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3 * V.D.M. PART NO. 92L0207-001B

4 *

RELEASED 1/18/74

5 *

6 *

7 *

DEBUG UTILITY (AID III)

0001

8 *

0002

9 *

0003

10 *

MEMORY SIZE WITH WRAPAROUND: 4K/8K/16K/32K

B

0004

11 *

WITHOUT WRAPAROUND: 32K

B

0005

12 *

B

0006

13 EJECT

OPSY

EJEC

B

0007

14 SPACE

OPSY

SPAC

B

0008

15 ENTRY

OPSY

ENTR

B

0009

16 *

B

0010

17 \$TTD

SET

1

0011

076000

ORG

076000

B

0012

077630 A 19 LOAD

SET

*+01630

B

0013

077434 A 20 DUMP

SET

*+01434

B

0014

21 *

0015

22 *

MAGNETIC TAPE UNIT ASSIGNMENTS:

0016

000110 A

23 \$U0

SET

0110

DA 10 UNIT 0

0017

000111 A

24 \$U1

SET

0111

DA 11 UNIT 0

0018

000112 A

25 \$U2

SET

0112

DA 12 UNIT 0

0019

000113 A

26 \$U3

SET

0113

DA 13 UNIT 0

0020

000000 A

27 \$U4

SET

0

NOT AVAILABLE

0021

000000 A

28 \$U5

SET

0

NOT AVAILABLE

0022

29

SMRY

0023

30	EJECT		0024
31 *	AID II SPACE SPACE		0025
34 *	WORD LENGTH: SPACE	16 OR 18	0028
36 *	MAGNETIC TAPE:	DA 010 = 1X1	0030
37 *		DA 011 = 1X1	0031
38 *		DA 012 = 1X1	0032
39 *		DA 013 = 1X1	0033
40 *		OPERATION OF AID II	0034
42 *	SPACE COMMAND LETTERS IMPLEMENTED: A,B,C,D,E,F,G,I,L,N,P,R,S,T,V,W,X SPACE		0036
44 *	A. SPACE	DISPLAY/CHANGE A PSUEDO REGISTER	0038
46 *	B. SPACE	DISPLAY/CHANGE B PSUEDO REGISTER	0040
48 *	CX. SPACE	DISPLAY/CHANGE LOCATION (X)	0042
50 *	DX,Y,Z..	PUNCH A PROGRAM TAPE AND RETURN	0044
51 *		X SETS BEGINNING ADDRESS	0045
52 *		Y SETS ENDING ADDRESS	0046
53 *		Z SETS EXECUTION ADDRESS	0047
55 *	SPACE EU.	WRITE A FILE MARK ON MAG TAPE UNIT (U).	0049
56 *		THIS PERMITS SEPARATION OF PROGRAMS	0050
57 *		THAT ARE DUMPED FROM CORE SINCE THE	0051
58 *		COMMAND (W) DOES NOT WRITE ONE.	0052
59 *		THIS WILL PERMIT DUMP OF NON-CONTIGUOUS	0053
60 *		MEMORY AREAS.	0054
62 *	SPACE FN,U.	SKIP TO FILE (N) ON UNIT (U).	0056
63 *		LOAD POINT IS DESIGNATED FILE 0.	0057
65 *	SPACE GX.	LOAD PSUEDO REGISTERS INTO A,B,X	0059
66 *		REGISTERS AND START EXECUTION AT (X).	0060
68 *	SPACE IX,Y,Z..	INITIALIZE MEMORY	0062
69 *		X IS START ADDRESS	0063
70 *		Y IS ENDING ADDRESS	0064
71 *		Z IS VALUE TO STORE IN MEMORY	0065
	SPACE		

73 *	LM.	LOAD AN OBJECT PAPER TAPE INTO CORE AND	0067
74 *		RETURN. THE VALUE OF (M) CONTROLS THE	0068
75 *		MODE OF LOADING. IF A CHECKSUM ERROR	0069
76 *		IS CALCULATED DURING A LOAD THE (B)	0070
77 *		REGISTER WILL BE -1 AND (X) REGISTER	0071
78 *		WILL BE SET TO LOAD ADDRESS OF LAST	0072
79 *		RECORD READ. A SUCCESSFUL LOAD WILL	0073
80 *		HAVE (A) AND (B) REGISTERS ZERO, AND	0074
81 *		(X) SET TO THE EXECUTION ADDRESS.	0075
82 *		THERE IS NO PRINT-OUT AFTER A LOAD	0076
83 *		AND EXECUTE.	0077
	SPACE		
85 *	N.	SKIP TO NEXT FILE ON MAG TAPE UNIT	0079
86 *		PREVIOUSLY SELECTED.	0080
	SPACE		
88 *	PU.	BACKSPACE 1 RECORD ON MAG TAPE UNIT (U).	0082
	SPACE		
90 *	RU.	READ OBJECT MAG TAPE INTO MEMORY FROM	0084
91 *		UNIT (U). A TERMINAL (.) CAUSES RETURN	0085
92 *		TO AID. A TERMINAL (,) CAUSES A LOAD	0086
93 *		AND EXECUTE. AN UP ARROW TYPE OUT	0087
94 *		INDICATES A FILE MARK WAS READ. A	0088
95 *		NUMBER TYPE OUT INDICATES A BAD READ DUE	0089
96 *		TO PARITY ERRORS. THE NUMBER IS THE	0090
97 *		LOAD ADDRESS IN THE RECORD.	0091
	SPACE		
99 *	SX,Y,Z,M.	SEARCH MEMORY AND PRINTOUT WHERE MATCH	0093
100 *		IS FOUND. TYPING (N) IN PLACE OF A	0094
101 *		MASK CAUSES A SEARCH FOR THE NEGATIVE	0095
102 *		OF THE VALUE (Z).	0096
103 *		X IS BEGINNING ADDRESS	0097
104 *		Y IS END ADDRESS	0098
105 *		Z IS SEARCH VALUE.	0099
106 *		N IS SEARCH MASK OF BITS FOR COMPARISON.	0100
	SPACE		
108 *	TY,X.	TRAP TO LOCATION (Y) BEGINNING AT (X).	0102
	SPACE		
110 *	VX.	VISUAL CORE DUMP TO TTY BEGINNING	0104
111 *		AT (X). LEFT COLUMN IS LOCATION	0105
112 *		FOLLOWED BY CONTENTS OF SUCCESSIVE	0106
113 *		LOCATIONS. DUMP IS TERMINATED BY	0107

