITH TEMP1 POINTING TO THE FIRST OPERAND OF THE
0324*  FORMULA. OPERATORS AND THE ADDRESSES OF OPERANDS ARE
0325*  STACKED SEPARATELY. OPERAND ADDRESSES ARE STACKED AS
0326*  SOON AS THE OPERAND IS SCANNED. AN OPERATOR IS NOT
0327*  STACKED WHILE THE OPERATOR ON TOP OF THE STACK HAS EQUAL
0328*  OR HIGHER PRECEDENCE, INSTEAD THE LATTER IS UNSTACKED
0329*  AND EXECUTED; THUS AN OPERATOR FORCES EXECUTION OF THOSE
0330*  PREVIOUSLY STACKED, DOWN TO THE LATEST ONE STACKED WHICH
0331*  HAS A LOWER PRECEDENCE. THE OPERATOR STACK IS INITIALIZED
0332*  WITH AN END-OF-FORMULA (LOWEST PRECEDENCE) OPERATOR. THE
0333*  ACTION OF OPERATORS IS IN GENERAL TO COMBINE THE TOP TWO
0334*  OPERANDS STACKED. THE ADDRESS OF THE PARTIAL RESULT THUS
0335*  OBTAINED REPLACES THE ADDRESSES OF ITS CONSTITUENT OPERANDS
0336*  ON THE STACK (VALUES OF PARTIAL RESULTS ARE KEPT ON THE
0337*  TEMPORARY STACK). UPON EXIT TEMP1 POINTS TO THE FIRST PROGRAM
0338*  WORD WHOSE OPERATOR DOES NOT MANIPULATE THE STACK (THIS
0339*  MAY BE AN END-OF-FORMULA, 'THEN', 'OF', ETC.).
0340*
0341  42377 015366 #FORM JSB PSHST      STACK
0342  42400 006400          CLB        BEGINNING-OF-FORMULA
0343  42401 174056          STB PBPTR,I OPERATOR
0344*                               *
0345**  PROCESS NEXT OPERAND  **
0346*                               *
0347  42402 161611 FORM1 LDA TEMP1,I  EXTRACT
0348  42403 035611          ISZ TEMP1  NEXT
0349  42404 010566          AND OPDMK  OPERAND
0350  42405 002003          SZA,RSS    NULL OPERAND?
0351  42406 026447          JMP FORM2  YES
0352  42407 035332          ISZ OPDST  NO, BUMP POINTER
0353  42410 035332          ISZ OPDST  TO OPERAND STACK
0354  42411 002020          SSA        VARIABLE OPERAND?
0355  42412 026525          JMP FORM6  NO
0356*                               *
0357**  STACK NON-FUNCTION VARIABLE OPERAND ADDRESS  **
0358*                               *
0359*
0360*  THE ADDRESSES STACKED ARE AS FOLLOWS; FOR SIMPLE VARIABLES,
0361*  A POINTER TO THE VALUE; FOR ARRAYS, THE BASE ADDRESS; FOR
0362*  STRING VARIABLES, THE NEGATION OF THE BASE ADDRESS.
0363*
0364  42413 040356          ADA .-1     COMPUTE
0365  42414 001000          ALS        POINTERS
0366  42415 041573          ADA SYMTB  TO SYMBOL
0367  42416 064000          LDB 0    TABLE
0368  42417 006004          INB        ENTRY
0369  42420 160000          LDA 0,I   PROGRAMMER-
0370  42421 010376          AND .+17B  DEFINED
0371  42422 050376          CPA .+17B  FUNCTION?
0372  42423 026557          JMP FORM8  YES
0373  42424 164001          LDB 1,I  NO, LOAD VALUE POINTER
0374  42425 002002          SZA        STRING VARIABLE?

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0375	42426	026446		JMP FORM2-1	NO
0376	42427	061611		LDA TEMP1	YES, END
0377	42430	051334		CPA PRGCT	OF FORMULA?
0378	42431	026436		JMP FORM0	YES
0379	42432	161611		LDA TEMP1, I	NO,
0380	42433	010570		AND OPMSK	FOLLOWED BY
0381	42434	050554		CPA LBOP	SUBSCRIPT?
0382	42435	026445		JMP FORM2-2	YES
0383	42436	075256	FORM0	STB TEMP4	NO
0384	42437	015400		JSB RSCHK	CREATE TEMPORARY
0385	42440	002400		CLA	RECORD
0386	42441	007400		CCB	
0387	42442	104400		DST TMPST, I	(0, -1)
		42443			
0388	42444	065256		LDB TEMP4	RETRIEVE AND
0389	42445	007004		CMB, INB	NEGATE STRING ADDRESS
0390	42446	175332		STB OPDST, I	STACK ADDRESS
0391*				*	
0392**				**	
0393*				*	
0394	42447	061611	FORM2	LDA TEMP1	FORMULA
0395	42450	051334		CPA PRGCT	EXHAUSTED?
0396	42451	026465		JMP FORM3	YES
0397	42452	161611		LDA TEMP1, I	NO,
0398	42453	010570		AND OPMSK	EXTRACT
0399	42454	001727		ALF, ALF	NEXT
0400	42455	064000		LDB 0	OPERATOR
0401	42456	050361		CPA .+2	STRING CONSTANT?
0402	42457	026657		JMP FOR13	YES
0403	42460	040337		ADA .-20B	NO, NON-FORMULA
0404	42461	002020		SSA	OPERATOR?
0405	42462	006400		CLB	YES
0406	42463	042001		ADA D66	NO, NON-FORMULA
0407	42464	002021		SSA, RSS	OPERATOR?
0408	42465	006400	FORM3	CLB	YES
0409	42466	002400		CLA	NO
0410	42467	006003		SZB, RSS	END-OF-FORMULA?
0411	42470	026474		JMP ++4	YES
0412	42471	044660		ADB FOPBS	NO, LOAD OPERATOR
0413	42472	160001		LDA 1, I	INFORMATION WORD
0414	42473	010500		AND B377	SAVE
0415	42474	071252		STA TEMP2	PRIORITY
0416	42475	120001		XOR 1, I	SAVE
0417	42476	001100		ARS	INTERNAL
0418	42477	071254		STA TEMP3	NAME
0419*				*	
0420**				**	
0421*				*	
0422	42500	160056	FORM4	LDA PBPTR, I	DOES OPERATOR
0423	42501	010500		AND B377	ON TOP
0424	42502	003000		CMA	OF STACK
0425	42503	041252		ADA TEMP2	HAVE HIGHER
0426	42504	002020		SSA	PRIORITY?
0427	42505	026515		JMP FORM5	YES
0428	42506	061252		LDA TEMP2	NO
0429	42507	050372		CPA .+13B	CORRECT

0430	42510	002404		CLA, INA	STACK PRIORITY
0431	42511	031254		IOR TEMP3	ADD NAME
0432	42512	015366		JSB PSHST	STACK
0433	42513	170056		STA PBPTR, I	OPERATOR
0434	42514	026402		JMP FORM1	
0435	42515	160056	FORM5	LDA PBPTR, I	POP
0436	42516	064355		LDB .-2	OPERATOR
0437	42517	044056		ADB PBPTR	FROM TOP
0438	42520	074056		STB PBPTR	OF STACK
0439	42521	001727		ALF, ALF	BRANCH
0440	42522	010500		AND B377	TO
0441	42523	042000		ADA ARBAS	APPROPRIATE
0442	42524	124000		JMP 0, I	ROUTINE
0443*					*
0444**	STACK CONSTANT OR PARAMETER ADDRESS				**
0445*					*
0446*					
0447*	FOR NUMERICAL CONSTANTS STACK A POINTER TO THE VALUE				
0448*	EMBEDDED IN THE PROGRAM, FOR PARAMETERS STACK THE				
0449*	PARAMETER ADDRESS.				
0450*					
0451	42525	001665	FORM6	ELA, CLE, ERA	ERASE FLAG BIT
0452	42526	002002		SZA	CONSTANT?
0453	42527	026534		JMP FORM7	NO
0454	42530	065611		LDB TEMP1	YES,
0455	42531	035611		ISZ TEMP1	STACK
0456	42532	035611		ISZ TEMP1	ADDRESS
0457	42533	026446		JMP FORM2-1	
0458	42534	071252	FORM7	STA TEMP2	PRE-
0459	42535	010376		AND .+17B	DEFINED
0460	42536	050376		CPA .+17B	FUNCTION?
0461	42537	026542		JMP ++3	YES
0462	42540	165464		LDB OPTRQ, I	NO, STACK
0463	42541	026446		JMP FORM2-1	PARAMETER ADDRESS
0464*					
0465*	FOR FUNCTIONS RECURSION ON FORMX EVALUATES THE PARAMETER				
0466*	AND, FOR PROGRAMMER DEFINED FUNCTIONS, THE VALUE.				
0467*	FUNCTION VALUES ARE LEFT ON THE TEMPORARY STACK AND A				
0468*	POINTER THERETO IS PLACED ON THE OPERAND STACK.				
0469*	'LEN' IS HANDLED IN A SPECIAL WAY.				
0470*					
0471*					*
0472**	EVALUATE PRE-DEFINED FUNCTION				**
0473*					*
0474	42542	021252		XOR TEMP2	IDENTIFY
0475	42543	001727		ALF, ALF	
0476	42544	001700		ALF	FUNCTION
0477	42545	050374		CPA .+15B	'LEN' ?
0478	42546	026636		JMP FOR12	YES
0479	42547	041000		ADA PDFBS	NO, STACK
0480	42550	015366		JSB PSHST	JUMP TO
0481	42551	170056		STA PBPTR, I	ENTRY POINT
0482	42552	061336		LDA FORMX	SAVE FORMX
0483	42553	171332		STA OPDST, I	RETURN ADDRESS
0484	42554	015336		JSB FORMX	EVALUATE ARGUMENT
0485	42555	015374		JSB STTOP	BRANCH TO

0486 42556 124056

JMP PBPTR,I

SUBROUTINE

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0488*
0489** EVALUATE PROGRAMMER-DEFINED FUNCTION **
0490*
0491 42557 160001 FORM8 LDA 1,I LOAD ADDRESS OF FORMULA
0492 42560 015366 JSB PSHST SAVE VALUE OF
0493 42561 065330 LDB TMPST CURRENT POINTER TO
0494 42562 174056 STB PBPTR,I TEMPORARY STACK
0495 42563 015366 JSB PSHST SAVE ADDRESS OF
0496 42564 170056 STA PBPTR,I DEFINING FORMULA
0497 42565 061336 LDA FORMX SAVE FORMX
0498 42566 171332 STA OPDST,I RETURN ADDRESS
0499 42567 015336 JSB FORMX EVALUATE ARGUMENT
0500 42570 161332 LDA OPDST,I SWAP
0501 42571 165464 LDB OPTRQ,I OLD AND NEW
0502 42572 175332 STB OPDST,I ARGUMENT
0503 42573 171464 STA OPTRQ,I ADDRESSES
0504 42574 051330 CPA TMPST PROTECT PARAMETER
0505 42575 015400 JSB R3CHK ON TEMPORARY STACK
0506 42576 061611 LDA TEMP1 SWAP ADDRESSES
0507 42577 164056 LDB PBPTR,I OF CURRENT
0508 42600 075611 STB TEMP1 AND FUNCTION
0509 42601 170056 STA PBPTR,I FORMULAS
0510 42602 015336 JSB FORMX EVALUATE FUNCTION
0511 42603 165332 LDB OPDST,I POP
0512 42604 060355 LDA ,-2 OPERAND
0513 42605 041332 ADA OPDST STACK,
0514 42606 071332 STA OPDST SAVING
0515 42607 161332 LDA OPDST,I RESULT ADDRESS
0516 42610 171464 STA OPTRQ,I AND ADDRESS OF
0517 42611 175332 STB OPDST,I OLD PARAMETER
0518 42612 160056 LDA PBPTR,I RESTORE
0519 42613 071611 STA TEMP1 FORMULA POINTER
0520 42614 060056 LDA PBPTR POP
0521 42615 040355 ADA ,-2 OPERATOR
0522 42616 070056 STA PBPTR STACK
0523 42617 160056 LDA PBPTR,I RESTORE ORIGINAL
0524 42620 071330 STA TMPST TEMPORARY STACK POINTER
0525 42621 015374 JSB STTOP LOAD FUNCTION RESULT
0526*
0527** RECORD RESULT OF FUNCTION **
0528*
0529*
0530* PRE-DEFINED FUNCTIONS RETURN TO THIS POINT WITH THEIR
0531* RESULT IN (A) AND (B).
0532*
0533 42622 104400 FOR10 DST TMPST,I SAVE RESULT
0534 42623 101330
0534 42624 161332 LDA OPDST,I RESTORE FORMX
0535 42625 071336 STA FORMX RETURN ADDRESS
0536 42626 061330 LDA TMPST RECORD LOCATION
0537 42627 171332 STA OPDST,I OF RESULT
0538 42630 064056 LDB PBPTR POP
0539 42631 044355 ADB ,-2 FUNCTION
0540 42632 074056 STB PBPTR ADDRESS
0541 42633 035611 ISZ TEMP1 OF RESULT
0542 42634 035611 ISZ TEMP1 ON TOP OF

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0543 42635 026447      JMP FORM2      OPERAND STACK
0544*
0545** EVALUATE 'LEN' **
0546*
0547 42636 015400  FOR12 JSB RSCHK      CREATE SPACE ON TEMPORARY STACK
0548 42637 161611      LDA TEMP1,I    FIND
0549 42640 010566      AND OPDMK      STRING'S
0550 42641 040356      ADA .-1        SYMBOL
0551 42642 001000      ALS           TABLE
0552 42643 041573      ADA SYMTB      ENTRY
0553 42644 002004      INA           LOAD ADDRESS
0554 42645 160000      LDA 0,I       OF STRING
0555 42646 040356      ADA .-1        EXTRACT
0556 42647 160000      LDA 0,I       STRING
0557 42650 010500      AND B377      LENGTH
0558 42651 105120      OCT 105120    STACK
0559 42652 104400      DST TMPST,I   STRING LENGTH
0560 42653 101330
0561 42654 061330      LDA TMPST     STACK ADDRESS
0562 42655 171332      STA OPDST,I   OF RESULT
0563*
0564** PROCESS STRING CONSTANT **
0565*
0566*
0567* WHEN STRING CONSTANTS ARE STACKED, AN APPROPRIATE
0568* ENTRY IS PLACED ON THE TEMPORARY STACK SO THAT ALL
0569* STRING OPERANDS HAVE THE SAME FORM: A NEGATED BASE
0570* ADDRESS ON THE OPERAND STACK AND A TWO WORD ENTRY ON
0571* THE TEMPORARY STACK CONTAINING THE START-OF-STRING
0572* AND END-OF-STRING DESIGNATORS BIASED BY -1 (DEFAULT
0573* START-OF-STRING DESIGNATORS HAVE A STACK VALUE OF 0,
0574* DEFAULT END-OF-STRING DESIGNATORS HAVE A STACK VALUE
0575* OF -1). IN THE CASE OF SUBSCRIPTED STRING VARIABLES,
0576* THE TEMPORARY IS CREATED WHEN THE ']' IS SCANNED; THE
0577* ENTRY FOR NON-SUBSCRIPTED STRING OPERANDS IS CREATED
0578* WHEN THEY ARE SCANNED.
0579*
0580 42657 002404  FOR13 CLA,INA      PRINT STATEMENT
0581 42660 051470      CPA EOL        STRING CONSTANT?
0582 42661 015340      JSB STSTR     NO, STACK STRING CONSTANT
0583 42662 026465      JMP FORM3     EXECUTE END-OF-FORMULA

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PAGE 0140 #11 FORMULA EVALUATION ROUTINES

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0585*
0586** RECORD RESULT OF OPERATION **
0587*
0588*
0589* OPERATORS CREATING INTERMEDIATE RESULTS RETURN TO HERE.
0590*
0591 42663 035332 FOR14 ISZ OPDST STACK
0592 42664 035332 ISZ OPDST TEMPORARY
0593 42665 104400 DST TMPST,I RESULT
      42666 101330
0594 42667 061330 LDA TMPST SAVE
0595 42670 171332 STA OPDST,I ADDRESS ON
0596 42671 026500 JMP FORM4 OPERAND STACK
0597*
0598** EXIT FORMULA EVALUATOR **
0599*
0600*
0601* THIS WORD IS ACTUALLY PART OF THE FORMULA OPERATOR JUMP
0602* TABLE. THE WORDS BETWEEN IT AND FOJT CORRESPOND TO
0603* OPERATORS WHICH ARE NOT EXECUTED, SO CODE IS INSERTED HERE
0604* TO UTILIZE THIS SPACE.
0605*
0606 42672 101336 DEF FORMX,I
0607**
0608*** SET LOGICAL VALUES ***
0609**
0610 42673 002400 FALSE CLA LOAD
0611 42674 006400 CLB ZERO
0612 42675 026663 JMP FOR14
0613 42676 061031 TRUE LDA HALF LOAD
0614 42677 064361 LDB ,+2 1.0
0615 42700 026663 JMP FOR14
0616**
0617*** EXECUTE UNARY - ***
0618**
0619 42701 015374 EUMIN JSB STTOP UNSTACK AND LOAD TOP OF STACK
0620 42702 015370 JSB ARINV NEGATE IT
0621 42703 026663 JMP FOR14 STORE IT
0622**
0623*** FORMULA OPERATOR JUMP TABLE ***
0624**
0625 42704 042734 FOJT DEF ELBRC (
0626 42705 042402 DEF FORM1 (
0627 42706 042500 DEF FORM4 UNARY +
0628 42707 042701 DEF EUMIN UNARY -
0629 42710 042743 DEF ESCMA SUBSCRIPT COMMA
0630 42711 043017 DEF ESTR ASSIGNMENT OPERATOR
0631 42712 043126 DEF EFAD +
0632 42713 043131 DEF EFSB -
0633 42714 043134 DEF EFMP *
0634 42715 043137 DEF EFDV /
0635 42716 043142 DEF EPWR ↑
0636 42717 043243 DEF EGTRT >
0637 42720 043247 DEF ELST <
0638 42721 043265 DEF ENEQL #
0639 42722 043255 DEF EEQL *

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0640	42723	000000	NOP	UNUSED
0641	42724	043312	DEF EAND	AND
0642	42725	043320	DEF EIOR	OR
0643	42726	043300	DEF EMIN	MIN
0644	42727	043271	DEF EMAX	MAX
0645	42730	043265	DEF ENEQL	<>
0646	42731	043251	DEF EGORE	>*
0647	42732	043261	DEF ELORE	<*
0648	42733	043326	DEF ENOT	NOT
0649**			**	
0650***	EXECUTE LEFT BRACKET		***	
0651**			**	
0652*				
0653*	LOAD A DEFAULT SECOND SUBSCRIPT AND ENTER THE CODE FOR			
0654*	A SUBSCRIPT COMMA.			
0655*				
0656	42734	061332	ELBRC LDA OPDST	LOAD
0657	42735	040355	ADA .-2	-1
0658	42736	160000	LDA 0,I	FOR A
0659	42737	007400	CCB	STRING,
0660	42740	002021	SSA,RSS	0
0661	42741	006400	CLB	FOR
0662	42742	026753	JMP ESCM1	AN ARRAY
0663**			**	
0664***	EXECUTE SUBSCRIPT COMMA		***	
0665**			**	
0666*				
0667*	BOTH SUBSCRIPTS ARE ROUNDED TO INTEGERS AND TESTED TO BE			
0668*	POSITIVE. FOR STRINGS, THE TWO INTEGERS ARE SAVED ON THE			
0669*	TEMPORARY STACK AS A PSEUDO-ENTRY LATER USED BY PSTR. FOR			
0670*	ARRAYS, THE SUBSCRIPTS ARE CHECKED AND IF WITHIN THE CURRENT			
0671*	BOUNDS THEY ARE COMBINED WITH THE BASE ADDRESS OF THE ARRAY.			
0672*	THE ARRAY ELEMENT ADDRESS THEN REPLACES THE BASE ADDRESS ON			
0673*	THE OPERAND STACK. UNSUITABLE SUBSCRIPTS EXIT TO THE ERROR			
0674*	ROUTINE.			
0675*				
0676	42743	015376	ESCM1 JSB OPCHK	UNSTACK
0677	42744	104200	DLD 1,I	SECOND SUBSCRIPT
	42745	100001		
0678	42746	015342	JSB SBFIX	ROUND TO INTEGER
0679	42747	115120	JSB RERRS+17,I	UNSUITABLE RESULT
0680	42750	060056	LDA PBPTR	UNSTACK
0681	42751	040355	ADA .-2	THE
0682	42752	070056	STA PBPTR	'['
0683	42753	075256	ESCM1 STB TEMP4	SAVE RESULT
0684	42754	015374	JSB STTOP	POP FIRST SUBSCRIPT
0685	42755	015342	JSB SBFIX	ROUND TO INTEGER
0686	42756	115120	JSB RERRS+17,I	UNSUITABLE RESULT
0687	42757	175330	STB TMPST,I	STORE IN TEMPORARY STACK
0688	42760	161332	LDA OPDST,I	STRING
0689	42761	002021	SSA,RSS	VARIABLE?
0690	42762	026770	JMP ESCM2	NO, ARRAY VARIABLE
0691	42763	061330	LDA TMPST	YES,
0692	42764	002004	INA	SAVE
0693	42765	065256	LDB TEMP4	SECOND SUBSCRIPT IN
0694	42766	174000	STB 0,I	TEMPORARY STACK

0695	42767	026402		JMP FORM1	
0696	42770	040355	ESCM2	ADA .-2	LOAD COLUMN
0697	42771	104200		DLD 0,I	AND ROW BOUNDS
	42772	100000			
0698	42773	003004		CMA,INA	IS SPECIFIED
0699	42774	141330		ADA TMPST,I	ROW
0700	42775	002021		SSA,RSS	LEGAL?
0701	42776	115120		JSB RERRS+17,I	NO
0702	42777	075272		STB TEMP5	YES
0703	43000	007004		CMB,INB	IS SPECIFIED
0704	43001	045256		ADB TEMP4	COLUMN
0705	43002	006021		SSB,RSS	LEGAL?
0706	43003	115120		JSB RERRS+17,I	NO
0707	43004	161330		LDA TMPST,I	YES, COMPUTE ROW
0708	43005	100200		MPY TEMP5	DISPLACEMENT
	43006	001272			
0709	43007	041256		ADA TEMP4	ADD COLUMN DISPLACEMENT
0710	43010	001000		ALS	DOUBLE FOR CORE WORDS
0711	43011	141332		ADA OPDST,I	STORE ACTUAL
0712	43012	171332		STA OPDST,I	ELEMENT ADDRESS
0713	43013	061330		LDA TMPST	POP UNUSED
0714	43014	040355		ADA .-2	TEMPORARY
0715	43015	071330		STA TMPST	STACK
0716	43016	026402		JMP FORM1	ENTRY
0001**				**	
0002***	EXECUTE STORE			***	
0003**				**	
0004*					
0005*	IN ORDER TO ALLOW MULTIPLE ASSIGNMENT STATEMENTS, NO				
0006*	ASSIGNMENT CAN TAKE PLACE UNTIL THE RIGHT-HAND FORMULA				
0007*	IS EVALUATED; I.E. ONLY AN END-OF-FORMULA OPERATOR CAN				
0008*	FORCE AN ASSIGNMENT OPERATOR OFF OF THE STACK. ASSIGNMENTS				
0009*	MAY BE NUMERICAL TO NUMERICAL TYPE OPERAND, IN WHICH CASE				
0010*	THE ASSIGNED QUANTITY IS SAVED FOR POSSIBLE ADDITIONAL				
0011*	ASSIGNMENTS; OR STRING TO STRING OPERAND. IN THE LATTER				
0012*	CASE AN INTERMEDIATE STRING IS NECESSARY IF THE HEAD OF				
0013*	THE DESTINATION STRING LIES IN THE TAIL OF THE ACTUAL				
0014*	SOURCE STRING.				
0015*					
0016	43017	065252	ESTR	LDB TEMP2	NEXT OPERATOR AN
0017	43020	006002		SZB	END-OF-FORMULA?
0018	43021	027120		JMP ESTR5	NO
0019	43022	055254		CPB TEMP3	YES, FIRST STORE OF FORMULA?
0020	43023	027036		JMP ESTR2	YES
0021	43024	161332	ESTR1	LDA OPDST,I	NO, SET
0022	43025	071260		STA TEMP6	DESTINATION ADDRESS
0023	43026	104200		DLD TEMP3,I	TRANSFER
	43027	101254			
0024	43030	104400		DST TEMP6,I	THE NUMBER
	43031	101260			
0025	43032	061332		LDA OPDST	UNSTACK
0026	43033	040355		ADA .-2	DESTINATION
0027	43034	071332		STA OPDST	OPERAND
0028	43035	026500		JMP FORM4	
0029	43036	161332	ESTR2	LDA OPDST,I	STRING
0030	43037	002020		SSA	OPERANDS?

0031	43040	027044		JMP	ESTR3	YES
0032	43041	015376		JSB	OPCHK	NO, UNSTACK SOURCE
0033	43042	075254		STB	TEMP3	AND SAVE VALUE ADDRESS
0034	43043	027024		JMP	ESTR1	
0035	43044	060355	ESTR3	LDA	, -2	PREPARE
0036	43045	015344		JSB	PSTR	SOURCE
0037	43046	071256		STA	TEMP4	STRING
0038	43047	075410		STB	TPRME	
0039	43050	003400		CCA		PREPARE
0040	43051	015344		JSB	PSTR	DESTINATION STRING
0041	43052	064056		LDB	PBPTR	SAVE CORE
0042	43053	075436		STB	EST1	POINTER
0043	43054	061256		LDA	TEMP4	TRANSFER
0044	43055	003000		CMA		TO
0045	43056	041272		ADA	TEMP5	HIGHER
0046	43057	002020		SSA		CORE?
0047	43060	027113		JMP	ESTR4	NO
0048	43061	041410		ADA	TPRME	YES,
0049	43062	040361		ADA	, +2	OVERLAPPING
0050	43063	002021		SSA, RSS		TRANSFER?
0051	43064	027113		JMP	ESTR4	NO
0052	43065	061272		LDA	TEMP5	YES, SAVE
0053	43066	071440		STA	EST2	DESTINATION ADDRESS
0054	43067	006004		INB		SET DESTINATION
0055	43070	005000		BLS		ADDRESS TO START
0056	43071	075272		STB	TEMP5	OF FREE CORE
0057	43072	061406		LDA	TNULL	SAVE TRANSFER
0058	43073	071442		STA	EST3	LENGTH
0059	43074	003004		CMA, INA		ALLOCATE
0060	43075	001100		ARS		SPACE FOR
0061	43076	015326		JSB	CUSP	INTERMEDIATE
0062	43077	070056		STA	PBPTR	STRING
0063	43100	060664		LDA	FSCHA	
0064	43101	015350		JSB	TRSTR	TRANSFER STRING TO FREE CORE
0065	43102	061442		LDA	EST3	RESTORE TRANSFER
0066	43103	071406		STA	TNULL	LENGTH
0067	43104	071410		STA	TPRME	RESET ACTUAL SOURCE LENGTH
0068	43105	061436		LDA	EST1	SET SOURCE
0069	43106	002004		INA		ADDRESS TO
0070	43107	001000		ALS		INTERMEDIATE
0071	43110	071256		STA	TEMP4	STRING
0072	43111	061440		LDA	EST2	RESTORE ORIGINAL
0073	43112	071272		STA	TEMP5	DESTINATION STRING
0074	43113	060664	ESTR4	LDA	FSCHA	
0075	43114	015350		JSB	TRSTR	COMPLETE TRANSFER
0076	43115	061436		LDA	EST1	RESTORE FREE
0077	43116	070056		STA	PBPTR	CORE POINTER
0078	43117	026515		JMP	FORM5	EXECUTE END-OF-FORMULA
0079	43120	034056	ESTR5	ISZ	PBPTR	DEFER
0080	43121	034056		ISZ	PBPTR	EXECUTION
0081	43122	063125		LDA	BASSO	
0082	43123	170056		STA	PBPTR, I	
0083	43124	026506		JMP	FORM4+6	
0084*						
0085	43125	007402	BASSO	OCT	7402	
0086**			**			

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0087*** EXECUTE + ***
0088**
0089 43126 015372 EFAD JSB BINOP
0090 43127 015402 JSB .FAD
0091 43130 026663 JMP FOR14
0092**
0093*** EXECUTE - ***
0094**
0095 43131 015372 EFSB JSB BINOP
0096 43132 015404 JSB .FSB
0097 43133 026663 JMP FOR14
0098**
0099*** EXECUTE * ***
0100**
0101 43134 015372 EFMP JSB BINOP
0102 43135 015406 JSB .FMP
0103 43136 026663 JMP FOR14
0104**
0105*** EXECUTE / ***
0106**
0107 43137 015372 EFDV JSB BINOP
0108 43140 015410 JSB .FDV
0109 43141 026663 JMP FOR14
0110**
0111*** EXECUTE ↑ ***
0112**
0113*
0114** REAL POWER **
0115*
0116*
0117* EXIT TO ERROR IF BASE IS NEGATIVE. ELSE COMPUTE
0118* RESULT AS E↑(POWER*LN(BASE)),
0119*
0120 43142 165332 EPWR LDB OPDST,I LOAD
0121 43143 104200 DLD 1,I POWER
0122 43144 100001
0122 43145 015414 JSB IFIX INTEGER?
0123 43146 027151 JMP ++3 NO
0124 43147 102301 SOS YES, 16-BIT?
0125 43150 027164 JMP IPWR YES
0126 43151 015372 JSB BINOP NO, UNSTACK
0127 43152 002001 RSS ARGUMENTS
0128 43153 015354 JSB PCHK CHECK ARGUMENTS
0129 43154 002020 SSA NEGATIVE BASE?
0130 43155 115135 JSB RERRS+30,I YES
0131 43156 065640 LDB BIN01 NO, LOAD BASE ADDRESS
0132 43157 015434 JSB .LOG TAKE NATUAL LOG
0133 43160 015406 JSB .FMP MULTIPLY
0134 43161 101641 DEF BIN02,I BY POWER
0135 43162 015432 JSB .EXP EXPONENTIATE
0136 43163 026663 JMP FOR14
0137*
0138** INTEGER POWER **
0139*
0140*
0141* MULTIPLY BASE REPEATEDLY, USING POWERS-OF-TWO METHOD

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0142* TO SPEED PROCESS. IF POWER IS NEGATIVE, TAKE RECIPROCAL
0143* FOR FINAL RESULT.
0144*
0145 43164 075264 IPWR STB TT1 SAVE SIGN
0146 43165 006020 SSB FORM ABSOLUTE
0147 43166 007004 CMB,INB VALUE OF POWER
0148 43167 075266 STB TT2 SAVE IT
0149 43170 015372 JSB BINOP UNSTACK
0150 43171 002001 RSS ARGUMENTS
0151 43172 015354 JSB PCHK CHECK ARGUMENTS
0152 43173 065640 LDB BIN01 STORE
0153 43174 071640 STA BIN01
0154 43175 075641 STB BIN02
0155 43176 061031 LDA HALF BASE
0156 43177 071614 STA TT3 INITIALIZE
0157 43200 060361 LDA .+2 RESULT
0158 43201 071615 STA TT4 TO
0159 43202 065266 IPWR1 LDB TT2 1.0
0160 43203 004031 SLB,BRS DIVIDE POWER
0161 43204 027223 JMP IPWR4 BY 2
0162 43205 075266 STB TT2 ODD POWER
0163 43206 006002 IPWR2 SZB EVEN POWER
0164 43207 027234 JMP IPWR5 ZERO?
0165 43210 061264 LDA TT1 NO
0166 43211 002020 SSA YES
0167 43212 027216 JMP IPWR3 POSITIVE POWER?
0168 43213 061614 LDA TT3 NO
0169 43214 065615 LDB TT4 YES, RETURN
0170 43215 026663 JMP FOR14 WITH
0171 43216 061031 IPWR3 LDA HALF RESULT
0172 43217 064361 LDB .+2 TAKE
0173 43220 015410 JSB .FDV RECIPROCAL
0174 43221 001614 DEF TT3 FOR
0175 43222 026663 JMP FOR14 FINAL
0176 43223 075266 IPWR4 STB TT2 RESULT
0177 43224 061640 LDA BIN01 SAVE POWER
0178 43225 065641 LDB BIN02 LOAD
0179 43226 015406 JSB .FMP BASE
0180 43227 001614 DEF TT3 MULTIPLY BY
0181 43230 071614 STA TT3 RESULT SO FAR
0182 43231 075615 STB TT4 SAVE NEW
0183 43232 065266 LDB TT2 PARTIAL
0184 43233 027206 JMP IPWR2 RESULT
0185 43234 061640 IPWR5 LDA BIN01 SQUARE
0186 43235 065641 LDB BIN02
0187 43236 015406 JSB .FMP BASE
0188 43237 001640 DEF BIN01
0189 43240 071640 STA BIN01 RECORD
0190 43241 075641 STB BIN02 NEW
0191 43242 027202 JMP IPWR1 BASE

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0193**          **
0194*** EXECUTE > ***
0195**          **
0196 43243 015352 EGRT JSB COMPR COMPARE OPERANDS
0197 43244 002020      SSA          < ?
0198 43245 026673      JMP FALSE   YES
0199 43246 027266      JMP ENEQL+1 NO
0200**          **
0201*** EXECUTE < ***
0202**          **
0203 43247 015352 ELST JSB COMPR COMPARE OPERANDS
0204 43250 003001      CMA,RSS REVERSE COMPARISON SENSE
0205**          **
0206*** EXECUTE >= ***
0207**          **
0208 43251 015352 EGORE JSB COMPR COMPARE OPERANDS
0209 43252 002020      SSA          < ?
0210 43253 026673      JMP FALSE   YES
0211 43254 026676      JMP TRUE    NO
0212**          **
0213*** EXECUTE = ***
0214**          **
0215 43255 015352 EEQL JSB COMPR COMPARE OPERANDS
0216 43256 002002      SZA          = ?
0217 43257 026673      JMP FALSE   NO
0218 43260 026676      JMP TRUE    YES
0219**          **
0220*** EXECUTE <= ***
0221**          **
0222 43261 015352 ELORE JSB COMPR COMPARE OPERANDS
0223 43262 002020      SSA          >= ?
0224 43263 026676      JMP TRUE    NO
0225 43264 027256      JMP EEQL+1 YES
0226**          **
0227*** EXECUTE # OR <> ***
0228**          **
0229 43265 015352 ENEQL JSB COMPR COMPARE OPERANDS
0230 43266 002002      SZA          # ?
0231 43267 026676      JMP TRUE    NO
0232 43270 026673      JMP FALSE   YES
0233**          **
0234*** EXECUTE 'MAX' ***
0235**          **
0236 43271 015372 EMAX JSB BINOP SUBTRACT THE
0237 43272 015404      JSB ,FSB TOP TWO OPERANDS
0238 43273 002021      SSA,RSS TOP OPERAND LARGER?
0239 43274 027304      JMP ARG1 NO
0240 43275 104200 ARG2 DLD BIN02,I YES, RETRIEVE
      43276 101641
0241 43277 026663      JMP FOR14 ITS VALUE
0242**          **
0243*** EXECUTE 'MIN' ***
0244**          **
0245 43300 015372 EMIN JSB BINOP SUBTRACT THE
0246 43301 015404      JSB ,FSB TOP TWO OPERANDS
0247 43302 002021      SSA,RSS TOP OPERAND LARGER?

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0248 43303 027275          JMP ARG2          NO
0249 43304 035332 ARG1  ISZ OPDST    YES,
0250 43305 035332          ISZ OPDST    RETRIEVE
0251 43306 165332          LDB OPDST,I   VALUE OF
0252 43307 104200          DLD 1,I       NEXT-TO-TOP
                    43310 100001
0253 43311 026665          JMP FOR14+2    OPERAND
0254**
0255*** EXECUTE 'AND' ***
0256**
0257 43312 015372 EAND  JSB BINOP    UNSTACK
0258 43313 002001          RSS           OPERANDS
0259 43314 002003          SZA,RSS      TOP OPERAND ZERO?
0260 43315 026673          JMP FALSE     YES
0261 43316 161641          LDA BIN02,I  NO, CHECK
0262 43317 027266          JMP ENEQL+1  NEXT-TO-TOP OPERAND
0263**
0264*** EXECUTE 'OR' ***
0265**
0266 43320 015372 EIOR  JSB BINOP    UNSTACK
0267 43321 002001          RSS           OPERANDS
0268 43322 002002          SZA           TOP OPERAND NON_ZERO?
0269 43323 026676          JMP TRUE     YES
0270 43324 161641          LDA BIN02,I  NO, CHECK
0271 43325 027266          JMP ENEQL+1  NEXT-TO-TOP OPERAND
0272**
0273*** EXECUTE 'NOT' ***
0274**
0275 43326 015374 ENOT  JSB STTOP    LOAD TOP OPERAND
0276 43327 027256          JMP EEQL+1   GO TO CHECK
0277**
0278*** INSURE VALID POWERING ***
0279**
0280*
0281* INSURES THAT A+B HAS ACCEPTABLE ARGUMENTS. A=B=0 IS A NON-
0282* RECOVERABLE ERROR. A=0 AND B<0 PRINTS A WARNING MESSAGE AND
0283* RETURNS THE MAXIMUM POSITIVE NUMBER AS THE RESULT.
0284*
0285 43330 075640 #PCHK STB BIN01    LOAD HIGH PART
0286 43331 165641          LDB BIN02,I  OF POWER
0287 43332 002002          SZA           BASE ZERO?
0288 43333 027344          JMP PCHK1    NO
0289 43334 006003          SZB,RSS     YES, POWER ZERO?
0290 43335 115134          JSB RERRS+29,I YES
0291 43336 006021          SSB,RSS     NO, POWER POSITIVE?
0292 43337 026673          JMP FALSE   YES
0293 43340 115203          JSB WERRS+2,I NO
0294 43341 060273          LDA INF     USE POSITIVE
0295 43342 064355          LDB ,-2     INFINITY
0296 43343 026663          JMP FOR14   FOR RESULT
0297 43344 006003 PCHK1 SZB,RSS  POWER ZERO?
0298 43345 026676          JMP TRUE    YES, TAKE RESULT AS 1.0
0299 43346 125354          JMP PCHK,I  NO

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0357**
0358*** PREPARE STRING OPERAND **
0359**
0360*
0361* THE STRING ADDRESS ON TOP OF THE OPERAND STACK IS COMBINED
0362* WITH THE SUBSCRIPTS IN A PSEUDO-ENTRY ON THE TEMPORARY STACK
0363* TO FORM A STRING OPERAND. (A) = -2 UPON ENTRY FOR A SOURCE
0364* STRING; (A) = -1 FOR A DESTINATION STRING. THE ADDRESS OF
0365* THE FIRST CHARACTER OF THE STRING OPERAND IS LEFT IN TEMP5;
0366* FOR SOURCE STRINGS (A) = TEMP5 UPON EXIT. THE REQUESTED
0367* STRING LENGTH (IN CHARACTERS) IS LEFT IN TNULL; FOR SOURCE
0368* STRINGS THE ACTUAL STRING LENGTH (WHICH MAY BE LESS THAN THE
0369* REQUESTED LENGTH) IS IN (B) UPON EXIT. THE FOLLOWING
0370* CONDITIONS EXIT TO ERROR: NEGATIVE STRING LENGTH, REQUESTED
0371* DESTINATION STRING WOULD EXCEED PHYSICAL STRING BOUNDARY, OR
0372* REQUESTED DESTINATION STRING WOULD PRODUCE A STRING QUANTITY
0373* WITH TWO UNCONNECTED PARTS. THE LOGICAL LENGTH OF A
0374* DESTINATION STRING IS ADJUSTED AS NEEDED.
0375*
0376 43426 071466 #PSTR STA PS0 SAVE MODE FLAG
0377 43427 015376 JSB OPCHK UNSTACK OPERAND
0378 43430 075462 STB PS1 SET FLAG POSITIVE
0379 43431 005000 BLS SAVE ADDRESS OF FIRST
0380 43432 075272 STB TEMP5 CHARACTER OF STRING
0381 43433 005100 BRS SAVE
0382 43434 044356 ADB ,-1 POINTER TO
0383 43435 075260 STB TEMP6 STRING LENGTH
0384 43436 065330 LDB TMPST LOAD
0385 43437 044361 ADB ,+2 START-OF-STRING
0386 43440 160001 LDA 1,I DESIGNATOR
0387 43441 071400 STA MPT SAVE IT
0388 43442 041272 ADA TEMP5 RECORD CHARACTER ADDRESS
0389 43443 071272 STA TEMP5 OF START-OF-STRING
0390 43444 071572 STA SBPTR SAVE ADDRESS
0391 43445 006004 INB LOAD
0392 43446 160001 LDA 1,I END-OF-STRING DESIGNATOR
0393 43447 002006 INA,SZA SPECIFIED?
0394 43450 027463 JMP PSTR2 YES
0395 43451 003400 CCA NO
0396 43452 051466 CPA PS0 'SOURCE' MODE?
0397 43453 027457 JMP PSTR1 NO
0398 43454 161260 LDA TEMP6,I YES, LOAD STRING'S
0399 43455 010500 AND B377 LOGICAL LENGTH
0400 43456 027463 JMP PSTR2
0401 43457 071462 PSTR1 STA PS1 SET FLAG TO -1
0402 43460 061410 LDA TPRME COMPUTE
0403 43461 003000 CMA END-OF-STRING
0404 43462 041400 ADA MPT DESIGNATOR
0405 43463 071376 PSTR2 STA NQT SAVE IT
0406 43464 003000 CMA IS LENGTH
0407 43465 041400 ADA MPT OF SPECIFIED STRING
0408 43466 002021 SSA,RSS NEGATIVE?
0409 43467 115121 JSB RERRS+18,I YES
0410 43470 071406 STA TNULL
0411 43471 042005 ADA ,73 >72?
0412 43472 002020 SSA

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0413	43473	115123		JSB RERRS+20,I	
0414	43474	161260		LDA TEMP6,I	DOES
0415	43475	010500		AND B377	START-OF-STRING
0416	43476	003000		CMA	CHARACTER
0417	43477	035466		ISZ PS0	RELATE TO
0418	43500	002004		INA	PREVIOUS
0419	43501	041400		ADA MPT	VALUE
0420	43502	002021		SSA,RSS	OF STRING?
0421	43503	027522		JMP PSTR3	NO
0422	43504	161260		LDA TEMP6,I	YES, EXTRACT
0423	43505	035466		ISZ PS0	END-OF-
0424	43506	001727		ALF,ALF	PERMITTED-STRING
0425	43507	010500		AND B377	DESIGNATOR
0426	43510	003000		CMA	COMPUTE DIFFERENCE FROM
0427	43511	041376		ADA NQT	END OF SPECIFIED STRING =1
0428	43512	006404		CLB,INB	'SOURCE'
0429	43513	055466		CPB PS0	MODE?
0430	43514	027527		JMP PSTR5	NO
0431	43515	065406		LDB TNULL	YES, SPECIFIED SOURCE STRING
0432	43516	002004		INA	CONTAINED WITHIN
0433	43517	002021		SSA,RSS	DEFINED SOURCE STRING?
0434	43520	044000		ADB 0	NO, CORRECT LENGTH
0435	43521	027525		JMP PSTR4	OF ACTUAL SOURCE STRING
0436	43522	035466	PSTR3	ISZ PS0	'SOURCE' MODE?
0437	43523	115122		JSB RERRS+19,I	NO
0438	43524	007400		CCB	YES, SET ACTUAL LENGTH TO 0
0439	43525	061272	PSTR4	LDA TEMP5	LOAD START-OF-STRING
0440	43526	125344		JMP PSTR,I	CHARACTER ADDRESS
0441	43527	002021	PSTR5	SSA,RSS	PHYSICAL STORAGE OVERFLOW?
0442	43530	115123		JSB RERRS+20,I	YES
0443	43531	035462		ISZ PS1	END-OF-STRING SPECIFIED?
0444	43532	027540		JMP PSTR7	YES
0445	43533	161260	PSTR6	LDA TEMP6,I	NO,
0446	43534	010316		AND M256	RESET
0447	43535	031376		IOR NQT	LOGICAL LENGTH
0448	43536	171260		STA TEMP6,I	OF STRING
0449	43537	125344		JMP PSTR,I	
0450	43540	161260	PSTR7	LDA TEMP6,I	IS NEW
0451	43541	010500		AND B377	DESTINATION
0452	43542	003000		CMA	STRING
0453	43543	041376		ADA NQT	LONGER
0454	43544	002021		SSA,RSS	THAN OLD?
0455	43545	027533		JMP PSTR6	YES
0456	43546	125344		JMP PSTR,I	NO
0457**				**	
0458**	STACK STRING CONSTANT			***	
0459**				**	
0460*					
0461*	SEE NOTE AT FOR13 OF ROUTINE FORMX				
0462*					
0463	43547	035332	#STST	ISZ OPDST	STACK
0464	43550	035332		ISZ OPDST	NEGATIVE
0465	43551	061611		LDA TEMP1	OF
0466	43552	003000		CMA	STRING
0467	43553	171332		STA OPDST,I	ADDRESS
0468	43554	161611		LDA TEMP1,I	COMPUTE

0469	43555	010500	AND B377	STRING
0470	43556	007400	CCB	LENGTH
0471	43557	044000	ADB 0	=1
0472	43560	040362	ADA ,+3	UPDATE
0473	43561	001100	ARS	INTRA-STATEMENT
0474	43562	041611	ADA TEMP1	POINTER
0475	43563	071611	STA TEMP1	PAST STRING
0476	43564	015400	JSB RSCHK	CREATE TEMPORARY
0477	43565	002400	CLA	RECORD
0478	43566	104400	DST TMPST,I	(0,(B))
	43567	101330		
0479	43570	125340	JMP STSTR,I	
0480**				**
0481***	FETCH SOURCE CHARACTER			***
0482**				**
0483*				
0484*	CHARACTER ADDRESS IN TEMP4, SOURCE CHARACTER COUNT			
0485*	IN TPRME (IN 1'S COMPLEMENT). EXIT TO (P+1) ON NO			
0486*	MORE CHARACTERS (TPRME = -1) ELSE EXIT TO (P+2) WITH			
0487*	NEXT CHARACTER IN (A).			
0488*				
0489	43571	061410	#FSCH LDA TPRME	MORE
0490	43572	002007	INA,SZA,RSS	CHARACTERS?
0491	43573	125364	JMP FSCH,I	NO
0492	43574	071410	STA TPRME	YES, UPDATE CHARACTER COUNT
0493	43575	061256	LDA TEMP4	LOAD CHARACTER
0494	43576	000065	CLE,ERA	ADDRESS
0495	43577	160000	LDA 0,I	EXTRACT
0496	43600	002041	SEZ,RSS	NEXT
0497	43601	001727	ALF,ALF	CHARACTER
0498	43602	010500	AND B377	
0499	43603	035256	ISZ TEMP4	UPDATE CHARACTER ADDRESS
0500	43604	035364	ISZ FSCH	
0501	43605	125364	JMP FSCH,I	
0502**				**
0503***	FETCH SOURCE CHARACTER (UPPER CASE)			***
0504**				**
0505*				
0506*	SAME AS FSCH, EXCEPT LOWER CASE CHARACTERS ARE CONVERTED TO			
0507*	UPPER CASE. USED BY CHAIN AND ASSIGN STATEMENTS.			
0508*				
0509	43606	061410	#FCUC LDA TPRME	MORE
0510	43607	002007	INA,SZA,RSS	CHARACTERS?
0511	43610	125560	JMP FCUC,I	NO
0512	43611	071410	STA TPRME	YES, UPDATE CHARACTER COUNT
0513	43612	061256	LDA TEMP4	LOAD CHARACTER
0514	43613	000065	CLE,ERA	ADDRESS
0515	43614	160000	LDA A,I	EXTRACT
0516	43615	002041	SEZ,RSS	NEXT
0517	43616	001727	ALF,ALF	CHARACTER
0518	43617	010500	AND B377	
0519	43620	040317	ADA M96	
0520	43621	002021	SSA,RSS	LOWER CASE
0521	43622	040450	ADA M32	NO
0522	43623	040470	ADA ,140	YES
0523	43624	035256	ISZ TEMP4	UPDATE CHARACTER ADDRESS

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0524 43625 035560      ISZ FCUC
0525 43626 125560      JMP FCUC,I
0526**
0527***  FETCH INPUT CHARACTER  ***
0528**
0529*
0530*  EXITS NORMALLY TO (P+2) WITH NEXT INPUT CHARACTER IN (A).
0531*  IF THE CHARACTER IS A " OR THE INPUT RECORD IS EMPTY,
0532*  EXIT TO TRSTR,I (THE ONLY CALLER WHO CAN ENCOUNTER THIS
0533*  CONDITION).
0534*
0535 43627 035274  #FINC ISZ FINCH
0536 43630 015446      JSB GETCR      FETCH NEXT CHARACTER
0537 43631 125350      JMP TRSTR,I    NONE IN BUFFER
0538 43632 060001      LDA B         ALLOW LOWER CASE
0539 43633 050421      CPA ,+42B    " ?
0540 43634 125350      JMP TRSTR,I    YES, TERMINAL EXIT
0541 43635 125274      JMP FINCH,I    NO

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0543**
0544***  FETCH ENTER CHARACTER ***
0545**
0546*
0547*  SAME AS FINCH EXCEPT IT DOES NOT CHECK FOR A QUOTE
0548*
0549  43636 035522 #FENC ISZ FENCH
0550  43637 015446      JSB GETCR      FETCH NEXT CHARACTER
0551  43640 125350      JMP TRSTR,I    NONE IN BUFFER
0552  43641 060001      LDA B         ALLOW LOWER CASE
0553  43642 125522      JMP FENCH,I   CHARACTER FOUND
0554**
0555***  FETCH TOP OF STACK ***
0556**
0557*
0558*  EXIT WITH TOP OPERAND IN (A) AND (B) AFTER UNSTACKING
0559*  IT.  CREATE EMPTY SPACE ON TEMPORARY STACK FOR FUTURE
0560*  INTERMEDIATE RESULT.
0561*
0562  43643 015376 #STTP JSB OPCHK      UNSTACK OPERAND
0563  43644 015400      JSB RSCHK     CREATE SPACE FOR TEMPORARY
0564  43645 104200      DLD 1,I      LOAD TOP OPERAND
          43646 100001
0565  43647 125374      JMP STTOP,I
0566**
0567***  EXECUTE A BINARY OPERATOR ***
0568**
0569*
0570*  ON ENTRY (P+1) CONTAINS A SUBROUTINE CALL FOR A BINARY
0571*  OPERATION.  THE TOP TWO OPERANDS ON THE STACK ARE
0572*  UNSTACKED AND VERIFIED AS NOT BEING 'UNDEFINED.'  THE
0573*  APPROPRIATE SUBROUTINE IS CALLED WITH THE TOP ARGUMENT'S
0574*  ADDRESS IN BIN02 AND THE NEXT-TO-TOP ARGUMENT'S VALUE IN
0575*  (A) AND (B).  EXIT IS TO (P+2) WITH THE RESULT IN (A)
0576*  AND (B).
0577  43650 161372 #BNOP LDA BINOP,I   SAVE
0578  43651 071640      STA BIN01     SUBROUTINE
0579  43652 035372      ISZ BINOP     CALL
0580  43653 015376      JSB OPCHK     SAVE ADDRESS OF
0581  43654 075641      STB BIN02     TOP OPERAND
0582  43655 015374      JSB STTOP    FETCH NEXT OPERAND
0583  43656 025640      JMP BIN01     EXECUTE SUBROUTINE
0584**
0585***  VERIFY LEGITIMACY OF OPERAND ***
0586**
0587*
0588*  THE VALUE REFERENCED BY THE TOP OF THE OPERAND STACK
0589*  IS CHECKED.  EXIT TO ERROR IF VALUE IS 'UNDEFINED.'
0590*  ELSE REMOVE OPERAND ADDRESS FROM STACK AND REMOVE VALUE
0591*  FROM TOP OF TEMPORARY STACK, IF IT IS THERE.  EXIT
0592*  WITH OPERAND ADDRESS IN (B).
0593*
0594  43657 165332 #OPCK LDB OPDST,I   STRING
0595  43660 006020      SSB          OPERAND?
0596  43661 027704      JMP OPCH3-1  YES
0597  43662 160001      LDA 1,I     NO, HIGH PART OF

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0598 43663 001222      RAL,RAL      IS
0599 43664 002004      INA          OPERAND
0600 43665 001310      RAR,SLA     NORMALIZED?
0601 43666 027676      JMP OPCH1    YES
0602 43667 051027      CPA BIT15   WAS FIRST WORD ZERO
0603 43670 006005      INB,RSS     YES
0604 43671 115126      JSB RERRS+23,I NO--ERROR
0605 43672 160001      LDA 1,I     SECOND
0606 43673 002002      SZA        WORD ZERO?
0607 43674 115126      JSB RERRS+23,I NO--ERROR
0608 43675 044356      ADB .-1    YES--RESTORE OPERAND ADDRESS
0609 43676 055330      OPCH1 CPB TMPST  TEMPORARY?
0610 43677 027705      JMP OPCH3   YES
0611 43700 061332      OPCH2 LDA OPDST  NO,
0612 43701 040355      ADA .-2    UNSTACK
0613 43702 071332      STA OPDST  OPERAND
0614 43703 125376      JMP OPCHK,I ADDRESS
0615 43704 007004      CMB,INB   SET ADDRESS TRUE
0616 43705 061330      OPCH3 LDA TMPST  UNSTACK
0617 43706 040355      ADA .-2    TEMPORARY
0618 43707 071330      STA TMPST  OPERAND
0619 43710 027700      JMP OPCH2

0620**
0621*** ALLOCATE AN ENTRY ON THE TEMPORARY STACK ***
0622**
0623*
0624* (B) IS UNCHANGED UPON EXIT. ON STACK OVERFLOW,
0625* THE OPERATOR AND OPERAND STACKS ARE MOVED TO HIGHER
0626* CORE TO MAKE ROOM FOR FIVE MORE TEMPORARY ENTRIES.
0627*
0628 43711 061330      #RSCK LDA TMPST  ADVANCE
0629 43712 040361      ADA .+2    POINTER TO
0630 43713 071330      STA TMPST  NEXT ENTRY
0631 43714 002004      INA      STACK
0632 43715 051464      CPA OPTRQ  OVERFLOW?
0633 43716 002001      RSS      YES
0634 43717 125400      JMP RSCHK,I NO
0635 43720 075436      STB RT0   SAVE (B)
0636 43721 064056      LDB PBPTR LOAD SOURCE ADDRESS
0637 43722 060371      LDA .+10  ALLOCATE SPACE FOR
0638 43723 015326      JSB CUSP  FIVE MORE
0639 43724 070056      STA PBPTR TEMPORARIES
0640 43725 071440      STA RT1   SAVE DESTINATION ADDRESS
0641 43726 160001      RSCH1 LDA 1,I  TRANSFER
0642 43727 171440      STA RT1,I A WORD
0643 43730 055330      CPB TMPST DONE?
0644 43731 027737      JMP RSCH2 YES
0645 43732 003400      CCA      NO, DECREMENT
0646 43733 041440      ADA RT1   DESTINATION
0647 43734 071440      STA RT1   AND SOURCE
0648 43735 044356      ADB .-1   ADDRESSES
0649 43736 027726      JMP RSCH1
0650 43737 061332      RSCH2 LDA OPDST  CORRECT
0651 43740 040371      ADA .+10
0652 43741 071332      STA OPDST  STACK
0653 43742 061464      LDA OPTRQ

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0654	43743	040371		ADA	.,+10		POINTERS
0655	43744	071464		STA	OPTRQ		
0656	43745	065436		LDB	RT0		RESTORE (B)
0657	43746	125400		JMP	RSCHK,I		
0658	**						**
0659	***						**
							**
0660	**						**
0661	*						
0662	*						
0663	*						
0664	*						
0665	43747	064056	#PSHS	LDB	PBPTR		ADVANCE
0666	43750	044361		ADB	.,+2		STACK POINTER
0667	43751	007000		CMB			USER
0668	43752	044716		ADB	LWAUS		SPACE
0669	43753	006020		SSB			OVERFLOW?
0670	43754	115111		JSB	RERRS+10,I		YES
0671	43755	034056		ISZ	PBPTR		NO, ALLOCATE
0672	43756	034056		ISZ	PBPTR		STORAGE
0673	43757	125366		JMP	PSHST,I		

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0002 44000          ORG 44000B
0003 44000 077600   SMSK OCT 77600
0004 44001 176745   SERRA ABS =SERRS
0005 44002 177734   RERRA ABS SERRS=RERRS
0006 44003 177715   FERRA ABS RERRS=FERRS
0007 44004 177761   WERRA ABS FERRS=WERRS
0008 44005 072221   DSERR DEF DSERA
0009**              **
0010*** ROUND NUMBER TO INTEGER ***
0011**              **
0012*
0013* ENTER WITH NUMBER IN (A) AND (B). EXIT TO (P+2) IF
0014* INTEGER FORM (ROUNDED AS NEEDED) IS POSITIVE AND NOT
0015* LARGER THAN 15 BITS, ELSE EXIT TO (P+1). ON EXIT TO
0016* (P+2), (B) HOLDS THE INTEGER BIASED BY -1.
0017*
0018 44006 015414   #SBFX JSB IFIX          TRUNCATE NUMBER
0019 44007 125342   JMP SBFIX,I        NUMBER TOO LARGE
0020 44010 002002   SZA                INTEGER OVERFLOW?
0021 44011 125342   JMP SBFIX,I        YES
0022 44012 002041   SEZ,RSS           NO, ROUNDING BIT?
0023 44013 044356   ADB ,-1          NO, BIAS INTEGER BY -1
0024 44014 006021   SSB,RSS           YES, POSITIVE RESULT?
0025 44015 035342   ISZ SBFIX         YES
0026 44016 125342   JMP SBFIX,I        NO

```

```

0028**
0029*** INTEGERIZE A NUMBER ***
0030**
0031*
0032* ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B).
0033* IF EXPONENT EXCEEDS 23, NUMBER HAS INTEGER SIGNIFICANCE;
0034* EXIT TO (P+1). ALL OTHER CASES EXIT TO (P+2) WITH 32-BIT
0035* INTEGER RIGHT JUSTIFIED IN (A) AND (B). ON EXIT (O) = 0
0036* IF NUMBER IS EXACTLY REPRESENTABLE AS A 16-BIT INTEGER.
0037* IF EXPONENT IS NEGATIVE, TRUNCATE TO 0 OR -1 APPROPRIATELY
0038* AND LET (O) = 1. OTHERWISE RIGHT JUSTIFY INTEGER AND EXIT
0039* WITH LAST BIT LOST IN (E).
0040*
0041 44017 071260 *IFIX STA TEMP6 SAVE (A)
0042 44020 102101 STO SET 'NOT ONE-WORD INTEGER' MODE
0043 44021 015412 JSB ,FLUN UNPACK (B)
0044 44022 002020 SSA NEGATIVE EXPONENT?
0045 44023 026046 JMP IFIX3 YES
0046 44024 040337 ADA ,-16 NO, EXPONENET
0047 44025 002020 SSA <= 15?
0048 44026 103101 CLO YES
0049 44027 040347 ADA ,-8 NO, EXPONENT
0050 44030 002021 SSA,RSS <= 23?
0051 44031 125414 JMP IFIX,I NO, ALL SIGNIFICANCE IS INTEGER
0052 44032 040347 ADA ,-8 YES, MOVE BINARY POINT TO END OF
0053 44033 071322 STA EXP (B) AND SAVE SHIFT COUNT
0054 44034 061260 LDA TEMP6 RETRIEVE (A)
0055 44035 026042 JMP IFIX2
0056 44036 000071 IFIX1 CLE,SLA,ARS SHIFT (A) RIGHT
0057 44037 002200 CME SHIFT
0058 44040 004035 SLB,ERB (B) RIGHT
0059 44041 102101 STO LOST A 1
0060 44042 035322 IFIX2 ISZ EXP ALL SHIFTS DONE?
0061 44043 026036 JMP IFIX1 NO
0062 44044 035414 ISZ IFIX YES
0063 44045 125414 JMP IFIX,I
0064 44046 061260 IFIX3 LDA TEMP6 RETRIEVE (A)
0065 44047 002120 CLE,SSA TRUNCATE
0066 44050 003401 CCA,RSS TO
0067 44051 002401 CLA,RSS =1
0068 44052 007401 CCB,RSS OR
0069 44053 006400 CLB 0
0070 44054 026044 JMP IFIX3-2

```

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0072**          **
0073***  REQUEST A RECORD  ***
0074**          **
0075*
0076*  UPON ENTRY (A) HOLDS A FILE NUMBER (POSITIVE FOR A READ
0077*  REQUEST, NEGATIVE FOR A WRITE REQUEST) AND (B) SPECIFIES
0078*  VALIDATION OF THE FILE'S EXISTENCE ( (B) = -2) OR THE FILE
0079*  RECORD TO BE PUT IN THE FILE BUFFER ( (B) = -1 REQUESTS
0080*  THE RECORD WHICH FOLLOWS THE ONE CURRENTLY IN THE BUFFER,
0081*  (B) >= 0 REQUESTS RECORD (B)+1 ), EXIT TO ERROR IF THE
0082*  FILE DOES NOT EXIST OR A WRITE REQUEST IS GIVEN FOR A
0083*  READ-ONLY FILE. EXIT TO THE END-OF-FILE CODE IF THE
0084*  REQUESTED RECORD DOES NOT EXIST. OTHERWI, THE DIRTY
0085*  BIT IS EXAMINED TO DETERMINE IF THE FILE BUFFER SHOULD
0086*  BE WRITTEN BACK TO DISC.
0087*  A READ REQUEST READS THE REQUESTED RECORD INTO THE BUFFER;
0088*  A WRITE REQUEST MERELY INITIALIZES THE BUFFER TO 'EMPTY'.
0089*  THE FILE TABLE IS UPDATED TO REFLECT THE CHANGES.
0090*
0091  44055 075647 #RQST STB RQ2      SAVE RECORD REFERENCE
0092  44056 007400          CCB          GET 1'S COMPLEMENT
0093  44057 002020          SSA          OF FILE NUMBER AND
0094  44060 006401          CLB,RSS      SET RQ1 = -1 FOR A
0095  44061 003000          CMA          READ REQUEST OR 0
0096  44062 075644          STB RQ1     FOR A WRITE REQUEST
0097  44063 041500          ADA FCNTR   DOES REQUESTED
0098  44064 003021          CMA,SSA,RSS  FILE EXIST?
0099  44065 115142          JSB RERRS+35,I NO
0100  44066 041500          ADA FCNTR   YES
0101  44067 100200          MPY ,+FTEL  SET POINTER
0102  44070 000376
0103  44071 041502          ADA FILTB   TO FILE TABLE
0104  44072 071236          STA FBASE  ENTRY
0105  44073 161236          LDA FBASE,I  LOAD NUMBER OF RECORDS
0106  44074 002003          SZA,RSS     DOES FILE EXIST?
0107  44075 115142          JSB RERRS+35,I
0108  44076 065236          LDB FBASE
0109  44077 044363          ADB ,+4
0110  44100 075236          STB FBASE
0111  44101 007500          CCB,CLE
0112  44102 002020          SSA          READ_ONLY FILE?
0113  44103 055644          CPB RQ1     YES, READ REQUEST?
0114  44104 001675          ELA,CLE,SLA,ERA  YES, CLEAR BIT 15 AND SKIP
0115  44105 115143          JSB RERRS+36,I NO
0116  44106 065647          LDB RQ2     FILE VALIDATION
0117  44107 054355          CPB , -2   ONLY?
0118  44110 026320          JMP RQST9   YES
0119  44111 035647          ISZ RQ2     NO, RECORD SPECIFIED?
0120  44112 026137          JMP RQST2   YES
0121  44113 165236          LDB FBASE,I NO, GET HIGH OLD RECORD ADDRESS
0122  44114 055027          CPB BIT15  NULL RECORD?
0123  44115 026136          JMP RQST6   YES
0124  44116 035236          ISZ FBASE  NO, COMPUTE
0125  44117 165236          LDB FBASE,I  RECORD'S
0126  44120 035236          ISZ FBASE  DISTANCE
0127  44121 035236          ISZ FBASE  FROM

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0127	44122	007000	CMB	FIRST
0128	44123	145236	ADB FBASE,I	RECORD
0129	44124	007000	CMB	
0130	44125	060350	LDA .-7	GET RECORD
0131	44126	041236	ADA FBASE	COUNT BACK
0132	44127	160000	LDA A,I	INTO A
0133	44130	001665	ELA,CLE,ERA	CLEAR BIT 15
0134	44131	004010	SLB	
0135	44132	044000	ADB A	
0136	44133	004065	CLE,ERB	
0137	44134	006004	INB	NUMBER
0138	44135	026142	JMP RQST7	
0139	44136	006400	RQST6 CLB	NO RECORD IN CORE
0140	44137	035236	RQST2 ISZ FBASE	ADJUST POINTER
0141	44140	035236	ISZ FBASE	TO LOW WORD
0142	44141	035236	ISZ FBASE	OF BASE ADDRESS
0143	44142	003004	RQST7 CMA,INA	DOES
0144	44143	040001	ADA 1	RECORD
0145	44144	002020	SSA	EXIST?
0146	44145	026151	JMP **4	YES
0147	44146	035236	ISZ FBASE	NO, CORRECT FBASE
0148	44147	035236	ISZ FBASE	
0149	44150	124656	JMP FDT4A,I	FOR EOF EXIT CHECK
0150	44151	040001	ADA 1	
0151	44152	030360	IOR .+1	COMPUTE RELATIVE
0152	44153	005000	BLS	DISC
0153	44154	002020	SSA	ADDRESS
0154	44155	060001	LDA 1	OF NEW RECORD
0155	44156	007400	CCB	GET HIGH
0156	44157	045236	ADB FBASE	DISC
0157	44160	164001	LDB B,I	ADDRESS
0158	44161	000040	CLE	
0159	44162	141236	ADA FBASE,I	COMPUTE LOW DISC ADDRESS
0160	44163	071647	STA RQ2	SAVE IT
0161	44164	002040	SEZ	INCREMENT IF
0162	44165	006004	INB	CARRY FROM
0163	44166	075646	STB RQ4	LOW ADD
0164	44167	064351	LDB .-6	GET
0165	44170	045236	ADB FBASE	NEGATIVE
0166	44171	164001	LDB B,I	OF BUFFER
0167	44172	005423	BLR,RBR	
0168	44173	007004	CMB,INB	SIZE
0169	44174	075650	STB RQ5	SAVE IT
0170	44175	035236	ISZ FBASE	SET POINTER
0171	44176	145236	ADB FBASE,I	TO BEGINNING
0172	44177	035236	ISZ FBASE	
0173	44200	175236	STB FBASE,I	OF RECORD BUFFER
0174	44201	075645	STB RQ3	SAVE ADDRESS OF BUFFER
0175	44202	065236	LDB FBASE	MOVE TO
0176	44203	044353	ADB .-4	DISC
0177	44204	075236	STB FBASE	ADDRESSES
0178	44205	044356	ADB .-1	IS ANY
0179	44206	164001	LDB B,I	RECORD
0180	44207	055027	CPB BIT15	IN CORE?
0181	44210	026214	JMP RQS15	NO, SKIP COMPARE AND WRITE
0182	44211	151236	CPA FBASE,I	OLD AND NEW RECORDS THE SAME?

0183	44212	026236		JMP RQST3	YES
0184	44213	015514		JSB WRBUF	NO, WRITE OLD RECORD TO DISC
0185	44214		RQS15	EQJ *	
0186	44214	035644		ISZ RQ1	READ REQUEST?
0187	44215	026241		JMP RQST4	NO
0188	44216	065650		LDB RQ5	GET NEGATIVE BUFFER SIZE
0189	44217	103100		CLF 0	
0190	44220	060362		LDA .+3	GET ADDRESS
0191	44221	040650		ADA ERSCA	OF DOUBLE WORD ADDRESS
0192	44222	074204		STB MWORD	STORE WORD COUNT
0193	44223	065645		LDB RQ3	GET CORE ADDRESS
0194	44224	045027		ADB BIT15	AND READ BIT
0195	44225	114201		JSB DISCA,I	READ
0196	44226	102030		HLT DEATH+30B	IN
0197	44227	102031		HLT DEATH+31B	REQUESTED
0198	44230	060203		LDA MBUSY	RECORD
0199	44231	002020		SSA	
0200	44232	026230		JMP *-2	
0201	44233	002003		SZA,RSS	SKIP ON ERROR
0202	44234	026244		JMP RQST5	
0203	44235	115154		JSB RERRS+45,I	GO INDICATE ERROR
0204	44236	035644	RQST3	ISZ RQ1	WRITE REQUEST?
0205	44237	002001		RSS	YES
0206	44240	026311		JMP RQS14	NO, GO FINISH UP
0207	44241	064355	RQST4	LDB EOR	SCRATCH RECORD
0208	44242	175645		STB RQ3,I	WITH END-OF-RECORD MARK
0209	44243	026311		JMP RQS14	GO FINISH UP
0210	44244	065236	RQST5	LDB FBASE	GET
0211	44245	044370		ADB .+9	PROTECT
0212	44246	160001		LDA B,I	MASK
0213	44247	002003		SZA,RSS	IS IT ZERO?
0214	44250	026311		JMP RQS14	YES, SKIP MASKING
0215	44251	071767		STA PMASK	NO, SAVE MASK
0216	44252	044351		ADB .-6	ADJUST FBASE TO
0217	44253	075236		STB FBASE	BUFFER LIMIT POINTER
0218	44254	065645		LDB RQ3	
0219	44255	155236	RQS11	CPB FBASE,I	DONE ?
0220	44256	026306		JMP RQS13	YES
0221	44257	160001		LDA 1,I	NO
0222	44260	050355		CPA EOR	EOR ?
0223	44261	026306		JMP RQS13	
0224	44262	050356		CPA EOF	EOF ?
0225	44263	026306		JMP RQS13	
0226	44264	010316		AND M256	
0227	44265	050506		CPA B1000	STRING ?
0228	44266	026271		JMP ++3	
0229	44267	044361		ADB .+2	SKIP TWO WORDS
0230	44270	026255		JMP RQS11	
0231	44271	160001		LDA 1,I	YES
0232	44272	010500		AND B377	
0233	44273	040362		ADA .+3	
0234	44274	001100		ARS	
0235	44275	040001		ADA 1	
0236	44276	071632		STA ATMP	
0237	44277	006004	RQS12	INB	MASK
0238	44300	055632		CPB ATMP	

0239	44301	026255		JMP RQS11	STRING
0240	44302	160001		LDA 1,I	
0241	44303	021767		XOR PMASK	
0242	44304	170001		STA 1,I	
0243	44305	026277		JMP RQS12	
0244	44306	061236	RQS13	LDA FBASE	RESTORE
0245	44307	040354		ADA ,-3	
0246	44310	071236		STA FBASE	FBASE
0247	44311		RQS14	EQU *	
0248	44311	061647		LDA RQ2	
0249	44312	171236		STA FBASE,I	NEW RECORD INTO FILE TABLE
0250	44313	061646		LDA RQ4	
0251	44314	007400		CCB	
0252	44315	045236		ADB FBASE	
0253	44316	075236		STB FBASE	
0254	44317	170001		STA 8,I	
0255	44320	065236	RQST9	LDB FBASE	MOVE POINTER
0256	44321	044364		ADB ,+5	TO REFERENCE
0257	44322	075236		STB FBASE	RECORD POINTER
0258	44323	125506		JMP RQSTR,I	

```

0260**                               **
0261*** STORE ITEM IN FILE ***
0262**                               **
0263*
0264* UPON ENTRY (B) INDICATES WHAT IS TO BE WRITTEN ON THE FILE:
0265* (B) = -1 WRITES AN END-OF-FILE MARK, (B) = -2 WRITES A TWO-
0266* WORD FLOATING POINT NUMBER, (B) = -3 WRITES A STRING. IF
0267* THE RECORD CANNOT ACCOMMODATE THE QUANTITY, A SERIAL WRITE
0268* WILL PLACE IT IN THE FOLLOWING RECORD WHILE A RECORD WRITE
0269* WILL EXIT TO THE END-OF-FILE CODE.
0270*
0271 44324 075653 #FILS STB FILT SAVE REQUEST TYPE
0272 44325 065236 LDB FBASE GET
0273 44326 044364 ADB .+5 PROTECT
0274 44327 164001 LDB 1,I MASK
0275 44330 075767 STB PMASK
0276 44331 007400 CCB LOAD
0277 44332 045236 ADB FBASE ACTIVE AND LIMIT
0278 44333 104200 DLD 1,I RECORD POINTERS
0279 44334 100001
0279 44335 050001 CPA 1 RECORD FULL?
0280 44336 026430 JMP FILS1 YES
0281 44337 075652 STB DADRR NO, SAVE ACTIVE POINTER
0282 44340 035653 ISZ FILT EOF REQUEST?
0283 44341 026352 JMP FILS2 NO
0284 44342 003400 CCA YES, OVERLAY PREVIOUS
0285 44343 170001 STA 1,I EOR OR EOF WITH EOF MARK
0286 44344 065236 FILS7 LDB FBASE MAKE POINTER TO SECOND WORD OF
0287 44345 044347 ADB .-8 FILE TABLE ENTRY.
0288 44346 160001 LDA B,I SET BUFFER
0289 44347 031027 IOR BIT15 DIRTY
0290 44350 170001 STA 1,I BIT.
0291 44351 125510 JMP FILST,I
0292 44352 035653 FILS2 ISZ FILT STRING?
0293 44353 026413 JMP FILS6 YES
0294 44354 044361 ADB .+2 NO
0295 44355 003004 FILS3 CMA,INA COMPARE PROSPECTIVE
0296 44356 040001 ADA 1 ACTIVE POINTER WITH
0297 44357 003004 CMA,INA END-OF-RECORD POINTER
0298 44360 002020 SSA OVERFLOW?
0299 44361 026423 JMP FILS0 YES
0300 44362 175236 STB FBASE,I NO, SAVE NEW ACTIVE POINTER
0301 44363 002003 SZA,RSS RECORD EXACTLY FULL?
0302 44364 026367 JMP FILS4 YES
0303 44365 060355 LDA EOR NO, FOLLOW ENTRY SPACE
0304 44366 170001 STA 1,I WITH EOR MARK
0305 44367 035653 FILS4 ISZ FILT STRING?
0306 44370 026400 JMP FILS5 NO
0307 44371 061406 LDA TNULL YES
0308 44372 003000 CMA COMPUTE AND
0309 44373 030506 IOR B1000 STORE STRING
0310 44374 171652 STA DADRR,I HEADER WORD
0311 44375 060664 LDA FSCHA TRANSFER
0312 44376 015350 JSB TRSTR STRING
0313 44377 026344 JMP FILS7
0314 44400 104200 FILS5 DLD SBPTR,I TRANSFER

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0315	44401	101572			
0316	44402	002003		SZA, RSS	ZEROS ARE
0317	44403	026410		JMP FIL5A	NOT MASKED
0318	44404	021767		XOR PMASK	MASK
0319	44405	101100		SWP	
0320	44406	021767		XOR PMASK	DATA
0321	44407	101100		SWP	
	44410	104400	FIL5A	DST DADRR, I	NUMBER
	44411	101652			
0322	44412	026344		JMP FILS7	
0323	44413	006004	FILS6	INB	COMPUTE
0324	44414	005000		BLS	DESTINATION
0325	44415	075272		STB TEMP5	ADDRESS
0326	44416	007004		CMB, INB	COMPUTE
0327	44417	045406		ADB TNULL	RECORD
0328	44420	007004		CMB, INB	SPACE
0329	44421	005100		BRS	REQUIRED
0330	44422	026355		JMP FILS3	
0331	44423	060355	FILS0	LDA EOR	INSURE EOR MARK
0332	44424	171652		STA DADRR, I	ENDS PRESENT RECORD
0333	44425	060355		LDA #-2	RESTORE
0334	44426	041653		ADA FILT	REQUEST
0335	44427	071653		STA FILT	TYPE
0336	44430	007400	FILS1	CCB	
0337	44431	055520		CPB RCRD#	SERIAL WRITE?
0338	44432	002001		RSS	YES
0339	44433	124656		JMP FDT4A, I	NO
0340	44434	061234		LDA FILE#	REQUEST
0341	44435	003000		CMA	RECORD
0342	44436	015506		JSB RQSTR	TO WRITE
0343	44437	026325		JMP #FILS+1	
0344**				**	
0345***	GET NEXT FILE ITEM TYPE			***	
0346**				**	
0347*					
0348*	THE NEXT ITEM IN THE FILE, NUMBER, STRING, END-OF-FILE, OR				
0349*	END-OF-RECORD, IS IDENTIFIED AND UPON EXIT (A) =1,2,3, OR 4				
0350*	RESPECTIVELY. EORFL = -1 WILL IGNORE END-OF-RECORD'S AND				
0351*	RETURN WITH THE FIRST OF THE OTHER ITEMS ENCOUNTERED.				
0352*					
0353	44440	061234	GTTY1	LDA FILE#	REQUEST
0354	44441	015506		JSB RQSTR	NEXT RECORD
0355	44442	007400	#GTTY	CCB	LOAD ACTIVE
0356	44443	045236		ADB FBASE	AND LIMIT
0357	44444	104200		DLD 1, I	RECORD POINTERS
	44445	100001			
0358	44446	050001		CPA 1	PHYSICAL END OF RECORD?
0359	44447	026463		JMP GTTY3	YES
0360	44450	160001		LDA 1, I	NO, LOAD WORD
0361	44451	006404		CLB, INB	OF RECORD
0362	44452	050355		CPA EOR	END-OF-RECORD?
0363	44453	026463		JMP GTTY3	YES
0364	44454	050356		CPA EOF	NO, END-OF-FILE?
0365	44455	026501		JMP GTTY4	YES
0366	44456	010316		AND M256	NO
0367	44457	050506		CPA B1000	STRING?

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0368 44460 006004          INB          YES, (B) = 2
0369 44461 060001  GTTY2 LDA 1          SET (A) = (B)
0370 44462 125512          JMP GTTYP,I
0371 44463 065236  GTTY3 LDB FBASE      PHYSICAL
0372 44464 044352          ADB ,-6          NULL RECORD
0373 44465 160001          LDA B,I
0374 44466 051027          CPA BIT15        IN CORE?
0375 44467 026475          JMP GTTY6        YES, SKIP COMPARE
0376 44470 044356          ADB ,-1          NO, PHYSICAL
0377 44471 160001          LDA B,I          END
0378 44472 044361          ADB ,+2          OF
0379 44473 150001          CPA B,I          FILE?
0380 44474 026503          JMP GTTY5        YES
0381 44475          GTTY6 EQU *
0382 44475 007400          CCB              NO
0383 44476 055651          CPB EORFL        EOR'S WANTED?
0384 44477 026440          JMP GTTY1        NO
0385 44500 064361          LDB ,+2          YES, SET (B) = 4
0386 44501 044361  GTTY4 ADB ,+2      (B) = (B) + 2
0387 44502 026461          JMP GTTY2
0388 44503 060362  GTTY5 LDA ,+3      (A) = 3
0389 44504 125512          JMP GTTYP,I
0390**
0391*** WRITE BUFFER TO DISC ***
0392**
0393*
0394* THE BUFFER OF THAT FILE CURRENTLY REFERENCED BY FBASE IS
0395* WRITTEN TO ITS PLACE ON THE DISC, UNLESS NOTHING HAS BEEN
0396* WRITTEN INTO THE BUFFER.
0397*
0398 44505 065236  #WRBU LDB FBASE      LOAD SECOND
0399 44506 044353          ADB ,-4          WORD FROM
0400 44507 160001          LDA B,I          FILE TABLE
0401 44510 001600          ELA              ENTRY (RECORD LENGTH)
0402 44511 002141          SEZ,CLE,RSS     HAS BIT 15 BEEN SET?
0403 44512 125514          JMP WRBUF,I     NO
0404 44513 001500          ERA              YES, CLEAR IT
0405 44514 170001          STA B,I         STORE IT BACK
0406 44515 044362          ADB ,+3         GET HIGH CURRENT
0407 44516 160001          LDA B,I         RECORD ADDRESS
0408 44517 051027          CPA BIT15       NULL RECORD?
0409 44520 125514          JMP WRBUF,I     YES, DON'T WRITE RECORD OUT
0410 44521 044371          ADB ,+10        GET
0411 44522 160001          LDA B,I         PROTECT MASK
0412 44523 002003          SZA,RSS         IS IT ZERO?
0413 44524 026566          JMP WRBU7       YES, SKIP STRING MASKING
0414 44525 071767          STA PMASK       NO, SAVE MASK
0415 44526 044351          ADB ,-6         ADJUST FBASE TO
0416 44527 075236          STB FBASE       BUFFER LIMIT POINTER
0417 44530 065645          LDB RQ3
0418 44531 155236  WRBU4 CPB FBASE,I     DONE ?
0419 44532 026562          JMP WRBU6
0420 44533 160001          LDA 1,I         NO
0421 44534 050355          CPA EOR          EOR ?
0422 44535 026562          JMP WRBU6
0423 44536 050356          CPA EOF         EOF ?

