

```

1 *
2 *
3 *      70/620 TEST EXECUTIVE=PRELIM. TESTS
4 *      AND PAPER TAPE LOADER
5 *
6 *      ****  ****  ***** *      *** * *
7 *      *  *  *  *  *  *      *  ** **
8 *      *  *  *  *  *  *      *  *  **
9 *      ****  ****  ***  *      *  *  **
10 *     *  *  *  *  *  *      *  *  **
11 *     *  *  *  *  *  *      *  *  **
12 *     *  *  *  ****  *****  *** * *
13 *
14 *

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15 *      THIS LISTING CONTAINS A PRELIMINARY INSTRUCTION TEST AND A
16 *      PRELIMINARY MEMORY TEST FOR THE 70/620 COMPUTER.
17 *

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18 *      INSTRUCTION TEST
19 *      ONLY A BASIC SET OF INSTRUCTIONS ARE TESTED TO GAIN CONFIDENCE
20 *      THAT STANDARD TEST PROGRAMS CAN BE LOADED.
21 *      MOST OF THE SUBTESTS BUILT FROM PRECEDING SUBTESTS AND ASSUME
22 *      THAT THE INSTRUCTIONS USED PREVIOUSLY ARE WORKING.
23 *

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24 *      MEMORY TEST
25 *      LOCATIONS EMDB - 017777 ARE EXERCISED WITH THE
26 *      ORIGINAL CONTENTS RESTORED. LOCATIONS 0 - EMDB
27 *      ARE DESTROYED BY THE MEMORY TEST ROUTINE.
28 *

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29 *      SWITCHES
30 *      USE S82 TO LOOP ON ERROR AFTER HALT
31 *      USE S83 TO LOOP ON BOTH PRELIMINARY TESTS
32 *

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33 *      LOADER
34 *      THE BINARY LOADER WILL ADAPT TO THE BOOTSTRAP
35 *      AND LOAD/EXEC THE NEXT PROGRAM.
36 *
37 *
38 *

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39 *
40 *
41 *
42 *
43 *
44 *
45 *
46 *