114 *		TYPING A RUBOUT CHARACTER.	0108
116 *	SPACE WX,Y,Z,U.	WRITE OBJECT MAG TAPE FROM MEMORY WHERE	0110
117 *		X IS THE STARTING ADDRESS	0111
118 *		Y IS THE ENDING ADDRESS	0112
119 *		Z IS THE EXECUTION ADDRESS	0113
120 *		U IS THE UNIT NUMBER	0114
122 *	SPACE X.	DISPLAY/CHANGE X PSUEDO REGISTER	0116
124 *	SPACE SPECIAL NOTE:		0118
125 *		TYPING A RUBOUT CHARACTER WILL TERMINATE TTY PRINTING OR	0119
126 *		THE MAG TAPE OPERATION IN PROGRESS.	0120

			127	EJECT			0121	
			128	SMRY			0122	
076000	006010	A	129	DBUG	LDAI	0103601	0123	
076001	103601	A						
076002	002000	A	130	CALL	DCH2	PRINT ON, BELL	0124	
076003	077143	A						
076004	002000	A	131	CALL	ICH		0125	
076005	076141	A						
076006	006140	A	132	SUBI	'A'		0126	
076007	000301	A						
076010	001004	A	133	JAN	END	ILLEGAL COMAND	0127	
076011	077224	A						
076012	006140	A	134	SUBI	032		0128	
076013	000032	A						
076014	001002	A	135	JAP	END	ILLEGAL COMAND	0129	
076015	077224	A						
076016	006120	A	136	ADDI	(TBL+032)*		0130	
076017	176056	A						
076020	054002	A	137	STA	++3		0131	
076021	005007	A	138	ZERO	7		0132	
076022	001000	A	139	JMP	*		0133	
076023	076022	A						
076024	076405	A	140	TBL	DATA	RGA	A REGISTER	0134
076025	076404	A	141		DATA	RGB	B REGISTER	0135
076026	076074	A	142		DATA	CNG	CHANGE	0136
076027	076115	A	143		DATA	DMP	DUMP	0137
076030	077006	A	144		DATA	EOF	EOF WRITE	0138
076031	076740	A	145		DATA	FIL	FILE POSITION	0139
076032	076127	A	146		DATA	GOT	GOTO	0140
076033	077224	A	147		DATA	END	H	0141
076034	076166	A	148		DATA	INI	INITIALIZE CORE	0142
076035	077224	A	149		DATA	END	J	0143
076036	077224	A	150		DATA	END	K	0144
076037	076323	A	151		DATA	LOD	LOAD	0145
076040	077224	A	152		DATA	END	M	0146
076041	076754	A	153		DATA	FIL3	NEXT MAG TAPE FILE ON UNIT SELECTED	0147
076042	077224	A	154		DATA	END	O	0148
076043	077013	A	155		DATA	BCK	P BACKSPACE 1 RECORD ON MAG TAPE	0149
076044	077224	A	156		DATA	END	Q	0150
076045	076635	A	157		DATA	RMT	READ MAG TAPE	0151
076046	076414	A	158		DATA	SRC	SEARCH CORE	0152
076047	076460	A	159		DATA	TRP	TRAP	0153

076050	077224	A	160	DATA	END	U	0154	
076051	077203	A	161	DATA	LIST	VISUAL DUMP	0155	
076052	076546	A	162	DATA	WMT	WRITE MAG TAPE	0156	
076053	076403	A	163	DATA	RGX	X REGISTER	0157	
076054	077224	A	164	DATA	END	Y	0158	
076055	077224	A	165	DATA	END	Z	0159	
				SPACE				
076056	000000	A	167	CLC	ENTR		0161	
076057	034711	A	168	LDX	T2		0162	
076060	015000	A	169	LDA	0,1		0163	
076061	002000	A	170	JMPM	OLC	OUTPUT LOCATION	0164	
076062	076351	A						
076063	002000	A	171	JMPM	INN	INPUT NUMBER	0165	
076064	076202	A						
076065	001020	A	172	JBZ	*+3		0166	
076066	076070	A						
076067	055000	A	173	STA	0,1		0167	
076070	002000	A	174	JMPM	OND	OUTPUT VALUE	0168	
076071	077230	A						
076072	001000	A	175	JMP*	CLC		0169	
076073	176056	A						
076074	002000	A	177	CNG	JMPM	ILC	CHANGE ROUTINE	
076075	076154	A					0171	
076076	054672	A	178	STA	T2		0172	
076077	002000	A	179	JMPM	OND		0173	
076100	077230	A						
076101	014667	A	180	CNGA	LDA	T2	0174	
076102	002000	A	181	JMPM	OCT	OUTPUT OCTAL	0175	
076103	076334	A						
076104	002000	A	182	JMPM	CLC		0176	
076105	076056	A						
076106	014673	A	183	LDA	TC		0177	
076107	140561	A	184	SUB	COMA		0178	
076110	044660	A	185	INR	T2		0179	
076111	001010	A	186	JAZ	CNGA		0180	
076112	076101	A						
076113	001000	A	187	JMP	DEBUG		0181	
076114	076000	A						
076115	002000	A	189	DMP	CALL	ISP	0183	
076116	076262	A						