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0424	44537	026562		JMP WRBU6	
0425	44540	010316		AND M256	
0426	44541	050506		CPA B1000	STRING ?
0427	44542	026545		JMP ++3	
0428	44543	044361		ADB .+2	SKIP TWO WORDS
0429	44544	026531		JMP WRBU4	
0430	44545	160001		LDA 1,I	YES
0431	44546	010500		AND B377	
0432	44547	040362		ADA .+3	
0433	44550	001100		ARS	
0434	44551	040001		ADA 1	
0435	44552	071632		STA ATMP	
0436	44553	006004	WRBU5	INB	
0437	44554	055632		CPB ATMP	
0438	44555	026531		JMP WRBU4	
0439	44556	160001		LDA 1,I	
0440	44557	021767		XOR PMASK	
0441	44560	170001		STA 1,I	
0442	44561	026553		JMP WRBU5	
0443	44562	065236	WRBU6	LDB FBASE	
0444	44563	044354		ADB .-3	
0445	44564	075236		STB FBASE	
0446	44565	044370		ADB .+9	=> PMASK WORD
0447	44566	044342	WRBU7	ADB .-13	=> WORDS/RECORD WORD
0448	44567	160001		LDA B,I	
0449	44570	030215		IOR BIT14	SET FILE
0450	44571	170001		STA B,I	DIRTY BIT
0451	44572	001423		ALR,RAR	CLEAR DIRTY BITS AND
0452	44573	003004		CMA,INA	GET NEG. REC. LENGTH
0453	44574	103100		CLF 0	
0454	44575	070204		STA MWORD	WRITE
0455	44576	065645		LDB RQ3	
0456	44577	003400		CCA	RECORD
0457	44600	041236		ADA FBASE	
0458	44601	114201		JSB DISCA,I	TO
0459	44602	102030		HLT DEATH+30B	
0460	44603	102031		HLT DEATH+31B	DISC
0461	44604	060203		LDA MBUSY	
0462	44605	002020		SSA	
0463	44606	026604		JMP *-2	
0464	44607	002003		SZA,RSS	SKIP ON ERROR
0465	44610	125514		JMP WRBUF,I	
0466	44611	115155		JSB RERRS+46,I	GO INDICATE ERROR
0467**				**	
0468**	TRANSFER A STRING			**	
0469**				**	
0470*					
0471*	THE NUMBER OF CHARACTERS SPECIFIED BY TNULL (IN 1'S				
0472*	COMPLEMENT) IS TRANSFERRED FROM THE SOURCE STRING TO				
0473*	A DESTINATION STRING BEGINNING WITH THE CHARACTER				
0474*	ADDRESSED BY TEMP5.				
0475*					
0476	44612	071402	#TRST	STA TRFCH	SAVE SUBROUTINE CALL
0477	44613	035406		ISZ TNULL	MORE TRANSFER STRING?
0478	44614	002001		RSS	YES
0479	44615	125350		JMP TRSTR,I	NO

0480	44616	115402	JSB TRFCH,I	FETCH A SOURCE CHARACTER
0481	44617	060417	LDA .+400	NONE LEFT, LOAD A BLANK
0482	44620	071404	STA TRS0	SAVE IT
0483	44621	065272	LDB TEMP5	LOAD
0484	44622	004065	CLE,ERB	DESTINATION
0485	44623	160001	LDA 1,I	WORD
0486	44624	002041	SEZ,RSS	SAVE
0487	44625	001727	ALF,ALF	OTHER
0488	44626	010316	AND M256	CHARACTER
0489	44627	031404	IOR TRS0	COMBINE WITH
0490	44630	002041	SEZ,RSS	NEW CHARACTER
0491	44631	001727	ALF,ALF	AND STORE
0492	44632	170001	STA 1,I	WORD
0493	44633	035272	ISZ TEMP5	INCREMENT DESTINATION ADDRESS
0494	44634	026613	JMP #TRST+1	

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0496**
0497***   ADD TWO FLOATING POINT NUMBERS
0498**
0499   44635 071616 #FAD STA A1           SET POINTER TO 2ND ARGUMENT.
0500   44636 161402          LDA .FAD,I
0501   44637 071617          STA A2
0502   44640 061616          LDA A1
0503   44641 105000          OCT 105000       CALL HARDWARE ROUTINE.
0504   44642 101617          DEF A2,I
0505   44643 035402          ISZ .FAD       SET RETURN ADDRESS.
0506   44644 102201          SOC
0507   44645 015346          JSB OUCHK     OVERFLOW OR UNDERFLOW!
0508   44646 125402          JMP .FAD,I    RETURN.
0509**
0510***   SUBTRACT TWO FLOATING POINT NUMBERS
0511**
0512   44647 071616 #FSB STA A1           SET POINTER TO 2ND ARGUMENT.
0513   44650 161404          LDA .FSB,I
0514   44651 071617          STA A2
0515   44652 061616          LDA A1
0516   44653 105020          OCT 105020       CALL HARDWARE ROUTINE.
0517   44654 101617          DEF A2,I
0518   44655 035404          ISZ .FSB     SET RETURN ADDRESS.
0519   44656 102201          SOC
0520   44657 015346          JSB OUCHK     OVERFLOW OR UNDERFLOW!
0521   44660 125404          JMP .FSB,I    RETURN.
0522**
0523***   DETERMINES IF OVERFLOW OR UNDERFLOW
0524***   MESSAGE HAS TO BE GIVEN.
0525**
0526   44661 071616 #OUCHK STA A1          SAVE REGISTERS.
0527   44662 075617          STB A2
0528   44663 002002          SZA           OVER- OR UNDERFLOW?
0529   44664 026672          JMP OUCK2
0530   44665 015474          JSB CHOUF     UNDERFLOW! CHECK STATUS.
0531   44666 115207          JSB WERRS+6,I
0532   44667                   OUCK1 EQU *
0533   44667 061616          LDA A1           RE-INSTATE REGISTERS.
0534   44670 065617          LDB A2
0535   44671 125346          JMP OUCHK,I    RETURN.
0536   44672                   OUCK2 EQU *
0537   44672 015474          JSB CHOUF     OVERFLOW! CHECK STATUS.
0538   44673 115206          JSB WERRS+5,I
0539   44674 026667          JMP OUCK1
0540**
0541**
0542***   MULTIPLY TWO FLOATING POINT NUMBERS   **
0543**
0544   44675 071616 #FMP STA A1           SET POINTER TO 2ND ARGUMENT
0545   44676 161406          LDA .FMP,I
0546   44677 071617          STA A2
0547   44700 061616          LDA A1
0548   44701 105040          OCT 105040       CALL HARDWARE ROUTINE.
0549   44702 101617          DEF A2,I
0550   44703 035406          ISZ .FMP     SET RETURN ADDRESS.
0551   44704 102201          SOC

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0552 44705 015346      JSB OUCHK      OVERFLOW OR UNDERFLOW!
0553 44706 125406      JMP .FMP,I     RETURN.
0554**
0555***  DIVIDE TWO FLOATING POINT NUMBERS
0556**
0557 44707 071616  #FDV  STA A1          SET POINTER TO 2ND ARGUMENT
0558 44710 161410      LDA .FDV,I
0559 44711 071617      STA A2
0560 44712 061616      LDA A1
0561 44713 105060      OCT 105060    CALL HARDWARE ROUTINE.
0562 44714 101617      DEF A2,I
0563 44715 035410      ISZ .FDV      SET RETURN ADDRESS.
0564 44716 102201      SOC
0565 44717 015346      JSB OUCHK      OVERFLOW OR UNDERFLOW!
0566 44720 125410      JMP .FDV,I     RETURN.
0567**
0568***  TAKE ARITHMETIC INVERSE  ***
0569**
0570*
0571*  ENTER WITH A FLOATING POINT NUMBER IN (A) AND (B).
0572*  EXIT WITH ITS ARITHMETIC INVERSE IN (A) AND (B).
0573*
0574 44721 104400  #ARIN DST C1      STORE NUMBER.
      44722 001620
0575 44723 002400      CLA          A=0.
0576 44724 006400      CLB          B=0.
0577 44725 105020      OCT 105020  CALL SUBTRACT HARDWARE ROUTINE
0578 44726 001620      DEF C1
0579 44727 125370      JMP ARINV,I
0580**
0581***  UNPACK LOW WORD OF NUMBER ***
0582**
0583*
0584*  ENTER WITH LOW WORD OF FLOATING POINT NUMBER IN (B).
0585*  EXIT WITH EXPONENT IN (A) AND MANTISSA IN (B).
0586*
0587 44730 002400  #FLUN CLA          EXTRACT
0588 44731 101050      LSR 8        EXPONENT
0589 44732 001727      ALF,ALF     IN (A) AND
0590 44733 005727      BLF,BLF     MANTISSA IN (B)
0591 44734 000033      SLA,RAR     NEGATIVE EXPONENT?
0592 44735 032000      IOR SMSK    YES, FILL IN LEADING BITS
0593 44736 125412      JMP .FLUN,I  NO

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0002*
0003* WHILE READING A PROGRAM IN 'TAPE' MODE, ERRONEOUS STATEMENTS
0004* ARE REPLACED WITH ERROR PSEUDO-STATEMENTS. THESE ARE THREE
0005* WORD 'STATEMENTS': THE STATEMENT NUMBER, THE LENGTH (ALWAYS
0006* 3), AND THE ERROR NUMBER. SINCE BITS 15-9 ARE CLEAR IN WORD
0007* THREE, ERRORS HAVE A STATEMENT TYPE OF 0. ERRCT HOLDS A
0008* COUNT OF THE EMBEDDED ERRORS AND THE USER'S BIT OF TERR IS
0009* SET IF ANY EMBEDDED ERRORS EXIST. ADDITIONALLY, THE 'OUT-OF-
0010* STORAGE' ERROR SETS SYMTB = 1 TO ASSIST SYNTAX. ALL STATEMENTS
0011* WITH A SEQUENCE NUMBER OF ZERO WILL BE COLLAPSED INTO A SINGLE
0012* ERROR AND UNDER/OVERFLOWS IN NUMERICAL CONSTANTS ARE NOT
0013* REPORTED.
0014*
0015**
0016*** OUTPUT TAPE MODE ERRORS ***
0017**
0018*
0019* UPON ENTRY ALL EMBEDDED ERRORS ARE STRIPPED FROM THE PROGRAM
0020* AND STORED BELOW IT AS TWO-WORD QUANTITIES (THE LENGTH WORD
0021* IS DROPPED). FOLLOWING THIS THE ERRORS ARE PRINTED ONE BY
0022* ONE WITH LINE NUMBERS. AFTER PRINTING ALL ERRORS (OR, IF THE
0023* USER ABORTS THE ERROR PRINTING, AFTER THE USER TYPES THE NEXT
0024* LINE) EVERYTHING IS CLEANED UP AND A MESSAGE PRINTED TO SAY
0025* THE LAST RECEIVED INPUT HAS BEEN IGNORED.
0026*
0027 44737 002400 TAPER CLA FIRST
0028 44740 051574 CPA ERRCT ENTRY?
0029 44741 027054 JMP TAPE5 NO
0030 44742 071573 STA SYMTB YES, RESET 'OUT OF STORAGE' FLAG
0031 44743 060056 LDA PBPTR INITIALIZE
0032 44744 071230 STA SPTR
0033 44745 064726 LDB PBUFF PROGRAM
0034 44746 075512 STB DEST
0035 44747 075510 STB SOURC POINTERS
0036*
0037** STRIP OUT EMBEDDED ERRORS **
0038*
0039 44750 006004 TAPE1 INB SET (B)
0040 44751 060001 LDA 1 TO FIRST WORD
0041 44752 144001 ADB 1,I OF NEXT
0042 44753 044356 ADB -1 PROGRAM STATEMENT
0043 44754 002004 INA IS THE
0044 44755 160000 LDA 0,I CURRENT STATEMENT
0045 44756 010570 AND OPMSK OF TYPE
0046 44757 002002 SZA 'ERROR' ?
0047 44760 026750 JMP TAPE1 NO
0048 44761 061510 LDA SOURC YES, LOAD SOURCE ADDRESS
0049 44762 075510 STB SOURC SET SOURCE TO NEW VALUE
0050 44763 044354 ADB -3 JUXTAPOSED
0051 44764 050001 CPA 1 ERRORS?
0052 44765 026771 JMP TAPE2 YES, NO MOVE NEEDED
0053 44766 051512 CPA DEST NO, FIRST ERROR ENCOUNTERED?
0054 44767 027065 JMP TAPE6 YES
0055 44770 015476 JSB MOVER NO, DELETE PRIOR ERROR(S)
0056 44771 064056 TAPE2 LDB PBPTR ENOUGH
0057 44772 075476 STB TAP0

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0058	44773	006004	INB	USER SPACE
0059	44774	054716	CPB LWAUS	
0060	44775	027070	JMP TAPE7	TO TRANSFER
0061	44776	006004	INB	
0062	44777	054716	CPB LWAUS	ERROR?
0063	45000	027070	JMP TAPE7	NO
0064	45001	074056	STB PBPTR	YES, APPEND TWO WORDS
0065	45002	164000	LDB 0,I	TRANSFER
0066	45003	175476	STB TAP0,I	LINE NUMBER
0067	45004	035476	ISZ TAP0	
0068	45005	040361	ADA ,+2	TRANSFER
0069	45006	164000	LDB 0,I	ERROR
0070	45007	175476	STB TAP0,I	NUMBER
0071	45010	065510	LDB SOURC	RETRIEVE POINTER TO STATEMENT
0072	45011	003400	CCA	DECREMENT
0073	45012	041574	ADA ERRCT	ERROR
0074	45013	071574	STA ERRCT	COUNTER
0075	45014	002002	SZA	ALL ERRORS DELETED?
0076	45015	026750	JMP TAPE1	NO
0077	45016	055230	CPB SPTR	YES, PROGRAM REMAINING?
0078	45017	027023	JMP TAPE3	NO
0079	45020	061510	LDA SOURC	YES, SLIDE UP
0080	45021	065230	LDB SPTR	OVER LAST
0081	45022	015476	JSB MOVER	ERROR(S)
0082*			*	
0083**	OUTPUT ERROR MESSAGES		**	
0084*			*	
0085	45023	063042	TAPE3 LDA RETAD	SET
0086	45024	071472	STA SERR	RETURN ADDRESS
0087	45025	062004	LDA WERRA	FAKE
0088	45026	042003	ADA FERRA	
0089	45027	003004	CMA,INA	'WARNING ONLY'
0090	45030	071440	STA LT5	ERROR MODE
0091	45031	007400	TAPE4 CCB	FORCE
0092	45032	075442	STB LT6	LINE NUMBER
0093	45033	165230	LDB SPTR,I	MAKE LINE NUMBER OF
0094	45034	075566	STB ,LNUM	CURRENT ERROR ACCESSIBLE
0095	45035	035230	ISZ SPTR	LOAD
0096	45036	161230	LDA SPTR,I	ERROR NUMBER
0097	45037	071430	STA LT3	
0098	45040	006400	CLB	EXIT TO
0099	45041	027200	JMP SERR1+3	ERROR PRINTER
0100	45042	045043	RETAD DEF ++1	
0101	45043	062003	LDA FERRA	RESTORE
0102	45044	003004	CMA,INA	'WARNING
0103	45045	041440	ADA LT5	ONLY'
0104	45046	071440	STA LT5	MODE
0105	45047	035230	ISZ SPTR	MORE
0106	45050	061230	LDA SPTR	
0107	45051	050056	CPA PBPTR	ERRORS?
0108	45052	002001	RSS	NO
0109	45053	027031	JMP TAPE4	YES
0110	45054	061512	TAPE5 LDA DEST	CORRECT POINTER TO
0111	45055	070056	STA PBPTR	LAST WORD +1 OF PROGRAM
0112	45056	103100	CLF 0	
0113	45057	060360	LDA TERR	TURN

0114	45060	003000	CMA	ERROR
0115	45061	110255	AND MAIN,I	FLAG
0116	45062	170255	STA MAIN,I	OFF
0117	45063	102100	STF 0	
0118	45064	115140	JSB RERRS+33,I	EMIT PARTING SHOT
0119*				
0120	45065	075512	TAPE6 STB DEST	SET DESTINATION POINTER
0121	45066	060001	LDA 1	TO FIRST ERROR ENCOUNTERED
0122	45067	026771	JMP TAPE2	
0123	45070	071472	TAPE7 STA TAP1	SAVE SOURCE ADDRESS
0124	45071	003004	CMA,INA	COMPUTE SIZE OF AREA
0125	45072	041512	ADA DEST	TO BE RECLAIMED
0126	45073	071476	STA TAP0	AND SAVE IT
0127	45074	041230	ADA SPTR	RESET POINTER TO
0128	45075	071230	STA SPTR	LAST WORD +1 OF PROGRAM
0129	45076	065510	LDB SOURC	SET POINTER TO
0130	45077	045476	ADB TAP0	NEXT STATEMENT
0131	45100	075510	STB SOURC	TO NEW VALUE
0132	45101	061472	LDA TAP1	RETRIEVE SOURCE ADDRESS
0133	45102	064056	LDB PBPTR	RECLAIM
0134	45103	015476	JSB MOVER	SPACE
0135	45104	065512	LDB DEST	SET NEW POINTER TO
0136	45105	074056	STB PBPTR	PROTECTED AREA
0137	45106	061510	LDA SOURC	COMPUTE POINTER TO
0138	45107	040354	ADA ,-3	CURRENT ERROR STATEMENT
0139	45110	071512	STA DEST	SET NEW DESTINATION POINTER
0140	45111	026772	JMP TAPE2+1	
0141**				**
0142***	MOVE BLOCK TO LOWER CORE			***
0143**				**
0144*				
0145*	UPON ENTRY (B) POINTS TO THE LAST WORD +1 TO BE MOVED AND			
0146*	(A) POINTS TO THE FIRST WORD TO BE MOVED. DEST POINTS TO THE			
0147*	FIRST WORD OF THE DESTINATION SPACE.			
0148*				
0149	45112	075741	#MOVE STB ETEMP	SAVE POINTER TO LAST WORD + 1
0150	45113	164000	LDB 0,I	TRANSFER
0151	45114	175512	STB DEST,I	WORD
0152	45115	035512	ISZ DEST	BUMP
0153	45116	002004	INA	POINTERS
0154	45117	051741	CPA ETEMP	DONE?
0155	45120	125476	JMP MOVER,I	YES
0156	45121	027113	JMP #MOVE+1	NO

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0158**          **
0159***  OUTPUT AN ERROR MESSAGE  ***
0160**          **
0161*
0162*  THE ERROR IS IDENTIFIED VIA THE RELATIVE JUMP THROUGH THE ERROR
0163*  JUMP TABLE.  IF THE ERROR IS A SYNTAX TYPE AND THE USER IS IN
0164*  'TAPE' MODE, THE ERROR IS EMBEDDED IN THE PROGRAM AS A PSEUDO-
0165*  STATEMENT FOR LATER PRINTOUT AND THE ERROR FLAGS ARE ADJUSTED
0166*  AS APPROPRIATE.  OTHERWISE, THE DISC BLOCK CONTAINING THE ERROR
0167*  MESSAGE IS READ INTO CORE (IF IT IS NOT ALREADY THERE) AND THE
0168*  MESSAGE IS PLACED IN A USER BUFFER FOR PRINTOUT.  IF A SYNTAX
0169*  ERROR IS IDENTIFIED IN THE 'KEY' MODE, 'ERROR' IS PRINTED AND INP
0170*  REQUESTED.  THE ERROR MESSAGE IS PRINTED IF THE REPLY IS OTHER
0171*  THAN A SIMPLE CARRIAGE RETURN.  IF THE LENGTH WORD OF THE ERROR
0172*  MESSAGE IS POSITIVE THE CURRENT LINE NUMBER IS APPENDED.
0173*
0174  45122 003400 #SERR CCA          COMPUTE
0175  45123 041472          ADA SERR
0176  45124 160000          LDA 0,I          AND SAVE
0177  45125 042001          ADA SERRA
0178  45126 010504          AND B777          ERROR NUMBER
0179  45127 071430          STA LT3
0180  45130 042002          ADA RERRA
0181  45131 071440          STA LT5
0182  45132 042003          ADA FERRA
0183  45133 042004          ADA WERRA          WARNING
0184  45134 002021          SSA,RSS          ERROR?
0185  45135 027154          JMP SERR0          YES
0186  45136 060255          LDA MAIN          DOES THIS
0187  45137 002004          INA          USER HAVE
0188  45140 050253          CPA PRIST          THE LP?
0189  45141 002001          RSS
0190  45142 027154          JMP SERR0          NO
0191  45143 063454          LDA SLPMS          YES
0192  45144 071426          STA LT1
0193  45145 006400          CLB          OUTPUT
0194  45146 075274          STB LT2
0195  45147 074253          STB PRIST          MESSAGE
0196  45150 060351          LDA .-6
0197  45151 015460          JSB OUTST          TO USER
0198  45152 060243          LDA LPD          TELL I/O PROCESSOR
0199  45153 114736          JSB S14SC,I          TO REMOVE USER
0200  45154 061440          SERR0 LDA LT5          SYNTAX
0201  45155 002021          SSA,RSS          ERROR?
0202  45156 027175          JMP SERR1          NO
0203  45157 060367          LDA TAPEF          YES
0204  45160 110255          AND MAIN,I          TAPE
0205  45161 002002          SZA          MODE?
0206  45162 027414          JMP SERR6          YES
0207  45163 006400          CLB          NO
0208  45164 075274          STB LT2          OUTPUT
0209  45165 063442          LDA ASCER          'ERROR'
0210  45166 071426          STA LT1          AND
0211  45167 060354          LDA .-3          WAIT
0212  45170 015460          JSB OUTST          FOR
0213  45171 060225          LDA INT

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0214	45172	114742		JSB SCHIN,I	INPUT.
0215	45173	015446		JSB GETCR	CARRIAGE RETURN ONLY?
0216	45174	027305		JMP SERR4	YES
0217*				*	
0218**		PRINT THE MESSAGE		**	
0219*				*	
0220	45175	061430	SERR1	LDA LT3	
0221	45176	006400		CLB	CLEAR 'LINE
0222	45177	075442		STB LT6	NUMBER' FLAG
0223	45200	066005		LDB DSERR	CALCULATE
0224	45201	040450	SERA	ADA M32	ON NEXT BLOCK
0225	45202	002020		SSA	
0226	45203	027207		JMP SERIA	
0227	45204	044361		ADB .+2	
0228	45205	071430		STA LT3	THE
0229	45206	027201		JMP SERA	NOT FOUND YET
0230	45207	054256	SERIA	CPB LIB	IS MESSAGE IN CORE?
0231	45210	027221		JMP SER1B	YES
0232	45211	074256		STB LIB	
0233	45212	060001		LDA B	FIX DISC ADDRESS POINTER
0234	45213	064315		LDB M512	STORE NUMBER
0235	45214	074204		STB MWORD	OF WORDS
0236	45215	064606		LDB #LIB#	FIX CORE ADDRESS POINTER
0237	45216	045027		ADB MNEG	AND 'READ' INDICATOR
0238	45217	114206		JSB DISCZ,I	READ ERROR MESSAGE INTO CORE
0239	45220	114207		JSB SICKP,I	BAD LUCK
0240	45221	061430	SER1B	LDA LT3	LOAD
0241	45222	100200		MPY .+16	
	45223	000377			
0242	45224	040606		ADA #LIB#	ERROR MESSAGE
0243	45225	065512		LDB DEST	SAVE
0244	45226	075742		STB ETMP1	DEST
0245	45227	064650		LDB ERSCA	
0246	45230	075512		STB DEST	INTO
0247	45231	064000		LDB A	
0248	45232	044377		ADB .+16	OUTPUT
0249	45233	015476		JSB MOVER	BUFFER
0250	45234	065742		LDB ETMP1	RESTORE
0251	45235	075512		STB DEST	DEST
0252	45236	061440		LDA LT5	
0253	45237	002021		SSA,RSS	EXECUTION ERROR?
0254	45240	027360		JMP SERR5	YES
0255	45241	002400		CLA	NO, OUTPUT
0256	45242	015452		JSB OUTCR	A NULL.
0257	45243	060350		LDA .-7	
0258	45244	071426		STA LT1	OUTPUT
0259	45245	060417		LDA .+40B	
0260	45246	015452		JSB OUTCR	7
0261	45247	035426		ISZ LT1	
0262	45250	027245		JMP *-3	BLANKS.
0263	45251	060650	SERR2	LDA ERSCA	STORE MESSAGE
0264	45252	071426		STA LT1	ADDRESS
0265	45253	007400		CCB	
0266	45254	160000		LDA 0,I	
0267	45255	002020		SSA	LINE NUMBER?
0268	45256	027261		JMP **3	NO

0269	45257	075442		STB LT6	YES, SET FLAG
0270	45260	003004		CMA, INA	
0271	45261	006400		CLB	OUTPUT
0272	45262	075274		STB LT2	ERROR
0273	45263	015460		JSB OUTST	MESSAGE
0274	45264	035442		ISZ LT6	LINE NUMBER FLAG SET?
0275	45265	027275		JMP SERR3	NO
0276	45266	063446		LDA LINEA	YES
0277	45267	071426		STA LT1	PRINT
0278	45270	006400		CLB	
0279	45271	060352		LDA .-5	" IN LINE "
0280	45272	015460		JSB OUTST	
0281	45273	065566		LDB .LNUM	OUTPUT
0282	45274	015454		JSB OUTIN	LINE NUMBER
0283	45275	061440	SERR3	LDA LT5	IBAD
0284	45276	042003		ADA FERRA	
0285	45277	071440		STA LT5	
0286	45300	042004		ADA WERRA	INPUT
0287	45301	002003		SZA, RSS	ERROR
0288	45302	027316		JMP SERR8	YES
0289	45303	060374		LDA .+15B	OUTPUT
0290	45304	015452		JSB OUTCR	CARRIAGE RETURN
0291	45305	060371	SERR4	LDA .+12B	OUTPUT
0292	45306	015452		JSB OUTCR	LINE FEED
0293	45307	061440		LDA LT5	RUN
0294	45310	002020		SSA	ERROR?
0295	45311	027347		JMP SER13	YES
0296	45312	042004		ADA WERRA	NO, WARNING
0297	45313	002020		SSA	ONLY?
0298	45314	027320		JMP SERR9	NO, FORMAT ERROR
0299	45315	002400		CLA	YES
0300	45316	071570	SERR8	STA CHRCT	
0301	45317	125472		JMP SERR, I	
0302	45320	006400	SERR9	CLB	
0303	45321	061757		LDA IFSTR	CONVERT
0304	45322	101101		RRR 1	CHARACTER
0305	45323	071426		STA LT1	SAVE POINTER
0306	45324	061760		LDA NCH	SAVE
0307	45325	003004		CMA, INA	NUMBER OF
0308	45326	071760		STA NCH	CHARACTERS
0309	45327	006002		SZB	START WITH RIGHT BYTE?
0310	45330	027340		JMP SER11	YES
0311	45331		SER10	EQU *	
0312	45331	161426		LDA LT1, I	FETCH
0313	45332	001727		ALF, ALF	LEFT
0314	45333	010500		AND B377	CHAR
0315	45334	015452		JSB OUTCR	OUTPUT IT
0316	45335	035760		ISZ NCH	FINISHED ALL CHARS?
0317	45336	002001		RSS	NO
0318	45337	027346		JMP SER12	YES
0319	45340		SER11	EQU *	
0320	45340	161426		LDA LT1, I	FETCH RIGHT
0321	45341	010500		AND B377	CHARACTER
0322	45342	015452		JSB OUTCR	OUTPUT IT
0323	45343	035426		ISZ LT1	BUMP POINTER
0324	45344	035760		ISZ NCH	FINISHED ALL CHARS?

0325	45345	027331		JMP SER10	NO
0326	45346		SER12	EQU *	
0327	45346	015534		JSB OUTCL	OUTPUT CR-LF
0328	45347		SER13	EQU *	
0329	45347	103100		CLF 0	
0330	45350	160255		LDA MAIN,I	DISALLOW
0331	45351	030377		IOR UNABT	
0332	45352	170255		STA MAIN,I	ABORTS
0333	45353	102100		STF 0	
0334	45354	061500		LDA FCNTR	
0335	45355	071550		STA FRMAT	
0336	45356	015556		JSB LCDLP	UPDATE LAST CHANGE DATE
0337	45357	124740		JMP SCHEN,I	
0338*					
0339	45360	060374	SERR5	LDA .+15B	OUTPUT
0340	45361	015452		JSB OUTCR	CARRIAGE RETURN
0341	45362	060371		LDA .+12B	AND
0342	45363	015452		JSB OUTCR	LINE FEED
0343	45364	002400		CLA	BLOCK
0344	45365	170632		STA DCLC1,I	CLOCK
0345	45366	114614		JSB ABCK,I	CHECK FOR ABORTS
0346	45367	160634		LDA DCLC2,I	UNBLOCK
0347	45370	170632		STA DCLC1,I	CLOCK
0348	45371	061440		LDA LT5	WARNING
0349	45372	042003		ADA FERRA	
0350	45373	042004		ADA WERRA	
0351	45374	002021		SSA,RSS	ERROR?
0352	45375	027251		JMP SERR2	YES
0353	45376	060506		LDA CHNFG	NO
0354	45377	003000		CMA	
0355	45400	103100		CLF 0	
0356	45401	110001		AND 1,I	CLEAR
0357	45402	170001		STA 1,I	CHAIN FLAG
0358	45403	102100		STF 0	
0359	45404	006004		INB	
0360	45405	160001		LDA 1,I	TELL 2114
0361	45406	030224		IOR UNR	THAT USER IS
0362	45407	114736		JSB S14LP,I	NO LONGER RUNNING
0363	45410	060363		LDA .+4	CLEAR PBFLG AND CBFLG
0364	45411	044356		ADB .-?TNUM	
0365	45412	015562		JSB EDABR	BITS.
0366	45413	027251		JMP SERR2	
0367	45414	064056	SERR6	LDB PBPTR	
0368	45415	044361		ADB .+2	STORE
0369	45416	061430		LDA LT3	ERROR
0370	45417	170001		STA 1,I	NUMBER
0371	45420	006004		INB	SET POINTER TO
0372	45421	075572		STB SBPTR	LAST WORD +1 OF ERROR
0373	45422	002003		SZA,RSS	'OUT OF STORAGE' ERROR?
0374	45423	035573		ISZ SYMTB	YES
0375	45424	103100		CLF 0	NO
0376	45425	160255		LDA MAIN,I	FIRST
0377	45426	030360		IOR TERR	
0378	45427	150255		CPA MAIN,I	ERROR?
0379	45430	027434		JMP **4	NO
0380	45431	170255		STA MAIN,I	YES--SET FLAG

0381	45432	002400	CLA		CLEAR
0382	45433	071574	STA	ERRCT	ERROR COUNTER
0383	45434	102100	STF	0	
0384	45435	035574	ISZ	ERRCT	COUNT ERROR
0385	45436	015450	JSB	BCKSP	SEEK
0386	45437	015446	SERR7 JSB	GETCR	CARRIAGE RETURN
0387	45440	124620	JMP	ACCSA,I	
0388	45441	027437	JMP	*-2	
0389*					
0390	45442	045442	ASCER	DEF ERR=1	
0391	45443	005105	ERR	OCT 5105	
0392	45444	051122		ASC 2,RROR	
	45445	047522			
0393	45446	045446	LINEA	DEF *	
0394	45447	020111		ASC 4, IN LINE	
	45450	047040			
	45451	046111			
	45452	047105			
0395	45453	020000		OCT 20000	
0396	01741		ETEMP	EQU ERSEC+62	
0397	01742		ETMP1	EQU ERSEC+63	
0398	45454	071231	SLPMS	DEF LPM=1	=> LP FREE MESSAGE

```

0400 46000                                ORG 46000B
0401 46000 040512  ENDIN DEF EIN12
0402 46001 040450  MINP2 DEF EINP0+3
0403 46002 040375  MINP1 DEF EINP1
0404 46003 177713  D65   OCT =65
0405*
0406***
0407** EXECUTE <MAT STATEMENT> **
0408***
0409*
0410 46004 046323  MLP2A DEF MLOP2
0411 46005 046325  MLP3A DEF MLOP3
0412 46006 047212  MADDA DEF MADD
0413 46007 047215  MSUBA DEF MSUB
0414 46010 047227  SMULA DEF SMULT
0415 46011 047220  IDNA  DEF IDN
0416 46012 047232  MCPYA DEF MCPY
0417 46013 041433  TOLC  DEC +1E-6
      46014 157733
0418 46015 046016  F0.0A DEF F0.0
0419 46016 000000  F0.0  DEC 0.0
      46017 000000
0420 46020 046021  F1.0A DEF F1.0
0421 46021 040000  F1.0  DEC 1.0
      46022 000002
0422*
0423 46023 161611  EMAT  LDA TEMP1,I  FIRST
0424 46024 010566                AND OPDMK          OPERAND
0425 46025 002002                SZA                    NULL?
0426 46026 026206                JMP EMAT1          NO
0427*
0428** IDENTIFY MATRIX I/O **
0429*
0430 46027 035611                ISZ TEMP1
0431 46030 003400                CCA
0432 46031 071470                STA ELCNT
0433 46032 015552                JSB EPRUS
0434 46033 161611                LDA TEMP1,I
0435 46034 101111                RRR 9
0436 46035 010460                AND B77
0437 46036 042003                ADA D65
0438 46037 071314                STA MT1
0439 46040 002026                SSA,INA,SZA
0440 46041 071312                STA MT0
0441 46042 015504                JSB VLFIL
0442 46043 000000                NOP
0443 46044 161611  MID1  LDA TEMP1,I
0444 46045 010566                AND OPDMK
0445 46046 002003                SZA,RSS
0446 46047 124762                JMP XEC1A,I
0447*
0448** PREPARE A MATRIX FOR I/O **
0449*
0450 46050 001000                ALS
0451 46051 041573                ADA SYMTB
0452 46052 040356                ADA .-1

```

```

FIRST
OPERAND
NULL?
NO

CHECK
FOR
'MAT PRINT USING'
COMPUTE AND SAVE
I/O TYPE:
INPUT = -2
READ = -1
PRINT = 0
SAVE FLAG
IF 'INPUT'
PROCESS ANY
FILE REQUEST
LOAD NEXT
IDENTIFIER
ZERO?
YES

LOAD
BASE ADDRESS
OF ARRAY

```

0453	46053	164000	LDB 0,I	
0454	46054	044355	ADB .-2	SAVE POINTER TO
0455	46055	075572	STB SBPTR	DYNAMIC DIMENSIONS
0456	46056	061611	LDA TEMP1	LAST
0457	46057	002004	INA	WORD OF
0458	46060	051334	CPA PRGCT	STATEMENT?
0459	46061	002400	CLA	YES
0460	46062	160000	LDA 0,I	NO, LOAD (A) WITH
0461	46063	010570	AND OPMSK	FOLLOWING OPERATOR
0462	46064	065314	LDB MT1	MAT
0463	46065	006003	SZB,RSS	PRINT?
0464	46066	026121	JMP MIO2	YES
0465	46067	050554	CPA LBOP	NO, 'I' NEXT OPERATOR?
0466	46070	015466	JSB REDIM	YES, REDIMENSION ARRAY
0467	46071	161572	LDA SBPTR,I	SET POINTER
0468	46072	035572	ISZ SBPTR	TO FIRST ELEMENT
0469	46073	100200	MPY SBPTR,I	OF ARRAY
	46074	101572		
0470	46075	035572	ISZ SBPTR	WHILE COMPUTING
0471	46076	003004	CMA,INA	NUMBER OF
0472	46077	071476	STA MCNT	ELEMENTS
0473	46100	003400	CCA	MAT
0474	46101	051314	CPA MT1	READ?
0475	46102	026110	JMP MIO9	YES
0476*				
0477**	INPUT VALUES FOR MATRIX **			
0478*				
0479	46103	035312	ISZ MT0	FIRST MATRIX TO BE INPUT?
0480	46104	002001	RSS	NO
0481	46105	126002	JMP MINP1,I	YES
0482	46106	041312	ADA MT0	RETRIEVE
0483	46107	126001	JMP MINP2,I	SAVED CHARACTER
0484*				
0485**	READ VALUES FOR MATRIX **			
0486*				
0487	46110	006404	MIO9 CLB,INB	FETCH
0488	46111	015362	JSB FDATA	CONSTANT
0489	46112	104400	DST SBPTR,I	STORE
	46113	101572		
0490	46114	035572	ISZ SBPTR	
0491	46115	035572	ISZ SBPTR	IT
0492	46116	035476	ISZ MCNT	DONE?
0493	46117	026110	JMP MIO9	NO
0494	46120	026174	JMP MIO7	YES
0495*				
0496	46121	050516	MIO2 CPA B3000	'I' FOLLOWING ARRAY?
0497	46122	007400	CCB	YES
0498	46123	075476	STB MCNT	NO, TREAT AS COMMA
0499	46124	065572	LDB SBPTR	VALIDATE
0500	46125	015470	JSB VCHK	ARRAY ELEMENTS
0501	46126	161572	LDA SBPTR,I	SAVE
0502	46127	035572	ISZ SBPTR	COUNT
0503	46130	003004	CMA,INA	OF
0504	46131	071312	STA MT0	ROWS
0505	46132	161572	LDA SBPTR,I	
0506	46133	035572	ISZ SBPTR	

0507	46134	065234		LDB FILE#	WRITE ON
0508	46135	006020		SSB	A FILE?
0509	46136	026151		JMP M103	NO
0510*				*	
0511**	WRITE MATRIX ON FILE			**	
0512*				*	
0513	46137	100200		MPY M10	SET
	46140	001312			
0514	46141	071476		STA MCNT	ELEMENT COUNTER
0515	46142	064355	M104	LDB .-2	WRITE ELEMENT
0516	46143	015510		JSB FILST	TO FILE
0517	46144	035572		ISZ SBPTR	MOVE TO
0518	46145	035572		ISZ SBPTR	NEXT ELEMENT
0519	46146	035476		ISZ MCNT	MATRIX DONE?
0520	46147	026142		JMP M104	NO
0521	46150	026174		JMP M107	YES

```

0523*
0524** WRITE MATRIX ON TELETYPE **
0525*
0526 46151 003004 M103 CMA,INA SAVE
0527 46152 071623 STA MT3 COLUMN COUNT
0528 46153 071622 M108 STA MT2 SET COLUMN COUNT
0529 46154 026160 JMP M106
0530 46155 002400 M105 CLA
0531 46156 051476 CPA MCNT
0532 46157 015426 JSB EDELM
0533 46160 104200 M106 DLD SBPTR,I PRINT
    46161 101572
0534 46162 015416 JSB ENOUT ELEMENT
0535 46163 035572 ISZ SBPTR MOVE TO
0536 46164 035572 ISZ SBPTR NEXT ELEMENT
0537 46165 035622 ISZ MT2 ROW DONE?
0538 46166 026155 JMP M105 NO
0539 46167 015424 JSB OUTLN YES, DOUBLE
0540 46170 015424 JSB OUTLN SPACE
0541 46171 061623 LDA MT3
0542 46172 035312 ISZ MT0 MATRIX DONE?
0543 46173 026153 JMP M108 NO
0544*
0545** CHECK FOR MORE MATRICES **
0546*
0547 46174 035611 M107 ISZ TEMP1
0548 46175 065611 LDB TEMP1 STATEMENT
0549 46176 055334 CPB PRGCT FINISHED?
0550 46177 026202 JMP ++3 YES
0551 46200 071312 STA MT0 NO, SAVE (A)
0552 46201 026044 JMP M101
0553 46202 064355 LDB .-2 MATRIX
0554 46203 055314 CPB MT1 INPUT?
0555 46204 126000 JMP ENDIN,I YES
0556 46205 124762 JMP XEC1A,I NO
0557*
0558** PREPARE MATRIX ASSIGNMENT **
0559*
0560 46206 064762 EMAT1 LDB XEC1A SET MAIN LOOP TO
0561 46207 075364 STB MEXIT STATEMENT EXIT MODE
0562 46210 001000 ALS
0563 46211 041573 ADA SYMTB COMPUTE
0564 46212 040356 ADA .-1 POINTER
0565 46213 164000 LDB 0,I TO
0566 46214 044355 ADB .-2 DESTINATION
0567 46215 075572 STB BS1 MATRIX
0568 46216 035611 ISZ TEMP1
0569 46217 161611 LDA TEMP1,I MATRIX
0570 46220 002020 SSA FUNCTION?
0571 46221 026455 JMP EMAT6 YES
0572 46222 066004 LDB MLP2A NO, SET OPERATION
0573 46223 075340 EMAT2 STB MOP JUMP TO 'REPLACE' MODE
0574 46224 035611 ISZ TEMP1
0575 46225 010566 AND OPDMK SCALAR
0576 46226 002003 SZA,RSS MULTIPLICATION?
0577 46227 026445 JMP EMAT5 YES

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0578	46230	001000	ALS		NO
0579	46231	041573	ADA SYMTB		COMPUTE
0580	46232	040356	ADA .-1		POINTER
0581	46233	164000	LDB 0,1		TO FIRST
0582	46234	044355	ADB .-2		SOURCE
0583	46235	075350	STB BS2		MATRIX
0584	46236	015470	JSB VCHK		VALIDATE ITS ELEMENTS
0585	46237	061611	LDA TEMP1		END OF
0586	46240	051334	CPA PRGCT		STATEMENT?
0587	46241	026277	JMP EMAT3		YES
0588	46242	161611	LDA TEMP1,I		NO
0589	46243	010566	AND OPDMK		COMPUTE
0590	46244	001000	ALS		
0591	46245	041573	ADA SYMTB		POINTER TO
0592	46246	040356	ADA .-1		
0593	46247	164000	LDB 0,1		SECOND
0594	46250	044355	ADB .-2		
0595	46251	075352	STB BS3		SOURCE MATRIX
0596	46252	015470	JSB VCHK		VALIDATE ITS ELEMENTS
0597	46253	161611	LDA TEMP1,I		
0598	46254	010570	AND OPMSK		MATRIX
0599	46255	050560	CPA MULOP		MULTIPLICATION?
0600	46256	026334	JMP EMAT4		YES
0601	46257	100106	RRL 6		NO
0602*					*
0603**	SET UP MATRIX ADD, SUBTRACT, OR REPLACE				**
0604*					*
0605	46260	066006	LDB MADDA		RECORD
0606	46261	002020	SSA		'MATRIX ADD'
0607	46262	066007	LDB MSUBA		OR 'MATRIX SUBTRACT'
0608	46263	075340	STB MOP		OPERATION JUMP
0609	46264	065572	LDB BS1		
0610	46265	160001	LDA 1,I		ROW
0611	46266	151352	CPA BS3,I		COMPATIBILITY?
0612	46267	006005	INB,RSS		YES
0613	46270	115112	JSB RERRS+11,I		NO
0614	46271	035352	ISZ BS3		
0615	46272	164001	LDB 1,1		COLUMN
0616	46273	155352	CPB BS3,I		COMPATIBILITY?
0617	46274	002001	RSS		YES
0618	46275	115112	JSB RERRS+11,I		NO
0619	46276	035352	ISZ BS3		
0620	46277	161350	EMAT3 LDA BS2,I		ROW
0621	46300	151572	CPA BS1,I		COMPATIBILITY?
0622	46301	002001	RSS		YES
0623	46302	115112	JSB RERRS+11,I		NO
0624	46303	035350	ISZ BS2		
0625	46304	035572	ISZ BS1		COMPUTE NUMBER
0626	46305	100200	MPY BS2,I		OF MATRIX ELEMENTS
	46306	101350			
0627	46307	165350	LDB BS2,I		COLUMN
0628	46310	155572	CPB BS1,I		COMPATIBILITY?
0629	46311	003005	CMA,INA,RSS		YES
0630	46312	115112	JSB RERRS+11,I		NO
0631	46313	071476	STA MCNT		SAVE 2'S COMPLEMENT OF SIZE
0632	46314	035350	ISZ BS2		

0633 46315 035572

TSZ BS1

```

0001*
0002**  ASSIGN MATRIX VALUE **
0003*
0004*
0005*  MOP HOLDS A POINTER TO CODE WHICH COMPUTES ONE ELEMENT OF THE
0006*  DESTINATION MATRIX AND RETURNS IT IN (A) AND (B). MEXIT
0007*  HOLDS THE EXIT ADDRESS SET BY THE CALLER.
0008*
0009  46316 104200 MLOOP DLD BS2,I      LOAD ELEMENT OF SOURCE MATRIX
      46317 101350
0010  46320 125340                JMP MOP,I      JUMP TO OPERATION
0011  46321 035352 MLOP1 ISZ BS3    MOVE TO NEXT ELEMENT
      46322 035352                ISZ BS3        OF SECOND SOURCE MATRIX
0012  46323 035350 MLOP2 ISZ BS2    MOVE TO NEXT ELEMENT
      46324 035350                ISZ BS2        OF FIRST SOURCE MATRIX
0013  46325 104400 MLOP3 DST BS1,I  RECORD ELEMENT
      46326 101572
0014  46327 035572                ISZ BS1        OF DESTINATION MATRIX
0015  46330 035572                ISZ BS1        AND MOVE TO NEXT ELEMENT
0016  46331 035476                ISZ MCNT       DONE?
0017  46332 026316                JMP MLOOP      NO
0018  46333 125364                JMP MEXIT,I    YES
0019
0020
0021*
0022**  COMPUTE MATRIX PRODUCT **
0023*
0024  46334 161572 EMAT4 LDA BS1,I      DESTINATION MATRIX
      46335 151350                CPA BS2,I      ROW COMPATIBILITY?
0025  46336 003005                CMA,INA,RSS   YES
0026  46337 115112                JSB RERRS+11,I NO
0027  46340 071632                STA MMT0       SAVE ROW COUNTER
0028  46341 035572                ISZ BS1
0029  46342 035350                ISZ BS2
0030  46343 161350                LDA BS2,I      INNER PRODUCT
0031  46344 151352                CPA BS3,I      COMPATIBILITY?
0032  46345 003005                CMA,INA,RSS   YES
0033  46346 115112                JSB RERRS+11,I NO
0034  46347 071633                STA MMT1       SAVE INNER PRODUCT
0035  46350 071634                STA MMT2       COUNTERS
0036  46351 001000                ALS           SAVE ROW
0037  46352 071630                STA MMT6       BACK UP AMOUNT
0038  46353 100200                MPY BS1,I      SAVE COLUMN
0039  46354 101572
0040  46355 040361                ADA ,+2        BACK UP
0041  46356 071631                STA MMT7       AMOUNT
0042  46357 035352                ISZ BS3
0043  46360 161572                LDA BS1,I      DESTINATION MATRIX
0044  46361 151352                CPA BS3,I      COLUMN COMPATIBILITY?
0045  46362 003005                CMA,INA,RSS   YES
0046  46363 115112                JSB RERRS+11,I NO
0047  46364 071635                STA MMT3       SAVE COLUMN
0048  46365 071636                STA MMT4       COUNTERS
0049  46366 003004                CMA,INA       SAVE COLUMN
0050  46367 001000                ALS           ADVANCE
0051  46370 071637                STA MMT5       AMOUNT
0052  46371 035572                ISZ BS1        MOVE TO
0053  46372 035350                ISZ BS2        FIRST ELEMENT

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0054	46373	035352		ISZ BS3	OF MATRICES
0055	46374	065352		LDB BS3	SAVE FIRST-ELEMENT ADDRESS
0056	46375	075376		STB MMT8	OF SECOND SOURCE MATRIX
0057	46376	104200	MPR1	DLD F0,0	INITIALIZE DESTINATION
	46377	046016			
0058	46400	104400		DST BS1,I	ELEMENT TO ZERO
	46401	101572			
0059	46402	104200	MPR2	DLD BS2,I	COMPUTE
	46403	101350			
0060	46404	035350		ISZ BS2	TERM
0061	46405	035350		ISZ BS2	OF
0062	46406	015406		JSB .FMP	INNER
0063	46407	101352		DEF BS3,I	PRODUCT
0064	46410	015402		JSB .FA0	ADD IN PREVIOUS
0065	46411	101572		DEF BS1,I	RUNNING SUM
0066	46412	104400		DST BS1,I	SAVE RUNNING SUM
	46413	101572			
0067	46414	065352		LDB BS3	ADVANCE TO
0068	46415	045637		ADB MMT5	NEXT ROW OF
0069	46416	075352		STB BS3	SECOND SOURCE MATRIX
0070	46417	035634		ISZ MMT2	INNER PRODUCT COMPLETE?
0071	46420	026402		JMP MPR2	NO
0072	46421	035572		ISZ BS1	YES, MOVE TO NEXT
0073	46422	035572		ISZ BS1	DESTINATION ELEMENT
0074	46423	065633		LDB MMT1	RESET INNER PRODUCT
0075	46424	075634		STB MMT2	TERM COUNTER
0076	46425	035636		ISZ MMT4	ROW COMPLETE?
0077	46426	026434		JMP MPR3	NO
0078	46427	065635		LDB MMT3	YES, RESET
0079	46430	075636		STB MMT4	COLUMN COUNTER
0080	46431	035632		ISZ MMT0	DONE?
0081	46432	026442		JMP MPR4	NO
0082	46433	124762		JMP XEC1A,I	YES
0083	46434	065350	MPR3	LDB BS2	BACK UP
0084	46435	045630		ADB MMT6	TO BEGINNING OF ROW OF
0085	46436	075350		STB BS2	FIRST SOURCE MATRIX
0086	46437	065352		LDB BS3	BACK UP TO BEGINNING
0087	46440	045631		ADB MMT7	OF NEXT COLUMN
0088	46441	002001		RSS	OF SECOND SOURCE MATRIX
0089	46442	065376	MPR4	LDB MMT8	BACK UP TO FIRST ELEMENT
0090	46443	075352		STB BS3	
0091	46444	026376		JMP MPR1	
0092*					*
0093**	SET UP SCALAR MULTIPLICATION				**
0094*					*
0095	46445	015356	EMAT5	JSB FETCH	COMPUTE AND
0096	46446	104400		DST SCALR	SAVE SCALAR
	46447	001622			
0097	46450	035611		ISZ TEMP1	LOAD OPERATION JUMP
0098	46451	035611		ISZ TEMP1	PROCESS
0099	46452	161611		LDA TEMP1,I	FOLLOWING
0100	46453	066010		LDB SMULA	MATRIX
0101	46454	026223		JMP EMAT2	
0102*					
0103	46455	101104	EMAT6	RRR 4	COMPUTE
0104	46456	010416		AND .+37B	MATRIX

Address	Hex	Hex	Code	Label	Function	Type
0105	46457	040330	ADA	.-27B		
0106	46460	071514	STA	ID0		
0107	46461	002021	SSA,RSS		MATRIX INITIALIZATION?	
0108	46462	026521	JMP	EMAT8		NO
0109*						*
0110**				SET UP MATRIX INITIALIZATION		**
0111*						*
0112	46463	065611	LDB	TEMP1		
0113	46464	006004	INB			
0114	46465	055334	CPB	PRGCT	REDIMENSIONING?	
0115	46466	002001	RSS			NO
0116	46467	015466	JSB	REDIM		YES
0117	46470	161572	INVL LDA	BS1,I	COMPUTE	
0118	46471	071362	STA	ID1	NUMBER	
0119	46472	035572	ISZ	BS1	OF ELEMENTS	
0120	46473	100200	MPY	BS1,I	IN 2'S	
	46474	101572				
0121	46475	003004	CMA,INA		COMPLEMENT	
0122	46476	071476	STA	MCNT	SAVE IT	
0123	46477	035514	ISZ	ID0	'IDN' ?	
0124	46500	026512	JMP	EMAT7		NO
0125	46501	161572	LDA	BS1,I		YES
0126	46502	051362	CPA	ID1	SQUARE MATRIX?	
0127	46503	003001	CMA,RSS			YES
0128	46504	115127	JSB	RERRS+24,I		NO
0129	46505	071514	STA	ID0	SET	
0130	46506	003400	CCA		DIAGONAL	
0131	46507	071362	STA	ID1	COUNTER	
0132	46510	062011	LDA	IDNA	LOAD OPERATION JUMP	
0133	46511	026515	JMP	++4		
0134	46512	062005	EMAT7 LDA	MLP3A	RECORD	
0135	46513	066020	LDB	F1,0A	CORRECT CONSTANT;	
0136	46514	035514	ISZ	ID0	0.0 FOR 'ZER'	
0137	46515	066015	LDB	F0,0A	1.0 FOR 'CON'	
0138	46516	075350	STB	BS2	0.0 FOR 'IDN'	
0139	46517	071340	STA	MOP	RECORD OPERATION JUMP	
0140	46520	026315	JMP	MLOOP-1		
0141*						
0142	46521	035611	EMAT8 ISZ	TEMP1	COMPUTE	
0143	46522	161611	LDA	TEMP1,I		
0144	46523	010566	AND	OPDMK	POINTER	
0145	46524	001000	ALS			
0146	46525	041573	ADA	SYMTB	TO	
0147	46526	040356	ADA	.-1		
0148	46527	164000	LDB	0,I	SOURCE	
0149	46530	044355	ADB	.-2		
0150	46531	075350	STB	BS2	MATRIX	
0151	46532	015470	JSB	VCHK	VALIDATE IT	
0152	46533	165572	LDB	BS1,I	LOAD DESTINATION ROW DIMENSION	
0153	46534	005000	BLS		SAVE COLUMN	
0154	46535	075635	STB	MMT3	ADVANCE AMOUNT	
0155	46536	005100	BRS			
0156	46537	035572	ISZ	BS1		
0157	46540	161572	LDA	BS1,I	ARE COLUMNS OF DESTINATION	
0158	46541	151350	CPA	BS2,I	AND ROWS OF SOURCE EQUAL?	
0159	46542	003005	CMA,INA,RSS		YES	

0160	46543	115112		JSB RERRS+11,I	NO
0161	46544	071633		STA MMT1	SAVE DESTINATION MATRIX
0162	46545	071634		STA MMT2	COLUMN COUNTERS
0163	46546	035350		ISZ BS2	ARE ROWS OF DESTINATION AND
0164	46547	155350		CPB BS2,I	COLUMNS OF SOURCE EQUAL?
0165	46550	007005		CMB,INB,RSS	YES
0166	46551	115112		JSB RERRS+11,I	NO
0167	46552	075632		STB MMT0	SAVE ROW COUNTER
0168	46553	100200		MPY MMT3	SAVE COLUMN BACK UP
	46554	001635			
0169	46555	035350		ISZ BS2	
0170	46556	065514		LDB ID0	
0171	46557	006003		SZB,RSS	'TRN' ?
0172	46560	026610		JMP INV	NO
0173	46561	040361		ADA ,+2	YES, SAVE COLUMN
0174	46562	071636		STA MMT4	BACK UP AMOUNT
0175	46563	035572		ISZ BS1	FOR SOURCE MATRIX
0176	46564	026572		JMP TRN	
0177	46565	065633	TRN1	LDB MMT1	RESET
0178	46566	075634		STB MMT2	COUNTER
0179	46567	065350		LDB BS2	BACK UP TO
0180	46570	045636		ADB MMT4	FIRST ELEMENT
0181	46571	075350		STB BS2	OF NEXT COLUMN
0182*				*	
0183**	TRANSPOSE A MATRIX			**	
0184*				*	
0185	46572	104200	TRN	OLD BS2,I	TRANSFER
	46573	101350			
0186	46574	104400		DST BS1,I	ELEMENT
	46575	101572			
0187	46576	035572		ISZ BS1	
0188	46577	035572		ISZ BS1	
0189	46600	065350		LDB BS2	ADVANCE TO
0190	46601	045635		ADB MMT3	NEXT ELEMENT
0191	46602	075350		STB BS2	OF COLUMN
0192	46603	035634		ISZ MMT2	COLUMN TRANSFERRED?
0193	46604	026572		JMP TRN	NO
0194	46605	035632		ISZ MMT0	YES, DONE?
0195	46606	026565		JMP TRN1	NO
0196	46607	124762		JMP XEC1A,I	YES
0197*				*	
0198**	INVERT A MATRIX			**	
0199*				*	
0200	46610	064000	INV	LDB 0	SAVE 2'S COMPLEMENT
0201	46611	001100		ARS	OF NUMBER OF
0202	46612	071476		STA MCNT	ELEMENTS IN MATRIX
0203	46613	061572		LDA BS1	SAVE ADDRESS OF
0204	46614	071352		STA BS3	DESTINATION MATRIX
0205	46615	061330		LDA TMPST	SET ADDRESS
0206	46616	040361		ADA ,+2	OF FREE CORE
0207	46617	071572		STA BS1	AS BASE ADDRESS
0208	46620	003004		CMA,INA	SUFFICIENT
0209	46621	040716		ADA LWAUS	FREE CORE
0210	46622	040001		ADA 1	TO COPY
0211	46623	003021		CMA,SSA,RSS	SOURCE MATRIX?
0212	46624	115111		JSB RERRS+10,I	NO

0213	46625	040716		ADA LWAUS	YES, INCLUDE IT
0214	46626	070056		STA PBPTR	IN SWAP AREA
0215	46627	006400		CLB	SET 'MAXIMUM ELEMENT'
0216	46630	075624		STB MAXE	VALUE TO
0217	46631	075625		STB MAXE+1	ZERO
0218	46632	062012		LDA MCPYA	SET UP TO
0219	46633	071340		STA MOP	COPY MATRIX,
0220	46634	062637		LDA INV1	FIND MAXIMUM (ABSOLUTE
0221	46635	071364		STA MEXIT	VALUE) ELEMENT,
0222	46636	026316		JMP MLOOP	AND RETURN
0223	46637	046640	INV1	DEF ++1	
0224	46640	104200		DLD MAXE	COMPUTE
	46641	001624			
0225	46642	015406		JSB .FMP	RELATIVE
0226	46643	046013		DEF TOLC	TOLERANCE
0227	46644	104400		DST TOL	
	46645	001626			
0228	46646	003400		CCA	
0229	46647	071514		STA ID0	RESTORE
0230	46650	041352		ADA BS3	DESTINATION
0231	46651	071572		STA BS1	BASE ADDRESS
0232	46652	003004		CMA,INA	COMPUTE DIFFERENCE
0233	46653	041330		ADA TMPST	BETWEEN BASE ADDRESSES
0234	46654	003004		CMA,INA	OF SOURCE (COPIED)
0235	46655	071352		STA BS3	AND DESTINATION
0236	46656	062661		LDA INV2	MATRICES
0237	46657	071364		STA MEXIT	SET DESTINATION MATRIX
0238	46660	026470		JMP INVL	TO IDENTITY AND RETURN
0239	46661	046662	INV2	DEF ++1	
0240	46662	065330		LDB TMPST	SAVE
0241	46663	044361		ADB .+2	BASE ADDRESS
0242	46664	060001		LDA 1	OF SOURCE
0243	46665	075350		STB BS2	MATRIX
0244	46666	045352		ADB BS3	SAVE BASE ADDRESS OF
0245	46667	075572		STB BS1	DESTINATION MATRIX
0246	46670	006400		CLB	SET PIVOT ELEMENT
0247	46671	075514		STB ID0	BIAS TO ZERO
0248	46672	026703		JMP INV4	
0249	46673	061514	INV3	LDA ID0	SET BIAS
0250	46674	040355		ADA .-2	FOR NEXT
0251	46675	071514		STA ID0	PIVOT ELEMENT
0252	46676	061632		LDA MMT0	INITIALIZE COUNTER TO
0253	46677	071634		STA MMT2	2'S COMPLEMENT OF COLUMNS
0254	46700	061344		LDA PIVEL	UPDATE PIVOT
0255	46701	041635		ADA MMT3	ADDRESS
0256	46702	040361		ADA .+2	TO NEXT
0257	46703	071344	INV4	STA PIVEL	DIAGONAL ELEMENT
0258	46704	071636		STA MMT4	INITIALIZE
0259	46705	006400		CLB	PIVOT ELEMENT
0260	46706	075624		STB MAXE	AS MAXIMUM
0261	46707	075625		STB MAXE+1	IN COLUMN
0262	46710	065633		LDB MMT1	SET COUNTER TO SEARCH
0263	46711	075637		STB MMT5	REMAINDER OF COLUMN
0264	46712	071630	INV5	STA MMT6	LOAD
0265	46713	104200		DLD MMT6,I	ELEMENT
	46714	101630			

0266	46715	002020	SSA	GET
0267	46716	015370	JSB ARINV	ABSOLUTE
0268	46717	104400	DST SCALR	VALUE
	46720	001622		
0269	46721	015404	JSB ,FSB	SUBTRACT
0270	46722	001624	DEF MAXE	PREVIOUS MAXIMUM
0271	46723	002002	SZA	RESULT
0272	46724	002020	SSA	POSITIVE?
0273	46725	026734	JMP INV6	NO
0274	46726	104200	DLD SCALR	YES, RECORD
	46727	001622		
0275	46730	104400	DST MAXE	NEW MAXIMUM
	46731	001624		
0276	46732	061630	LDA MMT6	AND ITS
0277	46733	071636	STA MMT4	LOCATION
0278	46734	061630	INV6 LDA MMT6	MOVE TO NEXT
0279	46735	041635	ADA MMT3	ELEMENT OF COLUMN
0280	46736	035637	ISZ MMT5	COLUMN DONE?
0281	46737	026712	JMP INV5	NO
0282	46740	065344	LDB PIVEL	YES
0283	46741	045514	ADB ID0	SET POINTERS
0284	46742	075631	STB MMT7	TO OLD
0285	46743	045352	ADB BS3	PIVOT ROWS OF
0286	46744	075637	STB MMT5	BOTH MATRICES
0287	46745	075362	STB ID1	
0288	46746	061636	LDA MMT4	NEED TO
0289	46747	051344	CPA PIVEL	SWAP ROWS?
0290	46750	027017	JMP INV8	NO
0291	46751	041514	ADA ID0	YES, SET POINTERS
0292	46752	071376	STA MMT8	TO NEW
0293	46753	041352	ADA BS3	PIVOT ROWS OF
0294	46754	071630	STA MMT6	BOTH MATRICES
0295	46755	104200	INV7 DLD MMT5, I	SWAP
	46756	101637		
0296	46757	104400	DST SCALR	
	46760	001622		
0297	46761	104200	DLD MMT6, I	ROW
	46762	101630		
0298	46763	104400	DST MMT5, I	
	46764	101637		
0299	46765	104200	DLD SCALR	ELEMENT
	46766	001622		
0300	46767	104400	DST MMT6, I	
	46770	101630		
0301	46771	104200	DLD MMT7, I	OF
	46772	101631		
0302	46773	104400	DST SCALR	
	46774	001622		
0303	46775	104200	DLD MMT8, I	EACH
	46776	101376		
0304	46777	104400	DST MMT7, I	
	47000	101631		
0305	47001	104200	DLD SCALR	MATRIX
	47002	001622		
0306	47003	104400	DST MMT8, I	
	47004	101376		

0307	47005	035637		ISZ MMT5	BUMP
0308	47006	035637		ISZ MMT5	
0309	47007	035630		ISZ MMT6	ALL
0310	47010	035630		ISZ MMT6	
0311	47011	035631		ISZ MMT7	FOUR
0312	47012	035631		ISZ MMT7	
0313	47013	035376		ISZ MMT8	POINTERS
0314	47014	035376		ISZ MMT8	
0315	47015	035634		ISZ MMT2	ROW SWAPPED?
0316	47016	026755		JMP INV7	NO
0317	47017	104200	INV8	DLD MAXE	YES
	47020	001624			
0318	47021	015404		JSB .FSB	PIVOT ELEMENT
0319	47022	001626		DEF TOL	SMALLER THAN
0320	47023	002020		SSA	TOLERANCE?
0321	47024	115131		JSB RERRS+26,I	YES
0322	47025	104200		DLD F1,0	NO
	47026	046021			
0323	47027	015410		JSB .FDV	COMPUTE
0324	47030	101344		DEF PIVEL,I	INVERSE OF
0325	47031	104400		DST MAXE	PIVOT ELEMENT
	47032	001624			
0326	47033	061633		LDA MMT1	LAST
0327	47034	002007		INA,SZA,RSS	PIVOT?
0328	47035	027053		JMP INV10	YES
0329	47036	071637		STA MMT5	NO, PREPARE
0330	47037	061344		LDA PIVEL	TO SCALE
0331	47040	071630		STA MMT6	PIVOT ROW
0332	47041	035630	INV9	ISZ MMT6	MOVE TO NEXT
0333	47042	035630		ISZ MMT6	ELEMENT OF ROW
0334	47043	104200		DLD MMT6,I	MULTIPLY
	47044	101630			
0335	47045	015406		JSB .FMP	BY 1/PIVOT
0336	47046	001624		DEF MAXE	AND STORE
0337	47047	104400		DST MMT6,I	NEW VALUE
	47050	101630			
0338	47051	035637		ISZ MMT5	ROW DONE?
0339	47052	027041		JMP INV9	NO
0340	47053	061362	INV10	LDA ID1	YES
0341	47054	071630		STA MMT6	
0342	47055	061632		LDA MMT0	SET
0343	47056	071634		STA MMT2	
0344	47057	071637		STA MMT5	COUNTERS
0345	47060	104200	INV11	DLD MMT6,I	SCALE ELEMENTS OF
	47061	101630			
0346	47062	002003		SZA,RSS	
0347	47063	027070		JMP INV12	PIVOT ROW
0348	47064	015406		JSB .FMP	
0349	47065	001624		DEF MAXE	OF DESTINATION
0350	47066	104400		DST MMT6,I	
	47067	101630			
0351	47070	035630	INV12	ISZ MMT6	MATRIX
0352	47071	035630		ISZ MMT6	
0353	47072	035637		ISZ MMT5	ROW DONE?
0354	47073	027060		JMP INV11	NO
0355	47074	065572		LDB BS1	YES, SET POINTER TO

0356	47075	075400	STB VT0	DESTINATION ARRAY
0357	47076	061350	LDA BS2	SET POINTER
0358	47077	003004	CMA, INA	TO PIVOT COLUMN
0359	47100	041514	ADA ID0	IN FIRST ROW
0360	47101	003004	CMA, INA	OF SOURCE
0361	47102	071376	INV13 STA MMT8	MATRIX
0362	47103	051344	CPA PIVEL	PIVOT ROW?
0363	47104	027206	JMP INV19	YES
0364	47105	071631	STA MMT7	NO
0365	47106	104200	DLD MMT7, I	LOAD MULTIPLIER FOR PIVOT ROW
	47107	101631		
0366	47110	002003	SZA, RSS	ZERO?
0367	47111	027206	JMP INV19	YES
0368	47112	104400	DST SCALR	NO, SAVE MULTIPLIER
	47113	001622		
0369	47114	061633	LDA MMT1	LAST
0370	47115	002007	INA, SZA, RSS	ROW?
0371	47116	027144	JMP INV15	YES
0372	47117	071637	STA MMT5	NO, SET POINTER TO
0373	47120	061344	LDA PIVEL	PIVOT ELEMENT IN
0374	47121	071630	STA MMT6	SOURCE MATRIX
0375	47122	035630	INV14 ISZ MMT6	MOVE
0376	47123	035630	ISZ MMT6	TO
0377	47124	035631	ISZ MMT7	NEXT
0378	47125	035631	ISZ MMT7	COLUMN
0379	47126	104200	DLD SCALR	COMPUTE
	47127	001622		
0380	47130	015406	JSB .FMP	
0381	47131	101630	DEF MMT6, I	
0382	47132	104400	DST MAXE	TRANSFORMED
	47133	001624		
0383	47134	104200	DLD MMT7, I	
	47135	101631		
0384	47136	015404	JSB .FSB	
0385	47137	001624	DEF MAXE	ELEMENT
0386	47140	104400	DST MMT7, I	
	47141	101631		
0387	47142	035637	ISZ MMT5	ROW DONE?
0388	47143	027122	JMP INV14	NO
0389	47144	061362	INV15 LDA ID1	YES, SET POINTER TO PIVOT
0390	47145	071630	STA MMT6	ROW OF DESTINATION MATRIX
0391	47146	061632	LDA MMT0	SET
0392	47147	071636	STA MMT4	COUNTER
0393	47150	104200	INV16 DLD MMT6, I	COMPUTE
	47151	101630		
0394	47152	002003	SZA, RSS	
0395	47153	027166	JMP INV17	
0396	47154	015406	JSB .FMP	
0397	47155	001622	DEF SCALR	TRANSFORMED
0398	47156	104400	DST MAXE	
	47157	001624		
0399	47160	104200	DLD VT0, I	
	47161	101400		
0400	47162	015404	JSB .FSB	
0401	47163	001624	DEF MAXE	ELEMENT
0402	47164	104400	DST VT0, I	

0403	47165	101400				
0404	47166	035400	INV17	ISZ VT0	MOVE	
0405	47167	035400		ISZ VT0	TO	
0406	47170	035630		ISZ MMT6	NEXT	
0407	47171	035630		ISZ MMT6	COLUMN	
0408	47172	035636		ISZ MMT4	ROW DONE?	
0409	47173	027150		JMP INV16	NO	
0410	47174	061376	INV18	LDA MMT8	YES, MOVE TO NEXT	
0411	47175	041635		ADA MMT3	ROW IN SOURCE MATRIX	
0412	47176	035634		ISZ MMT2	ALL ROWS TRANSFORMED?	
0413	47177	027102		JMP INV13	NO	
0414	47200	035633		ISZ MMT1	YES, MATRIX INVERTED?	
0415	47201	026673		JMP INV3	NO	
0416	47202	061330		LDA TMPST	YES	
0417	47203	040406		ADA .+23	RELEASE EXTRA	
0418	47204	070056		STA PBPTR	CORE	
0419	47205	124762		JMP XEC1A,I		
0420	47206	061400	INV19	LDA VT0	ADVANCE TO	
0421	47207	041635		ADA MMT3	NEXT ROW OF	
0422	47210	071400		STA VT0	DESTINATION	
0423*	47211	027174		JMP INV18	MATRIX	
0424**						*
0425*						**
0426	47212	015402	MADD	JSB .FAD	ADD	
0427	47213	101352		DEF BS3,I	SOURCE	
0428	47214	026321		JMP MLOP1	ELEMENTS	
0429*						*
0430	47215	015404	MSUB	JSB .FSB	SUBTRACT	
0431	47216	101352		DEF BS3,I	SOURCE	
0432	47217	026321		JMP MLOP1	ELEMENTS	
0433*						*
0434	47220	035362	IDN	ISZ ID1	DIAGONAL ELEMENT?	
0435	47221	026325		JMP MLOP3	NO	
0436	47222	061514		LDA ID0	YES, RESET	
0437	47223	071362		STA ID1	DIAGONAL COUNTER	
0438	47224	104200		DLD F1.0	LOAD	
0439	47225	046021				
0440*	47226	026325		JMP MLOP3	1.0	
0441	47227	015406	SMULT	JSB .FMP	MULTIPLY	
0442	47230	001622		DEF SCALR	SOURCE ELEMENT	
0443	47231	026323		JMP MLOP2	BY SCALAR	
0444*						*
0445	47232	002020	MCPY	SSA	GET	
0446	47233	015370		JSB ARINV	ABSOLUTE	
0447	47234	104400		DST SCALR	VALUE	
0448	47235	001622				
0449	47236	015404		JSB .FSB	SUBTRACT	
0450	47237	001624		DEF MAXE	PREVIOUS	
0451	47240	002002		SZA	MAXIMUM	
0452	47241	002020		SSA	POSITIVE RESULT?	
0453	47242	027247		JMP MCPY1	NO	
0454	47243	104200		DLD SCALR	YES, RECORD	
	47244	001622				
	47245	104400		DST MAXE	NEW MAXIMUM	

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      47246 001624
0455 47247 104200 MCPY1 DLD BS2,I      RELOAD VALUE
      47250 101350
0456 47251 126004          JMP MLP2A,I
0457**
0458*** CHECK VALIDITY OF MATRIX ***
0459**
0460*
0461* ENTER WITH (B) POINTING TO THE DYNAMIC ARRAY DIMENSIONS.
0462* COMPUTE THE NUMBER OF ELEMENTS AND CHECK EACH ONE. EXIT
0463* TO ERROR IF ANY ELEMENT HAS VALUE 'UNDEFINED'.
0464*
0465 47252 160001 #VCHK LDA 1,I      LOAD ROW DIMENSION
0466 47253 006004          INB
0467 47254 075400          STB VT0
0468 47255 100200          MPY VT0,I      MULTIPLY BY
      47256 101400
0469 47257 065400          LDB VT0      COLUMN DIMENSION
0470 47260 003000          CMA      SAVE 1'S COMPLEMENT
0471 47261 071400          STA VT0      OF MATRIX SIZE
0472 47262 035400 VCHK1 ISZ VT0      DONE?
0473 47263 006005          INB,RSS      NO, MOVE TO NEXT ELEMENT
0474 47264 125470          JMP VCHK,I      YES
0475 47265 160001          LDA 1,I
0476 47266 001222          RAL,RAL      IS
0477 47267 002004          INA      OPERAND
0478 47270 001310          RAR,SLA      NORMALIZED?
0479 47271 027301          JMP VCHK2      YES
0480 47272 051027          CPA BIT15      MAYBE, WAS FIRST WORD ZERO?
0481 47273 006005          INB,RSS      YES
0482 47274 115126          JSB RERRS+23,I NO==ERROR
0483 47275 160001          LDA 1,I      SECOND
0484 47276 002002          SZA      WORD ZERO?
0485 47277 115126          JSB RERRS+23,I NO==ERROR
0486 47300 027262          JMP VCHK1
0487 47301 006004 VCHK2 INB
0488 47302 027262          JMP VCHK1

```

```

0490**
0491*** REDIMENSION A MATRIX ***
0492**
0493*
0494* UPON ENTRY (TEMP1)+1 POINTS TO THE REDIMENSION SUBSCRIPT IN
0495* THE PROGRAM AND SBPTR POINTS TO THE CURRENT DYNAMIC DIMENSIONS
0496* OF THE ARRAY. THE SUBSCRIPT BOUNDS ARE EVALUATED, ROUNDED,
0497* AND RECORDED. IF THE NUMBER OF ELEMENTS IS WITHIN THE
0498* PHYSICAL ARRAY ALLOWANCE, EXIT WITH TEMP1 POINTING TO THE
0499* WORD FOLLOWING THE SUBSCRIPT AND SBPTR AS UPON ENTRY, ELSE
0500* EXIT TO ERROR.
0501*
0502 47303 035611 #RDIM ISZ TEMP1 COMPUTE NEW
0503 47304 015356 JSB FETCH ROW DIMENSION
0504 47305 015342 JSB SBFIX 15 BIT INTEGER > 0?
0505 47306 115120 JSB RERRS+17,I NO
0506 47307 006004 INB YES, SAVE
0507 47310 175572 STB SBPTR,I TRUE VALUE
0508 47311 075470 STB RD0 IN ARRAY
0509 47312 035572 ISZ SBPTR ENTRY
0510 47313 165611 LDB TEMP1,I EXPLICIT NEW
0511 47314 006003 SZB,RSS COLUMN DIMENSION?
0512 47315 027321 JMP RDIM1 NO
0513 47316 015356 JSB FETCH YES,
0514 47317 015342 JSB SBFIX COMPUTE
0515 47320 115120 JSB RERRS+17,I IT
0516 47321 006004 RDIM1 INB SAVE TRUE VALUE
0517 47322 175572 STB SBPTR,I IN ARRAY ENTRY
0518 47323 061470 LDA RD0 COMPUTE
0519 47324 100200 MPY SBPTR,I NUMBER OF
0520 47325 101572
0520 47326 006003 SZB,RSS ELEMENTS
0521 47327 003025 CMA,SSA,INA,RSS SPECIFIED
0522 47330 115130 JSB RERRS+25,I TOO MANY
0523 47331 071470 STA RD0
0524 47332 065572 LDB SBPTR RESET
0525 47333 044354 ADB ,-3 ARRAY POINTER
0526 47334 160001 LDA 1,I AND COMPUTE
0527 47335 006004 INB NUMBER OF
0528 47336 075572 STB SBPTR ELEMENTS
0529 47337 100200 MPY SBPTR,I AVAILABLE
0530 47340 101572
0530 47341 035572 ISZ SBPTR FOR ARRAY
0531 47342 041470 ADA RD0 SUFFICIENT
0532 47343 002020 SSA PHYSICAL SPACE?
0533 47344 115130 JSB RERRS+25,I NO
0534 47345 035611 ISZ TEMP1 YES
0535 47346 125466 JMP REDIM,I

```

```

0002 50000          ORG 50000B
0003 50000 174000  HMASK OCT 174000
0004 50001 052470  LCALL DEF LIS10-1
0005 50002 001614  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 015420          JSB NUMOT          OUTPUT NUMBER
0021 50012 026015          JMP ++3
0022 50013 060417          LDA ,+40B          OUTPUT
0023 50014 015452          JSB OUTCR          A BLANK
0024 50015 065456          LDB EOPF          FIELD
0025 50016 045570          ADB CHRCT
0026 50017 006002          SZB          FULL?
0027 50020 026013          JMP *-5          NO
0028 50021 125416          JMP ENOUT,I      YES
0029*
0030 50022 114631  MINFX DEC -0.099999959
0031 50023 116373
0031 50024 102756  MAXFX DEC -999999.5
0032 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 071614  #NMOT STA NUMBF          SAVE HIGH MANTISSA
0043 50027 002041          SEZ,RSS          SIGN?
0044 50030 026042          JMP NUMO1          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 071614          STA NUMBF          SAVE HIGH MANTISSA
0049 50035 060434          LDA ,+55B          LOAD '-'
0050 50036 002001          RSS
0051 50037 060417          LDA ,+40B          LOAD '+'
0052 50040 071266          STA SIGN          SAVE SIGN
0053 50041 061614          LDA NUMBF          RETRIEVE HIGH MANTISSA
0054 50042 075615  NUMO1 STB NUMBF+1  SAVE LOW MANTISSA
0055 50043 015414          JSB IFIX          INTEGER?

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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	075614	STB	NUMBF	SAVE INTEGER
0063	50050	046007	ADB	M1000	
0064	50051	060365	LDA	,+6	
0065	50052	006021	SSB	,RSS	3 DIGIT INTEGER?
0066	50053	040362	ADA	,+3	NO
0067	50054	041570	ADA	CHRCT	COMPUTE END_OF_FIELD
0068	50055	003004	CMA	,INA	SAVE
0069	50056	071456	STA	EOPF	IT
0070	50057	042003	ADA	,74	ENOUGH
0071	50060	002020	SSA		ROOM?
0072	50061	016424	JSB	OUTLN	NO
0073	50062	061266	LDA	SIGN	YES
0074	50063	002002	SZA		SIGN?
0075	50064	015452	JSB	OUTCR	YES, OUTPUT IT
0076	50065	065614	LDB	NUMBF	NO
0077	50066	015454	JSB	OUTIN	OUTPUT THE INTEGER
0078	50067	125420	JMP	NUM02,I	
0079*			*		
0080**	OUTPUT A FLOATING POINT NUMBER			**	
0081*			*		
0082	50070	060355	NUM02	LDA	,-2
0083	50071	071336	STA	FFLAG	SET 'FIXED'
0084	50072	104200	DLD	NUMBF	FLAG FALSE
	50073	001614			LOAD NUMBER
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	DLD	NUMBF	YES, IS
	50101	001614			
0090	50102	015402	JSB	,FAD	NUMBER
0091	50103	050022	DEF	MINFX	LESS THAN
0092	50104	002021	SSA	,RSS	0,9999995 ?
0093	50105	035336	ISZ	FFLAG	NO, SET 'FIXED' FLAG TRUE
0094	50106	104200	NUM03	DLD	LOAD NUMBER
	50107	001614			
0095	50110	071316	STA	MANT1	UNPACK
0096	50111	015412	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
0104	50121	061322	LDA	EXP	NO
0105	50122	003026	CMA	,SSA,INA,SZA	MULTIPLY
0106	50123	026126	JMP	++3	NUMBER BY 10
0107	50124	035324	ISZ	EXPON	UNTIL IT IS
0108	50125	026120	JMP	NUM00	GREATER
					THAN 1

0109	50126	015302		JSB DBY10	DIVIDE BY 10
0110	50127	061324		LDA EXPON	
0111	50130	065322	NUM04	LDB EXP	DIVIDE
0112	50131	007004		CMB, INB	NUMBER
0113	50132	006021		SSB, RSS	BY 10
0114	50133	026141		JMP NUM05	UNTIL
0115	50134	071324		STA EXPON	IT IS
0116	50135	015302		JSB DBY10	LESS
0117	50136	003400		CCA	THAN
0118	50137	041324		ADA EXPON	1
0119	50140	026130		JMP NUM04	
0120	50141	003000	NUM05	CMA	SET EXPONENT
0121	50142	071324		STA EXPON	TO TRUE VALUE-1
0122	50143	064351		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	015422	NUM06	JSB GETDG	STORE A
0130	50150	040437		ADA .+60B	DECIMAL
0131	50151	171362		STA NMPTR, I	DIGIT
0132	50152	035362		ISZ NMPTR	
0133	50153	035356		ISZ DIGCT	SIXTH DIGIT?
0134	50154	026147		JMP NUM06	NO
0135	50155	015422		JSB GETDG	YES,
0136	50156	040352		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	044356	NUM07	ADB .-1	LOAD LAST
0144	50163	160001		LDA 1, I	DIGIT
0145	50164	002004		INA	INCREMENT IT
0146	50165	050452		CPA .58	WAS IT A 9?
0147	50166	002001		RSS	YES
0148	50167	026200		JMP NUM09	NO
0149	50170	056002		CPB NMBFA	LEADING DIGIT?
0150	50171	026175		JMP NUM08	YES
0151	50172	060437		LDA .+60B	NO, OVERLAY
0152	50173	170001		STA 1, I	A 0
0153	50174	026162		JMP NUM07	
0154	50175	035324	NUM08	ISZ EXPON	BUMP DECIMAL
0155	50176	000000		NOP	EXPONENT AND
0156	50177	060440		LDA .+61B	OVERLAY A 1
0157	50200	170001	NUM09	STA 1, I	
0158	50201	061324		LDA EXPON	IS NUMBER
0159	50202	002021		SSA, RSS	LESS THAN 1 ?
0160	50203	026221		JMP NM011	NO
0161	50204	071360		STA NMTMP	YES
0162	50205	060437		LDA .+60B	
0163	50206	065362		LDB NMPTR	
0164	50207	035360	NM010	ISZ NMTMP	COUNT ZEROS

0165	50210	000000		NOP	PLUS 1
0166	50211	044356		ADB , -1	LAST
0167	50212	150001		CPA 1, I	DIGIT 0?
0168	50213	026207		JMP NMO10	YES
0169	50214	061360		LDA NMTMP	NO, ALL SIGNIFICANCE
0170	50215	002020		SSA	IN SIX DIGITS?
0171	50216	026221		JMP NMO11	NO
0172	50217	003400		CCA	YES, SET
0173	50220	071336		STA FFLAG	'FIXED' FLAG TRUE
0174	50221	064373	NMO11	LDB , +12	COMPUTE
0175	50222	035336		ISZ FFLAG	FIELD
0176	50223	044362		ADB , +3	WIDTH
0177	50224	045570		ADB CHRCT	SAVE
0178	50225	007004		CMB, INB	END-OF-FIELD
0179	50226	075456		STB EOPF	MARKER
0180	50227	046004		ADB , 75	ENOUGH
0181	50230	006020		SSB	ROOM?
0182	50231	015424		JSB OUTLN	NO
0183	50232	061266		LDA SIGN	YES
0184	50233	002002		SZA	SIGN?
0185	50234	015452		JSB OUTCR	YES, OUTPUT IT
0186	50235	064350		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 NMO16	
0196	50247	071360		STA NMTMP	SET INDICATOR FOR DECIMAL POINT
0197	50250	062001		LDA LCALL	CALLED
0198	50251	051420		CPA NUMOT	FROM 'LIST' ?
0199	50252	026261		JMP NMO16	YES
0200	50253	026303		JMP NMO14	NO
0201*				*	
0202**				**	
0203*				*	
0204	50254	061356	NMO12	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	044356	NMO16	ADB , -1	LAST
0210	50262	160001		LDA 1, I	DIGIT
0211	50263	050437		CPA , +60B	0?
0212	50264	026254		JMP NMO12	YES
0213	50265	003400		CCA	NO, FIXED
0214	50266	051336		CPA FFLAG	FORMAT?
0215	50267	026303		JMP NMO14	NO
0216	50270	061324		LDA EXPON	YES, LEADING
0217	50271	002021		SSA, RSS	DECIMAL POINT?
0218	50272	026303		JMP NMO14	NO
0219	50273	071360		STA NMTMP	YES, SET LEADING ZEROS COUNTER
0220*				*	

```

0221** OUTPUT MANTISSA **
0222* *
0223 50274 060435 LDA .+56B OUTPUT A
0224 50275 002001 RSS DECIMAL POINT
0225 50276 060437 NM013 LDA .+60B OUTPUT
0226 50277 015452 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 DECIMAL POINT NEXT?
0233 50306 035360 NM015 ISZ NMTMP NO
0234 50307 026312 JMP ++3 YES, LOAD IT
0235 50310 060435 LDA .+56B
0236 50311 026314 JMP ++3
0237 50312 161362 LDA NMPTR,I LOAD NEXT
0238 50313 035362 ISZ NMPTR DIGIT
0239 50314 015452 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 125420 JMP NUMOT,I NO
0244* *
0245** OUTPUT THE EXPONENT **
0246* *
0247 50321 060464 LDA E
0248 50322 015452 JSB OUTCR OUTPUT AN 'E'
0249 50323 060434 LDA .+55B OUTPUT
0250 50324 065324 LDB EXPON
0251 50325 006020 SSB AN
0252 50326 007005 CMB,INB,RSS EXPONENT
0253 50327 060432 LDA .+53B SIGN
0254 50330 075324 STB EXPON COMPUTE
0255 50331 015452 JSB OUTCR
0256 50332 061324 LDA EXPON EXPONENT'S
0257 50333 006400 CLB 10'S DIGIT
0258 50334 100400 DIV .+10 OUTPUT IT
0259 50335 000371 EXPON OUTPUT
0259 50336 040437 ADA .+60B 1'S DIGIT
0260 50337 044437 ADB .+60B
0261 50340 075324 STB EXPON
0262 50341 015452 JSB OUTCR
0263 50342 061324 LDA EXPON
0264 50343 015452 JSB OUTCR
0265 50344 125420 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 #GTDG JSB MBY10 MULTIPLY BY 10
0274 50346 065322 LDB EXP GET EXPONENT IN (B)
0275 50347 007004 CMB,INB AS NEGATIVE

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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	010500	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	125422	JMP GETDG, 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	060353	#OTIN	LDA , -4	SET DIGIT
0301	50371	071374		STA DGCNT	COUNTER
0302	50372	061015		LDA LDVSR	SET DIVISOR
0303	50373	071444		STA OT1	ADDRESS
0304	50374	002400		CLA	SUPPRESS
0305	50375	071452		STA OUTCR	ZEROS
0306	50376	101040	OUTI1	LSR 16	DIVIDE INTEGER BY
0307	50377	100400		DIV OT1, I	CURRENT DIVISOR
	50400	101444			
0308	50401	075450		STB OT3	SAVE THE REMAINDER
0309	50402	051452		CPA OUTCR	LEADING ZERO?
0310	50403	026406		JMP OUTI2	YES
0311	50404	040437		ADA , +60B	NO, TURN OFF ZERO SUPPRESS
0312	50405	015452		JSB OUTCR	OUTPUT DIGIT
0313	50406	065450	OUTI2	LDB OT3	RETRIEVE REMAINDER
0314	50407	035444		ISZ OT1	SET FOR NEXT DIVISOR
0315	50410	035374		ISZ DGCNT	ALL DIVISORS USED?
0316	50411	026376		JMP OUTI1	NO
0317	50412	060001		LDA 1	YES
0318	50413	040437		ADA , +60B	OUTPUT
0319	50414	015452		JSB OUTCR	LAST DIGIT
0320	50415	125454		JMP OUTIN, I	

0321** **
 0322*** SPACE FOR A COMMA ***
 0323** **

0324*
 0325* MOVE TO THE NEXT FIELD OF 15 ON THE PRINT LINE OR TO THE
 0326* NEXT LINE IF THE CURRENT ONE IS EXHAUSTED.

0327*					
0328	50416	065570	#EDLM	LDB CHRCT	LOAD CURRENT CHARACTER COUNT
0329	50417	006003		SZB, RSS	ZERO?
0330	50420	125426		JMP EDELM, I	YES, AT START OF ZONE
0331	50421	044340		ADB , -15	NO, SUBTRACT ZONE WIDTH
0332	50422	006021		SSB, RSS	NON-NEGATIVE RESULT?
0333	50423	026417		JMP #EDLM+1	YES
0334	50424	075470		STB EOL	NO, SAVE COUNT
0335	50425	060417		LDA , +40B	OUTPUT
0336	50426	015452		JSB OUTCR	A BLANK
0337	50427	035470		ISZ EOL	ZONE FULL?
0338	50430	026425		JMP * -3	NO
0339	50431	065570		LDB CHRCT	YES,
0340	50432	046006		ADB MM74	PAST THE
0341	50433	006021		SSB, RSS	END OF LINE?
0342	50434	015424		JSB OUTLN	YES
0343	50435	125426		JMP EDELM, I	NO

```

0345**
0346*** OUTPUT AN END-OF-LINE ***
0347**
0348 50436 065456 #OTLN LDB EOPF          RESET
0349 50437 045570          ADB CHRCT      END-OF-FIELD
0350 50440 075456          STB EOPF          MARKER
0351 50441 060402          LDA .+23B      OUTPUT
0352 50442 015452          JSB OUTCR      AN X-OFF
0353 50443 060374          LDA .+15B      OUTPUT A
0354 50444 015452          JSB OUTCR      CARRIAGE RETURN
0355 50445 060371          LDA .+12B      AND A
0356 50446 015452          JSB OUTCR      LINE FEED
0357 50447 125424          JMP OUTLN,I
0358**
0359*** OUTPUT A CHARACTER ***
0360**
0361*
0362* OUTPUT THE CHARACTER IN (A). NON-PRINTING CHARACTERS DO NOT
0363* COUNT AGAINST THE 72 CHARACTERS PER LINE. A CARRIAGE RETURN
0364* (CONTROL 0) IN A STRING OR AN END-OF-LINE, FOR EXAMPLE)
0365* RESETS THE PRINT POSITION TO 0.
0366*
0367 50450 071310 #OTCR STA OCTMP      SAVE CHARACTER
0368 50451 050474          CPA B177        CHECK FOR
0369 50452 026456          JMP OTCRA      RUBOUT
0370 50453 010470          AND .140      NON-PRINTING
0371 50454 002002          SZA          CHARACTER?
0372 50455 035570          ISZ CHRCT     NO, COUNT IT
0373 50456          OTCRA EQU *
0374 50456 006400          CLB
0375 50457 061310          LDA OCTMP      RETRIEVE CHARACTER
0376 50460 050374          CPA .+15B     CARRIAGE RETURN?
0377 50461 075570          STB CHRCT     YES, ZERO CHARACTER COUNT
0378 50462 064272          LDB MLINK+1
0379 50463 044341          ADB .-?LINK
0380 50464 114724          JSB OUTCH,I
0381 50465 125452          JMP OUTCR,I
0382**
0383*** BACKSPACE IN BUFFER ***
0384**
0385*
0386* BACKSPACE IN BUFFER
0387*
0388 50466 060255 #BKSP LDA MAIN      TELL 2114
0389 50467 002004          INA
0390 50470 160000          LDA 0,I      TO BACKSPACE
0391 50471 030245          IOR BKS
0392 50472 114736          JSB S14LP,I  IN BUFFER
0393 50473 125450          JMP BCKSP,I

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0395**
0396***  FETCH NEXT BUFFER CHARACTER ***
0397**
0398*
0399*  THE NEXT CHARACTER FROM THE INPUT BUFFER IS FETCHED, NORMAL
0400*  EXIT IS TO (P+2) WITH THE CHARACTER IN (A). BLANKS ARE SKIPPED
0401*  IF 'BLANK' = 40 OCTAL, A 'CARRIAGE RETURN' EXITS TO (P+1)
0402  50474 060215 #GTCR LDA GTC      LOAD OPCODE
0403  50475 064255      LDB MAIN      FOR GET CHARACTER
0404  50476 006004      INB          => TTY #
0405  50477 130001      IOR 1,I      TTY # IN BITS 12-8
0406  50500 006400      CLB          BLOCK
0407  50501 174632      STB DCLC1,I  CLOCK
0408  50502 114736      JSB S14SC,I  CALL 2114 DRIVER
0409  50503 102311      SFS CH2     WAIT FOR
0410  50504 026503      JMP *-1     RESPONSE
0411  50505 102511      LIA CH2     LOAD CHARACTER
0412  50506 164634      LDB DCLC2,I UNBLOCK
0413  50507 174632      STB DCLC1,I CLOCK
0414  50510 051571      CPA BLANK   BLANK?
0415  50511 026474      JMP #GTCR  YES==IGNORE IT
0416  50512 050374      CPA .+15B  NO, CARRIAGE RETURN?
0417  50513 125446      JMP GETCR,I YES
0418  50514 064000      LDB 0      COPY CHAR TO B
0419  50515 040317      ADA M96
0420  50516 002021      SSA,RSS   LOWER CASE
0421  50517 040450      ADA M32   MAKE INTO UPPER CASE
0422  50520 040470      ADA .140
0423  50521 035446      ISZ GETCR NO==EXIT
0424  50522 125446      JMP GETCR,I TO (P+2)

```



```

0426* *
0427** EXECUTE TAB(X) *
0428* *
0429 50523 015440 ETAB JSB ,IENT INTEGERIZE ARGUMENT
0430 50524 060273 LDA INF ARG > 32767
0431 50525 006400 CLB SET FLAG TO
0432 50526 075470 STB EOL 'ITAB OCCURRED'
0433 50527 065754 LDB FFLG GET FORMAT FLAG
0434 50530 006002 SZB IN FORMATTER ?
0435 50531 026536 JMP ETAB2 YES
0436 50532 066005 LDB MM72
0437 50533 044000 ADB A
0438 50534 006021 SSB,RSS
0439 50535 026550 JMP ETAB4=1 YES, GO TO NEXT LINE
0440 50536 003004 ETAB2 CMA,INA NO
0441 50537 041570 ADA CHRCT ANY BLANKS
0442 50540 002021 SSA,RSS REQUIRED?
0443 50541 026551 JMP ETAB4 NO
0444 50542 071434 STA LBTMP YES
0445 50543 060417 ETAB1 LDA ,+40B OUTPUT
0446 50544 015452 JSB OUTCR A BLANK
0447 50545 035434 ISZ LBTMP DONE?
0448 50546 026543 JMP ETAB1 NO
0449 50547 002001 RSS YES
0450 50550 015424 JSB OUTLN
0451 50551 061027 ETAB4 LDA BIT15 SO OPCHK DOESN'T BARF
0452 50552 124662 JMP FRET,1
0453* *
0454** EXECUTE SPA(X) *
0455 50553 015440 ESpa JSB ,IENT INTEGERIZE ARGUMENT
0456 50554 060273 LDA INF ARG > 32767
0457 50555 006400 CLB SET FUNCTION FLAG
0458 50556 075470 STB EOL TO EXECUTED
0459 50557 002003 SZA,RSS IS IT ZERO ?
0460 50560 026606 JMP ESPA4 YES
0461 50561 002020 SSA NO, NEGATIVE?
0462 50562 026606 JMP ESPA4 YES
0463 50563 003004 CMA,INA NO
0464 50564 071774 STA REPCT OUTPUT
0465 50565 065754 LDB FFLG
0466 50566 006002 SZB
0467 50567 026576 JMP ESPA1 NO
0468 50570 040466 ADA ,72
0469 50571 065570 LDB CHRCT SPACING PAST
0470 50572 007004 CMB,INB END OF LINE ?
0471 50573 040001 ADA 1
0472 50574 002020 SSA
0473 50575 026605 JMP ESPA4=1
0474 50576 061571 ESPA1 LDA BLANK
0475 50577 015452 JSB OUTCR
0476 50600 035774 ISZ REPCT
0477 50601 026576 JMP ESPA1
0478 50602 003400 CCA RESET
0479 50603 071774 STA REPCT REPCT
0480 50604 002001 RSS
0481 50605 015424 JSB OUTLN