076117	014652	A	190	LDA	T3		0184
076120	024652	A	191	LDB	T4		0185
076121	034652	A	192	LDX	T5		0186
076122	007401	A	193	SOF			0187
076123	002000	A	194	CALL	DUMP		0188
076124	077434	A					
076125	001000	A	195	JMP	END		0189
076126	077224	A					

076127	002000	A	197	GOT	JMPM	ILC	GO TO ROUTINE	0191
076130	076154	A						
076131	054647	A	198	STA	L			0192
076132	002000	A	199	JMPM	OND		OUTPUT END	0193
076133	077230	A						
076134	014641	A	200	GO	LDA	A	GO ROUTINE	0194
076135	024641	A	201		LDB	B		0195
076136	034641	A	202		LDX	X		0196
076137	001000	A	203		JMP*	L		0197
076140	177001	A						

			205	*INPUT CHARACTER				0199
076141	000000	A	206	ICH	ENTR			0200
076142	002000	A	207		JMPM	RCH	READ CHARACTER	0201
076143	077135	A						
076144	054635	A	208		STA	TC		0202
076145	006140	A	209		SUBI	'/'		0203
076146	000257	A						
076147	001010	A	210		JAZ	END	ERROR END OF LINE	0204
076150	077224	A						
076151	014630	A	211		LDA	TC		0205
076152	001000	A	212		JMP*	ICH		0206
076153	176141	A						

			214	*INPUT LOCATION				0208
076154	000000	A	215	ILC	ENTR			0209
076155	002000	A	216		JMPM	INN	INPUT NUMBER	0210
076156	076202	A						
076157	001020	A	217		JBZ	END	NO NUMBER	0211
076160	077224	A						
076161	024605	A	218		LDB	TO - zero?		0212
076162	001020	A	219		JBZ*	ILC		0213
076163	176154	A						

076164	001000	A	220	JMP	END	NEGATIVE	0214
076165	077224	A					
076166	002000	A	222	INI	JMPM	ISP	INITIALIZE ROUTINE
076167	076262	A					0216
076170	034601	A	223	LDX	T3		0217
076171	014602	A	224	LDA	T5		0218
076172	055000	A	225	STA	0,1	SET VALUE	0219
076173	044576	A	226	INR	T3		0220
076174	005041	A	227	TXA			0221
076175	144575	A	228	SUB	T4		0222
076176	001010	A	229	JAZ	DEBUG		0223
076177	076000	A					
076200	001000	A	230	JMP	INI+2		0224
076201	076170	A					
			232	*INPUT NUMBER			0226
076202	000000	A	233	INN	ENTR		0227
076203	005001	A	234		TZA		0228
076204	054576	A	235	STA	V		0229
076205	054561	A	236	STA	T0		0230
076206	054561	A	237	STA	T1		0231
076207	002000	A	238	JMPM	ICH	INPUT CHARACTER	0232
076210	076141	A					
076211	144161	A	239	SUB	SP	0240 'SP'	0233
076212	001010	A	240	JAZ	ICH+1	PASS SPACES	0234
076213	076142	A					
076214	006140	A	241	SUBI	015	NEGATIVE SIGN	0235
076215	000015	A					
076216	001010	A	242	JAZ	INN1		0236
076217	076237	A					
076220	014561	A	243	INN2	LDA	TC	0237
076221	144563	A	244		SUB	ZERO	0260 '0'
076222	001004	A	245		JAN	INN3	NOT DIGIT
076223	076244	A					
076224	144557	A	246	SUB	010		0240
076225	001002	A	247	JAP	INN3		0241
076226	076244	A					
076227	014553	A	248	LDA	V		0242
076230	004243	A	249	LRLA	3		0243
076231	144553	A	250	SUB	ZERO	'0'	0244
076232	124547	A	251	ADD	TC		0245

076233	054547	A	252	STA	V		0246
076234	044533	A	253	INR	T1	DIGIT COUNT	0247
076235	001000	A	254	JMP	*+3		0248
076236	076240	A					
076237	044527	A	255	INN1	INR	T0	0249
076240	002000	A	256	JMPM	ICH	INPUT CHARACTER	0250
076241	076141	A					
076242	001000	A	257	JMP	INN2		0251
076243	076220	A					
076244	014523	A	258	INN3	LDA	T1	0252
076245	144434	A	259	SUB	07		0253
076246	001002	A	260	JAP	END	TO BIG	0254
076247	077224	A					
076250	014532	A	261	LDA	V		0255
076251	024515	A	262	LDB	T0		0256
076252	001020	A	263	JBZ	*+5		0257
076253	076257	A					
076254	005211	A	264	CPA			0258
076255	005111	A	265	IAR			0259
076256	054524	A	266	STA	V		0260
076257	024510	A	267	LDB	T1		0261
076260	001000	A	268	JMP*	INN		0262
076261	176202	A					
			270	* INPUT SPECIAL			0264
076262	000000	A	271	ISP	ENTR		0265
076263	002000	A	272	JMPM	ILC	INPUT LOCATION	0266
076264	076154	A					
076265	054504	A	273	STA	T3		0267
076266	002000	A	274	JMPM	ILC		0268
076267	076154	A					
076270	054502	A	275	STA	T4		0269
076271	005001	A	276	TZA			0270
076272	054501	A	277	STA	T5		0271
076273	005311	A	278	DAR			0272
076274	054500	A	279	STA	T6	-1	0273
076275	002000	A	280	JMPM	INN	INPUT NUMBER	0274
076276	076202	A					
076277	001020	A	281	JBZ	ISP1		0275
076300	076307	A					
076301	054472	A	282	STA	T5	VALUE	0276
076302	002000	A	283	JMPM	INN		0277