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0482	50606	061027	ESPA4	LDA BIT15	SO OPCHK DOESN'T BARF
0483	50607	124662		JMP FRET,I	
0484*				*	
0485*				*	
0486**				EXECUTE LIN(X)	*
0487*				*	
0488	50610	015440	ELIN	JSB .IENT	INTEGERIZE ARGUMENT
0489	50611	060502		LDA B400	
0490	50612	006400		CLB	SET FUNCTION FLAG
0491	50613	075470		STB EOL	TO EXECUTED
0492	50614	002021		SSA,RSS	NO, NEGATIVE ?
0493	50615	026632		JMP ELIN1	NO
0494	50616	040502		ADA B400	
0495	50617	002020		SSA	
0496	50620	002400		CLA	
0497	50621	040316		ADA M256	
0498	50622	071774		STA REPCT	
0499	50623	060371		LDA .+12B	REPCT LINEFEEDS
0500	50624	015452		JSB OUTCR	
0501	50625	035774		ISZ REPCT	
0502	50626	026623		JMP *-3	
0503	50627	003400		CCA	
0504	50630	071774		STA REPCT	REINITIALIZE REPCT
0505	50631	026656		JMP ELIN2	YES
0506	50632	040316	ELIN1	ADA M256	
0507	50633	002021		SSA,RSS	ARGUMENT > 2 56 ?
0508	50634	002400		CLA	
0509	50635	040502		ADA B400	
0510	50636	002002		SZA	
0511	50637	026647		JMP ELIN3	
0512	50640	060374		LDA .+15B	
0513	50641	015452		JSB OUTCR	
0514	50642	002400		CLA	
0515	50643	015452		JSB OUTCR	
0516	50644	002400		CLA	
0517	50645	071570		STA CHRCT	
0518	50646	026656		JMP ELIN2	YES
0519	50647	003004	ELIN3	CMA,INA	
0520	50650	071774		STA REPCT	OUTPUT
0521	50651	015534		JSB OUTCL	CR=LF'S
0522	50652	035774		ISZ REPCT	
0523	50653	026651		JMP *-2	
0524	50654	003400		CCA	RESET
0525	50655	071774		STA REPCT	REPCT
0526	50656	061027	ELIN2	LDA BIT15	SO OPCHK DOESN'T BARF
0527	50657	124662		JMP FRET,I	

```

0002* *
0003** COMPUTE ABS(X) *
0004* *
0005 50660 002020 EABS SSA ARGUMENT NEGATIVE?
0006 50661 015370 JSB ARINV YES, NEGATE IT
0007 50662 124662 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 50663 075434 EINT STB LBTMP SAVE (B)
0015 50664 015414 JSB IFIX TAKE ENTIER
0016 50665 026674 JMP EINT1 ALL SIGNIFICANCE IN MANTISSA
0017 50666 075434 STB LBTMP SAVE (B)
0018 50667 064416 LDB .+31 CORRECT FOR
0019 50670 075322 STB EXP BINARY POINT BIAS
0020 50671 065434 LDB LBTMP RETRIEVE (B)
0021 50672 015306 JSB .PACK NORMALIZE AND PACK
0022 50673 124662 JMP FRET,I
0023 50674 061260 EINT1 LDA TEMP6 RETRIEVE
0024 50675 065434 LDB LBTMP NUMBER
0025 50676 124662 JMP FRET,I
0026* *
0027** EXECUTE TIM(X) *
0028* *
0029 50677 015414 ETIM JSB IFIX INTEGERIZE ARGUMENT
0030 50700 115152 JSB RERRS+43,I ILLEGAL ARGUMENT
0031 50701 002002 SZA
0032 50702 115152 JSB RERRS+43,I ILLEGAL ARGUMENT
0033 50703 060001 LDA 1 IS ARGUMENT
0034 50704 010362 AND .+3 <=3 AND
0035 50705 050001 CPA 1 >=0 ?
0036 50706 002001 RSS YES
0037 50707 115152 JSB RERRS+43,I NO--ILLEGAL ARGUMENT
0038 50710 042736 ADA DTMTB BRANCH TO
0039 50711 124000 JMP 0,I APPROPRIATE ROUTINE
0040 50712 060172 ETIM0 LDA DATIM+1 # OF 100 MS
0041 50713 040526 ADA D36K UNITS
0042 50714 006400 CLB CONVERT
0043 50715 100400 DIV D600 TO MINUTES
0044 50716 000510
0044 50717 026734 JMP ETIM3+1
0045 50720 060171 ETIM1 LDA DATIM HOURS OF YEAR
0046 50721 006400 CLB CONVERT
0047 50722 100400 DIV .+24 TO DAYS
0048 50723 000407
0048 50724 060001 LDA 1 REMAINDER IS HOUR OF DAY
0049 50725 026734 JMP ETIM3+1
0050 50726 060171 ETIM2 LDA DATIM HOURS OF YEAR
0051 50727 006400 CLB CONVERT
0052 50730 100400 DIV .+24 TO DAYS
0053 50731 000407
0053 50732 002001 RSS
0054 50733 060170 ETIM3 LDA YEAR GET YEAR

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0055	50734	105120	OCT	105120	CONVERT TO FLOATING POINT
0056	50735	124662	JMP	FRET,I	EXIT WITH RESULT IN (A) AND (B)
0057	50736	150737	DTMTB	DEF ++1,I	
0058	50737	050712	DEF	ETIM0	
0059	50740	050720	DEF	ETIM1	
0060	50741	050726	DEF	ETIM2	
0061	50742	050733	DEF	ETIM3	
0062*	*		*		
0063**	COMPUTE	RND(X)	*		
0064*	*		*		
0065*					
0066*	THE	RANDOM	NUMBER	FUNCTION	COMPUTES
0067*	FORMULAS:				
0068*					
0069*	$X(N) = A * X(N-1) + C(\text{MOD } 2 \uparrow 30)$				$(A = 5 \uparrow 11, C = 2 \uparrow 30 * (1/2 = 1/\text{SQR}(12)))$
0070*	$\text{RND} = X / 2 \uparrow 30 \text{ MIN } (1 = 2 \uparrow = 23)$				
0071*					
0072	50743		ERND	EQU *	
0073	50743	002021	SSA,RSS		POSITIVE ARGUMENT?
0074	50744	026751	JMP	ERND1	YES, USE PREVIOUS VALUE
0075	50745	005265	RBL,CLE,ERB		NO, MAKE A
0076	50746	001600	ELA		
0077	50747	071564	STA	RNDX1	A NEW SEED
0078	50750	075565	STB	RNDX2	
0079	50751		ERND1	EQU *	
0080	50751	061564	LDA	RNDX1	COMPUTE FIRST
0081	50752	100200	MPY	RNDA2	CROSS PRODUCT.
	50753	051013			
0082	50754	071564	STA	RNDX1	SAVE (ONLY NEED LOW ORDER PART)
0083	50755	061565	LDA	RNDX2	COMPUTE 2ND
0084	50756	100200	MPY	RNDA1	CROSS PRODUCT.
	50757	051012			
0085	50760	041564	ADA	RNDX1	ADD IN FIRST.
0086	50761	043014	ADA	RNDC1	ADD IN HIGH PART OF C.
0087	50762	071564	STA	RNDX1	SAVE TOTAL. (THIS IS HIGH PART).
0088	50763	002500	CLA,CLE		SET EXP=0.
0089	50764	071322	STA	EXP	
0090	50765	061565	LDA	RNDX2	COMPUTE LOW ORDER PRODUCT.
0091	50766	100200	MPY	RNDA2	
	50767	051013			
0092	50770	043015	ADA	RNDC2	ADD IN LOW PART OF C.
0093	50771	002040	SEZ		ADD ANY CARRY INTO
0094	50772	006004	INB		B.
0095	50773	001265	RAL,CLE,ERA		$E \leftarrow A(15), A(15) \leftarrow 0.$
0096	50774	071565	STA	RNDX2	SAVE LOW ORDER RESULT.
0097	50775	005600	ELB		SHIFT HIGH ORDER PART & ADD IN
0098	50776	045564	ADB	RNDX1	PREVIOUS TOTAL.
0099	50777	005665	ELB,CLE,ERB		CLEAR BIT 15 AND STORE.
0100	51000	075564	STB	RNDX1	
0101	51001	001200	RAL		SHIFT A ADJACENT TO B.
0102	51002	101100	SWP		EXCHANGE REGISTERS AND
0103	51003	015306	JSB	.PACK	PACK.
0104	51004	054361	CPB	.+2	TEST FOR RESULT=1.0
0105	51005	002001	RSS		
0106	51006	124662	JMP	FRET,I	EXIT IF NOT.
0107	51007	060273	LDA	INF	SET RESULT TO $1 = 2 \uparrow = 23$

0108	51010	064316		LDB M256	
0109	51011	124662		JMP FRET,I	
0110*					
0111*					
0112	51012	002722	RNDA1	DEC 1490	A DIV 2+15
0113	51013	007335	RNDA2	DEC 3805	A MOD 2+15
0114	51014	016441	RNDC1	OCT 16441	C DIV 2+15
0115	51015	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	51016	006400	ESGN	CLB	CLEAR LOW PART OF NUMBER
0125	51017	002003		SZA,RSS	ZERO?
0126	51020	124662		JMP FRET,I	YES, RETURN 0
0127	51021	002021		SSA,RSS	POSITIVE?
0128	51022	064361		LDB ,+2	YES, LOAD EXPONENT FOR +1
0129	51023	061027		LDA FLGBT	NO, LOAD HIGH PART OF -1
0130	51024	006002		SZB	WAS ARGUMENT POSITIVE?
0131	51025	001300		RAR	YES, SET RESULT TO +1
0132	51026	124662		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	51027	075434	ETYP	STB LBTMP	SAVE (B)
0146	51030	065234		LDB FILE#	SAVE VALUE
0147	51031	075643		STB PINTG	OF FILE#
0148	51032	002003		SZA,RSS	'DATA' FILE?
0149	51033	027063		JMP ETYP3	YES
0150	51034	007400		CCB	NO, IGNORE
0151	51035	002020		SSA	END-OF-RECORDS
0152	51036	006400		CLB	UNLESS ARGUMENT
0153	51037	075651		STB EORFL	IS NEGATIVE
0154	51040	065434		LDB LBTMP	RETRIEVE (B)
0155	51041	002020		SSA	TAKE ABSOLUTE VALUE
0156	51042	015370		JSB ARINV	OF ARGUMENT
0157	51043	015342		JSB SBFIX	15-BIT INTEGER?
0158	51044	115142		JSB RERRS+35,I	NO
0159	51045	075234		STB FILE#	YES
0160	51046	061234		LDA FILE#	VALIDATE
0161	51047	064355		LDB ,+2	
0162	51050	015506		JSB RQSTR	FILE
0163	51051	015512		JSB GTTYP	GET TYPE

0164	51052	065643	ETYP1	LDB	PINTG	RESTORE
0165	51053	075234		STB	FILE#	FILE#
0166	51054	105120		OCT	105120	RETURN TYPE IN
0167	51055	124662		JMP	FRET,I	FLOATING POINT FORM
0168	51056	060362	ETYP2	LDA	,+3	
0169	51057	065244		LDB	NXTDT	OUT-OF-DATA
0170	51060	055573		CPB	SYMTB	CONDITION?
0171	51061	027052		JMP	ETYP1	YES, (A) = 3
0172	51062	015360		JSB	SETDP	NO, SEEK NEXT <DATA STATEMENT>
0173	51063	003400	ETYP3	CCA		MORE DATA IN
0174	51064	051262		CPA	DCCNT	CURRENT STATEMENT?
0175	51065	027056		JMP	ETYP2	NO
0176	51066	165244		LDB	NXTDT,I	YES, LOAD TYPE WORD
0177	51067	002404		CLA	INA	SET NUMBER
0178	51070	006021		SSB	RSS	NUMBER?
0179	51071	060361		LDA	,+2	NO, SET FOR STRING
0180	51072	027052		JMP	ETYP1	

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0182**
0183*** COMPUTE CHEBYSHEV(X) ***
0184**
0185 51073 015406 #CHEB JSB ,FMP
0186 51074 051366 DEF K2
0187 51075 104400 DST X2TMP X2TMP = X*2
      51076 001630
0188 51077 165436 LDB ,CHEB,I
0189 51100 075376 STB CTMP POINTER TO COEFFICIENT TABLE
0190 51101 104200 DLD 1,I
      51102 100001
0191 51103 104400 DST DTMP DTMP = COEFF(N)
      51104 001636
0192 51105 002400 CLA
0193 51106 071634 STA BTMP
0194 51107 071635 STA BTMP+1 B = 0
0195 51110 035376 CHEB1 ISZ CTMP N = N-1
0196 51111 035376 ISZ CTMP
0197 51112 161376 LDA CTMP,I
0198 51113 002003 SZA,RSS C(N) = 0?
0199 51114 027136 JMP CHEB2 YES
0200 51115 104200 DLD BTMP NO
      51116 001634
0201 51117 104400 DST ATMP A = B
      51120 001632
0202 51121 104200 DLD DTMP
      51122 001636
0203 51123 104400 DST BTMP B = D
      51124 001634
0204 51125 015406 JSB ,FMP
0205 51126 001630 DEF X2TMP
0206 51127 015404 JSB ,FSB
0207 51130 001632 DEF ATMP
0208 51131 015402 JSB ,FAD
0209 51132 101376 DEF CTMP,I
0210 51133 104400 DST DTMP D = COEFF(N)-A+B*X2
      51134 001636
0211 51135 027110 JMP CHEB1
0212 51136 104200 CHEB2 DLD DTMP
      51137 001636
0213 51140 015404 JSB ,FSB
0214 51141 001632 DEF ATMP
0215 51142 015406 JSB ,FMP
0216 51143 001031 DEF HALF
0217 51144 035436 ISZ ,CHEB ANS = (D-A)/2
0218 51145 125436 JMP ,CHEB,I

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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	51146	071434	#IENT	STA	LBTMP	SAVE (A)
0230	51147	060001		LDA	1	EXTRACT
0231	51150	010500		AND	B377	EXPONENT
0232	51151	000033		SLA,	RAR	NEGATIVE?
0233	51152	027156		JMP	IENT1	YES
0234	51153	040340		ADA	, -15	NO, LESS THAN
0235	51154	002021		SSA,	RSS	OR EQUAL TO 14?
0236	51155	125440		JMP	, IENT, I	NO
0237	51156	035440	IENT1	ISZ	, IENT	YES
0238	51157	061434		LDA	LBTMP	RESTORE (A)
0239	51160	015414		JSB	IFIX	TAKE ENTIER
0240	51161	000000		NOP		
0241	51162	060001		LDA	1	LOAD INTEGER
0242	51163	125440		JMP	, IENT, I	INTO (A)

0244** **

0245*** MULTIPLY BY A POWER OF 2 ***

0246** **

0247*

0248* ENTER WITH NUMBER IN (A) AND (B). AUGMENT EXPONENT

0249* BY THE VALUE POINTED TO BY (P+1) AND EXIT TO (P+2).

0250* NO CHECK ON EXPONENT UNDERFLOW OR OVERFLOW.

0251*

0252	51164	002003	#PWR2	SZA,	RSS	ARGUMENT ZERO?
0253	51165	027200		JMP	PWR2A	YES, RETURN 0
0254	51166	071630		STA	X2TMP	NO, SAVE HIGH PART OF MANTISSA
0255	51167	015412		JSB	, FLUN	UNPACK LOW PART OF NUMBER
0256	51170	075631		STB	X2TMP+1	SAVE LOW MANTISSA
0257	51171	165442		LDB	, PWR2, I	COMPUTE NEW
0258	51172	140001		ADA	1, I	EXPONENT
0259	51173	001200		RAL		POSITION
0260	51174	010500		AND	B377	AND MASK IT
0261	51175	070001		STA	1	COMPUTE NEW LOW
0262	51176	045631		ADB	X2TMP+1	PART OF NUMBER
0263	51177	061630		LDA	X2TMP	RETRIEVE HIGH MANTISSA
0264	51200	035442	PWR2A	ISZ	, PWR2	
0265	51201	125442		JMP	, PWR2, I	

0266* * *

0267** COMPUTE COS(X) *

0268* * *

0269	51202	015402	ECOS	JSB	, FAD	COMPUTE
0270	51203	051470		DEF	PIBY2	SIN(X+PI/2)

0271* * *

0272** COMPUTE SIN(X) *

0273* * *

0274	51204	015406	ESIN	JSB	, FMP	
0275	51205	051254		DEF	TOPI	
0276	51206	104400		DST	XTEMP	X = 2*X/PI

51207 001622

0277 51210 015402 JSB ,FAD

0278 51211 051364 DEF K1

0279 51212 015442 JSB ,PWR2

0280 51213 000355 DEF , -2

0281 51214 015440 JSB ,IENT

0282 51215 115136 JSB RERRS+31, I EXPONENT EXCEEDS 14

0283	51216	105120	OCT	105120	
0284	51217	015406	JSB	.FMP	
0285	51220	051256	DEF	MM4	
0286	51221	015402	JSB	.FAD	
0287	51222	001622	DEF	XTEMP	
0288	51223	104400	DST	XTEMP	$X = X-4*ENTIER((X+1)/4)$
	51224	001622			
0289	51225	015404	JSB	.FSB	
0290	51226	051364	DEF	K1	
0291	51227	002020	SSA		X<1?
0292	51230	027237	JMP	ESIN1	YES
0293	51231	104200	DLN	K2	NO
	51232	051366			
0294	51233	015404	JSB	.FSB	
0295	51234	001622	DEF	XTEMP	
0296	51235	104400	DST	XTEMP	$X = 2-X$
	51236	001622			
0297	51237	104200	ESIN1	DLN	XTEMP
	51240	001622			
0298	51241	015406	JSB	.FMP	
0299	51242	001622	DEF	XTEMP	
0300	51243	015442	JSB	.PWR2	
0301	51244	000360	DEF	.+1	
0302	51245	015404	JSB	.FSB	
0303	51246	051364	DEF	K1	
0304	51247	015436	JSB	.CHEB	
0305	51250	051260	DEF	COEF2	
0306	51251	015406	JSB	.FMP	
0307	51252	001622	DEF	XTEMP	
0308	51253	124662	JMP	FRET,I	$ANS = X * CHEBY(2 * X + 2 - 1)$
0309*					
0310	51254	050574	TOPI	DEC .636619772	2/PI
	51255	141000			
0311	51256	100000	MM4	DEC -4.	
	51257	000004			
0312	51260	047605	COEF2	DEC 1.18496E-6	
	51261	072733			
0313	51262	134143		DEC -1.365875E-4	
	51263	104751			
0314	51264	045261		DEC 9.118016E-3	
	51265	157365			
0315	51266	133371		DEC -.2852615692	
	51267	014777			
0316	51270	050656		DEC 2.5525579248	
	51271	107004			
0317	51272	000000	OCT	0	
0318*	*		*		
0319**	COMPUTE TAN(X)	*	*		
0320*	*		*		
0321	51273	015406	ETAN	JSB .FMP	
0322	51274	051362	DEF	FOPI	4/PI
0323	51275	104400	DST	XTEMP	
	51276	001622			
0324	51277	015402	JSB	.FAD	
0325	51300	051364	DEF	K1	
0326	51301	015442	JSB	.PWR2	

0327	51302	000355	DEF	.-2	
0328	51303	015440	JSB	.IENT	
0329	51304	115136	JSB	RERRS+31,I	
0330	51305	105120	OCT	105120	
0331	51306	015370	JSB	ARINV	
0332	51307	015442	JSB	.PWR2	
0333	51310	000361	DEF	.+2	
0334	51311	015402	JSB	.FAD	
0335	51312	001622	DEF	XTEMP	
0336	51313	104400	DST	XTEMP	$X = X-4*ENTIER((X+1)/4)$
	51314	001622			
0337	51315	015404	JSB	.FSB	
0338	51316	051364	DEF	K1	
0339	51317	071434	STA	LBTMP	
0340	51320	002020	SSA		X<1?
0341	51321	027354	JMP	ETAN2	YES
0342	51322	104200	DLD	K2	NO
	51323	051366			
0343	51324	015404	JSB	.FSB	
0344	51325	001622	DEF	XTEMP	
0345	51326	104400	ETAN1 DST	YTEMP	$Y = 2-X$
	51327	001624			
0346	51330	015406	JSB	.FMP	
0347	51331	001624	DEF	YTEMP	
0348	51332	015406	JSB	.FMP	
0349	51333	051366	DEF	K2	
0350	51334	015404	JSB	.FSB	
0351	51335	051364	DEF	K1	
0352	51336	015436	JSB	.CHEB	
0353	51337	051370	DEF	COEF0	
0354	51340	015406	JSB	.FMP	
0355	51341	001624	DEF	YTEMP	
0356	51342	104400	DST	YTEMP	$Y = Y*CHEBY(2*Y+2 -1)$
	51343	001624			
0357	51344	061434	LDA	LBTMP	
0358	51345	002020	SSA		X<1?
0359	51346	027357	JMP	ETAN3	YES
0360	51347	104200	DLD	K1	NO
	51350	051364			
0361	51351	015410	JSB	.FDV	
0362	51352	001624	DEF	YTEMP	
0363	51353	124662	JMP	FRET,I	ANS = 1/Y
0364	51354	104200	ETAN2 DLD	XTEMP	
	51355	001622			
0365	51356	027326	JMP	ETAN1	Y = X
0366	51357	104200	ETAN3 DLD	YTEMP	
	51360	001624			
0367	51361	124662	JMP	FRET,I	ANS = Y
0368*					
0369	51362	050574	FOPI	DEC 1,273239545	
	51363	141002			
0370	51364	040000	K1	DEC 1,	
	51365	000002			
0371	51366	040000	K2	DEC 2,	
	51367	000004			
0372	51370	076061	COEF0	DEC 1,4458E-8	

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0373 51371 075315
      51372 066034      DEC 2.013766E-7
      51373 176725
0374 51374 057035      DEC 2.804816E-6
      51375 030335
0375 51376 050755      DEC 3.906637E-5
      51377 114745
0376 51400 043523      DEC 5.4417038E-4
      51401 052355
0377 51402 076112      DEC 7.586101578E-3
      51403 065763
0378 51404 066520      DEC .10675392857
      51405 163773
0379 51406 070512      DEC 1.7701474227
      51407 014002
0380 51410 000000      OCT 0
0381* *
0382** COMPUTE ATN(X) *
0383* *
0384 51411 104400      EATN DST XTEMP
      51412 001622
0385 51413 060001      LDA 1
0386 51414 010500      AND B377
0387 51415 071434      STA LBTMP
0388 51416 002002      SZA
0389 51417 000010      SLA          ABS(X) > 1?
0390 51420 027455      JMP EATN2    NO
0391 51421 104200      DLD K1      YES
      51422 051364
0392 51423 015410      JSB .FDV
0393 51424 001622      DEF XTEMP   U = 1/X
0394 51425 104400      EATN1 DST UTEMP
      51426 001626
0395 51427 015406      JSB .FMP
0396 51430 001626      DEF UTEMP
0397 51431 015406      JSB .FMP
0398 51432 051366      DEF K2
0399 51433 015404      JSB .FSB
0400 51434 051364      DEF K1
0401 51435 015436      JSB .CHEB
0402 51436 051474      DEF COEF1
0403 51437 015406      JSB .FMP
0404 51440 001626      DEF UTEMP
0405 51441 104400      DST YTEMP   Y = U*CHEBY(2*U+2 -1)
      51442 001624
0406 51443 061434      LDA LBTMP
0407 51444 002002      SZA
0408 51445 000010      SLA          ABS(X) > 1?
0409 51446 027460      JMP EATN3    NO
0410 51447 061622      LDA XTEMP   YES
0411 51450 002020      SSA        X<0?
0412 51451 027463      JMP EATN4    YES
0413 51452 104200      DLD PIBY2   NO
      51453 051470
0414 51454 027465      JMP EATN4+2
0415 51455 104200      EATN2 DLD XTEMP

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0416 51456 001622          JMP EATN1      U = X
0417 51460 104200      EATN3 DLD YTEMP
      51461 001624
0418 51462 124662          JMP FRET,I     ANS = Y
0419 51463 104200      EATN4 DLD MP2
      51464 051472
0420 51465 015404          JSB .FSB
0421 51466 001624          DEF YTEMP
0422 51467 124662          JMP FRET,I     ANS = -PI/2-Y
0423*
0424 51470 062207      PIBY2 DEC 1.5707963268  PI/2
      51471 166402
0425 51472 115570      MP2   DEC -1.5707963268  -PI/2
      51473 011402
0426 51474 106671      COEF1 DEC -1.33034E-8
      51475 102315
0427 51476 056335          DEC 8.64888E-8
      51477 156323
0428 51500 131601          DEC -56.99186E-8
      51501 137731
0429 51502 040033          DEC 3.821037E-6
      51503 035737
0430 51504 111013          DEC -2.6215196E-5
      51505 123343
0431 51506 060542          DEC 1.8574297E-4
      51507 000351
0432 51510 122573          DEC -1.381195004E-3
      51511 062757
0433 51512 055471          DEC .01113584206
      51513 107365
0434 51514 111620          DEC -.1058929245
      51515 147373
0435 51516 070320          DEC 1.762747174
      51517 155002
0436 51520 000000          OCT 0
0437* *
0438** COMPUTE EXP(X) *
0439* *
0440 51521 015432      EEXP  JSB .EXP
0441 51522 124662          JMP FRET,I
0442 51523 015406      #EXP  JSB .FMP
0443 51524 051643          DEF L2E
0444 51525 104400          DST XTEMP      X = ARG*LOG2(E)
      51526 001622
0445 51527 015440          JSB .IENT
0446 51530 027622          JMP .EXP2
0447 51531 071434          STA LBTMP
0448 51532 105120          OCT 105120
0449 51533 104400          DST YTEMP      Y = ENTIER(X)
      51534 001624
0450 51535 061434          LDA LBTMP
0451 51536 043631          ADA M124
0452 51537 002021          SSA,RSS      X >= 124?
0453 51540 027622          JMP .EXP2      YES
0454 51541 043632          ADA .244      NO

```

0455	51542	002020	SSA	X < -120?
0456	51543	027617	JMP .EXP1	YES
0457	51544	104200	DLD XTEMP	NO
	51545	001622		
0458	51546	015404	JSB .FSB	
0459	51547	001624	DEF YTEMP	
0460	51550	104400	DST XTEMP	X = X-ENTIER(X)
	51551	001622		
0461	51552	015406	JSB .FMP	
0462	51553	001622	DEF XTEMP	
0463	51554	104400	DST UTEMP	U = X↑2
	51555	001626		
0464	51556	015402	JSB .FAD	
0465	51557	051633	DEF AAAA	
0466	51560	104400	DST YTEMP	Y = X↑2+AAAA
	51561	001624		
0467	51562	104200	DLD BBBB	
	51563	051635		
0468	51564	015410	JSB .FDV	
0469	51565	001624	DEF YTEMP	
0470	51566	104400	DST YTEMP	Y = BBBB/Y
	51567	001624		
0471	51570	104200	DLD CCCC	
	51571	051637		
0472	51572	015406	JSB .FMP	
0473	51573	001626	DEF UTEMP	
0474	51574	015402	JSB .FAD	
0475	51575	051641	DEF DDDD	
0476	51576	015404	JSB .FSB	
0477	51577	001622	DEF XTEMP	
0478	51600	015404	JSB .FSB	
0479	51601	001624	DEF YTEMP	
0480	51602	104400	DST YTEMP	Y = -X+DDDD+CCCC*X↑2-Y
	51603	001624		
0481	51604	104200	DLD XTEMP	
	51605	001622		
0482	51606	015410	JSB .FDV	
0483	51607	001624	DEF YTEMP	
0484	51610	015402	JSB .FAD	
0485	51611	001031	DEF HALF	
0486	51612	035434	ISZ LBTMP	
0487	51613	000000	NOP	
0488	51614	015442	JSB .PWR2	
0489	51615	001434	DEF LBTMP	
0490	51616	125432	JMP .EXP, I	ANS = (0.5+X/Y)*2↑ENTIER(ARG+LE)
0491	51617	002400	.EXP1 CLA	
0492	51620	006400	CLB	
0493	51621	125432	JMP .EXP, I	ANS = 0
0494	51622	061434	.EXP2 LDA LBTMP	LARGE ARGUMENT
0495	51623	002020	SSA	NEGATIVE?
0496	51624	027617	JMP .EXP1	YES
0497	51625	115205	JSB WERRS+4, I	NO
0498	51626	060273	LDA INF	
0499	51627	064355	LDB #-2	ANS = POSITIVE INFINITY
0500	51630	125432	JMP .EXP, I	
0501*				

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0502	51631	177604	M124	DEC	=124
0503	51632	000364	.244	DEC	244
0504	51633	053552	AAAA	DEC	87.417497202
	51634	160416			
0505	51635	046477	BBBB	DEC	617.9722695
	51636	016424			
0506	51637	043372	CCCC	DEC	.03465735903
	51640	070371			
0507	51641	047643	DDDD	DEC	9.9545957821
	51642	001410			
0508	51643	056125	L2E	DEC	1.4426950409
	51644	017002			

```

0002* *
0003** COMPUTE LOG(X) *
0004* *
0005 51645 015434 ELOG JSB .LOG
0006 51646 124662 JMP FRET,I
0007 51647 002003 #LOG SZA,RSS NON-ZERO ARGUMENT?
0008 51650 027724 JMP .LOG1 NO
0009 51651 002020 SSA YES, POSITIVE ARGUMENT?
0010 51652 115132 JSB RERRS+27,I NO
0011 51653 071622 STA XTEMP YES,
0012 51654 015412 JSB .FLUN SAVE MANTISSA
0013 51655 075623 STB XTEMP+1 AND FLOATED
0014 51656 105120 OCT 105120 EXPONENT
0015 51657 104400 DST YTEMP SEPARATELY
      51660 001624
0016 51661 104200 DLD XTEMP
      51662 001622
0017 51663 015402 JSB .FAD
0018 51664 051731 DEF R22
0019 51665 104400 DST UTEMP U = X+SQR(0.5)
      51666 001626
0020 51667 104200 DLD XTEMP
      51670 001622
0021 51671 015404 JSB .FSB
0022 51672 051731 DEF R22
0023 51673 015410 JSB .FDV
0024 51674 001626 DEF UTEMP
0025 51675 104400 DST UTEMP U = (X-SQR(0.5))/U
      51676 001626
0026 51677 015406 JSB .FMP
0027 51700 001626 DEF UTEMP
0028 51701 015404 JSB .FSB
0029 51702 051741 DEF CCC
0030 51703 104400 DST XTEMP
      51704 001622
0031 51705 104200 DLD MB
      51706 051737
0032 51707 015410 JSB .FDV
0033 51710 001622 DEF XTEMP
0034 51711 015402 JSB .FAD
0035 51712 051735 DEF AAA
0036 51713 015406 JSB .FMP
0037 51714 001626 DEF UTEMP
0038 51715 015404 JSB .FSB
0039 51716 001031 DEF HALF
0040 51717 015402 JSB .FAD
0041 51720 001624 DEF YTEMP
0042 51721 015406 JSB .FMP
0043 51722 051733 DEF LE2 ANS = LOG(2)*
0044 51723 125434 JMP .LOG,I (MANTISSA=0.5+U*(AAA+MB/X))
0045 51724 115202 .LOG1 JSB WERRS+1,I
0046 51725 061027 LDA MNEG
0047 51726 067730 LDB B776 ANS = NEGATIVE INFINITY
0048 51727 125434 JMP .LOG,I
0049*
0050 51730 000776 B776 OCT 776

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PAGE 0218 #18 LIBRARY FUNCTIONS

0051	51731 055202	R22	DEC .707106781	SQR(0.5)
	51732 075000			
0052	51733 054271	LE2	DEC .6931471806	LOG BASE E (2)
	51734 006000			
0053	51735 051260	AAA	DEC 1.2920070987	
	51736 037402			
0054	51737 125606	MB	DEC -2.6398577035	
	51740 044404			
0055	51741 065010	CCC	DEC 1.6567626301	
	51742 063002			

0057*

0058* ENTER WITH:

0059*

0060* (A)*1 IF PBFLG HAS TO BE SET.

0061*

0062* (A)*2 IF PBFLG HAS TO BE CLEARED.

0063*

0064* (A)*4 IF PBFLG AND CBFLG HAVE TO BE CLEARED.

0065*

0066* (B)* POINTER TO ?FLAG

0067*

0068* EXIT WITH ORIGINAL CONTENTS IN B.

0069*

0070	51743	#EDAB EQU *	
0071	51743 103100	CLF 0	
0072	51744 002011	SLA,RSS	BIT#0 SET?
0073	51745 027751	JMP ++4	
0074	51746 060600	LDA PBFLG	YES, SET PBFLG.
0075	51747 130001	IOR B,I	
0076	51750 027756	JMP #EDB1	
0077	51751 001310	RAR,SLA	NO, BIT#1 SET?
0078	51752 060600	LDA PBFLG	YES, CLEAR PBFLG.
0079	51753 060524	LDA B30M	NO, CLEAR PBFLG AND CBFLG.
0080	51754 003000	CMA	
0081	51755 110001	AND B,I	
0082	51756	#EDB1 EQU *	
0083	51756 170001	STA B,I	STORE ?FLAG WORD BACK.
0084	51757 102100	STF 0	
0085	51760 125562	JMP EDABR,I	EXIT.
0086*			
0087*			

```

0090 52000          ORG 52000B
0091 52000 063146  TENTH OCT 63146
0092 52001 000063  B63   OCT 63
0093 52002 000120  B120  OCT 120      "P"
0094 52003 177716  D62   OCT -62
0095 52004 177707  M71B  OCT -71
0096 52005 000776  BB776 OCT 776
0097 52006 000106  F      OCT 106
0098 52007 000116  N      OCT 116
0099* *
0100** COMPUTE SQR(X) *
0101* *
0102 52010 002003  ESQR  SZA,RSS      X = 0?
0103 52011 124662  JMP FRET,I     YES, ANS = 0
0104 52012 002020  SSA          NO, X < 0?
0105 52013 115133  JSB RERRS+28,I YES
0106 52014 071622  STA XTEMP     NO
0107 52015 015412  JSB .FLUN
0108 52016 000031  SLA,ARS      EXPONENT ODD?
0109 52017 026055  JMP ESQR2     YES
0110 52020 040356  ADA .-1      NO
0111 52021 071434  STA LBTMP     EXPONENT/2 = 1
0112 52022 075623  STB XTEMP+1  MANTISSA SAVED
0113 52023 061622  LDA XTEMP
0114 52024 015406  JSB .FMP
0115 52025 052070  DEF SA2
0116 52026 015402  JSB .FAD
0117 52027 052074  DEF SB2      Y = SB2+SA2*X
0118 52030 104400  ESQR1 DST YTEMP
      52031 001624
0119 52032 104200  DLD XTEMP
      52033 001622
0120 52034 015410  JSB .FDV
0121 52035 001624  DEF YTEMP
0122 52036 015402  JSB .FAD
0123 52037 001624  DEF YTEMP
0124 52040 015442  JSB .PWR2
0125 52041 000356  DEF .-1
0126 52042 104400  DST YTEMP      Y = (Y+X/Y)/2
      52043 001624
0127 52044 104200  DLD XTEMP
      52045 001622
0128 52046 015410  JSB .FDV
0129 52047 001624  DEF YTEMP
0130 52050 015402  JSB .FAD
0131 52051 001624  DEF YTEMP
0132 52052 015442  JSB .PWR2
0133 52053 001434  DEF LBTMP
0134 52054 124662  JMP FRET,I     ANS = (P+F/P)*2↑ESQR0
0135 52055 071434  ESQR2 STA LBTMP     EXPONENT/2
0136 52056 044500  ADB B377
0137 52057 075623  STB XTEMP+1  MANTISSA/2 SAVED
0138 52060 061622  LDA XTEMP
0139 52061 015406  JSB .FMP
0140 52062 052066  DEF SA1
0141 52063 015402  JSB .FAD

```

0142	52064	052072		DEF SB1	
0143	52065	026030		JMP ESR1	Y = SB1+SA1*X
0144*					
0145	52066	070000	SA1	DEC .875	
	52067	000000			
0146	52070	045000	SA2	DEC .578125	
	52071	000000			
0147	52072	043524	SB1	DEC .27863	
	52073	046377			
0148	52074	066000	SB2	DEC .421875	
	52075	000377			
0149*	*		*		
0150**	COMPUTE BRK(X)	*			
0151*	*		*		
0152*					
0153*	ENTER WITH ARGUMENT IN A AND B.				
0154*	IF X=0, DISABLE ABORT CAPABILITY.				
0155*	IF X>0, ENABLE ABORT CAPABILITY.				
0156*	IF X<0, DO NOT DISABLE OR ENABLE BUT JUST				
0157*	RETURN A VALUE.				
0158*					
0159*	RETURN WITH:				
0160*					
0161*	1. 0 IF ABORT CAPABILITY WAS DISABLED PREVIOUS				
0162*	TO EVALUATION.				
0163*					
0164*	2. +1 IF ABORT CAPABILITY WAS ENABLED PREVIOUS				
0165*	TO EVALUATION.				
0166*					
0167	52076	071622	EBRK	STA XTEMP	STORE HIGH PART OF ARGUMENT.
0168	52077	160255		LDA MAIN,I	A = ?FLAG
0169	52100	010600		AND PBFLG	
0170	52101	006400		CLB	
0171	52102	002003		SZA,RSS	PBFLG BIT SET?
0172	52103	064361		LDB ,+2	NO. SET (B)=EXPONENT OF +1.
0173	52104	061027		LDA FLGBT	YES. SET (A)=1000000.
0174	52105	006003		SZB,RSS	WAS PBFLG SET?
0175	52106	002400		CLA	YES. SET RETURN VALUE TO 0.
0176	52107	001300		RAR	NO. SET RETURN VALUE TO +1.
0177	52110	104400		DST YTEMP	SAVE.
	52111	001624			
0178*					
0179	52112	064255		LDB MAIN	(B)=> ? FLAG
0180	52113	061622		LDA XTEMP	RETRIEVE HIGH PART OF ARGUMENT.
0181	52114	002002		SZA	ARGUMENT=0?
0182	52115	026130		JMP EBRK1	
0183	52116	002404		CLA,INA	YES. SET PBFLG TO 1(=DISABLE
0184	52117	015562		JSB EDABR	ABORT).
0185	52120	103100		CLF 0	
0186	52121	044374		ADB ,+?STAT	B=> ?STAT
0187	52122	164001		LDB B,I	B = ?STAT
0188	52123	003400		CCA	
0189	52124	050001		CpA B	
0190	52125	126137		JMP SUSPN,I	QUIT IF ABORT REQUEST.
0191	52126	102100		STF 0	
0192	52127	026134		JMP EBRK2	

```

0193 52130          EBRK1 EQU *
0194 52130 002020   SSA
0195 52131 026134   JMP EBRK2
0196 52132 060361   LDA ,+2
0197 52133 015562   JSB EDABR
0198 52134          EBRK2 EQU *
0199 52134 104200   DLD YTEMP
          52135 001624
0200 52136 124662   JMP FRET,I
0201*
0202*
0203 52137 071662   SUSPN DEF SUSP
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 071550 STA LT8 NO PAGINATION
0230 52147 064726 LDB PBUFF NULL
0231 52150 054056 CPB PBPTR PROGRAM?
0232 52151 026575 JMP LIS16 YES
0233 52152 006404 CLB,INB NO, SET FIRST STATEMENT NUMBER
0234 52153 075430 STB LT3
0235 52154 015462 JSB SINIT PREPARE PROGRAM FOR LISTING
0236 52155 064056 LDB PBPTR
0237 52156 103100 CLF 0
0238 52157 060361 LDA CFLAG SAVE
0239 52160 110255 AND MAIN,I PROGRAM
0240 52161 071440 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 065573 LDB SYMTB LAST WORD +1
0247 52165 075442 STB LT6 OF PROGRAM
0248 52166 065027 LDB BIT15 GET LARGE SEQUENCE NUMBER
0249 52167 075432 STB LT7 SET ENDING SEQUENCE NUMBER
0250 52170 015446 JSB GETCR STARTING LINE NUMBER?
0251 52171 026233 JMP LIS00 NO
0252 52172 006400 CLB
0253 52173 050433 CPA .+54B CHECK FOR COMMA
0254 52174 026206 JMP LISCM FIRST STATEMENT NUMBER OMITTED.
0255 52175 052002 CPA B120 PAGINATION?
0256 52176 026226 JMP LISCP YES
0257 52177 015450 JSB BCKSP BACK UP FOR FIRST STATEMENT NUMB
0258 52200 015464 JSB BLDIN FETCH INTEGER
0259 52201 050374 CPA .+15B CHECK FOR CARRIAGE RETURN
0260 52202 026234 JMP LISCR YES, END OF COMMAND
0261 52203 050433 CPA .+54B COMMA FOLLOWS?
0262 52204 002001 RSS YES

```

0263	52205	115113		JSB RERRS+12,I	
0264	52206		LISCM	EQU *	
0265	52206	075430		STB LT3	SAVE STARTING SEQUENCE NUMBER
0266	52207	015446		JSB GETCR	GET THE NEXT CHARACTER
0267	52210	115113		JSB RERRS+12,I	
0268	52211	052002		CPA B120	CHECK FOR P
0269	52212	026226		JMP LISCP	PAGINATION
0270	52213	015450		JSB BCKSP	BACK UP FOR SECOND STATEMENT #
0271	52214	015464		JSB BLDIN	GET INTEGER
0272	52215	007000		CMB	
0273	52216	075432		STB LT7	SAVE ENDING SEQUENCE NUMBER
0274	52217	050374		CPA .+15B	END OF RECORD?
0275	52220	026233		JMP LISCP	YES
0276	52221	015446		JSB GETCR	NO, GET NEXT CHARACTER
0277	52222	115113		JSB RERRS+12,I	
0278	52223	052002		CPA B120	PAGINATION?
0279	52224	002001		RSS	YES
0280	52225	115113		JSB RERRS+12,I	NO
0281	52226		LISCP	EQU *	
0282	52226	062004		LDA M71B	SET LINE COUNTER
0283	52227	071550		STA LT8	
0284	52230	015446		JSB GETCR	TEST FOR END OF LINE
0285	52231	002001		RSS	
0286	52232	115113		JSB RERRS+12,I	
0287	52233		LISCP	EQU *	
0288	52233	065430		LDB LT3	GET BACK STARTING SEQUENCE NUMBER
0289	52234		LISCR	EQU *	
0290	52234	061442		LDA LT6	SEEK
0291	52235	015314		JSB FNDPS	STATEMENT
0292	52236	026575		JMP LIS16	ALL LINE NUMBERS < GIVEN INTEGER
0293	52237	000000		NOP	SAVE DESIRED
0294	52240	075430		STB LT3	STARTING POINT
0295	52241	060371		LDA .+12B	OUTPUT A
0296	52242	015452		JSB OUTCR	LINE FEED
0297*				*	
0298**	OUTPUT PROGRAM NAME			**	
0299*				*	
0300	52243	061567		LDA LNAME	
0301	52244	071426		STA LT1	
0302	52245	040360		ADA .+?NAME=?ID	
0303	52246	160000		LDA A,I	REMOVE RUN-ONLY
0304	52247	010273		AND INF	BIT AND CHECK FOR
0305	52250	002003		SZA,RSS	NULL PROGRAM NAME
0306	52251	026260		JMP LISCU	YES
0307	52252	006400		CLB	NO
0308	52253	075274		STB LT2	OUTPUT
0309	52254	060354		LDA .-3	PROGRAM
0310	52255	015460		JSB OUTST	NAME
0311	52256	060374		LDA .+15B	OUTPUT
0312	52257	015452		JSB OUTCR	CARRIAGE RETURN
0313	52260		LISCU	EQU *	
0314	52260	060371		LDA .+12B	AND
0315	52261	015452		JSB OUTCR	DOUBLE
0316	52262	060371		LDA .+12B	LINE
0317	52263	015452		JSB OUTCR	FEED
0318*				*	

```

0319** OUTPUT LEADER IF 'PUNCH' **
0320*
0321 52264 002400 CLA
0322 52265 051400 CPA LT0
0323 52266 026275 JMP LIST2-2
0324 52267 060322 LDA M72B
0325 52270 071356 STA DIGCT
0326 52271 002400 CLA
0327 52272 015452 JSB OUTCR
0328 52273 035356 ISZ DIGCT
0329 52274 026271 JMP *-3
0330 52275 065430 LDB LT3
0331 52276 075426 STB LT1
0332*
0333** MAIN LIST LOOP **
0334*
0335 52277 065426 LIST2 LDB LT1
0336 52300 055442 CPB LT6
0337 52301 026563 JMP LIS15
0338 52302 165426 LDB LT1,I
0339 52303 045432 ADB LT7
0340 52304 006021 SSB,RSS
0341 52305 026563 JMP LIS15
0342*
0343 52306 035550 ISZ LT8
0344 52307 026320 JMP LISPM
0345 52310 060347 LDA *-8
0346 52311 071550 STA LT8
0347 52312 LISPF EQU *
0348 52312 060371 LDA .+12B
0349 52313 015452 JSB OUTCR
0350 52314 035550 ISZ LT8
0351 52315 026312 JMP LISPF
0352 52316 060322 LDA M72B
0353 52317 071550 STA LT8
0354 52320 LISPM EQU *
0355*
0356 52320 165426 LDB LT1,I
0357 52321 015454 JSB OUTIN
0358 52322 060417 LDA .+40B
0359 52323 015452 JSB OUTCR
0360 52324 035426 ISZ LT1
0361 52325 161426 LDA LT1,I
0362 52326 015554 JSB STLCK
0363 52327 161426 LDA LT1,I
0364 52330 003004 CMA,INA
0365 52331 002004 INA
0366 52332 071274 STA LT2
0367 52333 026336 JMP LIST3
0368 52334 165426 LDB LT1,I
0369 52335 015454 JSB OUTIN
0370 52336 035426 LIST3 ISZ LT1
0371 52337 035274 ISZ LT2
0372 52340 026354 JMP LIST4
0373 52341 002404 CLA,INA
0374 52342 051400 CPA LT0

```

```

'LIST'
MODE?
YES
NO,
OUTPUT
FEED
FRAMES
FOR
LEADER
SET POINTER TO
STARTING POINT

```

```

PROGRAM
EXHAUSTED?
YES
GET LINE NUMBER
CHECK FOR END OF LISTING
SKIP IF NOT DONE YET
STOP LISTING HERE

```

```

CHECK FOR NEW PAGE
NOT YET

```

```

OUTPUT A
BUNCH OF
LINE FEEDS

```

```

RESET LINE COUNTER

```

```

NO, OUTPUT
LINE NUMBER
OUTPUT
BLANK
CHECK
STATEMENT
LENGTH
LENGTH
COUNTER
FOR
STATEMENT

```

```

OUTPUT
BOUND
MORE OF
STATEMENT?
YES
XPUNCH?

```

0375	52343	002001		RSS	YES
0376	52344	026347		JMP **3	NO
0377	52345	060402		LDA .+23B	OUTPUT
0378	52346	015452		JSB OUTCR	X=OFF
0379	52347	060374		LDA .+15B	NO,
0380	52350	015452		JSB OUTCR	OUTPUT A
0381	52351	060371		LDA .+12B	CARRIAGE RETURN
0382	52352	015452		JSB OUTCR	AND LINE FEED
0383	52353	026277		JMP LIST2	
0384*				*	
0385**	IDENTIFY OPERATOR			**	
0386*				*	
0387	52354	161426	LIST4	LDA LT1,I	EXTRACT
0388	52355	010570		AND OPMSK	OPERATOR
0389	52356	002003		SZA,RSS	NULL OPERATOR?
0390	52357	026400		JMP LIST5	YES
0391	52360	050552		CPA LETOP	NO, 'IMPLIED' LET?
0392	52361	026376		JMP LIST5-2	YES, OUTPUT A BLANK
0393	52362	001727		ALF,ALF	NO,
0394	52363	042003		ADA D62	SINGLE-CHARACTER
0395	52364	002021		SSA,RSS	OPERATOR?
0396	52365	026532		JMP LIS12	NO
0397	52366	042001		ADA B63	YES,
0398	52367	040660		ADA FOPBS	EXTRACT
0399	52370	160000		LDA 0,I	ASCII
0400	52371	001727		ALF,ALF	CODE
0401	52372	010474		AND B177	
0402	52373	050421		CPA .+42B	" ?
0403	52374	026600		JMP LIS14	YES
0404	52375	002001		RSS	NO
0405	52376	060417		LDA .+40B	LOAD A BLANK
0406	52377	015452		JSB OUTCR	
0407*				*	
0408**	IDENTIFY OPERAND			**	
0409*				*	
0410	52400	161426	LIST5	LDA LT1,I	EXTRACT
0411	52401	010566		AND OPDMK	OPERAND
0412	52402	071430		STA LT3	
0413	52403	002020		SSA	FLAG BIT SET?
0414	52404	026452		JMP LIST9	YES
0415	52405	006400		CLB	NO, NULL
0416	52406	055430		CPB LT3	OPERAND?
0417	52407	026336		JMP LIST3	YES
0418	52410	055440		CPB LT5	NO, 'COMPILED' ?
0419	52411	026417		JMP LIST0	NO
0420	52412	040356		ADA .-1	YES
0421	52413	001000		ALS	LOAD
0422	52414	041573		ADA SYMTB	ACTUAL
0423	52415	160000		LDA 0,I	SYMBOL
0424	52416	071430		STA LT3	SAVE SYMBOL
0425*				*	
0426**	LIST SYMBOLIC OPERAND			**	
0427*				*	
0428	52417	010572	LIST0	AND PDFFL	ISOLATE TYPE PART
0429	52420	050376		CPA .+17B	FUNCTION?
0430	52421	026445		JMP LIST8	YES

0431	52422	061430	LIST6	LDA	LT3	NO,
0432	52423	101104		RRR	4	COMPUTE
0433	52424	010416		AND	+37B	ASCII FOR
0434	52425	040462		ADA	B100	LETTER
0435	52426	015452		JSB	OUTCR	OUTPUT LETTER
0436	52427	061430		LDA	LT3	
0437	52430	010376		AND	+17B	
0438	52431	050376		CPA	+17B	FUNCTION?
0439	52432	026336		JMP	LIST3	YES
0440	52433	002003		SZA	RSS	NO, STRING VARIABLE?
0441	52434	026443		JMP	LIST7	YES
0442	52435	040352		ADA	-5	NO
0443	52436	002020		SSA		DIGIT?
0444	52437	026336		JMP	LIST3	NO
0445	52440	040437		ADA	+60B	YES,
0446	52441	015452		JSB	OUTCR	OUTPUT IT
0447	52442	026336		JMP	LIST3	
0448	52443	060423	LIST7	LDA	+44B	LOAD ASCII 'S'
0449	52444	026441		JMP	-3	
0450	52445	062006	LIST8	LDA	F	OUTPUT
0451	52446	015452		JSB	OUTCR	
0452	52447	062007		LDA	N	'FN'
0453	52450	015452		JSB	OUTCR	
0454	52451	026422		JMP	LIST6	
0455*						*
0456**	LIST CONSTANT OPERAND OR PARAMETER					**
0457*						*
0458	52452	001665	LIST9	FLA	CLE,ERA	CLEAR FLAG BIT
0459	52453	002002		SZA		CONSTANT?
0460	52454	026471		JMP	LIS10	NO
0461	52455	071570		STA	CHRCT	YES, SET
0462	52456	071266		STA	SIGN	FOR NO SIGN
0463	52457	035426		ISZ	LT1	LOAD
0464	52460	035274		ISZ	LT2	
0465	52461	104200		DLD	LT1,I	CONSTANT
	52462	101426				
0466	52463	035426		ISZ	LT1	
0467	52464	035274		ISZ	LT2	
0468	52465	002120		CLE	SSA	NEGATIVE NUMBER?
0469	52466	002300		CCE		YES, ENABLE SIGN
0470	52467	015420		JSB	NUMOT	OUTPUT THE CONSTANT
0471	52470	026336		JMP	LIST3	
0472	52471	010376	LIS10	AND	+17B	ISOLATE TYPE PART
0473	52472	050362		CPA	+3	PROGRAM INTEGER?
0474	52473	026504		JMP	LIS11	YES
0475	52474	050376		CPA	+17B	NO, PRE-DEFINED FUNCTION?
0476	52475	002001		RSS		YES
0477	52476	026422		JMP	LIST6	NO, MUST BE A PARAMETER SYMBOL
0478	52477	061430		LDA	LT3	OUTPUT
0479	52500	001722		ALF	RAL	
0480	52501	064624		LDB	ATAB	FUNCTION
0481	52502	015456		JSB	MCOUT	
0482	52503	026336		JMP	LIST3	SYMBOL
0483	52504	035426	LIS11	ISZ	LT1	
0484	52505	035274		ISZ	LT2	
0485	52506	061436		LDA	LT4	RESTORE OPERATOR

0486	52507	050540	CPA DIMOP	<DIM STATEMENT> ?
0487	52510	026334	JMP LIST3-2	YES
0488	52511	050534	CPA COMOP	NO, 'COM'?
0489	52512	026334	JMP LIST3-2	YES
0490	52513	061440	LDA LT5	NO
0491	52514	165426	LDB LT1,I	LOAD PROSPECTIVE INTEGER
0492	52515	002002	SZA	PROGRAM 'COMPILED' ?
0493	52516	164001	LDB 1,I	YES
0494	52517	015454	JSB OUTIN	OUTPUT INTEGER
0495	52520	035426	ISZ LT1	MORE
0496	52521	035274	ISZ LT2	STATEMENT?
0497	52522	002001	RSS	YES
0498	52523	026341	JMP LIST3+3	NO
0499	52524	061436	LDA LT4	LISTING
0500	52525	050604	CPA USEOP	'USING' ?
0501	52526	026354	JMP LIST4	YES
0502	52527	060433	LDA .+54B	EMIT
0503	52530	015452	JSB OUTCR	A COMMA
0504	52531	026513	JMP LIS11+7	
0505*				
0506**	LIST MULTICHAACTER OPERATOR			
0507*				
0508	52532	060417	LIS12 LDA .+40B	OUTPUT
0509	52533	015452	JSB OUTCR	A BLANK
0510	52534	161426	LDA LT1,I	OUTPUT
0511	52535	064720	LDB MCBOP	MULTICHAACTER
0512	52536	015456	JSB MCOU	OPERATOR
0513	52537	060417	LDA .+40B	
0514	52540	065436	LDB LT4	WAS IT
0515	52541	054576	CPB REMOP	A 'REM' ?
0516	52542	026557	JMP LIS13	YES
0517	52543	054544	CPB FILOP	NO, 'FILES' ?
0518	52544	026556	JMP LIS13-1	YES
0519	52545	054546	CPB IMGOP	NO, 'IMAGE'?
0520	52546	026551	JMP LIS18	YES
0521	52547	015452	JSB OUTCR	NO, OUTPUT A BLANK
0522	52550	026400	JMP LIST5	
0523	52551	006400	LIS18 CLB	
0524	52552	061274	LDA LT2	
0525	52553	002006	INA,SZA	
0526	52554	015460	JSB OUTST	OUTPUT IMAGE STRING
0527	52555	026336	JMP LIST3	
0528	52556	015452	JSB OUTCR	OUTPUT A BLANK
0529	52557	007400	LIS13 CCB	OUTPUT
0530	52560	061274	LDA LT2	THE
0531	52561	015460	JSB OUTST	REMARK
0532	52562	026336	JMP LIST3	
0533*				
0534**	OUTPUT TRAILER IF 'PUNCH'			
0535*				
0536	52563		LIS15 EQU *	
0537	52563	002400	CLA	'LIST'
0538	52564	051400	CPA LT0	MODE?
0539	52565	124740	JMP SCHEM,I	YES
0540	52566	060322	LDA M72B	NO,
0541	52567	071356	STA DIGCT	OUTPUT

0542	52570	002400		CLA		FEED
0543	52571	015452		JSB OUTCR		FRAMES
0544	52572	035356		ISZ DIGCT		FOR
0545	52573	026570		JMP *-3		TRAILER
0546	52574	124740		JMP SCHEN,I		
0547*						
0548	52575	060371	LIS16	LDA .+12B		ECHO
0549	52576	015452		JSB OUTCR		LINE
0550	52577	124740		JMP SCHEN,I		FEED
0551*						
0552**						
0553*						
0554	52600	015452	LIS14	JSB OUTCR		OUTPUT "
0555	52601	161426		LDA LT1,I		COMPUTE
0556	52602	010500		AND B377		WORDS
0557	52603	002003		SZA,RSS		
0558	52604	026611		JMP LIS17		
0559	52605	003004		CMA,INA		OF
0560	52606	001100		ARS		STRING
0561	52607	006400		CLB		OUTPUT
0562	52610	015460		JSB OUTST		STRING
0563	52611	060421	LIS17	LDA .+42B		
0564	52612	015452		JSB OUTCR		YES, OUTPUT IT
0565	52613	026336		JMP LIST3		
0566**						**
0567***						***
0568**						**
0569*						
0570*						
0571*						
0572*						
0573*						
0574	52614	010570	#MCOT	AND OPMSK		SAVE
0575	52615	071436		STA LT4		SYMBOL
0576	52616	160001	MCOT1	LDA 1,I		DESIRED
0577	52617	010570		AND OPMSK		TABLE
0578	52620	051436		CPA LT4		ENTRY?
0579	52621	026630		JMP MCOT2		YES
0580	52622	160001		LDA 1,I		NO,
0581	52623	010366		AND .+7		COMPUTE
0582	52624	040362		ADA .+3		ADDRESS
0583	52625	001100		ARS		OF NEXT
0584	52626	044000		ADB 0		ENTRY
0585	52627	026616		JMP MCOT1		
0586	52630	160001	MCOT2	LDA 1,I		COMPUTE
0587	52631	010366		AND .+7		COUNT
0588	52632	003004		CMA,INA		OF
0589	52633	001100		ARS		ASCII
0590	52634	071430		STA LT3		WORDS
0591	52635	075460		STB OUTST		SAVE ASCII SYMBOL ADDRESS
0592	52636	035460	MCOT3	ISZ OUTST		MOVE TO NEXT WORD OF SYMBOL
0593	52637	161460		LDA OUTST,I		OUTPUT
0594	52640	001727		ALF,ALF		HIGH
0595	52641	015452		JSB OUTCR		
0596	52642	161460		LDA OUTST,I		OUTPUT
0597	52643	010500		AND B377		LOW CHARACTER

0598	52644	002002		SZA		IF NOT
0599	52645	015452		JSB OUTCR		NULL
0600	52646	035430		ISZ LT3		MORE SYMBOL?
0601	52647	026636		JMP MCOT3		YES
0602	52650	125456		JMP MCOUT,I		NO
0603**				**		
0604***		LIST A STRING		***		
0605**				**		
0606*						
0607*						UPON ENTRY (A) HOLDS A NEGATIVE WORD COUNT OF THE STRING. IF
0608*						(B) # 0 THE STRING BEGINS WITH THE LOW HALF OF (LT1),I ; IF
0609*						(B) = 0 IT BEGINS WITH THE HIGH HALF OF THE WORD FOLLOWING
0610*						(LT1),I . A TRAILING NULL CHARACTER WILL NOT BE PRINTED.
0611*						
0612	52651	071436	#OTST	STA LT4		SAVE STRING WORD COUNT
0613	52652	006002		SZB		'REM' ?
0614	52653	026661		JMP OTST2		YES
0615	52654	035426	OTST1	ISZ LT1		NO, MOVE TO
0616	52655	035274		ISZ LT2		NEXT PROGRAM WORD
0617	52656	161426		LDA LT1,I		OUTPUT
0618	52657	001727		ALF,ALF		HIGH
0619	52660	015452		JSB OUTCR		
0620	52661	161426	OTST2	LDA LT1,I		OUTPUT
0621	52662	010500		AND B377		LOW CHARACTER
0622	52663	002002		SZA		IF NOT
0623	52664	015452		JSB OUTCR		NULL
0624	52665	035436		ISZ LT4		MORE STRING?
0625	52666	026654		JMP OTST1		YES
0626	52667	125460		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 52670 064355 #OVFL LDB .-2
0011 52671 002020          SSA
0012 52672 066005          LDB BB776
0013 52673 030273          IOR INF
0014 52674 002020          SSA
0015 52675 061027          LDA MNEG
0016 52676 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 52677 061567 #CHOU LDA LNAME          COMPUTE
0026 52700 040367          ADA .+?STAT=?ID
0027 52701 164000          LDB 0,I          STATUS
0028 52702 054363          CPB .+4          SYNTAX?
0029 52703 002001          RSS          YES
0030 52704 026713          JMP CHOU1          NO
0031 52705 060367          LDA TAPEF          TAPE
0032 52706 110255          AND MAIN,I
0033 52707 002003          SZA,RSS          MODE?
0034 52710 075573          STB SYMTB          NO
0035 52711 035474          ISZ CHOUF
0036 52712 125474          JMP CHOUF,I
0037 52713 035607 CHOU1 ISZ ENOUF          ARE WE EXECUTING ENTER STATE?
0038 52714 002001          RSS          NO
0039 52715 035474          ISZ CHOUF          YES==SUPPRESS ERROR
0040 52716 125474          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 SBPTR,I = M)
0054* EXIT IS TO (P+2) WITH THE NEXT INPUT STRING CHARACTER
0055* IN (A) AND TEMP+1.
0056*
0057 52717 006400 #NMCK CLB          ZERO

```

0058	52720	075322		STB EXP	ALL
0059	52721	075316		STB MANT1	COMPONENTS
0060	52722	075320		STB MANT2	OF THE
0061	52723	075324		STB EXPON	NUMBER
0062	52724	075612		STB TEMP+1	SET 'NUMBER FLAG' FALSE
0063	52725	007400		CCB	SET 'DECIMAL POINT'
0064	52726	075750		STB DPFLG	FLAG FALSE
0065	52727	050435	NUMC1	CPA .+56B	DECIMAL POINT?
0066	52730	035750		ISZ DPFLG	YES
0067	52731	026735		JMP NUMC2	NO
0068	52732	002400		CLA	ZERO POST-DECIMAL
0069	52733	071324		STA EXPON	DIGIT
0070	52734	026772		JMP NUMC4+1	COUNTER
0071	52735	015264	NUMC2	JSB DIGCK	DIGIT?
0072	52736	027006		JMP NUMC7	NO
0073	52737	035324		ISZ EXPON	YES, COUNT DIGIT
0074	52740	100033		ASL 11	LEFT-JUSTIFY DIGIT
0075	52741	071613		STA TEMP+2	AND SAVE IT
0076	52742	015300		JSB MBY10	MULTIPLY PREVIOUS NUMBER BY 10
0077	52743	065322		LDB EXP	ZERO
0078	52744	006003		SZB, RSS	EXPONENT?
0079	52745	027001		JMP NUMC6	YES
0080	52746	044353		ADB .-4	NO,
0081	52747	007000		CMB	SAVE
0082	52750	061613		LDA TEMP+2	SHIFT
0083	52751	075613		STB TEMP+2	COUNT
0084	52752	006400		CLB	CLEAR LOWER MANTISSA
0085	52753	035613	NUMC3	ISZ TEMP+2	ALL SHIFTS DONE?
0086	52754	026776		JMP NUMC5	NO
0087	52755	000040		CLE	YES, ADD IN
0088	52756	045320		ADB MANT2	LOW PART
0089	52757	103101		CLO	OF NUMBER
0090	52760	002040		SEZ	OVERFLOW FROM (B)?
0091	52761	002004		INA	YES
0092	52762	041316		ADA MANT1	ADD IN HIGH PART OF MANTISSA
0093	52763	102301		SOS	OVERFLOW?
0094	52764	026771		JMP NUMC4	NO
0095	52765	000065		CLE, ERA	YES, CORRECT
0096	52766	005500		ERB	MANTISSA
0097	52767	035322		ISZ EXP	AND BUMP
0098	52770	000000		NOP	EXPONENT
0099	52771	015304	NUMC4	JSB NORML	NORMALIZE THE NUMBER
0100	52772	035612		ISZ TEMP+1	SET 'NUMBER FLAG' TRUE
0101	52773	015446		JSB GETCR	FETCH CHARACTER
0102	52774	027055		JMP NUM12-1	NONE FOUND
0103	52775	026727		JMP NUMC1	
0104	52776	000065	NUMC5	CLE, ERA	SHIFT
0105	52777	005500		ERB	DIGIT
0106	53000	026753		JMP NUMC3	RIGHT
0107	53001	060363	NUMC6	LDA .+4	SET
0108	53002	071322		STA EXP	EXPONENT
0109	53003	061613		LDA TEMP+2	LOAD
0110	53004	006400		CLB	NUMBER
0111	53005	026771		JMP NUMC4	
0112	53006	006400	NUMC7	CLB	SET EXPONENT
0113	53007	075613		STB TEMP+2	SIGN TO '+'

0114	53010	055612		CPB TEMP+1	DIGIT OR DECIMAL POINT FOUND?
0115	53011	125276		JMP NUMCK,I	NO
0116	53012	050464		CPA E	'E' ?
0117	53013	002001		RSS	YES
0118	53014	027056		JMP NUM12	NO
0119	53015	015446		JSB GETCR	FETCH CHARACTER
0120	53016	027115		JMP NUM16	NONE FOUND
0121	53017	050432		CPA .+53B	'+' ?
0122	53020	027025		JMP NUMC8	YES
0123	53021	050434		CPA .+55B	NO, '-' ?
0124	53022	003401		CCA,RSS	YES
0125	53023	027027		JMP NUMC9	NO
0126	53024	071613		STA TEMP+2	SET EXPONENT SIGN TO '-'
0127	53025	015446	NUMC8	JSB GETCR	FETCH CHARACTER
0128	53026	027115		JMP NUM16	NONE FOUND
0129	53027	015264	NUMC9	JSB DIGCK	DIGIT?
0130	53030	027115		JMP NUM16	NO
0131	53031	071612		STA TEMP+1	YES, SAVE IT
0132	53032	015446		JSB GETCR	
0133	53033	027051		JMP NUM11	
0134	53034	015264		JSB DIGCK	DIGIT?
0135	53035	027051		JMP NUM11	NO
0136	53036	061612		LDA TEMP+1	YES, MULTIPLY
0137	53037	075612		STB TEMP+1	PREVIOUS DIGIT
0138	53040	100200		MPY .+10	BY 10
	53041	000371			
0139	53042	041612		ADA TEMP+1	ADD IN NEW DIGIT
0140	53043	071612		STA TEMP+1	SAVE EXPONENT
0141	53044	015446		JSB GETCR	
0142	53045	027051		JMP NUM11	
0143	53046	015264		JSB DIGCK	THIRD DIGIT?
0144	53047	002001		RSS	NO
0145	53050	027115		JMP NUM16	YES
0146	53051	065612	NUM11	LDB TEMP+1	LOAD EXPONENT
0147	53052	035613		ISZ TEMP+2	POSITIVE?
0148	53053	007004		CMB,INB	YES, COMPLEMENT IT
0149	53054	002001		RSS	NO
0150	53055	006400		CLB	
0151	53056	071612	NUM12	STA TEMP+1	SAVE CHARACTER
0152	53057	035750		ISZ DPFLG	DECIMAL POINT FOUND?
0153	53060	045324		ADB EXPON	YES, CORRECT EXPONENT
0154	53061	006003		SZB,RSS	NO, ZERO EXPONENT?
0155	53062	027077		JMP NUM14	YES
0156	53063	006020		SSB	NO, POSITIVE EXPONENT?
0157	53064	027073		JMP NUM13	YES
0158	53065	007004		CMB,INB	NO, SET
0159	53066	075324		STB EXPON	COUNTER
0160	53067	015302		JSB DBY10	DIVIDE NUMBER BY 10
0161	53070	035324		ISZ EXPON	DONE?
0162	53071	027067		JMP *-2	NO
0163	53072	027077		JMP NUM14	YES
0164	53073	075324	NUM13	STB EXPON	SET COUNTER
0165	53074	015300		JSB MBY10	MULTIPLY NUMBER BY 10
0166	53075	035324		ISZ EXPON	DONE?
0167	53076	027074		JMP *-2	NO
0168	53077	061316	NUM14	LDA MANT1	LOAD

0169	53100	065320		LDB MANT2	MANTISSA
0170	53101	035266		ISZ SIGN	POSITIVE?
0171	53102	027106		JMP NUM15	YES
0172	53103	003000		CMA	NO, COMPLEMENT
0173	53104	007007		CMB, INB, SZB, RSS	THE
0174	53105	002004		INA	NUMBER
0175	53106	015306	NUM15	JSB .PACK	NORMALIZE AND PACK
0176	53107	171572		STA SBPTR, I	STORE
0177	53110	015270		JSB SBPUD	NUMBER IN
0178	53111	175572		STB SBPTR, I	DESTINATION
0179	53112	015270		JSB SBPUD	ADDRESS
0180	53113	061612		LDA TEMP+1	RETRIEVE CHARACTER
0181	53114	035276		ISZ NUMCK	
0182	53115	035276	NUM16	ISZ NUMCK	
0183	53116	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	53117	061316	#MB10	LDA MANT1	LOAD HIGH MANTISSA
0192	53120	002003		SZA, RSS	ZERO NUMBER?
0193	53121	125300		JMP MBY10, I	YES
0194	53122	065322		LDB EXP	NO,
0195	53123	044362		ADB .+3	MULTIPLY
0196	53124	075322		STB EXP	BY 8
0197	53125	065320		LDB MANT2	LOAD LOW MANTISSA
0198	53126	000065		CLE, ERA	DIVIDE
0199	53127	005500		ERB	BY
0200	53130	000065		CLE, ERA	4
0201	53131	005540		ERB, CLE	
0202	53132	045320		ADB MANT2	ADD INTO
0203	53133	002040		SEZ	BOTH REGISTERS
0204	53134	002004		INA	PRODUCING
0205	53135	041316		ADA MANT1	1.25 * MANTISSA
0206	53136	002021		SSA, RSS	CORRECT
0207	53137	027144		JMP MBY01	
0208	53140	000065		CLE, ERA	ON
0209	53141	005500		ERB	
0210	53142	035322		ISZ EXP	OVERFLOW
0211	53143	000000		NOP	
0212	53144	071316	MBY01	STA MANT1	STORE
0213	53145	075320		STB MANT2	MANTISSA
0214	53146	125300		JMP MBY10, I	


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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 53147 071300 #NRML STA NT0 SET
0225 53150 002400 CLA LEFT-SHIFT
0226 53151 071613 STA TEMP+2 COUNTER
0227 53152 061300 LDA NT0 TO ZERO
0228 53153 002003 SZA,RSS IF NUMBER
0229 53154 006002 SZB IS ZERO,
0230 53155 027163 JMP NORM2+1 CLEAR
0231 53156 071322 STA EXP EVERYTHING
0232 53157 071316 STA MANT1 STORE
0233 53160 075320 NORM1 STB MANT2 MANTISSA
0234 53161 125304 JMP NORML,I
0235 53162 035613 NORM2 ISZ TEMP+2 COUNT A LEFT SHIFT
0236 53163 004066 CLE,ELB ROTATE (A)
0237 53164 001600 ELA AND (B) LEFT
0238 53165 002061 SEZ,SSA,RSS TWO HIGHEST BITS 0?
0239 53166 027162 JMP NORM2 YES, POSITIVE UNNORMALIZED
0240 53167 002060 SEZ,SSA NO, TWO HIGHEST BITS 1?
0241 53170 027162 JMP NORM2 YES, NEGATIVE UNNORMALIZED
0242 53171 001500 ERA NO, NORMALIZE
0243 53172 005540 ERB,CLE MANTISSA
0244 53173 071316 STA MANT1 COMPUTE
0245 53174 061613 LDA TEMP+2
0246 53175 003004 CMA,INA CORRECTED
0247 53176 041322 ADA EXP
0248 53177 071322 STA EXP EXPONENT
0249 53200 061316 LDA MANT1
0250 53201 027160 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 53202 015304 #PACK JSB NORML NORMALIZE NUMBER
0261 53203 002103 CLE,SZA,RSS ZERO?
0262 53204 125306 JMP ,PACK,I YES
0263 53205 044474 ADB B177 NO, ROUND
0264 53206 002021 SSA,RSS POSITIVE?
0265 53207 006004 INB YES, FINISH ROUND
0266 53210 103101 CLO
0267 53211 002040 SEZ ON OVERFLOW FROM (B)
0268 53212 002104 CLE,INA CORRECT (A)
0269 53213 102301 SOS OVERFLOW? ( (A)=100000, (B)=0 )
0270 53214 001200 RAL TWO HIGH BITS
0271 53215 002031 SSA,SLA,RSS BOTH 1? ( IF (A) WAS 140000 )

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0272	53216	027221		JMP PACK1	NO
0273	53217	002300		CCE	YES
0274	53220	001130		ARS,SLA,ALS	SET (A) * 100000 AND SKIP
0275	53221	001300	PACK1	RAR	UNDOES RAL ABOVE
0276	53222	071613		STA TEMP+2	SAVE (A)
0277	53223	101050		LSR 8	DELETE 8 LOW BITS
0278	53224	005727		BLF,BLF	OF MANTISSA
0279	53225	061322		LDA EXP	DECREMENT
0280	53226	002040		SEZ	EXPONENT
0281	53227	040356		ADA .-1	ON (E) # 0
0282	53230	102201		SOC	INCREMENT
0283	53231	002004		INA	EXPONENT ON OVERFLOW
0284	53232	040476		ADA B200	EXPONENT
0285	53233	002020		SSA	UNDERFLOW?
0286	53234	027253		JMP PACK3	YES
0287	53235	040316		ADA M256	NO, EXPONENT
0288	53236	002021		SSA,RSS	OVERFLOW?
0289	53237	027260		JMP PACK4	YES
0290	53240	040476		ADA B200	NO, RESTORE EXPONENT
0291	53241	001200		RAL	POSITION
0292	53242	010500		AND B377	EXPONENT AND
0293	53243	044000		ADB 0	ADD LOW MANTISSA
0294	53244	061613		LDA TEMP+2	RETRIEVE HIGH MANTISSA
0295	53245	051027		CPA MNEG	
0296	53246	002001		RSS	NEGATIVE
0297	53247	125306		JMP .PACK,I	
0298	53250	055030		CPB MNEG+1	OVERFLOW?
0299	53251	027260		JMP PACK4	YES
0300	53252	125306		JMP .PACK,I	NO
0301	53253	015474	PACK3	JSB CHOUF	CHECK STATUS
0302	53254	115207		JSB WERRS+6,I	
0303	53255	002400		CLA	ZERO RESULT
0304	53256	006400		CLB	ON UNDERFLOW
0305	53257	125306		JMP .PACK,I	
0306	53260	015474	PACK4	JSB CHOUF	CHECK STATUS
0307	53261	115206		JSB WERRS+5,I	
0308	53262	061613		LDA TEMP+2	RETRIEVE HIGH MANTISSA
0309	53263	015310		JSB OVFLW	
0310	53264	125306		JMP .PACK,I	
0311**					**
0312***				DIVIDE UNPACKED NUMBER BY 10	***
0313**					**
0314*					
0315*				INVERSE OF MBY10	
0316*					
0317	53265	061316	#DB10	LDA MANT1	RETURN
0318	53266	002003		SZA,RSS	ON
0319	53267	125302		JMP DBY10,I	ZERO
0320	53270	064355		LDB -2	ADD EXPONENT
0321	53271	045322		ADB EXP	OF 1/10 TO
0322	53272	075322		STB EXP	THAT OF NUMBER
0323	53273	061320		LDA MANT2	JUSTIFY
0324	53274	000065		CLE,ERA	LOWER MANTISSA
0325	53275	100200		MPY TENTH	MULTIPLY BY 1/10
	53276	052000			
0326	53277	000066		CLE,ELA	SHIFT

0327	53300	005640	ELB,CLE	BACK
0328	53301	040001	ADA 1	ADD IN EQUIVALENT OF
0329	53302	002040	SEZ	LOWER MANTISSA+
0330	53303	006104	CLE,INB	TENTH*2 [↑] (-16)
0331	53304	075320	STB MANT2	AND ROUND TO 16 BITS
0332	53305	061316	LDA MANT1	DO
0333	53306	100200	MPY TENTH	SAME TO
	53307	052000		
0334	53310	040001	ADA 1	HIGH MANTISSA
0335	53311	041320	ADA MANT2	PERFORM EFFECTIVE
0336	53312	002040	SEZ	SUM OF DOUBLE-LENGTH
0337	53313	006004	INB	PRODUCTS
0338	53314	101100	SWP	SWAP (A) AND (B)
0339	53315	015304	JSB NORML	NORMALIZE
0340	53316	125302	JMP DBY10,I	RESULT

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0342**
0343*** PRINT NAME TABLE FOR MULTICHARACTER 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** MULTICHARACTER BINARY OPERATORS **
0353*
0354 53317 032003 MCBOS OCT 32003 AND
0355 53320 040516 ASC 1,AN
0356 53321 042000 OCT 42000
0357 53322 033002 OCT 33002 OR
0358 53323 047522 ASC 1,OR
0359 53324 034003 OCT 34003 MIN
0360 53325 046511 ASC 1,MI
0361 53326 047000 OCT 47000
0362 53327 035003 OCT 35003 MAX
0363 53330 046501 ASC 1,MA
0364 53331 054000 OCT 54000
0365 53332 036002 MRELS OCT 36002 UNEQUAL
0366 53333 036076 ASC 1,<=
0367 53334 037002 OCT 37002 GREATER THAN OR EQUAL
0368 53335 037075 ASC 1,>=
0369 53336 040002 OCT 40002 LESS THAN OR EQUAL
0370 53337 036075 ASC 1,<=
0371*
0372** MULTICHARACTER UNARY OPERATOR **
0373*
0374 53340 041003 NOT OCT 41003
0375 53341 047117 ASC 1,NO
0376 53342 052000 OCT 52000
0377*
0378** STATEMENT TYPES **
0379*
0380 53343 042006 STYPS OCT 42006 ASSIGN
0381 53344 040523 ASC 3,ASSIGN
    53345 051511
    53346 043516
0382 53347 043005 USTMT OCT 43005 USING
0383 53350 052523 ASC 2,USIN
    53351 044516
0384 53352 043400 OCT 43400
0385 53353 044005 OCT 44005 IMAGE
0386 53354 044515 ASC 2,IMAG
    53355 040507
0387 53356 042400 OCT 42400
0388 53357 045003 OCT 45003 COM
0389 53360 041517 ASC 1,CO
0390 53361 046400 OCT 46400
0391 53362 046003 OCT 46003 LET
0392 53363 046105 ASC 1,LE
0393 53364 052000 OCT 52000

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0394	53365	047003	OCT 47003	DIM
0395	53366	042111	ASC 1,DI	
0396	53367	046400	OCT 46400	
0397	53370	050003	OCT 50003	DEF
0398	53371	042105	ASC 1,DE	
0399	53372	043000	OCT 43000	
0400	53373	051003	OCT 51003	REM
0401	53374	051105	ASC 1,RE	
0402	53375	046400	OCT 46400	
0403	53376	052004	OCT 52004	GOTO
0404	53377	043517	ASC 2,GOTO	
	53400	052117		
0405	53401	053002	OCT 53002	IF
0406	53402	044506	ASC 1,IF	
0407	53403	054003	OCT 54003	FOR
0408	53404	043117	ASC 1,FO	
0409	53405	051000	OCT 51000	
0410	53406	055004	OCT 55004	NEXT
0411	53407	047105	ASC 2,NEXT	
	53410	054124		
0412	53411	056005	OCT 56005	GOSUB
0413	53412	043517	ASC 2,GOSU	
	53413	051525		
0414	53414	041000	OCT 41000	
0415	53415	057006	OCT 57006	RETURN
0416	53416	051105	ASC 3,RETURN	
	53417	052125		
	53420	051116		
0417	53421	060003	EOFOP OCT 60003	END
0418	53422	042516	ASC 1,EN	
0419	53423	042000	OCT 42000	
0420	53424	061004	OCT 61004	STOP
0421	53425	051524	ASC 2,STOP	
	53426	047520		
0422	53427	062004	OCT 62004	DATA
0423	53430	042101	ASC 2,DATA	
	53431	052101		
0424	53432	063005	IOSTS OCT 63005	INPUT
0425	53433	044516	ASC 2,INPU	
	53434	050125		
0426	53435	052000	OCT 52000	
0427	53436	064004	OCT 64004	READ
0428	53437	051105	ASC 2,READ	
	53440	040504		
0429	53441	065005	OCT 65005	PRINT
0430	53442	050122	ASC 2,PRIN	
	53443	044516		
0431	53444	052000	OCT 52000	
0432	53445	066007	OCT 66007	RESTORE
0433	53446	051105	ASC 3,RESTOR	
	53447	051524		
	53450	047522		
0434	53451	042400	OCT 42400	
0435	53452	067003	OCT 67003	MAT
0436	53453	046501	ASC 1,MA	
0437	53454	052000	OCT 52000	

0438	53455	070005		OCT 70005	FILES
0439	53456	043111		ASC 2,FILE	
	53457	046105			
0440	53460	051400		OCT 51400	
0441	53461	071005		OCT 71005	CHAIN
0442	53462	041510		ASC 2,CHAI	
	53463	040511			
0443	53464	047000		OCT 47000	
0444	53465	072005		OCT 72005	ENTER
0445	53466	042516		ASC 2,ENTE	
	53467	052105			
0446	53470	051000		OCT 51000	
0447	53471	073001		OCT 73001	'IMPLIED' LET
0448	53472	000000		OCT 0	
0449*					*
0450**	MISCELLANEOUS OPERATORS				**
0451*					*
0452	53473	074002		OCT 74002	OF
0453	53474	047506		ASC 1,OF	
0454	53475	075004	THEN	OCT 75004	
0455	53476	052110		ASC 2,THEN	
	53477	042516			
0456	53500	076002		OCT 76002	TO
0457	53501	052117		ASC 1,TO	
0458	53502	077004	STEP	OCT 77004	
0459	53503	051524		ASC 2,STEP	
	53504	042520			
0460*					*
0461**	PREDEFINED FUNCTIONS, BITS 13-9 ARE USED				**
0462**	FOR INTERNAL IDENTIFICATION				**
0463*					*
0464	53505	001003	TAB	OCT 1003	TAB
0465	53506	052101		ASC 1,TA	
0466	53507	041000		OCT 41000	
0467	53510	002003		OCT 2003	LIN
0468	53511	046111		ASC 1,LI	
0469	53512	047000		OCT 47000	
0470	53513	003003		OCT 3003	SPA
0471	53514	051520		ASC 1,SP	
0472	53515	040400		OCT 40400	
0473	53516	004003	PRDFS	OCT 4003	TAN
0474	53517	052101		ASC 1,TA	
0475	53520	047000		OCT 47000	
0476	53521	005003		OCT 5003	ATN
0477	53522	040524		ASC 1,AT	
0478	53523	047000		OCT 47000	
0479	53524	006003		OCT 6003	EXP
0480	53525	042530		ASC 1,EX	
0481	53526	050000		OCT 50000	
0482	53527	007003		OCT 7003	LOG
0483	53530	046117		ASC 1,LO	
0484	53531	043400		OCT 43400	
0485	53532	010003		OCT 10003	ABS
0486	53533	040502		ASC 1,AB	
0487	53534	051400		OCT 51400	
0488	53535	011003		OCT 11003	SQR

0489	53536	051521		ASC	1, SQ	
0490	53537	051000		OCT	51000	
0491	53540	012003		OCT	12003	INT
0492	53541	044516		ASC	1, IN	
0493	53542	052000		OCT	52000	
0494	53543	013003		OCT	13003	RND
0495	53544	051116		ASC	1, RN	
0496	53545	042000		OCT	42000	
0497	53546	014003		OCT	14003	SGN
0498	53547	051507		ASC	1, SG	
0499	53550	047000		OCT	47000	
0500	53551	015003		OCT	15003	LEN
0501	53552	046105		ASC	1, LE	
0502	53553	047000		OCT	47000	
0503	53554	016003		OCT	16003	TYP
0504	53555	052131		ASC	1, TY	
0505	53556	050000		OCT	50000	
0506	53557	017003		OCT	17003	TIM
0507	53560	052111		ASC	1, TI	
0508	53561	046400		OCT	46400	
0509	53562	020003		OCT	20003	SIN
0510	53563	051511		ASC	1, SI	
0511	53564	047000		OCT	47000	
0512	53565	021003		OCT	21003	COS
0513	53566	041517		ASC	1, CO	
0514	53567	051400		OCT	51400	
0515	53570	022003		OCT	22003	BRK
0516	53571	041122		ASC	1, BR	
0517	53572	045400		OCT	45400	
0518*				*		
0519**	MATRIX	FUNCTIONS		**		
0520*				*		
0521	53573	024003	MATFS	OCT	24003	ZER
0522	53574	055105		ASC	1, ZE	
0523	53575	051000		OCT	51000	
0524	53576	025003		OCT	25003	CON
0525	53577	041517		ASC	1, CO	
0526	53600	047000		OCT	47000	
0527	53601	026003		OCT	26003	IDN
0528	53602	044504		ASC	1, ID	
0529	53603	047000		OCT	47000	
0530	53604	027003		OCT	27003	INV
0531	53605	044516		ASC	1, IN	
0532	53606	053000		OCT	53000	
0533	53607	030003		OCT	30003	TRN
0534	53610	052122		ASC	1, TR	
0535	53611	047000		OCT	47000	

0058	54053	002001		RSS	YES
0059	54054	026105		JMP FMT3	NO
0060	54055	065743	FMT1	LDB CC	END OF
0061	54056	055760		CPB NCH	STRING ?
0062	54057	115162		JSB FERRS,I	YES, ERROR
0063	54060	071746		STA CONTR	SAVE CARR. CONTROL CHARACTER
0064	54061	035644		ISZ FST	INCREMENT STRING POINTER
0065	54062	061644		LDA FST	
0066	54063	102101		STO	IGNORE BLANKS
0067	54064	015540		JSB MCHAR	GET NEXT CHARACTER
0068	54065	051747		CPA DP	DELIMITER FOUND ?
0069	54066	002001		RSS	YES
0070	54067	026073		JMP FMT01	NO, CHARACTER FOUND ?
0071	54070	103101		CLO	GET
0072	54071	061747		LDA DP	THE
0073	54072	015540		JSB MCHAR	DELIMITER
0074	54073	050433	FMT01	CPA ,+54B	IS IT A COMMA ?
0075	54074	002001		RSS	YES
0076	54075	115163		JSB FERRS+1,I	NO, ERROR
0077	54076	035747		ISZ DP	INCREMENT DELIMITER POINTER
0078	54077	035743		ISZ CC	AND CHARACTER COUNTER
0079	54100	065743		LDB CC	
0080	54101	055760		CPB NCH	ALL CHARACTERS USED ?
0081	54102	115162		JSB FERRS,I	YES, ERROR
0082	54103	061747		LDA DP	NO
0083	54104	015536		JSB DSRCH	FIND NEXT DELIMITING CHARACTER
0084	54105	003400	FMT3	CCA	INITIALIZE
0085	54106	071750		STA DPFLG	FIXED FLAG
0086	54107	071752		STA EFLAG	FLOATING FLAG
0087	54110	002004		INA	
0088	54111	071761		STA NUM1	PRE-DECIMAL POINT D COUNTER
0089	54112	071762		STA NUM2	POST-DECIMAL POINT D COUNTER
0090	54113	071766		STA SBD	S BEFORE D COUNTER
0091	54114	071765		STA SAD	S AFTER D COUNTER
0092	54115	071740		STA SNFLG	SIGN FLAG
0093	54116	071730		STA NAD	POST-DECIMAL ZERO COUNTER
0094	54117	071731		STA NBD	PRE-DECIMAL POINT DIGIT COUNT
0095	54120	002004		INA	
0096	54121	071774		STA REPCY	REPETITION COUNT
0097	54122	061756		LDA IFSS	FORMAT STACK
0098	54123	071755		STA FSP	POINTER
0099	54124	061644		LDA FST	GET NON-DELIMITING
0100	54125	102101		STO	CHARACTER
0101	54126	015540		JSB MCHAR	IGNORING BLANKS
0102	54127	051747		CPA DP	IS IT A DELIMITER ?
0103	54130	115162		JSB FERRS,I	YES
0104	54131	050421		CPA ,+42B	IS IT A QUOTE?
0105	54132	002001		RSS	YES
0106	54133	026177		JMP FMT0	NO
0107	54134	065747		LDB DP	
0108	54135	007004		CMB,INB	RESET
0109	54136	045644		ADB FST	CHARACTER
0110	54137	045743		ADB CC	COUNTER
0111	54140	075743		STB CC	
0112	54141	035644	FMT16	ISZ FST	INCREMENT STRING POINTER
0113	54142	061743		LDA CC	ALL

0114	54143	051760	CPA NCH	CHARACTERS USED ?
0115	54144	115164	JSB FERRS+2,I	YES, ERROR
0116	54145	035743	ISZ CC	INCREMENT CHARACTER COUNTER
0117	54146	061644	LDA FST	
0118	54147	103101	CLO	DON'T IGNORE BLANKS
0119	54150	015540	JSB MCHAR	GET NEXT CHARACTER
0120	54151	171755	STA FSP,I	LOAD CHARACTER ONTO STACK
0121	54152	035755	ISZ FSP	INCREMENT STACK POINTER
0122	54153	050421	CPA .+42B	IS IT A " ?
0123	54154	002001	RSS	YES
0124	54155	026141	JMP FMT16	NO
0125	54156	035644	ISZ FST	INCREMENT STRING POINTER
0126	54157	035743	ISZ CC	AND CHARACTER COUNTER
0127	54160	061743	LDA CC	ALL
0128	54161	051760	CPA NCH	CHARACTERS USED ?
0129	54162	026435	JMP FMT46	YES
0130	54163	061644	LDA FST	RESET
0131	54164	071747	STA DP	DELIMITER
0132	54165	015536	JSB DSRCH	POINTER
0133	54166	061644	LDA FST	NEXT CHARACTER
0134	54167	051747	CPA DP	A DELIMITER ?
0135	54170	026435	JMP FMT46	YES
0136	54171	102101	STO	IGNORE BLANKS
0137	54172	015540	JSB MCHAR	FETCH A FORMAT STRING CHARACTER
0138	54173	061644	LDA FST	WOULD IT BE
0139	54174	055747	CPB DP	A DELIMITER ?
0140	54175	026435	JMP FMT46	YES
0141	54176	115163	JSB FERRS+1,I	NO, ERROR
0142	54177	052001	FMT0 CPA S	IS IT AN S ?
0143	54200	026330	JMP FMT14	YES
0144	54201	050435	CPA .+56B	IS IT A . ?
0145	54202	026316	JMP FMT9	YES
0146	54203	050464	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	071774	STA REPCT	YES, STORE IN REPCT
0151	54210	035644	ISZ FST	INCREMENT STRING POINTER
0152	54211	061644	LDA FST	NEXT CHARACTER
0153	54212	051747	CPA DP	A DELIMITER ?
0154	54213	115165	JSB FERRS+3,I	YES, ERROR
0155	54214	102101	STO	IGNORE BLANKS
0156	54215	015540	JSB MCHAR	GET NEXT CHARACTER
0157	54216	051747	CPA DP	IS IT A DELIMITER ?
0158	54217	115165	JSB FERRS+3,I	
0159	54220	015264	JSB DIGCK	IS IT A DIGIT ?
0160	54221	026243	JMP FMT5	NO
0161	54222	061774	LDA REPCT	YES,
0162	54223	075774	STB REPCT	MULTIPLY PREVIOUS
0163	54224	100200	MPY .+12B	DIGIT BY 10
		54225		
0164	54226	041774	ADA REPCT	ADD IN ONES DIGIT
0165	54227	071774	STA REPCT	
0166	54230	035644	ISZ FST	INCREMENT STRING POINTER
0167	54231	061644	LDA FST	NEXT CHARACTER
0168	54232	051747	CPA DP	A DELIMITER ?