076303	076202	A						
076304	001020	A	284	JBZ	ISP1			0278
076305	076307	A						
076306	054466	A	285	STA	T6	MASK		0279
076307	002000	A	286	ISP1	JMPM	OND	OUTPUT END	0280
076310	077230	A						
076311	014461	A	287	LDA	T4			0281
076312	144457	A	288	SUB	T3			0282
076313	001002	A	289	JAP*	ISP		PROPER ORDER	0283
076314	176262	A						
076315	014455	A	290	LDA	T4		CORRECT ORDERING	0284
076316	024453	A	291	LDB	T3			0285
076317	054452	A	292	STA	T3			0286
076320	064452	A	293	STB	T4			0287
076321	001000	A	294	JMP*	ISP			0288
076322	176262	A						
076323	006010	A	296	L0D	LDAI	T3	LOAD PGM FROM PAPER TAPE	0290
076324	076772	A						
076325	054215	A	297	STA	TRP2		NOP TRAP FIX-UP	0291
076326	002000	A	298	CALL	INN		GET LOAD MODE	0292
076327	076202	A						
076330	002000	A	299	CALL	LOAD		LOAD	0293
076331	077630	A						
076332	001000	A	300	JMP	TRP1		DISPLAY INDICATORS	0294
076333	076505	A						
			302	*OUTPU	OCTAL			0296
076334	000000	A	303	OCT	ENTR	0		0297
076335	005002	A	304		TZB			0298
076336	004557	A	305		LLSR	15		0299
076337	005122	A	306		IBR			0300
076340	114444	A	307	OCT1	ORA	ZERO		0301
076341	002000	A	308		CALL	OCH		0302
076342	077155	A						
076343	005001	A	309		TZA			0303
076344	004443	A	310		LLRL	3		0304
076345	001020	A	311		JBZ*	OCT		0305
076346	176334	A						
076347	001000	A	312		JMP	OCT1		0306
076350	076340	A						

		314 *OUTPUT LOCATION		0308
076351	000000 A	315	OLC ENTRY	0309
076352	054414 A	316	STA T0	0310
076353	006010 A	317	LDAI 0124240 SPACE, LEFT PAREN	0311
076354	124240 A			
076355	002000 A	318	CALL OCH2	0312
076356	077143 A			
076357	014407 A	319	LDA T0	0313
076360	002000 A	320	JMPM OCT OUTPUT OCTAL	0314
076361	076334 A			
076362	006010 A	321	LDAI 0120251 RIGHT PAREN, SPACE	0315
076363	120251 A			
076364	002000 A	322	CALL OCH2	0316
076365	077143 A			
076366	001000 A	323	JMP* OLC	0317
076367	176351 A			
		325 *OUTPUT NUMBER		0319
076370	000000 A	326	ONB ENTRY	0320
076371	054375 A	327	STA T0 (A) IS NUMBER	0321
076372	006010 A	328	LDAI 0240	0322
076373	000240 A			
076373		329	SP BES 0	0323
076374	002000 A	330	JMPM OCH OUTPUT CHARACTER	0324
076375	077155 A			
076376	014370 A	331	LDA T0	0325
076377	002000 A	332	JMPM OCT OUTPUT OCTAL	0326
076400	076334 A			
076401	001000 A	333	JMP* ONB	0327
076402	176370 A			
076403	005111 A	335	RGX IAR REGISTER X ROUTINE	0329
076404	005111 A	336	RGB IAR REGISTER B ROUTINE	0330
076405	006120 A	337	RGA ADDI A REGISTER A ROUTINE	0331
076406	076776 A			
076407	054361 A	338	STA T2	0332
076410	002000 A	339	JMPM CLC CHANGE LOCATION	0333
076411	076056 A			
076412	001000 A	340	JMP DBUG	0334
076413	076000 A			
076414	002000 A	342	SRC JMPM ISP SEARCH ROUTINE	0336

076415	076262	A					
076416	014355	A	343	LDA	T5		0337
076417	154355	A	344	ANA	T6		0338
076420	054353	A	345	STA	T5		0339
076421	034350	A	346	LDX	T3		0340
076422	015000	A	347	LDA	0,1		0341
076423	154351	A	348	ANA	T6	MASK	0342
076424	144347	A	349	SUB	T5		0343
076425	005012	A	350	TAB			0344
076426	014353	A	351	LDA	TC		0345
076427	006140	A	352	SURI	0316		0346
076430	000316	A					
076431	001030	A	353	JIF	030, SRC1		0347
076432	076437	A					
076433	001020	A	354	JBZ	SRC2		0348
076434	076446	A					
076435	001010	A	355	JAZ	SRC2		0349
076436	076446	A					
076437	044332	A	356 SRC1	INR	T3		0350
076440	005041	A	357	TXA			0351
076441	144331	A	358	SUB	T4		0352
076442	001010	A	359	JAZ	DEBUG		0353
076443	076000	A					
076444	001000	A	360	JMP	SRC+2		0354
076445	076416	A					
076446	014323	A	361 SRC2	LDA	T3		0355
076447	002000	A	362	JMPM	OCT	OUTPUT OCTAL	0356
076450	076334	A					
076451	015000	A	363	LDA	0,1		0357
076452	002000	A	364	JMPM	OLC	OUTPUT LOCATION	0358
076453	076351	A					
076454	002000	A	365	JMPM	OND	OUTPUT END	0359
076455	077230	A					
076456	001000	A	366	JMP	SRC1		0360
076457	076437	A					
076460	002000	A	368 TRP	JMPM	ILC	TRAP ROUTINE	0362
076461	076154	A					
076462	034320	A	369	LDX	V		0363
076463	002000	A	370	JMPM	INN		0364
076464	076202	A					
076465	001020	A	371	JBZ	*+3		0365

076466	076470	A						
076467	054311	A	372	STA	L	ENTRANCE		0366
076470	015000	A	373	LDA	0,1			0367
076471	025001	A	374	LDB	1,1			0368
076472	054277	A	375	STA	T3			0369
076473	064277	A	376	STB	T4			0370
076474	014051	A	377	LDA	WMT	CALL OP CODE		0371
076475	006020	A	378	LOBI	TRP2			0372
076476	076543	A						
076477	055000	A	379	STA	0,1			0373
076500	065001	A	380	STB	1,1			0374
076501	002000	A	381	JMPM	OND	OUTPUT END		0375
076502	077230	A						
076503	001000	A	382	JMP	GU			0376
076504	076134	A						
076505	074272	A	383	TRP1 STX	X	SAVE REGISTER		0377
076506	064270	A	384	STB	B			0378
076507	054266	A	385	STA	A			0379
076510	034032	A	386	LDX	TRP2			0380
076511	005344	A	387	DXR				0381
076512	005344	A	388	DXR				0382
076513	074265	A	389	STX	L	EXIT POINT		0383
076514	014255	A	390	LDA	T3			0384
076515	024255	A	391	LDB	T4			0385
076516	055000	A	392	STA	0,1	RESOTRE COMMANDS		0386
076517	065001	A	393	STB	1,1			0387
076520	002000	A	394	JMPM	OND	OUTPUT END		0388
076521	077230	A						
076522	005041	A	395	TXA				0389
076523	002000	A	396	JMPM	OCT	OUTPUT OCTAL LOCATION		0390
076524	076334	A						
076525	014244	A	397	LDA	T3	ACTUAL COMMAND		0391
076526	002000	A	398	JMPM	OLC	OUTPUT LOCATION		0392
076527	076351	A						
076530	014245	A	399	LDA	A			0393
076531	002000	A	400	JMPM	ONB	OUTPUT NUMBER		0394
076532	076370	A						
076533	014243	A	401	LDA	B			0395
076534	002000	A	402	JMPM	ONB			0396
076535	076370	A						
076536	014241	A	403	LDA	X			0397
076537	002000	A	404	TRPX JMPM	ONB			0398

076540	076370	A					
076541	001000	A	405	JMP	END		0399
076542	077224	A					
076543	000000	A	406	TRP2	ENTR		0400
076544	001000	A	407	JMP	TRP1		0401
076545	076505	A					
			409 *	DUMP PROGRAM ONTO MAG TAPE UNIT 0 TO 7			0403
			410 *	WFIRST, LAST, EXECUTION, DRIVE.			0404
076546	002000	A	411	WMT	CALL	INN	0405
076547	076202	A					
076550	054221	A	412	STA	FRST		0406
076551	002000	A	413	CALL	INN		0407
076552	076202	A					
076553	054217	A	414	STA	LAST		0408
076554	002000	A	415	CALL	INN		0409
076555	076202	A					
076556	054215	A	416	STA	EXEC		0410
076557	002000	A	417	CALL	SET		0411
076560	076676	A					
076561	005001	A	418	WRI2	TZA		0412
076562	054455	A	419	STA	CNTR	RESET COUNTER	0413
076563	034206	A	420	LDX	FRST		0414
076564	074461	A	421	SIX	MTBF+1	SET ADDRESS CONTROL	0415
076565	024456	A	422	LDB	BUFR	BUFFER ADDRESS	0416
076566	005122	A	423	IBR			0417
076567	005122	A	424	WRI3	IBR		0418
076570	015000	A	425	LDA	0,1	PICK UP WORD	0419
076571	056000	A	426	STA	0,2	PUT IN BUFFER	0420
076572	044445	A	427	INR	CNTR	INCREMENT WORD COUNT	0421
076573	005041	A	428	TXA			0422
076574	144176	A	429	SUB	LAST	END OF RECORD	0423
076575	005144	A	430	IXR			0424
076576	001010	A	431	JAZ	WRI4	YES	0425
076577	076604	A					
076600	014437	A	432	LDA	CNTR		0426
076601	144437	A	433	SUB	K75	RECORD FULL	0427
076602	001004	A	434	JAN	WRI3	NO	0428
076603	076567	A					
076604	074165	A	435	WRI4	STX	FRST	SAVE POINTER
076605	024432	A	436	LDB	CNTR		0430
076606	064436	A	437	STB	MTBF	SET RECORD LENGTH	0431

076607	005122	A	438	IBR			0432
076610	005122	A	439	IBR			0433
076611	034432	A	440	LDX	BUFR		0434
076612	002000	A	441	CALL	MT0		0435
076613	077072	A					
076614	014155	A	442	LDA	FRST		0436
076615	005311	A	443	DAR			0437
076616	144154	A	444	SUB	LAST		0438
076617	001004	A	445	JAN	WRI2	MORE	0439
076620	076561	A					
076621	054423	A	446	STA	MTBF	SET FOR EXECUTION RECORD	0440
076622	014151	A	447	LDA	EXEC		0441
076623	001004	A	448	JAN	END	NO EXECUTION RECORD	0442
076624	077224	A					
076625	054420	A	449	STA	MTBF+1		0443
076626	005102	A	450	INCR	2		0444
076627	005122	A	451	IBR			0445
076630	034413	A	452	LDX	BUFR		0446
076631	002000	A	453	CALL	MT0		0447
076632	077072	A					
076633	001000	A	454	JMP	END		0448
076634	077224	A					
	456 *			LOAD PROGRAM FROM MAG TAPE	UNIT 0 TO 7		0450
	457 *			RDRIVE, LOAD AND GO IF ,			0451
076635	002000	A	458	RMT	CALL SET	SET DRIVE NUMBER	0452
076636	076676	A					
076637	002000	A	459	CALL	MTI	INPUT RECORD	0453
076640	077020	A					
076641	005001	A	460	TZA			0454
076642	054375	A	461	STA	CNTR	RESET WORD COUNTER	0455
076643	014401	A	462	LDA	MTBF	IS IT EXECUTION RECORD	0456
076644	001010	A	463	JAZ	RMT2	YES	0457
076645	076665	A					
076646	034375	A	464	LDX	BUFR		0458
076647	005144	A	465	IXR			0459
076650	025000	A	466	LDR	0,1	GET STORE POINTER	0460
076651	005144	A	467	IXR		SET LOAD POINTER	0461
076652	015000	A	468	RMT1	LDA 0,1	GET WORD.	0462
076653	056000	A	469	STA	0,2	STORE WORD	0463
076654	044363	A	470	INR	CNTR	COUNT WORDS	0464
076655	014362	A	471	LDA	CNTR		0465