0169	54233	115165		JSB FERRS+3,I	YES, ERROR
0170	54234	102101		STO	IGNORE BLANKS
0171	54235	015540		JSB MCHAR	GET NEXT CHARACTER
0172	54236	051747		CPA DP	IS IT A DELIMITER ?
0173	54237	115165		JSB FERRS+3,I	
0174	54240	015264		JSB DIGCK	THIRD DIGIT ?
0175	54241	002001		RSS	
0176	54242	115166		JSB FERRS+4,I	YES, ERROR
0177	54243	065774	FMT5	LDB REPCT	
0178	54244	006003		SZB,RSS	REPCT ZERO ?
0179	54245	115167		JSB FERRS+5,I	YES
0180	54246	044321		ADB M73	NO, GREATER
0181	54247	006021		SSB,RSS	THAN 72?
0182	54250	115166		JSB FERRS+4,I	YES
0183	54251	046005		ADB ..73	RESTORE REPCT
0184	54252	007004		CMB,INB	SET NUMBER FLAG
0185	54253	175755		STB FSP,I	LOAD ONTO FORMAT STACK
0186	54254	035755		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	065750		LDB DPFLG	DPFLG = -1?
0195	54265	006002		SZB	
0196	54266	026273		JMP FMT7	YES
0197	54267	065762		LDB NUM2	ADD REPCT TO
0198	54270	045774		ADB REPCT	POST-DECIMAL
0199	54271	075762		STB NUM2	DIGIT COUNTER
0200	54272	026276		JMP FMT8	
0201	54273	065761	FMT7	LDB NUM1	ADD REPCT TO
0202	54274	045774		ADB REPCT	PRE-DECIMAL
0203	54275	075761		STB NUM1	DIGIT COUNTER
0204	54276	006404	FMT8	CLB,INB	REINITIALIZE
0205	54277	075774		STB REPCT	REPCT
0206	54300	171755		STA FSP,I	LOAD CHARACTER ONTO STACK
0207	54301	035644		ISZ FST	INCREMENT STRING POINTER
0208	54302	035755		ISZ FSP	AND STACK POINTER
0209	54303	061644		LDA FST	NEXT CHARACTER
0210	54304	051747		CPA DP	A DELIMITER ?
0211	54305	026313		JMP FMT08	YES
0212	54306	102101		STO	IGNORE BLANKS
0213	54307	015540		JSB MCHAR	GET NEXT CHARACTER
0214	54310	051747		CPA DP	IS IT A DELIMITER ?
0215	54311	002001		RSS	YES
0216	54312	026177		JMP FMT0	
0217	54313	065755	FMT08	LDB FSP	
0218	54314	075753		STB EST	SET END OF STACK MARK
0219	54315	026343		JMP FMT18	
0220	54316	035750	FMT9	ISZ DPFLG	DPFLG = -1 ?
0221	54317	115170		JSB FERRS+6,I	NO
0222	54320	026300		JMP FMT8+2	YES
0223	54321	065646	FMT10	LDB SFLG	IS SFLG
0224	54322	006003		SZB,RSS	

0225	54323	035646	ISZ SFLG	YES, INCREMENT IT
0226	54324	026276	JMP FMT8	NO
0227	54325	035752	FMT13 ISZ EFLAG	EFLAG = -1?
0228	54326	115171	JSB FERRS+7, I	NO
0229	54327	026300	JMP FMT8+2	YES
0230	54330	065761	FMT14 LDB NUM1	
0231	54331	045762	ADB NUM2	ANY D'S FOUND ?
0232	54332	006003	SZB, RSS	
0233	54333	035766	ISZ SBD	NO, INCREMENT BEFORE COUNTER
0234	54334	065766	LDB SBD	ANY S'S BEFORE A D ?
0235	54335	006003	SZB, RSS	
0236	54336	035765	ISZ SAD	NO, INCREMENT AFTER COUNTER
0237	54337	026300	JMP FMT8+2	
0238	54340	050427	FMT15 CPA ,+50B	IS CHARACTER A (?
0239	54341	027433	JMP FMT95	YES
0240	54342	115172	JSB FERRS+8, I	NO, ILLEGAL CHARACTER
0241	54343	061756	FMT18 LDA IFSS	REINITIALIZE
0242	54344	071755	STA FSP	STACK POINTER
0243	54345	003400	CCA	AND
0244	54346	071774	STA REPCT	REPCT
0245	54347	041646	ADA SFLG	SFLG = 1 ?
0246	54350	002003	SZA, RSS	
0247	54351	026500	JMP FMT24	YES
0248	54352	040355	ADA .-2	SFLG = 3 ?
0249	54353	002021	SSA, RSS	
0250	54354	026502	JMP FMT25	YES
0251	54355	061761	LDA NUM1	NO, ANY
0252	54356	041762	ADA NUM2	D'S
0253	54357	002003	SZA, RSS	FOUND ?
0254	54360	026457	JMP FMT20	NO
0255	54361	015542	JSB EVEXP	EVALUATE EXPRESSION
0256	54362	027673	JMP FMEND	NONE FOUND
0257	54363	115173	JSB FERRS+9, I	STRING--ERROR
0258	54364	071316	STA MANT1	IF NUMBER
0259	54365	071736	STA NUMW1	SAVE HIGH MANTISSA
0260	54366	015412	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	060434	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	071736	STA NUMW1	SAVE HIGH MANTISSA

0281	54413	026416		JMP **3	
0282	54414	060432	FMT31	LDA ,+53B	SET SIGN
0283	54415	071266		STA SIGN	TO PLUS
0284	54416	075320		STB MANT2	
0285	54417	075737		STB NUMW2	SAVE LOW MANTISSA
0286	54420	061322		LDA EXP	
0287	54421	071647		STA EXPW	AND EXPONENT
0288	54422	006404		CLB,INB	SET EXPRESSION
0289	54423	075643		STB EC	FOUND FLAG
0290	54424	060670		LDA IHB	HOLDING BUFFER
0291	54425	071726		STA HBP	POINTER
0292	54426	061752		LDA EFLAG	EFLAG
0293	54427	002003		SZA,RSS	SET ?
0294	54430	027210		JMP FMT62	YES
0295	54431	061750		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	061756	FMT46	LDA IFSS	RESET
0303	54436	071755		STA FSP	STACK POINTER
0304	54437	161755		LDA FSP,I	TOP OF STACK
0305	54440	050421		CPA ,+42B	A " ?
0306	54441	027332		JMP FMT90	YES, DONE WITH THIS SPEC
0307	54442	050375		CPA ,+16B	IS IT A PSEUDO-LINEFEED ?
0308	54443	060371		LDA ,+12B	YES, MAKE IT A LINEFEED
0309	54444	050376		CPA ,+17B	IS IT A PSEUDO CARRIAGE RETURN ?
0310	54445	002001		RSS	YES
0311	54446	026454		JMP FMT47	NO
0312	54447	060402		LDA ,+23B	OUTPUT AN X-OFF
0313	54450	015452		JSB OUTCR	
0314	54451	060374		LDA ,+15B	OUTPUT A
0315	54452	015452		JSB OUTCR	CARRIAGE RETURN
0316	54453	002400		CLA	AND A NULL.
0317	54454		FMT47	EQU *	
0318	54454	015452		JSB OUTCR	NO, OUTPUT THE CHARACTER
0319	54455	035755		ISZ FSP	INCREMENT STACK POINTER
0320	54456	026437		JMP FMT46+2	NO
0321**					**
0322***				OUTPUT A BLANK SPECIFICATION	***
0323**					**
0324	54457	161755	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	071774		STA REPC	YES, STORE NUMBER IN REPC
0328	54463	035755		ISZ FSP	INCREMENT STACK POINTER
0329	54464	161755		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	115172		JSB FERRS+8,I	NO, ERROR
0333	54470	015532		JSB OUTBL	
0334	54471	003400		CCA	REINITIALIZE
0335	54472	071774		STA REPC	REPC
0336	54473	061755		LDA FSP	END

0337	54474	051753	CPA EST	OF STACK
0338	54475	027332	JMP FMT90	YES
0339	54476	161755	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	015542	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	115200	JSB FERRS+14,I	
0350	54504	075643	STB EC	FOUND FLAG
0351	54505	161755	LDA FSP,I	LOAD TOP OF STACK
0352	54506	002021	SSA,RSS	IS IT A NUMBER ?
0353	54507	026513	JMP FMT26	NO
0354	54510	071774	STA REPCT	YES
0355	54511	035755	ISZ FSP	INCREMENT STACK POINTER
0356	54512	161755	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	015532	JSB OUTBL	
0361	54517	026543	JMP FMT28	
0362	54520	052003	FMT27 CPA .A	IS IT AN A ?
0363	54521	002001	RSS	YES
0364	54522	115173	JSB FERRS+9,I	NO, ERROR
0365	54523	035755	ISZ FSP	INCREMENT STACK POINTER
0366	54524		FMT05 EQU *	
0367	54524	015364	JSB FSCH	FETCH STRING CHARACTER
0368	54525	061571	LDA BLANK	NO, FETCH A BLANK
0369	54526	050375	CPA .+16B	IS IT A PSEUDO-LINEFEED ?
0370	54527	060371	LDA .+12B	YES, MAKE IT A LINEFEED
0371	54530	050376	CPA .+17B	IS IT A PSEUDO CARRIAGE RETURN ?
0372	54531	002001	RSS	YES
0373	54532	026540	JMP FMT29	NO
0374	54533	060402	LDA .+23B	OUTPUT AN X-OFF
0375	54534	015452	JSB OUTCR	
0376	54535	060374	LDA .+15B	OUTPUT A
0377	54536	015452	JSB OUTCR	CARRIAGE RETURN
0378	54537	002400	CLA	AND A NULL.
0379	54540		FMT29 EQU *	
0380	54540	015452	JSB OUTCR	OUTPUT CHARACTER
0381	54541	035774	ISZ REPCT	REPCT USED UP ?
0382	54542	026524	JMP FMT05	NO
0383	54543	003400	FMT28 CCA	REINITIALIZE
0384	54544	071774	STA REPCT	REPCT
0385	54545	061755	LDA FSP	END OF
0386	54546	051753	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	060437		LDA ,+60B	YES, LOAD A
0399	54560	171726		STA HBP, I	ZERO
0400	54561	035726		ISZ HBP	INCREMENT BUFFER POINTER
0401	54562	003400		CCA	NUMBER OF BUFFER WORDS
0402	54563	071733		STA NHBW	IS ONE
0403	54564	026576		JMP FMT33	
0404	54565	015526	FMT32	JSB DTL1	
0405	54566	071324		STA EXPON	SAVE NUMBER
0406	54567	071733		STA NHBW	OF DIGITS
0407	54570	015422		JSB GETDG	GET DIGIT
0408	54571	040437		ADA ,+60B	CONVERT TO ASCII
0409	54572	171726		STA HBP, I	STORE IN HOLD BUFFER
0410	54573	035726		ISZ HBP	ALL DIGITS
0411	54574	035324		ISZ EXPON	FOUND ?
0412	54575	026570		JMP FMT32+3	NO
0413	54576	061761	FMT33	LDA NUM1	COMPUTE NUMBER OF
0414	54577	041733		ADA NHBW	LEADING BLANKS
0415	54600	065766		LDB SBD	ANY S'S
0416	54601	045765		ADB SAD	FOUND ?
0417	54602	006002		SZB	
0418	54603	026612		JMP FMT43	YES
0419	54604	065266		LDB SIGN	NO, NUMBER POSITIVE ?
0420	54605	054432		CPB ,+53B	
0421	54606	026612		JMP FMT43	YES
0422	54607	040356		ADA , -1	NO, SAVE ROOM
0423	54610	006404		CLB, INB	FOR
0424	54611	075740		STB SNFLG	PRINTING SIGN
0425	54612	002020	FMT43	SSA	NUMBER OF BLANKS NEGATIVE ?
0426	54613	027570		JMP FMT80	YES
0427	54614	071732		STA NBLK	NO
0428	54615	015530		JSB ROUND	ROUND NUMBER IN BUFFER
0429	54616	002001		RSS	
0430	54617	027570		JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0431	54620	064670		LDB IHB	REINITIALIZE
0432	54621	075726		STB HBP	HOLD BUFFER POINTER
0433**					**
0434***					***
0435**					**
0436	54622	161755	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	035755		ISZ FSP	INCREMENT STACK POINTER
0441	54627	061740		LDA SNFLG	
0442	54630	002002		SZA	SNFLG = 0 ?
0443	54631	026777		JMP FMT59	NO, IGNORE THE S
0444	54632	065766		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	015452		JSB OUTCR	IMMEDIATELY

0449	54637	060361	LDA	.,+2	SET SNFLG TO 2
0450	54640	071740	STA	SNFLG	
0451	54641	026777	JMP	FMT59	
0452	54642	007400	FMT35	CCB	
0453	54643	075740	STB	SNFLG	SET SNFLG TO -1
0454	54644	026622	JMP	FMT34	
0455	54645	002021	FMT36	SSA, RSS	TOP OF STACK A NUMBER ?
0456	54646	026652	JMP	FMT06	NO
0457	54647	071774	STA	REPCT	YES, STORE IN REPCT
0458	54650	035755	ISZ	FSP	INCREMENT STACK POINTER
0459	54651	161755	LDA	FSP, I	LOAD NEW TOP OF STACK
0460	54652	052000	FMT06	CPA .X	IS TOP AN X ?
0461	54653	002001	RSS		YES
0462	54654	026661	JMP	FMT37	NO
0463	54655	015532	JSB	OUTBL	
0464	54656	003400	CCA		REINITIALIZE
0465	54657	071774	STA	REPCT	REPCT
0466	54660	026777	JMP	FMT59	
0467	54661	052002	FMT37	CPA D	TOP OF STACK A D ?
0468	54662	002001	RSS		YES
0469	54663	026753	JMP	FMT57	NO
0470	54664	035755	ISZ	FSP	INCREMENT STACK POINTER
0471	54665	003400	CCA		
0472	54666	041732	ADA	NBLK	NUMBER OF BLANKS > 0 ?
0473	54667	002020	SSA		
0474	54670	026677	JMP	FMT07	NO
0475	54671	061571	LDA	BLANK	YES, OUTPUT A
0476	54672	015452	JSB	OUTCR	BLANK
0477	54673	007400	CCB		DECREMENT
0478	54674	045732	ADB	NBLK	BLANK
0479	54675	075732	STB	NBLK	COUNT
0480	54676	026746	JMP	FMT40	
0481	54677	061732	FMT07	LDA NBLK	NUMBER OF BLANKS
0482	54700	002020	SSA		LESS THAN ZERO ?
0483	54701	026713	JMP	FMT56	YES
0484	54702	003400	CCA		NO, DECREMENT
0485	54703	071732	STA	NBLK	BLANK COUNT
0486	54704	007400	CCB		
0487	54705	055740	CPB	SNFLG	SNFLG = - 1 ?
0488	54706	026717	JMP	FMT02	YES
0489	54707	045740	ADB	SNFLG	SNFLG = 1 ?
0490	54710	006003	SZB, RSS		
0491	54711	026746	JMP	FMT40	YES
0492	54712	026723	JMP	FMT58	NO
0493	54713	007400	FMT56	CCB	
0494	54714	045740	ADB	SNFLG	SNFLG = 1 ?
0495	54715	006002	SZB		
0496	54716	026723	JMP	FMT58	NO
0497	54717	061266	FMT02	LDA SIGN	YES, OUTPUT
0498	54720	015452	JSB	OUTCR	SIGN AND
0499	54721	060361	LDA	.,+2	SET SNFLG
0500	54722	071740	STA	SNFLG	TO 2
0501	54723	060670	FMT58	LDA IHB	END
0502	54724	040435	ADA	.,+46	OF
0503	54725	051726	CPA	HBP	BUFFER ?
0504	54726	026777	JMP	FMT59	

0505	54727	161726	LDA HBP,I	OUTPUT A
0506	54730	015452	JSB OUTCR	DIGIT
0507	54731	035726	ISZ HBP	INCREMENT HOLD BUFFER POINTER
0508	54732	061752	LDA EFLAG	IS THIS A
0509	54733	002002	SZA	FLOATING POINT SPECIFICATION ?
0510	54734	026746	JMP FMT40	NO
0511	54735	002404	CLA,INA	YES, HAS THE DECIMAL POINT
0512	54736	051750	CPA DPFLG	BEEN FOUND YET ?
0513	54737	026746	JMP FMT40	YES
0514	54740	003400	CCA	NO, DECREMENT
0515	54741	041324	ADA EXPON	DECIMAL
0516	54742	164670	LDB IHB,I	IS THE
0517	54743	054437	CPB ,+60B	NUMBER ZERO?
0518	54744	002400	CLA	YES, ZERO EXPONENT
0519	54745	071324	STA EXPON	EXPONENT
0001	54746	035774	FMT40 ISZ REPCT	REPCT = 0 ?
0002	54747	026665	JMP FMT37+4	NO
0003	54750	003400	CCA	YES, REINITIALIZE
0004	54751	071774	STA REPCT	REPCT
0005	54752	026777	JMP FMT59	
0006	54753	065750	FMT57 LDB DPFLG	FIXED POINT
0007	54754	006002	SZB	SPECIFICATION ?
0008	54755	027003	JMP FMT42	NO
0009	54756	050435	CPA ,+56B	TOP OF STACK A DECIMAL POINT ?
0010	54757	002001	RSS	YES
0011	54760	027003	JMP FMT42	NO
0012	54761	035755	ISZ FSP	INCREMENT STACK POINTER
0013	54762	065740	LDB SNFLG	
0014	54763	006020	SSB	SNFLG = -1 ?
0015	54764	026770	JMP FM00	YES
0016	54765	044356	ADB , -1	NO, = 1 ?
0017	54766	006002	SZB	
0018	54767	026774	JMP FM01	NO
0019	54770	061266	FMT00 LDA SIGN	YES, OUTPUT
0020	54771	015452	JSB OUTCR	SIGN
0021	54772	060361	LDA ,+2	SET SNFLG
0022	54773	071740	STA SNFLG	TO 2
0023	54774	060435	FMT01 LDA ,+56B	OUTPUT
0024	54775	015452	JSB OUTCR	DECIMAL POINT
0025	54776	035750	ISZ DPFLG	INCREMENT FLAG TO SHOW D.P. FOUND
0026	54777	061755	FMT59 LDA FSP	END OF
0027	55000	051753	CPA EST	STACK
0028	55001	027332	JMP FMT90	YES
0029	55002	026622	JMP FMT34	NO
0030	55003	035755	FMT42 ISZ FSP	INCREMENT STACK POINTER
0031	55004	015452	JSB OUTCR	OUTPUT AN E
0032	55005	061755	FMT76 LDA FSP	END OF
0033	55006	051753	CPA EST	STACK ?
0034	55007	027025	JMP FMT78	YES
0035	55010	161755	LDA FSP,I	NO, TOP OF
0036	55011	002021	SSA,RSS	STACK A NUMBER ?
0037	55012	027016	JMP FM02	NO
0038	55013	035755	ISZ FSP	YES, INCREMENT STACK POINTER
0039	55014	071774	STA REPCT	STORE NUMBER
0040	55015	161755	LDA FSP,I	GET NEW TOP OF STACK
0041	55016	052000	FMT02 CPA ,X	IS IT AN X ?

0042	55017	002001	RSS	YES
0043	55020	115171	JSB FERRS+7,I	NO, ERROR
0044	55021	015532	JSB OUTBL	
0045	55022	003400	CCA	RESET
0046	55023	071774	STA REPCT	REPCT
0047	55024	027005	JMP FMT76	
0048	55025	060434	FMT78 LDA .+55B	OUTPUT
0049	55026	065324	LDB EXPON	
0050	55027	006020	SSB	AN
0051	55030	007005	CMB, INB, RSS	
0052	55031	060432	LDA .+53B	EXPONENT
0053	55032	075324	STB EXPON	
0054	55033	015452	JSB OUTCR	SIGN
0055	55034	061324	LDA EXPON	
0056	55035	006400	CLB	COMPUTE
0057	55036	100400	DIV .+12B	
	55037	000371		
0058	55040	040437	ADA .+60B	EXPONENT'S
0059	55041	044437	ADB .+60B	
0060	55042	075324	STB EXPON	10'S DIGIT
0061	55043	015452	JSB OUTCR	OUTPUT IT
0062	55044	061324	LDA EXPON	
0063	55045	015452	JSB OUTCR	OUTPUT 1'S DIGIT
0064	55046	027332	JMP FMT90	
0065**				**
0066***			PREPARE FIXED POINT NUMBER	***
0067**				**
0068	55047	002400	FMT45 CLA	SET PRE-DECIMAL POINT
0069	55050	071324	STA EXPON	DIGIT COUNTER
0070	55051	071730	STA NAD	ZERO COUNTER
0071	55052	051322	CPA EXP	ZERO EXPONENT ?
0072	55053	027161	JMP FMT61+3	YES
0073	55054	065322	LDB EXP	NO
0074	55055	006020	SSB	EXPONENT NEGATIVE
0075	55056	027156	JMP FMT61	YES
0076	55057	015526	JSB DTL1	
0077	55060	071324	STA EXPON	LOAD
0078	55061	071731	STA NBD	PRE-DECIMAL POINT
0079	55062	015422	FM03 JSB GETDG	DIGITS
0080	55063	040437	ADA .+60B	
0081	55064	171726	STA HBP, I	INTO
0082	55065	035726	ISZ HBP	HOLD
0083	55066	035324	ISZ EXPON	BUFFER
0084	55067	027062	JMP FM03	
0085	55070	065762	FMT50 LDB NUM2	ANY D'S AFTER
0086	55071	006003	SZB, RSS	DECIMAL POINT ?
0087	55072	027126	JMP FMT51	NO
0088	55073	060670	LDA IHB	END
0089	55074	040435	ADA .+46	OF
0090	55075	051726	CPA HBP	BUFFER ?
0091	55076	027116	JMP FM04	YES
0092	55077	065730	LDB NAD	LEADING
0093	55100	002400	CLA	ZEROES
0094	55101	006003	SZB, RSS	AFTER
0095	55102	027106	JMP **4	DECIMAL
0096	55103	044356	ADB .-1	POINT

0097	55104	075730		STB NAD	
0098	55105	002001		RSS	YES
0099	55106	015422		JSB GETDG	
0100	55107	040437		ADA ,+60B	LOAD
0101	55110	171726		STA HBP,I	POST-DECIMAL POINT
0102	55111	007400		CCB	DIGITS
0103	55112	045762		ADB NUM2	INTO
0104	55113	075762		STB NUM2	HOLD
0105	55114	035726		ISZ HBP	BUFFER
0106	55115	027071		JMP FMT50+1	
0107	55116	061762	FMT04	LDA NUM2	OUTPUT BLANKS
0108	55117	003004		CMA,INA	TO
0109	55120	071774		STA REPCT	FILL FIELD
0110	55121	015532		JSB OUTBL	
0111	55122	003400		CCA	REINITIALIZE
0112	55123	071774		STA REPCT	REPCT
0113	55124	041755		ADA FSP	CORRECT
0114	55125	071755		STA FSP	STACK POINTER
0115	55126	061731	FMT51	LDA NBD	COMPUT NUMBER
0116	55127	041761		ADA NUM1	OF LEADING BLANKS
0117	55130	065766		LDB SBD	ANY S'S
0118	55131	045765		ADB SAD	FOUND ?
0119	55132	006002		SZB	
0120	55133	027142		JMP FMT54	YES
0121	55134	065266		LDB SIGN	NO, NUMBER
0122	55135	054432		CPB ,+53B	POSITIVE ?
0123	55136	027142		JMP FMT54	YES
0124	55137	040356		ADA ,-1	NO, LEAVE ROOM FOR
0125	55140	006404		CLB,INB	SIGN TO BE PRINTED AND
0126	55141	075740		STB SNFLG	SET SNFLG TO 1
0127	55142	002020	FMT54	SSA	NUMBER OF BLANKS NEGATIVE ?
0128	55143	027570		JMP FMT80	YES
0129	55144	071732		STA NBLK	NO,
0130	55145	007400		CCB	NEXT DIGIT A
0131	55146	045730		ADB NAD	LEADING ZERO ?
0132	55147	006020		SSB	
0133	55150	015530		JSB ROUND	NO, ROUND NUMBER
0134	55151	002001		RSS	
0135	55152	027570		JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0136	55153	060670		LDA IHB	RESET HOLD
0137	55154	071726		STA HBP	BUFFER POINTER
0138	55155	026622		JMP FMT34	GO OUTPUT THE NUMBER
0139	55156	015524	FMT61	JSB MTG1	
0140	55157	061324		LDA EXPON	
0141	55160	071730		STA NAD	
0142	55161	065761		LDB NUM1	ANY D'S FOUND
0143	55162	006003		SZB,RSS	BEFORE THE DECIMAL POINT ?
0144	55163	027070		JMP FMT50	NO
0145	55164	061762		LDA NUM2	YES, ANY D'S FOUND
0146	55165	002003		SZA,RSS	AFTER THE DECIMAL POINT ?
0147	55166	027201		JMP FMT55	NO
0148	55167	054360		CPB ,+1	YES, ONLY ONE OF THEM ?
0149	55170	002001		RSS	
0150	55171	027201		JMP FMT55	NO
0151	55172	061765		LDA SAD	YES, ANY S'S FOUND ?
0152	55173	041766		ADA SBD	

0153	55174	002002		SZA	
0154	55175	027201		JMP FMT55	YES
0155	55176	061266		LDA SIGN	NO, NUMBER
0156	55177	050434		CPA ,+5B	NEGATIVE ?
0157	55200	027070		JMP FMT50	YES
0158	55201	060437	FMT55	LDA ,+60B	NO, LOAD PRE-DECIMAL POINT
0159	55202	171726		STA HBP,I	ZERO INTO BUFFER
0160	55203	035726		ISZ HBP	
0161	55204	003400		CCA	DECREASE NUMBER OF
0162	55205	041761		ADA NUM1	D'S AVAILABLE FOR SIGN
0163	55206	071761		STA NUM1	AND BLANKS BEFORE DECIMAL PT
0164	55207	027070		JMP FMT50	
0165**					**
0166**			PREPARE FLOATING POINT NUMBER		***
0167**					**
0168	55210	002400	FMT62	CLA	INITIALIZE DECIMAL
0169	55211	071324		STA EXPON	EXPONENT
0170	55212	051322		CPA EXP	ZERO EXPONENT ?
0171	55213	027216		JMP ++3	YES
0172	55214	015524		JSB MTG1	
0173	55215	015526		JSB DTL1	
0174	55216	003004		CMA,INA	SAVE DECIMAL EXPONENT
0175	55217	071324		STA EXPON	
0176	55220	061761		LDA NUM1	GET
0177	55221	041762		ADA NUM2	TOTAL NUMBER
0178	55222	071741		STA TOTDG	OF DIGITS
0179	55223	061766		LDA SBD	
0180	55224	041765		ADA SAD	ANY S'S FOUND ?
0181	55225	002002		SZA	
0182	55226	027246		JMP FMT67	YES
0183	55227	061266		LDA SIGN	NO, NUMBER
0184	55230	050432		CPA ,+5B	POSITIVE ?
0185	55231	027246		JMP FMT67	YES
0186	55232	007400		CCB	NO, LEAVE ROOM
0187	55233	045761		ADB NUM1	FOR SIGN
0188	55234	006020		SSB	NONE ?
0189	55235	027570		JMP FMT80	YES
0190	55236	075761		STB NUM1	NO, DECREMENT
0191	55237	003400		CCA	TOTAL NUMBER OF D'S
0192	55240	041741		ADA TOTDG	AVAILABLE FOR SIGN
0193	55241	071741		STA TOTDG	AND BLANKS BEFORE DEC. PT.
0194	55242	002003		SZA,RSS	
0195	55243	027570		JMP FMT80	
0196	55244	006404		CLB,INB	SET SNFLG
0197	55245	075740		STB SNFLG	TO 1
0198	55246	061762	FMT67	LDA NUM2	NUM2
0199	55247	003004		CMA,INA	> 7 ?
0200	55250	064365		LDB ,+6	
0201	55251	044000		ADB 0	
0202	55252	006020		SSB	
0203	55253	027273		JMP FMT70	YES
0204	55254	061741		LDA TOTDG	YES, TOTAL NUMBER OF D'S
0205	55255	040347		ADA , -10B	> 7 ?
0206	55256	002020		SSA	
0207	55257	027265		JMP FMT68	NO
0208	55260	064350		LDB , -7	PREPARE TO GET

0209	55261	075742	STB DCTR	SEVEN DIGITS
0210	55262	002004	INA	NUMBER OF BLANKS
0211	55263	071732	STA NBLK	BECOMES TOTDG = 7
0212	55264	027314	JMP FMT72	
0213	55265	061741	FMT68 LDA TOTDG	PREPARE TO GET
0214	55266	003004	CMA, INA	
0215	55267	071742	STA DCTR	TOTDG DIGITS
0216	55270	006400	CLB	SET NUMBER OF BLANKS
0217	55271	075732	STB NBLK	TO ZERO
0218	55272	027314	JMP FMT72	
0219	55273	065761	FMT70 LDB NUM1	ANY D'S BEFORE
0220	55274	006002	SZB	DECIMAL POINT ?
0221	55275	040356	ADA .-1	YES, INCREMENT NUMBER OF DIGITS
0222	55276	071742	STA DCTR	PREPARE TO GET NUM2 DIGITS
0223	55277	006002	SZB	SET
0224	55300	044356	ADB .-1	BLANK
0225	55301	075732	STB NBLK	COUNT
0226	55302	061742	LDA DCTR	MORE THAN
0227	55303	040435	ADA .+46	FOURTY-SIX
0228	55304	002021	SSA, RSS	DIGITS NEEDED ?
0229	55305	027314	JMP FMT72	NO
0230	55306	071774	STA REPCT	YES, OUTPUT NECESSARY BLANKS
0231	55307	015532	JSB OUTBL	
0232	55310	041755	ADA FSP	CORRECT
0233	55311	071755	STA FSP	STACK POINTER
0234	55312	062004	LDA M46	SET DCTR
0235	55313	071742	STA DCTR	TO 46
0236	55314		FMT72 EQU *	
0237	55314	003400	CCA	REINITIALIZE
0238	55315	071774	STA REPCT	REPCT
0239	55316	015422	JSB GETDG	
0240	55317	040437	ADA .+60B	CONVERT TO ASCII
0241	55320	171726	STA HBP, I	STORE IN HOLD BUFFER
0242	55321	035726	ISZ HBP	INCREMENT BUFFER POINTER
0243	55322	035742	ISZ DCTR	ALL DIGITS GOT ?
0244	55323	027314	JMP FMT72	NO
0245	55324	015530	JSB ROUND	YES, ROUND THE NUMBER IN BUFFER
0246	55325	002001	RSS	
0247	55326	027570	JMP FMT80	NO ROOM FOR CARRY FROM ROUND
0248	55327	060670	LDA IHB	RESET
0249	55330	071726	STA HBP	BUFFER POINTER
0250	55331	026622	JMP FMT34	
0251**				**
0252***	HANDLE END OF SPECIFICATION			***
0253**				**
0254	55332	002400	FMT90 CLA	
0255	55333	071646	STA SFLG	STRING FLAG
0256	55334	061743	LDA CC	ENF OF
0257	55335	051760	CPA NCH	FORMAT STRING ?
0258	55336	002001	RSS	YES
0259	55337	027357	JMP FMT92	NO
0260	55340	061744	FMT09 LDA CC1	YES, PARENTHESIS
0261	55341	002002	SZA	BALANCED ?
0262	55342	115174	JSB FERRS+10, I	NO, ERROR
0263	55343	065643	FMT91 LDB EC	ANY EXPRESSIONS
0264	55344	006003	SZB, RSS	USED ?

0265	55345	027673	JMP FMEND	NO
0266	55346	065751	LDB EDSTA	END OF
0267	55347	006003	SZB,RSS	STATEMENT ?
0268	55350	027673	JMP FMEND	YES
0269	55351	002400	CLA	
0270	55352	071643	STA EC	YES, CLEAR EC
0271	55353	071743	STA CC	
0272	55354	061757	LDA IFSTR	RESET
0273	55355	071747	STA DP	DELIMITER POINTER
0274	55356	026040	JMP FMT2	
0275	55357	061747	FMT92 LDA DP	GET THE
0276	55360	103101	CLO	DELIMITING CHARACTER
0277	55361	015540	JSB MCHAR	NOT IGNORING BLANKS
0278	55362	050430	CPA .+51B	IS IT A RIGHT PARENTHESIS
0279	55363	027470	JMP FMT97	YES
0280	55364	071727	STA LCH	NO, SAVE THE CHARACTER
0281	55365	050433	CPA .+54B	IS IT A COMMA ?
0282	55366	027373	JMP FMT93+1	YES
0283	55367	050436	CPA .+57B	IS IT A SLASH ?
0284	55370	002001	RSS	YES
0285	55371	115163	JSB FERRS+1,I	NO, ERROR EXIT
0286	55372	015534	FMT93 JSB OUTCL	
0287	55373	035743	ISZ CC	INCREMENT CHARACTER COUNTER
0288	55374	061743	LDA CC	ALL CHARACTERS
0289	55375	051760	CPA NCH	USED ?
0290	55376	027424	JMP FMT94	YES
0291	55377	035747	ISZ DP	INCREMENT DELIMITER POINTER
0292	55400	015536	JSB DSRCH	FIND NEXT DELIMITER
0293	55401	102101	STO	IGNORE BLANKS
0294	55402	061644	LDA FST	
0295	55403	015540	JSB MCHAR	NEXT CHARACTER
0296	55404	051747	CPA DP	IS IT A DELIMITER
0297	55405	002001	RSS	YES
0298	55406	027415	JMP FM11	NO
0299	55407	061743	LDA CC	ALL CHARACTERS
0300	55410	051760	CPA NCH	USED ?
0301	55411	027424	JMP FMT94	YES
0302	55412	061747	LDA DP	NO, GET DELIMITING
0303	55413	103101	CLO	CHARACTER
0304	55414	015540	JSB MCHAR	IGNORING BLANKS
0305	55415	050445	FMT11 CPA .+54	IS IT A COMMA
0306	55416	115162	JSB FERRS,I	YES, ERROR
0307	55417	050436	CPA .+57B	NO, A SLASH
0308	55420	027424	JMP FMT94	YES
0309	55421	050430	CPA .+51B	NO, A RIGHT PARENTHESIS ?
0310	55422	027470	JMP FMT97	YES
0311	55423	026105	JMP FMT3	
0312	55424	061727	FMT94 LDA LCH	LAST CHARACTER
0313	55425	050433	CPA .+54B	A COMMA ?
0314	55426	115162	JSB FERRS,I	
0315	55427	061743	LDA CC	NO, ALL CHARACTERS
0316	55430	051760	CPA NCH	USED ?
0317	55431	027340	JMP FMT09	YES
0318	55432	027372	JMP FMT93	NO
0319**				**
0320***			HANDLE GROUPS OF SPECIFICATIONS	***

0321**

0322	55433	003400	FMT95	CCA	SECOND
0323	55434	041755		ADA FSP	CHARACTER
0324	55435	051756		CPA IFSS	IN STACK ?
0325	55436	002001		RSS	
0326	55437	115175		JSB FERRS+11,I	NO, ERROR
0327	55440	061744		LDA CC1	YES, FIRST LEVEL
0328	55441	002002		SZA	OF PARENTHESIS ?
0329	55442	027454		JMP FMT96	NO
0330	55443	035644		ISZ FST	INCREMENT STRING POINTER
0331	55444	003400		CCA	FIND CHARACTER COUNT
0332	55445	041757		ADA IFSTR	UP TO AND INCLUDING
0333	55446	003000		CMA	LEFT
0334	55447	041644		ADA FST	PARENTHESIS
0335	55450	071744		STA CC1	
0336	55451	065774		LDB REPCT	STORE REPETITION
0337	55452	075763		STB PC1	COUNT
0338	55453	026105		JMP FMT3	PROCESS STRING
0339	55454	061745	FMT96	LDA CC2	SECOND LEVEL
0340	55455	002002		SZA	OF PARENTHESIS
0341	55456	115176		JSB FERRS+12,I	NO, ERROR
0342	55457	035644		ISZ FST	
0343	55460	003400		CCA	FIND CHARACTER COUNT
0344	55461	041757		ADA IFSTR	UP TO AND
0345	55462	003000		CMA	INCLUDING
0346	55463	041644		ADA FST	LEFT
0347	55464	071745		STA CC2	PARENTHESIS
0348	55465	065774		LDB REPCT	STORE REPETITION
0349	55466	075764		STB PC2	COUNT
0350	55467	026105		JMP FMT3	
0351	55470	061764	FMT97	LDA PC2	SECOND LEVEL OF
0352	55471	002003		SZA,RSS	PARENTHESIS ?
0353	55472	027530		JMP FMT98	NO
0354	55473	040356		ADA ,-1	YES, REPEAT IT
0355	55474	071764		STA PC2	
0356	55475	002003		SZA,RSS	
0357	55476	027505		JMP FMT99	
0358	55477	065745		LDB CC2	RESET
0359	55500	075743		STB CC	CHARACTER COUNTER
0360	55501	045757		ADB IFSTR	
0361	55502	075747		STB DP	AND STRING POINTER
0362	55503	015536		JSB DSRCH	
0363	55504	026105		JMP FMT3	REPROCESS PARENTHESIZED STRING
0364	55505	002400	FMT99	CLA	CLEAR SECOND
0365	55506	071745		STA CC2	LEVEL POINTER
0366	55507	071646		STA SFLG	AND STRING FLAG
0367	55510	035743		ISZ CC	INCREMENT CHARACTER COUNTER
0368	55511	061743		LDA CC	ALL CHARACTERS
0369	55512	051760		CPA NCH	USED ?
0370	55513	115163		JSB FERRS+1,I	YES, ERROR
0371	55514	035747		ISZ DP	NO, POINT TO DELIMITER
0372	55515	015536		JSB DSRCH	FIND NEXT DELIMITER
0373	55516	102101		STO	GET NEXT
0374	55517	061644		LDA FST	NON-BLANK
0375	55520	015540		JSB MCHAR	CHARACTER
0376	55521	051747		CPA DP	IS IT A DELIMITER ?

0377	55522	002001	RSS	YES
0378	55523	027362	JMP FMT92+3	MAYBE
0379	55524	065743	LDB CC	ALL
0380	55525	055760	CPB NCH	CHARACTERS USED ?
0381	55526	115174	JSB FERRS+10,I	YES, ERROR
0382	55527	027357	JMP FMT92	NO, INVESTIGATE THE CHARACTER
0383	55530	061763	FMT98 LDA PC1	FIRST LEVEL
0384	55531	002003	SZA,RSS	OF PARENTHESIS ?
0385	55532	115177	JSB FERRS+13,I	NO, ERROR
0386	55533	040356	ADA .-1	YES, REPEAT IT
0387	55534	071763	STA PC1	
0388	55535	002003	SZA,RSS	
0389	55536	027545	JMP FMT00	RESET
0390	55537	065744	LDB CC1	CHARACTER COUNTER
0391	55540	075743	STB CC	
0392	55541	045757	ADB IFSTR	
0393	55542	075747	STB DP	
0394	55543	015536	JSB DSRCH	REPROCESS PARENTHESIZED STRING
0395	55544	026105	JMP FMT3	CLEAR FIRST
0396	55545	002400	FMT00 CLA	LEVEL POINTER
0397	55546	071744	STA CC1	AND STRING FLAG
0398	55547	071646	STA SFLG	INCREMENT CHARACTER COUNTER
0399	55550	035743	ISZ CC	POINT TO DELIMITER
0400	55551	035747	ISZ DP	ALL
0401	55552	061743	LDA CC	CHARACTERS USED ?
0402	55553	051760	CPA NCH	YES
0403	55554	027343	JMP FMT91	NO, FIND NEXT DELIMITER
0404	55555	015536	JSB DSRCH	GET NEXT
0405	55556	102101	STO	NON-BLANK
0406	55557	061644	LDA FST	CHARACTER
0407	55560	015540	JSB MCHAR	IS IT A DELIMITER ?
0408	55561	051747	CPA DP	YES
0409	55562	002001	RSS	NO
0410	55563	027362	JMP FMT92+3	ALL
0411	55564	065743	LDB CC	CHARACTERS USED ?
0412	55565	055760	CPB NCH	YES
0413	55566	027343	JMP FMT91	NO, INVESTIGATE THE FOUND CHARAC
0414	55567	027357	JMP FMT92	
0415**				**
0416***		OUTPUT NUMBER IN DEFAULT FORMAT		***
0417**				**
0418	55570	061736	FMT80 LDA NUMW1	
0419	55571	071316	STA MANT1	LOAD
0420	55572	065737	LDB NUMW2	
0421	55573	075320	STB MANT2	SAVED
0422	55574	061647	LDA EXPW	
0423	55575	071322	STA EXP	NUMBER
0424	55576	002400	CLA	CLEAR
0425	55577	071324	STA EXPON	DECIMAL EXPONENT
0426	55600	071752	STA EFLAG	SET FLOATING POINT FLAG
0427	55601	051322	CPA EXP	ZERO EXPONENT ?
0428	55602	027605	JMP ++3	YES
0429	55603	015524	JSB MTG1	
0430	55604	015526	JSB DTL1	
0431	55605	003000	CMA	
0432	55606	071324	STA EXPON	

0433	55607	015534	JSB	OUTCL	
0434	55610	060670	LDA	IHB	RESET HOLD
0435	55611	071726	STA	HBP	BUFFER POINTER
0436	55612	060351	LDA	,-6	PREPARE TO GET
0437	55613	071741	STA	TOTDG	SIX DIGITS
0438	55614	018422	JSB	GETDG	GET
0439	55615	040437	ADA	,+60B	
0440	55616	171726	STA	HBP,I	SIX
0441	55617	035726	ISZ	HBP	
0442	55620	035741	ISZ	TOTDG	DIGITS
0443	55621	027614	JMP	+,-5	
0444	55622	060361	LDA	,+2	SET NBLK TO
0445	55623	071732	STA	NBLK	WHERE IT WONT CAUSE TROUBLE
0446	55624	015530	JSB	ROUND	ROUND NUMBER IN HOLD BUFFER
0447	55625	000000	NOP		
0448	55626	061266	LDA	SIGN	OUTPUT
0449	55627	015452	JSB	OUTCR	SIGN
0450	55630	060670	LDA	IHB	INITIALIZE
0451	55631	071726	STA	HBP	HOLD BUFFER POINTER
0452	55632	161726	LDA	HBP,I	OUTPUT
0453	55633	015452	JSB	OUTCR	DIGIT
0454	55634	035726	ISZ	HBP	INCREMENT HOLD BUFFER POINTER
0455	55635	060435	LDA	,+56B	OUTPUT
0456	55636	015452	JSB	OUTCR	DECIMAL POINT
0457	55637	060352	LDA	,-5	PREPARE TO OUTPUT
0458	55640	071741	STA	TOTDG	FIVE DIGITS
0459	55641	161726	LDA	HBP,I	OUTPUT
0460	55642	015452	JSB	OUTCR	FIVE
0461	55643	035726	ISZ	HBP	DIGITS
0462	55644	035741	ISZ	TOTDG	
0463	55645	027641	JMP	+,-4	
0464	55646	060464	LDA	E	OUTPUT
0465	55647	015452	JSB	OUTCR	AN E
0466	55650	060434	LDA	,+55B	
0467	55651	065324	LDB	EXPON	OUTPUT
0468	55652	006020	SSB		
0469	55653	007005	CMB	,INB,RSS	EXPONENT
0470	55654	060432	LDA	,+53B	
0471	55655	075324	STB	EXPON	SIGN
0472	55656	015452	JSB	OUTCR	
0473	55657	061324	LDA	EXPON	
0474	55660	006400	CLB		GET BOTH EXPONENT DIGITS
0475	55661	100400	DIV	,+12B	
	55662	000371			
0476	55663	040437	ADA	,+60B	CONVERT BOTH
0477	55664	044437	ADB	,+60B	TO ASCII
0478	55665	075324	STB	EXPON	
0479	55666	015452	JSB	OUTCR	OUTPUT 10'S DIGIT
0480	55667	061324	LDA	EXPON	
0481	55670	015452	JSB	OUTCR	OUTPUT 1'S DIGIT
0482	55671	015534	JSB	OUTCL	
0483	55672	027332	JMP	FMT90	
0484	55673	061746	FMEND	LDA CONTR	YES, CONTROL
0485	55674	002002	SZA		CHARACTER FOUND ?
0486	55675	027700	JMP	+,-3	YES
0487	55676	015534	JSB	OUTCL	NO

0488	55677	124762		JMP XEC1A,I	
0489	55700	050432		CPA .+53B	IS CARRIAGE
0490	55701	002001		RSS	CONTROL A +
0491	55702	027714		JMP FM10	NO
0492	55703	060402		LDA .+23B	YES
0493	55704	015452		JSB OUTCR	OUTPUT AN X-OFF
0494	55705	060374		LDA .+15B	AND A
0495	55706	015452		JSB OUTCR	CARRIAGE RETURN
0496	55707	002400		CLA	AND A
0497	55710	015452		JSB OUTCR	NULL.
0498	55711	002400		CLA	
0499	55712	071570		STA CHRCT	
0500	55713	124762		JMP XEC1A,I	
0501	55714	050434	FM10	CPA .+55B	IS IT A MINUS ?
0502	55715	002001		RSS	YES
0503	55716	124762		JMP XEC1A,I	
0504	55717	060371		LDA .+12B	OUTPUT A
0505	55720	015452		JSB OUTCR	LINEFEED
0506	55721	124762		JMP XEC1A,I	

```

0002 56000          ORG 56000B
0003**
0004***  MAKE A NUMBER LESS THAN 1  ***
0005**
0006*
0007*  MULTIPLY AN UNPACKED FLOATING POINT
0008*  NUMBER IN MANT1, MANT2 AND EXP BY 10 UNTIL
0009*  IT IS GREATER THAN 1.  THEN DIVIDE BY 10
0010*
0011 56000 015300  #MTG1 JSB MBY10
0012 56001 061322          LDA EXP          MULTIPLY
0013 56002 003026          CMA,SSA,INA,SZA  NUMBER BY 10
0014 56003 026006          JMP ++3          UNTIL IT IS
0015 56004 035324          ISZ EXPON          GREATER
0016 56005 025525          JMP MTG1+1      THAN 1
0017 56006 015302          JSB DBY10      DIVIDE BY 10
0018 56007 125524          JMP MTG1,I
0019*
0020*  DIVIDE AN UNPACKED FLOATING POINT NUMBER
0021*  IN MANT1, MANT2 AND EXP BY 10 UNTIL IT IS
0022*  LESS THAN 1
0023*
0024 56010 061324  #DTL1 LDA EXPON
0025 56011 065322  DTL10 LDB EXP          DIVIDE
0026 56012 007004          CMB,INB          NUMBER
0027 56013 006021          SSB,RSS          BY 10
0028 56014 125526          JMP DTL1,I      UNTIL
0029 56015 071324          STA EXPON          IT IS
0030 56016 015302          JSB DBY10      LESS
0031 56017 003400          CCA          THAN
0032 56020 041324          ADA EXPON          1
0033 56021 026011          JMP DTL10

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0035**
0036*** ROUND ASCII NUMBER ***
0037**
0038*
0039* NUMBER STORED ONE ASCII DIGIT PER WORD IN
0040* HOLDING BUFFER. ROUTINE GETS NEXT DIGIT
0041* AND ROUNDS IF IT IS >= 5.
0042* IF THERE IS A CARRY TO AN EXTRA DIGIT AND NO
0043* ROOM EXISTS, EXIT IS TO (P+1). OTHERWISE RETURN
0044* TO (P+2).
0045*
0046 56022 015422 #RUND JSB GETDG GET NEXT DIGIT
0047 56023 040352 ADA .-5 IS IT >= 5 ?
0048 56024 002020 SSA
0049 56025 125530 JMP ROUND,I
0050 56026 003400 CCA DECREMENT HOLD
0051 56027 041726 ADA HBP BUFFER POINTER
0052 56030 164000 ROND1 LDB 0,I LOAD NEXT DIGIT
0053 56031 006004 INB INCREMENT IT
0054 56032 054452 CPB .58 WAS IT A 9 ?
0055 56033 026036 JMP ++3 YES
0056 56034 174000 STB 0,I NO, SAVE IT
0057 56035 125530 JMP ROUND,I AND RETURN
0058 56036 064437 LDB .+60B OVERLAY
0059 56037 174000 STB 0,I A 0
0060 56040 050670 CPA IHB LEADING DIGIT ?
0061 56041 026044 JMP ++3 YES
0062 56042 040356 ADA .-1 NO, DECREMENT POINTER
0063 56043 026030 JMP ROND1
0064 56044 064440 LDB .+61B OVERLAY A
0065 56045 174000 STB 0,I ONE
0066 56046 064437 LDB .+60B LOAD
0067 56047 175726 STB HBP,I EXTRA ZERO
0068 56050 065752 LDB EFLAG FLOATING POINT
0069 56051 006002 SZB SPECIFICATION ?
0070 56052 026056 JMP ROND2 NO
0071 56053 035324 ISZ EXPON INCREMENT EXPONENT
0072 56054 000000 NOP
0073 56055 125530 JMP ROUND,I
0074 56056 007400 ROND2 CCB IS NBLK
0075 56057 045732 ADB NBLK LESS
0076 56060 006020 SSB THAN 1 ?
0077 56061 035530 ISZ ROUND NO, RETURN TO (P+2)
0078 56062 075732 STB NBLK YES, KEEP DECREMENTED VALUE
0079 56063 125530 JMP ROUND,I

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0081**
0082*** OUTPUT BLANKS ***
0083**
0084*
0085* OUTPUTS THE NUMBER OF BLANKS SPECIFIED
0086* BY THE NEGATIVE OF REPT. THE STACK POINTER
0087* IS INCREMENTED AND REPT HAS THE VALUE ZERO
0088* UPON EXIT.
0089*
0090 56064 035755 #OTBL ISZ FSP INCREMENT STACK POINTER
0091 56065 061571 LDA BLANK OUTPUT A
0092 56066 015452 JSB OUTCR BLANK
0093 56067 035774 ISZ REPT REPT USED UP ?
0094 56070 026065 JMP +=3
0095 56071 125532 JMP OUTBL,I
0096*
0097* OUTPUT X=OFF, CARRIAGE RETURN, LINE FEED
0098*
0099 56072 #OTCL EQU *
0100 56072 060402 LDA .+23B
0101 56073 015452 JSB OUTCR
0102 56074 060374 LDA .+15B
0103 56075 015452 JSB OUTCR
0104 56076 060371 LDA .+12B
0105 56077 015452 JSB OUTCR
0106 56100 002400 CLA
0107 56101 071570 STA CHRCT
0108 56102 125534 JMP OUTCL,I

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0110**
0111*** SEARCH FOR A DELIMITING CHARACTER ***
0112**
0113*
0114* BEGINS SEARCH AT CHARACTER DP. WHEN A COMMA
0115* OR SLASH IS FOUND, DP IS SET TO POINT TO THAT
0116* CHARACTER. CHARACTERS ARE COUNTED AND IF THE
0117* END OF THE STRING IS ENCOUNTERED BEFORE A
0118* DELIMITER IS FOUND, A FLAG IS SET
0119*
0120 56103 061747 #DSCH LDA DP SET STRING POINTER TO
0121 56104 071644 STA FST FIRST CHARACTER
0122 56105 103101 CLO DONIT IGNORE BLANKS
0123 56106 015540 SER1 JSB MCHAR GET STRING CHARACTER
0124 56107 050433 CPA ,+54B IS IT A COMMA ?
0125 56110 125536 JMP DSRCH,I YES
0126 56111 050436 CPA ,+57B NO, IS IT A SLASH ?
0127 56112 125536 JMP DSRCH,I YES
0128 56113 050430 CPA ,+51B NO, IS IT A RIGHT PARENTHESIS ?
0129 56114 125536 JMP DSRCH,I YES
0130 56115 035747 ISZ DP NO, INCREMENT DELIMITER POINTER
0131 56116 035743 ISZ CC AND CHARACTER COUNTER
0132 56117 061747 LDA DP
0133 56120 065743 LDB CC
0134 56121 055760 CPB NCH ALL CHARACTERS USED ?
0135 56122 125536 JMP DSRCH,I YES
0136 56123 026106 JMP SER1 NO
0137**
0138*** MASK OUT A CHARACTER ***
0139**
0140*
0141* GET NEXT CHARACTER FROM FORMAT STRING
0142* ADDRESS OF CHARACTER IS IN (A). CHARACTER IS
0143* RETURNED IN (A)
0144*
0145 56124 000065 #MCHR CLE,ERA SHIFT ADDRESS RIGHT
0146 56125 164000 LDB 0,I LOAD WORD FROM STRING
0147 56126 002041 SEZ,RSS HIGH CHARACTER ?
0148 56127 005727 BLF,BLF YES, SWITCH POSITIONS
0149 56130 060001 LDA 1 NO
0150 56131 010500 AND B377 MASK OUT LOW CHARACTER
0151 56132 102301 SOS SHOULD BLANKS BE IGNORED ?
0152 56133 125540 JMP MCHAR,I YES, IS CHARACTER A BLANK ?
0153 56134 051571 CPA BLANK YES
0154 56135 026143 JMP MCHR1 YES
0155 56136 040317 ADA M96 NO
0156 56137 002021 SSA,RSS LOWER CASE?
0157 56140 040450 ADA M32 YES
0158 56141 040470 ADA ,140 NO
0159 56142 125540 JMP MCHAR,I
0160 56143 MCHR1 EQU *
0161 56143 035644 ISZ FST INCREMENT STRING POINTER
0162 56144 061644 LDA FST NEXT CHARACTER
0163 56145 051747 CPA DP A DELIMITER ?
0164 56146 125540 JMP MCHAR,I YES, RETURN
0165 56147 025541 JMP MCHAR+1 IGNORE THE BLANK

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0166**
0167*** EVALUATE EXPRESSION ***
0168**
0169*
0170* EXTRACT THE NEXT VARIABLE TO BE OUTPUT BY THE FORMATTER, IF
0171* NONE FOUND, EXIT TO (P+1). IF A STRING IS FOUND, EXIT TO
0172* (P+2) AFTER PREPARING THE STRING FOR OUTPUT. IF A NUMERIC
0173* QUANTITY IS FOUND, EXIT TO (P+3) WITH THE NUMBER IF (A) AND (B).
0174* EDSTA IS SET TO 0 IF THIS IS THE LAST VARIABLE IN THE STATEMENT.
0175*
0176 56150 #EVEX EQU *
0177 56150 061754 LDA FFLG MAT
0178 56151 002020 SSA PRINT?
0179 56152 026212 JMP EVEX5 YES
0180 56153 065611 EVEX0 LDB TEMP1
0181 56154 055334 CPB PRGCT END OF STATEMENT?
0182 56155 125542 JMP EVEXP,I YES
0183 56156 003400 CCA TURN OFF
0184 56157 071470 STA EOL FUNCTION FLAG
0185 56160 015336 JSB FORMX EVALUATE FORMULA
0186 56161 165332 LDB OPDST,I IS IT A
0187 56162 006020 SSB STRING VARIABLE ?
0188 56163 026177 JMP EVEX3 YES
0189 56164 015376 JSB OPCHK NO, UNSTACK VALUE ADDRESS
0190 56165 035470 ISZ EOL A FUNCTION ?
0191 56166 026153 JMP EVEX0
0192 56167 061611 LDA TEMP1 LAST VARIABLE?
0193 56170 051334 CPA PRGCT
0194 56171 002400 CLA YES
0195 56172 071751 STA EDSTA NO
0196 56173 104200 DLD 1,I NO, LOAD NUMBER
0197 56174 100001
0197 56175 035542 ISZ EVEXP RETURN TO (P+3)
0198 56176 026210 JMP EVEX4
0199 56177 060355 EVEX3 LDA =2 PREPARE
0200 56200 015344 JSB PSTR PRINT
0201 56201 071256 STA TEMP4 STRING
0202 56202 075410 STB TPRME
0203 56203 065611 LDB TEMP1 END OF
0204 56204 055334 CPB PRGCT STATEMENT?
0205 56205 006400 CLB YES
0206 56206 075751 STB EDSTA NO
0207 56207 065410 LDB TPRME
0208 56210 EVEX4 EQU *
0209 56210 035542 ISZ EVEXP RETURN TO
0210 56211 125542 JMP EVEXP,I (P+2)
0211 56212 035470 EVEX5 ISZ ELCNT FINISHED CURRENT MATRIX?
0212 56213 026244 JMP EVEX7 NO
0213 56214 065611 EVEX6 LDB TEMP1 YES
0214 56215 055334 CPB PRGCT END OF STATEMENT?
0215 56216 125542 JMP EVEXP,I YES
0216 56217 161611 LDA TEMP1,I GET NEXT OPERAND
0217 56220 010566 AND OPDMK
0218 56221 002003 SZA,RSS NULL
0219 56222 125542 JMP EVEXP,I YES
0220 56223 002020 SSA NO, FUNCTION?

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0221	56224	026262		JMP EVEX8	YES
0222	56225	001000		ALS	NO, LOAD
0223	56226	041573		ADA SYMTB	BASE ADDRESS
0224	56227	040356		ADA .-1	OF ARRAY
0225	56230	164000		LDB A,I	
0226	56231	044355		ADB .-2	SAVE POINTER TO
0227	56232	075572		STB SBPTR	DYNAMIC DIMENSIONS
0228	56233	015470		JSB VCHK	VALIDATE ARRAY ELEMENTS
0229	56234	161572		LDA SBPTR,I	SET POINTER
0230	56235	035572		ISZ SBPTR	TO FIRST ELEMENT
0231	56236	100200		MPY SBPTR,I	OF ARRAY
		56237			
0232	56240	035572		ISZ SBPTR	WHILE COMPUTING
0233	56241	003004		CMA,INA	NUMBER OF
0234	56242	071470		STA ELCNT	ELEMENTS
0235	56243	035611		ISZ TEMP1	BUMP TO NEXT OPERAND
0236	56244	003400	EVEX7	CCA	LAST
0237	56245	051470		CPA ELCNT	ELEMENT?
0238	56246	002001		RSS	YES
0239	56247	026253		JMP EVEX9	NO
0240	56250	061611		LDA TEMP1	END OF
0241	56251	051334		CPA PRGCT	STATEMENT?
0242	56252	002400		CLA	YES
0243	56253		EVEX9	EQU *	
0244	56253	071751		STA EDSTA	NO
0245	56254	104200		DLD SBPTR,I	GET NUMBER
		56255			
0246	56256	035572		ISZ SBPTR	BUMP TO
0247	56257	035572		ISZ SBPTR	NEXT ELEMENT
0248	56260	035542		ISZ EVEXP	
0249	56261	026210		JMP EVEX4	EXIT
0250	56262	003400	EVEX8	CCA	TURN OFF
0251	56263	071470		STA EOL	FUNCTION FLAG
0252	56264	015336		JSB FORMX	EVALUATE FUNCTION
0253	56265	015376		JSB OpCHK	REMOVE ARGUMENT FROM TEMP STACK
0254	56266	026214		JMP EVEX6	GET NEXT OPERAND
0255*					
0256*					
				MESSAGE BUFFER	
0257*					
0258	56267	000000	MSGHD	BSS MESBN	
0259	56641			BSS 0	
0260*					
0261	56641	020134	RVRSL	ASC 1, \	
0262	56642	160000	TBITS	OCT 160000	
0263	56643	120000	B120K	OCT 120000	
0264	56644	130000	B130K	OCT 130000	
0265	00222		B160K	EQU INI	
0266	56645	000137	BKSPC	OCT 137	
0267	56646	000000	TTA	BSS 1	
0268	56647	000000	TTB	BSS 1	
0269	56650	000000	TTE	BSS 1	
0270	56651	000000	TOG	BSS 1	
0271	56652	000000	TADR	BSS 1	

0273* THE POWER FAIL/RESTART ROUTINE INSURES A LOGICAL SHUTDOWN AND
 0274* RESTART OF THE SYSTEM IN CASE OF POWER FAIL.

0276	56653	000000	POW	NOP	INTERRUPT ENTRY POINT,
0277	56654	102204		SFC 4	TEST FOR FAIL OR RESTART.
0278	56655	026726		JMP POW1	TRANSFER TO RESTART SECTION.
0279*					
0280*					POWER FAIL SECTION.
0281*					
0282	56656	104400		DST POWI	SAVE REGISTERS TEMPORARILY.
	56657	057055			
0283	56660	005520		ERB,BLS	
0284	56661	102201		SOC	
0285	56662	006004		INB	
0286	56663	002400		CLA	IF POWFF WAS NONZERO,
0287	56664	053054		CPA POWFF	INTERRUPT WAS FROM POWER FAIL.
0288	56665	026670		JMP ++3	
0289	56666	073054		STA POWFF	
0290	56667	026724		JMP POW2	
0291*					
0292	56670	062653		LDA POW	TEST FOR INTERRUPT OUT OF
0293	56671	043107		ADA POWD1	RESTART SECTION.
0294	56672	002020		SSA	
0295	56673	026677		JMP ++4	NORMAL FAIL.
0296	56674	043110		ADA POWD2	
0297	56675	002020		SSA	
0298	56676	026724		JMP POW2	FAILED FROM RESTART SECTION.
0299*					
0300	56677	077061		STB POWEO	NORMAL FAILURE--SAVE REGISTERS.
0301	56700	104200		DLD POWI	
	56701	057055			
0302	56702	104400		DST POWAB	
	56703	057057			
0303	56704	062653		LDA POW	
0304	56705	073062		STA POWP	
0305	56706	102501		LIA 01	LOAD AND SAVE
0306	56707	073065		STA POWSW	THE SWITCH REGISTER
0307*					
0308	56710	002400		CLA	GET FLAGS FOR ALL DEVICES THAT
0309*					CAN INTERRUPT.
0310	56711	102211		SFC CH2	CHECK SEND CHANNEL
0311	56712	030361		IOR .+2	BIT 1 FOR CHANNEL 11
0312	56713	102212		SFC ?SC	CHECK FLAG ON CONSOLE TTY.
0313	56714	030363		IOR .+4	BIT 2 FOR TTY
0314	56715	102214		SFC CLOCK	CHECK TIME BASE GENERATOR
0315	56716	030377		IOR .+20B	BIT 4 FOR TIME BASE GENERATOR
0316	56717	073063		STA POWFL	
0317	56720	006400		CLB	
0318	56721	102200		SFC 0	IF INTERRUPT IS SET, STORE
0319	56722	067010		LDB STF0	STF 0 INTO POWND; ELSE NOP.
0320	56723	077052		STB POWND	
0321*					
0322	56724	106704	POW2	CLC 4	SET FOR RESTART.
0323	56725	102036		HLT DEATH+36B	

0325* RESTART SECTION

0327	56726	102704	POW1	STC 4	RESET FOR POWER FAIL,
0328	56727	063065		LDA POWSW	FETCH AND RESTORE
0329	56730	102601		OTA 01	THE SWITCH REGISTER
0330	56731	060366		LDA .+7	INITIALIZE J AS A POWER FAIL POI
0331	56732	073056		STA POWJ	TER AND I AS DMA POINTER,
0332	56733	002004		INA	
0333	56734	073055		STA POWI	
0334	56735	060362		LDA .+3	RESET CLOCK FREQUENCY.
0335	56736	102614		OTA CLOCK	
0336	56737	063063		LDA POWFL	COPY FLAGS.
0337	56740	073064		STA POWF	
0338	56741	066642		LDB TBITS	IF ASR.35 FLAG WAS CLEAR, SET UP
0339	56742	010363		AND .+4	THE CORRECT STATE OF THE ASR35
0340	56743	002003		SZA,RSS	OTHERWISE LEAVE IT SET IN THE
0341	56744	106612		OTB ?SC	INPUT STATE.
0342*					
0343*	NOW TEST THE INDIVIDUAL IO FLAGS, IF A FLAG WAS CLEAR, WE PERFORM				
0344*	A CLF OPERATION, IF IT WAS SET, WE TAKE STRONGER ACTION.				
0345*					
0346	56745	063064	POW4	LDA POWF	GET WORD CONTAINING FLAGS, THE
0347	56746	001300		RAR	ONE TO BE TESTED IS IN BIT 0 AND
0348	56747	073064		STA POWF	I* ITS SELECT CODE.
0349	56750	002020		SSA	
0350	56751	026763		JMP POW5	FLAG SET.
0351*					
0352	56752	063055		LDA POWI	PRODUCE CLF INSTRUCTION.
0353	56753	043012		ADA CLF0	
0354	56754	072755		STA ++1	
0355	56755	000000		NOP	EXECUTE CLF.
0356	56756	063055	POW6	LDA POWI	TEST FOR DONE.
0357	56757	050373		CPA .+14B	CHECK FOR CLOCK LOCATION
0358	56760	027021		JMP POW14	DONE.
0359	56761	037055		ISZ POWI	OTHERWISE, BUMP I AND LOOP.
0360	56762	026745		JMP POW4	
0361*					
0362*	FLAG WAS SET. TEST IF ROUTINE HAD ACTUALLY BEEN				
0363*	ENTERED. IF SO, PERFORM A DUMMY INTERRUPT TO PRE-				
0364*	VENT IT FROM BEING REENTERED.				
0365*					
0366	56763	067066	POW5	LDB POWTB	COMPUTE LOCATION OF RETURN AD-
0367	56764	047056		ADB POWJ	DRESS OF HIGHEST PRIORITY ROU-
0368	56765	164001		LDB 1,I	TINE NOT YET TESTED.
0369	56766	160001		LDA 1,I	GET ITS RETURN ADDRESS
0370	56767	067066		LDB POWTB	
0371	56770	047055		ADB POWI	POINT TO RET.ADR. OF TEST ROUTIN
0372	56771	003000		CMA	TEST FOR INTERRUPT OUT OF THAT
0373	56772	140001		ADA 1,I	ROUTINE.
0374	56773	002021		SSA,RSS	
0375	56774	026756		JMP POW6	NO--INTERRUPT WAS PENDING.
0376	56775	044364	ADB5	ADB .+5	BUMP INDEX REGISTER
0377	56776	140001		ADA 1,I	
0378	56777	002020		SSA	
0379	57000	026756		JMP POW6	NOT INTERRUPTED.
0380*					

```

0381* PERFORM DUMMY INTERRUPT TO PREVENT AN UNWANTED ONE LATER.
0382*
0383 57001 062775 LDA ADB5 PLACE ADB5 IN INTERRUPT CELL
0384 57002 173055 STA POWI,I
0385 57003 063055 LDA POWI
0386 57004 043111 ADA STC0 SET UP STC AND CLC.
0387 57005 073007 STA POWST
0388 57006 020520 XOR B4000 CREATE CLC.
0389 57007 102700 POWST STC 0 SET DEVICE CONTROL
0390 57010 102100 STF0 STF 0 ENABLE INTERRUPT CAUSING ADB5 TO
0391 57011 073013 STA POWCL COMPUTE ADR. OF CORRECT INT. VAL
0392 57012 103100 CLF0 CLF 0 DISABLE INTERRUPT.
0393 57013 106700 POWCL CLC 0 DISABLE DEVICE.
0394 57014 160001 LDA 1,I GET CORRECT INTERRUPT CONTENTS
0395 57015 173055 STA POWI,I STORE IN INTERRUPT CELL.
0396 57016 063055 LDA POWI UPDATE INTERRUPT CHAIN
0397 57017 073056 STA POWJ POINTER.
0398 57020 026756 JMP POW6 GO TEST NEXT DEVICE.
0399*
0400*** HAVE DONE ALL DUMMY INTERRUPTS.
0401*** SET CONTROL ON CLOCK AND TTY.
0402*** AND RESTART INTERCONNECT.
0403*
0404 57021 POW14 EQU *
0405 57021 103710 STC CH1,C RESTART FIRST CHANNEL
0406 57022 060073 LDA SVCH2 PUT WORD BACK OUT ON CH2
0407 57023 102611 OTA CH2
0408 57024 102111 STF CH2
0409 57025 063063 LDA POWFL LOAD FLAG WORD
0410 57026 010361 AND .+2 LEAVE BIT 1
0411 57027 002003 SZA,RSS SKIP IF FLAG SET
0412 57030 103711 STC CH2,C OTHERWISE, TELL OTHER MACHINE
0413 57031 106711 CLC CH2 WANT NO INTERRUPT
0414 57032 102714 STC CLOCK
0415 57033 102712 STC ?SC
0416 57034 062642 LDA TBITS RE-ESTABLISH PREVIOUS
0417 57035 102612 OTA ?SC STATE OF ASR35
0418 57036 037054 ISZ POWFF SET IN CASE OF ANOTHER PF
0419 57037 063112 LDA POWFF GET POINTER TO POWFF
0420 57040 067062 LDB POWP GET POWER FAIL LOCATION
0421 57041 114205 JSB DREDP,I GO DO DISC STUFF
0422 57042 002400 CLA
0423 57043 073054 STA POWFF SAY NOT RESTARTING
0424*** RESTORE REGISTERS.
0425 57044 063061 LDA POWEO 'E' AND OVERFLOW
0426 57045 103101 CLO
0427 57046 000036 SLA,FLA
0428 57047 102101 STO
0429 57050 104200 DLD POWAB
57051 057057
0430*** RESET INTERRUPT SYSTEM TO SAME AS BEFORE FAIL.
0431 57052 000000 POWND NOP OR STF 0.
0432 57053 127062 JMP POWP,I RETURN.
0433 57054 POW40 EQU *
0434*
0435 57054 000000 POWFF NOP SET TO 1 DURING DISC RECALL.

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0436	57055	000000	POWI	BSS	1	POINTER TO DEVICE BEING TESTED.
0437	57056	000000	POWJ	BSS	1	POINTER TO INTERRUPT CHAIN.
0438	57057	000000	POWAB	BSS	2	TEMPS TO HOLD VALUES OF A&B.
0439	57061	000000	POWEO	BSS	1	TEMP TO HOLD VALUE OF E&O.
0440	57062	000000	POWP	BSS	1	TEMP TO HOLD VALUE OF P
0441	57063	000000	POWFL	BSS	1	TEMP TO HOLD STATE OF I/O FLAGS.
0442	57064	000000	POWF	BSS	1	COPY OF POWFL.
0443	57065	000000	POWSW	BSS	1	TEMP TO HOLD SWITCH REGISTER
0444*						
0445	57066	057060	POWTB	DEF	+*6	POINTER TO FOLLOWING TABLE
0446*						
0447*						THIS TABLE POINTS TO THE ENTRY POINTS FOR
0448*						THE INTERRUPT ROUTINES.
0449*						
0450	57067	057062	DEF	POWP		POWER FAIL RTN.ADR.
0451	57070	062025	DEF	R14CM		INTERCONNECT RETURN ADDRESS
0452	57071	062025	DEF	R14CM		
0453	57072	057133	DEF	?TT2		TTY RTN.ADR.
0454	57073	000000	BSS	1		NO INTERRUPT OCCURS ON THIS CHN.
0455	57074	070024	DEF	CLKIN		CLK RTN.ADR.
0456*						
0457*						
0458*						THIS SECTION GIVES THE LENGTH OF EACH ROUTINE
0459*						SO THAT POWER FAIL CAN DETERMINE WHETHER
0460*						THAT ROUTINES INTERRUPT HAD ACTUALLY OCCURRED
0461*						OR WAS STILL PENDING AT THE TIME OF THE POWER FAILURE.
0462*						
0463	57075	000220	ABS	R14ED=R14CM		
0464	57076	000000	ABS	0		NO SUCH ROUTINE
0465	57077	000166	ABS	TTYED=?TT2+1		WITHIN INTERRUPT
0466	57100	000000	BSS	1		NO INTERRUPT OCCURS ON THIS CHN.
0467	57101	000030	ABS	CLKED=CLKIN+1		ROUTINES.
0468*						
0469	57102	114734	JSB	R14DR,I		
0470	57103	102011	HLT	DEATH+11B		
0471	57104	114756	JSB	T35DR,I		
0472	57105	107713	CLC	13B,C		
0473	57106	114630	JSB	CLKDR,I		
0474*						
0475	57107	121052	POWD1	ABS	=POW1	
0476	57110	177652	POWD2	ABS	POW1=POW40	
0477	57111	102700	STC0	STC	0	
0478	57112	057054	POFFP	DEF	POWFF	

0002* THE SYSTEM CONSOLE DRIVER CONTROLS ALL TRANSMISSION OF DATA BETWEEN THE SYSTEM CONSOLE (ASR-35) AND THE SYSTEM. IT HANDLES ALL * IO FOR THE DEVICE AND PROVIDES FOR COMMUNICATION OF MESSAGES TO 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 BEEN RECEIVED. UNTIL IT IS CLEARED BY THE SYSTEM, ALL FURTHER INPUT IS INHIBITED.
 0009*
 0010*
 0011* T35F3: NORMALLY 0, IT IS SET TO =1 WHEN A COMPLETE MESSAGE HAS BEEN RECEIVED. UNTIL IT IS CLEARED BY THE OUTPUT INITIALIZATION SECTION OF THIS DRIVER, LOG AND MESSAGE ENTRIES ARE HELD OFF.
 0012*
 0013*
 0014*
 0015* TOG: NOT USED DURING INPUT. DURING OUTPUT, BIT 0 = 0 IF NEXT CHARACTER IS ON LEFT, 1 IF ON RIGHT.
 0016*
 0017* TADR: NOT USED DURING INPUT. DURING OUTPUT, TADR(14:0) POINTS TO THE WORD FROM WHICH THE NEXT CHARACTER WILL BE TAKEN.
 0018*
 0019* BIT 15=1 FOR PUNCH & PRINT, 0 FOR PRINT ONLY.
 0020* TCNT: DURING INPUT, TCNT=# OF CHARS IN SO FAR. DURING OUTPUT, TCNT(14:0)=# OF CHARS REMAINING TO BE OUTPUT, BIT 15=0 IF A CRLF IS TO BE APPENDED, 1 IF NOT.
 0021*
 0022*
 0023* TBITS: CONTAINS CURRENT CONTROL BITS.
 0024* 120000 => PRINT
 0025* 130000 => PUNCH AND PRINT
 0026* 160000 => INPUT
 0027* TTA,TTB,TTE: USED TO SAVE THE VALUES OF A,B,E REGISTERS DURING INTERRUPTS.
 0028*
 0029*

0030* CALLING SEQUENCE:
 0031* JSR TTY35,I 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	57113	000000	?TT35	NOP	ENTRY POINT FOR OUTPUT.
0038	57114	103100		CLF 0	INHIBIT INTERRUPT.
0039	57115	070074		STA TCNT	SET UP INITIAL PARAMETERS.
0040	57116	076652		STB TADR	
0041	57117	003400		CCA	SET FLAG TO SAY
0042	57120	070311		STA T35F1	OUTPUT.
0043	57121	063113		LDA ?TT35	COPY RETURN ADDRESS INTO THAT OF
0044	57122	073133		STA ?TT2	INTERRUPT SECTION.
0045	57123	002400		CLA	SET TOG TO SAY LEFT HAND CHAR.
0046	57124	072651		STA TOG	
0047	57125	070313		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	57126	102512		LIA ?SC	
0053	57127	002021		SSA,RSS	
0054	57130	027157		JMP TT18	NONE PENDING--GO OUTPUT 1ST CHAR
0055	57131	102100		STF 0	
0056	57132	127113		JMP ?TT35,I	

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0057*
0058* INTERRUPT SECTION
0059*
0060 57133 000000 ?TT2 NOP
0061 57134 072646 STA TTA SAVE REGISTERS.
0062 57135 076647 STB TTB
0063 57136 001500 ERA
0064 57137 072650 STA TTE
0065 57140 060311 LDA T35F1 TEST FLAG TO DETERMINE IF
0066 57141 002003 SZA,RSS INPUT OR OUTPUT.
0067 57142 027235 JMP TT17 INPUT
0068 57143 102512 LIA ?SC LOAD BACK LINE STATUS DURING OUT
0069 57144 064276 LDB T35ST GET CONSOLE STATUS
0070 57145 054362 CPB %OUTW IF OUTPUT WAIT
0071 57146 064300 LDB T35PR USE PRIORITY
0072 57147 007004 CMB,INB
0073 57150 044440 ADB .+XSYNT-.+1+ROS-COM2
0074 57151 006021 SSB,RSS SKIP IF ABORT NOT ALLOWED
0075 57152 050500 CPA B377 CHECK FOR A KEY STRUCK
0076 57153 027157 JMP TT18 NO INPUT, CONTINUE ON
0077 57154 002400 CLA
0078 57155 070312 STA T35F2 CLEAR CONTINUEING OUTPUT FLAG
0079 57156 070276 STA T35ST SET CONSOLE STATUS TO IDLE
0080*
0081 57157 060074 TT18 LDA TCNT GET # OF CHARS LEFT.
0082 57160 001265 RAL,CLE,ERA COPY CRLF BIT INTO E.
0083 57161 002002 SZA ANY CHARS LEFT?
0084 57162 027212 JMP TT5 YES--GO OUTPUT NEXT ONE.
0085 57163 002040 SEZ NO--WANT CRLF?
0086 57164 027176 JMP TT6 NO--GO RESET FOR INPUT.
0087 57165 072651 STA TOG SET UP OUTPUT OF CRLF.
0088 57166 060362 LDA .+3 3 CHARS WITH
0089 57167 031027 IOR BIT15 NO CRLF FOLLOWING.
0090 57170 070074 STA TCNT
0091 57171 062652 LDA TADR KEEP PRINT/PUNCH BIT.
0092 57172 011027 AND BIT15
0093 57173 033321 IOR TTXCP
0094 57174 072652 STA TADR
0095 57175 027157 JMP TT18
0096*
0097* END OF OUTPUT--RESET FOR INPUT.
0098*
0099 57176 070074 TT6 STA TCNT SET COUNTER TO SAY NO CHARS IN.
0100 57177 070311 STA T35F1 SET FLAG TO SAY INPUT.
0101 57200 060222 LDA B160K GET CONTROL BITS FOR INPUT.
0102 57201 072642 STA TBITS SAVE.
0103 57202 102612 TT8 OTA ?SC OUTPUT TO CONSOLE.
0104 57203 062650 TT10 LDA TTE RESTORE REGISTERS.
0105 57204 001600 FLA
0106 57205 062646 LDA TTA
0107 57206 066647 LDB TTB
0108 57207 103712 STC ?SC,C ENABLE DEVICE.
0109 57210 102100 STF 0 ENABLE INTERRUPT.
0110 57211 127133 JMP ?TT2,I EXIT.
0111*
0112* OUTPUT NEXT CHARACTER

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0113*					DECREMENT
0114	57212	003400	TT5	CCA	COUNTER.
0115	57213	040074		ADA TCNT	
0116	57214	070074		STA TCNT	
0117	57215	066652		LDB TADR	GET POINTER TO OUTPUT BUFFER.
0118	57216	062643		LDA B120K	GET BITS FOR PRINT ONLY.
0119	57217	005275		RBL,CLE,SLB,ERB	TEST & CLEAR BIT 15 OF B.
0120	57220	062644		LDA B130K	GET PRINT/PUNCH BITS.
0121	57221	072642		STA TBITS	SAVE CONTROL BITS.
0122	57222	102612		OTA ?SC	OUTPUT TO DEVICE.
0123	57223	160001		LDA 1,I	GET WORD CONTAINING CHARACTER.
0124	57224	066651		LDB TOG	GET LEFT/RIGHT TOGGLE.
0125	57225	004010		SLB	IF RIGHT CHARACTER,
0126	57226	036652		ISZ TADR	BUMP POINTER.
0127	57227	006011		SLB,RSS	IF LEFT CHARACTER,
0128	57230	001727		ALF,ALF	POSITION ON RIGHT.
0129	57231	036651		ISZ TOG	REVERSE TOGGLE SENSE.
0130	57232	010474	TT15	AND B177	KEEP BITS 6-0 AND
0131	57233	030476		IOR B200	SET BIT 7.
0132	57234	027202		JMP TT8	GO OUTPUT CHARACTER.
0133*					
0134*	CHARACTER HAS BEEN INPUT.				
0135*					
0136	57235	060312	TT17	LDA T35F2	IGNORE CHARACTER IF T35F2 IS SET
0137	57236	102401		MIA 1	OR SWITCH 0 IS SET.
0138	57237	000010		SLA	
0139	57240	027203		JMP TT10	GET CHARACTER IN A.
0140	57241	102512		LIA ?SC	
0141	57242	010474		AND B177	
0142	57243	007400		CCB	PREPARE =1 IN B.
0143	57244	050371		CPA .+12B	IGNORE LF, RUBOUT, NULL, XOFF.
0144	57245	027203		JMP TT10	
0145	57246	050474		CPA B177	
0146	57247	027203		JMP TT10	
0147	57250	002002		SZA	
0148	57251	050402		CPA .+23B	
0149	57252	027203		JMP TT10	
0150*					
0151**	TEST FOR 'CONTROL X'				
0152*					
0153	57253	050407		CPA .+30B	
0154	57254	027310		JMP TT11	
0155*					
0156	57255	052645		CPA BKSPC	TEST FOR "+"
0157	57256	027276		JMP TT12	
0158	57257	050374		CPA .+15B	TEST FOR CR.
0159	57260	074312		STB T35F2	SET COMMUNICATION FLAG.
0160	57261	050374		CPA .+15B	
0161	57262	074313		STB T35F3	
0162*					
0163*	NOW INSERT CHARACTER IN BUFFER.				
0164*					
0165	57263	064074		LDB TCNT	GET COUNT IN B.
0166	57264	054466		CPB .72	DON'T IF BUFFER IS FULL
0167	57265	027203		JMP TT10	
0168	57266	004065		CLE,ERB	MOVE LEFT/RIGHT BIT TO E, AND

0169	57267	044303		ADB T35B1	COMPUTE ADDRESS OF DESTINATION.
0170	57270	002041		SEZ,RSS	LEFT/RIGHT TEST.
0171	57271	001737		ALF,SLA,ALF	LEFT.
0172	57272	130001		IOR 1,I	RIGHT.
0173	57273	034074		ISZ TCNT	BUMP COUNTER.
0174	57274	170001	TT16	STA 1,I	STORE IN BUFFER.
0175	57275	027203		JMP TT10	GO EXIT.
0176*					
0177*	HANDLE BACKSPACE.				
0178*					
0179	57276	064074	TT12	LDB TCNT	GET CHARACTER COUNT
0180	57277	006003		SZB,RSS	IGNORE IF NO CHARS YET.
0181	57300	027203		JMP TT10	
0182	57301	044356		ADB ,-1	GET NEW TCNT.
0183	57302	074074		STB TCNT	
0184	57303	004065		CLE,ERB	CLEAR RIGHT HALF OF NEW DESTIN-
0185	57304	044303		ADB T35B1	ATION.
0186	57305	160001		LDA 1,I	
0187	57306	010316		AND HIMSK	
0188	57307	027274		JMP TT16	
0189*					
0190**	HANDLE 'CONTROL X'				
0191*					
0192	57310	074311	TT11	STB T35F1	SET OUTPUT FLAG.
0193	57311	002400		CLA	SET TCNT FOR CRLF AFTER "\".
0194	57312	070074		STA TCNT	
0195	57313	072652		STA TADR	SET FOR NO PUNCHING.
0196	57314	062643		LDA B120K	SET FOR PRINT ONLY.
0197	57315	072642		STA TBITS	
0198	57316	102612		OTA ?SC	
0199	57317	062641		LDA RVRSL	GO OUTPUT "\"
0200	57320	027232	TTYED	JMP TT15	
0201	57321	057322	TTXCP	DEF ++1	
0202	57322	011415		OCT 011415	X-OFF CR
0203	57323	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*	PUALT = 2000	PROGRAM UNALTERED
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* DISC ADDRESS OF THIS USER'S SWAP AREA

0238 00004 ?PROG EQU ?DISC+2

0240* POINTS TO LAST USED WORD OF CORE PROGRAM.

0242 00005 ?ID EQU ?PROG+1

0244* USER ID.

0246 00006 ?NAME EQU ?ID+1

0248* 8 CHAR PROGRAM NAME

0250 00011 ?TIME EQU ?NAME+3

0252* STARTING TIME

0254 00013 ?CLOC EQU ?TIME+2

0256* USER'S TIMEOUT CLOCK.

0258 00014 ?RSTR EQU ?CLOC+1

0260* RESTART ADDRESS FOR SUSPENDED PROGRAMS.