076656	144366	A	472	SUB	MTBF	DONE YET	0466
076657	005144	A	473	IXR			0467
076660	005122	A	474	IBR			0468
076661	001004	A	475	JAN	RMT1	NO	0469
076662	076652	A					
076663	001000	A	476	JMP	RMT+2	READ ANOTHER RECORD	0470
076664	076637	A					
076665	014360	A	477	RMT2	LDA	MTBF+1	GET EXECUTION ADDRESS
076666	054004	A	478		STA	RMT3	SET UP JUMP
076667	014112	A	479		LOA	TC	GET TERM CHAR
076670	006140	A	480		SUBI	' , '	WAS IT A LOAD AND GO ' , '
076671	000254	A					
076671			481	COMA	BES	0	0475
076672	001010	A	482		JAZ	*	YES
076673	076672	A					
076673			483	RMT3	BES	0	0477
076674	001000	A	484		JMP	END	NO
076675	077224	A					
			486	*	SET UP	MAG TAPE DEVICE ADDRESS	0480
076676	000000	A	487	SET	ENTRY	0	0481
076677	002000	A	488		CALL	INN	GET DRIVE NUMBER
076700	076202	A					
076701	006150	A	489		ANAI	7	0483
076702	000007	A					
076702			490	07	BES	0	0484
076703	006120	A	491		ADDI	UTBL	0485
076704	077345	A					
076705	005012	A	492		TAB		0486
076706	026000	A	493		LDB	0,2	0487
076707	006010	A	494		LDAI	0104000	SELECT COMMAND
076710	104000	A					
076711	005031	A	495		MERGE	031	NEW SELECT COMMAND
076712	054000	A	496		STA	*+1	0489
076713	104000	A	497		SEL2	0	0490
076714	006150	A	498		ANAI	077	DA
076715	000077	A					
076716	054010	A	499		STA	SET2	0491
076717	006030	A	500		LDXI	MTL	0492
076720	077353	A					
076721	025000	A	501	SET1	LDR	0,1	0493
076722	001020	A	502		JBZ	SET3	0494

6723	076734	A						
6724	016000	A	503	LDA	0,2	GET COMMAND		0497
6725	154315	A	504	ANA	MASK			0498
6726	006110	A	505	ORAI	*			0499
6727	076726	A						
6727	←		506	SET2	BES	0		0500
6730	056000	A	507	STA	0,2			0501
6731	005144	A	508	IXR				0502
6732	001000	A	509	JMP	SET1			0503
6733	076721	A						
6734	002000	A	510	SET3	CALL	SMR		0504
6735	077124	A						
6736	001000	A	511	JMP*	SET			0505
6737	176676	A						
			513	*	SKIP TO FILE (X)	UNIT 0 TO 7		0507
			514	*	FNUMBER,DRIVE.			0508
6740	002000	A	515	FIL	CALL	INN		0509
6741	076202	A						
6742	054031	A	516	STA	EXEC	SAVE		0510
6743	002000	A	517	CALL	SET			0511
6744	076676	A						
6745	101610	A	518	SEN	0610,**+3	SENSE LOAD POINT		0512
6746	076750	A						
6747	100710	A	519	FIL1	SEL	0710	REWIND	0513
6750	014023	A	520	LDA	EXEC	GET FILE NO.		0514
6751	001010	A	521	FIL2	JAZ	END	DONE	0515
6752	077224	A						
6753	005311	A	522	DAR				0516
6754	002000	A	523	FIL3	CALL	SMR		0517
6755	077124	A						
6756	100510	A	524	SEL	0510	FORWARD 1 RECORD		0518
6757	002000	A	525	CALL	BORT			0519
6760	077176	A						
6761	002000	A	526	CALL	SMR			0520
6762	077124	A						
6763	101310	A	527	FIL4	SEN	0310,FIL2	FILE MARK	0521
6764	076751	A						
6765	001000	A	528	JMP	FIL3	NO, KEEP GOING		0522
6766	076754	A						
6767	000000	A	530	TO	DATA	0		0524

076770	000000	A	531	T1	DATA	0		0525
076771	000000	A	532	T2	DATA	0		0526
076772	000000	A	533	T3	DATA	0		0527
076773	000000	A	534	T4	DATA	0		0528
076774	000000	A	535	T5	DATA	0		0529
076775	000000	A	536	T6	DATA	0		0530
076776	000000	A	537	A	DATA	0		0531
076777	000000	A	538	B	DATA	0		0532
077000	000000	A	539	X	DATA	0		0533
077001	000000	A	540	L	DATA	0	LOCATION COUNTER	0534
077002	000000	A	541	TC	DATA	0	TERM CH	0535
077003	000000	A	542	V	DATA	0	VALUE	0536
077004	000010	A	543	010	DATA	010		0537
077005	000260	A	544	ZERO	DATA	0260		0538
			546 *		WRITE FILE MARK	UNIT 0 TO 7		0540
			547 *		EDRIVE.			0541
077006	002000	A	548	EOF	CALL	SET		0542
077007	076676	A						
077010	100410	A	549	EOF1	SEL	0410	WRITE FILE MARK	0543
077011	001000	A	550		JMP	END		0544
077012	077224	A						
			552 *		BACKSPACE ONE RECORD	UNIT 0 TO 7		0546
			553 *		PDRIVE.			0547
077013	002000	A	554	BCK	CALL	SET		0548
077014	076676	A						
077015	100610	A	555	BCK1	SEL	0610	BACKSPACE	0549
077016	001000	A	556		JMP	END		0550
077017	077224	A						
			558 *		MAG TAPE INPUT			0552
077020	000000	A	559	MTI	ENTRY		MAG TAPE INPUT	0553
077021	005001	A	560		TZA			0554
077022	054214	A	561		STA	MGER		0555
077023	024216	A	562	MTI0	LDR	K100	BUFFER SIZE	0556
077024	034217	A	563		LOX	BUFR	BUFFER ADDRESS	0557
077025	002000	A	564		CALL	SMR	MT RDY	0558
077026	077124	A						
077027	100010	A	565		SEL	010	READ BIN	0559
077030	101110	A	566	MTI1	SEN	0110,MTI2	BFR RDY	0560
077031	077036	A						