0262	00015	?STAT EQU ?RSTR+1
0264*		USER STATUS--WHEN ON Q INDICATED PROGRAM TYPE;
0265*		WHEN NOT ON Q INDICATED REASON WHY.
0267	00016	?LINK EQU ?STAT+1
0269*		POINTS TO LINK POSITION OF NEXT ENTRY ON QUEUE.
0271	00017	?PLEV EQU ?LINK+1
0273*		FOR PROGRAMS ON Q, CONTAINS PRIORITY LEVEL, FOR
0274*		SUSPENDED PROGRAMS CONTAINS PROGRAM TYPE.
0276	00020	?RTIM EQU ?PLEV+1
0278*		RESPONSE TIME FOR ENTER STATEMENT
0279*		
0280	00021	?TEMP EQU ?RTIM+1
0281*		
0282*		TEMPORARIES FOR LIBRARY ROUTINES

0284	57324	000000	TTY00	OCT 0
0285	57325	000000		OCT 0
0286	57326	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0287	57344	000000		OCT 0,0,0,0
0288*				
0289	57350	000000	TTY01	OCT 0
0290	57351	000400		OCT 400
0291	57352	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0292	57370	000000		OCT 0,0,0,0
0293*				
0294	57374	000000	TTY02	OCT 0
0295	57375	001000		OCT 1000
0296	57376	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0297	57414	000000		OCT 0,0,0,0
0298*				
0299	57420	000000	TTY03	OCT 0
0300	57421	001400		OCT 1400
0301	57422	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0302	57440	000000		OCT 0,0,0,0
0303*				
0304	57444	000000	TTY04	OCT 0
0305	57445	002000		OCT 2000
0306	57446	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0307	57464	000000		OCT 0,0,0,0
0308*				
0309	57470	000000	TTY05	OCT 0
0310	57471	002400		OCT 2400
0311	57472	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0312	57510	000000		OCT 0,0,0,0
0313*				
0314	57514	000000	TTY06	OCT 0
0315	57515	003000		OCT 3000
0316	57516	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0317	57534	000000		OCT 0,0,0,0
0318*				
0319	57540	000000	TTY07	OCT 0
0320	57541	003400		OCT 3400
0321	57542	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0322	57560	000000		OCT 0,0,0,0
0323*				
0324	57564	000000	TTY08	OCT 0
0325	57565	004000		OCT 4000
0326	57566	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0327	57604	000000		OCT 0,0,0,0
0328*				
0329	57610	000000	TTY09	OCT 0
0330	57611	004400		OCT 4400
0331	57612	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0332	57630	000000		OCT 0,0,0,0
0333*				
0334	57634	000000	TTY10	OCT 0
0335	57635	005000		OCT 5000
0336	57636	000000		OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0337	57654	000000		OCT 0,0,0,0
0338*				
0339	57660	000000	TTY11	OCT 0

0340	57661	005400		OCT	5400
0341	57662	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0342	57700	000000		OCT	0,0,0,0
0343*					
0344	57704	000000	TTY12	OCT	0
0345	57705	006000		OCT	6000
0346	57706	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0347	57724	000000		OCT	0,0,0,0
0348*					
0349	57730	000000	TTY13	OCT	0
0350	57731	006400		OCT	6400
0351	57732	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0352	57750	000000		OCT	0,0,0,0
0353*					
0354	57754	000000	TTY14	OCT	0
0355	57755	007000		OCT	7000
0356	57756	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0357	57774	000000		OCT	0,0,0,0
0358*					
0359	60000	000000	TTY15	OCT	0
0360	60001	007400		OCT	7400
0361	60002	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0362	60020	000000		OCT	0,0,0,0
0363*					
0364	60024	000000	TTY16	OCT	0
0365	60025	010000		OCT	10000
0366	60026	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0367	60044	000000		OCT	0,0,0,0
0368*					
0369	60050	000000	TTY17	OCT	0
0370	60051	010400		OCT	10400
0371	60052	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0372	60070	000000		OCT	0,0,0,0
0373*					
0374	60074	000000	TTY18	OCT	0
0375	60075	011000		OCT	11000
0376	60076	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0377	60114	000000		OCT	0,0,0,0
0378*					
0379	60120	000000	TTY19	OCT	0
0380	60121	011400		OCT	11400
0381	60122	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0382	60140	000000		OCT	0,0,0,0
0383*					
0384	60144	000000	TTY20	OCT	0
0385	60145	012000		OCT	12000
0386	60146	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0387	60164	000000		OCT	0,0,0,0
0388*					
0389	60170	000000	TTY21	OCT	0
0390	60171	012400		OCT	12400
0391	60172	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0
0392	60210	000000		OCT	0,0,0,0
0393*					
0394	60214	000000	TTY22	OCT	0
0395	60215	013000		OCT	13000

0396	60216	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0397	60234	000000		OCT	0,0,0,0
0398*					
0399	60240	000000	TTY23	OCT	0
0400	60241	013400		OCT	13400
0401	60242	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0402	60260	000000		OCT	0,0,0,0
0403*					
0404	60264	000000	TTY24	OCT	0
0405	60265	014000		OCT	14000
0406	60266	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0407	60304	000000		OCT	0,0,0,0
0408*					
0409	60310	000000	TTY25	OCT	0
0410	60311	014400		OCT	14400
0411	60312	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0412	60330	000000		OCT	0,0,0,0
0413*					
0414	60334	000000	TTY26	OCT	0
0415	60335	015000		OCT	15000
0416	60336	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0417	60354	000000		OCT	0,0,0,0
0418*					
0419	60360	000000	TTY27	OCT	0
0420	60361	015400		OCT	15400
0421	60362	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0422	60400	000000		OCT	0,0,0,0
0423*					
0424	60404	000000	TTY28	OCT	0
0425	60405	016000		OCT	16000
0426	60406	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0427	60424	000000		OCT	0,0,0,0
0428*					
0429	60430	000000	TTY29	OCT	0
0430	60431	016400		OCT	16400
0431	60432	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0432	60450	000000		OCT	0,0,0,0
0433*					
0434	60454	000000	TTY30	OCT	0
0435	60455	017000		OCT	17000
0436	60456	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0437	60474	000000		OCT	0,0,0,0
0438*					
0439	60500	000000	TTY31	OCT	0
0440	60501	017400		OCT	17400
0441	60502	000000		OCT	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
0442	60520	000000		OCT	0,0,0,0
0443	60524		TTY32	EQU	*

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

0450*

0451**

0452*** JETTISON PORT

0453**

0454*

0455* THIS ROUTINE IS CALLED WHEN A DISC TRANSFER TO OR FROM A
 0456* USER'S SWAP TRACK HAS FAILED. THE ROUTINE SETS THE USER'S
 0457* PORT TO AN UNAVAILABLE STATUS AND CLEARS HIS FUSS TABLE.
 0458* ENTER WITH TTY TABLE ADDRESS IN B.

```

0460 60524 000000 JETPT NOP
0461 60525 064272 LDB MLINK+1 TAKE THIS
0462 60526 076624 STB JETT1 USER OFF
0463 60527 116623 JSB JDEQU,I THE QUEUE
0464 60530 066624 LDB JETT1
0465 60531 044356 ADB .+?STAT=?LINK => STATUS WORD
0466 60532 060353 LDA XPUN SET PORT TO
0467 60533 170001 STA B,I UNAVAILABLE
0468 60534 044347 ADB .+?ID=?STAT
0469 60535 002400 CLA
0470 60536 070255 STA MAIN SAY NOBODY IN CORE
0471 60537 170001 STA B,I CLEAR ID
0472 60540 044352 ADB .+?FLAG=?ID
0473 60541 170001 STA B,I CLEAR FLAGS WORD
0474 60542 060612 LDA M2000 READ IN
0475 60543 070204 STA MWORD THE FUSS TABLE
0476 60544 060666 LDA FUSS
0477 60545 064700 LDB LIBDI
0478 60546 114206 JSB DISCZ,I
0479 60547 017234 JSB SICK IT'S STUCK ON THE DISC: GIVE UP
0480 60550 066624 LDB JETT1 GET TABLE POINTER AGAIN
0481 60551 044342 ADB .+?TNUM=?LINK
0482 60552 160001 LDA B,I GET THE PORT NUMBER
0483 60553 001727 ALF,ALF
0484 60554 072624 STA JETT1 SAVE IT
0485 60555 001720 ALF,ALS TIMES 32
0486 60556 040676 ADA LIBD
0487 60557 072625 STA JETT2
0488 60560 002400 CLA ZERO OUT
0489 60561 064450 LDB M32 THIS CLOD'S PART
0490 60562 172625 STA JETT2,I OF THE FUSS
0491 60563 036625 ISZ JETT2 TABLE
0492 60564 006006 INB,SZB
0493 60565 026562 JMP *-3
0494 60566 060666 LDA FUSS WRITE THE FUSS
0495 60567 064676 LDB LIBD TABLE BACK TO
0496 60570 114206 JSB DISCZ,I THE DISC
0497 60571 017234 JSB SICK DARN, IT'S STUCK IN CORE. CROAK
0498 60572 062624 LDA JETT1 GET PORT NUMBER
0499 60573 017477 JSB TCRIR AND GO INFORM VICTIM
0500*
0501* ALSO INFORM THE SYSTEM OPERATOR WHAT WE'VE DONE.
0502*
0503 60574 103100 CLF 0
0504 60575 114200 JSB GMQBP,I GO GET POINTER TO MESSAGE 0

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0505	60576	126622	JMP JSCH1,I	NO ROOM, SORRY
0506	60577	072625	STA JETT2	SAVE POINTER TO AVAILABLE BUFFER
0507	60600	062624	LDA JETT1	GET PORT NUMBER
0508	60601	006400	CLB	
0509	60602	100400	DIV .+10	CONVERT
0510	60604	001727	ALF,ALF	IT
0511	60605	040001	ADA B	TO
0512	60606	040530	ADA ASC00	ASCII
0513	60607	072634	STA JETNO	INSERT IT INTO THE MESSAGE
0514	60610	062626	LDA JETMS	GET ADDRESS OF
0515	60611	072624	STA JETT1	STUFF TO BE MOVED
0516	60612	064337	LDB .-16	MOVE
0517	60613	162624	JET1 LDA JETT1,I	IT
0518	60614	172625	STA JETT2,I	INTO
0519	60615	036624	ISZ JETT1	THE
0520	60616	036625	ISZ JETT2	MESSAGE
0521	60617	006006	INB, SZB	QUEUE
0522	60620	026613	JMP JET1	BUFFER
0523	60621	126622	JMP JSCH1,I	DONE, RETURN TO SCHEDULAR

0525	60622	070360	JSCH1	DEF	SCH1	
0526	60623	071610	JDEQU	DEF	DEQUE	
0527	60624	000000	JETT1	BSS	1	
0528	60625	000000	JETT2	BSS	1	
0529	60626	060627	JETMS	DEF	*+1	
0530	60627	000036		DEC	30	
0531	60630	006412		OCT	6412	CR LF
0532	60631	050117		ASC	3,PORT #	
0533	60634	000000	JETNO	BSS	1	
0534	60635	020115		ASC	9, MADE UNAVAILABLE.	
0535	60646	006412		OCT	6412	CR LF

0002*
 0003* THE SALVG ROUTINE IS CALLED WHEN A SYSTEM TRACK WITH VITAL
 0004* INFORMATION, SUCH AS A DIRECTORY OR IDT TRACK, CANNOT BE
 0005* WRITTEN BACK TO ITS ASSIGNED DISC ADDRESS, BUT WHEN RECOVERY
 0006* MIGHT BE POSSIBLE IF THE INFORMATION CAN BE SAVED. SALVG
 0007* ASSUMES THE FOLLOWING POINTERS HAVE BEEN SET:
 0008*
 0009* LIBUS = STARTING CORE ADDRESS OF THE TRACK
 0010* MWORD = NEGATIVE LENGTH OF THE TRACK IN CORE
 0011* STDAP = ADDRESS OF A DOUBLE WORD CONTAINING
 0012* THE TRACK'S DISC ADDRESS
 0013*
 0014* SALVG READS THE ADT IN PIECES INTO THE UPPER 2K OF THE USER
 0015* AREA AND SEARCHES FOR AN ENTRY LARGE ENOUGH TO HOLD THE TRACK.
 0016* IF AN ENTRY IS FOUND, THE TRACK IS WRITTEN TO DISC AND ITS NEW
 0017* ADDRESS IS STORED INTO THE DOUBLE WORD LOCATION POINTED TO BY
 0018* STDAP (SYSTEM TABLE DISC ADDRESS POINTER.) THE ADT IS THEN
 0019* UPDATED BY RETURNING SPACE FOR THE OLD TRACK AND CLAIMING SPACE
 0020* FOR THE NEW ONE.
 0021*
 0022* SALVG CALLS CLNOT TO PRINT ANY REMAINING SYSTEM MESSAGES AND
 0023* AN INDICATION OF SALVG'S SUCCESS OR FAILURE, AND THEN HALTS.
 0024* THE THREE POSSIBLE HALTS HAVE THE FOLLOWING MEANINGS:
 0025*
 0026* 32B - RECOVERY POSSIBLE BY BOOTING UP FROM DISC
 0027* 33B - RECOVERY POSSIBLE BY LOADING FROM MAG TAPE
 0028* 34B - RECOVERY IS OUT OF THE QUESTION
 0029*

0031	60647	000000	SALVG	NOP	
0032	60650	002400		CLA	BLOCK
0033	60651	170632		STA DCLC1,I	CLOCK
0034	60652	060077		LDA STDAP	SAVE ADDRESS
0035	60653	073215		STA SALAD	POINTER AND
0036	60654	060204		LDA MWORD	DISC LENGTH OF
0037	60655	073216		STA SALLN	TRACK TO BE SALVAGED
0038	60656	104200		DLD STDAP,I	SAVE DISC ADDRESS
0039	60660	104400		DST SDADR	FOR FADT ROUTINE
0040	60662	060347		LDA .-8	INITIALIZE ADT
0041	60663	073217		STA SCNT1	TRACK COUNTER
0042	60664	063221		LDA SADTP	INITIALIZE ADT
0043	60665	073222	SAL01	STA SADTA	ADDRESS POINTER
0044	60666	040361		ADA .+2	INITIALIZE ADT
0045	60667	073223		STA SADTL	LENGTH POINTER
0046	60670	104200		DLD SADTA,I	INITIALIZE
0047	60672	104400		DST SADA,I	CURRENT DISC
0048	60674	163223		LDA SADTL,I	ADDRESS AND
0049	60675	073227		STA SADL	LENGTH
0050	60676	067227	SAL02	LDB SADL	B = # OF WORDS LEFT
0051	60677	006003		SZB,RSS	ANY MORE ON THIS TRACK?
0052	60700	026744		JMP SAL05	NO
0053	60701	047231		ADB D1536	REDUCE COUNT BY 6 BLOCKS
0054	60702	006020		SSB	ANY LEFT?
0055	60703	026706		JMP SAL03	YES
0056	60704	063227		LDA SADL	NO, GET ORIGINAL LENGTH
0057	60705	006401		CLB,RSS	SET ADJUSTED LENGTH TO ZERO


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0058 60706 063230 SAL03 LDA M1536      MAXIMUM LENGTH FOR READ
0059 60707 070204          STA MWORD      SET DISC LENGTH WORD
0060 60710 077227          STB SADL       SAVE ADJUSTED TRACK LENGTH
0061 60711 007400          CCB          COMPUTE ADT
0062 60712 100400          DIV ,+3        ENTRY COUNT
0063 60714 073220          STA SCNT2      AND SAVE IT
0064 60715 063224          LDA SADA      => DISC ADDRESS
0065 60716 064674          LDB L8192     = CORE ADDRESS
0066 60717 045027          ADB BIT15    ADD READ BIT
0067 60720 114206          JSB DISCZ,I   READ ADT CHUNK
0068 60721 026750          JMP DOOM      DISC FAILURE - FLUSH SYSTEM
0069*
0070**      CHECK ADT FOR A LARGE ENOUGH ENTRY
0071*
0072 60722 064674          LDB L8192     => START OF TABLE
0073 60723 044361 SAL04  ADB ,+2      => LENGTH WORD
0074 60724 160001          LDA B,I       = LENGTH
0075 60725 040450          ADA M32      IS THIS ENTRY LARGE ENOUGH
0076 60726 002021          SSA,RSS      FOR THE SYSTEM TRACK?
0077 60727 026756          JMP SAL06     YES
0078 60730 006004          INB
0079 60731 037220          ISZ SCNT2     NO, ANY ENTRIES LEFT?
0080 60732 026723          JMP SAL04     YES
0081 60733 104200          DLD SADA,I   ADJUST
0082 60735 000040          CLE          DISC
0083 60736 044365          ADB ,+6      ADDRESS
0084 60737 002040          SEZ          FOR NEXT
0085 60740 002004          INA          6 BLOCK
0086 60741 104400          DST SADA,I   CHUNK
0087 60743 026676          JMP SAL02     CHECK NEXT CHUNK
0088*
0089**      ADJUST POINTERS FOR CHECKING NEXT ADT TRACK
0090*
0091 60744 063222 SAL05  LDA SADTA
0092 60745 040362          ADA ,+3
0093 60746 037217          ISZ SCNT1    ANY TRACKS LEFT?
0094 60747 026665          JMP SAL01    YES
0095*
0096**      THIS SYSTEM IS BEYOND HELP
0097*
0098 60750 103100 DOOM  CLF 0
0099 60751 067156          LDB SALFA    GET ADDRESS OF FAILURE MESSAGE
0100 60752 017412          JSB CLNOT    PRINT MESSAGES
0101 60753 062647          LDA SALVG    GET THE CALLING ADDRESS
0102 60754 102034          HLT DEATH+34B EXPIRE
0103 60755 026754          JMP *-1      NO CHANCE!

0105*
0106**      A NEW TRACK HAS BEEN FOUND
0107*
0108 60756 170001 SAL06  STA B,I       UPDATE ENTRY'S LENGTH WORD
0109 60757 044355          ADB , -2     => DISC ADDRESS
0110 60760 077222          STB SADTA    SAVE POINTER
0111 60761 104200          DLD B,I     PUT NEW DISC ADDRESS IN SALVAGED
0112 60763 104400          DST SALAD,I TRACK'S CORE RESIDENT TABLE

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0113	60765	000040	CLE	UPDATE
0114	60766	044417	ADB .+32	ENTRY'S
0115	60767	002040	SEZ	DISC
0116	60770	002004	INA	ADDRESS
0117	60771	104400	DST SADTA,I	WORDS
0118	60773	060204	LDA MWORD	SAVE LENGTH OF ADT CHUNK
0119	60774	073227	STA SADL	THAT ENTRY WAS FOUND ON
0120	60775	063216	LDA SALLN	SET TRANSFER LENGTH OF
0121	60776	070204	STA MWORD	TRACK TO BE SALVAGED
0122	60777	063215	LDA SALAD	=> NEW DISC ADDRESS FOR TRACK
0123	61000	064676	LDB LIBD	=> CORE LOCATION
0124	61001	114206	JSB DISCZ,I	SALVAGE THE TRACK
0125	61002	026750	JMP DOOM	DANG IT! TUBE THIS SYSTEM

0127*
0128** TRACK HAS BEEN SALVAGED - NOW UPDATE ADT

0129*				
0130	61003	063227	LDA SADL	SET TRANSFER LENGTH
0131	61004	070204	STA MWORD	OF UPDATED ADT CHUNK
0132	61005	063224	LDA SADA	=> DISC ADDRESS OF ADT CHUNK
0133	61006	064674	LDB L8192	= CORE ADDRESS
0134	61007	114206	JSB DISCZ,I	WRITE TO DISC
0135	61010	027035	JMP SPSUC	BLEW IT
0136	61011	117232	JSB SFADT,I	FIND ADT OF SALVAGED TRACK
0137	61012	160043	LDA SDLPR,I	SET TRANSFER
0138	61013	070204	STA MWORD	LENGTH WORD
0139	61014	060044	LDA SDAPR	=> ADT DISC ADDRESS
0140	61015	064700	LDB LIBDI	READ IN
0141	61016	114206	JSB DISCZ,I	ADT TRACK
0142	61017	027035	JMP SPSUC	MORE PROBLEMS
0143	61020	060417	LDA .+32	SET AMOUNT TO
0144	61021	070045	STA SDALN	BE RETURNED
0145	61022	117233	JSB SRBAT,I	RETURN THE BLOCKS
0146	61023	060044	LDA SDAPR	WRITE THE
0147	61024	064676	LDB LIBD	UPDATED TRACK
0148	61025	114206	JSB DISCZ,I	TO THE DISC
0149	61026	027035	JMP SPSUC	FOUR OUT OF FIVE AIN'T
0150*				BAD FOR A SICK DISC

0151*
0152** THE ADT HAS BEEN UPDATED

0153*				
0154	61027	103100	CLF 0	
0155	61030	067043	LDB SALSU	LOAD ADDRESS OF COMPLETE SUCCESS
0156	61031	017412	JSB CLNOT	OUTPUT MESSAGES
0157	61032	062647	LDA SALVG	LOAD CALLING ADDRESS
0158	61033	102032	HLT DEATH+32B	KICK OFF
0159	61034	027033	JMP *-1	

0161*
0162** THE ADT COULD NOT BE UPDATED

0163*				
0164	61035	103100	SPSUC CLF 0	
0165	61036	067111	LDB SALPS	LOAD ADDRESS OF PARTIAL SUCCESS
0166	61037	017412	JSB CLNOT	PRINT MESSAGES
0167	61040	062647	LDA SALVG	LOAD CALLING ADDRESS

0168	61041	102033	HLT DEATH+33B DIE	
0169	61042	027041	JMP *-1	
0171	61043	061044	SALSU DEF ++1	
0172	61044	000110	DEC 72	
0173	61045	006412	OCT 6412	
0174	61046	046517	ASC 17, MOVED SYSTEM TRACK.	EMERGENCY DIS
0175	61067	041415	OCT 41415	C=CR
0176	61070	005123	OCT 5123	LF=S
0177	61071	046105	ASC 16, LEEP AND THEN BOOT UP FROM DISC.	
0179	61111	061112	SALPS DEF ++1	
0180	61112	000106	DEC 70	
0181	61113	006412	OCT 6412	
0182	61114	046517	ASC 15, MOVED SYSTEM TRACK.	EMERGENCY
0183	61133	006412	OCT 6412	
0184	61134	046501	ASC 18, MAG TAPE SLEEP AND RELOAD FROM TAPE.	
0186	61156	061157	SALFA DEF ++1	
0187	61157	000072	DEC 58	
0188	61160	006412	OCT 6412	
0189	61161	041501	ASC 12, CAN'T WRITE SYSTEM TRACK	
0190	61175	027015	OCT 27015	.-CR
0191	61176	005122	OCT 5122	LF=R
0192	61177	042503	ASC 14, RECOVERY OUT OF THE QUESTION.	
0194	61215	000000	SALAD BSS 1	=> ADDR. OF TRACK TO BE SALVAGED
0195	61216	000000	SALLN BSS 1	= LENGTH OF TRACK TO BE SALVAGED
0196	61217	000000	SCNT1 OCT 0	
0197	61220	000000	SCNT2 OCT 0	
0198	61221	000116	SADTP DEF ADTAT	=> ADT TABLE
0199	61222	000000	SADTA BSS 1	ADT DISC ADDRESS POINTER
0200	61223	000000	SADTL BSS 1	ADT TRACK LENGTH POINTER
0201	61224	061225	SADA DEF ++1	=> ADDRESS OF CURRENT ADT CHUNK
0202	61225	000000	BSS 2	
0203	61227	000000	SADL BSS 1	= ADT TRACK REMAINDER'S LENGTH
0204	61230	175000	M1536 DEC -1536	
0205	61231	003000	D1536 DEC 1536	
0206	00043		SDLPR EQU LTEMP+11	= DLPTR
0207	00044		SDAPR EQU LTEMP+12	= DAPTR
0208	00045		SDALN EQU LTEMP+13	= DALEN
0209	00046		SDADR EQU LTEMP+14	= DADDR
0210	61232	072357	SFADT DEF FADT	=> FIND ADT ROUTINE
0211	61233	072415	SRBAT DEF RBADT	=> RETURN BLOCK TO ADT ROUTINE

0213* THIS ROUTINE IS CALLED WHEN THE SYSTEM CANNOT CONTINUE
 0214* OPERATING BUT MAY BE ABLE TO BE RESUSCITATED.

```

0216 61234 000000 SICK NOP
0217 61235 103100 CLF 0 DISABLE INTERRUPTS
0218 61236 067243 LDB SICKM GET ADDRESS OF OPTIMISTIC MESSAG
0219 61237 017412 JSB CLNOT GO PRINT MESSAGES
0220 61240 063234 LDA SICK A GETS CALLING ADDRESS
0221 61241 102033 HLT DEATH+33B CROAK
0222 61242 027241 JMP *-1
0223*
0224 61243 061244 SICKM DEF ++1
0225 61244 000073 DEC 59
0226 61245 006412 OCT 6412
0227 61246 041501 ASC 19,CAN'T ACCESS SYSTEM SEGMENT OR TABLE.
0228 61271 020122 ASC 10, RECOVERY POSSIBLE.
    
```

0230* THIS ROUTINE IS CALLED WHEN THE SYSTEM CANNOT CONTINUE
 0231* OPERATING AND HAS ALTERED ITS TABLES IN SUCH A WAY THAT
 0232* THEY CONTAIN CONFLICTING INFORMATION AND RESUSCITATION IS
 0233* IMPOSSIBLE.

```

0235 61303 000000 DEAD NOP
0236 61304 103100 CLF 0 DISABLE INTERRUPTS
0237 61305 067312 LDB DEADM GET ADDRESS OF PESSIMISTIC MESAG
0238 61306 017412 JSB CLNOT GO PRINT MESSAGES
0239 61307 063303 LDA DEAD A GETS CALLING ADDRESS
0240 61310 102034 HLT DEATH+34B PASS AWAY
0241 61311 027310 JMP *-1
0242*
0243 61312 061313 DEADM DEF ++1
0244 61313 000063 DEC 51
0245 61314 006412 OCT 6412
0246 61315 051531 ASC 19,SYSTEM TABLES INCOMPATIBLE. RECOVERY
0247 61340 044515 ASC 6,IMPOSSIBLE.
    
```

0249* THIS ROUTINE IS CALLED WHEN THE SYSTEM HAS BLOWN IT WRITING
 0250* ON THE LOCKED BLOCKS TABLE OF ONE OF THE DISCS. THE SITUATION
 0251* IS SIMILAR TO THOSE WHICH CALL "DEAD", BUT SINCE LOCKED BLOCKS
 0252* TABLES ARE IMMORTAL, THE OPERATOR MUST BE INFORMED THAT ONE
 0253* HAS BEEN DAMAGED.

```

0255 61346 000000 MDEAD NOP
0256 61347 103100 CLF 0 DISABLE INTERRUPTS
0257 61350 067355 LDB MDEDM GET ADDRESS OF WARNING MESSAGE
0258 61351 017412 JSB CLNOT GO PRINT MESSAGES
0259 61352 063346 LDA MDEAD A GETS CALLING ADDRESS
0260 61353 102034 HLT DEATH+34B MUERTO
0261 61354 027353 JMP *-1
0262*
0263 61355 061356 MDEDM DEF ++1
0264 61356 000066 DEC 54
0265 61357 006412 OCT 6412
0266 61360 046117 ASC 16,LOCKED BLOCKS TABLE DESTROYED.
    
```

PAGE 0287 #24 SYSTEM DEATH EMERGENCY TRACK GRABBER

0267 61400 051105

ASC 10, RECOVERY IMPOSSIBLE.

0269* THIS ROUTINE SENDS A SYSTEM DEATH MESSAGE TO THE USERS,
 0270* NEXT, IT COMPLETES ANY OUTPUT WHICH HAS BEEN STARTED
 0271* BY THE SYSTEM CONSOLE DRIVER. IT THEN PRINTS ANY MESSAGES
 0272* REMAINING IN THE MESSAGE BUFFER. IF IT IS ENTERED WITH (B)
 0273* NONZERO, IT WILL LAST PRINT THE ASCII STRING WHOSE LENGTH
 0274* IS POINTED TO BY (B) AND WHICH STARTS IN THE WORD FOLLOWING
 0275* THIS LENGTH.

0277	61412	000000	CLNOT	NOP	
0278	61413	002400		CLA	BLOCK
0279	61414	170632		STA DCLC1,I	CLOCK
0280	61415	077473		STB CLNB	SAVE SPECIAL MESSAGE POINTER
0281	61416	003400		CCA	INFORM USERS OF
0282	61417	017477		JSB TCRIR	SYSTEM DEATH
0283	61420	103100		CLF 0	
0284	61421	060311		LDA T35F1	WAS SYSTEM CONSOLE DRIVER
0285	61422	002021		SSA,RSS	DOING INPUT OR OUTPUT?
0286	61423	027442		JMP CLN1	INPUT, GO CHECK FOR MESSAGES
0287	61424	102312		SFS ?SC	OUTPUT, WAIT FOR CURRENT
0288	61425	027424		JMP *-1	CHARACTER TO BE OUTPUT
0289	61426	163474		LDA CLADR,I	GET CHARACTER POINTER
0290	61427	000066		CLE,ELA	DOUBLE FOR SYCON AND LOSE BIT 15
0291	61430	167475		LDB CLTOG,I	GET LEFT-RIGHT WORD
0292	61431	004010		SLB	WHERE IS NEXT CHARACTER?
0293	61432	002004		INA	ON THE RIGHT: BUMP POINTRE
0294	61433	073723		STA SYCBA	SAVE POINTER FOR SYCON
0295	61434	064074		LDB TCNT	GET REMAINING CHARACTER COUNT
0296	61435	077722		STB SYCCC	AND STORE FOR SYCON
0297	61436	067476		LDB CLN1P	GET RETURN ADDRESS
0298	61437	077656		STB SYCON	AND STORE IN SYCON
0299	61440	163724		LDA SYBIT,I	GET CURRENT OUTPUT CONTROL BITS
0300	61441	027664		JMP SYC3	JUMP INTO MIDDLE OF ROUTINE
0301*					
0302*					COME HERE TO CHECK FOR MORE MESSAGES IN QUEUE
0303*					
0304	61442	003400	CLN1	CCA	ARE THERE MESSAGES
0305	61443	040304		ADA MSQCT	IN THE
0306	61444	050356		CPA ,-1	QUEUE?
0307	61445	027460		JMP CLN2	NO
0308	61446	070304		STA MSQCT	YES, DECREMENT THE COUNT
0309	61447	064305		LDB MSQP1	BUMP POINTER
0310	61450	044426		ADB ,+MESLN	TO NEXT MESSAGE BUFFER
0311	61451	054307		CPB MSQND	WRAP AROUND?
0312	61452	064310		LDB MSQBG	YES
0313	61453	074305		STB MSQP1	SAVE NEW CURRENT MESSAGE POINTER
0314	61454	160001		LDA B,I	GET CHARACTER COUNT INTO A
0315	61455	006004		INB	POINTER TO FIRST WORD INTO B
0316	61456	017656		JSB SYCON	GO OUTPUT IT
0317	61457	027442		JMP CLN1	CHECK FOR MORE
0318*					
0319*					COME HERE TO PRINT FINAL SPECIAL MESSAGE
0320*					
0321	61460	067473	CLN2	LDB CLNB	GET SPECIAL BUFFER POINTER
0322	61461	006003		SZB,RSS	IS THERE A MESSAGE?
0323	61462	027466		JMP CLN3	NO

0324	61463	160001		LDA B,I	YES, GET CHARACTER COUNT
0325	61464	006004		INB	BUMP POINTER TO FIRST MES. WORD
0326	61465	017656		JSB SYCON	GO OUTPUT IT
0327	61466	002400	CLN3	CLA	FINALLY,
0328	61467	017656		JSB SYCON	OUTPUT 3
0329	61470	017656		JSB SYCON	"AGONIZING DEATH"
0330	61471	017656		JSB SYCON	CRLF'S AND
0331	61472	127412		JMP CLNOT,I	RETURN
0332*					
0333*					
0334	61473	000000	CLNB	BSS 1	B REG. SAVE WORD
0335	61474	056652	CLADR	DEF TADR	POINTER TO ?TT35'S CHAR POINTER
0336	61475	056651	CLTOG	DEF TOG	POINTER TO ?TT35'S LEFT-RIGHT WD
0337	61476	061442	CLN1P	DEF CLN1	RETURN ADDRESS FOR FAKE SYCON CL

0339* THIS ROUTINE IS CALLED TO INFORM ALL USERS THAT THE SYSTEM
 0340* IS GOING DOWN BECAUSE OF A HARDWARE FAILURE OR TO INFORM A
 0341* SINGLE USER THAT HIS PORT IS BEING MADE UNAVAILABLE (BECAUSE
 0342* OF A SWAP TRACK ERROR). IT MUST BE ENTERED WITH THE AFFECTED
 0343* PORT NUMBER IN A IN THE LATTER CASE OR WITH A=-1 TO INFORM
 0344* ALL USERS OF SYSTEM DEATH.

0346	61477	000000	TCRIR	NOP	SAVE PORT NUMBER
0347	61500	073647		STA TCRPT	IS THIS A SYSTEM DEATH?
0348	61501	003002		CMA, SZA	NO, GO SET UP FOR 1 PORT NEWS
0349	61502	027511		JMP TCR1	YES, SET FIRST PORT TO ZERO
0350	61503	073647		STA TCRPT	GET COUNT OF PORTS TO GET NEWS
0351	61504	064167		LDB NPORT	AND SET IT INTO TCRPC
0352	61505	077650		STB TCRPC	GET LENGTH OF MESSAGE (CHARS)
0353	61506	060417		LDA .+32	AND POINTER TO MESSAGE
0354	61507	067626		LDB TCRSD	
0355	61510	027515		JMP TCR2	
0356*					
0357	61511	003400	TCR1	CCA	SINGLE PORT BEING ZAPPED
0358	61512	073650		STA TCRPC	SET PORT COUNT TO -1
0359	61513	060424		LDA .+37	GET LENGTH OF MESSAGE
0360	61514	067602		LDB TCRPU	AND POINTER TO IT
0361*					
0362	61515	003000	TCR2	CMA	SAVE -MESSAGE
0363	61516	073651		STA TCRCC	LENGTH=1
0364	61517	004066		CLE, ELB	SAVE MESSAGE
0365	61520	077652		STB TCRBA	BUFFER CHARACTER POINTER
0366*					
0367	61521	060374		LDA .+15B	PRECEDE
0368	61522	017552		JSB TCROT	MESSAGE
0369	61523	060371		LDA .+12B	WITH
0370	61524	017552		JSB TCROT	CR
0371	61525	060371		LDA .+12B	LF
0372	61526	017552		JSB TCROT	LF
0373*					
0374	61527	037651	TCR3	ISZ TCRCC	ARE THERE MORE CHARACTERS?
0375	61530	002001		RSS	YES
0376	61531	027543		JMP TCR4	NO, GO FINISH UP
0377	61532	067652		LDB TCRBA	GET BUFFER POINTER
0378	61533	037652		ISZ TCRBA	BUMP IT
0379	61534	004065		CLE, ERB	CALCULATE WORD ADDRESS
0380	61535	160001		LDA B, I	GET 2 CHARACTERS
0381	61536	002041		SEZ, RSS	WHICH ONE?
0382	61537	001727		ALF, ALF	LEFT ONE: MOVE IT
0383	61540	010474		AND B177	ISOLATE CHARACTER
0384	61541	017552		JSB TCROT	GO SEND IT
0385	61542	027527		JMP TCR3	CHECK FOR MORE
0386*					
0387	61543	060374	TCR4	LDA .+15B	SEND
0388	61544	017552		JSB TCROT	USER(S)
0389	61545	060371		LDA .+12B	FINAL
0390	61546	017552		JSB TCROT	GASP
0391	61547	060371		LDA .+12B	FORM
0392	61550	017552		JSB TCROT	FEEDS
0393	61551	127477		JMP TCRIR, I	

0394*					
0395	61552	000000	TCROT	NOP	COME HERE TO OUTPUT CHAR IN A
0396	61553	073653		STA TCR02	SAVE CHARACTER
0397	61554	063650		LDA TCRPC	SAVE NUMBER
0398	61555	073654		STA TCR03	OF PORTS
0399	61556	063647		LDA TCRPT	AND FIRST
0400	61557	073655		STA TCR04	PORT
0401	61560	063655	TCR5	LDA TCR04	ASK 2114 IF
0402	61561	001727		ALF,ALF	THIS USER'S BUFFER
0403	61562	030240		IOR IBF	IS FULL
0404	61563	114736		JSB S14SC,I	
0405	61564	102311		SFS CH2	
0406	61565	027564		JMP *-1	
0407	61566	102511		LIA CH2	GET RESPONSE
0408	61567	002002		SZA	
0409	61570	027560		JMP TCR5	YES, GO ASK AGAIN
0410	61571	063655		LDA TCR04	NO, GET PORT #
0411	61572	001727		ALF,ALF	
0412	61573	030213		IOR OCR	OUTPUT CODE
0413	61574	033653		IOR TCR02	AND CHARACTER
0414	61575	114736		JSB S14SC,I	GO SEND IT
0415	61576	037655		ISZ TCR04	BUMP PORT NUMBER
0416	61577	037654		ISZ TCR03	OUTPUT TO ANOTHER?
0417	61600	027560		JMP TCR5	YES
0418	61601	127552		JMP TCROT,I	NO, RETURN
0419*					
0420*					
0421	61602	061603	TCRPU	DEF **1	
0422	61603	044101		ASC 19,HARDWARE FAILURE -- PORT UNAVAILABLE.	
0423	61626	061627	TCRSD	DEF **1	
0424	61627	044101		ASC 16,HARDWARE FAILURE -- SYSTEM DOWN.	
0425*					
0426	61647	000000	TCRPT	BSS 1	NUMBER OF FIRST PORT TO GET NEWS
0427	61650	000000	TCRPC	BSS 1	TOTAL # OF PORTS TO RECEIVE NEWS
0428	61651	000000	TCRCC	BSS 1	LENGTH OF MESSAGE
0429	61652	000000	TCRBA	BSS 1	MESSAGE CHARACTER POINTER
0430	61653	000000	TCR02	BSS 1	OUTPUT CHARACTER
0431	61654	000000	TCR03	BSS 1	ROUTINE
0432	61655	000000	TCR04	BSS 1	TEMPS

0434* UPON ENTRY (A) HOLDS THE NUMBER OF CHARACTERS TO BE OUTPUT.
 0435* BIT 15 OF A = 0 FOR X-OFF CR LF AFTER OUTPUT.
 0436* (B) POINTS TO THE FIRST WORD OF THE BUFFER TO BE OUTPUT.

0438	61656	000000	SYCON	NOP	
0439	61657	073722		STA SYCCC	SET CHARACTER COUNT
0440	61660	004066		CLE,ELB	INITIALIZE
0441	61661	077723		STB SYCBA	CHARACTER POINTER
0442	61662	060220		LDA SBP	BITS FOR "PRINT ONLY"
0443	61663	173724		STA SYBIT,I	SAVE THEM
0444	61664	102612	SYC3	OTA ?SC	SEND THEM
0445	61665	063722	SYC1	LDA SYCCC	HAVE ALL CHARACTERS
0446	61666	001265		RAL,CLE,ERA	(COPY CRLF BIT INTO E)
0447	61667	002003		SZA,RSS	BEEN OUTPUT?
0448	61670	027711		JMP SYC2	YES, GO SEE ABOUT CRLF
0449	61671	003400		CCA	NO, DECREMENT
0450	61672	043722		ADA SYCCC	
0451	61673	073722		STA SYCCC	CHARACTER COUNT
0452	61674	067723		LDB SYCBA	COMPUTE
0453	61675	037723		ISZ SYCBA	WORD-CHARACTER
0454	61676	004065		CLE,ERB	ADDRESS
0455	61677	160001		LDA B,I	LOAD WORD
0456	61700	002041		SEZ,RSS	POSITION
0457	61701	001727		ALF,ALF	CHARACTER
0458	61702	010474		AND B177	EXTRACT CHARACTER
0459	61703	030476		IOR B200	ADD IN BIT 7
0460	61704	102612		OTA ?SC	OUTPUT IT
0461	61705	103712		STC ?SC,C	REQUEST CHARACTER TRANSFER
0462	61706	102312		SFS ?SC	WAIT FOR
0463	61707	027706		JMP +-1	COMPLETION FLAG
0464	61710	027665		JMP SYC1	GO DO NEXT CHARACTER
0465*					
0466*					
0467	61711	002040	SYC2	SEZ	WANT CRLF?
0468	61712	127656		JMP SYCON,I	NO, RETURN
0469	61713	060362		LDA ,+3	YES, 3 CHARACTERS
0470	61714	031027		IOR BIT15	WITH NO CRLF
0471	61715	073722		STA SYCCC	FOLLOWING
0472	61716	067725		LDB SYCCL	ADDRESS OF
0473	61717	004066		CLE,ELB	X-OFF CR LF
0474	61720	077723		STB SYCBA	
0475	61721	027665		JMP SYC1	GO OUTPUT THESE
0476*					
0477*					
0478	61722	000000	SYCCC	BSS 1	COUNT OF CHARACTERS TO BE OUTPUT
0479	61723	000000	SYCBA	BSS 1	CURRENT CHARACTER POINTER
0480	61724	056642	SYBIT	DEF TBITS	POINTER TO CURRENT CONTROL BITS
0481	61725	061726	SYCCL	DEF +-1	
0482	61726	011415		OCT 011415	X-OFF CR
0483	61727	005000		OCT 005000	LF
0484				UNS	

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0486*
0487* THESE ROUTINES ARE USED FOR COMMUNICATION BETWEEN THE 2114
0488* AND 2116
0489*
0490* 2116 TO 2114 SEND DRIVER
0491*
0492 62000          ORG 62000B
0493 62000 000000  S14SH NOP
0494 62001 103100  CLF 0
0495 62002 070073  STA SVCH2      SAVE COMMUNICATION
0496 62003 076245  STB SVBC2
0497 62004 164632  LDB DCLC1,I   GET CLOCK WORD
0498 62005 005726  BLF,ELB      IF IT IS A JMP, BIT 12
0499 62006 006400  CLB          WILL BE SET
0500 62007 174632  STB DCLC1,I  BLOCK CLOCK
0501 62010 102100  STF 0
0502 62011 102311  SFS CH2      WAIT FOR ACKNOWLEDGMENT
0503 62012 026011  JMP *-1      OF PREVIOUS TRANSMISSION
0504 62013 102611  OTA CH2      OUTPUT WORD
0505 62014 103711  STC CH2,C    INTERRUPT OTHER MACHINE
0506 62015 106711  CLC CH2
0507 62016 164634  LDB DCLC2,I
0508 62017 103100  CLF 0
0509 62020 002040  SEZ
0510 62021 174632  STB DCLC1,I  UNBLOCK CLOCK UNLESS IT WAS
0511 62022 066245  LDB SVBC2    BLOCKED WHEN WE ENTERED
0512 62023 102100  STF 0
0513 62024 126000  JMP S14SH,I  EXIT
0514*
0515* 2114 TO 2116 RECEIVE DRIVER
0516*
0517 62025 000000  R14CM NOP
0518 62026 070070  STA CMA      SAVE
0519 62027 074071  STB CMB
0520 62030 001520  ERA,ALS     A,B,E
0521 62031 102201  SOC
0522 62032 002004  INA        AND OVERFLOW
0523 62033 070072  STA CME
0524 62034 102510  LIA CH1     LOAD REQUEST WORD
0525 62035 001723  ALF,RAR    OP CODE IN BITS 2-0.
0526 62036 010366  AND .+7    MASK TO THREE BITS
0527 62037 042041  ADA CMTBL  ADD ON DECODE TABLE POINTER
0528 62040 124000  JMP 0,I    BRANCH TO APPROPRIATE ROUTINE
0529*
0530 62041 162042  CMTBL DEF ++1,I
0531 62042 062062  DEF HVL
0532 62043 062077  DEF ABR
0533 62044 062145  DEF BFL
0534 62045 062154  DEF BFE
0535 62046 062166  DEF ETO
0536 62047 062204  DEF UHU
0537 62050 062052  DEF R14RT
0538 62051 062052  DEF R14RT

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0540*
0541* ALWAYS RETURNS HERE
0542*
0543 62052 060072 R14RT LDA CME RESTORE
0544 62053 103101 CLO
0545 62054 000036 SLA,ELA A,B,E
0546 62055 102101 STO
0547 62056 060070 LDA CMA AND OVERFLOW
0548 62057 064071 LDB CMB
0549 62060 103710 STC CH1,C ACKNOWLEDGE RECEIPT
0550 62061 126025 JMP R14CM,I EXIT
0551*
0552* 2114 HAS A LINE
0553*
0554 62062 016227 HVL JSB FDTTY B=> FIRST WORD OF TTY TABLE
0555 62063 002002 SZA SKIP IF STATUS IS IDLE.
0556 62064 050361 CPA %INPT NO SKIP IF INPUT WAIT
0557 62065 002001 RSS IDLE OR WAITING FOR INPUT
0558 62066 026052 JMP R14RT IGNORE
0559 62067 160001 LDA 1,I SET 2114
0560 62070 030462 IOR COM14 COMMUNICATION
0561 62071 170001 STA 1,I BIT
0562 62072 102510 LIA CH1 STORE RESPONSE
0563 62073 010500 AND B377 TIME IN TTY
0564 62074 044377 ADB ,+?RTIM TABLE (=0 IF NO
0565 62075 170001 STA 1,I ENTER TIMING)
0566 62076 026052 JMP R14RT RETURN TO 2114 DRIVER
0567*
0568* USER'S ABORT REQUEST
0569*
0570 62077 016227 ABR JSB FDTTY B=> FIRST WORD OF TTY TABLE
0571 62100 160001 LDA 1,I
0572 62101 010524 AND B30M
0573 62102 050600 CPA PBFLG CBFLG=0 AND PBFLG=1?
0574 62103 026052 JMP R14RT YES, ABORT NOT ALLOWED†
0575 62104 160001 LDA B,I NO, ABORT POSSIBLE†
0576 62105 010377 AND UNABT UNABLE TO
0577 62106 002003 SZA,RSS ABORT?
0578 62107 026114 JMP ABR1 NO
0579 62110 160001 LDA 1,I
0580 62111 030476 IOR ABTRY DELAY ABORT
0581 62112 170001 STA 1,I ATTEMPT
0582 62113 026052 JMP R14RT RETURN TO 2114 DRIVER
0583 62114 ABR1 EQU *
0584 62114 044374 ADB ,+?STAT B => STATUS
0585 62115 160001 LDA 1,I A = STATUS
0586 62116 050363 CPA %SYNT CHECK FOR SYNTAX.
0587 62117 026052 JMP R14RT CAN'T ABORT OUT OF SYNTAX.
0588 62120 040344 ADA ,+.-%SYNT-1-COM3+COM2
0589 62121 002020 SSA SKIP IF LIBRARY PROGRAM.
0590 62122 026135 JMP ABR2 OTHERWISE ABORT ALWAYS ALLOWED.
0591 62123 060412 LDA ,+%SYNT-.,+1+CAT-COM2
0592 62124 003004 CMA,INA ABORTABLE
0593 62125 140001 ADA B,I LIBRARY
0594 62126 002020 SSA PROGRAM?
0595 62127 026052 JMP R14RT NO

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0596	62130	160001		LDA B,I	MAYBE
0597	62131	003004		CMA,INA	
0598	62132	040420		ADA .+XSYNT-.+1+STA-COM2	
0599	62133	002020		SSA	
0600	62134	026052		JMP R14RT	NO
0601	62135		ABR2	EQU *	
0602	62135	044342		ADB .-?STAT	B => FLAGS
0603	62136	160001		LDA 1,I	SET 2114
0604	62137	030462		IOR COM14	COMMUNICATIONS
0605	62140	170001		STA 1,I	BIT
0606	62141	044374		ADB .+?STAT	SET
0607	62142	003400		CCA	STATUS TO
0608	62143	170001		STA 1,I	ABORTING
0609	62144	026052		JMP R14RT	RETRUN TO 2114 DRIVER
0610*					
0611*	BUFFER IS FULL				
0612*					
0613	62145	016227	BFL	JSB FDTTY	B => FIRST WORD OF TTY TABLE
0614	62146	050362		CPA XOUTW	IGNORE IF
0615	62147	026052		JMP R14RT	ALREADY OUTPUT WAIT
0616	62150	160001		LDA 1,I	SET
0617	62151	030417		IOR OUTWT	OUTPUT
0618	62152	170001		STA 1,I	WAIT BIT
0619	62153	026052		JMP R14RT	RETURN TO 2114 DRIVER
0620*					
0621*					
0622*	BUFFER IS EMPTY AGAIN				
0623*					
0624	62154	016227	BFE	JSB FDTTY	B=> FIRST WORD OF TTY TABLE
0625	62155	050362		CPA XOUTW	CHECK FOR STATUS OUTPUT WAIT
0626	62156	003701		CCA,CCE,RSS	A ← -1, E ← 1
0627	62157	003500		CCA,CLE	A ← -1, E ← 0
0628	62160	020417		XOR OUTWT	CLEAR OUTPUT
0629	62161	110001		AND 1,I	WAIT BIT
0630	62162	002040		SEZ	IF STATUS # XOUTW, THEN DONIT
0631	62163	030462		IOR COM14	SET 2114
0632	62164	170001		STA 1,I	COMMUNICATIONS BIT
0633	62165	026052		JMP R14RT	RETURN TO 2114 DRIVER
0634*	ENTER STATEMENT TIMED OUT				
0635*					
0636	62166	016227	ETO	JSB FDTTY	B=> FIRST WORD OF TTY TABLE
0637	62167	044373		ADB .+?RSTR	B => RESTART ADDRESS
0638	62170	160001		LDA 1,I	A * RESTART ADDRESS
0639	62171	052246		CPA DENRT	WAITING FOR ENTER?
0640	62172	002001		RSS	YES, SET COM BIT.
0641	62173	026052		JMP R14RT	NO, MUST BE MISTAKE.
0642	62174	044343		ADB .-?RSTR	
0643	62175	160001		LDA 1,I	SET 2114
0644	62176	030462		IOR COM14	COMMUNICATIONS
0645	62177	170001		STA 1,I	BIT
0646	62200	044374		ADB .+?STAT	SET
0647	62201	060354		LDA XENTO	STATUS TO
0648	62202	170001		STA 1,I	ENTER TIMEOUT
0649	62203	026052		JMP R14RT	RETURN TO 2114 DRIVER

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0651*
0652**      USER HUNG UP
0653*
0654  62204 016227  UHU   JSB FDTTY      A = USER'S STATUS
0655  62205 044375          ADB .+?LINK
0656  62206 050363          CPA %SYNT      CAN'T DISCONNECT
0657  62207 026213          JMP UHU1       OUT OF SYNTAX
0658  62210 040344          ADA .+.-%SYNT-1-COM3+COM2
0659  62211 002020          SSA           LIBRARY PROGRAM RUNNING?
0660  62212 026215          JMP UHU2       NO
0661  62213 054272  UHU1  CPB MLINK+1  YES, IS USER HEAD OF QUEUE?
0662  62214 026225          JMP UHU3       YES
0663  62215 044356  UHU2  ADB .+?STAT-?LINK NO
0664  62216 060355          LDA %DISC     SET STATUS
0665  62217 170001          STA B,I      TO DISCONNECT
0666  62220 044342          ADB .+?FLAG-?STAT
0667  62221 160001          LDA B,I      SET I/O
0668  62222 030462          IOR COM14    COMMUNICATIONS
0669  62223 170001          STA B,I      BIT
0670  62224 026052          JMP R14RT    RETURN

0671*
0672  62225 074260  UHU3  STB HQDIS    SET DISCONNECT FLAG
0673  62226 026052          JMP R14RT

0674**
0675* FIND FIRST WORD OF TTY TABLE *
0676**
0677* EXIT WITH (B) => FIRST WORD OF TELETYPE TABLE
0678*      (A) = USERS STATUS
0679*
0680  62227 000000  FDTTY NOP
0681  62230 102510          LIA CH1      LOAD REQUEST WORD
0682  62231 001727          ALF,ALF     TTY# IN 4=0
0683  62232 010416          AND .+37B   MASK TO 5 BITS
0684  62233 100200          MPY .+TTY01-TTY00

0685  62235 064000          LDB 0        COMPUT LOCATION
0686  62236 044644          ADB DTTY0   OF FLAG WORD
0687  62237 060001          LDA 1       A => FLAGS
0688  62240 040374          ADA .+?STAT A => STATUS
0689  62241 160000          LDA 0,I    A = STATUS
0690  62242 050353          CPA %PUN    CHECK FOR PORT UNAVAILABLE
0691  62243 026052          JMP R14RT  IGNORE IF 90
0692  62244 126227          JMP FDTTY,I
0693  62245          R14ED EQU *
0694  62245 000000  SVBC2 BSS 1
0695  62246 041235  DENRT DEF ENTRT  WHERE ENTER WAITS.

0696*
0697* ROUTINE TO CLEAR PBFLG & CBFLG BITS AND TO TELL
0698* THE OTHER MACHINE ABOUT THE ABORT.
0699*
0700  62247 000000  TRNOF NOP
0701  62250 044342          ADB .-?STAT B=> ?FLAG
0702  62251 103100          CLF 0
0703  62252 060524          LDA B30M    CLEAR PBFLG & CBFLG
0704  62253 003000          CMA        BITS.
0705  62254 110001          AND B,I

```

0706 62255 170001
0707 62256 006004
0708 62257 160001
0709 62260 030251
0710 62261 114736
0711 62262 126247
0712*
0713*

STA B,I
INB
LDA B,I
IOR ABT
JSB S14SC,I
JMP TRNOF,I

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

0002	70000		ORG	70000B
0003	70000	000140	B140	OCT 140
0004	70001	177720	M60B	OCT -60
0005	70002	177737	M41B	OCT -41
0006	70003	177645	M133B	OCT -133
0007	70004	106051	MCOM2	ABS -COM2
0008	70005	071540	M36K	ABS -30000-6000
0009	70006	047040	ASCIN	ASC 1,N
0010	70007	043106	ASCFF	ASC 1,FF
0011	70010	020100	ASCBA	ASC 1, *
0012	70011	030040	ASC0B	ASC 1,0
0013	70012	072037	DCOM6	DEF COM6
0014	70013	057324	TTYCK	ABS TTY00
0015	70014	000000	OUTM1	BSS 1
0016	70015	177776	X	OCT -2
0017	70016	000000	CTEMP	BSS 1
0018	70017	000000	SMAIN	OCT 0
0019	70020	000000	FMAIN	OCT 0
0020	70021	072024	XCOM5	DEF COM5-2
0021	70022	074252	INSQA	DEF INSEQ
0022	70023	062247	TRNFP	DEF TRNOF

TEMPS USED BY OUTCH ROUTINE,

CURRENT SWAPR DRUM TRANSFER FLAG
 OLD TOP OF Q FLAGS POINTER

0024* THE CLOCK DRIVER IS THE CENTRAL POINT THROUGH WHICH CONTROL IS
 0025* PASSED TO THE SCHEDULER. ENTRY COMES TO THE DRIVER WHENEVER THE
 0026* CLOCK (REAL TIME SCALAR) INTERRUPTS. THIS EVENT OCCURS EVERY
 0027* 100 MS. BESIDES GIVING CONTROL TO THE SCHEDULER, THE CLOCK
 0028* DRIVER ALSO HAS THE TASK OF UPDATING THE TIME OF DAY CLOCK.
 0029* THIS CLOCK IS A TWO WORD ENTRY WHOSE VALUE IS AS FOLLOWS:
 0030* DATIM=24*DAY+HOUR
 0031* DATIM+1=600*MIN+10*SEC+36000

0033	70024	000000	CLKIN	NOP	ENTRY POINT.
0034	70025	072016		STA CTEMP	SAVE A.
0035	70026	034172		ISZ DATIM+1	BUMP 100MS COUNTER
0036	70027	026034		JMP CLC0	NO PROBLEM IF NO SKIP
0037	70030	062005		LDA M36K	RESET 100MS COUNTER.
0038	70031	070172		STA DATIM+1	
0039	70032	034171		ISZ DATIM	BUMP HR COUNTER.
0040	70033	000000		NOP	JUST IN CASE.
0041	70034	036015	CLC0	ISZ X	ENTER SCHEDULER THIS TIME?
0042	70035	026042		JMP CLC1+1	NO
0043	70036	060355		LDA ,-2	YES, RESET
0044	70037	072015		STA X	RESET SKIP WORD
0045	70040	062016		LDA CTEMP	RESET A

0047* THE NEXT INSTRUCTION IS NORMALLY A JMP. WHEN THE
 0048* SCHEDULER IS RUNNING, HOWEVER, IT PREVENTS ITSELF
 0049* FROM BEING REENTERED BY INSERTING A NOP.

0051	70041	000000	CLC1	NOP	
0052	70042	062016		LDA CTEMP	RESET A
0053	70043	103114		CLF CLOCK	ALLOW ANOTHER CLOCK INTERRUPT.
0054	70044	126024		JMP CLKIN,I	RETURN.
0056	70045	026046	CLC2	JMP SCHED	USED TO INSERT IN CLC1.

0058* THE SCHEDULER SECTION OF TSB DETERMINES WHICH
 0059* PROGRAM IS TO RUN NEXT. FIRST IT CLEARS CLC1,
 0060* ALLOWING THE CLOCK TO CONTINUE INTERRUPTING.

0062	70046	071224	SCHED	STA AREG	SAVE A-REGISTER.
0063	70047	002400		CLA	INSERT NOP IN CLC1 TO PREVENT
0064	70050	072041		STA CLC1	REENTERING SCHED.
0065	70051	062024		LDA CLKIN	SAVE THE PROGRAM COUNTER
0066	70052	071227		STA PREG	ALSO.
0067	70053	103114	CLKED	CLF CLOCK	NOW LET THE CLOCK IN AGAIN.
0068	70054	075225		STB BREG	SAVE B REGISTER,
0069	70055	001520		ERA,ALS	E-REGISTER,
0070	70056	102201		SOC	AND OVERFLOW REGISTER.
0071	70057	002004		INA	
0072	70060	071226		STA EREG	
0073	70061	064272		LDB MLINK+1	GET POINTER
0074	70062	044341		ADB ,-?LINK	
0075	70063	076020		STB FMAIN	TO FLAG WORD

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0076 70064 060262          LDA TIMEF          GET TIMER FLAG.
0077 70065 002002          SZA                IF 0, THIS IS NOT A TIMED PROG.
0078 70066 134057          ISZ TIMER,I        IF NOT 0, BUMP TIMER.
0079 70067 026360          JMP SCH1            IF NOT OUT OF TIME, SKIP
                                                ROTATING THE RUN QUEUE
0080*
0081*
0082*
0083*
0084*
0085*
0086*
0087*
0088 70070 064272          LDB MLINK+1        GET THE ADDRESS OF PRIORITY
0089 70071 006004          INB                FOR THE CURRENT PROGRAM.
0090 70072 060363          LDA .+4            SET IT TO LOW PRIORITY.
0091 70073 170001          STA 1,I
0092 70074 044356          ADB .+?LINK-?PLEV
0093 70075 160001          LDA 1,I            GET THE LINK FROM THE CURRENT
0094 70076 070272          STA MLINK+1        PROGRAM AND STORE IT IN MLINK+1
0095 70077 116022          SCH3 JSB INSQL,I    INSERT USER IN QUEUE
0096 70100 017251          JSB SWAPR          START EARLY SWAPPING
0097 70101 026360          JMP SCH1            CHECK FOR COMMUNICATION
0098*
                                                FROM I/O PROCESSOR

0100*
0101**          TEST FOR ANY TTY35 BUSINESS
0102*
0103 70102          SCHS1 EQU *          JUST FINISHED CHECKING TTYS
0104 70102 064644          LDB DTTY0          REINITIALIZE
0105 70103 076013          STB TTYCK          POINTER
0106 70104 003400          SCH5 CCA           TEST FOR DRIVER BUSY
0107 70105 050311          CPA T35F1
0108 70106 026271          JMP SCH15          DRIVER IS BUSY.
0109 70107 050313          CPA T35F3
0110 70110 026222          JMP SCH16          COMMAND ENTERED BUT NOT STARTED
0111*
0112*          WHEN T35F1=0, THE CONSOLE IS QUIET SO WE CAN DO LOGGING.
0113*
0114 70111 040304          ADA MSQCT          TEST FOR ANY ENTRIES ON MESSAGE
0115 70112 050356          CPA .-1
0116 70113 026126          JMP SCH52          MESSAGE QUEUE EMPTY
0117*
0118*          OUTPUT AN ELEMENT OF THE MESSAGE QUEUE
0119*
0120 70114 070304          STA MSQCT          DECREMENT MESSAGE COUNTER
0121 70115 064305          LDB MSQP1          ADVANCE MESSAGE POINTER
0122 70116 044426          ADB .+MESLN
0123 70117 054307          CPB MSGND          IF AT END OF BUFFER
0124 70120 064310          LDB MSQBG          THEN WRAP AROUND
0125 70121 074305          STB MSQP1          SET UP NEW ADDRESS
0126 70122 160001          LDA B,I            GET ADDRESS AND
0127 70123 006004          INB                LENGTH OF MESSAGE
0128 70124 114760          JSB TTY35,I        AND OUTPUT IT
0129 70125 026271          JMP SCH15
0130*
0131 70126          SCH52 EQU *

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0132	70126	040772	ADA	LOGCT	TEST FOR ANY ENTRIES IN LOGTABLE
0133	70127	050356	CPA	.-1	
0134	70130	026222	JMP	SCH16	LOG TABLE IS EMPTY.
0135*					
0136*		SET UP LOG BUFFER			
0137*					
0138	70131	070772	STA	LOGCT	DECREMENT LOG COUNTER.
0139	70132	060706	LDA	LOGP1	BUMP LOG POINTER
0140	70133	002004	INA		
0141	70134	050704	CPA	LOGND	IF AT END,
0142	70135	060702	LDA	LOGBG	WRAP AROUND.
0143	70136	070706	STA	LOGP1	
0144	70137	160706	LDA	LOGP1,I	TEST FOR LOGON
0145	70140	066006	LDB	ASCIN	OR LOGOUT.
0146	70141	002020	SSA		
0147	70142	066007	LDB	ASCFF	
0148	70143	076212	STB	LOGBF+3	
0149	70144	101052	LSR	10	SHIFT LOG CHAR TO LEAST 5 BITS.
0150	70145	010416	AND	.+37B	MASK OFF OTHER STUFF.
0151	70146	042010	ADA	ASCBA	CONVERT TO ASCII.
0152	70147	072213	STA	LOGBF+4	
0153	70150	160706	LDA	LOGP1,I	GET ACCOUNT NUMBER AGAIN.
0154	70151	010512	AND	B1777	KEEP ONLY # PART.
0155	70152	006400	CLB		
0156	70153	100400	DIV	.+10	GET 1ST 2 DIGITS IN A, LAST IN B
	70154	000371			
0157	70155	005727	BLF	BLF	SET UP LAST DIGIT AS
0158	70156	046011	ADB	ASC0B	ASCII LEFT HALF.
0159	70157	076215	STB	LOGBF+6	
0160	70160	017063	JSB	#LTEN	CONVERT FIRST 2 TO ASCII ALSO
0161	70161	072214	STA	LOGBF+5	
0162	70162	034706	ISZ	LOGP1	
0163	70163	160706	LDA	LOGP1,I	NOW GET THE TIME.
0164	70164	010416	AND	.+37B	GET TERMINAL NUMBER
0165	70165	017063	JSB	#LTEN	CONVERT AND STORE IN BUFFER.
0166	70166	072221	STA	LOGBF+10	
0167	70167	160706	LDA	LOGP1,I	
0168	70170	006400	CLB		
0169	70171	101025	ASR	5	
0170	70172	100400	DIV	D60	
	70173	000456			
0171	70174	174706	STB	LOGP1,I	SAVE SECOND HALF
0172	70175	017063	JSB	#LTEN	CONVERT FIRST HALF TO ASCII.
0173	70176	072216	STA	LOGBF+7	
0174	70177	160706	LDA	LOGP1,I	
0175	70200	017063	JSB	#LTEN	CONVERT 2ND HALF TO ASCII.
0176	70201	072217	STA	LOGBF+8	
0177	70202	060405	LDA	.+22	
0178	70203	066206	LDB	LOGR2	TO PRINT THE
0179	70204	114760	SCH21 JSB	TTY35,I	STUFF.
0180	70205	026271	JMP	SCH15	
0182			SUP		
0183	70206	170207	LOGR2	DEF *+1,I	BUFFER ADDRESS (I=>PUNCH)
0184	70207	025052	LOGBF	ASC 11,**LOGOFF	A123 0930 #01
0185			UNS		

```

0187*
0188**      TTY35 I/O COMPLETE
0189*
0190  70222 050312 SCH16 CPA T35F2      TEST DRIVER COMMUNICATE FLAG.
0191  70223 002001          RSS
0192  70224 026271          JMP SCH15
0193  70225 060276          LDA T35ST      GET CONSOLE STATUS.
0194  70226 064300          LDB T35PR
0195  70227 050362          CPA %OUTW      IF OUTPUT WAIT,
0196  70230 026254          JMP SCH23      GO SET HIM UP.
0197  70231 002002          SZA          IF NOT IDLE WEVE ALREADY
0198  70232 026271          JMP SCH15      QUEUED HIM.
0199*
0200*      TTY35 INPUT COMMAND
0201*
0202  70233 060301          LDA T35B2      POINTER TO FIRST CHARACTER
0203  70234 070060          STA SBHED      OF CONSOLE BUFFER.
0204  70235 060302          LDA T35ND      POINTER TO END OF
0205  70236 070061          STA SCHL      CONSOLE BUFFER.
0206  70237 060417          LDA .+40B     INITIALIZE COMMAND
0207  70240 070064          STA SCHP      HOLDER.
0208  70241 017111          JSB SCOM      GET COMMAND.
0209  70242 026262          JMP SCH17     BLANK LINE
0210  70243 026264          JMP SCH18     ERROR
0211  70244 026264          JMP SCH18     ERROR
0212*
0213* SET UP QUEUE ENTRY FOR CONSOLE.
0214*
0215  70245 060060          LDA SBHED      SET POINTER FOR
0216  70246 070054          STA T35CP     T35CR.
0217  70247 060417          LDA .+40B     SET UP THE LAST
0218  70250 070055          STA T35LC     CHARACTER AS A BLANK
0219  70251 060606          LDA #LIB#     SET RESTART ADDRESS.
0220  70252 070275          STA T35RS
0221  70253 046261          ADB SCH19     SET PROGRAM STATUS
0222  70254 074276 SCH23 STB T35ST     TYPE.
0223  70255 060361          LDA .+2       SET PRIORITY.
0224  70256 070300          STA T35PR
0225  70257 064263          LDB T35LN     GO INSERT IN QUEUE
0226  70260 026077          JMP SCH3
0227  70261 106056 SCH19 ABS -COM2+%SYNT-.+1
0229  70262 060722 SCH17 LDA ONEI      OUTPUT LINE FEED
0230  70263 002001          RSS
0231  70264 060363 SCH18 LDA .+4       OUTPUT ERROR MESSAGE
0232  70265 006400          CLB
0233  70266 074312          STB T35F2
0234  70267 064636          LDB DEH
0235  70270 026204          JMP SCH21

```

0237*
 0238*
 0239*
 0240*
 0241*
 0242*

70271 017251 SCH15 JSB SWAPR

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.

0244*
 0245*
 0246*
 0247*

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.

0249	70272	103100	CLF 0	INHIBIT INTERRUPT.
0250	70273	062045	LDA CLC2	RESTORE A <JMP SCHED> IN THE
0251	70274	072041	STA CLC1	CLOCK INTERRUPT ROUTINE.
0252	70275	060272	LDA MLINK+1	GET THE STATUS
0253	70276	040356	ADA .+?STAT=?LINK	OF THIS PROGRAM
0254	70277	164000	LDB A,I	AND CHECK TO SEE
0255	70300	044344	ADB .+.-XSYNT+COM2-COM3-1	IF IT IS TYPE III
0256	70301	040361	ADA .+?PLEV=?STAT	
0257	70302	006020	SSB	
0258	70303	026306	JMP SCH2	NOT TYPE III
0259	70304	006400	CLB	IT IS, SO SET THIS
0260	70305	174000	STB A,I	USER'S PRIORITY TO ZERO
0261	70306	040354	ADA .+?RSTR=?PLEV	GET RESTART ADDRESS
0262	70307	164000	LDB 0,I	IF NOT 0, PUT IT IN PREG
0263	70310	006002	SZB	TO START UP PROPERLY.
0264	70311	075227	STB PREG	
0265	70312	006400	CLB	PUT 0 INTO TABLE IN ANY CASE
0266	70313	174000	STB 0,I	
0267	70314	074262	STB TIMEF	SET TO SAY NO TIMING.
0268	70315	002004	INA	GET PROGRAM STATUS.
0269	70316	164000	LDB 0,I	
0270	70317	040355	ADA .+?CLOC=?STAT	SET TIMER POINTER.
0271	70320	070057	STA TIMER	
0272	70321	054364	CPB XSYNT+1	IF STATUS IS RUN, SET
0273	70322	034262	ISZ TIMEF	TIMEFLAG FOR CLOCKING.
0274	70323	040344	ADA .-?CLOC	SAVE FLAGS
0275	70324	064000	LDB A	POINTER
0276	70325	160001	LDA B,I	RESTORE
0277	70326	010520	AND MBUST	DISC BUSY
0278	70327	070203	STA MBUSY	FLAG
0279	70330	061226	LDA EREG	RESTORE E
0280	70331	103101	CLO	AND OVERFLOW
0281	70332	000036	SLA,ELA	REGISTERS.
0282	70333	102101	STO	
0283	70334	061224	LDA AREG	RESTORE A AND
0284	70335	065225	LDB BREG	B REG.
0285	70336	102100	STF 0	ENABLE INTERRUPT AND
0286	70337	125227	JMP PREG,I	TRANSFER TO PROGRAM.

```

0288*
0289**      START OF SYSTEM
0290*
0291  70340 060362 TSB   LDA   +3      START CLOCK COUNTING IN
0292  70341 102614      OTA   CLOCK      100 MS UNITS.
0293  70342 103714      STC   CLOCK,C    START CLOCK
0294  70343 106711      CLC   CH2
0295  70344 106712      CLC   ?SC
0296  70345 060167      LDA   NPORT
0297  70346 003000      CMA
0298  70347 001727      ALF,ALF
0299  70350 030222      IOR   INI      PLUG IN INITIALIZATION CODE.
0300  70351 114736      JSB   S14SC,I  WE'RE STARTING
0301  70352 102311      SFS   CH2      WAIT FOR 2114
0302  70353 026352      JMP   *-1      TO FINISH
0303  70354 103710      STC   CH1,C
0304  70355 060365      LDA   +6      START SYSTEM
0305  70356 064265      LDB   READY   TELETYPE BY OUTPUTTING
0306  70357 114760      JSB   TTY35,I  READY MESSAGE.

0307*
0308*      THIS SECTION IS THE BEGINNING OF THE MAIN PART OF THE SCHEDU-
0309*      LER. CONTROL ALWAYS COMES HERE TO EXAMINE THE TTQ UNTIL IT'S
0310*      EXHAUSTED, OR WHEN THERE IS NOTHING TO DO. SWAPR ALWAYS COMES
0311*      TO THIS POINT WHEN THE QUEUE IS EMPTY OR THE FIRST PROGRAM ON
0312*      THE QUEUE IS ABSENT.
0313*      THIS SECTION ACTUALLY PROCESSES A TTQ ENTRY. THERE ARE SEVERAL
0314*      KINDS OF ENTRIES WHICH MAY BE CLASSIFIED AS FOLLOWS:
0315*
0316*      1) ABORT - THIS IS INDICATED BY THE TELETYPE STATUS BEING
0317*      -1. THE ACTION TAKEN IS TO STOP THE PROGRAM (IF IT IS
0318*      IN THE QUEUE), AND TO INITIATE THE ABORT MESSAGE.
0319*
0320*      2) OUTPUT TERMINATE - THIS IS INDICATED BY THE STATUS BEING
0321*      %OUTW. THE TTQ ENTRY REALLY MEANS THAT THE OUTPUT BUFFER
0322*      IS ALMOST EMPTY. THE PROGRAM IS PLACED BACK ON THE QUEUE
0323*      ACCORDING TO ITS PRIORITY.
0324*
0325*      3) INPUT - THIS IS INDICATED BY STATUS BEING %INPT. IT INDI-
0326*      CATES THAT A USER PROGRAM OR SYSTEM PROGRAM THAT HAS
0327*      REQUESTED INPUT HAS GOTTEN IT. THE PROGRAM IS PLACED IN
0328*      THE QUEUE.
0329*
0330*      4) COMMAND - WHEN STATUS IS %IDLE, EITHER A COMMAND OR
0331*      A SYNTAX STATEMENT HAS BEEN ENTERED. THESE CAN BE DISTIN-
0332*      GUISHED BY THE FIRST NON BLANK INPUT CHARACTER, WHICH IS
0333*      A DIGIT ONLY IF SYNTAX HAS BEEN ENTERED.
0334*
0335*      5) DISCONNECT - THIS IS INDICATED BY STATUS BEING %DISC.
0336*      THE ACTION TAKEN IS TO CALL THE BYE ROUTINE
0337*
0338*      6) ENTER TIMEOUT - THIS IS INDICATED BY THE STATUS BEING
0339*      %ENTO. THE RESTART ADDRESS IS BUMPED AND THE PROGRAM IS
0340*      PLACED ON THE QUEUE.
0341*
0342  70360 102100 SCH1  STF  0
0343  70361 066013      LDB   TTYCK

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```

0344 70362 054642      CPB DTT32      HAVE ALL TELETYPES BEEN CHECKED?
0345 70363 026102      JMP SCHS1      YES
0346 70364 160001      LDA 1,I        LOAD STATUS FOR THIS USER
0347 70365 044403      ADB .+TTY01-TTY00  GENERATE ADDRESS FOR NEXT
0348 70366 076013      STB TTYCK      USER
0349 70367 010462      AND COM14      COMMUNICATION FROM 2114?
0350 70370 002003      SZA,RSS        SKIP IF 00
0351 70371 026360      JMP SCH1        NO== CHECK NEXT ONE
0352 70372 044333      ADB .+TTY00-TTY01  MOVE ADDRESS BACK TO THIS U
0353 70373 103100      CLF 0
0354 70374 120001      XOR 1,I        CLEAR
0355 70375 170001      STA 1,I        COM14 BIT
0356 70376 074062      STB TTQ        SAVE TABLE ADDRESS
0357 70377 044364      ADB .+?ID      STORE ID
0358 70400 074063      STB SCHID      ADDRESS
0359 70401 044367      ADB .+?STAT-?ID
0360 70402 160001      LDA 1,I        A=STATUS
0361 70403 040353      ADA .-4        MAKE SURE
0362 70404 002021      SSA,RSS        STATUS<4
0363 70405 026360      JMP SCH1        IGNORE OTHERWISE
0364 70406 042410      ADA ++2        BRANCH TO SECTION
0365 70407 124000      JMP 0,I        TO HANDLE REQUEST
0366 70410 070420      DEF ++8
0367 70411 026527      JMP SCH4        ENTER TIMEOUT
0368 70412 026512      JMP SCH8        DISCONNECT
0369 70413 026431      JMP SCH7        ABORT
0370 70414 026533      JMP SCH6        COMMAND
0371 70415 026104      JMP SCH5        ABORTING
0372 70416 000000      NOP            INPUT
0373*
0374* CODE TO HANDLE INPUT OR OUTPUT.
0375*
0376 70417 044361      ADB .+?PLEV-?STAT
0377 70420 160001      SCH51 LDA 1,I   GET ACTUAL STATUS
0378 70421 044355      ADB .+?STAT-?PLEV
0379 70422 170001      STA 1,I       SET ACTUAL STATUS
0380 70423 102100      STF 0
0381 70424 044361      ADB .+?PLEV-?STAT
0382 70425 002400      CLA           SET PRIORITY TO 0
0383 70426 170001      STA 1,I
0384 70427 044356      ADB .+?LINK-?PLEV
0385 70430 026077      JMP SCH3      GO INSERT USER IN QUEUE
0386*
0387* CODE TO HANDLE ABORT
0388*
0389 70431 102100      SCH7 STF 0
0390 70432 006004      INB          B=>LINK
0391 70433 017610      JSB DEQUE    REMOVE USER FROM QUEUE.
0392 70434 064062      LDB TTQ
0393 70435 060417      LDA OUTWT    CLEAR
0394 70436 003000      CMA          OUTPUT
0395 70437 103100      CLF 0
0396 70440 110001      AND 1,I      WAIT
0397 70441 170001      STA 1,I      BIT
0398 70442 006004      INB
0399 70443 160001      LDA B,I      GET TTY NUMBER

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0400	70444	030235		IOR KAO	
0401	70445	114736		JSB S14SC,I	KILL OUTPUT
0402	70446	044356		ADB .-1	
0403	70447	060502		LDA DFCHK	
0404	70450	110001		AND 1,I	
0405	70451	002003		SZA,RSS	NEED TO UPDATE CHANGE DATE?
0406	70452	026473		JMP SCH75	NO
0407	70453	060377		LDA UNABT	YES
0408	70454	130001		IOR B,I	DISALLOW
0409	70455	170001		STA B,I	ABORTS
0410	70456	102100		STF 0	
0411	70457	044376		ADB .+?PLEV	
0412	70460	002400		CLA	
0413	70461	170001		STA B,I	SET PRIORITY TO 0
0414	70462	044355		ADB .+?STAT=?PLEV	
0415	70463	060370		LDA .+%SYNT=,+1+UCDAB=COM2	
0416	70464	170001		STA B,I	SET STATUS TO LAST CHANGE DATE
0417	70465	044356		ADB .+?RSTR=?STAT	
0418	70466	042021		ADA XCOM5	FIND POSITION IN TABLE
0419	70467	160000		LDA A,I	GET RESTART ADDRESS
0420	70470	170001		STA B,I	SAVE IT
0421	70471	044361		ADB .+?LINK=?RSTR	
0422	70472	026077		JMP SCH3	GO INSERT IN QUEUE
0423	70473		SCH75	EQU *	
0424	70473	044374		ADB .+?STAT	SET STATUS
0425	70474	170001		STA 1,I	
0426	70475	116023		JSB TRNFP,I	CLEAR PBFLG & CBFLG BITS AND TELL OTHER MACHINE.
0427*					USER HAVE LP?
0428	70476	054253		CPB PRIST	YES.
0429	70477	017227		JSB SCLPR	NO. PRINT ABORT MESSAGE
0430	70500	064062		LDB TTQ	
0431	70501	060347		LDA .-8	
0432	70502	017073		JSB TYPE	
0433	70503	006412		OCT 6412	CRLF
0434	70504	051524		ASC 2,STOP	
		70505			
0435	70506	006412		OCT 6412	CRLF
0436	70507	064062		LDB TTQ	SCRATCH IF SHELL0 IS RUNNING
0437	70510	017711		JSB HTEST	
0438	70511	026360		JMP SCH1	
0439*					
0440**					
					CODE TO SET UP FORCED DISCONNECT
0441*					
0442	70512	044360	SCH8	ADB .+?LINK=?STAT	
0443	70513	017610		JSB DEQUE	REMOVE FROM QUEUE
0444	70514	064062		LDB TTQ	CLEAR
0445	70515	060377		LDA UNABT	
0446	70516	030476		IOR ABTRY	ABORT
0447	70517	030502		IOR DFCHK	
0448	70520	003000		CMA	
0449	70521	110001		AND 1,I	FLAGS
0450	70522	170001		STA 1,I	
0451	70523	102100		STF 0	
0452	70524	060001		LDA 1	
0453	70525	040373		ADA .+?RSTR	
0454	70526	026766		JMP SCH61	GO SET UP STARTING INFO.


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0455*
0456* CODE TO HANDLE ENTER TIMEOUT
0457*
0458 70527 044356 SCH4 ADB .+?RSTR-?STAT
0459 70530 134001      ISZ 1,I      BUMP RESTART ADDRESS
0460 70531 044362      ADB .+?PLEV-?RSTR
0461 70532 026420      JMP SCH51      GO RESTORE STATUS
0462*
0463*
0464* CODE TO HANDLE COMMANDS.
0465*
0466 70533 102100 SCH6 STF 0
0467 70534 002400      CLA          FLAG BUFFER HEAD TO
0468 70535 070060      STA SBHED   SAY BUFFER IN 2114
0469 70536 070064      STA SCHP    INITIALIZE TO HOLD CHARACTERS
0470 70537 017111      JSB SCOM    INTERPRET COMMAND
0471 70540 026566      JMP SCH30   EMPTY LINE.
0472 70541 026544      JMP SCH9    FIRST CHARACTER A DIGIT
0473 70542 026611      JMP EHERR   INVALID COMMAND.
0474 70543 026623      JMP SCH11   COMMAND IS OK.
0475*
0476* THE FIRST CHARACTER IS A DIGIT, THIS MEANS THE LINE IS SYNTAX AND
0477* WE HAVE TO QUEUE IT AS SUCH.
0478*
0479 70544 064062 SCH9 LDB TTQ
0480 70545 060612      LDA PUALT   REMOVE
0481 70546 003000      CMA          PROGRAM
0482 70547 110001      AND B,I     UNALTERED
0483 70550 170001      STA B,I     FLAG
0484 70551 044376      ADB .+?PLEV B=> PRIORITY
0485 70552 002400      CLA          SET PRIORITY TO 0
0486 70553 150063      CPA SCHID,I IF NO ID, GO LOG IN.
0487 70554 026627      JMP SCH25
0488 70555 170001      STA 1,I
0489 70556 044354      ADB .+?RSTR-?PLEV SET UP STARTING ADDRESS
0490 70557 060446      LDA SYNTA   FOR SYNTAX
0491 70560 170001      STA 1,I
0492 70561 044360      ADB .+?STAT-?RSTR
0493 70562 060363      LDA %SYNT   SET STATUS TO
0494 70563 170001      STA 1,I     SYNTAX.
0495 70564 006004      INB          GO INSERT IN QUEUE.
0496 70565 026077      JMP SCH3
0497*
0498 70566 064062 SCH30 LDB TTQ      TEST FOR TAPE MODE IF NULL LINE.
0499 70567 060367      LDA TAPEF
0500 70570 110001      AND B,I
0501 70571 006004      INB          => TTY #
0502 70572 002003      SZA,RSS
0503 70573 026603      JMP SCH31   NO TAPE - GO EMIT LINE FEED
0504 70574 160001      LDA 1,I     SPACE
0505 70575 030215      IOR GTC     PAST
0506 70576 114736      JSB S14SC,I CARRIAGE RETURN
0507 70577 160001      LDA 1,I     INFORM 2114
0508 70600 030236      IOR ALI     THAT MORE INPUT
0509 70601 114736      JSB S14SC,I IS ALLOWABLE
0510 70602 026360      JMP SCH1

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0511*
0512 70603 054253 SCH31 CPB PRIST      IF USER HAS LP,
0513 70604 017227          JSB SCLPR      RELEASE IT
0514 70605 060371 SCH20 LDA .+12B      OUTPUT A LINE FEED,
0515 70606 064062          LDB TTQ
0516 70607 114724          JSB OUTCH,I
0517 70610 026360          JMP SCH1
0518*
0519* COME HERE WHEN ANY ILLEGAL INPUT IS FOUND.
0520*
0521 70611 064062 EHERR LDB TTQ
0522 70612 006004          INB
0523 70613 054253          CPB PRIST      IF USER HAS LP,
0524 70614 017227          JSB SCLPR      RELEASE IT
0525 70615 060351          LDA .-6
0526 70616 017073          JSB TYPE
0527 70617 005077 EH      OCT 5077,37477,6412 (???)
      70620 037477
      70621 006412
0528 70622 026360          JMP SCH1
0529*
0530* COME HERE WHEN A LEGITIMATE COMMAND IS FOUND
0531*
0532 70623 160063 SCH11 LDA SCHID,I    PROCESS COMMAND ONLY IF
0533 70624 002003          SZA,RSS      ID#0 OR
0534 70625 056642          CPB HI        HELLO COMMAND.
0535 70626 026644          JMP SCH22
0536 70627 060337 SCH25 LDA .-16      PRINT LOG IN MESSAGE
0537 70630 017073          JSB TYPE
0538 70631 005120          OCT 5120      LF=P
0539 70632 046105          ASC 6,LEASE LOG IN
      70633 040523
      70634 042440
      70635 046117
      70636 043440
      70637 044516
0540 70640 006412          OCT 6412
0541 70641 026360          JMP SCH1
0542 70642 071750 HI      DEF HELLO
0543 70643 071734 DTAPR DEF CTAPR
0544 70644 064062 SCH22 LDB TTQ
0545 70645 160001          LDA 1,I      TAPE
0546 70646 010367          AND TAPEF
0547 70647 002003          SZA,RSS      MODE?
0548 70650 026671          JMP SCH24    NO
0549 70651 006004          INB
0550 70652 160001          LDA 1,I      YES--CHECK
0551 70653 030233          IOR ILI      FOR ADDITIONAL
0552 70654 114736          JSB S14SC,I  INPUT
0553 70655 102311          SFS CH2      WAIT FOR
0554 70656 026655          JMP *-1      ACKNOWLEDGMENT
0555 70657 102511          LIA CH2
0556 70660 002002          SZA          ILLEGAL INPUT?
0557 70661 026611          JMP EHERR    YES
0558 70662 103100          CLF 0        NO
0559 70663 044356          ADB .-1

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0560	70664	060367		LDA TAPEF	CLEAR
0561	70665	003000		CMA	TAPE
0562	70666	110001		AND 1,I	FLAG
0563	70667	170001		STA 1,I	
0564	70670	102100		STF 0	
0565	70671	160064	SCH24	LDA SCHP,I	TEST FOR HELLO,BYE, OR SCRATCH
0566	70672	053750		CPA HELLO	OK TO PROCEED IF ANY
0567	70673	026707		JMP SCH27	OF THESE.
0568	70674	053724		CPA SCR	
0569	70675	026707		JMP SCH27	
0570	70676	053751		CPA BYE	
0571	70677	026707		JMP SCH27	
0572	70700	160001		LDA 1,I	TEST FOR ANY TAPE ERRORS.
0573	70701	010360		AND TERR	
0574	70702	002003		SZA,RSS	
0575	70703	026713		JMP SCH26	NO TAPE ERRORS--CONTINUE.
0576*					
0577	70704	062643		LDA DTAPR	OTHERWISE, SET UP FOR EXECU-
0578	70705	070064		STA SCHP	TION OF TAPE ERROR
0579	70706	026713		JMP SCH26	PRINTOUT ROUTINE.
0580*					
0581	70707	060360	SCH27	LDA TERR	IF HELLO, BYE OR SCRATCH,
0582	70710	003000		CMA	CLEAR TAPE
0583	70711	110001		AND 1,I	ERROR BIT
0584	70712	170001		STA 1,I	AND PROCEED
0585	70713	044365	SCH26	ADB ,+?NAME	
0586	70714	160001		LDA 1,I	TEST FOR
0587	70715	002021		SSA,RSS	RUN-ONLY PROGRAM.
0588	70716	026732		JMP SCH28	NOT RUN-ONLY.
0589	70717	160064		LDA SCHP,I	IF RUN-ONLY, DON'T
0590	70720	053743		CPA SAVE	ALLOW THESE
0591	70721	026746		JMP SCH29	COMMANDS.
0592	70722	053744		CPA CSAV	
0593	70723	026746		JMP SCH29	
0594	70724	053730		CPA LIS	
0595	70725	026746		JMP SCH29	
0596	70726	053731		CPA PUN	
0597	70727	026746		JMP SCH29	
0598	70730	053732		CPA XPUN	
0599	70731	026746		JMP SCH29	
0600*					
0601	70732	064064	SCH28	LDB SCHP	TEST FOR TYPE I COMMAND.
0602	70733	046004		ADB MCOM2	
0603	70734	006021		SSB,RSS	NOT TYPE I.
0604	70735	026756		JMP SCH12	
0605	70736	060062		LDA TTQ	
0606	70737	002004		INA	** TYPE I COMMAND **
0607	70740	050253		CPA PRIST	IF USER HAS LP,
0608	70741	017227		JSB SCLPR	RELEASE IT
0609	70742	064064		LDB SCHP	COMPUTE STARTING ADDRESS
0610	70743	046745		ADB **2	FOR COMMAND PROCESSOR
0611	70744	124001		JMP B,I	AND GO THERE
0612	70745	100102		DEF COM5=COM1,I	
0614	70746	060345	SCH29	LDA .-10	

0615	70747	017073	JSB	TYPE	
0616	70750	005122	OCT	5122	LF-R
0617	70751	052516	ASC	3,UN ONL	
	70752	020117			
	70753	047114			
0618	70754	054415	OCT	54415	Y-CR
0619	70755	026605	JMP	SCH20	

0621*
0622** TYPE II AND III COMMANDS

0623*					
0624	70756	044364	SCH12	ADB XSYNT+1	DETERMINE PROGRAM STATUS.
0625	70757	060062		LDA TTQ	
0626	70760	040374		ADA .+?STAT	
0627	70761	174000		STB 0,I	
0628	70762	040356		ADA .+?RSTR-?STAT A=>RESTART ADDRESS	
0629	70763	044344		ADB .+.-XSYNT+COM2-COM3-1	TYPE II OR III ??
0630	70764	006020		SSB	
0631	70765	026777		JMP SCH13	TYPE II COMMAND
0632	70766	064606	SCH61	LDB #LIB#	TYPE III COMMANDS HAVE A STANDARD STARTING ADDRESS AND PRIORITY 2.
0633	70767	174000		STB 0,I	
0634	70770	064361		LDB .+2	
0635	70771	040362	SCH14	ADA .+?PLEV-?RSTR	
0636	70772	174000		STB 0,I	
0637	70773	007400		CCB	GET LINK POINTER IN B AND GO TO INSERT INTO QUEUE.
0638	70774	044000		ADB 0	
0639	70775	026077		JMP SCH3	
0640	70776	072037		DEF COM3+COM5=COM1	
0641	70777	046776	SCH13	ADB +-1	GET STARTING ADDRESS FOR TYPE II COMMANDS.
0642	71000	164001		LDB 1,I	
0643	71001	174000		STB 0,I	
0644	71002	006404		CLB,INB	GO SET PRIORITY TO 1
0645	71003	026771		JMP SCH14	

0646*
0647* "SCRATCH" COMMAND

0648*					
0649	71004	064062	#SCR	LDB TTQ	B=>TTY TABLE.
0650	71005	017007		JSB SCRAT	PERFORM SCRATCH FUNCTION.
0651	71006	026605		JMP SCH20	TERMINATE.
0652*					
0653	71007	000000	SCRAT	NOP	SCRATCH A PROGRAM (B=>USERS TTY)
0654	71010	060612		LDA PUALT	REMOVE PROGRAM
0655	71011	003000		CMA	UNALTERED FLAG
0656	71012	110001		AND B,I	
0657	71013	170001		STA B,I	
0658	71014	060726		LDA PBUFF	IF MAIN=B, SET PBPTR.
0659	71015	054255		CPB MAIN	
0660	71016	070056		STA PBPTR	
0661	71017	044363		ADB .+?PROG	B=>PROGEND
0662	71020	170001		STA 1,I	RESET TABLE(PROG)
0663	71021	044361		ADB .+?NAME-?PROG	CLEAR PROGRAM NAME
0664	71022	002400		CLA	
0665	71023	170001		STA 1,I	
0666	71024	127007		JMP SCRAT,I	

0001*

0002* "TAPE" COMMAND

0003*

0004	71025	103100	#TAP	CLF 0	
0005	71026	064062		LDB TTQ	B => ?FLAG
0006	71027	006004		INB	B=> ?TNUM
0007	71030	160001		LDA B,I	A= ?TNUM
0008	71031	030252		IOR WTP	ASK WHAT TYPE.
0009	71032	114736		JSB S14SC,I	
0010	71033	103100		CLF 0	
0011	71034	102311		SFS CH2	
0012	71035	027034		JMP *-1	
0013	71036	102511		LIA CH2	
0014	71037	002003		SZA,RSS	
0015	71040	027051		JMP #TAP1	TYPE #1, OK
0016	71041	060345		LDA .-10	
0017	71042	017073		JSB TYPE	
0018	71043	005111		OCT 5111	LF, I
0019	71044	046114		ASC 3,LLEGAL	

71045 042507
71046 040514

0020	71047	006412		OCT 6412	CR, LF
0021	71050	026360		JMP SCH1	PRINT MESSAGE & TERMINATE.
0022	71051	064062	#TAP1	LDB TTQ	B => FLAG WORD
0023	71052	160001		LDA 1,I	
0024	71053	030367		IOR TAPEF	SET TAPE BIT
0025	71054	170001		STA 1,I	
0026	71055	102100		STF 0	
0027	71056	006004		INB	
0028	71057	160001		LDA 1,I	TELL
0029	71060	030232		IOR TPO	
0030	71061	114736		JSB S14SC,I	2114
0031	71062	026605		JMP SCH20	TERMINATE.

0032*
0033*

0034	71063	000000	#LTEN	NOP	CONVERT A # FROM 0-99 TO ASCII.
0035	71064	006400		CLB	GET FIRST DIGIT IN A,
0036	71065	100400		DIV .+10	SECOND IN B.
		71066		000371	
0037	71067	001727		ALF,ALF	POSITION FIRST ON LEFT,
0038	71070	040001		ADA 1	ADD IN SECOND,
0039	71071	040530		ADA ASC00	ADD IN ASCII BITS.
0040	71072	127063		JMP #LTEN,I	RETURN.

0042*

0043** TYPE

0044*

0045*

0046* TYPE SENDS AN ENTIRE STRING TO A TELETYPE. IT IS CALLED AS FOLLOWS

0047* A=#OF CHARS--MUST END ON RIGHT HALF OF WORD

0048* JSB TYPE

0049* <CHAR STRING>

0050* RETURN

0052	71073	000000	TYPE	NOP	
0053	71074	073110		STA TYPET	SAVE COUNTER

0054	71075	163073	TYPEL	LDA TYPE,I	GET WORD CONTAINING CHAR.
0055	71076	067110		LDB TYPET	GET COUNT IN B.
0056	71077	006011		SLB,RSS	IF COUNT IS EVEN, TAKE HIGH
0057	71100	001727		ALF,ALF	CHAR;
0058	71101	004010		SLB	IF COUNT IS ODD,
0059	71102	037073		ISZ TYPE	BUMP TYPE.
0060	71103	064062		LDB TTQ	OUTPUT CHARACTER TO TTY
0061	71104	114724		JSB OUTCH,I	
0062	71105	037110		ISZ TYPET	ANY MORE?
0063	71106	027075		JMP TYPEL	YES.
0064	71107	127073		JMP TYPE,I	NO.
0065	71110	000000	TYPET	NOP	

0067*

0068** SCOM

0069*

0070* SCOM SCANS A COMMAND INPUT BUFFER TO DETERMINE WHAT

0071* THE COMMAND IS. THE CALLING SEQUENCE TO SCOM IS:

0072*

0073* JSB SCOM

0074* <RETURN IF BLANK LINE>

0075* <RETURN IF FIRST CHARACTER A DIGIT>

0076* <RETURN IF NO LEGAL COMMAND>

0077* <RETURN IF COMMAND FOUND--B=COMMAND ADDRESS>

0078*

0079* SCOM ASSUMES THAT BEFORE IT IS CALLED, SBHED AND

0080* SCHL ARE INITIALIZED AS REQUIRED BY SCHAR,, AND

0081* SCHP=0 FOR NORMAL USERS AND OCT40 FOR CONSOLE.

0083	71111	000000	SCOM	NOP	ENTRY POINT.
0084	71112	064354		LDB ,-3	INITIALIZE CHAR. COUNT TO -3
0085	71113	074065		STB SCNT	
0086	71114	017540		JSB SCHAR	GET A CHARACTER.
0087	71115	127111		JMP SCOM,I	NOT THERE=BLANK LINE.
0088	71116	037111		ISZ SCOM	BUMP SCOM TO POINT AT DIGIT RET.
0089	71117	042001		ADA M60B	TEST FOR FIRST CHAR A DIGIT.
0090	71120	002020		SSA	AUTOMATIC FAILURE IF
0091	71121	037111		ISZ SCOM	< ASC0
0092	71122	040345		ADA ,-10	
0093	71123	002021		SSA,RSS	IF <=ASC9, RETURN TO P+2 IF A
0094	71124	027136		JMP SCOME	DIGIT, P+3 IF NOT
0095	71125	064064		LDB SCHP	
0096	71126	006002		SZB	CONSOLE?
0097	71127	127111		JMP SCOM,I	YES
0098	71130	064062		LDB TTQ	NO
0099	71131	006004		INB	
0100	71132	160001		LDA 1,I	TELL 2114
0101	71133	030245		IOR BKS	
0102	71134	114736		JSB S14SC,I	TO BACKSPACE
0103	71135	127111		JMP SCOM,I	
0104	71136	037111	SCOME	ISZ SCOM	
0105	71137	042002		ADA M41B	TEST FOR LETTER.
0106	71140	002021	SCOMB	SSA,RSS	
0107	71141	127111		JMP SCOM,I	NOT A LETTER.
0108	71142	040411		ADA .+32B	
0109	71143	002020		SSA	

0110	71144	127111		JMP SCOM,I	NOT A LETTER.
0111	71145	030064		IOR SCHP	
0112	71146	034065		ISZ SCNT	TEST FOR 3 LETTERS IN.
0113	71147	001732		ALF,SLA,RAL	NO--ROTATE FOR NEXT ONE.
0114	71150	027156		JMP SCOMA	YES--GO TO SEARCH TABLE.
0115	71151	070064		STA SCHP	
0116	71152	017540		JSB SCHAR	GET NEXT CHARACTER
0117	71153	127111		JMP SCOM,I	FAIL.
0118	71154	042003		ADA M133B	
0119	71155	027140		JMP SCOMB	
0120*					
0121**	SEARCH COMMAND TABLE				
0122*					
0123	71156	064746	SCOMA	LDB SCOM1	B=>TABLE
0124	71157	002020		SSA	
0125	71160	044431		ADB ,+COM4-COM1	
0126	71161	150001	SCOMD	CPA 1,I	
0127	71162	027167		JMP SCOMC	COMMAND FOUND
0128	71163	054750		CPB SCOM5	
0129	71164	127111		JMP SCOM,I	ILLEGAL COMMAND
0130	71165	006004		INB	
0131	71166	027161		JMP SCOMD	
0132	71167	037111	SCOMC	ISZ SCOM	RETURN O.K.
0133	71170	074064		STB SCHP	SAVE ADDRESS OF COMMAND.
0134	71171	017540		JSB SCHAR	SCAN
0135	71172	027176		JMP ++4	FOR CR
0136	71173	050434		CPA ,+55B	OR DASH.
0137	71174	002001		RSS	
0138	71175	027171		JMP *-4	
0139	71176	064064		LDB SCHP	
0140	71177	127111		JMP SCOM,I	

0142*
 0143**
 0144*** RELEASE LINE PRINTER
 0145**
 0146*
 0147*
 0148** SCRLP - USER BUFFER MAY BE FULL
 0149* MLINK+1 = POINTER TO USER
 0150*
 0151** SCLPR - USER BUFFER EMPTY
 0152* TTQ = POINTER TO USER
 0153*

0155	71200	000000	SCRLP	NOP	
0156	71201	064272		LDB MLINK+1	INITIALIZE
0157	71202	044341		ADB ,=?LINK	POINTER TO
0158	71203	077246		STB RLPFW	USER'S FLAG WORD
0159	71204	060351		LDA ,=6	
0160	71205	073247		STA RLPCT	SET COUNTER
0161	71206	063245		LDA LPMES	INITIALIZE POINTER
0162	71207	073250		STA RLPTR	TO MESSAGE BUFFER
0163	71210	163250	RLP	LDA RLPTR, I	LOAD NEXT WORD FROM THE BUFFER
0164	71211	001727		ALF, ALF	A=LEFT CHARACTER
0165	71212	067246		LDB RLPFW	=> FLAG WORD
0166	71213	114724		JSB OUTCH, I	OUTPUT CHARACTER
0167	71214	163250		LDA RLPTR, I	A=RIGHT CHARACTER
0168	71215	067246		LDB RLPFW	=>FLAG WORD
0169	71216	114724		JSB OUTCH, I	OUTPUT CHARACTER
0170	71217	037250		ISZ RLPTR	INCREMENT POINTER
0171	71220	037247		ISZ RLPCT	DONE?
0172	71221	027210		JMP RLP	NO
0173	71222	060243		LDA LPD	YES, TELL I/O PROCESSOR
0174	71223	114736		JSB S14SC, I	TO REMOVE USER FROM LP
0175	71224	002400		CLA	REMOVE USER FROM
0176	71225	070253		STA PRIST	SYSTEM INDICATOR
0177	71226	127200		JMP SCRLP, I	

0179	71227	000000	SCLPR	NOP	
0180	71230	060343		LDA ,=12	A = -# OF CHARACTERS
0181	71231	017073		JSB TYPE	OUTPUT MESSAGE
0182	71232	011423	LPM	OCT 11423	X-OFF, X-OFF
0183	71233	005114		OCT 5114	LF, L
0184	71234	050040		ASC 3, P FREE	
		71235		043122	
		71236		042505	
0185	71237	006412		OCT 6412	CR, LF
0186	71240	060243		LDA LPD	TELL I/O PROCESSOR TO
0187	71241	114736		JSB S14SC, I	REMOVE USER FROM LP
0188	71242	002400		CLA	REMOVE USER FROM
0189	71243	070253		STA PRIST	SYSTEM INDICATOR
0190	71244	127227		JMP SCLPR, I	

0192	71245	071232	LPMES	DEF LPM
0193	71246	000000	RLPFW	BSS 1
0194	71247	000000	RLPCT	BSS 1

PAGE 0315 #26 SCHEDULER

0195 71250 000000 RLPTB BSS 1

0197*
 0198**
 0199*** SWAPR
 0200**
 0201*
 0202* THE SWAPR ROUTINE IS CALLED FROM VARIOUS POINTS IN THE SCHEDULER
 0203* IN ORDER TO DETERMINE IF A PROGRAM IS READY TO RUN. IT IS ALSO
 0204* CALLED WHENEVER THE QUEUE IS UPDATED. THE FUNCTION OF SWAPR IS TO
 0205* DETERMINE IF THERE IS A PROGRAM ON THE QUEUE, AND IF SO, IS THE
 0206* PROGRAM AT THE HEAD OF THE QUEUE READY TO RUN. IF SAID PROGRAM IS
 0207* NOT READY, SWAPR INITIATES THE NECESSARY DRUM TRANSFERS. SWAPR IN-
 0208* DICATES WHETHER A PROGRAM CAN BE RUN OR NOT AS FOLLOWS:
 0209*
 0210* READY : NORMAL RETURN
 0211* NOT READY: TRANSFER TO SCH1

0213	71251	000000	SWAPR	NOB	
0214	71252	060203		LDA	MBUSY TEST FOR
0215	71253	002020		SSA	DISC BUSY
0216	71254	026360		JMP	SCH1 WAIT FOR TRANSFER COMPLETION
0217	71255	066017		LDB	SMAIN
0218	71256	006002		SZB	WAS SWAPR DOING A TRANSFER?
0219	71257	027324		JMP	SWAP5 YES, GO CHECK SUCCESS
0220	71260	066020		LDB	FMAIN NO, HAVE WE SAVED
0221	71261	006003		SZB,	RSS DRIVER FLAGS FOR THIS USER?
0222	71262	027276		JMP	SWAP7 YES, DON'T SAVE CURRENT ONES
0223	71263	060520		LDA	MBUST NO, SAVE DISC
0224	71264	003000		CMA	
0225	71265	103100		CLF	0 "NOT BUSY"
0226	71266	112020		AND	FMAIN,I
0227	71267	064203		LDB	MBUSY FLAG IN
0228	71270	006002		SZB	
0229	71271	030520		IOR	MBUST THIS USER'S
0230	71272	172020		STA	FMAIN,I
0231	71273	102100		STF	0
0232	71274	006400		CLB	FLAGS WORD
0233	71275	076020		STB	FMAIN SAY DRIVER
0234	71276	064272	SWAP7	LDB	MLINK+1 FLAGS SAVED
0235	71277	054271		CPB	MLINK GET FIRST QUEUE ENTRY
0236	71300	026360		JMP	SCH1 TEST FOR QUEUE EMPTY.
0237	71301	060313		LDA	T35F3 EMPTY--NOTHING TO DO.
0238	71302	050356		CPA	.-1 HAS A COMMAND BEEN
0239	71303	027335		JMP	SWAP4 ENTERED BUT NOT STARTED?
0240	71304	060772		LDA	LOGCT YES - GO START IT
0241	71305	030311		IOR	T35F1 NO, IS THERE
0242	71306	054263		CPB	T35LN CURRENT OR
0243	71307	002003		SZA,	RSS IMMINEENT
0244	71310	027335		JMP	SWAP4 OUTPUT TO TTY35?
0245	71311	060276		LDA	T35ST NO
0246	71312	003004		CMA,	INA GET THE STATUS
0247	71313	040440		ADA	.*XSUNT-.+1+ROS=COM2
0248	71314	002020		SSA	CHECK TO SEE IF THIS IS
0249	71315	027335		JMP	SWAP4 A ROUTINE THAT CAN'T BE DEQUED
0250	71316	017610		JSB	DEQUE SUSPEND UNTIL ITS DONE.
0251	71317	060276		LDA	T35ST

0252	71320	070300		STA T35PR	
0253	71321	060362		LDA XOUTW	
0254	71322	070276		STA T35ST	
0255	71323	027252		JMP SWAPR+1	
0256*					
0257	71324	002400	SWAP5	CLA	CLEAR "SWAPR INVOKED
0258	71325	072017		STA SMAIN	TRANSFER" FLAG
0259	71326	050203		CPA MBUSY	WAS DISC TRANSFER SUCCESSFUL?
0260	71327	027276		JMP SWAP7	YES, CONTINUE
0261	71330	070203		STA MBUSY	NO, CLEAR MBUSY FOR KICKS
0262	71331	006020		SSB	WERE WE SWAPPING A USER?
0263	71332	114207		JSB SICKP,I	NO, GO FOLD CON GRACIA
0264	71333	124210		JMP PTZAP,I	YES, GO FLUSH HIM OR HER
0265	71334	026360		JMP SCH1	
0267	71335	044356	SWAP4	ADB ,+?STAT-?LINK	=> STATUS OF FIRST ENTRY
0268	71336	160001		LDA 1,I	A=STATUS
0269	71337	050355		CPA ,-2	TEST FOR SPECIAL DISCONNECT.
0270	71340	060406		LDA %SYNT+1+BYE-COM2	
0271	71341	040344		ADA ,-5+COM2-COM3	TEST FOR TYPE II OR III.
0272	71342	002021		SSA,RSS	
0273	71343	027406		JMP SWAP3	PROGRAM IS OF TYPE III.
0274	71344	044342		ADB ,-?STAT	TEST FOR PROGRAM IN CORE.
0275	71345	054255		CPB MAIN	
0276	71346	127251		JMP SWAPR,I	PROGRAM PRESENT.
0277	71347	060255		LDA MAIN	FIND OUT WHAT PROGRAM IS.
0278	71350	002002		SZA	IS ANY PROGRAM PRESENT?
0279	71351	027372		JMP SWAP1	YES.
0280	71352	074255		STB MAIN	SET MAIN TO NEW PROGRAM.
0281*					
0282**					INITIATE DISC TO CORE TRANSFER
0283*					
0284	71353	076017		STB SMAIN	SAVE TABLE OF USER IN QUESTION
0285	71354	044363		ADB ,+?PROG	B=>PROGRAM END LOCATION.
0286	71355	160001		LDA 1,I	COMPUTE NUMBER OF
0287	71356	070056		STA PBPTR	
0288	71357	003000		CMA	WORDS IN PROGRAM.
0289	71360	041213		ADA USE	
0290	71361	070204		STA MWORD	SAVE -LENGTH
0291	71362	044355		ADB ,+?DISC-?PROG	
0292	71363	060001		LDA B	A => DISC ADDRESS
0293	71364	065214		LDB USEI	B=CORE ADDRESS
0294	71365	114201	SWAP8	JSB DISCA,I	CALL DISC DRIVER
0295	71366	102030		HLT DEATH+30B	DRIVER BUSY
0296	71367	102031		HLT DEATH+31B	DISC NOT PRESENT
0297	71370	026360		JMP SCH1	RETURN BUSY.
0299*					
0300**					INITIATE CORE TO DISC TRANSFER
0301*					
0302	71371	060255	SWAP2	LDA MAIN	
0303	71372	072017	SWAP1	STA SMAIN	SAVE TABLE => OF USER
0304	71373	006400		CLB	SET MAIN TO SAY
0305	71374	074255		STB MAIN	NO USER IN CORE
0306	71375	040363		ADA ,+?PROG	SAVE PROGRAM

0307	71376	064056	LDB	PBPTR	END LOCATION
0308	71377	174000	STB	A,I	
0309	71400	007000	CMB		COMPUTE AND
0310	71401	045213	ADB	USE	SAVE TRANSFER
0311	71402	074204	STB	MWORD	LENGTH
0312	71403	040355	ADA	.+?DISC-?PROG	=> DISC ADDRESS
0313	71404	065213	LDB	USE	= CORE ADDRESS
0314	71405	027365	JMP	SWAP8	GO START DISC WRITE

0316*

0317** TYPE III PROGRAMS

0318*

0320	71406		SWAP3	EQU *	
0321	71406	160001	LDA	B,I	GET STATUS
0322	71407	050425	CPA	.+XSYNT-.+1+OPE=COM2	
0323	71410	002401	CLA	RSS	SET PRIORITY TO 0 IF OPEN
0324	71411	027415	JMP	SWAP6	
0325	71412	044361	ADB	.+?PLEV=?STAT	
0326	71413	170001	STA	B,I	
0327	71414	044355	ADB	.+?STAT-?PLEV	
0328	71415		SWAP6	EQU *	
0329	71415	044356	ADB	.+?RSTR-?STAT	B => RESTART ADDRESS
0330	71416	160001	LDA	B,I	
0331	71417	050606	CPA	#LIB#	IF THIS A FRESH CALL,
0332	71420	070264	STA	LCHCR	ZAP THE LCHCR FLAG
0333	71421	044360	ADB	.+?STAT-?RSTR	
0334	71422	160001	LDA	B,I	
0335	71423	050355	CPA	.-2	
0336	71424	060406	LDA	XSYNT+1+BYE=COM2	
0337	71425	040344	ADA	.-5+COM2=COM3	
0338	71426	064255	LDB	MAIN	TEST FOR MAIN PROGRAM IN CORE
0339	71427	006002	SZB		
0340	71430	027371	JMP	SWAP2	GO TO WRITE OUT MAIN PROGRAM.
0341	71431	001000	ALS		MULTIPLY BY 2
0342	71432	042012	ADA	DCOM6	A=> LIBRARY PROGRAM DISC ADDRESS
0343	71433	050256	CPA	LIB	IS IT IN CORE?
0344	71434	127251	JMP	SWAPR,I	YES--RETURN PRESENT.
0345	71435	070256	STA	LIB	IF NOT, INITIATE READ IN.
0346	71436	064315	LDB	M512	LENGTH OF PROGRAM = 512
0347	71437	074204	STB	MWORD	
0348	71440	007400	CCB		SMAIN = -1 SEZ
0349	71441	076017	STB	SMAIN	READING LIBRARY PROGRAM
0350	71442	064610	LDB	#LIBI	
0351	71443	027365	JMP	SWAP8	INITIATE DISC READ

0353*

0354** ENTRY POINT FOR INPUT REQUEST

0355*

0356	71444	000000	SCHIO	NOP	
0357	71445	103100	CLF	0	INTERRUPT INHIBIT.
0358	71446	064272	LDB	M LINK+1	
0359	71447	044342	ADB	.+?TNUM-?LINK	
0360	71450	130001	IOR	1,I	TELL 2114

0361	71451	114736	JSB	S14SC,I	ABOUT INPUT WAIT
0362	71452	103100	CLF	0	
0363	71453	044372	ADB	.,+?RSTR=?TNUM	
0364	71454	063444	LDA	SCHIQ	
0365	71455	170001	STA	1,I	
0366	71456	006004	INB		GET PROGRAM TYPE
0367	71457	160001	LDA	1,I	
0368	71460	002020	SSA		QUIT IF ABORT REQUEST.
0369	71461	027662	JMP	SUSP	
0370	71462	044361	ADB	.,+?PLEV=?STAT	
0371	71463	170001	STA	1,I	SET INTO PLEV.
0372	71464	044355	ADB	.,+?STAT=?PLEV	
0373	71465	060361	LDA	XINPT	CHANGE STATUS TO
0374	71466	170001	STA	1,I	INPUT WAIT.
0375	71467	027662	JMP	SUSP	GO REMOVE FROM QUEUE.

0377*
 0378** ENTRY POINT FOR TERMINATION

0379*			SCHQ0	CLF	0	
0380	71470	103100	LDA	HQDIS		DID THIS GUY TRY TO
0381	71471	060260	SZA	RSS		DISCONNECT?
0382	71472	002003	JMP	SCHQ1		NO
0383	71473	027507	CLA			YES
0384	71474	002400	STA	HQDIS		RESET DISCONNECT FLAG
0385	71475	070260	LDB	MLINK+1		
0386	71476	064272	ADB	.,-?LINK		
0387	71477	044341	LDA	1,I	SET	
0388	71500	160001	IOR	COM14	COMMUNICATIONS	
0389	71501	030462	STA	1,I	BIT	
0390	71502	170001	ADB	.,+?STAT		
0391	71503	044374	LDA	XDISC	SET STATUS	
0392	71504	060355	STA	1,I	TO DISCONNECT	
0393	71505	170001	JMP	SUSP		
0394	71506	027662	SCHQ1	LDA	MLINK+1	DOES THIS
0395	71507	060272	ADA	.,+?TNUM=?LINK		USER HAVE
0396	71510	040342	CPA	PRIST		THE LINE
0397	71511	050253	RSS			PRINTER?
0398	71512	002001	JMP	SCHQ3	NO	
0399	71513	027523	LDA	LFLAG	YES - IS THE LPR	
0400	71514	060254	SZA		COMMAND FLAG SET?	
0401	71515	002002	JMP	SCHQ2	YES	
0402	71516	027521	STA	CLC1	NO, BLOCK CLOCK	
0403	71517	072041	JSB	SCRLP	REMOVE USER FROM LP	
0404	71520	017200	SCHQ2	CLA	CLEAR	
0405	71521	002400	STA	LFLAG	FLAG	
0406	71522	070254	SCHQ3	LDB	MLINK+1	SCRATCH IF
0407	71523	064272	CPB	T35LN		
0408	71524	054263	JMP	++4		
0409	71525	027531	ADB	.,-?LINK	THIS IS	
0410	71526	044341	JSB	HTEST	SHELLO.	
0411	71527	017711	LDB	MLINK+1	CHANGE	
0412	71530	064272	ADB	.,+?STAT=?LINK	STATUS	
0413	71531	044356	LDA	1,I		
0414	71532	160001	CPA	.-1	QUIT IF ABORT REQUEST.	
0415	71533	050356	JMP	SUSP		
0416	71534	027662				

0417 71535 002400
0418 71536 170001
0419 71537 027662

CLA
STA 1,I
JMP SUSP

TO IDLE

```

0421*
0422**      SCHAR
0423*
0424* SCHAR FETCHES THE NEXT CHARACTER FROM A BUFFER. BUFFER
0425* POINTERS FOR SCHAR ARE INITIALIZED AS FOLLOWS:
0426*      SBHED=> FIRST CHARACTER IF TTY35; =0 OTHERWISE
0427*      SCHL,I=> END OF TTY35 BUFFER
0428*
0429* SCHAR CALLING SEQUENCE:
0430*
0431*      JSB SCHAR
0432*      RETURN HERE IF CR
0433*      RETURN HERE IF ANY OTHER CHARACTER

0435 71540 000000 SCHAR NOP
0436 71541 064060 LDB SBHED GET POINTER,
0437 71542 006003 SZB,RSS TTY35?
0438 71543 027562 JMP SCHR1 NO
0439 71544 004065 CLE,ERB YES==POSITION AS WORD POINTER
0440 71545 160001 LDA 1,I GET WORD CONTAINING CHARACTER.
0441 71546 005610 ELB,SLB REPOSITION POINTER AND TEST
0442 71547 002001 RSS FOR UPPER OR LOWER.
0443 71550 001727 ALF,ALF
0444 71551 010500 AND B377 MASK OUT CHARACTER.
0445 71552 050374 CPA .+15B RETURN IMMEDIATELY IF CR
0446 71553 127540 JMP SCHAR,I
0447 71554 006004 INB BUMP CHARACTER POINTER.
0448 71555 074060 STB SBHED
0449 71556 050417 CPA .+40B SKIP BLANKS
0450 71557 027542 JMP SCHAR+2
0451 71560 037540 ISZ SCHAR
0452 71561 127540 JMP SCHAR,I
0453 71562 064062 SCHR1 LDB TTO FETCH
0454 71563 006004 INB
0455 71564 160001 LDA 1,I CHARACTER
0456 71565 030215 IOR GTC
0457 71566 114736 JSB S14SC,I FROM 2114
0458 71567 102311 SFS CH2 WAIT FOR RESPONSE
0459 71570 027567 JMP *-1
0460 71571 102511 LIA CH2
0461 71572 050417 CPA .+40B BLANK?
0462 71573 027564 JMP SCHR1+2 YES==IGNORE IT
0463 71574 050374 CPA .+15B NO, CARRIAGE RETURN?
0464 71575 027604 JMP SCHR2 YES
0465 71576 040317 ADA M96 CHECK FOR CODES
0466 71577 002021 SSA,RSS GREATER THAN 140.
0467 71600 040450 ADA M32 CODE IS LOWER CASE, MAKE UPPER.
0468 71601 042000 ADA B140 RESTORE ASCII CODES.
0469 71602 037540 ISZ SCHAR NO==EXIT
0470 71603 127540 JMP SCHAR,I TO (P+2)
0471 71604 SCHR2 EQU *
0472 71604 160001 LDA 1,I B=>TTY #
0473 71605 030245 IOR BKS TELL 2114
0474 71606 114736 JSB S14SC,I TO BACKSPACE
0475 71607 127540 JMP SCHAR,I

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0477*

0478** DEQUE

0479*

0480* DEQUE REMOVES A USER FROM THE QUEUE. IT IS CALLED WITH THE USER'S

0481* LINK ADDRESS IN B.

0482*

0483	71610	000000	DEQUE	NOP	
0484	71611	060271		LDA MLINK	GET POINTER TO FIRST ENTRY.
0485	71612	154000	DEQ1	CPB 0,I	TEST FOR ENTRY FOUND.
0486	71613	027620		JMP DEQ2	
0487	71614	160000		LDA 0,I	LINK TO NEXT ENTRY.
0488	71615	050271		CPA MLINK	TEST FOR END OF QUEUE.
0489	71616	127610		JMP DEQUE,I	NOT ON QUEUE--RETURN.
0490	71617	027612		JMP DEQ1	LOOP.
0491	71620	164001	DEQ2	LDB 1,I	LINK AROUND THIS USER.
0492	71621	174000		STB 0,I	
0493	71622	127610		JMP DEQUE,I	

0495* THE OUTCH ROUTINE OUTPUTS A CHARACTER TO A USER'S
 0496* BUFFER IN THE 2114. THE CALLING SEQUENCE IS:
 0497*
 0498* JSB OUTCH,I A=CHARACTER TO BE OUTPUT
 0499* B=TTY TABLE ADDRESS.
 0500*
 0501* OUTCH FIRST CHECKS TO MAKE SURE THAT THE 2114 CAN ACCEPT
 0502* CHARACTERS. IF NOT, THE USER IS PLACED IN OUTPUT WAIT STATUS
 0503* AND A TRANSFER IS MADE INTO THE SYSTEM TO DELETE THE USER
 0504* FROM THE QUEUE
 0505*

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0507 71623 000000 #OUTC NOP
0508 71624 103100 CLF 0
0509 71625 010500 AND B377 MASK AND
0510 71626 072014 STA OUTM1 SAVE CHARACTER
0511 71627 160001 LDA 1,I CAN 2114
0512 71630 010417 AND OUTWT TAKE THIS
0513 71631 002002 SZA CHARACTER?
0514 71632 027641 JMP OUTC1 NO
0515 71633 006004 INB YES
0516 71634 160001 LDA 1,I BUILD OUTPUT WORD
0517 71635 032014 IOR OUTM1 WITH USER'S TTY #,
0518 71636 030213 IOR OCR CHARACTER AND OPCODE.
0519 71637 114736 JSB S14LP,I CALL 2114 DRIVER
0520 71640 127623 JMP #OUTC,I
0521*
0522* TAKE CARE OF FULL BUFFER IN 2114
0523*
0524 71641 044374 OUTC1 ADB .+?STAT
0525 71642 160001 LDA 1,I
0526 71643 002020 SSA IF ABORTED GO DIRECTLY
0527 71644 027662 JMP SUSP TO SUSPEND.
0528 71645 044361 ADB .+?PLEV-?STAT MOVE STATUS TO
0529 71646 170001 STA 1,I PLEV AND SET
0530 71647 044355 ADB .+?STAT-?PLEV STATUS TO
0531 71650 060362 LDA %OUTW OUTWAIT.
0532 71651 170001 STA 1,I
0533 71652 003400 CCA SET RETURN ADDRESS TO
0534 71653 043623 ADA #OUTC RECALL OUTC
0535 71654 044356 ADB .+?RSTR-?STAT
0536 71655 170001 STA 1,I
0537 71656 062014 LDA OUTM1
0538 71657 071224 STA AREG
0539 71660 044343 ADB .-?RSTR
0540 71661 075225 STB BREG
0541 71662 160272 SUSP LDA MLINK+1,I
0542 71663 070272 STA MLINK+1
0543 71664 002400 CLA LOCK
0544 71665 072041 STA CLC1 CLOCK
0545 71666 026360 JMP SCH1 JUMP TO SCHEDULER
0546*
0547 71667 000000 SCH00 NOP OUTPUT SUSPEND REQUEST ENTRY.
0548 71670 103100 CLF 0 TURN OFF INTERRUPT.

```

```

0549 71671 063667      LDA SCH00      SET UP RETURN ADDRESS.
0550 71672 002004      INA
0551 71673             SCHSQ EQU *
0552 71673 073623      STA #OUTC
0553 71674 064272      LDB MLINK+1
0554 71675 044341      ADB .-?LINK
0555 71676 160001      LDA 1,I
0556 71677 030417      IOR OUTWT     SET OUTPUT WAIT BIT
0557 71700 170001      STA 1,I
0558 71701 006004      INB
0559 71702 160001      LDA 1,I       PUT USER
0560 71703 030237      IOR OWT
0561 71704 114736      JSB S14LP,I   IN OUTPUT WAIT
0562 71705 103100      CLF 0         NO INTERRUPTS DURING $USPEND
0563 71706 064272      LDB MLINK+1   FOOL OUTCR INTO DOING THE WORK.
0564 71707 044356      ADB .+?STAT=?LINK
0565 71710 027642      JMP OUTC1+1

```

0567* HTEST SCRATCHES A PROGRAM IF THE ASSOCIATED HFLAG BIT IS SET.

0568* B POINTS TO THE USER'S TTY ADDRESS.

0569*

```

0570 71711 000000      HTEST NOP
0571 71712 160001      LDA 1,I
0572 71713 010363      AND HFLAG     GET HFLAG BIT.
0573 71714 002003      SZA,RSS
0574 71715 127711      JMP HTEST,I   RETURN IF HFLAG BIT =0.
0575 71716 103100      CLF 0
0576 71717 120001      XOR 1,I
0577 71720 170001      STA 1,I       CLEAR HFLAG BIT
0578 71721 102100      STF 0
0579 71722 017007      JSB SCRAT
0580 71723 127711      JMP HTEST,I   RETURN.

```

0002*

0003**

0004*** COMMAND TABLE

0005**

0006*

0007* THIS TABLE CONSISTS OF TWO PARTS. PART 1 CONTAINS THE ENCODED
 0008* SYMBOLIC COMMANDS. THESE ARE CODED AS THREE BYTES, EACH BYTE
 0009* BEING OF LENGTH 5 BITS AND OF OCTAL VALUE 101 LESS THAN THE
 0010* OCTAL VALUE OF THE CHARACTER. THE THREE BYTES ARE IN BIT POSI-
 0011* TIONS 14-10, 9-5, AND 4-0, RESPECTIVELY. BIT 15 IS SET TO 1 FOR
 0012* COMMANDS THAT ARE LEGAL FOR THE SYSTEM CONSOLE.

0013*

0014* PART 1 IS ITSELF DIVIDED INTO 3 SECTIONS. COMMANDS IN SECTION 1
 0015* ARE THOSE COMMANDS WHICH ARE HANDLED IMMEDIATELY BY THE EXECUTIVE
 0016* WITHOUT ANY DISC ACCESS. THOSE IN SECTION 2 ARE COMPILER COMMANDS
 0017* WHICH ARE RESIDENT BUT WHICH REQUIRE THE PROGRAM TO BE LOADED
 0018* FROM DISC. COMMANDS IN SECTION 3 ARE SYSTEM COMMANDS WHICH ARE
 0019* DISC RESIDENT. ALL SYSTEM COMMANDS ARE OF THIS TYPE AND MUST BE
 0020* LOCATED AFTER COM4.

0021*

0022* PART 2 OF THE COMMAND TABLE CONTAINS THE CORE STARTING ADDRESSES
 0023* FOR THOSE COMMANDS IN SECTIONS 1 AND 2, AND THE TWO WORD DISC
 0024* ADDRESSES OF THOSE IN SECTION 3.

0025*

0026* PART I

0027*

0028* SECTION I

0029*

0030	71724 044121	COM1	OCT 44121	SCRATCH
0031	71724	SCR	EQU COM1	
0032	71725 046017		OCT 46017	TAPE
0033	71726 024230		OCT 24230	KEY

0034*

0035* SECTION II

0036*

0037	71727 043215	COM2	OCT 43215	RUN
0038	71730 026422	LIS	OCT 26422	LIST
0039	71731 037215	PUN	OCT 37215	PUNCH
0040	71732 056764	XPUN	OCT 056764	XPUNCH
0041	71733 177777	UCDAB	OCT =1	FOR ABORT UPDATE CHANGE DATE
0042	71734 177777	CTAPR	OCT =1	USED FOR TAPE ERROR PRINTOUT.

0043*

0044* SECTION III

0045*

0046	71735 177777	COM3	OCT =1	FOR LENGTH SECTION
0047	71736 177777		OCT =1	FOR TWO HALVES
0048	71737 177777		OCT =1	OF FUSS TABLE
0049	71740 177777	COMFL	OCT =1	FOR FILES
0050	71741 177777	ASGNA	OCT =1	ASSIGN
0051	71742 177777	COMCH	OCT =1	FOR CHAIN
0052	71743 044025	SAVE	OCT 44025	SAVE
0053	71744 005100	CSAV	OCT 5100	CSAVE
0054	71745 177777	SAVO	OCT =1	FOR SAVE OVERLAY
0055	71746 014223		OCT 14223	GET
0056	71747 000757		OCT 757	APPEND
0057	71750 016213	HELLO	OCT 16213	HELLO

0058	71751	003404	BYE	OCT	3404	BYE
0059	71752	024413		OCT	24413	KILL
0060	71753	042215		OCT	42215	RENUMBER
0061	71754	032014		OCT	32014	NAME
0062	71755	004023	CAT	OCT	004023	CATALOG
0063	71756	026401		OCT	26401	LIBRARY
0064	71757	015056		OCT	15056	GROUP
0065	71760	006421		OCT	6421	DIRECTORY = USER CONSOLE
0066	71761	042217		OCT	42217	REPORT = USER CONSOLE
0067	71762	045140		OCT	45140	STATUS = USER CONSOLE
0068	71763	177777	STA	OCT	=1	STATUS OVERLAY = USER CONSOLE
0069	71764	006213		OCT	6213	DELETE
0070	71765	046414		OCT	46414	TIME
0071	71766	037056		OCT	37056	PROTECT
0072	71767	050657		OCT	50657	UNPROTECT
0073	71770	034744	OPE	OCT	34744	OPEN
0074	71771	026215		OCT	26215	LENGTH
0075	71772	010107		OCT	10107	ECHO
0076	71773	030222		OCT	030222	MESSAGE
0077	71774	026761		OCT	26761	LPRINTER
0078	71775	036721		OCT	36721	PORT=USER CONSOLE
0079	71776		COM4	EQU	*	
0080	71776	142217		OCT	142217	REPORT = SYSTEM CONSOLE
0081	71777	106421		OCT	106421	DIRECTORY = SYSTEM CONSOLE
0082	72000	145140		OCT	145140,-1	STATUS = SYSTEM CONSOLE
		72001				
0083	72002	136721		OCT	136721	PORT=SYSTEM CONSOLE
0084	72003	142722	ROS	OCT	142722	ROSTER
0085	72004	100655		OCT	100655	ANNOUNCE
0086	72005	142222		OCT	142222	RESET
0087	72006	104340		OCT	104340	CHANGE
0088	72007	144544		OCT	144544	SLEEP
0089	72010	116401		OCT	116401	HIBERNATE
0090	72011	132226		OCT	132226	NEWID
0091	72012	124413		OCT	124413	KILLID
0092	72013	131215		OCT	131215	MUNLOCK
0093	72014	130556		OCT	130556,-1	MLOCK
		72015				
0094	72016	104717		OCT	104717	COPY
0095	72017	102222		OCT	102222	BESTOW
0096	72020	137221		OCT	137221	PURGE
0097	72021	130006		OCT	130006	MAGTAPE
0098	72022	136356		OCT	136356	PHO
0099	72023	137050		OCT	137050	PRINTER
0100	72024	144744		OCT	144744	SPEED
0101	72025	103044		OCT	103044	BREAK

0103*

0104* PART II -- STARTING ADDRESSES

0105*

0106* SECTION I

0107*

0108 72026 071004 COM5 DEF #SCR

0109 72027 071025 DEF #TAP

0110 72030 070605 DEF SCH20 KEY

0111*

0112* SECTION II

0113*

0114 72031 036006 DEF CUPLE

0115 72032 052143 DEF LIST

0116 72033 052142 DEF PUNCH

0117 72034 052140 DEF XPNCH

0118 72035 073506 DEF ABUCD

0119 72036 044737 DEF TAPER

0120*

0121* SECTION III

0122*

0123* THIS SECTION CONTAINS THE TWO WORD DISC ADDRESSES OF THE
0124* LIBRARY ROUTINES. THIS TABLE IS FILLED BY THE LOADER.

0125*

0126 72037 000000 COM6 BSS COM5-COM3+COM5-COM3

0128 72045 FILIB EQU COM6-COM3+COMFL-COM3+COMFL FILES

0129 72051 CHLIB EQU COM6-COM3+COMCH-COM3+COMCH CHAIN

0130 72047 ASNIB EQU COM6-COM3+ASGNA-COM3+ASGNA ASSIGN

0132 72221 000000 DSERA BSS 8 ERROR MESSAGE DISC ADDRESSES

0134 72231 000000 LOGGR BSS 64 HOLDS INFO FOR LOGGING

0136*

0137** LIBRARY SUBROUTINE POINTERS AND TEMPORARIES

0138*

0139	72331	000000	LSTP1	BSS	1	
0140	72332	000000	LSTP2	BSS	1	
0141	72333	000000	LSTP3	BSS	1	
0142	72334	000000	LSTP4	BSS	1	
0143	72335	000000	LSTP5	BSS	1	
0144	00035		TECNT	EQU	LTEMP+5	* TABLE ENTRY COUNT (NEGATIVE)
0145	00043		DLPTR	EQU	LTEMP+11	*-> TO A TRACK LENGTH
0146	00044		DAPTR	EQU	LTEMP+12	*-> TO A TWO WORD DISC ADDRESS
0147	00045		DALEN	EQU	LTEMP+13	* DISC ADDRESS LENGTH
0148	00046		DADDR	EQU	LTEMP+14	CONTAINS A 2 WORD
0149*				EQU	LTEMP+15	DISC ADDRESS

0151	72336	000116	ADTAP	DEF	ADTAT	*-> TO ADT ADDRESS TABLE
0152	72337	000113	IDECL	DEF	IDEC+11	*-> LAST IDEC ENTRY TRACK LENGTH
0153	72340	025130	DFNAM	DEF	LIBUS+10176	DIRTY FILE NAMES BUFFER
0154	72341	000000	LCDFC	BSS	1	COUNT OF FILES TO BE CHECKED
0155	72342	000000	DFCNT	BSS	1	COUNT OF CHANGED (DIRTY) FILES
0156	72343	000000	LCDID	BSS	1	POINTER TO USER ID
0157	72344	000000	LCDBS	BSS	1	POINTER FOR LCD'S SEARCHES
0158	72345	074434	MOVFB	DEF	MOVEB	
0159	72346	074450	MOVFW	DEF	MOVEW	
0160	72347	031073	DLOKA	DEF	DLOOK	
0161	72350	074561	LOUTA	DEF	LOUT	
0162	72351	074516	LEN2A	DEF	LEND2	
0163	72352	070431	DSCH7	DEF	SCH7	
0164	72353	000161	DSYID	DEF	SYSID	
0165	72354	160002	M8190	DEC	-8190	
0166	72355	005040	LFSPA	OCT	5040	
0167	72356	030057	ZERSL	ASC	1,0/	

```

0169*
0170**
0171***      FIND ADT
0172**
0173*
0174*      THIS ROUTINE FINDS THE ADT THAT THE DISC ADDRESS CONTAINED IN
0175*      DADDR SHOULD GO INTO. THE RETURNED RESULTS ARE:
0176*      DAPTR => ADT DISC ADDRESS
0177*      DLPTR => ADT LENGTH
0178*
0179      72357 000000      FADT  NOP
0180      72360 060346      LDA  ,~9      SET COUNT FOR
0181      72361 072331      STA  LSTP1      NUMBER OF ADTS
0182      72362 060177      LDA  MHAD      A => DISC TABLES
0183      72363 040437      ADA  ,+48     START WITH LAST ENTRY
0184      72364 070044      FADT1 STA  DAPTR  A => DISC TABLE ENTRY
0185      72365 104200      DLD  DAPTR,I  AB = FIRST ADDRESS ON THIS DISC
0186      72366 100044
0186      72367 000065      CLE,ERA      CONVERT
0187      72370 005500      ERB          TO BLOCKS
0188      72371 016611      JSB  DASUB
0189      72372 002021      SSA, RSS
0190      72373 026402      JMP  FADT3    RESULT POSITIVE, FOUND THE DISC
0191      72374 060044      LDA  DAPTR    RESULT NEGATIVE, MOVE
0192      72375 040351      ADA  ,~6     TO PRECEEDING ENTRY
0193      72376 036331      ISZ  LSTP1
0194      72377 026364      JMP  FADT1    GO TRY NEXT DISC
0195      72400 102037      FADT2 HLT  DEATH+37B BETTER FIND DISC
0196      72401 026400      JMP  *-1
0198      72402 062331      FADT3 LDA  LSTP1
0199      72403 003000      CMA
0200      72404 050367      CPA  ,+8     CHECK FOR BAD
0201      72405 026400      JMP  FADT2    DISC ADDRESS
0202      72406 100200      MPY  ,+3     GENERATE TABLE
0203      72407 000362
0203      72410 042336      ADA  ADTAP    ADDRESS FOR DISC
0204      72411 070044      STA  DAPTR    POINTER = AND
0205      72412 040361      ADA  ,+2     POINTER FOR
0206      72413 070043      STA  DLPTR    DISC LENGTH
0207      72414 126357      JMP  FADT,I

```

```

0209*
0210**
0211*** RETURN BLOCK TO ADT
0212**
0213*
0214* THIS ROUTINE ADDS A BLOCK OF DISC SPACE BACK INTO THE ADT.
0215* THE ROUTINE ASSUMES THE FOLLOWING:
0216*
0217* DADDR = 2 WORD DISC ADDRESS OF BLOCK TO BE ADDED
0218* DALEN = LENGTH OF THE BLOCK
0219* DAPTR => 2 WORD DISC ADDRESS OF ADT TRACK
0220* DLPTR => LENGTH OF ADT TRACK
0221*
0222* THE CORRECT ADT TRACK IS IN CORE
0223*
0224* THE ROUTINE RETURNS WITH THE LENGTHS IN MWORD AND DLPTR,I BOTH
0225* UPDATED, BUT THE TRACK IS NOT WRITTEN OUT.
0226*

0228 72415 000000 RBADT NOP
0229 72416 060045 LDA DALEN DON'T WASTE
0230 72417 002003 SZA,RSS TIME ON
0231 72420 126415 JMP RBADT,I ZERO LENGTH
0232 72421 160043 LDA DLPTR,I GET ADT LENGTH
0233 72422 003004 CMA,INA
0234 72423 040676 ADA LIBD
0235 72424 072331 STA LSTP1 => END OF ADT TRACK
0236 72425 064676 LDB LIBD => BEGINNING OF ADT TRACK
0237 72426 076332 RADT1 STB LSTP2 B => CURRENT ENTRY
0238 72427 056331 CPB LSTP1 CHECK FOR END OF TRACK
0239 72430 026532 JMP RADT3 YES, INSERT ENTRY AT END
0240 72431 104200 DLD LSTP2,I GET DISC ADDRESS FOR THIS ENTRY
72432 172332
0241 72433 016611 JSB DASUB SUB, FROM ADDRESS BEING RETURNED
0242 72434 002020 SSA FAR ENOUGH?
0243 72435 026441 JMP RADT2 YES, FOUND NEXT ENTRY GREATER
0244 72436 066332 LDB LSTP2 NO, ADVANCE
0245 72437 044362 ADB ,+3 ADT POINTER
0246 72440 026426 JMP RADT1 TO NEXT ENTRY
0247*
0248* CHECK TO SEE IF THE NEW ENTRY IS
0249* ADJACENT TO THE FOLLOWING ENTRY
0250*
0251 72441 104200 RADT2 DLD DADDR GET CURRENT DISC ADDRESS
72442 000046
0252 72443 000040 CLE
0253 72444 044045 ADB DALEN ADD LENGTH OF RETURNED BLOCK
0254 72445 002040 SEZ CHECK FOR
0255 72446 002004 INA OVERFLOW
0256 72447 152332 CPA LSTP2,I CHECK FOR MATCH
0257 72450 002405 CLA,INA,RSS FIRST WORDS ARE EQUAL
0258 72451 026532 JMP RADT3 NO MATCH
0259 72452 042332 ADA LSTP2 CHECK SECOND
0260 72453 154000 CPB A,I WORD FOR MATCH
0261 72454 002001 RSS YES, COMBINE THE TWO ENTRIES
0262 72455 026532 JMP RADT3 NO, ENTRIES CAN'T BE COMBINED

```


0263*				
0264*			COMBINE THIS ENTRY WITH THE NEXT ENTRY	
0265*				
0266	72456	104200	DLD DADDR	REPLACE THE NEXT ENTRY WITH
	72457	000046		
0267	72460	104400	DST LSTP2,I	DISC ADDRESS OF RETURNED BLOCK
	72461	172332		
0268	72462	066332	LDB LSTP2	
0269	72463	044361	ADB ,+2	B => LENGTH OF ENTRY
0270	72464	060045	LDA DALEN	A = RETURNED LENGTH
0271	72465	140001	ADA B,I	ADD RETURNED LENGTH
0272	72466	170001	STA B,I	TO CURRENT LENGTH
0273*				
0274*			CHECK TO SEE IF THE NEW ENTRY IS	
0275*			ADJACENT TO THE PREVIOUS ENTRY	
0276*			(DID RETURNED BLOCK BRIDGE THE GAP)	
0277*				
0278	72467	062332	LDA LSTP2	CHECK FOR NO
0279	72470	050676	CPA LIBD	PREVIOUS ENTRY
0280	72471	126415	JMP RBADT,I	NONE
0281	72472	040356	ADA ,-1	
0282	72473	072331	STA LSTP1	=> PREVIOUS ENTRY LENGTH
0283	72474	040355	ADA ,-2	
0284	72475	104200	DLD A,I	= PREVIOUS ENTRY DISC ADDRESS
	72476	100000		
0285	72477	000040	CLE	
0286	72500	146331	ADB LSTP1,I	ADD PREVIOUS LENGTH
0287	72501	002040	SEZ	TO PREVIOUS ADDRESS
0288	72502	002004	INA	
0289	72503	152332	CPA LSTP2,I	CHECK FOR FIRST WORD MATCH
0290	72504	002405	CLA,INA,RSS	FIRST WORDS ARE EQUAL
0291	72505	126415	JMP RBADT,I	NO MATCH
0292	72506	042332	ADA LSTP2	CHECK SECOND
0293	72507	154000	CPB A,I	WORD FOR MATCH
0294	72510	002005	INA,RSS	=> LENGTH OF COMBINED ENTRY
0295	72511	126415	JMP RBADT,I	NO MATCH
0296*				
0297*			COMBINE PREVIOUS ENTRY WITH THE COMBINED ENTRY	
0298*				
0299	72512	164000	LDB A,I	B = LENGTH OF COMBINED ENTRY
0300	72513	040354	ADA ,-3	A => LENGTH OF PREVIOUS ENTRY
0301	72514	144000	ADB A,I	SUM AND THEN
0302	72515	174000	STB A,I	UPDATE LENGTH
0303	72516	066332	LDB LSTP2	NOW SET UP FOR MOVE
0304	72517	074051	STB MOVED	COMBINED
0305	72520	044362	ADB ,+3	ENTRY IS TO
0306	72521	074050	STB MOVES	BE REMOVED
0307	72522	044774	ADB MLIBD	COMPUTE LENGTH
0308	72523	144043	ADB DLPTR,I	OF MOVE
0309	72524	116346	JSB MOVFW,I	MOVE TABLE DOWN
0310	72525	160043	LDA DLPTR,I	A = CURRENT ADT LENGTH
0311	72526	040362	ADA ,+3	SHORTEN AND
0312	72527	170043	STA DLPTR,I	UPDATE ADT
0313	72530	070204	STA MWORD	UPDATE LENGTH WORD
0314	72531	126415	JMP RBADT,I	
0315*				

```

0316*      NOT ADJACENT TO THE FOLLOWING ENTRY -
0317*      CHECK FOR COMBINABILITY WITH PREVIOUS ENTRY
0318*
0319  72532 062332 RADT3 LDA LSTP2      CHECK FOR NO
0320  72533 050676      CPA LIBD      PREVIOUS ENTRY
0321  72534 026560      JMP RADT4      NONE
0322  72535 040356      ADA , -1
0323  72536 072331      STA LSTP1      => PREVIOUS ENTRY LENGTH
0324  72537 040355      ADA , -2
0325  72540 104200      DLD A, I      = PREVIOUS ENTRY DISC ADDRESS
        72541 100000
0326  72542 000040      CLE
0327  72543 146331      ADB LSTP1, I  ADD PREVIOUS LENGTH
0328  72544 002040      SEZ          TO PREVIOUS ADDRESS
0329  72545 002004      INA
0330  72546 050046      CPA DADDR    CHECK FOR FIRST
0331  72547 002001      RSS          WORD MATCH
0332  72550 026560      JMP RADT4    NO MATCH
0333  72551 054047      CPB DADDR+1 DO SECOND WORDS MATCH?
0334  72552 002001      RSS          YES, ENTRIES CAN COMBINE
0335  72553 026560      JMP RADT4    NO MATCH
0336  72554 060045      LDA DALEN    COMPUTE NEW
0337  72555 142331      ADA LSTP1, I LENGTH AND
0338  72556 172331      STA LSTP1, I UPDATE ENTRY
0339  72557 126415      JMP RBADT, I
0340*
0341*      THE NEW ENTRY IS NOT ADJACENT TO
0342*      THE FOLLOWING OR PRECEDING ENTRY -
0343*      MOVE TABLE IF POSSIBLE AND INSERT
0344*
0345  72560 164043 RADT4 LDB DLPTR, I  IF THERE IS NO ROOM
0346  72561 056354      CPB M8190    TO EXPAND THE ADT,
0347  72562 126415      JMP RBADT, I THE SPACE IS LOST
0348  72563 007000      CMB
0349  72564 044676      ADB LIBD
0350  72565 074050      STB MOVES    SET UP FOR
0351  72566 044362      ADB , +3     THE MOVE
0352  72567 074051      STB MOVED
0353  72570 007004      CMB, INB
0354  72571 044361      ADB , +2
0355  72572 046332      ADB LSTP2
0356  72573 116345      JSB MOVFB, I MOVE TABLE UP TO MAKE ROOM
0357  72574 104200      DLD DADDR    GET DISC ADDRESS AND
        72575 000046
0358  72576 104400      DST LSTP2, I SET INTO THE ADT
        72577 172332
0359  72600 066332      LDB LSTP2
0360  72601 044361      ADB , +2     GET LENGTH OF
0361  72602 060045      LDA DALEN    NEW ENTRY AND
0362  72603 170001      STA B, I     SET INTO ADT
0363  72604 160043      LDA DLPTR, I INCREASE ADT
0364  72605 040354      ADA , -3     TRACK LENGTH
0365  72606 170043      STA DLPTR, I THREE WORDS
0366  72607 070204      STA MWORD
0367  72610 126415      JMP RBADT, I

```

0369*

0370**

0371*** DISC ADDRESS SUBTRACTION

0372**

0373*

0374* THE TWO WORD DISC ADDRESS IN AB IS SUBTRACTED

0375* FROM THE DISC ADDRESS IN DADDR AND DADDR+1

0376*

0377	72611	000000	DASUB	NOP	
0378	72612	007104		CMB,CLE,INB	
0379	72613	003040		CMA,SEZ	
0380	72614	002004		INA	
0381	72615	000040		CLE	
0382	72616	044047	ADB	DADDR+1	ADD LOWER ADDRESS WORDS
0383	72617	002040		SEZ	
0384	72620	002004		INA	
0385	72621	040046	ADA	DADDR	ADD UPPER ADDRESS WORDS
0386	72622	126611	JMP	DASUB,I	

```

0388*
0389**
0390***   RETURN TABLE TO ADT
0391**
0392*
0393*   THIS ROUTINE SCANS A TABLE AND PUTS DISC SPACE BACK INTO
0394*   THE ADTS.  THE ROUTINE RETURNS ALL SPACE ON ONE ADT BEFORE
0395*   WRITING IT BACK.  THE DISC ADDRESS OF EACH ENTRY IS ZEROED
0396*   AS THE SPACE IS RETURNED.  THE FORMAT OF THE TABLE IS:
0397*
0398*           LIBUS+8192 / (ID)
0399*                   / LENGTH
0400*                   / DISC
0401*                   / ADDRESS
0402*                   .
0403*                   .
0404*                   .
0405*
0406*           TECNT - CONTAINS THE NEGATIVE NUMBER OF ENTRIES
0407*
0408   72623 000000   RTADT NOP
0409   72624 060035   RTAD1 LDA TECNT           GET ENTRY COUNT
0410   72625 072333           STA LSTP3           AND SAVE IT
0411   72626 002003           SZA,RSS           DON'T WASTE TIME
0412   72627 126623           JMP RTADT,I         ON A NULL TABLE
0413   72630 064674           LDB L8192         LOAD TABLE BASE
0414   72631 006004           INB           => DISC LENGTH OF FIRST ENTRY
0415   72632 160001   RTAD2 LDA B,I           GET LENGTH AND SAVE
0416   72633 070045           STA DALEN         FOR FADT AND RBADT
0417   72634 006004           INB           => DISC ADDRESS
0418   72635 076334           STB LSTP4        SAVE POINTER
0419   72636 104200           DLD B,I           GET THE DISC ADDRESS
0420   72637 100001
0420   72640 002003           SZA,RSS         CHECK FOR
0421   72641 006002           SZB           NULL ENTRY
0422   72642 002001           RSS           NON-ZERO ENTRY, RETURN SPACE
0423   72643 026734           JMP RTNUL        NULL ENTRY
0424   72644 104400           DST DADDR       SAVE DISC ADDRESS FOR FADT,RBADT
0425   72645 000046
0425   72646 002400           CLA           PREVENT SECOND
0426   72647 006400           CLB           RETURN OF
0427   72650 104400           DST LSTP4,I    SPACE
0428   72651 172334
0428   72652 016357           JSB FADT        FIND THE CORRECT ADT TRACK
0429   72653 104200           DLD DAPTR,I    CHECK FOR
0430   72654 100044
0430   72655 030001           IOR B           EXISTANCE
0431   72656 002003           SZA,RSS         OF ADT TRACK
0432   72657 026734           JMP RTNUL        DOESN'T EXIST
0433   72660 160043           LDA DLPTR,I    GET THE ADT'S LENGTH AND
0434   72661 070204           STA MWORD      SET UP FOR DISC TRANSFER
0435   72662 060044           LDA DAPTR      => DISC ADDRESS
0436   72663 072335           STA LSTP5      SAVE POINTER
0437   72664 064700           LDB LIBDI      READ IN
0438   72665 114206           JSB DISCZ,I    ADT TRACK
0439   72666 026727           JMP RTDER      DISC ERROR

```

0440	72667	016415		JSB RBADT	RETURN BLOCK TO ADT
0441	72670	036333	RTAD3	ISZ LSTP3	CHECK COUNTER
0442	72671	026677		JMP RTAD4	MORE ENTRIES
0443	72672	060044		LDA DAPTR	WRITE ADT
0444	72673	064676		LDB LIBD	BACK TO
0445	72674	114206		JSB DISCZ, I	DISC
0446	72675	026727		JMP RTDER	DISC ERROR
0447	72676	026624		JMP RTAD1	SCAN TABLE UNTIL EMPTY
0449	72677	066334	RTAD4	LDB LSTP4	
0450	72700	044362		ADB ,+3	=> NEXT DISC LENGTH
0451	72701	160001		LDA B, I	GET LENGTH AND SAVE
0452	72702	070045		STA DALEN	FOR FADT AND RBADT
0453	72703	006004		INB	=> DISC ADDRESS
0454	72704	076334		STB LSTP4	SAVE UPDATED POINTER
0455	72705	104200		DLD B, I	GET DISC ADDRESS
	72706	100001			
0456	72707	002003		SZA, RSS	CHECK FOR
0457	72710	006002		SZB	NULL ENTRY
0458	72711	002001		RSS	NON-ZERO, RETURN SPACE
0459	72712	026670		JMP RTAD3	NULL, GO TRY NEXT ENTRY
0460	72713	104400		DST DADDR	SAVE ADDRESS
	72714	000046			
0461	72715	016357		JSB FADT	FIND THE CORRECT ADT TRACK
0462	72716	060044		LDA DAPTR	DOES THIS ENTRY GO
0463	72717	052335		CPA LSTP5	ON THE ADT TRACK
0464	72720	002401		CLA, RSS	CURRENTLY IN CORE?
0465	72721	026670		JMP RTAD3	NO - DEFER
0466	72722	006400		CLB	YES - PREVENT
0467	72723	104400		DST LSTP4, I	DOUBLE RETURNS
	72724	172334			
0468	72725	016415		JSB RBADT	RETURN BLOCK TO ADT
0469	72726	026670		JMP RTAD3	PROCESS NEXT ENTRY
0471	72727	002400	RTDER	CLA	DISC ERROR DURING ADT I/O
0472	72730	006400		CLB	REMOVE ADT
0473	72731	170043		STA DLPTR, I	TRACK FROM
0474	72732	104400		DST DAPTR, I	ADTAT
	72733	100044			
0476	72734	036333	RTNUL	ISZ LSTP3	CHECK THE
0477	72735	002001		RSS	COUNTER
0478	72736	126623		JMP RTADT, I	DONE, NO MORE ENTRIES
0479	72737	066334		LDB LSTP4	GET THE TABLE POINTER
0480	72740	044362		ADB ,+3	=> NEXT DISC LENGTH
0481	72741	026632		JMP RTAD2	TRY THIS ENTRY

```

0483*
0484**
0485***  FIND IDT
0486**
0487*
0488*  THIS ROUTINE FINDS WHICH ID TRACK THE SPECIFIED ID IS ON AND
0489*  READS THAT TRACK INTO CORE.  ENTER WITH THE IDCODE IN ID.  THE
0490*  RETURNED RESULTS ARE:
0491*          IDTAD => DISC ADDRESS OF IDT
0492*          IDTLN => LENGTH OF ID TRACK
0493*          MWORD = LENGTH OF ID TRACK
0494*          LSTP1 = 0 IF ID NOT ON ANY TRACK
0495*
0496  72742 000000  FIDT  NOP
0497  72743 060354          LDA  .-3          INITIALIZE
0498  72744 072331          STA  LSTP1        COUNTER
0499  72745 062337          LDA  IDECL        => LAST IDEC ENTRY TRACK LENGTH
0500  72746 070076  FIDT1 STA  IDTLN      STORE IN POINTER
0501  72747 164000          LDB  A,I        SKIP THIS ENTRY
0502  72750 040354          ADA  .-3
0503  72751 006003          SZB, RSS        IF THE TRACK
0504  72752 026760          JMP  FIDT2      LENGTH IS ZERO
0505  72753 164000          LDB  A,I        = FIRST ID ON THIS TRACK
0506  72754 007004          CMB, INB
0507  72755 044052          ADB  ID        > OR < ?
0508  72756 006021          SSB, RSS
0509  72757 026764          JMP  FIDT3      FOUND THE TRACK
0510  72760 040356  FIDT2 ADA  .-1        => NEXT TRACK LENGTH
0511  72761 036331          ISZ  LSTP1     ANY MORE TRACKS?
0512  72762 026746          JMP  FIDT1     YES
0513  72763 002004          INA          NO, READ IN 1ST TRACK AS DEFAULT
0514*
0515  72764 002004  FIDT3 INA          => DISC ADDRESS
0516  72765 070075          STA  IDTAD     STORE IN POINTER
0517  72766 164076          LDB  IDTLN,I  SET DISC DRIVER
0518  72767 074204          STB  MWORD    TRANSFER LENGTH
0519  72770 064700          LDB  LIBDI    READ IDT
0520  72771 114206          JSB  DISCZ,I  FROM DISC
0521  72772 114207          JSB  SICKP,I  BAD NEWS
0522  72773 126742          JMP  FIDT,I   RETURN

```

```

0524*
0525**
0526*** SEARCH IDT
0527**
0528*
0529* THIS ROUTINE SEARCHES THE ID TRACK IN CORE FOR THE IDCODE
0530* SPECIFIED BY ID, AND RETURNS WITH B POINTING TO IT. IF B = 0,
0531* THEN THE IDCODE WAS NOT FOUND. MWORD MUST EQUAL THE NEGATIVE
0532* TRACK LENGTH.
0533*
0534 72774 000000 SIDT NOP
0535 72775 064204 LDB MWORD
0536 72776 007004 CMB,INB
0537 72777 044676 ADB LIBD => EOT+1
0538 73000 060052 LDA ID GET THE ID
0539 73001 054676 SIDT1 CPB LIBD START OF TABLE?
0540 73002 027007 JMP SIDT2 YES, NO SUCH ID
0541 73003 044347 ADB ,-8 => NEXT ENTRY
0542 73004 150001 CPA B,I CHECK FOR ID
0543 73005 126774 JMP SIDT,I FOUND IT
0544 73006 027001 JMP SIDT1 TRY NEXT ENTRY
0545*
0546 73007 006400 SIDT2 CLB ID DOES NOT
0547 73010 126774 JMP SIDT,I EXIST, B=0

```

```

0549*
0550**
0551*** GET CURRENT USER'S IDT
0552**
0553*
0554* GCIDT READS THE PROPER ID TRACK INTO CORE, SEARCHES IT FOR
0555* THE CURRENT USER'S ID, AND RETURNS WITH B POINTING TO IT.
0556* IF B=0, THE USER LOGGED OFF OR HIS ID DOES NOT EXIST.
0557*
0558 73011 000000 GCIDT NOP
0559 73012 064272 LDB MLINK+1
0560 73013 044346 ADB ,+?ID-?LINK
0561 73014 164001 LDB B,I GET USER'S ID
0562 73015 074052 STB ID AND SAVE IT
0563 73016 006003 SZB,RSS RETURN WITH B=0 IF
0564 73017 127011 JMP GCIDT,I USER NOT LOGGED ON
0565 73020 016742 JSB FIDT FIND ID TRACK
0566 73021 066331 LDB LSTP1 RETURN WITH
0567 73022 006003 SZB,RSS B=0 IF TRACK
0568 73023 127011 JMP GCIDT,I NOT FOUND
0569 73024 016774 JSB SIDT SEARCH ID TRACK
0570 73025 127011 JMP GCIDT,I
0001*

```

```

0003*
0004**
0005*** RETURN TABLE TO IDT
0006**
0007*
0008* THIS ROUTINE SCANS A TABLE AND UPDATES THE AMOUNT OF DISC SPACE
0009* IN USE FOR THE SPECIFIED IDS. THE FORMAT OF THE TABLE IS:
0010* LIBUS+8192 / (ID)
0011* / LENGTH
0012* / DISC
0013* / ADDRESS
0014* .
0015* .
0016* .
0017*
0018* TECNT - CONTAINS THE NEGATIVE NUMBER OF ENTRIES
0019*
0020 73026 000000 RTIDT NOP
0021 73027 060035 LDA TECNT GET CHARACTER
0022 73030 072332 STA LSTP2 COUNT AND SAVE
0023 73031 002003 SZA,RSS DON'T WASTE TIME
0024 73032 127026 JMP RTIDT,I ON A NULL TABLE
0025 73033 064674 LDB L8192 => HEAD OF TABLE
0026 73034 076333 STB LSTP3 SAVE IN POINTER
0027 73035 160001 RTID1 LDA B,I GET AND SAVE
0028 73036 070052 STA ID NEXT IDCODE
0029 73037 016742 JSB FIDT FIND ID TRACK
0030 73040 016774 RTID2 JSB SIDT SEARCH FOR ID
0031 73041 006003 SZB,RSS WAS ID FOUND?
0032 73042 027061 JMP RTID3 NO
0033 73043 044366 ADB,+7 => SECTORS USED
0034 73044 062333 LDA LSTP3 => TABLE ENTRY
0035 73045 002004 INA
0036 73046 160000 LDA A,I = LENGTH TO BE RETURNED
0037 73047 003004 CMA,INA UPDATE
0038 73050 140001 ADA B,I DISC SPACE
0039 73051 170001 STA B,I USED
0040 73052 066333 LDB LSTP3 SET POINTER
0041 73053 044363 ADB,+4 TO NEXT
0042 73054 076333 STB LSTP3 ENTRY
0043 73055 160001 LDA B,I GET AND
0044 73056 070052 STA ID SAVE ID
0045 73057 036332 ISZ LSTP2 DONE?
0046 73060 027040 JMP RTID2 NO
0047*
0048 73061 060075 RTID3 LDA IDTAD => DISC ADDRESS
0049 73062 064676 LDB LIBD WRITE OUT
0050 73063 114206 JSB DISCZ,I ID TRACK
0051 73064 114212 JSB DEADP,I BAD NEWS
0052 73065 062332 LDA LSTP2 WORK ALL DONE?
0053 73066 002003 SZA,RSS
0054 73067 127026 JMP RTIDT,I YES - RETURN
0055 73070 066333 LDB LSTP3 NO, PROCESS
0056 73071 027035 JMP RTID1 NEXT ENTRY

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0058*
0059**
0060***   SET UP HEADING
0061**
0062*
0063*   HDBUF SETS UP THE HEADING FOR DIRECTORY, STATUS, AND REPORT
0064*   ON THE SYSTEM CONSOLE. THE HEADING CONSISTS OF THE SYSTEM
0065*   ID, DATE, AND TIME.
0066*
0067 73072 000000 HDBUF NOP
0068 73073 060303 LDA T35B1 INITIALIZE TTY
0069 73074 070041 STA LTEMP+9 BUFFER POINTER
0070 73075 062355 LDA LFSPA LF=SPACE
0071 73076 170041 STA LTEMP+9,I
0072 73077 060532 LDA ASCBB TWO SPACES
0073 73100 034041 ISZ LTEMP+9
0074 73101 170041 STA LTEMP+9,I
0075 73102 060303 LDA T35B1 MOVE
0076 73103 040361 ADA .+2
0077 73104 070051 STA MOVED SYSTEM
0078 73105 062353 LDA DSYID
0079 73106 070050 STA MOVES ID TO
0080 73107 064352 LDB .-5
0081 73110 116346 JSB MOVFW,I BUFFER
0082 73111 060532 LDA ASCBB TWO SPACES
0083 73112 064041 LDB LTEMP+9
0084 73113 044365 ADB .+6
0085 73114 170001 STA B,I
0086 73115 044361 ADB .+2
0087 73116 074041 STB LTEMP+9
0088 73117 060171 LDA DATIM GET HOUR OF YEAR
0089 73120 006400 CLB CONVERT
0090 73121 100400 DIV .+24 TO DAY
0091 73122 000407
0091 73123 074042 STB LTEMP+10 SAVE HOUR REMAINDER
0092 73124 006400 CLB GET LAST
0093 73125 100400 DIV .+10 DIGIT
0094 73126 000371
0094 73127 005727 BLF,BLF
0095 73130 046356 ADB ZERSL MERGE IN SLASH
0096 73131 174041 STB LTEMP+9,I
0097 73132 017165 JSB TDNUM FIRST TWO DIGITS OF DAY
0098 73133 007400 CCB
0099 73134 044041 ADB LTEMP+9
0100 73135 170001 STA B,I
0101 73136 044361 ADB .+2
0102 73137 074041 STB LTEMP+9
0103 73140 060170 LDA YEAR YEAR OF CENTURY
0104 73141 017165 JSB TDNUM
0105 73142 170041 STA LTEMP+9,I
0106 73143 060532 LDA ASCBB TWO SPACES
0107 73144 034041 ISZ LTEMP+9
0108 73145 170041 STA LTEMP+9,I
0109 73146 060042 LDA LTEMP+10 HOUR OF DAY
0110 73147 017165 JSB TDNUM
0111 73150 034041 ISZ LTEMP+9

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0112	73151	170041	STA LTEMP+9,I	
0113	73152	060172	LDA DATIM+1	CONVERT
0114	73153	040526	ADA D36K	100 MS
0115	73154	006400	CLB	UNITS TO
0116	73155	100400	DIV D600	MINUTES
	73156	000510		
0117	73157	017165	JSB TDNUM	OF HOUR
0118	73160	034041	ISZ LTEMP+9	
0119	73161	170041	STA LTEMP+9,I	
0120	73162	060413	LDA .+28	28 CHARS IN HEADING
0121	73163	064303	LDB T35B1	
0122	73164	127072	JMP HDBUF,I	
0123*				
0124*	CONVERT A NUMBER <100 TO ASCII			
0125*				
0126	73165	000000	TDNUM NOP	
0127	73166	006400	CLB	
0128	73167	100400	DIV .+10	
	73170	000371		
0129	73171	001727	ALF,ALF	FIRST DIGIT
0130	73172	040001	ADA B	SECOND DIGIT
0131	73173	040530	ADA ASC00	ASCII OFFSET
0132	73174	127165	JMP TDNUM,I	

```

0134*
0135**
0136*** PRINT HEADING
0137**
0138*
0139* UHDBF PRINTS THE HEADING FOR DIRECTORY, STATUS, AND REPORT
0140* ON THE USER TERMINAL. THE HEADING CONSISTS OF THE SYSTEM
0141* ID, DATE, AND TIME.
0142*
0143 73175 000000 UHDBF NOP
0144 73176 060371 LDA .+12B LF
0145 73177 116350 JSB LOUTA,I
0146 73200 060417 LDA .+40B BLANK
0147 73201 116350 JSB LOUTA,I
0148 73202 060417 LDA .+40B BLANK
0149 73203 116350 JSB LOUTA,I
0150 73204 060417 LDA .+40B BLANK
0151 73205 116350 JSB LOUTA,I
0152 73206 062353 LDA DSYID
0153 73207 070040 STA LTEMP+8 => SYSTEM ID
0154 73210 060352 LDA .-5
0155 73211 070041 STA LTEMP+9 5 WORDS
0156 73212 UHDB1 EQU *
0157 73212 160040 LDA LTEMP+8,I OUTPUT
0158 73213 001727 ALF,ALF
0159 73214 010500 AND B377
0160 73215 116350 JSB LOUTA,I SYSTEM
0161 73216 160040 LDA LTEMP+8,I
0162 73217 010500 AND B377
0163 73220 116350 JSB LOUTA,I ID
0164 73221 034040 ISZ LTEMP+8
0165 73222 034041 ISZ LTEMP+9
0166 73223 027212 JMP UHDB1
0167 73224 060417 LDA .+40B BLANK
0168 73225 116350 JSB LOUTA,I
0169 73226 060417 LDA .+40B BLANK
0170 73227 116350 JSB LOUTA,I
0171 73230 060171 LDA DATIM GET HOUR OF YEAR
0172 73231 006400 CLB
0173 73232 100400 DIV .+24 CONVERT TO DAY
    73233 000407
0174 73234 074041 STB LTEMP+9 SAVE HOUR REMAINDER
0175 73235 006400 CLB
0176 73236 100400 DIV .+10 1ST 2 DIGITS IN A, LAST IN B
    73237 000371
0177 73240 074040 STB LTEMP+8
0178 73241 017274 JSB UTDNM OUTPUT 1ST 2
0179 73242 060040 LDA LTEMP+8
0180 73243 040437 ADA .+60B
0181 73244 116350 JSB LOUTA,I OUTPUT LAST ONE
0182 73245 060436 LDA .+57B '/'
0183 73246 116350 JSB LOUTA,I
0184 73247 060170 LDA YEAR GET YEAR
0185 73250 017274 JSB UTDNM AND OUTPUT
0186 73251 060417 LDA .+40B BLANK
0187 73252 116350 JSB LOUTA,I

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0188	73253	060417	LDA	.,+40B	BLANK
0189	73254	116350	JSB	LOUTA,I	
0190	73255	060041	LDA	LTEMP+9	HOUR OF DAY
0191	73256	017274	JSB	UTDNM	
0192	73257	060172	LDA	DATIM+1	CONVERT
0193	73260	040526	ADA	D36K	100MS
0194	73261	006400	CLB		UNITS TO
0195	73262	100400	DIV	D600	MINUTES
	73263	000510			
0196	73264	017274	JSB	UTDNM	OF HOUR
0197	73265	060402	LDA	.,+23B	X=OFF
0198	73266	116350	JSB	LOUTA,I	
0199	73267	060374	LDA	.,+15B	CR
0200	73270	116350	JSB	LOUTA,I	
0201	73271	060371	LDA	.,+12B	LF
0202	73272	116350	JSB	LOUTA,I	
0203	73273	127175	JMP	UHDBF,I	
0204*					
0205*	CONVERT A #<100 TO ASCII AND OUTPUT IT				
0206*					
0207	73274	000000	UTDNM	NOP	
0208	73275	006400	CLB		
0209	73276	100400	DIV	.,+10	
	73277	000371			
0210	73300	074043	STB	LTEMP+11	
0211	73301	040437	ADA	.,+60B	
0212	73302	116350	JSB	LOUTA,I	
0213	73303	060043	LDA	LTEMP+11	
0214	73304	040437	ADA	.,+60B	
0215	73305	116350	JSB	LOUTA,I	
0216	73306	127274	JMP	UTDNM,I	

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0218*
0219*      UPDATE LAST CHANGED DATES IF NECESSARY
0220*
0221  73307      #LCDL EQU *
0222  73307 064272 LDB MLINK+1      IS THERE
0223  73310 044341 ADB .-?LINK      A NEED TO
0224  73311 160001 LDA B,I          CHECK FILES
0225  73312 010502 AND DFCHK        FOR POSSIBLE
0226  73313 002003 SZA,RSS         LCD UPDATE
0227  73314 027361 JMP EXIT7
0228  73315 044376 ADB .+?PLEV
0229  73316 002400 CLA
0230  73317 103100 CLF 0
0231  73320 170001 STA B,I          SET PRIORITY TO 0
0232  73321 070262 STA TIMEF       NO TIMING
0233  73322 044355 ADB .+?STAT=?PLEV
0234  73323 060363 LDA %SYNT       SET STATUS TO SYNTAX SO
0235  73324 170001 STA B,I          WE WON'T GET SWAPPED
0236  73325 044346 ADB .+?PROG=?STAT
0237  73326 060056 LDA PBPTR       BOUND INTO
0238  73327 170001 STA B,I          TTY TABLE
0239  73330 003000 CMA             CALCULATE LENGTH
0240  73331 041213 ADA USE         FOR WRITE
0241  73332 070204 STA MWORD       TO DISC
0242  73333 044355 ADB .+?DISC=?PROG
0243  73334 060001 LDA B           => SWAP TRACK DISC ADDRESS
0244  73335 065213 LDB USE        OUTPUT USER
0245  73336 114206 JSB DISCZ,I    TO DISC
0246  73337 124210 JMP PTZAP,I   BLEW IT, GO ZAP USER
0247  73340 061550 LDA FRMAT     GET FILE COUNT (=)
0248  73341 064272 LDB MLINK+1  GET POINTER
0249  73342 044346 ADB .+?ID=?LINK TO ID WORD
0250  73343 017367 JSB LCD       GO UPDATE LAST CHANGED DATES
0251  73344 027361 JMP EXIT7     CORE INTACT, EXIT
0252  73345 002400 CLA          BLOCK
0253  73346 170632 STA DCLC1,I  CLOCK
0254  73347 060272 LDA MLINK+1  RESTORE
0255  73350 040345 ADA .+?PROG=?LINK
0256  73351 164000 LDB A,I      USER
0257  73352 007000 CMB
0258  73353 045213 ADB USE
0259  73354 074204 STB MWORD    SWAP
0260  73355 040355 ADA .+?DISC=?PROG
0261  73356 065214 LDB USEI
0262  73357 114206 JSB DISCZ,I  AREA
0263  73360 124210 JMP PTZAP,I  BLEW IT, GO ZAP USER
0264  73361      EXIT7 EQU *
0265  73361 002400 CLA          BLOCK
0266  73362 170632 STA DCLC1,I  CLOCK
0267  73363 114614 JSB ABCK,I   CHECK FOR ABORTS
0268  73364 160634 LDA DCLC2,I  UNBLOCK
0269  73365 170632 STA DCLC1,I  CLOCK
0270  73366 125556 JMP LCDLP,I

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0272*
0273*      THIS ROUTINE ASSUMES THAT THE USER'S SWAP AREA IS IN CORE,
0274*      THAT THE B REGISTER POINTS TO HIS ID WORD IN THE TELETYPE
0275*      TABLE, AND THAT A CONTAINS THE NEGATIVE OF THE NUMBER OF FILES
0276*
0277*
0278  73367 000000 LCD   NOP           ENTRY POINT
0279  73370 072341      STA LCDFC      SAVE FILE COUNT
0280  73371 076343      STB LCDID      AND ID POINTER
0281  73372 002021      SSA,RSS       MAKE SURE THERE REALLY ARE
0282  73373 027452      JMP LCD9       SOME FILES
0283  73374 002400      CLA          INITIALIZE DIRTY
0284  73375 072342      STA DFCNT     FILE COUNT TO ZERO
0285  73376 062340      LDA DFNAM     GET ADDRESS FOR FIRST
0286  73377 070051      STA MOVED     DIRTY FILE'S NAME
0287  73400 065502      LDB FILTB     GET START OF FILE TABLE
0288  73401 006004      INB          BUMP POINTER TO WORD 1
0289  73402 076344      STB LCDBS     OF ENTRY AND SAVE
0290*
0291  73403 160001 LCD1  LDA B,I       GET DIRTY FILE BIT
0292  73404 010215      AND BIT14     HAS THIS FILE
0293  73405 002002      SZA          BEEN CHANGED?
0294  73406 027462      JMP LCD2      YES
0295  73407 044376 LCD3  ADB ,+FTEL    NO, POINT TO NEXT ENTRY
0296  73410 036341      ISZ LCDFC     ARE THERE MORE FILES?
0297  73411 027403      JMP LCD1      YES, CHECK NEXT ONE
0298  73412 062342      LDA DFCNT     NO, WERE
0299  73413 002003      SZA,RSS      ANY DIRTY?
0300  73414 027452      JMP LCD9      NO, RETURN
0301*
0302  73415 037367      ISZ LCD       YES, BUMP RETURN (CORE IS DIFF)
0303  73416 003004      CMA,INA      SAVE NEGATIVE OF
0304  73417 072342      STA DFCNT     DIRTY FILE COUNT
0305  73420 066340      LDB DFNAM     GET ADDRESS OF FIRST
0306  73421 076344      STB LCDBS     DIRTY FILE'S NAME
0307  73422 162343      LDA LCDID,I   STICK ID IN LTEMP
0308  73423 070030      STA LTEMP     FOR DLOOK
0309  73424 160001 LCD6  LDA B,I       MOVE DIRTY
0310  73425 070031      STA LTEMP+1  FILE'S
0311  73426 006004      INB          NAME
0312  73427 104200      DLD B,I      INTO
0313  73431 104400      DST LTEMP+2  LTEMPS
0314  73432 000032
0314  73433 116347      JSB DLOKA,I   GO HUNT FOR DIRECTORY ENTRY
0315  73434 027472      JMP LCD5      FOUND IT
0316  73435 066344 LCD7  LDB LCDBS     BUMP
0317  73436 044362      ADB ,+3      POINTER TO
0318  73437 076344      STB LCDBS     NEXT NAME
0319  73440 036342      ISZ DFCNT     MORE DIRTY FILES?
0320  73441 027424      JMP LCD6      YES, PROCESS NEXT ONE
0321*
0322  73442 060257      LDA DIRWD     NO, WRITE DIRECTORY TO
0323  73443 002003      SZA,RSS      DISC IF ANY IS IN CORE
0324  73444 027452      JMP LCD9      ELSE, RETURN
0325  73445 006400      CLB          TELL DLOOK

```

0326	73446	074257		STB DIRWD	THERE ISN'T
0327	73447	064676		LDB LIBD	WRITE TRACK
0328	73450	114206		JSB DISCZ,I	TO DISC
0329	73451	114211		JSB SLVAG,I	BAD NEWS, TRY TO SALVAGE
0330	73452	066343	LCD9	LDB LCDID	CLEAR
0331	73453	044352		ADB .-?ID	CHECK
0332	73454	060502		LDA DFCHK	FOR
0333	73455	103100		CLF 0	DIRTY
0334	73456	120001		XOR B,I	FILES
0335	73457	170001		STA B,I	BIT
0336	73460	102100		STF 0	
0337	73461	127367		JMP LCD,I	RETURN
0338*					
0339*					MOVE NAME OF DIRTY FILE TO SAFE PLACE
0340*					
0341	73462	036342	LCD2	ISZ DFCNT	BUMP DIRTY FILE COUNT
0342	73463	076344		STB LCDBS	SAVE POINTER TO FILE TABLE ENTRY
0343	73464	044371		ADB .+10	GET POINTER TO FILE NAME
0344	73465	074050		STB MOVES	AND SET IN MOVEM'S SOURCE ADR
0345	73466	064354		LDB .-3	MOVE THE 3
0346	73467	116346		JSB MOVFW,I	NAME WORDS
0347	73470	066344		LDB LCDBS	GET ENTRY POINTER BACK
0348	73471	027407		JMP LCD3	RETURN TO SCAN OF FILE TABLE
0349*					
0350*					PROCESS A FOUND DIRECTORY ENTRY
0351*					
0352	73472	060034	LCD5	LDA LTEMP+4	TELL DLOOK WHICH
0353	73473	040364		ADA .+5	DIRECTORY TRACK
0354	73474	070257		STA DIRWD	IS IN CORE
0355	73475	064035		LDB LTEMP+5	GET
0356	73476	044361		ADB .+2	WORD
0357	73477	160001		LDA B,I	2
0358	73500	002021		SSA,RSS	IS THE ENTRY A FILE?
0359	73501	027435		JMP LCD7	NO, GO PROCESS NEXT NAME
0360	73502	044363		ADB .+4	YES, UPDATE LAST
0361	73503	060171		LDA DATIM	CHANGED DATE IN
0362	73504	170001		STA B,I	DIRECTORY ENTRY
0363	73505	027435		JMP LCD7	GO PROCESS NEXT NAME

```

0365*
0366* THIS ROUTINE SETS UP THINGS TO UPDATE THE LAST CHANGE DATE
0367* WHEN A USER HAS ABORTED
0368*
0369 73506 060255 ABUCD LDA MAIN
0370 73507 040363 ADA .+?PROG
0371 73510 064056 LDB PBPTR SET BOUND IN
0372 73511 174000 STB A,I TTY TABLE
0373 73512 007000 CMB
0374 73513 045213 ADB USE COMPUTE AND SET
0375 73514 074204 STB MWORD TRANSFER LENGTH
0376 73515 040355 ADA .+?DISC-?PROG => DISC ADDRESS
0377 73516 065213 LDB USE WRITE SWAP
0378 73517 114206 JSB DISCZ,I TRACK TO DISC
0379 73520 124210 JMP PTZAP,I BLEW IT, FLUSH USER
0380 73521 061500 LDA FCNTR
0381 73522 003004 CMA,INA -# OF FILES
0382 73523 064255 LDB MAIN
0383 73524 044364 ADB .+?ID => ID WORD IN TTY TABLE
0384 73525 017367 JSB LCD UPDATE LAST CHANGE DATE
0385 73526 000000 NOP
0386 73527 103100 CLF 0
0387 73530 064255 LDB MAIN
0388 73531 074062 STB TTQ FOR SCHEDULER
0389 73532 060377 LDA UNABT
0390 73533 030476 IOR ABTRY
0391 73534 003000 CMA
0392 73535 110001 AND B,I
0393 73536 170001 STA B,I CLEAR ABORT FLAGS
0394 73537 002400 CLA
0395 73540 070255 STA MAIN USER NO LONGER IN CPRE
0396 73541 170632 STA DCLC1,I BLOCK CLOCK
0397 73542 044374 ADB .+?STAT => STATUS WORD
0398 73543 126352 JMP DSCH7,I ENTER ABORT CODE IN SCHEDULER
0399*

```

```

0401 SUP
0402 73544 MLKFL EQU *
0403 73544 060410 LDA .+25
0404 73545 067547 LDB **2
0405 73546 126351 JMP LEN2A,I
0406 73547 073550 DEF **1
0407 73550 005114 OCT 5114
0408 73551 047503 ASC 12,OCKED BLOCKS TABLE FULL

```

```

0410 DDERL EQU *
0411 73565 005104 OCT 5104
0412 73566 044523 ASC 11,ISC ERROR; CAN'T DO IT
0413 UNS

```

```

0415 73601 000000 FILBF BSS 131 FILE BUFFER
0416 74004 BSS 0

```


0002	00040		LIBSC EQU	LTEMP+8	SEMI-COMPILED FLAG
0003	00041		LIBSP EQU	LTEMP+9	START OF PROGRAM POINTER
0004	00045		LIBPB EQU	LTEMP+13	END OF PROGRAM POINTER (PBPTR) .
0005	74004	025055	ASCAH	ASC 1,+-	
0006	74005	030055	ASC0H	ASC 1,0-	
0007	74006	177645	M133,	OCT -133	
0008	74007	001400	PRTMK	OCT 1400	
0009	74010	005040	PLFBK	OCT 5040	
0010	74011	000000	LTP1	BSS 1	
0011	74012	000000	LTP2	BSS 1	
0012	74013	000000	STABF	BSS 1	USED BY STATUS
0013	74014	000000	STAV1	BSS 1	USED BY
0014	74015	000000	STAV2	BSS 1	STATUS WHILE SUSPENDED
0015	74016	074532	DLCHR	DEF LCHAR	
0016	74017	031073	DLOKP	DEF DLOOK	LINK TO DIRECTORY SEARCH ROUTINE
0017	74020	072357	FADTP	DEF FADT	=> FIND ADT
0018	74021	072742	FIDTP	DEF FIDT	=> FIND IDT
0019	74022	073011	GCID	DEF GCIDT	=> GET CURRENT USER'S IDT
0020	74023	073072	HDBFA	DEF HDBUF	
0021	74024	061346	MDEDP	DEF MDEAD	
0022	74025	073544	MLFLA	DEF MLKFL	
0023	74026	074671	PCRLF	DEF CRLF	
0024	74027	072415	RBAD	DEF RBADT	=> RETURN BLOCK TO ADT
0025	74030	000116	RKCYP	DEF ADTAT	CYCLIC POINTER TO CURRENT DISK ADT TRACK ADDRESS
0026*					
0027	74031	072623	RTAD	DEF RTADT	=> RETURN TABLE TO ADT
0028	74032	073026	RTID	DEF RTIDT	=> RETURN TABLE TO IDT
0029	74033	071667	SCHOU	DEF SCHOG	
0030	74034	070360	SCHR	DEF SCH1	=> SCHEDULER
0031	74035	072774	SIDTP	DEF SIDT	=> SEARCH IDT
0032	74036	071662	SUSPP	DEF SUSP	
0033	74037	073175	UHDBA	DEF UHDBF	
0034*					
0035	74040	000000	MLKCT	BSS 1	THESE
0036	74041	000000	MLKLB	BSS 2	WORDS
0037	74043	000000	MLKIN	BSS 2	ARE
0038	74045	000000	MLKLN	BSS 1	USED
0039	74046	000000	MLKRD	BSS 1	BY
0040	74047	074050	MLKRP	DEF **+1	MLOCK
0041	74050	000000		BSS 6	

```

0043*
0044* RDPRG READS THE CURRENT USER INTO CORE.
0045*
0046 74056 000000 RDPRG NOP
0047 74057 060272 LDA MLINK+1
0048 74060 040345 ADA .+?PROG=?LINK
0049 74061 164000 LDB A,I GET PROGRAM BOUND
0050 74062 074056 STB PBPTR
0051 74063 007000 CMB COMPUTE
0052 74064 045213 ADB USE TRANSFER
0053 74065 074204 STB MWORD LENGTH
0054 74066 006400 CLB BLOCK
0055 74067 174632 STB DCLC1,I CLOCK
0056 74070 040355 ADA .+?DISC=?PROG => DISC ADDRESS
0057 74071 065214 LDB USEI READ IN
0058 74072 114206 JSB DISCZ,I USER
0059 74073 124210 JMP PTZAP,I BLEW IT, ZAP THIS USER
0060 74074 160634 LDA DCLC2,I UNBLOCK SCHEDULER.
0061 74075 170632 STA DCLC1,I
0062 74076 126056 JMP RDPRG,I RETURN
0063*
0064**
0065*** GETID
0066**
0067*
0068*
0069* GETID SCANS THE INPUT BUFFER FOR AN ID NUMBER. IF NOT FOUND, IT
0070* OUTPUTS A MESSAGE AND TERMINATES.
0071* IF FOUND, THE RESULT IS PLACED IN ID, =RESULT
0072* IN MID. IF THE FOLLOWING CHARACTER IS A CR, GETID SKIPS ON THE
0073* WAY BACK. IN ANY CASE, THE NEXT CHARACTER IS IN A.
0074* GETID USES LTEMP+12,13,14,15.
0075*
0076 00044 GETCH EQU LTEMP+12
0077 00045 GETI1 EQU LTEMP+13
0078 00046 GETI2 EQU LTEMP+14
0079 00047 GETI3 EQU LTEMP+15

0081 74077 000000 GETID NOP
0082 74100 060272 LDA MLINK+1 DETERMINE WHICH SCANNER TO USE
0083 74101 066016 LDB DLCHR USE LCHAR IF USER TELETYPE,
0084 74102 050263 CPA T35LN T35CH IF SYSTEM.
0085 74103 064754 LDB T35CH
0086 74104 074044 STB GETCH
0087 74105 114044 JSB GETCH,I SCAN INPUT BUFFER FOR FIRST
0088 74106 026616 JMP GTFER CHARACTER.
0089 74107 042006 ADA M133. TEST FOR LETTER
0090 74110 002021 SSA,RSS
0091 74111 026616 JMP GTFER
0092 74112 040411 ADA .+32B
0093 74113 002024 SSA,INA
0094 74114 026616 JMP GTFER
0095 74115 100032 ASL 10
0096 74116 070045 STA GETI1 SAVE FOR LATER.
0097 74117 060354 LDA .-3 SET DIGIT
0098 74120 070046 STA GETI2 COUNTER.