077032	101210	A	567	SEN	0210,MTI3	MT RDY	0561
077033	077046	A					
077034	001000	A	568	JMP	MTI1	LOOP	0562
077035	077030	A					
077036	001020	A	569	MTI2	JRZ	MTI4	RCD TOO LONG
077037	077054	A					
077040	102510	A	570	CIA	010	INPUT	0564
077041	055000	A	571	STA	0,1	STORE	0565
077042	005144	A	572	IXR		COUNT	0566
077043	005322	A	573	DSR			0567
077044	001000	A	574	JMP	MTI1		0568
077045	077030	A					
077046	101310	A	575	MTI3	SEN	0310,MTI4	FLAG, IF FILE MARK
077047	077054	A					
077050	101010	A	576	SEN	010,MTI5	PARITY TEST	0570
077051	077062	A					
077052	001000	A	577	JMP*	MTI	RETURN	0571
077053	177020	A					
077054	006010	A	578	MTI4	LDAI	0336	0572
077055	000336	A					
077056	002000	A	579	CALL	OCH		0573
077057	077155	A					
077060	001000	A	580	JMP	END		0574
077061	077224	A					
077062	044154	A	581	MTI5	INR	MGER	0575
077063	014153	A	582	LDA	MGER		0576
077064	144155	A	583	SUB	K100		0577
077065	001002	A	584	JAP	ERR		0578
077066	077120	A					
077067	100310	A	585	MTI6	EXC	0610	BACKSPACE
077070	001000	A	586	JMP	MTI0		0580
077071	077023	A					
			588 *		MAG TAPE OUTPUT		0582
077072	000000	A	589	MT0	ENTRY	MAG TAPE OUTPUT	0583
077073	002000	A	590	CALL	SMR		0584
077074	077124	A					
077075	100210	A	591	SEL	0210	WRITE BINARY	0585
077076	101110	A	592	MT01	SEN	0110,MT02-1	BFR READY
077077	077102	A					
077100	001000	A	593	JMP	MT01		0587
077101	077076	A					

077102	015000	A	594	LDA	0,1	GET WORD	0588
077103	103110	A	595	MT02 OAR	010	OUTPUT	0589
077104	005144	A	596	IXR		COUNT	0590
077105	005322	A	597	DBR			0591
077106	001020	A	598	JBZ	*+4	DONE	0592
077107	077112	A					
077110	001000	A	599	JMP	MT01		0593
077111	077076	A					
077112	002000	A	600	CALL	SMR	MT RDY	0594
077113	077124	A					
077114	101010	A	601	MT03 SEN	010,ERR	PARITY ERR	0595
077115	077120	A					
077116	001000	A	602	JMP*	MT0	RETURN	0596
077117	177072	A					
077120	014125	A	604	ERR LDA	MTBF+1	MAG TAPE ERROR	0598
077121	001000	A	605	JNP	TRPX		0599
077122	076537	A					
077123	101210	A	607	SEN	0210,*	RETURN IF MT RDY	0601
077124	077123	A					
077124		A	608	SMR BES	0		0602
077125	002000	A	609	CALL	BORT		0603
077126	077176	A					
077127	001000	A	610	JMP	SMR-1		0604
077130	077123	A					
	076772	A	611	FRST EQU	T3		0605
	076773	A	612	LAST EQU	T4		0606
	076774	A	613	EXEC EQU	T5		0607
		A	615	*INPUT AND PRINT A CHARACTER			0609
077131	102501	A	616	RCHA CIA	\$TTD		0610
077132	002000	A	617	CALL	OCH		0611
077133	077155	A					
077134	001000	A	618	JMP	*		0612
077135	077134	A					
077135		A	619	RCH BES	0		0613
077136	101201	A	620	SEN	0200+\$TTD,RCHA		0614
077137	077131	A					
077140	005000	A	621	NOP		INTERRUPTABLE INSTR.	0615
077141	001000	A	622	JNP	*-3		0616
077142	077135	A					

			624	*OUTPUT TWO CHARACTERS			0618
077143	000000	A	625	OCH2	ENTRY		0619
077144	002000	A	626	CALL	OCH		0620
077145	077155	A					
077146	004350	A	627	LSRA	B		0621
077147	002000	A	628	CALL	OCH		0622
077150	077155	A					
077151	001000	A	629	JMP*	OCH2		0623
077152	177143	A					
077153	103101	A	631	OCHA	DAR	\$TTD	0625
077154	001000	A	632	JMP	*		0626
077155	077154	A					
077155			633	OCH	BES	0	0627
077156	002000	A	634	CALL	BORT		0628
077157	077176	A					
077160	101101	A	635	SEN	0100+\$TTD,OCHA		0629
077161	077153	A					
077162	005000	A	636	NOP		INTERRUPTABLE INSTR	0630
077163	001000	A	637	JMP	*-3		0631
077164	077160	A					
			639	*TEST FOR ABORT			0633
077165	054006	A	640	BORS	STA	*+7	0634
077166	102501	A	641		CIA	\$TTD	0635
077167	006130	A	642		ERAI	0377	0636
077170	000377	A					
077170			643	RUBO	BES	0	0637
077171	001010	A	644		JAZ	END	0638
077172	077224	A					
077173	006010	A	645		LDAI	0	0639
077174	000000	A					
077175	001000	A	646		JMP	*	0640
077176	077175	A					
077176			647	BORT	BES	0	0641
077177	101201	A	648		SEN	0200+\$TTD,BORS	0642
077200	077165	A					
077201	001000	A	649		JMP*	BORT	0643
077202	177176	A					
			651	*VISUAL DUMP			0645