```

0099	74121	006400	CLB	SET NUMBER
0100	74122	074047	GETI4 STB GETI3	TO 0.
0101	74123	114044	JSB GETCH,I	GET NEXT CHAR.
0102	74124	026616	JMP GTFER	FAIL.
0103	74125	040322	ADA M72B	TEST FOR DIGIT
0104	74126	002021	SSA,RSS	
0105	74127	026616	JMP GTFER	FAIL.
0106	74130	040371	ADA .+10	
0107	74131	002020	SSA	
0108	74132	026616	JMP GTFER	FAIL.
0109	74133	064047	LDB GETI3	GET PARTIAL VALUE.
0110	74134	005222	RBL,RBL	MULTIPLY BY 10.
0111	74135	044047	ADB GETI3	
0112	74136	005200	RBL	
0113	74137	044000	ADB 0	ADD IN NEW DIGIT.
0114	74140	034046	ISZ GETI2	TEST FOR DONE.
0115	74141	026122	JMP GETI4	
0116	74142	044045	ADB GETI1	MERGE IN LETTER.
0117	74143	074052	STB ID	
0118	74144	007004	CMB,INB	
0119	74145	074053	STB MID	
0120	74146	116021	JSB FIDTP,I	FIND ID TRACK
0121	74147	114044	JSB GETCH,I	GET NEXT CHARACTER.
0122	74150	036077	ISZ GETID	SKIP RETURN IF CR.
0123	74151	126077	JMP GETID,I	

0124*

0125**

0126*** SCHEDULE LIBRARY ROUTINE FOR EXECUTION

0127**

0128*

0129* THIS ROUTINE IS CALLED BY THE COMPILER WHEN IT WANTS TO EXECUTE
 0130* ONE OF THE FOLLOWING LIBRARY ROUTINES: CHAIN, FILES, OR ASSIGN.
 0131* THESE LIBRARY ROUTINES ARE ALWAYS EXECUTED WITH A PRIORITY OF 0,
 0132* AS ALL LIBRARY ROUTINES ARE. THE CALLING SEQUENCE IS;

0133*

0134*

0135*

0136*

0137*

0138*

JSB SCHLB,I
 DEF <POINTER TO DISC ADDRESS OF ROUTINE>
 <PARAMETERS IF DESIRED>
 <RETURN>

0139

0140

0141

0142

0143

0144

0145

0146

0147

0148

0149

0150

0151

0152

0153

0154

74152	000000	SCHLQ	NOP	
74153	103100	CLF	0	
74154	064272	LDB	M LINK+1	
74155	044341	ADB	.-?LINK	
74156	160001	LDA	B,I	SUSPEND
74157	010462	AND	COM14	IF USER
74160	002002	SZA		TRIED TO
74161	126036	JMP	SUSPP,I	ABORT
74162	160001	LDA	1,I	SET UNABLE
74163	030377	IOR	UNABT	TO ABORT
74164	170001	STA	1,I	BIT
74165	044376	ADB	.+?PLEV	
74166	002400	CLA		
74167	070262	STA	TIMEF	NO TIMING.
74170	170001	STA	1,I	SET PRIORITY TO 0
74171	044355	ADB	.+?STAT=?PLEV	SET STATUS TO SYNTAX

0155	74172	060363	LDA XSYNT	SO SCHEDULER DOESN'T KNOW
0156	74173	170001	STA 1,I	WHAT WE'RE DOING.
0157	74174	044346	ADB .+?PROG=?STAT	
0158	74175	060056	LDA PBPTR	SET PBPTR IN TABLE.
0159	74176	170001	STA B,I	
0160	74177	003000	CMA	COMPUTE
0161	74200	041213	ADA USE	TRANSFER
0162	74201	070204	STA MWORD	LENGTH
0163	74202	044355	ADB .+?DISC=?PROG	
0164	74203	060001	LDA B	=> SWAP AREA DISC ADDRESS
0165	74204	065213	LDB USE	SWAP USER
0166	74205	114206	JSB DISCZ,I	OUT OF CORE
0167	74206	124210	JMP PTZAP,I	NO GOOD, REMOVE THIS BUM
0168	74207	162152	LDA SCHLQ,I	=> LIBRARY ROUTINE DISC ADDRESS
0169	74210	036152	ISZ SCHLQ	
0170	74211	050256	CPA LIB	IF ROUTINE IS ALREADY
0171	74212	027000	JMP LIBRA	IN CORE, TRANSFER TO IT
0172	74213	070256	STA LIB	SET POINTER
0173	74214	064315	LDB M512	SET TRANSFER
0174	74215	074204	STB MWORD	LENGTH
0175	74216	064610	LDB #LIBI	READ IN
0176	74217	114206	JSB DISCZ,I	LIBRARY ROUTINE
0177	74220	114207	JSB SICKP,I	BAD NEWS
0178	74221	027000	JMP LIBRA	
0179*				
0180**	COMPILER CALLED ROUTINES ALWAYS RETURN HERE			
0181*				
0182	74222	103100	SCHBL CLF 0	
0183	74223	064272	LDB MLINK+1	
0184	74224	044356	ADB .+?STAT=?LINK	
0185	74225	134001	ISZ 1,I	TRUE STATUS IS RUN
0186	74226	034262	ISZ TIMEF	SET FLAG FOR TIMING
0187	74227	044355	ADB .+?CLOC=?STAT	
0188	74230	134001	ISZ 1,I	TIMED OUT?
0189	74231	026250	JMP SCHB1	NO
0190	74232	044363	ADB .+?PLEV=?CLOC	
0191	74233	060363	LDA .+4	SET PRIORITY TO 4
0192	74234	170001	STA B,I	
0193	74235	044354	ADB .+?RSTR=?PLEV	
0194	74236	062152	LDA SCHLQ	
0195	74237	170001	STA B,I	SET RESTART ADDRESS
0196	74240	002400	CLA	
0197	74241	170632	STA DCLC1,I	BLOCK CLOCK
0198	74242	102100	STF 0	
0199	74243	064272	LDB MLINK+1	REMOVE
0200	74244	160001	LDA B,I	USER FROM
0201	74245	070272	STA MLINK+1	QUEUE
0202	74246	016252	JSB INSEQ	INSERT AGAIN AT END
0203	74247	126034	JMP SCHR,I	RETURN TO SCHEDULER
0204	74250		SCHB1 EQU *	
0205	74250	102100	STF 0	
0206	74251	126152	JMP SCHLQ,I	RETURN TO LANGUAGE PROCESSOR

```

0208*
0209**
0210***  INSERT USER INTO THE QUEUE
0211**
0212*
0213*
0214*  THIS SUBROUTINE INSERTS A USER INTO THE QUEUE IN ORDER OF HIS
0215*  PRIORITY. WHEN WE ARRIVE HERE, THE B REGISTER POINTS TO THE LINK
0216*  WORD FOR THE USER. INSEQ TRANSFORMS THE USERS ENTERING PRIORITY
0217*  (EP) TO ANEW PRIORITY (NP) BY THE FOLLOWING ALGORITHM:
0218*          NP = EP*NPORT/4
0219*  WHERE NPORT IS THE NEGATIVE MAXIMUM NUMBER OF PORTS.
0220*
0221  74252 000000  INSEQ NOP
0222  74253 074061  STB SCHL      SAVE LINK ADDRESS
0223  74254 044360  ADB .+?PLEV-?LINK
0224  74255 074067  STB SCHPR    SAVE PRIORITY ADDRESS
0225  74256 160001  LDA B,I      COMPUTE AND
0226  74257 100200  MPY NPORT    SAVE PRIORITY
                74260 000167
0227  74261 001121  ARS,ARS      BASED UPON THE
0228  74262 170067  STA SCHPR,I  # OF AVAILABLE PORTS
0229  74263 003004  CMA,INA      SAVE POSITIVE
0230  74264 070067  STA SCHPR    VALUE FOR TEST
0231  74265 064271  LDB MLINK    => PHONY USER
0232  74266 074064  INS1 STB SCHP  SAVE LINK POINTER
0233  74267 164001  LDB B,I      B => NEXT USER
0234  74270 054271  CPB MLINK    DID WE REACH END OF QUEUE?
0235  74271 026303  JMP INS2     YES
0236  74272 060001  LDA B        NO
0237  74273 040360  ADA .+?PLEV-?LINK
0238  74274 070066  STA SCHK     SAVE THIS USER'S PRIORITY ADDR.
0239  74275 160000  LDA A,I      GET THE PRIORITY AND
0240  74276 040067  ADA SCHPR    ADD THE TEST VALUE
0241  74277 002021  SSA,RSS     IF >= TRY THE
0242  74300 026266  JMP INS1     LINK TO NEXT USER
0243  74301 134066  ISZ SCHK,I  INCREMENT PRIORITY
0244  74302 000000  NOP         OF PREVIOUS ENTRY
0245  74303 174061  INS2 STB SCHL,I SET NEW ENTRY TO POINT TO USER
0246  74304 060061  LDA SCHL
0247  74305 170064  STA SCHP,I  SET PREVIOUS ENTRY => NEW ENTRY.
0248  74306 040354  ADA .+?CLOC-?LINK SET NEW USERS CLOCK TO -10.
0249  74307 064345  LDB .-10
0250  74310 174000  STB 0,I
0251  74311 126252  JMP INSEQ,I
0252*
0253**
0254***  ABORT CHECK
0255**
0256*
0257*
0258*  TEST FOR ABORT ATTEMPT WHEN THEY WEREN'T ALLOWED. IF SO, LET
0259*  THE SCHEDULER KNOW TO ABORT HIM
0260  74312 000000  ABCHK NOP
0261  74313 064272  LDB MLINK+1 CLEAR
0262  74314 044341  ADB .-?LINK

```

0263	74315	060377	LDA UNABT	UNABLE TO
0264	74316	003000	CMA	
0265	74317	103100	CLF 0	ABORT
0266	74320	110001	AND 1,I	
0267	74321	170001	STA 1,I	FLAG
0268	74322	102100	STF 0	
0269	74323	010476	AND ABTRY	
0270	74324	002003	SZA,RSS	ABORT ATTEMPTED?
0271	74325	126312	JMP ABCHK,I	NO
0272	74326	103100	CLF 0	YES
0273	74327	030506	IOR CHNFG	
0274	74330	003000	CMA	CLEAR ABORT
0275	74331	110001	AND 1,I	TRY FLAG
0276	74332	030462	IOR COM14	SET COM14 BIT
0277	74333	170001	STA 1,I	TO SIGNAL SCHEDULER
0278	74334	002400	CLA	BLOCK
0279	74335	170632	STA DCLC1,I	CLOCK
0280	74336	044374	ADB ,+?STAT	
0281	74337	003400	CCA	SET STATUS
0282	74340	170001	STA 1,I	TO ABORTING
0283	74341	102100	STF 0	
0284	74342	126034	JMP SCHR,I	RETURN TO SCHEDULER
0285*				
0286**				
0287***	SEMI-COMPILE CHECK			
0288**				
0289*				
0290*				
0291*	CHECK IF THE PROGRAM WHICH HAS JUST BEEN LOADED FROM THE USER			
0292*	LIBRARY IS SEMI-COMPILED, AND SET THE NECESSARY COMPILER			
0293*	VARIABLES, LIBSC, LIBSP, AND LIBPB ARE PASSED TO THIS ROUTINE			
0294*	FROM THE LIBRARY ROUTINE WHICH CALLS IT (CHAIN, GET, OR HELLO)			
0295*				
0296	74343	000000	SEMIC NOP	
0297	74344	103100	CLF 0	
0298	74345	060040	LDA LIBSC	
0299	74346	002020	SSA	SEMI-COMPILED?
0300	74347	026362	JMP SEMI1	YES
0301	74350	002400	CLA	NO-CLEAR OUT-OF-
0302	74351	071573	STA SYMTB	STORAGE FLAG
0303	74352	060045	LDA LIBPB	SET LENGTH
0304	74353	070056	STA PBPTR	POINTER
0305	74354	064272	LDB MLINK+1	SET
0306	74355	044341	ADB , -?LINK	UNCOMPILED
0307	74356	060361	LDA CFLAG	BIT
0308	74357	003000	CMA	
0309	74360	110001	AND 1,I	
0310	74361	026414	JMP SEMI3	
0311	74362	060045	SEMI1 LDA LIBPB	SET
0312	74363	040350	ADA , -7	LENGTH
0313	74364	070056	STA PBPTR	POINTER
0314	74365	071502	STA FILTB	
0315	74366	164000	LDB 0,I	SET END-OF-
0316	74367	075573	STB SYMTB	PROGRAM POINTER
0317	74370	002004	INA	SET <FILES
0318	74371	164000	LDB 0,I	STATEMENT>

0319	74372	075604	STB	FILCT	COUNTER
0320	74373	064444	LDB	DFILT	POINTER TO
0321	74374	075603	STB	FILPT	<FILES STATEMENT>
0322	74375	064353	LDB	,-4	4 <FILES
0323	74376	075230	STB	SPTR	STATEMENTS> POSSIBLE
0324	74377	002004	SEMI2	INA	STORE
0325	74400	164000	LDB	0,I	POINTER
0326	74401	175603	STB	FILPT,I	TO <FILES
0327	74402	035603	ISZ	FILPT	STATEMENT>
0328	74403	035230	ISZ	SPTR	ALL 4 DONE?
0329	74404	026377	JMP	SEMI2	NO
0330	74405	002004	INA		SAVE
0331	74406	164000	LDB	0,I	'USING
0332	74407	075605	STB	USES	'SEEN' FLAG
0333	74410	064272	LDB	MLINK+1	SET
0334	74411	044341	ADB	,-?LINK	COMPILED
0335	74412	160001	LDA	1,I	BIT
0336	74413	030361	IOR	CFLAG	
0337	74414	030612	SEMI3	IOR	PUALT
0338	74415	170001	STA	B,I	SET PROGRAM
0339	74416	074255	STB	MAIN	UNALTERED BIT
0340	74417	064041	LDB	LIBSP	SET MAIN
0341	74420	075575	STB	SPROG	SET START-OF-
0342	74421	102100	STF	0	PROGRAM POINTER
0343	74422	126343	JMP	SEMIC,I	
0344*					
0345*	DATE COMPUTES A WORD CONTAINING THE YEAR IN ITS 7 HIGH ORDER BITS				
0346*	AND THE DAY IN ITS 9 LOW ORDER BITS.				
0347*					
0348	74423	000000	DATE	NOP	
0349	74424	060171	LDA	DATIM	GET HOUR OF YEAR.
0350	74425	006400	CLB		DIVIDE BY 24 TO
0351	74426	100400	DIV	,+24	GET THE DAY.
	74427	000407			
0352	74430	100047	LSL	7	POSITION ON LEFT.
0353	74431	064170	LDB	YEAR	POSITION THE YEAR
0354	74432	101047	LSR	7	
0355	74433	126423	JMP	DATE,I	
0356*					
0357**	MOVE BLOCK BACKWARD				
0358*					
0359	74434	000000	MOVEB	NOP	MOVE BACKWARD -B WORDS FROM
0360	74435	006025	SSB	,INB,RSS	MOVES TO MOVED.
0361	74436	126434	JMP	MOVEB,I	
0362	74437	160050	LDA	MOVES,I	
0363	74440	170051	STA	MOVED,I	
0364	74441	003400	CCA		UPDATE POINTERS.
0365	74442	040051	ADA	MOVED	
0366	74443	070051	STA	MOVED	
0367	74444	003400	CCA		
0368	74445	040050	ADA	MOVES	
0369	74446	070050	STA	MOVES	
0370	74447	026435	JMP	MOVEB+1	
0371*					
0372**	MOVE BLOCK FORWARD				
0373*					

0374	74450	000000	MOVEW NOP	MOVES -B WORDS FROM MOVES,I TO
0375	74451	006025	SSB,INB,RSS	MOVED,I
0376	74452	126450	JMP MOVEW,I	
0377	74453	160050	LDA MOVES,I	GET A WORD
0378	74454	170051	STA MOVED,I	STORE IT.
0379	74455	034050	ISZ MOVES	BUMP
0380	74456	034051	ISZ MOVED	POINTERS.
0381	74457	026451	JMP MOVEW+1	NO.


```

0383*
0384**
0385*** SYSTEM CONSOLE INPUT ROUTINE
0386**
0387*
0388*
0389* T35CQ IS USED BY LIBRARY PROGRAMS TO SCAN THE TTY35 INPUT BUFFER,
0390* EACH TIME IT IS CALLED, IT FETCHES THE NEXT CHARACTER, BUT SKIPS
0391* BLANKS. THE CHARACTER IS LEFT IN T35LC, AND IN A. WHEN A RETURN IS
0392* ENCOUNTERED, T35CQ RETURNS TO P+1; OTHERWISE TO P+2. IT IS INITI-
0393* ALIZED BY THE MONITOR BEFORE THE LIBRARY ROUTINE IS CALLED.
0394*
0395 74460 000000 T35CQ NOP ENTRY POINT.
0396 74461 060055 LDA T35LC GET LAST CHARACTER.
0397 74462 050374 CPA ,+15B IF CR,
0398 74463 126460 JMP T35CQ,I RETURN IMMEDIATELY.
0399 74464 T35C0 EQU *
0400 74464 064054 LDB T35CP GET CHARACTER POINTER IN B+
0401 74465 004065 CLE,ERB ADJUST.
0402 74466 160001 LDA 1,I FETCH
0403 74467 002041 SEZ,RSS CHAR.
0404 74470 001727 ALF,ALF
0405 74471 010474 AND B177
0406 74472 070055 STA T35LC SAVE IT.
0407 74473 034054 ISZ T35CP BUMP POINTER.
0408 74474 050374 CPA ,+15B IF CR.
0409 74475 126460 JMP T35CQ,I RETURN IMMEDIATELY.
0410 74476 050417 CPA ,+40B IF BLANK,
0411 74477 T35C1 EQU *
0412 74477 026464 JMP T35C0 OTHERWISE
0413 74500 036460 ISZ T35CQ RETURN NORMAL.
0414 74501 126460 JMP T35CQ,I
0415*
0416**
0417*** SYSTEM CONSOLE OUTPUT ROUTINES
0418**
0419*
0420*
0421** OUTPUT BUFFER TO SYSTEM CONSOLE AND WAIT
0422*
0423* A = # OF CHARACTERS (BIT 15 = 0 FOR CRLF)
0424* B => BUFFER (BIT 15 = 1 FOR PUNCHING)
0425*
0426 74502 000000 T35SP NOP
0427 74503 114760 JSB TTY35,I FIRST OUTPUT.
0428 74504 103100 CLF 0
0429 74505 062502 LDA T35SP MOVE RETURN ADDRESS
0430 74506 070275 STA T35RS INTO TABLE.
0431 74507 060276 LDA T35ST MOVE STATUS INTO PRIORITY
0432 74510 070300 STA T35PR
0433 74511 060362 LDA %OUTW SET STATUS TO OUTWAIT.
0434 74512 070276 STA T35ST
0435 74513 126036 JMP SUSPP,I GO HANG
0436*
0437** OUTPUT LF TO SYSTEM CONSOLE AND TERMINATE
0438*

```

```

0439 74514 060722 LEND LDA ONEI OUTPUT THE
0440 74515 064636 LDB DEH LINE FEED.
0441 74516 114760 LEND2 JSB TTY35,I OUTPUT BUFFER AND TERMINATE
0442 74517 103100 CLF 0
0443 74520 002400 CLA
0444 74521 070312 STA T35F2
0445 74522 124740 JMP SCHEN,I
0446*
0447** OUTPUT ILLEGAL FORMAT MESSAGE TO SYSTEM CONSOLE AND TERMINATE
0448*
0449 74523 060376 LFRER LDA ,+15
0450 74524 066713 LDB LFRDF
0451 74525 026516 JMP LEND2
0452*
0453** OUTPUT DISC ERROR MESSAGE TO SYSTEM CONSOLE AND TERMINATE
0454*
0455 74526 DDERR EQU *
0456 74526 060414 LDA ,+29
0457 74527 066531 LDB **2
0458 74530 026516 JMP LEND2
0459 74531 073565 DEF DDERRL
0460*
0461**
0462*** USER TELETYPE INPUT ROUTINE
0463**
0464*
0465*
0466* LCHAR IS USED BY LIBRARY PROGRAMS TO OBTAIN CHARACTERS FROM THE
0467* USER'S INPUT BUFFER IN THE I/O PROCESSOR. EACH TIME IT IS
0468* CALLED, IT FETCHES THE NEXT CHARACTER, SKIPS BLANKS, AND CONVERTS
0469* LOWER CASE CHARACTERS TO UPPER CASE. THE CHARACTER IS LEFT IN
0470* LCHCR AND A. WHEN A CR IS ENCOUNTERED, LCHAR RETURNS TO P+1;
0471* OTHERWISE TO P+2.
0472*
0473 74532 000000 LCHAR NOP
0474 74533 060264 LDA LCHCR GET CARRIAGE RETURN FLAG
0475 74534 050374 CPA ,+15B PREVIOUS RETURN?
0476 74535 126532 JMP LCHAR,I YES
0477 74536 064272 LCHR1 LDB MLINK+1
0478 74537 044342 ADB ,+?TNUM=?LINK
0479 74540 160001 LDA 1,I FETCH
0480 74541 030215 IOR GTC CHARACTER
0481 74542 114736 JSB S14SC,I FROM 2114
0482 74543 102311 SFS CH2 WAIT FOR
0483 74544 026543 JMP *-1 RESPONSE
0484 74545 102511 LIA CH2
0485 74546 070264 STA LCHCR SET CARRIAGE RETURN FLAG
0486 74547 050417 CPA ,+40B BLANK?
0487 74550 026536 LCHR2 JMP LCHR1 YES, IGNORE IT
0488 74551 050374 CPA ,+15B NO, CARRIAGE RETURN
0489 74552 126532 JMP LCHAR,I YES==EXIT
0490 74553 040317 ADA M96
0491 74554 002021 SSA,RSS LOWER CASE?
0492 74555 040450 ADA M32 YES, CONVERT
0493 74556 040470 ADA ,140 NO
0494 74557 036532 ISZ LCHAR NO==EXIT

```

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0495 74560 126532      JMP LCHAR,I      TO (P+2)
0496*
0497**
0498***  USER TELETYPE OUTPUT ROUTINES
0499**
0500*
0501*
0502**  OUTPUT CHARACTER IN A TO USER'S TELETYPE
0503*
0504 74561 000000  LOUT  NOP
0505 74562 064272      LDB MLINK+1
0506 74563 044341      ADB  ,-2LINK
0507 74564 114724      JSB OUTCH,I
0508 74565 126561      JMP LOUT,I
0509*
0510**  OUTPUT BUFFER TO USER'S TELETYPE
0511*      A =  -NUMBER OF CHARACTERS
0512*      B => BUFFER
0513*
0514 74566 000000  LTYPR  NOP
0515 74567 072011      STA LTYP1      SAVE CHARACTER COUNT
0516 74570 076012      STB LTYP2      SAVE BUFFER POINTER
0517 74571 162012  LTYP3  LDA LTYP2,I  GET FIRST
0518 74572 001727      ALF,ALF      CHARACTER OF WORD
0519 74573 016561      JSB LOUT      OUT.
0520 74574 036011      ISZ LTYP1     ANY MORE?
0521 74575 002001      RSS          YES
0522 74576 126566      JMP LTYPR,I  NO.
0523 74577 162012      LDA LTYP2,I  SEND 2ND
0524 74600 016561      JSB LOUT     CHAR.
0525 74601 036012      ISZ LTYP2     BUMP POINTER.
0526 74602 036011      ISZ LTYP1     ANY MORE?
0527 74603 026571      JMP LTYP3     YES
0528 74604 126566      JMP LTYPR,I
0529*
0530**  OUTPUT BUFFER AND CR-LF TO USER'S TELETYPE
0531*      A =  -NUMBER OF CHARACTERS
0532*      B => BUFFER
0533*
0534 74605 000000  LTYPE  NOP
0535 74606 016566      JSB LTYPR
0536 74607 060355      LDA  ,-2
0537 74610 066026      LDB PCRLF     => CR-LF
0538 74611 016566      JSB LTYPR
0539 74612 126605      JMP LTYPE,I
0540*
0541**  OUTPUT LF TO USER'S TTY AND TERMINATE
0542*
0543 74613 060371  LLEND  LDA  ,+12B
0544 74614 016561      JSB LOUT
0545 74615 124740      JMP SCHEN,I

0547*
0548**  ERROR MESSAGE TERMINAL CHECK
0549*

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```

0550 74616 060044  GTFER LDA GETCH      IF SYSTEM TELETYPE, PRINT
0551 74617 050754      CPA T35CH      ERROR MESSAGE THERE.
0552 74620 026523      JMP LFRER
0553*
0554**  OUTPUT ILLEGAL FORMAT MESSAGE TO USER'S TTY AND TERMINATE
0555*
0556 74621 060340  ILFER LDA ',-15      OTHERWISE PRINT IT ON
0557 74622 066713      LDB LFRDF      USER TELETYPE.
0558*
0559**  OUTPUT BUFFER AND CR-LF TO USER'S TTY AND TERMINATE
0560*
0561 74623 016605  LIBER JSB LTYPE
0562 74624 124740      JMP SCHEN,I  TERMINATE.
0563*
0564**
0565***  BUFFERS AND MESSAGES
0566**
0567*
0568      SUP
0569 74625 000000  T35BF BSS 36      BUFFER FOR INPUT AND REPLIES.
0570 74671 006412  CRLF  OCT 6412    MUST FOLLOW T35BF

0572 74672 074673  HELK  DEF ++1
0573 74673 005111      OCT 5111
0574 74674 046114      ASC 7,LLEGAL ACCESS

0576 74703 074704  HELH  DEF ++1
0577 74704 005116      OCT 5116
0578 74705 047440      ASC 6,0 TIME LEFT

0580 74713 074714  LFRDF DEF ++1
0581 74714 005111      OCT 5111
0582 74715 046114      ASC 7,LLEGAL FORMAT
0583      UNS

0585 74724      BSS 0

```

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	177703	ABS LIBRA-SSLPL
0010	75001	177000	DEC -512
0011	75002	177000	DEC -512
0012	75003	177216	ABS LIBRA-SFLB
0013	75004	177255	ABS LIBRA-SASN
0014	75005	177414	ABS LIBRA-SCHN
0015	75006	177000	ABS LIBRA-SSAV
0016	75007	177000	ABS LIBRA-SSAV
0017	75010	177005	ABS LIBRA-SSSAV
0018	75011	177433	ABS LIBRA-SGET
0019	75012	177321	ABS LIBRA-SAPP
0020	75013	177267	ABS LIBRA-SHEL
0021	75014	177521	ABS LIBRA-SBYE
0022	75015	177460	ABS LIBRA-SKIL
0023	75016	177171	ABS LIBRA-SREN
0024	75017	177653	ABS LIBRA-SNAM
0025	75020	177431	ABS LIBRA-SCAT
0026	75021	177431	ABS LIBRA-SCAT
0027	75022	177431	ABS LIBRA-SCAT
0028	75023	177332	ABS LIBRA-SDIRS
0029	75024	177425	ABS LIBRA-SREPS
0030	75025	177010	ABS LIBRA-SSTAS
0031	75026	177010	ABS LIBRA-SSTAS
0032	75027	177644	ABS LIBRA-SDEL
0033	75030	177644	ABS LIBRA-STIM
0034	75031	177654	ABS LIBRA-SPRO
0035	75032	177654	ABS LIBRA-SPRO
0036	75033	177000	ABS LIBRA-SOPE
0037	75034	177717	ABS LIBRA-SLEN
0038	75035	177737	ABS LIBRA-SECH
0039	75036	177655	ABS LIBRA-SMES
0040	75037	177723	ABS LIBRA-SLPR
0041	75040	177625	ABS LIBRA-SPORS
0042	75041	177426	ABS LIBRA-SREP
0043	75042	177416	ABS LIBRA-SDIR
0044	75043	177003	ABS LIBRA-SSTA
0045	75044	177003	ABS LIBRA-SSTA
0046	75045	177635	ABS LIBRA-SPOR
0047	75046	177663	ABS LIBRA-SROS
0048	75047	177606	ABS LIBRA-SANN
0049	75050	177614	ABS LIBRA-SRES
0050	75051	177624	ABS LIBRA-SCHA
0051	75052	177362	ABS LIBRA-SSLE
0052	75053	177362	ABS LIBRA-SSLE
0053	75054	177135	ABS LIBRA-SNEW
0054	75055	177305	ABS LIBRA-SKID
0055	75056	177202	ABS LIBRA-SMUN
0056	75057	177001	ABS LIBRA-SMLO
0057	75060	177111	ABS LIBRA-SSMLO

TWO HALVES OF
FUSS TABLE

SAVE OVERLAY.

GROUP

MESSAGE

HIBERNATE

PAGE 0360 #30 LIBRARY SIZES

0058	75061	177000	ABS	LIBRA-SCOP
0059	75062	177000	ABS	LIBRA-SBES
0060	75063	177377	ABS	LIBRA-SPUR
0061	75064	177730	ABS	LIBRA-SMAG
0062	75065	177747	ABS	LIBRA-SPHO
0063	75066	177716	ABS	LIBRA-SPRI
0064	75067	177417	ABS	LIBRA-SSPE
0065	75070	177671	ABS	LIBRA-SBRE
0066			REP	4
0067	75071	177000	DEC	=512
0067	75072	177000	DEC	=512
0067	75073	177000	DEC	=512
0067	75074	177000	DEC	=512
0068	75075		\$SLPL	EQU *

0087* THE FILES ROUTINE IS USED BY THE BASIC COMPILER TO PROCESS FILES
 0088* STATEMENTS DURING PHASE II. THE PURPOSE OF THE ROUTINE IS TO PRO-
 0089* VIDE THE COMPILER WITH INFORMATION ABOUT THE REQUESTED FILES. THIS
 0090* INFORMATION CONSISTS OF THE FILE'S DISC ADDRESS, ITS LENGTH,
 0091* AND ITS RECORD SIZE.
 0092* THE COMPILER PASSES PARAMETERS TO THE FILES ROUTINE AS FOLLOWS:

0093*
 0094* FILCT*=5+# OF FILES STATEMENTS
 0095* FILTB=>BEGINNING OF TABLE AREA FOR FILE INFO.
 0096* SCHLB,I=>FIRST POSSIBLE RETURN ADDRESS.

0097*
 0098* THE CALLING SEQUENCE TO THE FILES ROUTINE IS AS FOLLOWS:

0099* JSB SCHLB,I
 0100* DEF FILIB
 0101* <ERROR EXIT FOR BAD FORMAT IN FILES STATEMENT>
 0102* <ERROR EXIT IF A FILE IS UNACCESSIBLE>
 0103* <ERROR EXIT IF PROGRAM OVERFLOW>
 0104* <NORMAL EXIT>
 0105*

0107	75000		ORG	LIBRA	
0108*					
0109	75000	063561	LDA	FILBP	GET POINTER TO FILE BUFFER
0110	75001	070036	STA	FLBUF	SAVE BUFFER POINTER.
0111	75002	070037	STA	FLBFP	
0112	75003	060336	LDA	.-17	SET COUNTER FOR MAXIMUM NUMBER
0113	75004	070040	STA	FLBC1	OF FILES ALLOWED.
0114	75005	061604	LDA	FILCT	GET COUNT = 5 OF FILES STATEMENT
0115	75006	040364	ADA	.-5	GET COUNT
0116	75007	003004	CMA	INA	GET NEGATIVE
0117	75010	070046	STA	FLBFC	SAVE COUNT
0118	75011	060444	LDA	DFILT	GET POINTER TO FILES
0119	75012	070047	STA	FLBFF	STATEMENT TABLE
0120*					
0121*					INITIALIZATION IS COMPLETE. NOW BEGIN PROCESSING THE FILES STMTS.
0122*					
0123	75013		FLBA	EQU	+
0124	75013	164047	LDB	FLBFF,I	GET POINTER TO FILES STATEMENTS
0125	75014	003400	CCA		SET POINTER TO
0126	75015	140001	ADA	1,I	LAST CHAR + 1 OF
0127	75016	040001	ADA	1	FILES STATEMENT.
0128	75017	001200	RAL		
0129	75020	070042	STA	FLBP	INITIALIZE EOF STATEMENT POINTER
0130	75021	006004	INB		INITIALIZE POINTER TO
0131	75022	005000	BLS		
0132	75023	074043	STB	FLBCP	FILES STATEMENT.
0133*					
0134*					GET THE FILE NAME
0135*					
0136	75024	034040	FLB1	ISZ	FLBC1
0137	75025	002001	RSS		TEST FOR
0138	75026	027177	JMP	FLB8+1	TOO MANY
0139	75027	060354	LDA	.-3	FILES
0140	75030	070041	STA	FLBC2	SET FLAG TO SAY
0141	75031	002400	CLA		3 WORDS ALLOWED

0142	75032	070031		STA FLBCM	CLEAR COMMA FLAG.
0143	75033	070030		STA FLBS	
0144	75034	017527		JSB FLBCH	GET FIRST CHAR.
0145	75035	050423		CPA ,+44B	TEST FOR DOLLAR SIGN.
0146	75036	027060		JMP FLB2	
0147	75037	050431		CPA ,+52B	TEST FOR SNOWFLAKE
0148	75040	027064		JMP FLB22	
0149	75041	050417	FLB5	CPA ,+40B	BETTER NOT BE A BLANK.
0150	75042	027177		JMP FLB8+1	FAIL IF IT IS.
0151	75043		FLB25	EQU *	
0152	75043	040030		ADA FLBS	* OR S FLAG FIRST CHARACTER
0153	75044	001727	FLB3	ALF,ALF	POSITION ON LEFT
0154	75045	170036		STA FLBUF,I	AND STORE IN BUFFER.
0155	75046	017527		JSB FLBCH	GET RIGHT CHARACTER
0156	75047	130036		IOR FLBUF,I	AND PACK IN.
0157	75050	170036		STA FLBUF,I	
0158	75051	034036		ISZ FLBUF	BUMP BUFFER POINTER.
0159	75052	017527		JSB FLBCH	GET NEXT CHARACTER.
0160	75053	034041		ISZ FLBC2	TEST FOR END OF FILE NAME.
0161	75054	027044		JMP FLB3	
0162*					
0163*	TEST 7TH CHARACTER FOR BLANK				
0164*					
0165	75055	050417		CPA ,+40B	IF END OF FILE NAME, CHAR MUST
0166	75056	027103		JMP FLB4	BE A BLANK.
0167	75057	027177		JMP FLB8+1	FAIL IF NOT.
0168*					
0169*	COME HERE IF 1ST CHARACTER IS S				
0170*					
0171	75060	060476	FLB2	LDA B200	IF 1ST CHAR IS S, SET FILS TO
0172	75061	070030		STA FLBS	INDICATE LIBRARY FILE.
0173	75062	017527		JSB FLBCH	GET NEXT CHAR.
0174	75063	027041		JMP FLB5	
0175*					
0176*	COME HERE IF 1ST CHARACTER IS *				
0177*					
0178	75064	061027	FLB22	LDA BIT15	IF FIRST CHAR IS *, SET FILS TO
0179	75065	070030		STA FLBS	INDICATE GROUP LIBRARY FILE
0180	75066	017527		JSB FLBCH	GET NEXT CHARACTER
0181	75067	050417		CPA ,+40B	IS IT BLANK?
0182	75070	002401		CLA,RSS	YES, * IS PLACE HOLDER
0183	75071	027043		JMP FLB25	NO, CONTINUE PROCESSING NAME.
0184	75072	064350		LDB , -7	CLEAR BUFFER
0185	75073	170036		STA FLBUF,I	SINCE NO
0186	75074	034036		ISZ FLBUF	FILE NOW
0187	75075	006006		INB,SZB	
0188	75076	027073		JMP *-3	
0189	75077	064502		LDB B400	RESERVE 256 WORDS
0190	75100	174036		STB FLBUF,I	IN CORE FOR FUTURE FILE
0191	75101	002004		INA	
0192	75102	027104		JMP FLB26	
0193*					
0194*	THE FILE NAME HAS BEEN TESTED AS CORRECT AND STORED IN THE				
0195*	TEMPORARY BUFFER				
0196*					
0197	75103	060364	FLB4	LDA ,+5	LEAVE ROOM FOR STORAGE

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0198 75104          FLB26 EQU *
0199 75104 040036   ADA FLBUF      OF FILE INFORMATION
0200 75105 070036   STA FLBUF      FROM THE DIRECTORY
0201 75106 060031   LDA FLBCM     TEST FOR ANY MORE
0202 75107 002002   SZA          FILES REQUESTED
0203 75110 027024   JMP FLB1     YES IF COMMA WAS SEEN,
0204 75111 034047   ISZ FLBFF    COUNT UP POINTER INTO TABLE
0205 75112 034046   ISZ FLBFC    CHECK COUNTER
0206 75113 027013   JMP FLBA     PROCESS ANOTHER FILES STATEMENT,
0207*
0208* ALL FILE STATEMENTS HAVE NOW BEEN PROCESSED
0209*
0210 75114 060040   LDA FLBC1    SET FILC1 TO EQUAL
0211 75115 040400   ADA ,+17     =# OF FILES REQUESTED
0212 75116 003004   CMA,INA
0213 75117 070040   STA FLBC1
0214 75120 070041   STA FLBC2
0215*
0216 75121 036152   ISZ SCHLQ    BUMP RETURN ADDRESS SINCE WE'VE
0217 75122 060037   LDA FLBFP    NOW CHECKED FOR TYPE I ERRORS,
0218 75123 070036   STA FLBUF    SET POINTER TO BUFFER AGAIN,
0219*
0220* BEGIN BUILDING THE 'FILES' TABLE FOR THIS USER
0221*
0222 75124 060272   LDA MLINK+1  GET USER ID AND SAVE IT,
0223 75125 040346   ADA ,+?ID=?LINK
0224 75126 160000   LDA 0,I
0225 75127 070044   STA FLBID
0226*
0227 75130 164036   FLB6 LDB FLBUF,I  GET FIRST WORD OF FILE NAME,
0228 75131 006003   SZB,RSS     IS THIS A PLACE HOLDER
0229 75132 027143   JMP FLB27   YES, SKIP DIRECTORY LOOKUP
0230 75133 060044   LDA FLBID
0231 75134 006020   SSB
0232 75135 060514   LDA A000    IF BIT 15 OF FIRST WORD IS SET,
0233 75136 005727   BLF,BLF     PERFORM SEARCH USING A000.
0234 75137 006020   SSB         IF BIT 7 OF
0235 75140 027147   JMP FLB24   FIRST WORD IS SET
0236 75141 005727   BLF,BLF     SET UP FOR GROUP LIB SEARCH
0237 75142 027165   JMP FLB23   ELSE RESTORE FIRST WORD
0238*
0239 75143          FLB27 EQU *
0240 75143 064036   LDB FLBUF    BUMP POINTER
0241 75144 044367   ADB ,+8     TO NEXT TEMP
0242 75145 074036   STB FLBUF    BUFFER ENTRY
0243 75146 027264   JMP FLB28
0244*
0245 75147 005665   FLB24 ELB,CLE,ERB  CLEAR BIT 7
0246 75150 005727   BLF,BLF     AND
0247 75151 174036   STB FLBUF,I  RESTORE TO TABLE
0248 75152 010512   AND B1777   ISOLATE NUMERICAL PART OF ID
0249 75153 006400   CLB
0250 75154 100400   DIV ,100    GET
0251 75155 000472
0251 75156 100200   MPY ,100
0251 75157 000472

```

0252	75160	064000		LDB A	LIBRARIAN
0253	75161	060612		LDA M2000	
0254	75162	010044		AND FLBID	USER
0255	75163	030001		IOR B	NUMBER
0256	75164	164036		LDB FLBUF, I	RESTORE FIRST WORD OF FILE NAME
0257	75165	104400	FLB23	DST LTEMP	
	75166	000030			
0258	75167	034036		ISZ FLBUF	GET NEXT 2 WORDS ALSO.
0259	75170	104200		DLD FLBUF, I	
	75171	100036			
0260	75172	104400		DST LTEMP+2	
	75173	000032			
0261*					
0262	75174	116017		JSB DLOKP, I	SEARCH FOR FILE
0263	75175	027203		JMP FLB7	FOUND IT.
0264*					
0265	75176	016056	FLB8	JSB RDPRG	FAILURE
0266	75177	002400		CLA	
0267	75200	070257		STA DIRWD	NO DIRECTORY BLOCK IN CORE NOW
0268	75201	015322		JSB DCMP	
0269	75202	026222		JMP SCHBL	
0270*					
0271	75203		FLB7	EQU *	
0272	75203	060034		LDA LTEMP+4	LOAD POINTER TO DIREC ENTRY.
0273	75204	040364		ADA .+5	AND BUMP TO DISC ADDRESS
0274	75205	070257		STA DIRWD	SET DIRWD FOR DLOOK
0275	75206	064035		LDB LTEMP+5	TEST TO SEE
0276	75207	044361		ADB .+2	IF THIS IS
0277	75210	160001		LDA 1, I	REALLY A
0278	75211	002021		SSA, RSS	FILE.
0279	75212	027176		JMP FLB8	FAIL IF NOT.
0280	75213	060030		LDA LTEMP	IS THIS THE
0281	75214	050044		CPA FLBID	FILE OWNER?
0282	75215	027226		JMP FLB9	YES
0283	75216	044356		ADB .-1	NO
0284	75217	160001		LDA B, I	IS THE FILE
0285	75220	002020		SSA	PROTECTED?
0286	75221	027176		JMP FLB8	YES = FAIL
0287	75222	044361		ADB .+2	NO
0288	75223	160001		LDA B, I	IS THE FILE
0289	75224	002020		SSA	MASKED?
0290	75225	027176		JMP FLB8	YES = FAIL
0291*					
0292*	THE FOLLOWING SECTION OF CODE FILLS EACH INTERIM 8 WORD				
0293*	FILE TABLE WITH INFORMATION FROM THE DIRECTORY ENTRIES.				
0294*	THE TABLE APPEARS AS FOLLOWS:				
0295*	1	FILE			
0296*	2	..			
0297*	3	NAME			
0298*	4	NOT USED			
0299*	5	DISC			
0300*	6	ADDRESS			
0301*	7	FILE LENGTH			
0302*	8	RECORD SIZE			
0303*	(NOTE: THE FILE NAME HAD BEEN INSERTED IN FLB3)				
0304*					

0305	75226	034036	FLB9	ISZ FLBUF	CLEAR
0306	75227	034036		ISZ FLBUF	THE
0307	75230	002400		CLA	UNUSED
0308	75231	170036		STA FLBUF,I	WORD
0309	75232	034036		ISZ FLBUF	BUMP BUFF POINTER TO WORD 5
0310	75233	064035		LDB LTEMP+5	
0311	75234	044367		ADB .+8	
0312	75235	104200		DLD B,I	GET DISC ADDRESS AND
	75236	100001			
0313	75237	104400		DST FLBUF,I	PUT IT IN THE BUFFER
	75240	100036			
0314	75241	064035		LDB LTEMP+5	GET DIRECTORY ENTRY POINTER
0315	75242	044372		ADB .+11	ADJUST TO FILE LENGTH WORD
0316	75243	034036		ISZ FLBUF	BUMP BUFFER POINTER
0317	75244	034036		ISZ FLBUF	TO LENGTH SLOT
0318	75245	060044		LDA FLBID	TEST FOR USER REFERENCE
0319	75246	050030		CPA LTEMP	TO PUBLIC OR GROUP FILE
0320	75247	002401		CLA,RSS	NO,CLEAR BIT 15
0321	75250	061027		LDA BIT15	YES, SET BIT 15
0322	75251	130001		IOR B,I	OR IN FILE LENGTH
0323	75252	170036		STA FLBUF,I	STORE IT IN BUFFER
0324	75253	034036		ISZ FLBUF	BUMP POINTER TO RECORD SIZE SLOT
0325	75254	044350		ADB .+7	SAME FOR DIRECTORY POINTER
0326	75255	160001		LDA B,I	TRANSFER RECORD SIZE
0327	75256	170036		STA FLBUF,I	TO BUFFER
0328	75257	034036		ISZ FLBUF	BUMP POINTER TO NEXT ENTRY
0329	75260	016423		JSB DATE	GET DATE AND SET
0330	75261	064035		LDB LTEMP+5	INTO PURGE (LAST
0331	75262	044364		ADB .+5	REFERENCED)
0332	75263	170001		STA B,I	DATE.
0333*					
0334	75264		FLB28	EQU *	
0335	75264	034040		ISZ FLBC1	TEST FOR ANY MORE FILES.
0336	75265	027130		JMP FLB6	
0337*					
0338*	WE HAVE FOUND ALL THE FILES. WE NOW HAVE TO UPDATE THE FUSS TABLE.				
0339*	FIRST CHECK TO SEE IF THE PROGRAM HAS ROOM ENOUGH FOR THE TABLE.				
0340*					
0341	75266	060257		LDA DIRWD	WRITE DIRECTORY TO DISC
0342	75267	002003		SZA,RSS	IF ANY IS IN CORE
0343	75270	027276		JMP FLB29	
0344	75271	064676		LDB LIBD	OUTGOING CORE ADDRESS.
0345	75272	114206		JSB DISCZ,I	
0346	75273	114211		JSB SLVAG,I	CAN'T DO IT, TRY TO SALVAGE
0347	75274	002400		CLA	SAY DIRECTORY
0348	75275	070257		STA DIRWD	NOT IN CORE
0349	75276		FLB29	EQU *	
0350	75276	036152		ISZ SCHLQ	BUMP TO NEXT ERROR EXIT.
0351	75277	060041		LDA FLBC2	GET # OF FILES.
0352	75300	070040		STA FLBC1	
0353	75301	003004		CMA,INA	
0354	75302	100200		MPY .+FTCL	COMPUTE NEW VALUE OF PBPTR
	75303	000376			
0355	75304	040056		ADA PBPTR	
0356	75305	003000		CMA	
0357	75306	040716		ADA LWAUS	TEST FOR OVERFLOW.

0358	75307	002020	SSA		
0359	75310	027176	JMP	FLB8	FAIL--PROGRAM TOO LARGE,
0360*					
0361	75311	036152	ISZ	SCHLG	BUMP TO NORMAL RETURN ADDRESS,
0362	75312	060612	LDA	M2000	INPUT FUSS TABLE
0363	75313	070204	STA	MWORD	
0364	75314	060666	LDA	FUSS	
0365	75315	064700	LDB	LIBDI	
0366	75316	114206	JSB	DISCZ,I	
0367	75317	114207	JSB	SICKP,I	IT'S STUCK ON THE DISC
0368*					
0369	75320	060272	LDA	MLINK+1	DETERMINE USER #.
0370	75321	040342	ADA	,+7TNUM-?LINK	
0371	75322	160000	LDA	0,I	USER # IN BITS 12-8
0372	75323	001727	ALF	,ALF	RIGHT JUSTIFY USER #
0373	75324	001722	ALF	,RAL	MULTIPLY USER # BY 32 AND
0374	75325	040676	ADA	LIBD	ADD LIBD TO POINT AT USER'S
0375	75326	070045	STA	FLBFS	SECTION OF FUSS.
0376	75327	070030	STA	LTEMP	
0377	75330	064450	LDB	M32	ZERO OUT USER'S SECTION
0378	75331	002400	CLA		
0379	75332	170030	STA	LTEMP,I	
0380	75333	034030	ISZ	LTEMP	
0381	75334	006006	INB	,SZB	
0382	75335	027332	JMP	*-3	
0383*					
0384*	NOW CHECK TO SEE IF ANY OF THE REQUESTED FILES ARE BEING USED BY				
0385*	ANOTHER USER. IF THEY ARE, WE ALLOW ONLY FILE READS BUT NO WRITES.				
0386*	IF THE USER IS AN 'A', WE SKIP THE TEST.				
0387*					
0388	75336	060044	LDA	FLBID	
0389	75337	010612	AND	M2000	
0390	75340	050514	CPA	A000	
0391	75341	027407	JMP	FLB10	
0392*					
0393	75342	060037	LDA	FLBFP	SET BUFFER POINTER.
0394	75343		FLB11 EQU *		
0395	75343	070036	STA	FLBUF	ADDRESS.
0396*					
0397	75344	164036	LDB	FLBUF,I	GET FIRST WORD OF NAME
0398	75345	006003	SZB	,RSS	PLACE HOLDER?
0399	75346	027372	JMP	FLB30	YES
0400	75347	040363	ADA	,+4	NO, BUMP POINTER TO
0401	75350	070036	STA	FLBUF	DISC ADDRESS
0402*					
0403	75351	064676	LDB	LIBD	PUT ADDRESS OF FUSS
0404	75352	077562	STB	FUSCH	INTO FUSS SEARCH POINTER
0405	75353	104200	DLD	FLBUF,I	GET DISC ADDRESS
	75354	100036			
0406	75355	153562	FLB14 CPA	FUSCH,I	UPPER WORDS EQUAL?
0407	75356	027366	JMP	FLB18	YES, GO COMPARE LOWER
0408	75357	037562	ISZ	FUSCH	NO, BUMP
0409	75360	037562	FLB19 ISZ	FUSCH	FUSS POINTER
0410	75361	060672	LDA	L1024	GET FUSS END ADDRESS
0411	75362	053562	CPA	FUSCH	HAVE WE EXHAUSTED FUSS?
0412	75363	027402	JMP	FLB13	YES, GO CHECK NEXT FILE

0413	75364	160036		LDA FLBUF,I	NO, RESTORE UPPER ADDRESS WORD
0414	75365	027355		JMP FLB14	AND GO COMPARE AGAIN
0415	75366	037562	FLB18	ISZ FUSCH	BUMP TO LOW ADDRESS WORD
0416	75367	157562		CPB FUSCH,I	IS LOW ADDRESS ALSO EQUAL?
0417	75370	027374		JMP FLB12	YES, GO FLAG READ ONLY
0418	75371	027360		JMP FLB19	NO, GO CHECK NEXT FILE
0419*					
0420	75372		FLB30	EQU *	
0421	75372	060365		LDA ,+6	
0422	75373	027403		JMP FLB13+1	
0423*					
0424	75374	034036	FLB12	ISZ FLBUF	BUMP BUFFER POINTER
0425	75375	034036		ISZ FLBUF	TO LENGTH WORD
0426	75376	160036		LDA FLBUF,I	SET DISC LENGTH TO SAY
0427	75377	031027		IOR BIT15	READ ONLY.
0428	75400	170036		STA FLBUF,I	
0429*					
0430	75401	002401		CLA,RSS	
0431	75402	060361	FLB13	LDA ,+2	
0432	75403	040361		ADA ,+2	ADJUST BUFFER POINTER
0433	75404	040036		ADA FLBUF	TO NEXT FILE NAME
0434	75405	034040		ISZ FLBC1	TEST FOR ANY MORE
0435	75406	027343		JMP FLB11	
0436*					
0437*	NOW UPDATE FUSS BY PLACING THE DISC ADDRESSES JUST REQUESTED				
0438*	INTO THE USER'S FUSS AREA.				
0439*					
0440	75407	060041	FLB10	LDA FLBC2	SET COUNTER.
0441	75410	070040		STA FLBC1	
0442	75411	060037		LDA FLBFP	GET POINTER TO FIRST ONE.
0443	75412		FLB15	EQU *	
0444	75412	040365		ADA ,+6	GET FILE LENGTH
0445	75413	164000		LDB 0,I	
0446	75414	040355		ADA ,-2	A POINTS TO HIGH DISC ADDRESS
0447	75415	006021		SSB,RSS	IF NOT READ ONLY,
0448	75416	006401		CLB,RSS	LEAVE BIT 15 0.
0449	75417	065027		LDB BIT15	ELSE SET IT.
0450	75420	144000		ADB 0,I	
0451	75421	174045		STB FLBFS,I	AND PUT INTO TABLE.
0452	75422	034045		ISZ FLBFS	BUMP
0453	75423	002004		INA	POINTERS AND
0454	75424	164000		LDB A,I	STORE LOW
0455	75425	174045		STB FLBFS,I	DISC ADDRESS
0456	75426	034045		ISZ FLBFS	REBUMP
0457	75427	040362		ADA ,+3	POINTERS
0458	75430	034040		ISZ FLBC1	TEST FOR DONE.
0459	75431	027412		JMP FLB15	
0460*					
0461	75432	060666		LDA FUSS	
0462	75433	064676		LDB LIBD	
0463	75434	114206		JSB DISCZ,I	
0464	75435	114207		JSB SICKP,I	THE FUSS TABLE IS STUCK IN CORE
0465*					
0466	75436	016056		JSB RDPRG	READ IN USER'S PROGRAM AGAIN.
0467	75437	061502		LDA FILT3	
0468	75440	071574		STA VALTB	

0469	75441	064037	LDB FLBFP	GET BUFFER POINTER
0470	75442		FLB16 EQU *	
0471	75442	044365	ADB .+6	BUMP TO LENGTH WORD
0472	75443	104200	DLD B,I	GET LENGTH WORD AND RECORD SIZE
	75444	100001		
0473	75445	104400	DST VALTB,I	STORE THEM IN FILE TABLE
	75446	101574		
0474	75447	035574	ISZ VALTB	BUMP FILE
0475	75450	035574	ISZ VALTB	TABLE POINTER
0476	75451	001665	ELA,CLE,ERA	REMOVE BIT 15 FROM LENGTH
0477	75452	040355	ADA .-2	COMPUTE RELATIVE
0478	75453	002016	SLA,INA,SZA	ADDRESS OF LAST
0479	75454	040356	ADA .-1	LOGICAL RECORD
0480	75455	064037	LDB FLBFP	GET THE ADDRESS
0481	75456	044363	ADB .+4	OF HIGH DISC ADDRESS
0482	75457	077562	STB FUSCH	AND SAVE IT
0483	75460	006004	INB	GET POINTER TO LOW DISC ADD WD.
0484	75461	000040	CLE	
0485	75462	140001	ADA B,I	ADD RELATIVE LAST RECORD ADDRESS
0486	75463	067562	LDB FUSCH	B GETS HIGH DISC
0487	75464	164001	LDB B,I	ADDRESS WORD
0488	75465	002040	SEZ	IF LOW ADD OVERFLOW,
0489	75466	006004	INB	ADD 1 TO HIGH PART
0490	75467	101100	SWP	STORE BOTH WORDS
0491	75470	104400	DST VALTB,I	OF DISC ADDRESS
	75471	101574		
0492	75472	060363	LDA .+4	
0493	75473	041574	ADA VALTB	
0494	75474	071574	STA VALTB	
0495	75475	104200	DLD FUSCH,I	BASE DISC ADDRESS
	75476	175562		
0496	75477	104400	DST VALTB,I	INTO FILE TABLE
	75500	101574		
0497	75501	035574	ISZ VALTB	ADJUST POINTER
0498	75502	061574	LDA VALTB	BUMP POINTERS
0499	75503	040363	ADA .+4	
0500	75504	071574	STA VALTB	
0501	75505	164037	LDB FLBFP,I	MOVE
0502	75506	175574	STB VALTB,I	
0503	75507	034037	ISZ FLBFP	FILE
0504	75510	035574	ISZ VALTB	
0505	75511	104200	DLD FLBFP,I	NAME
	75512	100037		
0506	75513	104400	DST VALTB,I	
	75514	101574		
0507	75515	061574	LDA VALTB	INTO
0508	75516	040362	ADA .+FTEL-12	
0509	75517	071574	STA VALTB	TABLE
0510	75520	064037	LDB FLBFP	
0511	75521	044366	ADB .+7	
0512	75522	074037	STB FLBFP	
0513	75523	034041	ISZ FLBC2	TEST FOR ANY MORE.
0514	75524	027442	JMP FLB16	
0515	75525	070056	STA PBPTR	ADVANCE PBPTR TO
0516	75526	026222	JMP SCHBL	FIRST UNUSED WORD
0517*				


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0518*
0519* FLBCH GETS THE NEXT CHARACTER OUT OF THE FILES
0520* STATEMENT. IF FLBCM=1, IT ASSUMES A COMMA HAS BEEN
0521* SEEN AND RETURNS A BLANK. OTHERWISE IF THE CHARAC-
0522* TER IS A COMMA, IT SETS FLBCM AND RETURNS A BLANK.
0523* IT ALSO RETURNS BLANKS AT THE END OF THE CODE.
0524*
0525 75527 000000 FLBCH NOP
0526 75530 060417 LDA ,+40B RETURN BLANK IF
0527 75531 064031 LDB FLBCM FLBCH IS SET.
0528 75532 006002 SZB
0529 75533 127527 JMP FLBCH,I
0530 75534 064043 LDB FLBCP GET CHAR. POINTER.
0531 75535 006004 INB OTHERWISE BUMP
0532 75536 054042 CPB FLBP IF END OF STATEMENT,
0533 75537 127527 JMP FLBCH,I RETURN A BLANK.
0534 75540 074043 STB FLBCP POINTER.
0535 75541 004065 CLE,ERB GET NEXT CHAR.
0536 75542 160001 LDA 1,I
0537 75543 002041 SEZ,RSS
0538 75544 001727 ALF,ALF ROTATE IF NECESSARY.
0539 75545 010474 AND B177 MASK.
0540 75546 002003 SZA,RSS SKIP 0'S.
0541 75547 027530 JMP FLBCH+1
0542 75550 040317 ADA M96
0543 75551 002021 SSA,RSS LOWER CASE?
0544 75552 040450 ADA M32 YES, MAKE INTO UPPER CASE
0545 75553 040470 ADA .140 NO
0546 75554 050433 CPA ,+54B TEST FOR COMMA.
0547 75555 002001 RSS
0548 75556 127527 JMP FLBCH,I NOT A COMMA.
0549 75557 034031 ISZ FLBCM IF COMMA, SET FLAG AND GO
0550 75560 027530 JMP FLBCH+1 RETURN A BLANK.
0551*
0552 00030 FLBS EQU LTEMP * OR S FLAG
0553 00031 FLBCM EQU LTEMP+1 COMMA FLAG
0554 00036 FLBUF EQU LTEMP+6 INTERIM FILE TABLE INDEX
0555 00037 FLBFP EQU LTEMP+7 INTERIM FILE TABLE POINTER
0556 00040 FLBC1 EQU LTEMP+8 FILE COUNTER (NEG)
0557 00041 FLBC2 EQU LTEMP+9
0558 00042 FLBP EQU LTEMP+10 END OF FILE STATEMENT POINTER
0559 00043 FLBCP EQU LTEMP+11 FILE STATEMENT CHARACTER POINTER
0560 00044 FLBID EQU LTEMP+12 USER ID STORAGE
0561 00045 FLBFS EQU LTEMP+13 POINTER TO USERS FUSS TABLE
0562 00046 FLBFC EQU LTEMP+14 FILE STATEMENT COUNTER (NEG)
0563 00047 FLBFF EQU LTEMP+15 POINTER TO 4 WORD AREA CONTAIN-
0564* ING POINTERS TO THE FILES
0565* STATEMENTS
0566 75561 073601 FILBP DEF FILBF POINTER TO 131 WORD TEMPORARY
0567* FILE TABLE BUFFER
0568 75562 $FLB EQU *
0569 75562 000000 FUSCH BSS 1 FUSS TABLE SEARCH POINTER

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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: => 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 RECORD SIZE TOO LARGE>
 0020* <EXIT FOR NON=EXISTENT FILE>
 0021* <EXIT FOR 'READ=ONLY' (GROUP OR SYSTEM LIB.) FILE>
 0022* <EXIT FOR 'READ=ONLY' (IN USE) FILE>
 0023* <NORMAL EXIT>

0024	75000	ORG LIBRA	
0025	75000 060272	LDA MLINK+1	GET USER ID AND STORE
0026	75001 040346	ADA .+?ID=?LINK	
0027	75002 160000	LDA 0,I	
0028	75003 070041	STA ASNID	
0029*			
0030	75004 013505	AND HI6	LOSE NUMERICS
0031	75005 070030	STA LTEMP	SAVE
0032	75006 060041	LDA ASNID	GET THE ID BACK
0033	75007 020030	XOR LTEMP	LOSE THE TOP
0034	75010 006400	CLB	SET UP FOR DIVISION
0035	75011 100400	DIV .100	PRODUCE GROUP
	75012 000472		
0036	75013 100200	MPY .100	LIBRARY ID
	75014 000472		
0037	75015 030030	IOR LTEMP	AND SAVE
0038	75016 070030	STA LTEMP	IN LTEMP
0039	75017 063514	LDA ASFBF	INITIALIZE INFORMATION
0040	75020 073512	STA ASBUF	BUFFER POINTER
0041*			
0042	75021 064041	LDB ASNID	GET USER ID
0043	75022 061466	LDA ASTYP	GET LIBRARY INDICATOR
0044	75023 050360	CPA .+1	SYSTEM LIBRARY?
0045	75024 064514	LDB A000	YES
0046	75025 050361	CPA .+2	GROUP LIBRARY?
0047	75026 064030	LDB LTEMP	YES
0048	75027 177512	STB ASBUF,I	STORE CORRECT ID IN BUFFER
0049*			
0050	75030 061550	LDA ORDNO	SAVE SPECIFIED
0051	75031 070037	STA ASORD	ORDINAL NUMBER
0052	75032 100200	MPY .+FTEL	SAVE POINTER
	75033 000376		
0053	75034 041502	ADA FILTB	TO FILE TABLE
0054	75035 070036	STA ASFCB	ENTRY
0055	75036 002004	INA	

0056	75037	164000	LDB A,I	CLEAR
0057	75040	004066	CLE,ELB	"DIRTY" RECORD AND
0058	75041	004066	CLE,ELB	"DIRTY" FILE
0059	75042	005323	RBR,RBR	BITS
0060	75043	077511	STB ASSAV	SAVE OLD RECORD SIZE
0061	75044	002041	SEZ,RSS	DID WRITE OCCUR ON OLD FILE?
0062	75045	027111	JMP ASN21	NO
0063*				
0064*	UPDATE LAST CHANGED DATE OF OLD FILE			
0065*				
0066	75046	064041	LDB ASNID	YES, SET UP
0067	75047	074030	STB LTEMP	LTEMP(0:3)
0068	75050	040371	ADA .+10	WITH OLD
0069	75051	164000	LDB 0,I	FILE NAME
0070	75052	074031	STB LTEMP+1	
0071	75053	002004	INA	
0072	75054	104200	DLD 0,I	
	75055	100000		
0073	75056	104400	DST LTEMP+2	
	75057	000032		
0074	75060	061554	LDA ASBFP	SAVE
0075	75061	164000	LDB 0,I	NEW FILENAME
0076	75062	074042	STB LTEMP+10	BEFORE SWAP
0077	75063	002004	INA	OCCURS
0078	75064	104200	DLD 0,I	
	75065	100000		
0079	75066	104400	DST LTEMP+11	
	75067	000043		
0080	75070	116017	JSB DLOKP,I	FIND DIRECTORY ENTRY FOR OLD FIL
0081	75071	002001	RSS	
0082	75072	027102	JMP ASN20	NOT FOUND
0083	75073	060034	LDA LTEMP+4	SAVE CURRENT
0084	75074	040364	ADA .+5	DIRECTORY TRACK
0085	75075	070257	STA DIRWD	FOR DLOOK
0086	75076	060171	LDA DATIM	GET HOUR OF YEAR
0087	75077	064035	LDB LTEMP+5	AND UPDATE
0088	75100	044365	ADB .+6	'LAST CHANGE'
0089	75101	170001	STA 1,I	LOCATION
0090	75102	060042	ASN20 LDA LTEMP+10	GET
0091	75103	070031	STA LTEMP+1	
0092	75104	104200	DLD LTEMP+11	NEW
	75105	000043		
0093	75106	104400	DST LTEMP+2	
	75107	000032		
0094	75110	027121	JMP ASN22	
0095	75111	065554	ASN21 LDB ASBFP	
0096	75112	160001	LDA 1,I	FILE NAME
0097	75113	070031	STA LTEMP+1	
0098	75114	006004	INB	IN
0099	75115	104200	DLD 1,I	
	75116	100001		
0100	75117	104400	DST LTEMP+2	LTEMP(1:3)
	75120	000032		
0101	75121	163512	ASN22 LDA ASBUF,I	SET APPROPRIATE
0102	75122	070030	STA LTEMP	ID IN LTEMP
0103*				

0104	75123	116017		JSB DLOKP,I	SEARCH FOR FILE
0105	75124	006401		CLB,RSS	IF FOUND, CLEAR B
0106	75125	007400		CCB	IF NOT, B GETS -1
0107	75126	060034		LDA LTEMP+4	GET CURRENT
0108	75127	040364		ADA ,+5	DIRECTORY TRACK POINTER
0109	75130	050257		CPA DIRWD	SAME AS OTHER ONE?
0110	75131	027134		JMP ASN23	YES (SO NONE HAS BEEN WRITTEN)
0111	75132	002400		CLA	NO, SO UPDATED ONE HAS
0112	75133	070257		STA DIRWD	BEEN WRITTEN OUT
0113	75134	006003	ASN23	SZB,RSS	IF ENTRY WAS FOUND
0114	75135	027151		JMP ASN4	GO CHECK IT OUT
0115	75136	036152	ASN24	ISZ SCHLQ	
0116	75137	060257	ASN3	LDA DIRWD	IS THERE A CHANGED
0117	75140	002003		SZA,RSS	DIRECTORY TRACK IN CORE?
0118	75141	027147		JMP ASN26	NO
0119	75142	006400		CLB	YES, TELL DLOOK
0120	75143	074257		STB DIRWD	THERE ISN'T
0121	75144	064676		LDB LIBD	AND WRITE
0122	75145	114206		JSB DISCZ,I	IT OUT
0123	75146	114211		JSB SLVAG,I	BLEW IT; TRY TO SALVAGE
0124	75147	016056	ASN26	JSB RDPRG	
0125	75150	027503		JMP ASN14	
0126	75151	064035	ASN4	LDB LTEMP+5	IS THE
0127	75152	044361		ADB ,+2	ENTRY WE
0128	75153	160001		LDA B,I	FOUND
0129	75154	002021		SSA,RSS	A FILE?
0130	75155	027136		JMP ASN24	NO, FAIL
0131	75156	064035		LDB LTEMP+5	IS OWNER
0132	75157	160001		LDA B,I	TRYING TO
0133	75160	050041		CPA ASNID	ACCESS FILE?
0134	75161	027205		JMP ASN45	YES
0135	75162	006004		INB	NO, IS FILE
0136	75163	160001		LDA B,I	PROTECTED?
0137	75164	002020		SSA	
0138	75165	027136		JMP ASN24	YES = FAIL
0139	75166	044361		ADB ,+2	
0140	75167	160001		LDA B,I	IS MASK
0141	75170	002021		SSA,RSS	BIT SET?
0142	75171	027222		JMP ASN48	NO
0143	75172	064272		LDB MLINK+1	YES
0144	75173	044347		ADB ,+?NAME-?LINK	
0145	75174	160001		LDA B,I	IS THIS FILE RUNNING
0146	75175	002021		SSA,RSS	UNDER A PROTECTED PROGRAM?
0147	75176	027136		JMP ASN24	NO = FAIL
0148	75177	044351		ADB ,+?FLAG-?NAME	
0149	75200	160001		LDA B,I	GET PROGRAM
0150	75201	010612		AND PUALT	UNALTERED BIT
0151	75202	002003		SZA,RSS	HAS PROGRAM BEEN JIMMIED?
0152	75203	027136		JMP ASN24	ATTEMPTED RIP-OFF, FAIL
0153	75204	027222		JMP ASN48	
0154*					
0155	75205	061611	ASN45	LDA TEMP1	WAS A PROTECT
0156	75206	051334		CPA PRGCT	MASK REQUESTED?
0157	75207	027222		JMP ASN48	NO
0158	75210	160000		LDA A,I	MAYBE
0159	75211	010570		AND OPMSK	

0160	75212	050514	CPA	B2000	COMMA NEXT?
0161	75213	002001	RSS		
0162	75214	027222	JMP	ASN48	NO
0163	75215	064035	LDB	LTEMP+5	YES
0164	75216	044362	ADB	.,+3	
0165	75217	160001	LDA	B,I	SET
0166	75220	031027	IOR	BIT15	MASK
0167	75221	170001	STA	B,I	BIT
0168*					
0169	75222	064035	ASN48	LDB LTEMP+5	
0170	75223	044363	ADB	.,+4	GET LOGICAL
0171	75224	160001	LDA	B,I	RECORD SIZE
0172	75225	173512	STA	ASBUF,I	AND SAVE IT
0173	75226	003004	CMA,	INA	IS IT LARGER
0174	75227	043511	ADA	ASSAV	THAN THE ALLOCATED
0175	75230	002020	SSA		BUFFER?
0176	75231	027137	JMP	ASN3	YES, FAIL
0177	75232	036152	ISZ	SCHLQ	NO
0178	75233	037512	ISZ	ASBUF	
0179	75234	002400	CLA		
0180	75235	173512	STA	ASBUF,I	
0181	75236	037512	ISZ	ASBUF	
0182	75237	044363	ADB	.,+4	
0183	75240	160001	LDA	1,I	PUT
0184	75241	173512	STA	ASBUF,I	DISC
0185	75242	006004	INB		ADDRESS
0186	75243	037512	ISZ	ASBUF	IN
0187	75244	160001	LDA	1,I	BUFFER
0188	75245	173512	STA	ASBUF,I	
0189	75246	044361	ADB	.,+2	
0190	75247	037512	ISZ	ASBUF	
0191	75250	164001	LDB	1,I	
0192	75251	060041	LDA	ASNID	TEST FOR USER REFERENCE
0193	75252	050030	CPA	LTEMP	TO PUBLIC FILE
0194	75253	002001	RSS		
0195	75254	045027	ADB	BIT15	SET BIT 15 OF LENGTH IF IT IS
0196	75255	177512	STB	ASBUF,I	STORE LENGTH IN BUFFER
0197	75256	016423	JSB	DATE	GET DATE AND SET IN
0198	75257	064035	LDB	LTEMP+5	PURGE LOCATION
0199	75260	044364	ADB	.,+5	
0200	75261	170001	STA	1,I	
0201	75262	002400	CLA		TELL DLOOK THAT NO DIRECTORY
0202	75263	070257	STA	DIRWD	TRACK IS IN CORE AND
0203	75264	060034	LDA	LTEMP+4	WRITE IT BACK
0204	75265	040364	ADA	.,+5	
0205	75266	064676	LDB	LIBD	
0206	75267	114206	JSB	DISCZ,I	
0207	75270	114211	JSB	SLVAG,I	SCREWED UP - TRY TO SALVAGE
0208*					
0209	75271	036152	ISZ	SCHLQ	FILE EXISTS...BUMP RETURN ADDRESS
0210	75272	060612	LDA	M2000	INPUT FUSS TABLE
0211	75273	070204	STA	MWORD	
0212	75274	060666	LDA	FUSS	
0213	75275	064700	LDB	LIBDI	
0214	75276	114206	JSB	DISCZ,I	
0215	75277	114207	JSB	SICKP,I	ITS STUCK ON THE DISC

0216*					
0217	75300	060272		LDA MLINK+1	DETERMINE USER #
0218	75301	043506		ADA ASN5P	
0219	75302	006400		CLB	
0220	75303	100400		DIV .+TTY01-TTY00	
		75304			
0221	75305	001722		ALF,RAL	MULTIPLY USER# BY 32 AND
0222	75306	040676		ADA LIBD	ADD LIBD TO POINT TO USER'S
0223	75307	073507		STA ASUFS	
0224	75310	064037		LDB ASORD	SECTION OF FUSS
0225	75311	005000		BLS	
0226	75312	040001		ADA 1	SET POINTER TO FUSS
0227	75313	070040		STA ASNFS	ENTRY FOR THE
0228	75314	002400		CLA	SPECIFIED ORDINAL NO.
0229	75315	006400		CLB	
0230	75316	104400		DST ASNFS,I	ZERO OUT OLD FILE INFORMATION
		75317			
0231*					
0232	75320	002400		CLA	SAY ENTRY NOT YET
0233	75321	073513		STA ASNIF	FOUND IN FUSS TABLE
0234*					
0235	75322	064676	ASN6	LDB LIBD	
0236	75323	063512		LDA ASBUF	
0237	75324	040355		ADA .-2	
0238	75325	160000		LDA 0,I	GET FIRST WORD OF DISC ADDRESS
0239	75326	057507	ASN7	CPB ASUFS	SKIP OVER
0240	75327	044417		ADB .+32	USERS OWN FUSS
0241	75330	054672		CPB L1024	ALL FUSS CHECKED?
0242	75331	027356		JMP ASN11	YES, NOT THERE
0243	75332	150001		CPA 1,I	TEST FOR THERE
0244	75333	027336		JMP ASN9	IT IS
0245	75334	044361		ADB .+2	BUMP FUSS POINTER
0246	75335	027326		JMP ASN7	LOOK AT NEXT ENTRY
0247*					
0248	75336	063512	ASN9	LDA ASBUF	
0249	75337	040356		ADA .-1	GET 2ND WORD OF ADDRESS
0250	75340	160000		LDA 0,I	
0251	75341	006004		INB	BUMP FUSS TO 2ND WORD
0252	75342	150001		CPA 1,I	ARE THEY EQUAL?
0253	75343	027346		JMP ASN10	YES
0254	75344	006004		INB	MOVE TO NEXT FUSS ENTRY
0255	75345	027323		JMP ASN6+1	RETURN TO CHECKING FUSS
0256*					
0257	75346		ASN10	EQU *	
0258	75346	077513		STB ASNIF	SET TO SAY "IN FUSS"
0259	75347	060041		LDA ASNID	IS THIS
0260	75350	010612		AND M2000	AN "A"
0261	75351	050514		CPA A000	USER?
0262	75352	027356		JMP ASN11	YES
0263	75353	163512		LDA ASBUF,I	SET DISC LENGTH TO SAY
0264	75354	031027		IQR BIT15	READ ONLY
0265	75355	173512		STA ASBUF,I	
0266*					
0267	75356	063512	ASN11	LDA ASBUF	
0268	75357	040355		ADA .-2	
0269	75360	160000		LDA 0,I	GET HIGH DISC ADDRESS

0270	75361	167512	LDB ASBUF, I	GET LENGTH
0271	75362	006021	SSB, RSS	IF READ ONLY,
0272	75363	027371	JMP ASN30	
0273	75364	031027	IOR BIT15	SET BIT 15 OF HIGH ADDRESS, AND
0274	75365	064041	LDB ASNID	SKIP 1 OR BOTH RETURN INCREM
0275	75366	054030	CPB LTEMP	DEPENDING ON REASON FOR
0276	75367	027374	JMP ASN31	
0277	75370	027375	JMP ASN32	
0278	75371		ASN30 EQU *	
0279	75371	067513	LDB ASNIF	READ-WRITE; WAS IT
0280	75372	006003	SZB, RSS	IN FUSS?
0281	75373	036152	ISZ SCHLQ	NO, BUMP TWICE
0282	75374		ASN31 EQU *	
0283	75374	036152	ISZ SCHLQ	
0284	75375		ASN32 EQU *	
0285	75375	067512	LDB ASBUF	
0286	75376	044356	ADB .-1	GET LOW ADDRESS IN B
0287	75377	164001	LDB 1, I	STORE NEW FUSS INFORMATION
0288	75400	104400	DST ASNFS, I	
	75401	100040		
0289*				
0290	75402	060666	LDA FUSS	WRITE FUSS BACK TO DISC
0291	75403	064676	LDB LIBD	
0292	75404	114206	JSB DISCZ, I	CAN'T GET RID OF IT
0293	75405	114207	JSB SICKP, I	
0294*				
0295	75406	016056	JSB ROPRG	READ USER'S PROGRAM BACK IN
0296	75407	067512	LDB ASBUF	
0297	75410	160001	LDA 1, I	GET LENGTH WORD
0298	75411	170036	STA ASFCB, I	AND STORE IT
0299	75412	034036	ISZ ASFCB	
0300	75413	044353	ADB .-4	GET NEW RECORD SIZE
0301	75414	164001	LDB 1, I	AND STORE IT
0302	75415	174036	STB ASFCB, I	
0303	75416	034036	ISZ ASFCB	REMOVE BIT 15 FROM LENGTH
0304	75417	001665	ELA, CLE, ERA	COMPUTE RELATIVE
0305	75420	040355	ADA .-2	ADDRESS OF LAST
0306	75421	002016	SLA, INA, SZA	LOGICAL RECORD
0307	75422	040356	ADA .-1	GET ADDRESS
0308	75423	067512	LDB ASBUF	OF HIGH DISC ADDRESS
0309	75424	044355	ADB .-2	AND SAVE IT
0310	75425	077510	STB ASSCH	GET POINTER TO LOW DISC ADDRESS
0311	75426	006004	INB	
0312	75427	000040	CLE	ADD RELATIVE LAST RECORD ADDRESS
0313	75430	140001	ADA 1, I	B GETS HIGH DISC ADDRESS WORD
0314	75431	167510	LDB ASSCH, I	IF LOW ADDRESS OVERFLOWS,
0315	75432	002040	SEZ	ADD 1 TO HIGH PART
0316	75433	006004	INB	STORE BOTH WORDS OF
0317	75434	101100	SWP	DISC ADDRESS
0318	75435	104400	DST ASFCB, I	
	75436	100036		
0319	75437	060036	LDA ASFCB	
0320	75440	040363	ADA .+4	
0321	75441	070036	STA ASFCB	STORE BASE DISC ADDRESS
0322	75442	104200	OLD ASSCH, I	
	75443	175510		

0323	75444	104400	DST ASFCB,I	INTO FILE TABLE
	75445	100036		
0324	75446	034036	ISZ ASFCB	ADJUST POINTER
0325	75447	060036	LDA ASFCB	SET
0326	75450	040354	ADA ,=3	'NULL RECORD'
0327	75451	065027	LDB BIT15	CONDITION
0328	75452	174000	STB 0,I	
0329	75453	063512	LDA ASBUF	
0330	75454	040353	ADA ,=4	
0331	75455	067511	LDB ASSAV	
0332	75456	007004	CMB,INB	COMPUTE DIFFERENCE BETWEEN
0333	75457	144000	ADB 0,I	OLD AND NEW BUFFER SIZES
0334	75460	034036	ISZ ASFCB	
0335	75461	160036	LDA ASFCB,I	
0336	75462	040001	ADA 1	ADJUST BUFFER
0337	75463	170036	STA ASFCB,I	ADDRESS
0338	75464	034036	ISZ ASFCB	
0339	75465	170036	STA ASFCB,I	SET 'RECORD FULL' CONDITION
0340	75466	034036	ISZ ASFCB	
0341	75467	002400	CLA	SET 'NO EOF EXIT'
0342	75470	170036	STA ASFCB,I	CONDITION
0343	75471	034036	ISZ ASFCB	
0344	75472	061554	LDA ASBFP	MOVE
0345	75473	164000	LDB 0,I	FILE NAME
0346	75474	174036	STB ASFCB,I	TO
0347	75475	002004	INA	FILE TABLE
0348	75476	034036	ISZ ASFCB	
0349	75477	104200	OLD 0,I	
	75500	100000		
0350	75501	104400	DST ASFCB,I	
	75502	100036		
0351*				
0352	75503		ASN14 EQU *	
0353	75503	016312	JSB ABCHK	
0354	75504	026222	JMP SCHBL	ALL DONE
0355	75505	176000	HI6 OCT 176000	
0356	75506	120436	ASN5P ABS -TTY00-?LINK	
0357	00036		ASFCB EQU LTEMP+6	POINTER TO ORDINAL ENTRY IN FILE
0358*				TABLE
0359	00037		ASORD EQU LTEMP+7	ORDINAL FILE # IN FUSS ENTRY
0360	00040		ASNFS EQU LTEMP+8	POINTER TO ORDINAL ENTRY IN FUSS
0361*				TABLE
0362	00041		ASNID EQU LTEMP+9	USER ID
0363	75507	000000	ASUFS BSS 1	POINTER TO USER FUSS ENTRY
0364	75510	000000	ASSCH BSS 1	POINTER TO DISC ADDRESS IN
0365*				TEMPORARY BUFFER
0366	75511	000000	ASSAV BSS 1	RECORD SIZE OF OLD FILE
0367	75512	000000	ASBUF BSS 1	BUFFER INDEX
0368	75513	000000	ASNIF BSS 1	CLEAR UNLESS FILE IN FUSS
0369	75514	075515	ASFBF DEF **+1	
0370	75515	000000	BSS 6	TEMPORARY FILE TABLE INFORMATION
0371*				BUFFER
0372*				
0373*	LTEMP, LTEMP+1, LTEMP+2, LTEMP+3, LTEMP+4, LTEMP+5, LTEMP+10,			
0374*	LTEMP+11, AND LTEMP+12 ARE ALSO USED			
0375*				

PAGE 0379 #31 ASSIGN

0376 75523

SASN EQU *

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0378* THE CHAIN ROUTINE IS USED BY THE BASIC COMPILER TO PROCESS A CHAIN
0379* STATEMENT DURING PHASE III. THE PURPOSE OF THIS ROUTINE IS TO
0380* CHECK FOR THE REQUESTED PROGRAM ON THE USER'S PRIVATE LIBRARY OR
0381* ON THE PUBLIC LIBRARY (IF THE NAME IS PRECEDED BY A DOLLAR SIGN)
0382* OR ON THE GROUP LIBRARY (IF THE NAME IS PRECEDED BY A SNOWFLAKE).
0383* IF THE PROGRAM IS FOUND IT IS LOADED AND COMPILATION IS BEGUN.
0384 75000          ORG LIBRA
0385 75000 061500   LDA FCNTR          SET COUNTER TO
0386 75001 003000   CMA              1'S COMPLEMENT OF
0387 75002 071500   STA FCNTR          NUMBER OF FILES
0388 75003 002004   INA              PUT 2'S COMPLEMENT INTO
0389 75004 070034   STA CHNP          SAFE KEEPING FOR LCD
0390 75005 061232   LDA FCORE          LOAD FIRST BUFFER ADDRESS
0391 75006 065502   LDB FILTB         LOAD POINTER TO
0392 75007 044364   ADB .+5          FIRST DISC ADDRESS (LOW WORD)
0393 75010 035500   CHN01 ISZ FCNTR    MORE FILES?
0394 75011 002001   RSS              YES
0395 75012 027027   JMP CHAN0        NO==FINISHED DUMPING BUFFERS
0396 75013 075236   STB FBASE        WRITE
0397 75014 071645   STA RQ3          OUT
0398 75015 015514   JSB WRBUF        RECORD
0399 75016 065236   LDB FBASE
0400 75017 044372   ADB .+FTEL-4
0401 75020 160001   LDA 1,I
0402 75021 001423   ALR,RAR
0403 75022 003004   CMA,INA
0404 75023 044366   ADB .+7
0405 75024 140001   ADA 1,I
0406 75025 044354   ADB .-3
0407 75026 027010   JMP CHN01
0408 75027 064272   CHAN0 LDB MLINK+1
0409 75030 044346   ADB .+?ID=?LINK
0410 75031 074036   STB CHNI         => USER ID
0411 75032 044352   ADB .-?ID        CAN THERE BE
0412 75033 160001   LDA B,I          FILES WHOSE
0413 75034 010502   AND DFCHK        LCD'S NEED
0414 75035 002003   SZA,RSS          UPDATING?
0415 75036 027044   JMP CHN17        NO
0416 75037 060034   LDA CHNP         GET NEGATIVE FILE COUNT
0417 75040 044364   ADB .+?ID        AND ID POINTER
0418 75041 117363   JSB LCDP,I       GO UPDATE LCD'S
0419 75042 002001   RSS             CORE NOT CHANGED (OVERWRITTEN)
0420 75043 016056   JSB RDRPRG      RESTORE USER AREA
0421 75044 160036   CHN17 LDA CHNI,I  GET USER'S ID
0422 75045 070030   STA LTEMP        STORE IN LTEMP
0423 75046 060354   LDA .-3
0424 75047 070034   STA CHNP
0425 75050 063360   LDA TWOSP
0426 75051 064640   LDB DLTEM
0427 75052          CHN00 EQU *
0428 75052 006004   INB              INITIALIZE
0429 75053 170001   STA B,I          NAME TO
0430 75054 034034   ISZ CHNP         BLANKS
0431 75055 027052   JMP CHN00
0432 75056 002404   CLA,INA          ALLOW STRING
0433 75057 071470   STA EOL          CONSTANT

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0434	75060	015336	JSB FORMX	EVALUATE STRING
0435	75061	060355	LDA .-2	PREPARE
0436	75062	015344	JSB PSTR	STRING
0437	75063	071256	STA TEMP4	SAVE SOURCE POINTER
0438	75064	054356	CPB .-1	NULL STRING?
0439	75065	027137	JMP CHAN4	YES
0440	75066	075410	STB TPRME	SAVE LENGTH
0441	75067	065256	LDB TEMP4	EXTRACT
0442	75070	004065	CLE,ERB	
0443	75071	160001	LDA B,I	FIRST
0444	75072	002041	SEZ,RSS	
0445	75073	001727	ALF,ALF	CHARACTER
0446	75074	010500	AND B377	
0447	75075	050423	CPA .+44B	'S'?
0448	75076	027116	JMP CHAN2	YES
0449	75077	050431	CPA .+52B	NO, '!'?
0450	75100	002001	RSS	YES
0451	75101	027122	JMP CHAN3	NO
0452	75102	060030	LDA LTEMP	GET USER'S ID
0453	75103	010512	AND B1777	CONVERT
0454	75104	006400	CLB	IT
0455	75105	100400	DIV .100	TO
	75106	000472		
0456	75107	100200	MPY .100	ID
	75110	000472		
0457	75111	064000	LDB A	OF
0458	75112	060612	LDA M2000	GROUP
0459	75113	010030	AND LTEMP	LIBRARIAN
0460	75114	030001	IOR B	AND
0461	75115	002001	RSS	
0462	75116		CHAN2 EQU *	
0463	75116	060514	LDA A000	SET UP FOR PUBLIC LIBRARY
0464	75117	070030	STA LTEMP	SAVE ID
0465	75120	035256	ISZ TEMP4	BUMP SOURCE POINTER
0466	75121	035410	ISZ TPRME	BUMP LENGTH
0467	75122		CHAN3 EQU *	
0468	75122	061410	LDA TPRME	
0469	75123	040366	ADA .+7	
0470	75124	002020	SSA	LENGTH > 6?
0471	75125	002400	CLA	YES, SET TO 6
0472	75126	040350	ADA .-7	NO
0473	75127	071410	STA TPRME	
0474	75130	071406	STA TNULL	
0475	75131	060640	LDA DLTEM	
0476	75132	002004	INA	
0477	75133	001000	ALS	
0478	75134	071272	STA TEMP5	DESTINATION POINTER
0479	75135	060654	LDA FCUCA	UPPER CASE ONLY
0480	75136	015350	JSB TRSTR	TRANSFER STRING
0481	75137		CHAN4 EQU *	
0482	75137	007400	CCB	SET FLAG FOR NO LINE NUMBER
0483	75140	061611	LDA TEMP1	
0484	75141	051334	CPA PRGCT	END OF STATEMENT?
0485	75142	027147	JMP CHAN5	YES
0486	75143	015356	JSB FETCH	NO, GET LINE NUMBER
0487	75144	015342	JSB SBFIX	ROUND TO INTEGER

0488	75145	065023	LDB DVSR5	ILLEGAL LINE NUMBER
0489	75146	006004	INB	READJUST
0490	75147		CHAN5 EQU *	
0491	75147	077361	STB PKCNT	SAVE THE LINE NUMBER
0492	75150	061575	LDA SPROG	
0493	75151	073362	STA INWRD	
0494	75152	116017	JSB DLOKP,I	SEARCH DIRECTORY FOR PROGRAM
0495	75153	002001	RSS	
0496	75154	027354	JMP CHAN7	PROGRAM NOT FOUND
0497	75155	064035	LDB CHNPD	CHECK ILL-STORED
0498	75156	044363	ADB ,+4	PROGRAM FLAG
0499	75157	160001	LDA B,I	
0500	75160	002021	SSA,RSS	UNSUCCESSFULLY STORED?
0501	75161	027166	JMP CHN14	NO, CONTINUE
0502	75162	160036	LDA CHNI,I	GET USER'S ID
0503	75163	050030	CPA LTEMP	DOES HE OWN THE PROGRAM?
0504	75164	036152	ISZ SCHLQ	YES, BUMP TO ILL-STORED MESSAGE
0505	75165	027354	JMP CHAN7	NO, PRINT NONEXISTENT PROGRAM
0506	75166	036152	CHAN14 ISZ SCHLQ	PAST SECOND ERROR
0507	75167	036152	ISZ SCHLQ	AND ERROR 2,5
0508	75170	044355	ADB ,.-2	
0509	75171	160001	LDA 1,I	
0510	75172	002020	SSA	
0511	75173	027354	JMP CHAN7	ENTRY IS A FILE
0512	75174	036152	ISZ SCHLQ	PAST THIRD ERROR
0513*				
0514*	FOUND CORRECT ENTRY. FIRST CHECK TO SEE IF IT FITS			
0515*				
0516	75175	044356	ADB ,.-1	*-> FIRST WORD OF NAME
0517	75176	160001	LDA B,I	MOVE PROTECTED BIT
0518	75177	070031	STA LTEMP+1	TO SAFE PLACE
0519	75200	044361	ADB ,+2	*-> THIRD WORD OF NAME
0520	75201	160001	LDA 1,I	SAVE SEMI-
0521	75202	070040	STA LIBSC	COMPILED FLAG
0522	75203	006004	INB	
0523	75204	160001	LDA 1,I	SAVE START-OF-
0524	75205	001665	ELA,CLE,ERA	
0525	75206	070041	STA LIBSP	PROGRAM POINTER
0526	75207	044366	ADB ,+7	GET PROGRAM LENGTH
0527	75210	160001	LDA 1,I	
0528	75211	070042	STA CHNLN	
0529	75212	003004	CMA,INA	COMPUTE FIRST
0530	75213	040041	ADA LIBSP	UNUSED WORD
0531	75214	070045	STA LIBPB	
0532	75215	003004	CMA,INA	COMPUTE NEGATIVE
0533	75216	064040	LDB LIBSC	
0534	75217	006021	SSB,RSS	SEMI-COMPILED?
0535	75220	027225	JMP CHN18	NO
0536	75221	040716	ADA LW97	
0537	75222	002021	SSA,RSS	
0538	75223	027231	JMP CHN11	OK
0539	75224	027354	JMP CHAN7	TOO BIG
0540	75225		CHAN18 EQU *	
0541	75225	040714	ADA LW97	TOTAL LENGTH
0542	75226	002021	SSA,RSS	COMPARE WITH MAX ALLOWED
0543	75227	027231	JMP CHN11	

0544	75230	027354	JMP CHAN7	PROGRAM TOO LARGE
0545	75231		CHN11 EQU *	
0546	75231	036152	ISZ SCHLQ	PAST FOURTH ERROR
0547	75232	016423	JSB DATE	SET NEW DATE
0548	75233	064035	LDB CHNPD	INTO
0549	75234	044364	ADB .+5	DIRECTORY
0550	75235	170001	STA 1,I	
0551	75236	044362	ADB .+3	SET
0552	75237	104200	DLD B,I	DISC
	75240	100001		
0553	75241	104400	DST CHNDI	ADDRESS
	75242	000046		
0554	75243	160034	LDA CHNP,I	WRITE DIRECTORY
0555	75244	070204	STA MWORD	BACK TO
0556	75245	060034	LDA CHNP	DISC
0557	75246	040364	ADA .+5	
0558	75247	064676	LDB LIBD	
0559	75250	114206	JSB DISCZ,I	
0560	75251	114207	JSB SICKP,I	QUE PASA?
0561	75252	064272	LDB MLINK+1	SET TO NULL PROGRAM
0562	75253	044345	ADB .+?PROG=?LINK	
0563	75254	160001	LDA B,I	SAVE CURRENT
0564	75255	070037	STA CHNC	PROGRAM BOUND
0565	75256	063362	LDA INWRD	
0566	75257	170001	STA 1,I	
0567	75260	016056	JSB RDRPG	READ IN FIXED AREA
0568	75261	064042	LDB CHNLN	
0569	75262	074204	STB MWORD	
0570	75263	064041	LDB LIBSP	
0571	75264	045027	ADB BIT15	READ
0572	75265	063357	LDA CHNDP	PROGRAM
0573	75266	114206	JSB DISCZ,I	FROM DISC
0574	75267	002001	RSS	READ ERROR
0575	75270	027276	JMP CHN13	
0576	75271	064272	LDB MLINK+1	
0577	75272	044345	ADB .+?PROG=?LINK	
0578	75273	060037	LDA CHNC	
0579	75274	170001	STA B,I	
0580	75275	027354	JMP CHAN7	
0581	75276	160036	CHN13 LDA CHNI,I	GET USER'S ID
0582	75277	034036	ISZ CHNI	TO FIRST WORD OF NAME
0583	75300	064031	LDB LTEMP+1	GET FIRST WORD
0584	75301	050030	CPA LTEMP	IF PROGRAM OWNER CLEAR
0585	75302	005665	ELB,CLE,ERB	RUN=ONLY BIT
0586	75303	174036	STB CHNI,I	STORE FIRST WORD OF NAME
0587	75304	034036	ISZ CHNI	BUMP POINTER TO NEXT WORD
0588	75305	104200	DLD LTEMP+2	GET LAST 2 WORDS OF NAME
	75306	000032		
0589	75307	104400	DST CHNI,I	STORE IN TABLE
	75310	100036		
0590	75311	036152	ISZ SCHLQ	
0591	75312	016343	JSB SEMIC	
0592	75313	016312	JSB ABCHK	ABORT ATTEMPT?
0593*				
0594*	SET TO RUN			
0595*				

0596	75314	103100	CLF 0	
0597	75315	064255	LDB MAIN	
0598	75316	160001	LDA 1,I	DON'T ALLOW
0599	75317	030377	IOR UNABT	ABORTS
0600	75320	030506	IOR CHNFG	
0601	75321	170001	STA 1,I	DURING COMPILE
0602	75322	102100	STF 0	
0603	75323	061573	LDA SYMTB	UNCOMPILED?
0604	75324	002003	SZA,RSS	YES, USE PBPTR
0605	75325	060056	LDA PBPTR	LINE NUMBER
0606	75326	067361	LDB PKCNT	SPECIFIED?
0607	75327	006020	SSB	NO
0608	75330	027335	JMP CHAN6	FIND REFERENCED STATEMNET
0609	75331	015314	JSB FNDPS	BAD LINE NUMBER
0610	75332	027343	JMP CHAN9	
0611	75333	000000	NOP	
0612	75334	002001	RSS	
0613	75335		CHAN6 EQU *	
0614	75335	065575	LDB SPROG	DEFAULT LINE NUMBER
0615	75336	075334	STB PRGCT	SAVE FIRST STATEMENT
0616	75337	036152	ISZ SCHLQ	
0617	75340		CHAN8 EQU *	
0618	75340	060417	LDA ,+40B	
0619	75341	071571	STA BLANK	
0620	75342	026222	JMP SCHBL	
0621	75343	016312	CHAN9 JSB ABCHK	
0622	75344	060506	LDA CHNFG	
0623	75345	003000	CMA	
0624	75346	064255	LDB MAIN	
0625	75347	103100	CLF 0	
0626	75350	110001	AND B,I	CLEAR CHAIN FLAG
0627	75351	170001	STA B,I	
0628	75352	102100	STF 0	
0629	75353	027340	JMP CHAN8	
0630	75354	016056	CHAN7 JSB RDPRG	READ BACK USER PROGRAM
0631	75355	016312	JSB ABCHK	ABORT ATTEMPT?
0632	75356	026222	JMP SCHBL	NO
0633	75357	000046	CHNDP DEF CHNDI	
0634	75360	020040	TWOSP ASC 1,	
0635	75361	000000	PKCNT BSS 1	
0636	75362	000000	INWRD BSS 1	
0637	75363	073367	LCDP DEF LCD	
0638	00034		CHNP EQU LTEMP+4	
0639	00035		CHNPD EQU LTEMP+5	
0640	00036		CHNI EQU LTEMP+6	
0641	00037		CHNC EQU LTEMP+7	
0642	00042		CHNLN EQU LTEMP+10	PROGRAM LENGTH
0643	00046		CHNDI EQU LTEMP+14	DISC
0644*			LTEMP+15	ADDRESS
0645*				
0646*	LTEMP,	LTEMP+1,	LTEMP+2	AND LTEMP+3
0647*				ARE ALSO USED
0648	75364		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 DUPLICATELY 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.

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0017 75000          ORG LIBRA

0019 75000 064272    LDB MLINK+1  B=>LINK WORD.
0020 75001 044346    ADB .+?ID=?LINK  ID LOCN.
0021 75002 074050    STB MOVES
0022 75003 044356    ADB .+?PROG=?ID
0023 75004 074042    STB SAVP
0024 75005 044355    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 054532    CPB ASCBB
0029 75013 027531    JMP SAV3
0030 75014 164042    LDB SAVP,I      TEST FOR NULL PROGRAM.
0031 75015 060344    LDA .-11
0032 75016 054726    CPB PBUFF
0033 75017 027532    JMP SAV4
0034*
0035* WELL, AT LEAST THE PROGRAM HAS A NAME. NOW MAKE SURE IT IS
0036* DECOMPILED
0037*
0038 75020 016056    JSB RDPRG      READ PROGRAM TO CORE.
0039 75021 064042    LDB SAVP      TEST FOR COMPILED.
0040 75022 044353    ADB .+?FLAG=?PROG
0041 75023 160001    LDA 1,I
0042 75024 010361    AND CFLAG
0043 75025 002003    SAV0  SZA,RSS
0044 75026 027044    JMP SAV5      NOT COMPILED.
0045 75027 027043    JMP SAV5-1    ROOM FOR CSAVE CODE
0046 75030 000000    BSS 11
0047 75043 015322    JSB DCMPL     DECOMPILE IT.
0048*
0049* NEXT MAKE SURE 'COMMON' IS ALLOCATED IF NECESSARY
0050*
0051 75044 065575    SAV5  LDB SPROG      COMMON
0052 75045 054726    CPB PBUFF        ALLOCATED?
0053 75046 015516    JSB ALCOM        NO--DO IT
0054*
0055* PUT THE PROGRAM IN USERS SWAP AREA SO SOME WORK CAN GET DONE

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0056*
0057 75047 064056      LDB PBPTR      RESET PROGRAM BOUND
0058 75050 174042      STB SAVP,I     INTO TABLE
0059 75051 007004      CMB,INB       COMPUTE #
0060 75052 045213      ADB USE       OF WORDS
0061 75053 074204      STB MWORD
0062 75054 060043      LDA SAVD      GET DISC ADDRESS POINTER
0063 75055 065213      LDB USE       WRITE OUT TO
0064 75056 114206      JSB DISCZ,I   SWAP TRACK
0065 75057 124210      JMP PTZAP,I   BLEW IT - DUMP THIS DUDE
0066 75060 027104      SAV50 JMP SAV51
0067 75061 000000      BSS 19        ROOM FOR CSAVE CODE
0068*
0069* DETERMINE IF THIS USER HAS ENOUGH ALLOCATED SPACE AVAILABLE TO
0070* SAVE THE PROGRAM.
0071*
0072 75104 164042      SAV51 LDB SAVP,I     COMPUTE
0073 75105 007004      CMB,INB       PROGRAM
0074 75106 045575      ADB SPROG     LENGTH
0075 75107 074040      STB SAVWD     SAVE IN
0076 75110 101030      ASR 8         NEGATIVE WORDS AND
0077 75111 007004      CMB,INB       POSITIVE
0078 75112 076460      STB SAVLN     BLOCKS
0079 75113 065575      LDB SPROG     SAVE START-OF-
0080 75114 074042      STB SAVP     PROGRAM POINTER
0081*
0082 75115 116022      JSB GCID,I    GET USER IDT ENTRY
0083 75116 044366      ADB .+7      GET DISC USED TO DATE.
0084 75117 160001      LDA 1,I
0085 75120 042460      ADA SAVLN     GET TOTAL AMOUNT TO
0086 75121 003004      CMA,INA      USED AS A NEGATIVE QUANTITY
0087 75122 044356      ADB .-1
0088 75123 000040      CLE
0089 75124 140001      ADA 1,I      COMPARE WITH ALLOTMENT.
0090 75125 002040      SEZ
0091 75126 027145      JMP SAV6     OK.
0092 75127 067132      LDB ++3
0093 75130 060334      LDA .-19
0094 75131 026623      JMP LIBER
0095 75132 075133      DEF ++1
0096 75133 005114      OCT 5114     LF=L
0097 75134 044502      ASC 9,IBRARY SPACE FULL
75135 051101
75136 051131
75137 020123
75140 050101
75141 041505
75142 020106
75143 052514
75144 046040
0098*
0099* SEARCH ADT FOR SPACE TO PUT THE PROGRAM.
0100*
0101 75145      SAV6 EQU *
0102 75145 060347      LDA .-8      SET COUNT OF POSSIBLE DISK ADTS
0103 75146 070044      STA SAVDF

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0104 75147 SAVBA EQU *
0105 75147 062030 LDA RKCYP GET CYCLIC POINTER
0106 75150 040362 ADA .+3 AND ADVANCE
0107 75151 053553 CPA EALNA IT TO THE
0108 75152 063552 LDA EALCA NEXT ENTRY
0109 75153 072030 STA RKCYP IN THE TABLE
0110 75154 040361 ADA .+ADTLN=ADTAT => LENGTH WORD
0111 75155 070043 STA SAVD
0112 75156 160043 LDA SAVD,I IS THIS DISK AVAILABLE
0113 75157 002003 SZR,RSS ZERO SEZ NO ADT TABLE
0114 75160 027205 JMP SAVBF SO WE ADVANCE TO NEXT DISK
0115 75161 070204 STA MWORD OTHERWISE, SAVE LENGTH
0116 75162 062030 LDA RKCYP => DISC ADDRESS
0117 75163 064700 LDB LIBDI
0118 75164 114206 JSB DISCZ,I READ IT IN
0119 75165 114207 JSB SICKP,I SORRY, IT'S STUCK ON THE DISC
0120 75166 007400 CCB COMPUTE THE
0121 75167 160043 LDA SAVD,I ENTRY
0122 75170 100400 DIV .+3 COUNT
75171 000362
0123 75172 070041 STA SAVC AND SAVE
0124 75173 064676 LDB LIBD => FIRST ENTRY
0125 75174 044361 ADB .+2 => LENGTH WORD
0126 75175 SAVBD EQU *
0127 75175 160001 LDA B,I TEST THIS ENTRY FOR BIG ENOUGH
0128 75176 003100 CMA,CLE
0129 75177 042460 ADA SAVLN
0130 75200 002041 SEZ,RSS SKIP IF TOO SHORT
0131 75201 027237 JMP SAV7 GOTCHA
0132 75202 044362 ADB .+3 ADVANCE TO NEXT ENTRY
0133 75203 034041 ISZ SAVC DECREMENT ENTRY COUNT
0134 75204 027175 JMP SAVBD PROCESS NEXT ENTRY
0135 75205 SAVBF EQU * PROCESS NEXT TRACK
0136 75205 034044 ISZ SAVDF TRIED ALL DISKS FOR ROOM?
0137 75206 027147 JMP SAVBA NO, TRY THE NEXT ONE
0138*
0139 75207 SAV23 EQU *
0140 75207 060337 LDA .-16
0141 75210 067212 LDB ++2 PRINT "SYSTEM OVERLOAD"
0142 75211 026623 JMP LIBER
0143 75212 075213 DEF ++1
0144 75213 005123 OCT 5123 LF=S
0145 75214 054523 ASC 7,SYSTEM OVERLOAD
75215 052105
75216 046440
75217 047526
75220 042522
75221 046117
75222 040504
0146*
0147 75223 060337 SAV12 LDA .-16
0148 75224 067226 LDB ++2 PRINT "DUPLICATE ENTRY"
0149 75225 026623 JMP LIBER
0150 75226 075227 DEF ++1
0151 75227 005104 OCT 5104 LF=D
0152 75230 052520 ASC 7,UPPLICATE ENTRY

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75231	046111			
75232	041501			
75233	052105			
75234	020105			
75235	047124			
75236	051131			
0153*				
0154	75237	SAV7	EQU *	
0155	75237		LDA SAVLN	SAVE
0156	75240		CMA,INA	NEGATIVE NUMBER OF
0157	75241		ADA B,I	SECTORS LEFT
0158	75242		STA SAVDF	
0159	75243		ADB .-2	SAVE LOCATION OF
0160	75244		STB SAVC	DISK ADT ENTRY
0161	75245		DLB B,I	GET DISK ADDRESS
	75246			
0162	75247		DST SAVDS	AND SAVE
	75250			
0163*				
0164	75251		LDA DLTEM	MOVE ID/NAME ENTRY TO
0165	75252		STA MOVED	LTEMP(0:3),
0166	75253		LDB .-4	
0167	75254		JSB MOVEW	
0168	75255	SAV10	JMP SAV11	ROOM FOR CSAVE CODE
0169	75256		BSS 2	
0170*				
0171*	SEARCH THE DIRECTORY TO INSURE THE PROGRAM NAME DOES NOT ALREADY			
0172*	EXIST			
0173*				
0174	75260	SAV11	EQU *	
0175	75260		JSB DLOKP,I	SEARCH FOR ENTRY
0176	75261		JMP SAV12	ENTRY FOUND--ILLEGAL.
0177*				
0178	75262		LDB SAVI,I	IF TRACK IS FULL, GO DO
0179	75263		CPB M8184	OVERLAY SECTION.
0180	75264		JMP SAV98	
0181*				
0182*	EVERYTHING IS FINE. BUILD A NEW DIRECTORY ENTRY AND INSERT			
0183*				
0184	75265		CMB	SET UP SOURCE FOR
0185	75266		ADB LIBD	MOVE.
0186	75267		STB MOVES	
0187	75270		ADB .+12	SET UP DESTINATION
0188	75271		STB MOVED	
0189	75272		CMB	COMPUTE LENGTH.
0190	75273		ADB .+24	
0191	75274		ADB SAVS	
0192	75275		JSB MOVEB	
0193*				
0194	75276		LDA DLTEM	MOVE 5 WORDS IN FOR
0195	75277		STA MOVES	NEW ENTRY.
0196	75300		LDA SAVS	
0197	75301		ADA .+12	
0198	75302		STA MOVED	
0199	75303		LDB .-4	
0200	75304		JSB MOVEW	

0201	75305	060042	LDA SAVP	STORE START-OF-
0202	75306	170051	STA MOVED,I	PROGRAM POINTER
0203	75307	016423	JSB DATE	STORE DATE IN ALSO.
0204	75310	034051	ISZ MOVED	
0205	75311	170051	STA MOVED,I	LAST REFERENCE DATE
0206	75312	034051	ISZ MOVED	
0207	75313	060171	LDA DATIM	GET HOUR OF YEAR
0208	75314	170051	STA MOVED,I	LAST CHANGE DATE
0209	75315	034051	ISZ MOVED	
0210	75316	002400	CLA	ZERO
0211	75317	170051	STA MOVED,I	WORD 7
0212	75320	034051	ISZ MOVED	
0213	75321	104200	OLD SAVDS	GET DISK ADDRESS FOR
	75322	000036		
0214	75323	104400	DST MOVED,I	WORDS 8 AND 9
	75324	100051		
0215	75325	064051	LDB MOVED	
0216	75326	044362	ADB .+3	=> WORD 11
0217	75327	060040	LDA SAVWD	GET THE LENGTH WORD FOR
0218	75330	170001	STA B,I	WORD 11
0219*				
0220	75331	160034	LDA SAVI,I	ADJUST
0221	75332	040343	ADA .-12	DIRECTORY
0222	75333	170034	STA SAVI,I	LENGTH.
0223	75334	070204	STA MWORD	
0224	75335	060034	LDA SAVI	WRITE DIRECTORY BACK OUT.
0225	75336	002004	INA	
0226	75337	070051	STA MOVED	
0227	75340	040363	ADA .+4	
0228	75341	064676	LDB LIBD	
0229	75342	074050	STB MOVES	
0230	75343	114206	JSB DISCZ,I	WRITE OUT
0231	75344	114212	JSB DEADP,I	FORGET IT
0232*				
0233	75345	064353	LDB .-4	RESET DIREC.
0234	75346	016450	JSB MOVEW	
0235*				
0236*	NOW UPDATE THE USER'S AMOUNT OF DISC SPACE USED			
0237*				
0238	75347		SAV21 EQU *	
0239	75347	116022	JSB GCID,I	READ IN THE IDT
0240	75350	044366	ADB .+7	
0241	75351	062460	LDA SAVLN	ADJUST AMOUNT
0242	75352	140001	ADA B,I	OF DISK SPACE USED
0243	75353	170001	STA 1,I	
0244*				
0245	75354	060075	LDA IDTAD	GET DISC ADDRESS POINTER
0246	75355	064676	LDB LIBD	TO WRITE IDT BACK
0247	75356	114206	JSB DISCZ,I	TO THE DISC
0248	75357	114212	JSB DEADP,I	THIS SYSTEM HAS HAD IT
0249*				
0250*	NEXT, UPDATE THE ADT			
0251*				
0252	75360	160043	LDA SAVD,I	FETCH THE LENGTH OF THE
0253	75361	070204	STA MWORD	ADT TRACK
0254	75362	062030	LDA RKCYP	GET THE DISC ADDRESS POINTER

0255	75363	064700	LDB LIBDI	AND READ IN THE
0256	75364	114206	JSB DISCZ,I	ADT TRACK AGAIN
0257	75365	027407	JMP SAV30	CAN'T - MAKE IT DISAPPEAR
0258*				
0259	75366	064044	LDB SAVDF	
0260	75367	006002	SZB	ADT ENTRY COMPLETELY USED?
0261	75370	027415	JMP SAVCF	NO, SHORTEN IT
0262*				
0263	75371	064041	LDB SAVC	YES, REMOVE IT
0264	75372	074051	STB MOVED	
0265	75373	044362	ADB ,+3	SET UP POINTERS FOR MOVE
0266	75374	074050	STB MOVES	
0267	75375	044774	ADB MLIBD	CALCULATE THE NEEDED
0268	75376	044204	ADB MWORD	WORD COUNT
0269	75377	016450	JSB MOVEW	
0270*				
0271	75400	060362	LDA ,+3	SHORTEN THE APPROPRIATE COUNTS
0272	75401	164043	LDB SAVD,I	
0273	75402	044000	ADB A	SHORTEN THE TABLE ENTRY
0274	75403	174043	STB SAVD,I	
0275	75404	040204	ADA MWORD	AND THE DISC DRIVER COUNT
0276	75405	070204	STA MWORD	
0277	75406	027431	JMP SAVCG	
0278*				
0279	75407	006400	SAV30 CLB	
0280	75410	002400	CLA	
0281	75411	170043	STA SAVD,I	ZERO OUT ADT'S LENGTH
0282	75412	104400	DST RKCYP,I	AND DISC ADDRESS WORDS
	75413	174030		
0283	75414	027435	JMP SAV31	
0284*				
0285	75415		SAVCF EQU *	
0286	75415	104200	OLD SAVC,I	MOVE UP THE DISK ADDRESS
	75416	100041		
0287	75417	000040	CLE	
0288	75420	046460	ADB SAVLN	BY SAVLN BLOCKS
0289	75421	002040	SEZ	CHECK FOR OVERFLOW
0290	75422	002004	INA	
0291	75423	104400	DST SAVC,I	
	75424	100041		
0292	75425	064041	LDB SAVC	AND UPDATE THE COUNT
0293	75426	044361	ADB ,+2	=> LENGTH WORD
0294	75427	060044	LDA SAVDF	GET SAVED LENGTH
0295	75430	170001	STA B,I	AND PLUG IN
0296*				
0297	75431		SAVCG EQU *	
0298	75431	062030	LDA RKCYP	GET DISC ADDRESS POINTER
0299	75432	064676	LDB LIBD	AND WRITE THE DISK ADT
0300	75433	114206	JSB DISCZ,I	BACK TO THE DISC
0301	75434	027407	JMP SAV30	CAN'T - MAKE IT DISAPPEAR
0302*				
0303*	RETRIEVE THE	USER'S PROGRAM FROM	THE SWAP AREA & WRITE IT OUT TO	
0304*	THE SELECTED	AREA ON DISC.		
0305*				
0306	75435	016056	SAV31 JSB RDPRG	READ USER PROGRAM AGAIN
0307	75436	060040	LDA SAVWD	WRITE IT OUT.

```

0308 75437 070204          STA MWORD          TO LIBRARY
0309 75440 027463  SAV24 JMP SAV25          ROOM FOR CSAVE CODE
0310 75441 000000          BSS 18
0311*
0312 75463          SAV25 EQU *
0313 75463 063555          LDA SAVDP
0314 75464 064042          LDB SAVP
0315 75465 114206          JSB DISCZ,I        WRITE TO DISC
0316 75466 002003          SZA,RSS            TRANSFER SUCCESSFUL?
0317 75467 026613          JMP LLEND
0318*
0319* IF THE TRANSFER TO DISC WAS UNSUCCESSFUL, INDICATE 'BADLY SAVED
0320* PROGRAM' IN THE DIRECTORY ENTRY AND PRINT ERROR MESSAGE.
0321*
0322 75470 116017          JSB DLOKP,I        NO, GO GET DIRECTORY ENTRY AGAIN
0323 75471 002001          RSS              FOUND IT
0324 75472 102035          HLT DEATH+35B     NOT FOUND; TROUBLE
0325 75473 064035          LDB LTEMP+5       GET POINTER TO ENTRY
0326 75474 044363          ADB .+4           => END OF COMMON POINTER
0327 75475 160001          LDA B,I           SET BIT 15 TO
0328 75476 031027          IOR BIT15         INDICATE BADLY SAVED
0329 75477 170001          STA B,I           PROGRAM
0330 75500 060034          LDA LTEMP+4       WRITE OUT
0331 75501 040364          ADA .+5           DIRECTORY TRACK
0332 75502 064676          LDB LIBD
0333 75503 114206          JSB DISCZ,I
0334 75504 114211          JSB SLVAG,I       CAN'T DO IT, TRY TO SALVAGE
0335 75505 063557          LDA SM31
0336 75506 067510          LDB ++2
0337 75507 026623          JMP LIBER         PRINT FAILURE
0338 75510 075511          DEF ++1
0339 75511 005125          OCT 5125         LF=U
0340 75512 047123          ASC 15,NSUCCESSFUL; KILL AND REPEAT.
75513 052503
75514 041505
75515 051523
75516 043125
75517 046073
75520 020113
75521 044514
75522 046040
75523 040516
75524 042040
75525 051105
75526 050105
75527 040524
75530 027040
0341 75531 060337  SAV3  LDA .-16
0342 75532 067534  SAV4  LDB ++2
0343 75533 026623          JMP LIBER
0344 75534 075535          DEF ++1
0345 75535 005116          OCT 5116         LF=N
0346 75536 047440          ASC 7,0 PROGRAM NAME
75537 050122
75540 047507
75541 051101

```

```

75542 046440
75543 047101
75544 046505
0347 75545 SAV98 EQU *
0348 75545 063556 LDA SM507 SET UP
0349 75546 070204 STA MWORD OVERLAY.
0350 75547 063554 LDA SAVOV
0351 75550 064610 LDB #LIBI
0352 75551 027773 JMP SAV99
0353 75552 000116 EALCA DEF ADTAT
0354 75553 000146 EALNA DEF DKTBL
0355 75554 072057 SAVOV DEF COM6+SAVO-COM3+SAVO-COM3
0356 75555 000036 SAVDP DEF SAVDS => DISK ADDRESS
0357 75556 177005 SM507 DEC -507
0358 75557 177741 SM31 DEC -31
0359*
0360 00034 SAVI EQU LTEMP+4 => DIREC ENTRY OF TRACK IN CORE
0361 00035 SAVS EQU LTEMP+5 => DIRECTORY ENTRY PRECEEDING
SPACE FOR NEW ENTRY
0362*
0363 00036 SAVDS EQU LTEMP+6 DISC
ADDRESS
0364* LTEMP+7
0365 00040 SAVWD EQU LTEMP+8 LENGTH IN WORDS OF PROGRAM
0366 00041 SAVC EQU LTEMP+9 NUMBER OF ENTRIES IN ADT (NEG)
& POINTER TO DISC ADDRESS OF 1ST
0367* AVAILABLE LOCATION FOR STORAGE
0368* START-OF-PROGRAM POINTER
0369 00042 SAVP EQU LTEMP+10 DISC ADDRESS POINTER
0370 00043 SAVD EQU LTEMP+11
0371 00044 SAVDF EQU LTEMP+12
0372*
0373* LTEMP, LTEMP+1, LTEMP+2, AND LTEMP+3 ARE ALSO USED HERE
0374*
0375 74460 SAVLN EQU T35C0 LENGTH IN BLOCKS OF PROGRAM
0376*
0377*
0378 75773 ORG LIBRA+507
0379 75773 SAV99 EQU *
0380 75773 114206 JSB DISCZ,I
0381 75774 102077 HLT 77B
0382 75775 027000 JMP LIBRA
0383 75776 027347 JMP SAV21 NORMAL RETURN
0384 75777 027207 JMP SAV23 ERROR RETURN
0385 76000 $$SAV EQU *

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0387* THE CSAVE COMMAND IS USED TO SAVE PROGRAMS IN THE USER LIBRARY
0388* IN SEMI-COMPILED FORM. CSAVE BORROWS CODE FROM SAVE AND MUST
0389* FOLLOW IT.
0390*
0391 75000          ORG LIBRA
0392 75000 064272  LDB MLINK+1
0393*
0394 75025          ORG SAV0
0395 75025 002002  SZA          COMPILED?
0396 75026 027042  JMP CSAV1      YES
0397 75027 065575  LDB SPROG     NO, COMMON
0398 75030 054726  CPB PBUFF     ALLOCATED?
0399 75031 015516  JSB ALCOM     NO==DO IT
0400 75032 065575  LDB SPROG     SET PROGRAM
0401 75033 075334  STB PRGCT     COUNTER
0402 75034 060417  LDA .+40B     TURN ON
0403 75035 071571  STA BLANK     BLANK SUPPRESSION
0404 75036 002400  CLA          CLEAR OUT-OF
0405 75037 071573  STA SYMTB     STORAGE FLAG
0406 75040 127041  JMP ++1,I     GO COMPILE IT
0407 75041 036070  DEF CMP00
0408 75042 061230  CSAV1 LDA SPTR
0409 75043 002002  SZA          SEMI-COMPILED?
0410 75044 015520  JSB RSTPT     RESTORE SYMBOL TABLE POINTERS
0411 75045 002400  CSAV2 CLA     FLAG AS
0412 75046 071230  STA SPTR     SEMI-COMPILED
0413 75047 065502  LDB FILTB
0414*
0415 75060          ORG SAV50
0416 75060 065502  LDB FILTB
0417 75061 044366  ADB .+7
0418 75062 007004  CMB,INB
0419 75063 044716  ADB LWAUS
0420 75064 006021  SSB,RSS      TOO BIG?
0421 75065 027103  JMP CSAV4     NO
0422 75066 060335  LDA .-18     YES
0423 75067 067071  LDB ++2
0424 75070 026623  JMP LIBER
0425 75071 075072  DEF ++1
0426 75072 005120  OCT 5120     LF=P
0427 75073 051117  ASC 8,ROGRAM TOO LARGE
      75074 043522
      75075 040515
      75076 020124
      75077 047517
      75100 020114
      75101 040522
      75102 043505
0428 75103          CSAV4 EQU *
0429 75103 065502  LDB FILTB
0430 75104 044366  ADB .+7
0431*
0432 75255          ORG SAV10
0433 75255 060033  LDA LTEMP+3  FLAG NAME
0434 75256 031027  IOR BIT:5    TO INDICATE
0435 75257 070033  STA LTEMP+3  SEMI-COMPILED

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0436*			ORG SAV24	
0437	75440		LDA FILTB	*-> FIRST WORD AFTER SYMBOL TABLE
0438	75440	061502	LDB SYMTB	SAVE END-OF
0439	75441	065573	STB 0,I	PROGRAM POINTER
0440	75442	174000	INA	
0441	75443	002004	LDB FILCT	SAVE # OF
0442	75444	065604	STB 0,I	<FILES STATEMENTS>
0443	75445	174000	LDB DFILT	SAVE
0444	75446	064444	STB FILPT	
0445	75447	075603	LDB .-4	
0446	75450	064353	STB SPTR	POINTERS
0447	75451	075230	INA	
0448	75452	002004	LDB FILPT,I	
0449	75453	165603	STB 0,I	TO <FILES
0450	75454	174000	ISZ FILPT	
0451	75455	035603	ISZ SPTR	
0452	75456	035230	JMP CSAV3	STATEMENTS>
0453	75457	027452	INA	SAVE
0454	75460	002004	LDB USESN	'USING
0455	75461	065605	STB 0,I	SEEN' FLAG
0456	75462	174000		
0457*				
0458*	THIS ROUTINE USES ALL LTEMPS USED IN 'SAVE'			
0459*				


```

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)=POINTER TO DIREC ENTRY OF TRACK IN CORE
0007*     LTEMP(5)=CORE ADDRESS OF ENTRY TO PRECEED NEW ENTRY
0008*     LTEMP(6:7)=DISC ADDRESS
0009*     LTEMP(8)=LENGTH OF ENTRY IN WORDS
0010*     LTEMP(10)=START OF PROGRAM POINTER OR RECORD SIZE
0011*
0012 75000          ORG LIBRA
0013*
0014 75000 063722   LDA SDIR0      => 1ST DIREC ENTRY
0015*
0016* COMPUTE TOTAL # OF WORDS IN DIRECTORIES.
0017*
0018 75001 040364   ADA ,+5        => DIRECTORY DISC ADDRESS
0019 75002 164000   SUP1 LDB A,I      DOES
0020 75003 002104   CLE,INA      THE
0021 75004 144000   ADB A,I      DIRECTORY
0022 75005 002040   SEZ
0023 75006 006004   INB          TRACK
0024 75007 040351   ADA , -6
0025 75010 006003   SZB,RSS      EXIST?
0026 75011 027024   JMP SUP2      NO
0027 75012 164000   LDB 0,I      GET DIRECTORY LENGTH.
0028 75013 006103   CLE,SZB,RSS  LENGTH ZERO?
0029 75014 027023   JMP SUP2-1   YES
0030 75015 047730   ADB SUPS     ADD TO
0031 75016 077730   STB SUPS     TOTAL.
0032 75017 067727   LDB SUPS-1
0033 75020 002041   SEZ,RSS     INCREMENTING DOUBLE WORD QUANTIT
0034 75021 044356   ADB , -1
0035 75022 077727   STB SUPS-1
0036 75023 037732   ISZ SUPB    BUMP DIRECTORY TRACK COUNTER.
0037 75024          SUP2 EQU *
0038 75024 053723   CPA SDIRL    LAST DIRECTORY TRACK?
0039 75025 027030   JMP ++3     YES
0040 75026 040373   ADA ,+12    NO - GO TO NEXT ONE.
0041 75027 027002   JMP SUP1
0042*
0043* AT THIS POINT THE DOUBLEWORD SUP-1  CONTAINS 12 LESS THAN THE
0044*                               SUP
0045* TOTAL NUMBER OF WORDS IN ALL DIRECTORY TRACKS.
0046*
0047 75030 063730   LDA SUPS     GET TOTAL # OF DIRECTORY WORDS.
0048 75031 067727   LDB SUPS-1
0049 75032 100400   DIV ,+12    GET ENTRY COUNT IN A
0050 75033 000373
0050 75034 007400   CCB         COUNT < 65535
0051 75035 100400   DIV SUPB    COMPUTE # IN EACH DIRECTORY.
0051 75036 075732
0052 75037 053715   CPA M682
0053 75040 006003   SZB,RSS     TEST FOR FULL UP.
0054 75041 053716   CPA M683
0055 75042 027705   JMP SUP3     ALL TRACKS ARE FULL

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0056	75043	040356		ADA .-1	INCREASE # OF ENTRIES/TRACK BY 1
0057	75044	044356		ADB .-1	LET B COUNT HOW MANY WILL HAVE
0058	75045	077732		STB SUPB	THIS LARGER SIZE.
0059	75046	100200		MPY .+12	CONVERT TO -WORD SIZE
		75047			
0060	75050	073730		STA SUPS	AND SAVE
0061*					
0062*	COMPUTE AN EVEN DISTRIBUTION OF ENTRIES OVER ALL AVAILABLE TRACKS				
0063*					
0064	75051	067722		LDB SDIR0	GET POINTER TO FIRST TRACK AGAIN
0065	75052	044364		ADB .+5	GET THE DISC ADDRESS
0066	75053	160001	SUP4	LDA 1,I	
0067	75054	006004		INB	
0068	75055	130001		IOR B,I	
0069	75056	002003		SZA,RSS	IF TRACK DOES NOT EXIST
0070	75057	027065		JMP SUP5	DO NOT INCLUDE IT
0071	75060	063730		LDA SUPS	GET TRACK LENGTH
0072	75061	037732		ISZ SUPB	HAVE ALL BIG TRACKS BEEN PROCESS
0073	75062	027065		JMP SUP50	
0074	75063	040373		ADA .+12	YES - DECREMENT BY 1 ENTRY
0075	75064	073730		STA SUPS	AND SAVE
0076	75065		SUP50	EQU *	
0077	75065	173733	SUP5	STA SUPP,I	STORE IN TABLE.
0078	75066	044351		ADB .-6	TEST FOR DONE.
0079	75067	057723		CPB SDIRL	
0080	75070	027074		JMP SUP6	FINISHED
0081	75071	044373		ADB .+12	BUMP TO NEXT TRACK
0082	75072	037733		ISZ SUPP	BUMP TABLE POINTER ALSO.
0083	75073	027053		JMP SUP4	
0084*					
0085*	THE TABLE POINTED TO BY DEFNN NOW CONTAINS THE NEW LENGTHS OF EACH				
0086*	OF THE DIRECTORY TRACKS				
0087*					
0088	75074	063712	SUP6	LDA DEFNN	SET UP POINTER
0089	75075	073733		STA SUPP	TO NN AGAIN.
0090*					
0091*	SQUEEZE ALL THE DIRECTORY ENTRIES ONTO THE LASTMOST OF THE				
0092*	AVAILABLE TRACKS.				
0093*					
0094	75076	063723		LDA SDIRL	=> 1ST TRACK
0095	75077	073735		STA SUPK1	FOR READ
0096	75100	040364		ADA .+5	
0097	75101		SUP20	EQU *	GET ADDRESS
0098	75101	164000		LDB A,I	
0099	75102	002104		CLE,INA	
0100	75103	144000		ADB A,I	
0101	75104	002040		SEZ	
0102	75105	006004		INB	
0103	75106	006002		SZB	ZERO?
0104	75107	027112		JMP SUP21	NO, THE TRACK EXISTS
0105	75110	040347		ADA .-8	
0106	75111	027101		JMP SUP20	
0107	75112		SUP21	EQU *	
0108	75112	040351		ADA .-6	=> 1ST TRACK
0109	75113	073737		STA SUPL1	FOR WRITE
0110	75114	002400		CLA	# OF WORDS IN BUFFER

0111	75115	073736	STA SUPK2	INITIALIZED TO ZERO
0112*				
0113	75116	063735	LDA SUPK1	
0114	75117		SUP22 EQU *	
0115	75117	164000	LDB A,I	GET LENGTH FOR READ
0116	75120	006003	SZB,RSS	ZERO?
0117	75121	027262	JMP SUP27	YES
0118	75122	047736	ADB SUPK2	NO, ADD IN # OF WORDS IN BUFFER
0119	75123	047720	ADB S8184	ARE THE NUMBER OF WORDS IN THE
0120	75124	006020	SSB	BUFFER > 8184?
0121	75125	027156	JMP SUP23	YES
0122	75126	164000	LDB A,I	NO, SET
0123	75127	074204	STB MWORD	LENGTH
0124	75130	047736	ADB SUPK2	UPDATE # OF
0125	75131	077736	STB SUPK2	WORDS IN CORE
0126	75132	044712	ADB LULEN	
0127	75133	045027	ADB BIT15	CORE ADDRESS
0128	75134	040364	ADA .+5	=> DISC ADDRESS
0129	75135	114206	JSB DISCZ,I	
0130	75136	114212	JSB DEADP,I	
0131*				
0132	75137	063736	LDA SUPK2	
0133	75140	050314	CPA M8184	EXACTLY 8184 WORDS?
0134	75141	002001	RSS	YES
0135	75142	027262	JMP SUP27	NO
0136	75143	070204	STA MWORD	
0137	75144	067737	LDB SUPL1	SET LENGTH
0138	75145	170001	STA B,I	IN DIREC
0139	75146	044364	ADB .+5	
0140	75147	060001	LDA B	=> DISC ADDRESS
0141	75150	067721	LDB X2056	CORE ADDRESS
0142	75151	114206	JSB DISCZ,I	
0143	75152	114212	JSB DEADP,I	
0144	75153	006400	CLB	BUFFER NOW EMPTY
0145	75154	077736	STB SUPK2	
0146	75155	027245	JMP SUP24	
0147*				
0148	75156		SUP23 EQU *	
0149	75156	007004	CMB,INB	CONVERT TO POSITIVE VALUE
0150	75157	005121	BRS,BRS	COMPUTE
0151	75160	005121	BRS,BRS	NUMBER
0152	75161	005121	BRS,BRS	OF
0153	75162	005121	BRS,BRS	EXTRA
0154	75163	077742	STB SUPES	BLOCKS
0155	75164	005727	BLF,BLF	COMPUTE # OF
0156	75165	077741	STB SUPEX	EXTRA WORDS
0157	75166	144000	ADB A,I	# OF WORDS
0158	75167	074204	STB MWORD	TO READ
0159	75170	047736	ADB SUPK2	
0160	75171	044712	ADB LULEN	
0161	75172	074050	STB MOVES	
0162	75173	040364	ADA .+5	
0163	75174	104200	DLD A,I	COMPUTE
	75175	100000		
0164	75176	000040	CLE	ADDRESS
0165	75177	047742	ADB SUPES	OF REMAINING

0166	75200	002040	SEZ		WORDS
0167	75201	002004	INA		TO
0168	75202	104400	DST SUPET		READ
		75203			
0169	75204	063743	LDA SUPEA	=>	DISC ADDRESS
0170	75205	064050	LDB MOVES		
0171	75206	045027	ADB BIT15		CORE ADDRESS
0172	75207	114206	JSB DISCZ,I		
0173	75210	114212	JSB DEADP,I		
0174*					
0175	75211	060314	LDA M8184	# OF WORDS	
0176	75212	070204	STA MWORD	TO WRITE	
0177	75213	067737	LDB SUPL1		
0178	75214	170001	STA B,I		SAVE IN DIREC
0179	75215	044364	ADB .+5		
0180	75216	060001	LDA B	=>	DISC ADDRESS
0181	75217	067721	LDB X2056		CORE ADDRESS
0182	75220	114206	JSB DISCZ,I		
0183	75221	114212	JSB DEADP,I		
0184*					
0185	75222	067721	LDB X2056	# OF	
0186	75223	007004	CMB,INB	EXTRA	
0187	75224	044050	ADB MOVES	WORDS	
0188	75225	077736	STB SUPK2	TO MOVE	
0189	75226	060712	LDA LULEN		
0190	75227	040001	ADA B		
0191	75230	070051	STA MOVED	DESTINATION POINTER	
0192	75231	016450	JSB MOVEW	MOVE THEM	
0193*					
0194	75232	067741	LDB SUPEX	# OF WORDS	
0195	75233	007004	CMB,INB	TO READ FROM	
0196	75234	074204	STB MWORD	PARTIAL TRACK	
0197	75235	047736	ADB SUPK2		
0198	75236	077736	STB SUPK2	# OF WORDS IN BUFFER	
0199	75237	044712	ADB LULEN		
0200	75240	045027	ADB BIT15	CORE ADDRESS	
0201	75241	063735	LDA SUPK1		
0202	75242	040364	ADA .+5	=>	DISC ADDRESS
0203	75243	114206	JSB DISCZ,I		
0204	75244	114212	JSB DEADP,I		
0205*					
0206	75245		SUP24 EQU *		
0207	75245	060355	LDA .-2	BUMP TO NEXT	
0208	75246	043737	ADA SUPL1	TRACK TO WRITE	
0209	75247		SUP25 EQU *		
0210	75247	164000	LDB A,I	GET ADDRESS	
0211	75250	002104	CLE,INA		
0212	75251	144000	ADB A,I		
0213	75252	002040	SEZ		
0214	75253	006004	INB		
0215	75254	006002	SZB	ZERO?	
0216	75255	027260	JMP SUP26	NO	
0217	75256	040347	ADA .-8	YES, MOVE TO NEXT ONE	
0218	75257	027247	JMP SUP25		
0219	75260		SUP26 EQU *		
0220	75260	040351	ADA .-6	BUMP TO LENGTH WORD	

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0221 75261 073737          STA SUPL1          SAVE POINTER
0222*
0223 75262          SUP27 EQU *
0224 75262 063735          LDA SUPK1          => CURRENT READ TRACK
0225 75263 053722          CPA SDIR0          LAST ONE
0226 75264 027270          JMP SUP28          YES
0227 75265 040350          ADA .-7          NO, BUMP TO NEXT ONE
0228 75266 073735          STA SUPK1
0229 75267 027117          JMP SUP22
0230 75270          SUP28 EQU *
0231*
0232 75270 063736          LDA SUPK2          # OF WORDS IN BUFFER
0233 75271 002003          SZA, RSS          ZERO?
0234 75272 027311          JMP SUP30          YES
0235 75273 070204          STA MWORD          NO, MUST WRITE OUT BUFFER
0236 75274 067737          LDB SUPL1          SET LENGTH
0237 75275 170001          STA B, I           IN DIREC
0238 75276 044364          ADB .+5
0239 75277 060001          LDA B             => DISK ADDRESS
0240 75300 064204          LDB MWORD
0241 75301 044712          ADB LULEN          CORE ADDRESS
0242 75302 114206          JSB DISCZ, I
0243 75303 114212          JSB DEADP, I
0244*
0245 75304 063737          LDA SUPL1
0246 75305          SUP29 EQU *
0247 75305 053722          CPA SDIR0          LAST WRITE TRACK?
0248 75306 027326          JMP SUP31          YES, DONE
0249 75307 040350          ADA .-7          NO, BUMP TO NEXT ONE
0250 75310 002001          RSS
0251 75311          SUP30 EQU *
0252 75311 063737          LDA SUPL1
0253 75312 040364          ADA .+5
0254 75313 164000          LDB A, I           GET ADDRESS
0255 75314 002104          CLE, INA
0256 75315 144000          ADB A, I
0257 75316 002040          SEZ
0258 75317 006004          INB
0259 75320 040351          ADA .-6
0260 75321 006003          SZB, RSS          ZERO?
0261 75322 027305          JMP SUP29          YES
0262 75323 006400          CLB              NO, SET
0263 75324 174000          STB A, I          LENGTH =0
0264 75325 027305          JMP SUP29
0265*

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0266* THE MAIN PART OF THE ALGORITHM CONSISTS OF TWO SECTIONS, IN THE
0267* FIRST SECTION WE READ AS POSSIBLE INTO THE SWAP AREA. IN THE 2ND
0268* SECTION WE WRITE OUT AS MUCH AS POSSIBLE, THE ENTIRE PROCEDURE IS
0269* THEN REPEATED UNTIL WE ARE FINISHED. THE FOLLOWING MEANINGS ARE
0270* ASSOCIATED WITH THESE VARIABLES:

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0271*
0272* SUPK1=>DIREC ENTRY FOR TRACK BEING READ.
0273* SUPL1=>DIREC ENTRY FOR TRACK BEING WRITTEN.
0274* SUPK2=# OF WORDS READ SO FAR FROM K1.
0275* SUPL2=# OF WORDS WRITTEN SO FAR ON L1.
0276* SUP  =# OF WORDS IN CORE.

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0277*      SUPP =>  =# OF WORDS TO BE WRITTEN ON L1.
0278*
0279  75326      SUP31 EQU *
0280  75326 002400      CLA      INITIALIZE
0281  75327 073736      STA SUPK2      LENGTH
0282  75330 073740      STA SUPL2      WORDS
0283  75331 063722      LDA SDIR0      INITIALIZE
0284  75332 073735      STA SUPK1      DIREC
0285  75333 073737      STA SUPL1      POINTERS
0286*
0287  75334 063740      SUP7  LDA SUPL2      IS # OF WORDS WRITTEN SO FAR ON
0288  75335 003004      CMA,INA      L1=# OF WORDS TO BE WRITTEN?
0289  75336 153733      CPA SUPP,I
0290  75337 027542      JMP SUP10     YES--GO ADVANCE L19
0291*
0292  75340 063731      SUP8  LDA SUP      IS THE SWAP AREA FULL
0293  75341 043726      ADA STLE
0294  75342 002021      SSA,RSS
0295  75343 027553      JMP SUP11     YES--GO TO WRITE SECTION.
0296  75344 070204      STA MWORD     NO = SAVE =# OF CORE WORDS
0297*                                     AVAILABLE
0298  75345 067735      LDB SUPK1     HAVE WE READ ALL OF THE TRACKS?
0299  75346 057724      CPB SDIRU
0300  75347 027553      JMP SUP11     YES--GO TO WRITE SECTION.
0301  75350 163735      LDA SUPK1,I   A=# OF WORDS ON THIS TRACK.
0302  75351 043736      ADA SUPK2     A=# NOT READ YET.
0303  75352 002002      SZA          ENTIRE TRACK READ?
0304  75353 027360      JMP SUP9      NO.
0305  75354 044366      ADB ,+7      YES--BUMP K1 TO NEXT TRACK.
0306  75355 077735      STB SUPK1
0307  75356 073736      STA SUPK2     SET # OF WORDS READ TO 0.
0308  75357 027340      JMP SUP8      TEST THIS TRACK.
0309*
0310  75360 070001      SUP9  STA 1        B=# OF WORDS NOT YET READ ON K1
0311  75361 007004      CMB,INB      MAKE POSITIVE.
0312  75362 044204      ADB MWORD    IS # OF WORDS ON TRACK > # OF
0313  75363 006020      SSB          WORDS WE HAVE ROOM FOR?
0314  75364 027370      JMP **+4     NO--READ IN ENTIRE TRACK.
0315  75365 060204      LDA MWORD    GET =# WE HAVE ROOM FOR.
0316  75366 040500      ADA B377     REDUCE TO NEXT SMALLER
0317  75367 010316      AND M256     BLOCK SIZE.
0318  75370 002003      SZA,RSS     IF WE CAN'T READ IN ANY, GO TO
0319  75371 027553      JMP SUP11    WRITE SECTION.
0320*
0321  75372 070204      STA MWORD    SET WORD = =# OF WORDS TO READ.
0322  75373 063736      LDA SUPK2    GET # OF WORDS READ SO FAR.
0323  75374 006400      CLB          DIVIDE BY 64 TO GET
0324  75375 101030      ASR 8        BLOCK ADDRESS.
0325  75376 073744      STA SUPET
0326  75377 067735      LDB SUPK1    GET DIRECTORY
0327  75400 044364      ADB ,+5     TRACK ADDRESS
0328  75401 104200      DLD B,I
0329  75402 100001
0329  75403 000040      CLE
0330  75404 047744      ADB SUPET
0331  75405 002040      SEZ

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0332	75406	002004	INA	
0333	75407	104400	DST SUPET	
	75410	075744		
0334	75411	063743	LDA SUPEA	=> DISC ADDRESS
0335	75412	064700	LDB LIBDI	COMPUTE CORE LOCATION
0336	75413	047731	ADB SUP	TO READ INTO.
0337	75414	114206	JSB DISCZ,I	
0338	75415	114212	JSB DEADP,I	
0339*				
0340	75416	064204	LDB MWORD	UPDATE # OF WORDS
0341	75417	007004	CMB,INB	IN CORE.
0342	75420	047731	ADB SUP	
0343	75421	077731	STB SUP	
0344	75422	064204	LDB MWORD	UPDATE # OF WORDS
0345	75423	007004	CMB,INB	READ FROM K1.
0346	75424	047736	ADB SUPK2	
0347	75425	077736	STB SUPK2	
0348*				
0349	75426	063734	LDA SUPTG	HAVE WE INSERTED THE NEW ENTRY
0350	75427	002002	SZA	YET?
0351	75430	027340	JMP SUP8	YES--GO TRY TO READ MORE.
0352	75431	063740	LDA SUPL2	GET THE AMOUNT ALREADY WRITTEN
0353	75432	006400	CLB	ON THIS TRACK
0354	75433	100400	DIV ,+12	FIND EXCESS OVER EVEN ENTRY
	75434	000373		
0355	75435	060001	LDA B	
0356	75436	007004	CMB,INB	
0357	75437	077741	STB SUPEX	
0358	75440	043731	ADA SUP	GET THE COUNT
0359	75441	006400	CLB	OF WORDS IN CORE
0360	75442	100400	DIV ,+12	CONVERT TO ENTRY COUNT
	75443	000373		
0361	75444	100200	MPY ,+12	AND BACK TO WORD COUNT
	75445	000373		
0362	75446	040676	ADA LIBD	SO THAT WE LOOK AT
0363	75447	043741	ADA SUPEX	AN EVEN BOUNDARY
0364	75450	006003	SZB,RSS	
0365	75451	040343	ADA ,-12	
0366	75452	073741	STA SUPEX	=> ID/NAME OF NEW ENTRY
0367	75453	064640	LDB DLTEM	GO COMPARE
0368	75454	117725	JSB DIRCS,I	DOESN'T GO ON THIS TRACK
0369	75455	027340	JMP SUP8	
0370	75456		SUP32 EQU *	
0371	75456	067741	LDB SUPEX	GOES ON THIS
0372	75457	077742	STB SUPES	TRACK, SO
0373	75460	044343	ADB ,-12	SEARCH BACKWARDS
0374	75461	077741	STB SUPEX	TO FIND
0375	75462	044774	ADB MLIBD	
0376	75463	006020	SSB	NO SKIP IF SEARCH DONE
0377	75464	027471	JMP SUP33	
0378	75465	067741	LDB SUPEX	
0379	75466	060640	LDA DLTEM	OUT WHERE
0380	75467	117725	JSB DIRCS,I	COMPARE THIS ENTRY
0381	75470	027456	JMP SUP32	NOT THIS ONE
0382*				
0383	75471		SUP33 EQU *	

0384	75471	037734	ISZ SUPTG	SET TOGGLE TO SAY WE'VE INSERTED
0385	75472	060676	LDA LIBD	COMPUTE DESTINATION
0386	75473	043731	ADA SUP	OF WORDS TO BE
0387	75474	064000	LDB A	MOVED
0388	75475	040372	ADA .+11	
0389	75476	070051	STA MOVED	COMPUTE SOURCE
0390	75477	040343	ADA .-12	
0391	75500	070050	STA MOVES	
0392	75501	007004	CMB, INB	
0393	75502	047742	ADB SUPES	CALL REVERSE MOVER.
0394	75503	016434	JSB MOVEB	
0395*				
0396	75504	063742	LDA SUPES	=> HOLE
0397	75505	070051	STA MOVED	
0398	75506	060640	LDA DLTEM	SET SOURCE AT LTEMP.
0399	75507	070050	STA MOVES	
0400	75510	064353	LDB .-4	MOVE IN FIRST 4
0401	75511	016450	JSB MOVEW	WORDS.
0402	75512	060042	LDA SAVP	STORE START-OF-
0403	75513	170051	STA MOVED, I	PROGRAM POINTER
0404	75514	034051	ISZ MOVED	
0405	75515	016423	JSB DATE	INSERT DATE IN WORD 5
0406	75516	170051	STA MOVED, I	
0407	75517	034051	ISZ MOVED	AND
0408	75520	060171	LDA DATIM	GET HOUR OF YEAR FOR
0409	75521	170051	STA MOVED, I	WORD 6
0410	75522	034051	ISZ MOVED	
0411	75523	002400	CLA	
0412	75524	170051	STA MOVED, I	
0413	75525	034051	ISZ MOVED	
0414	75526	104200	DLD SAVDS	GET THE DISK ADDRESS AND SET IT
	75527	000036		
0415	75530	104400	DST MOVED, I	INTO WORDS 8 AND 9
	75531	100051		
0416	75532	064051	LDB MOVED	
0417	75533	044362	ADB .+3	=> WORD 11
0418	75534	060040	LDA SAVWD	GET LENGTH
0419	75535	170001	STA B, I	AND STORE AWAY
0420	75536	063731	LDA SUP	UPDATE THE COUNT OF WORDS
0421	75537	040373	ADA .+12	IN CORE BY TWELVE
0422	75540	073731	STA SUP	
0423	75541	027340	JMP SUP8	
0424*				
0425*	COME HERE WHEN CURRENT OUTPUT TRACK HAS BEEN FILLED.			
0426*				
0427	75542	063737	SUP10 LDA SUPL1	TEST FOR LAST TRACK.
0428	75543	053723	CPA SDIRL	
0429	75544	027672	JMP SUP16	ALL DONE--GO CLEAN UP DIREC.
0430	75545	040366	ADA .+7	BUMP TO NEXT TRACK.
0431	75546	073737	STA SUPL1	
0432	75547	002400	CLA	SET # OF WORDS WRITTEN SO FAR
0433	75550	073740	STA SUPL2	TO 0.
0434	75551	037733	ISZ SUPP	BUMP POINTER TO WORDS TO BE
0435	75552	027334	JMP SUP7	WRITTEN.

0437* THE NEXT SECTION IS THE OUTPUT SECTION. WE ONLY COME TO THIS SEC-
 0438* TION WHEN WE HAVE DETERMINED THAT NO MORE CAN BE READ. IN THIS
 0439* PART WE WRITE OUT AS MUCH AS POSSIBLE UNTIL WE HAVE EXHAUSTED ALL
 0440* WE HAVE IN CORE OR WE REACH THE POINT WHEN FURTHER OUTPUT WOULD
 0441* DESTROY INFORMATION NOT YET READ. IN THIS SECTION, THE VARIABLE
 0442* SUPS = # OF WORDS THAT HAVE BEEN OUTPUT FROM THE CURRENT CORE
 0443* LOAD.

0445	75553	002400	SUP11	CLA	SET # OF WORDS OUTPUT SO FAR TO
0446	75554	073730	SUP15	STA SUPS	ZERO.
0447	75555	063740		LDA SUPL2	SET WORD * -# OF WORDS LEFT
0448	75556	143733		ADA SUPP, I	TO BE WRITTEN ON L1.
0449	75557	067737		LDB SUPL1	TEST FOR WRITING ON A TRACK NOT
0450	75560	057735		CPB SUPK1	COMPLETELY READ.
0451	75561	027575		JMP SUP12	WE ARE.
0452	75562	067730	SUP13	LDB SUPS	SET B=# OF WORDS LEFT IN CORE.
0453	75563	007004		CMB, INB	
0454	75564	047731		ADB SUP	SAVE IN B.
0455	75565	077732		STB SUPB	COMPARE WITH # WE WANT TO WRITE.
0456	75566	044000		ADB 0	
0457	75567	006021		SSB, RSS	
0458	75570	027604		JMP SUP14	HAVE ENOUGH. -# IS IN A.
0459	75571	063732		LDA SUPB	ONLY WRITE WHAT WE HAVE.
0460	75572	010316		AND M256	USE ONLY FULL BLOCK'S WORTH
0461	75573	003004		CMA, INA	MAKE NEGATIVE.
0462	75574	027604		JMP SUP14	
0463	75575	067740	SUP12	LDB SUPL2	IF WRITING ON UNREAD TRACK, MAKE
0464	75576	007004		CMB, INB	SURE WE DON'T GO INTO UNREAD
0465	75577	047736		ADB SUPK2	AREA.
0466	75600	044000		ADB 0	
0467	75601	007025		CMB, SSB, INB, RSS	
0468	75602	040001		ADA 1	CHANGE A TO AVOID OVERLAY.
0469	75603	027562		JMP SUP13	
0470*					
0471*	A	NOW	CONTAINS	-#	OF WORDS WE'RE GOING TO WRITE.
0472*					
0473	75604	070204	SUP14	STA MWORD	IF NO WORDS TO BE
0474	75605	002003		SZA, RSS	WRITTEN GO TO SLIDE CORE FOR
0475	75606	027655		JMP SUP17	NEW INPUT.
0476	75607	003004		CMA, INA	
0477	75610	073732		STA SUPB	
0478	75611	063740		LDA SUPL2	TEST FOR FIRST WRITE ON THIS
0479	75612	002002		SZA	TRACK.
0480	75613	027625		JMP SUP18	
0481*					
0482	75614	063737		LDA SUPL1	IF FIRST WRITE,
0483	75615	002004		INA	
0484	75616	070051		STA MOVED	ADJUST DIREC TO TELL
0485	75617	060676		LDA LIBD	NEW FIRST ENTRY ON THAT
0486	75620	043730		ADA SUPS	TRACK.
0487	75621	070050		STA MOVES	
0488	75622	064353		LDB .-4	
0489	75623	016450		JSB MOVEW	
0490	75624	002400		CLA	
0491*					

0492	75625	006400	SUP18	CLB	CONVERT WORDS TO BLOCK
0493	75626	101030		ASR 8	ADDRESS
0494	75627	067737		LDB SUPL1	ADD IN TRACK ADDRESS.
0495	75630	044364		ADB .+5	
0496	75631	073744		STA SUPET	
0497	75632	104200		DLD B,I	
	75633	100001			
0498	75634	000040		CLE	
0499	75635	047744		ADB SUPET	
0500	75636	002040		SEZ	
0501	75637	002004		INA	
0502	75640	104400		DST SUPET	
	75641	075744			
0503	75642	063743		LDA SUPEA	=> DISC ADDRESS
0504	75643	064676		LDB LIBD	COMPUTE CORE
0505	75644	047730		ADB SUPS	ADDRESS.
0506	75645	114206		JSB DISCZ,I	OUTPUT TO DISC
0507	75646	114212		JSB DEADP,I	
0508	75647	063732		LDA SUPB	ADJUST # OF WORDS OUTPUT TO
0509	75650	043740		ADA SUPL2	TRACK.
0510	75651	073740		STA SUPL2	
0511	75652	063732		LDA SUPB	ADJUST # OF CORE WORDS WRITTEN
0512	75653	043730		ADA SUPS	OUT SO FAR.
0513	75654	027554		JMP SUP15	LOOP FOR ANY MORE WRITING.
0514*					
0515*	COME			HERE WHEN WE CAN'T WRITE ANYMORE.	
0516*					
0517	75655	053730	SUP17	CPA SUPS	IF NOTHING WRITTEN AT ALL, GO TO
0518	75656	027334		JMP SUP7	TRY AND READ AGAIN.
0519	75657	067730		LDB SUPS	ADJUST # OF WORDS IN CORE.
0520	75660	007004		CMB,INB	
0521	75661	047731		ADB SUP	
0522	75662	077731		STB SUP	
0523	75663	007004		CMB,INB	MAKE NEGATIVE FOR CORE MOVE.
0524	75664	060676		LDA LIBD	SET DESTINATION AND SOURCE.
0525	75665	070051		STA MOVED	
0526	75666	043730		ADA SUPS	
0527	75667	070050		STA MOVES	
0528	75670	016450		JSB MOVEW	
0529	75671	027334		JMP SUP7	
0530*					
0531*	ALL TRACKS WRITTEN BACK.			NOW UPDATE WORD COUNTS IN	
0532*	DIREC.				
0533*					
0534	75672		SUP16	EQU *	
0535	75672	063713		LDA M80	SET COUNT
0536	75673	073731		STA SUP	OF DIRECTORY TRAX
0537	75674	067722		LDB SDIR0	=> FIRST DIREC ENTRY
0538	75675		SUPLL	EQU *	
0539	75675	163712		LDA DEFNN,I	COPY NEW LENGTH WORDS INTO
0540	75676	170001		STA B,I	THE DIREC TABLE ENTRIES
0541	75677	037712		ISZ DEFNN	WIPE OUT "CONSTANT"
0542	75700	044366		ADB .+7	ADVANCE DIREC POINTER
0543	75701	037731		ISZ SUP	
0544	75702	027675		JMP SUPLL	
0545	75703	063717		LDA SUPR1	SET UP RETURN ADDRESS.

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0546 75704 073772      STA SUPR
0547 75705              SUP3 EQU *
0548 75705 063714      LDA SM504      SET WORD COUNT
0549 75706 070204      STA MWORD
0550 75707 060256      LDA LIB        => DISC ADDRESS
0551 75710 064610      LDB #LIBI
0552 75711 027770      JMP SUPRR
0553 75712 073601      DEFNN DEF FILBF
0554 75713 177660      M80 DEC -80
0555 75714 177010      SM504 DEC -504
0556 75715 176526      M682 DEC -682
0557 75716 176525      M683 DEC -683
0558 75717 027776      SUPR1 JMP LIBRA+510 JUMP FOR NORMAL RETURN
0559 75720 017770      S8184 DEC 8184
0560 75721 005240      X2056 DEF LIBUS+ULEN-8184
0561 75722 030000      SDIR0 DEF DIREC
0562 75723 031051      SDIRL DEF DIREL
0563 75724 031060      SDIRU DEF DIREU
0564 75725 031203      DIRCS DEF DIRCM
0565 75726 154024      STLE ABS -ULEN+20
0566 75727 177777      OCT -1
0567 75730 177764      SUPS DEC -12
0568 75731 000000      SUP OCT 0
0569 75732 000000      SUPB OCT 0
0570 75733 073601      SUPP DEF FILBF
0571 75734 000000      SUPTG OCT 0
0572 75735 000000      SUPK1 BSS 1
0573 75736 000000      SUPK2 BSS 1
0574 75737 000000      SUPL1 BSS 1
0575 75740 000000      SUPL2 BSS 1
0576 75741 000000      SUPEX BSS 1
0577 75742 000000      SUPES BSS 1
0578 75743 075744      SUPEA DEF SUPET      POINTER TO DISC ADDRESS
0579 75744 000000      SUPET BSS 2          DOUBLEWORD TO HOLD DISC ADDRESS
0580 75770              ORG LIBRA+504
0581 75770              SUPRR EQU *
0582 75770 114206      JSB DISCZ,I          OVERLAY WITH ORIGINAL ROUTINE
0583 75771 114212      JSB DEADP,I          CAN'T GET IT BACK, ARRGH!
0584 75772 027777      SUPR JMP LIBRA+511  SET FOR ERROR ROUTINE
0585 75773              $$$AV EQU *

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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 SNOWFLAKE (*). 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 060272   LDA MLINK+1   GET USER'S ID.
0013 75001 040346   ADA .+?ID=?LINK
0014 75002 070036   STA GETI
0015 75003 160000   LDA 0,I
0016 75004 070030   STA LTEMP          STORE IN LTEMP.
0017 75005 060640   LDA DLTEM          SET UP POINTER FOR NAME.
0018 75006 002004   INA
0019 75007 070034   STA GETP
0020 75010 060354   LDA .-3            SET UP COUNTER.
0021 75011 070037   STA GETC
0022 75012 016532   JSB LCHAR          GET FIRST INPUT CHAR.
0023 75013 027035   JMP GET1           ERROR IF NONE.
0024 75014 050423   CPA .+44B          IF $ GO TO SET UP FOR
0025 75015 027050   JMP GET2           SEARCHING PUBLIC LIBRARY.
0026 75016 050431   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 016532   JSB LCHAR          GET RIGHT CHARACTER.
0031 75023 060417   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 016532   JSB LCHAR          GET NEXT CHARACTER.
0036 75030 060417   LDA .+40B
0037 75031 034037   ISZ GETC           DO WE WANT IT?
0038 75032 027020   JMP GET3           YES.
0039 75033 050417   CPA .+40B          NO--A SHOULD NOW BE BLANK.
0040 75034 027074   JMP GET4

0041*
0042 75035 060342   GET1 LDA .-13
0043 75036 067040   LDB ++2
0044 75037 026623   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* PUBLIC LIBRARY PROGRAM
0050*
0051 75050 060514   GET2 LDA A000      SET UP FOR PUBLIC LIBRARY SEARCH
0052 75051 070030   STA LTEMP

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0053 75052 016532      JSB LCHAR      GET FIRST CHAR OF NAME.
0054 75053 027035      JMP GET1       FAIL IF NONE.
0055 75054 027020      JMP GET3
0056*
0057* GROUP LIBRARY PROGRAM
0058*
0059 75055 060030      GET14 LDA LTEMP      GET USER'S ID
0060 75056 010512      AND B1777     ISOLATE NUMERICAL PART
0061 75057 006400      CLB
0062 75060 100400      DIV .100     DIVIDE BY 100 AND
              75061 000472
0063 75062 100200      MPY .100     MULTIPLY BACK, DROPPING REMAIN
              75063 000472
0064 75064 064000      LDB A        SAVE RESULTING MULTIPLE OF 100
0065 75065 060612      LDA M2000    GET UPPER 6 BITS MASK
0066 75066 010030      AND LTEMP    GET ALPHABETIC PART OF ID
0067 75067 030001      IOR B        MERGE NEW NUMERICAL PART
0068 75070 070030      STA LTEMP    STORE LIBRARIAN ID
0069 75071 016532      JSB LCHAR    GET FIRST CHAR OF NAME
0070 75072 027035      JMP GET1     FAIL IF NONE
0071 75073 027020      JMP GET3     ELSE, CONTINUE
0072*
0073* AT THIS POINT THE ID OF THE LIBRARY CONTAINING THE DESIRED PROGRAM
0074* IS IN LTEMP AND THE PROGRAM NAME IS IN LTEMP+1, LTEMP+2, AND
0075* LTEMP+3
0076*
0077 75074 016056      GET4 JSB RDPRG
0078 75075 061575      LDA SPROG    SAVE END-OF-
0079 75076 070043      STA GETS     COMMON POINTER
0080 75077 116017      JSB DLOKP,I  SEARCH DIRECTORY FOR PROGRAM
0081 75100 027133      JMP GET18
0082*
0083 75101 060337      GET19 LDA .-16
0084 75102 067104      LDB **2
0085 75103 026623      JMP LIBER
0086 75104 075105      DEF **1
0087 75105 005116      OCT 5116
0088 75106 047440      ASC 7,0 SUCH PROGRAM
              75107 051525
              75110 041510
              75111 020120
              75112 051117
              75113 043522
              75114 040515
0089 75115 060334      GET22 LDA .-19
0090 75116 067120      LDB **2
0091 75117 026623      JMP LIBER
0092 75120 075121      DEF **1
0093 75121 005111      OCT 5111
0094 75122 046114      ASC 9,LL-STORED PROGRAM
              75123 026523
              75124 052117
              75125 051105
              75126 042040
              75127 050122
              75130 047507

```

75131 051101
75132 046440

0095*

0096* THE PROPER DIRECTORY TRACK IS NOW IN CORE WITH GETPD POINTING TO
0097* THE PROGRAM ENTRY

0098*

0099	75133	064035	GET18	LDB GETPD	CHECK ILL-STORED
0100	75134	044363		ADB .+4	PROGRAM FLAG
0101	75135	160001		LDA B,I	
0102	75136	002021		SSA,RSS	UNSUCCESSFULLY STORED?
0103	75137	027144		JMP GET9	NO, CONTINUE
0104	75140	160036		LDA GET1,I	YES, GET USER'S ID
0105	75141	050030		CPA LTEMP	DOES HE (OR SHE) OWN THE PROG?
0106	75142	027115		JMP GET22	YES, PRINT ILL-STORED PROGRAM
0107	75143	027101		JMP GET19	NO, PRINT NO SUCH PROGRAM
0108	75144	044355	GET9	ADB .-2	TEST FOR FILE
0109	75145	160001		LDA 1,I	
0110	75146	044365		ADB .+6	=> DISC ADDRESS
0111	75147	002021		SSA,RSS	SKIP IF FILE
0112	75150	027165		JMP GET15	
0113*					
0114	75151	060337		LDA .-16	
0115	75152	067154		LDB .+2	
0116	75153	026623		JMP LIBER	
0117	75154	075155		DEF .+1	
0118	75155	005105		OCT 5105	LF=E
0119	75156	047124		ASC 7,NTRY	IS A FILE
	75157	051131			
	75160	020111			
	75161	051440			
	75162	040440			
	75163	043111			
	75164	046105			

0120*

0121* FOUND CORRECT ENTRY. CHECK TO SEE IF THE PROGRAM FITS

0122*

0123	75165	044350	GET15	ADB .-7	=> FIRST WORD OF NAME
0124	75166	160001		LDA B,I	MOVE WITH PROTECTED FLAG
0125	75167	070031		STA LTEMP+1	TO SAFE PLACE
0126	75170	044361		ADB .+2	=> THIRD WORD OF NAME
0127	75171	160001		LDA 1,I	SAVE SEMI-
0128	75172	070040		STA LIBSC	COMPILED FLAG
0129	75173	006004		INB	RETRIEVE START.
0130	75174	160001		LDA 1,I	OF-PROGRAM
0131	75175	001665		ELA,CLE,ERA	
0132	75176	070041		STA LIBSP	POINTER
0133	75177	044366		ADB .+7	GET PROGRAM
0134	75200	160001		LDA 1,I	LENGTH.
0135	75201	070042		STA GETLN	
0136	75202	003004		CMA,INA	COMPUTE FIRST
0137	75203	040041		ADA LIBSP	UNUSED WORD
0138	75204	070045		STA LIBPB	
0139	75205	003004		CMA,INA	COMPUTE NEGATIVE
0140	75206	064040		LDB LIBSC	
0141	75207	006021		SSB,RSS	SEMI-COMPILED?
0142	75210	027215		JMP GET25	NO

0143	75211	040716	ADA	LWAUS	
0144	75212	002021	SSA,	RSS	TOO BIG?
0145	75213	027235	JMP	GET13	NO
0146	75214	027220	JMP	GET26	YES
0147	75215		GET25	EQU *	
0148	75215	040714	ADA	LW97	TOTAL LENGTH
0149	75216	002021	SSA,	RSS	COMPARE WITH MAX ALLOWED.
0150*					
0151	75217	027235	JMP	GET13	OK
0152	75220		GET26	EQU *	
0153	75220	060335	LDA	.-18	
0154	75221	067223	LDB	#+2	
0155	75222	026623	JMP	LIBER	
0156	75223	075224	DEF	#+1	
0157	75224	005120	OCT	5120	LF=P
0158	75225	051117	ASC	8,ROGRAM	TOO LARGE
	75226	043522			
	75227	040515			
	75230	020124			
	75231	047517			
	75232	020114			
	75233	040522			
	75234	043505			
0159*					
0160*	EVERYTHING CHECKS, GO GET THE PROGRAM				
0161*					
0162	75235	016423	GET13	JSB DATE	SET NEW DATE
0163	75236	064035	LDB	GETPD	INTO
0164	75237	044364	ADB	#+5	DIRECTORY.
0165	75240	170001	STA	1,I	
0166	75241	044362	ADB	#+3	GET PROGRAM
0167	75242	104200	DLD	B,I	DISC
	75243	100001			
0168	75244	104400	DST	GETDI	ADDRESS
	75245	000046			
0169*					
0170	75246	160034	LDA	GETP,I	WRITE DIRECTORY
0171	75247	070204	STA	MWORD	BACK TO
0172	75250	060034	LDA	GETP	DISC
0173	75251	040364	ADA	#+5	
0174	75252	064676	LDB	LIBD	
0175	75253	114206	JSB	DISCZ,I	
0176	75254	114207	JSB	SICKP,I	MUY MALOI
0177*					
0178*					
0179	75255	064272	LDB	MLINK+1	SET TO NULL PROGRAM
0180	75256	044345	ADB	#+?PROG-?LINK	
0181	75257	160001	LDA	B,I	SAVE PROGRAM
0182	75260	070037	STA	GETC	LENGTH
0183	75261	060043	LDA	GETS	
0184	75262	170001	STA	1,I	
0185	75263	016056	JSB	RDPRG	READ IN CURRENT USER PROGRAM.
0186	75264	064042	LDB	GETLN	GET WORD COUNT
0187	75265	074204	STB	MWORD	STORE WORD COUNT
0188	75266	064041	LDB	LIBSP	GET START OF PROGRAM POINTER
0189	75267	045027	ADB	BIT15	AND READ BIT

0190	75270	063344	LDA GETDP	GET PTR TO DISK ADDRESS
0191	75271	114206	JSB DISCZ,I	
0192	75272	002001	RSS	
0193	75273	027327	JMP GET17	
0194	75274	064272	LDB MLINK+1	
0195	75275	044341	ADB .-?LINK	
0196	75276	074255	STB MAIN	
0197	75277	044363	ADB .+?PROG	
0198	75300	060037	LDA GETC	
0199	75301	170001	STA B,I	
0200	75302	016056	JSB RDPRG	
0201	75303	060450	LDA M32	
0202	75304	067306	LDB **2	
0203	75305	026623	JMP LIBER	
0204	75306	075307	DEF **1	
0205	75307	005125	OCT 5125	LF=U
0206	75310	047101	ASC 15,NABLE	TO RETRIEVE FROM LIBRARY
	75311	041114		
	75312	042440		
	75313	052117		
	75314	020122		
	75315	042524		
	75316	051111		
	75317	042526		
	75320	042440		
	75321	043122		
	75322	047515		
	75323	020114		
	75324	044502		
	75325	051101		
	75326	051131		
0207*				
0208*	THE PROGRAM IS NOW IN CORE, WRAP THINGS UP.			
0209*				
0210	75327	160036	GET17 LDA GETI,I	GET USER'S ID
0211	75330	034036	ISZ GETI	FIRST WORD OF NAME.
0212	75331	064031	LDB LTEMP+1	GET IT
0213	75332	050030	CPA LTEMP	IF PROGRAM OWNER CLEAR
0214	75333	005665	ELB,CLE,ERB	RUN-ONLY BIT.
0215	75334	174036	STB GETI,I	STORE FIRST WORD OF NAME.
0216	75335	034036	ISZ GETI	BUMP POINTER TO NEXT WORD.
0217	75336	104200	DLD LTEMP+2	GET LAST 2 WORDS OF NAME.
	75337	000032		
0218	75340	104400	DST GETI,I	STORE IN TABLE.
	75341	100036		
0219	75342	016343	JSB SEMIC	
0220	75343	026613	JMP LLEND	TERMINATE.
0221	75344	000046	GETDP DEF GETDI	=> DISK ADDRESS
0222*				
0223	00034		GETP EQU LTEMP+4	=> DIREC ENTRY
0224	00035		GETPD EQU LTEMP+5	=> DIRECTORY ENTRY
0225	00036		GETI EQU LTEMP+6	USER ID
0226	00037		GETC EQU LTEMP+7	COUNTER
0227	00042		GETLN EQU LTEMP+10	PROGRAM LENGTH
0228	00043		GETS EQU LTEMP+11	=> START-OF-PROGRAM
0229	00046		GETDI EQU LTEMP+14	DISC

0230* LTEMP+15 ADDRESS
0231*
0232* LTEMP, LTEMP+1, LTEMP+2, LTEMP+3, LTEMP+8 & LTEMP+9 ARE ALSO USED
0233*
0234 75345 \$GET EQU *

0236* THE APPEND COMMAND ALLOWS A USER TO APPEND A LIBRARY PROGRAM ON TO
 0237* THE END OF HIS CURRENT PROGRAM. THE FIRST STATEMENT OF THE NEW
 0238* PROGRAM MUST HAVE A SEQUENCE NUMBER GREATER THAN THAT OF THE LAST
 0239* STATEMENT OF THE ORIGINAL PROGRAM. IF THE NEW SECTION IS PROTECTED
 0240* THE ENTIRE PROGRAM WILL BE PROTECTED. SEMI-COMPILED PROGRAMS AND
 0241* PROGRAMS WITH COMMON MAY NOT BE APPENDED
 0242*
 0243* THE CODE FOR APPEND MUST FOLLOW THE CODE FOR "GET".

0245 75000 ORG LIBRA THE CODE IS IDENTICAL TO "GET"
 0246 75000 060272 LDA MLINK+1 UP TO LOCATION GET15
 0247 75165 ORG GET15

0248*
 0249* THE PROPER DIRECTORY ENTRY IS NOW IN CORE AND IS POINTED TO BY
 0250* GETPD.

0251*
 0252 75165 044352 ADB .-5 => THIRD WORD OF NAME
 0253 75166 160001 LDA 1,I
 0254 75167 002021 SSA,RSS SEMI-COMPILED?
 0255 75170 027210 JMP APP01 NO
 0256*
 0257 75171 060331 LDA .-22
 0258 75172 067174 LDB *+2
 0259 75173 026623 JMP LIBER
 0260 75174 075175 DEF *+1
 0261 75175 005123 OCT 5123 LF=8
 0262 75176 042515 ASC 10,EMI-COMPILED PROGRAM
 75177 044455
 75200 041517
 75201 046520
 75202 044514
 75203 042504
 75204 020120
 75205 051117
 75206 043522
 75207 040515

0263*
 0264* THE PROGRAM TO BE APPENDED IS NOT SEMI-COMPILED

0265*
 0266 75210 006004 APP01 INB
 0267 75211 160001 LDA 1,I
 0268 75212 050726 CPA PBUFF COMMON AREA?
 0269 75213 027234 JMP APP02 NO
 0270*
 0271 75214 060330 LDA .-23
 0272 75215 067217 LDB *+2
 0273 75216 026623 JMP LIBER
 0274 75217 075220 DEF *+1
 0275 75220 005116 OCT 5116 LF=N
 0276 75221 047440 ASC 11,0 COMMON AREA ALLOWED
 75222 041517
 75223 046515
 75224 047516
 75225 020101
 75226 051105
 75227 040440

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75230 040514
75231 046117
75232 053505
75233 042040
0277*
0278* NOR DOES IT CONTAIN ANY COMMON STATEMENTS
0279*
0280 75234 016423 APP02 JSB DATE SET DATE OF LAST REFERENCE
0281 75235 064035 LDB GETPD INTO DIRECTORY ENTRY.
0282 75236 044364 ADB .+5
0283 75237 170001 STA 1,I
0284 75240 044353 ADB .-4 SAVE 'PROTECTED' BIT
0285 75241 160001 LDA 1,I
0286 75242 070036 STA APPLS
0287 75243 044366 ADB .+7 GET PROGRAM
0288 75244 104200 OLD B,I DISC
75245 100001
0289 75246 104400 DST GETDI ADDRESS
75247 000046
0290 75250 064035 LDB GETPD AND
0291 75251 044372 ADB .+11
0292 75252 160001 LDA B,I PROGRAM
0293 75253 070042 STA GETLN LENGTH
0294*
0295* RETURN UPDATED DIRECTORY TO DISC
0296*
0297 75254 160034 LDA GETP,I WRITE DIRECTORY
0298 75255 070204 STA MWORD BACK TO DISC
0299 75256 060034 LDA GETP
0300 75257 040364 ADA .+5
0301 75260 064676 LDB LIBD
0302 75261 114206 JSB DISCZ,I
0303 75262 114211 JSB SLVAG,I BLEW IT, TRY TO SALVAGE
0304*
0305 75263 016056 JSB RDPRG READ IN USER'S PROGRAM AND
0306 75264 015322 JSB DCMPL DECOMPILE IT.
0307*
0308* CHECK IF COMBINED PROGRAMS WILL FIT IN CORE
0309*
0310 75265 060042 LDA GETLN TEST FOR PROGRAM TOO
0311 75266 003004 CMA,INA LARGE.
0312 75267 040056 ADA PBPTR LAST WORD+1 OF COMBINED PROGS.
0313 75270 070045 STA LIBPB
0314 75271 003004 CMA,INA COMPUTE NEGATIVE
0315 75272 040714 ADA LW97 TOTAL LENGTH
0316 75273 002021 SSA,RSS COMPARE WITH MAX ALLOWED.
0317 75274 027315 JMP APP1 O.K.
0318*
0319 75275 060272 LDA MLINK+1 SET MAIN TO SAY PROGRAM IN
0320 75276 040341 ADA .-?LINK CORE.
0321 75277 070255 STA MAIN
0322 75300 060335 LDA .-18
0323 75301 067303 LDB ++2
0324 75302 026623 JMP LIBER
0325 75303 075304 DEF ++1
0326 75304 005120 OCT 5120 LF=P

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0327 75305 051117      ASC 8,ROGRAM TOO LARGE
      75306 043522
      75307 040515
      75310 020124
      75311 047517
      75312 020114
      75313 040522
      75314 043505

0328*
0329* EVERYTHING IS FINE, GO GET THE PROGRAM
0330*
0331 75315 064042  APP1  LDB GETLN      GET LENGTH OF PROGRAM TO BE APPD
0332 75316 074204      STB MWORD      STORE WORD COUNT
0333 75317 064056      LDB PBPTR      INITIATE
0334 75320 045027      ADB BIT15
0335 75321 063456      LDA APPDP      DISK
0336 75322 114206      JSB DISCZ,I    READ
0337 75323 027403      JMP APP9       UNABLE TO READ PROGRAM
0338*
0339* SCAN ORIGINAL PROGRAM TO DETERMINE LAST SEQUENCE NUMBER.
0340*
0341 75324 061575      LDA SPROG      A => LENGTH OF
0342 75325 002004      INA           FIRST STATEMENT.
0343 75326 064056      LDB PBPTR      SET B TO POINT AT LENGTH OF
0344 75327 006004      INB           FIRST NEW PROGRAM.
0345 75330 050001      CPA 1         IF EQUAL, PROGRAM IS NULL, SO
0346 75331 027354      JMP APP2      IT'S OK.
0347 75332 003004      CMA,INA
0348 75333 040001      ADA B
0349 75334 002021      SSA,RSS      IS SPROG>PBPTR?
0350 75335 027341      JMP APP5=2    NO
0351 75336 060056      LDA PBPTR     YES, RESET SPROG
0352 75337 071575      STA SPROG
0353 75340 027354      JMP APP2
0354*
0355 75341 061575      LDA SPROG     RESTORE
0356 75342 002004      INA          (A)
0357 75343 070037  APP5  STA APPS     SAVE LOCN OF THIS STATE. LENGTH.
0358 75344 140000      ADA 0,I      LINK TO NEXT ONE.
0359 75345 050001      CPA 1        IF SAVE AS B, APPS=>LAST STATE.
0360 75346 002001      RSS
0361 75347 027343      JMP APP5     OTHERWISE, LOOP.
0362*
0363 75350 003400      CCA          GET SEQUENCE # OF LAST STATE-
0364 75351 040037      ADA APPS     MENT.
0365 75352 160000      LDA 0,I     MAKE NEGATIVE AND SUBTRACT
0366 75353 003001      CMA,RSS     ONE.
0367 75354 003400  APP2  CCA          SET TO -1 (SEQNO=0) IF NO PROG.
0368*
0369* SEQUENCE NUMBER CHECK
0370*
0371 75355 140056      ADA PBPTR,I  CHECK THAT FIRST SEQUENCE # IS
0372 75356 002021      SSA,RSS     GREATER THAN LAST ONE OF OLD
0373 75357 027432      JMP APP3     PROGRAM.
0374*
0375 75360 060272      LDA MLINK+1 SET MAIN TO SAY PROGRAM IN

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