077203	002000	A	652	LIST	CALL	ILC	INPUT LOCATION	0646
077204	076154	A						
077205	005014	A	653		TAX			0647
077206	002000	A	654	LISU	CALL	OND		0648
077207	077230	A						
077210	005041	A	655		TXA			0649
077211	002000	A	656		CALL	OCT	OUTPUT LOCATION	0650
077212	076334	A						
077213	015000	A	657	LISV	LDA	0,1		0651
077214	002000	A	658		CALL	ONB	OUTPUT CONTENTS	0652
077215	076370	A						
077216	005145	A	659		INCR	045		0653
077217	004543	A	660		LLSR	3		0654
077220	001020	A	661		JBZ	LISU		0655
077221	077206	A						
077222	001000	A	662		JMP	LISV		0656
077223	077213	A						
077224	002000	A	664	END	JMPM	OND	OUTPUT END	0658
077225	077230	A						
077226	001000	A	665		JMP	DEBUG		0659
077227	076000	A						
			667	*OUTPUT END				0661
077230	000000	A	668	OND	ENTR			0662
077231	006010	A	669		LDAI	0105215	CR, LF	0663
077232	105215	A						
077233	002000	A	670		CALL	OCH2		0664
077234	077143	A						
077235	001000	A	671		JMP*	OND		0665
077236	177230	A						
077237	000000	A	673	MGER	DATA	0		0667
077240	000000	A	674	CNTR	DATA	0		0668
077241	000075	A	675	K75	DATA	075		0669
077242	000100	A	676	K100	DATA	0100		0670
077243	177700	A	677	MASK	DATA	0177700		0671
077244	077245	A	678	BUFR	DATA	MTBF		0672
077245			680	MTBF	BSS	64	MAG TAPE I/O BUFFER	0674
077345	000110	A	681	UTBL	DATA	\$U0,\$U1,\$U2,\$U3,\$U4,\$U5		0675
077346	000111	A						

077347	000112	A							
077350	000113	A							
077351	000000	A							
077352	000000	A							
077353	077123	A	682	MTL	DATA	SMR-1,MTI1-1,MTI1,MTI1+2,MTI2+2,MTI3,MTI3+2			0676
077354	077027	A							
077355	077030	A							
077356	077032	A							
077357	077040	A							
077360	077046	A							
077361	077050	A							
077362	077075	A	683		DATA	MT01-1,MT01,MT02,MT03,MTI6			0677
077363	077076	A							
077364	077103	A							
077365	077114	A							
077366	077067	A							
077367	076745	A	684		DATA	FIL1-2,FIL1,FIL3+2,FIL4,EOF1,BCK1,0			0678
077370	076747	A							
077371	076756	A							
077372	076763	A							
077373	077010	A							
077374	077015	A							
077375	000000	A							
	076000	A	685		END	DEBUG			0679

ENTRY NAMES

EXTERNAL NAMES

SYMBOLS

000001	A	\$STD	000110	A	SU0	000111	A	SU1	000112	A	SU2
000113	A	\$U3	000000	A	\$U4	000000	A	\$U5	076776	A	A
076777	A	B	077013	A	BCK	077015	A	BCK1	077165	A	BORS
077176	A	BORT	077244	A	BUFR	076056	A	CLC	076074	A	CNG
076101	A	CNGA	077240	A	CNTR	076671	A	COMA	076000	A	DEBUG
076115	A	DMP	077434	A	DUMP	077224	A	END	077006	A	EOF
077010	A	EOF1	077120	A	ERR	076774	A	EXEC	076740	A	FIL
076747	A	FIL1	076751	A	FIL2	076754	A	FIL3	076763	A	FIL4
076772	A	FRST	076134	A	GO	076127	A	GOT	076141	A	ICH
076154	A	ILC	076166	A	INI	076202	A	INN	076237	A	INN1
076220	A	INN2	076244	A	INN3	076262	A	ISP	076307	A	ISP1
077242	A	K100	077241	A	K75	077001	A	L	076773	A	LAST
077203	A	LIST	077206	A	LISU	077213	A	LISV	077630	A	LOAD
076323	A	LD0	077243	A	MASK	077237	A	MGER	077245	A	MTBF
077020	A	MTI	077023	A	MTI0	077030	A	MTI1	077036	A	MTI2

not punched

077046 A MTI3	077054 A MTI4	077062 A MTI5	077067 A MTI6
077353 A MTL	077072 A MTO	077076 A MTO1	077103 A MTO2
077114 A MTO3	077004 A O10	076702 A O7	077155 A OCH
077143 A OCH2	077153 A OCHA	076334 A OCT	076340 A OCT1
076351 A OLC	076370 A ONB	077230 A OND	077135 A RCH
077131 A RCHA	076405 A RGA	076404 A RGB	076403 A RGX
076635 A RMT	076652 A RMT1	076665 A RMT2	076673 A RMT3
077170 A RUBO	076676 A SET	076721 A SET1	076727 A SET2
076734 A SET3	077124 A SKR	076373 A SP	076414 A SRC
076437 A SRC1	076446 A SRC2	076767 A T0	076770 A T1
076771 A T2	076772 A T3	076773 A T4	076774 A T5
076775 A T6	076024 A TBL	077002 A TC	076460 A TRP
076505 A TRP1	076543 A TRP2	076537 A TRPX	077345 A UTBL
077003 A V	076546 A WMT	076561 A WRI2	076567 A WRI3
076604 A WRI4	077000 A X	077005 A ZERO	

not punched

0 ERRORS ASSEMBLY COMPLETE