```

INSTRUCTION TEST

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47 *
48 *
49 *      007000      ORG      07000      ORIGIN FOR ABL
50 *
007000 001000 A 51      JMP      ROFF
007001 007711 A
007002 005001 A 52 ENST  TZA
007003 001010 A 53      JAZ      ENA1
007004 007012 A
007005 001200 A 54 ENA0  JSS2  ENST
007006 007002 A
007007 000001 A 55      HLT      01      ERROR--TZA/DAR/JAZ/JAN
007010 001000 A 56      JMP      ENB0
007011 007027 A
007012 005311 A 57 ENA1  DAR
007013 054612 A 58      STA      ONES
007014 001004 A 59      JAN      ENA2
007015 007020 A
007016 001000 A 60      JMP      ENA0
007017 007005 A
007020 014605 A 61 ENA2  LDA      ONES
007021 005111 A 62      IAR
007022 001010 A 63      JAZ      ENB0
007023 007027 A
007024 001200 A 64      JSS2  ENA2
007025 007020 A
007026 000002 A 65      HLT      02      ERROR--LDA/IAR/STA
66 *
67 *
68 *
007027 024576 A 69 ENB0  LDB      ONES
007030 001020 A 70      JBZ      ENB1
007031 007035 A
007032 005002 A 71      TZR
007033 001020 A 72      JBZ      ENB2
007034 007040 A
007035 001200 A 73 ENB1  JSS2  ENB0
007036 007027 A
007037 000003 A 74      HLT      3      ERROR--LDB/JBZ/TZR
007040 005122 A 75 ENB2  IBR
007041 001020 A 76      JBZ      ENB3
007042 007046 A
007043 005322 A 77      DBR
007044 001020 A 78      JBZ      ENCO
007045 007051 A
007046 001200 A 79 ENB3  JSS2  ENB0
007047 007027 A
007050 000004 A 80      HLT      4      ERROR--IBR/DBR
81 *

```

			82 *						
			83 *						
007051	034554	A	84 ENCO	LOX	ONES				
007052	001040	A	85	JXZ	ENC1				
007053	007057	A							
007054	005004	A	86	TZX					
007055	001040	A	87	JXZ	ENC2		CONTINUE		
007056	007062	A							
007057	001200	A	88 ENC1	J882	ENCO				
007060	007051	A							
007061	000005	A	89	HLT	5		ERROR--LDX/JXZ/TZX		
007062	005144	A	90 ENC2	IXR					
007063	001040	A	91	JXZ	ENC3				
007064	007070	A							
007065	005344	A	92	DXR					
007066	001040	A	93	JXZ	ENCO		CONTINUE		
007067	007073	A							
007070	001200	A	94 ENC3	J882	ENCO				
007071	007051	A							
007072	000006	A	95	HLT	6		ERROR--IXR/DXR		
			96 *						
			97 *						
			98 *						
007073	014532	A	99 ENDO	LDA	ONES				
007074	054002	A	100	STA	**3				
007075	005001	A	101	TZA					
007076	006010	A	102	LDAI	1		(ALL ONES)		
007077	000001	A							
007100	001010	A	103	JAZ	END1				
007101	007104	A							
007102	001004	A	104	JAN	END2		CONTINUE		
007103	007107	A							
007104	001200	A	105 END1	J882	ENCO				
007105	007073	A							
007106	000007	A	106	HLT	7		ERROR--LDAI/JAN		
			107 *						
007107	134516	A	108 END2	ERA	ONES				
007110	001004	A	109	JAN	END3				
007111	007114	A							
007112	001010	A	110	JAZ	ENE0		CONTINUE		
007113	007117	A							
007114	001200	A	111 END3	J882	ENCO				
007115	007073	A							
007116	000010	A	112	HLT	010		ERROR--LDAI/ERA/JAN		
			113 *						
			114 *						
			115 *						
007117	014506	A	116 ENE0	LDA	ONES				
007120	054002	A	117	STA	**3				
007121	005001	A	118	TZA					
007122	006130	A	119	ERAI	1		(ALL ONES)		
007123	000001	A							
007124	001002	A	120	JAP	ENE1				
007125	007131	A							
007126	134477	A	121	ERA	ONES				
007127	001002	A	122	JAP	ENFO		CONTINUE		
007130	007134	A							
007131	001200	A	123 ENE1	J882	ENE0				
007132	007117	A							
007133	000011	A	124	HLT	011		ERROR--ERAI/JAP		
			125 *						
			126 *						
			127 *						
007134	014471	A	128 ENFO	LDA	ONES				
007135	054002	A	129	STA	**3				
007136	005002	A	130	TZR					
007137	006020	A	131	LDBI	1		(ALL ONES)		
007140	000001	A							
007141	005021	A	132	TBA					
007142	001002	A	133	JAP	ENF1				
007143	007147	A							
007144	134461	A	134	ERA	ONES				
007145	001010	A	135	JAZ	ENGO		CONTINUE		
007146	007152	A							
007147	001200	A	136 ENF1	J882	ENFO				
007150	007134	A							
007151	000012	A	137	HLT	012		ERROR--LDBI/TBA		
			138 *						
			139 *						
			140 *						
007152	014453	A	141 ENGO	LDA	ONES				
007153	054002	A	142	STA	**3				
007154	005001	A	143	TZA					
007155	006030	A	144	LDXI	1		(ALL ONES)		
007156	000001	A							
007157	005041	A	145	TXA					
007160	001002	A	146	JAP	ENG1				
007161	007165	A							
007162	134443	A	147	ERA	ONES				
007163	001010	A	148	JAZ	ENHO		CONTINUE		
007164	007170	A							
007165	001200	A	149 ENG1	J882	ENGO				
007166	007152	A							
007167	000013	A	150	HLT	013		ERROR--LDXI/TXA		
			151 *						

			152 *						
			153 *						
007170	024434	A	154	ENH0	LDB	D125		CONSTANT=125252	
007171	005024	A	155		TBX				
007172	001040	A	156		JXZ	ENH1			
007173	007200	A							
007174	005041	A	157		TXA				
007175	134427	A	158		ERA	D125			
007176	001010	A	159		JAZ	ENI0		CONTINUE	
007177	007203	A							
007200	001200	A	160	ENH1	JSS2	ENH0			
007201	007170	A							
007202	000014	A	161		HLT	014		ERROR==LDB/TBX	
			162 *						
			163 *						
			164 *						
007203	014420	A	165	ENI0	LDA	D052		CONSTANT=052525	
007204	134417	A	166		ERA	D052			
007205	001010	A	167		JAZ	ENI1		CONTINUE	
007206	007212	A							
007207	001200	A	168		JSS2	ENI0			
007210	007203	A							
007211	000015	A	169		HLT	015		ERROR==LDA/ERA	
			170 *						
007212	014412	A	171	ENI1	LDA	D125		CONSTANT=125252	
007213	054413	A	172		STA	T801		TEMP STORE	
007214	005001	A	173		TZA				
007215	014411	A	174		LDA	T801			
007216	001010	A	175		JAZ	ENI2			
007217	007223	A							
007220	134404	A	176		ERA	D125			
007221	001010	A	177		JAZ	ENJ0		CONTINUE	
007222	007226	A							
007223	001200	A	178	ENI2	JSS2	ENI1			
007224	007212	A							
007225	000016	A	179		HLT	016		ERROR==LDA/STA	
			180 *						
			181 *						
			182 *						
007226	024375	A	183	ENJ0	LDB	D052		CONSTANT=052525	
007227	064377	A	184		STB	T801		TEMP STORE	
007230	024376	A	185		LDB	T801			
007231	005021	A	186		TBA				
007232	134371	A	187		ERA	D052			
007233	001010	A	188		JAZ	ENK0		CONTINUE	
007234	007240	A							
007235	001200	A	189		JSS2	ENJ0			
007236	007226	A							
007237	000017	A	190		HLT	017		ERROR==LDB/STB	
			191 *						
			192 *						
			193 *						
007240	034363	A	194	ENK0	LDX	D052		CONSTANT=052525	
007241	074365	A	195		STX	T801		TEMP STORE	
007242	034364	A	196		LDX	T801			
007243	005041	A	197		TXA				
007244	134357	A	198		ERA	D052			
007245	001010	A	199		JAZ	ENL0		CONTINUE	
007246	007252	A							
007247	001200	A	200		JSS2	ENK0			
007250	007240	A							
007251	000020	A	201		HLT	020		ERROR==LDX/STX	
			202 *						
			203 *						
			204 *						
007252	005111	A	205	ENL0	IAR				
007253	005001	A	206		TZA				
007254	005002	A	207		TZB				
007255	003010	A	208		XAZ	ENL0			
007256	007252	A							
007257	006130	A	209		ERAI	1			
007260	000001	A							
007261	001010	A	210		JAZ	ENL1		CONTINUE	
007262	007266	A							
007263	001200	A	211		JSS2	ENL0			
007264	007252	A							
007265	000021	A	212		HLT	021		ERROR==XAZ	
			213 *						
007266	014337	A	214	ENL1	LDA	ONES			
007267	003020	A	215		XBZ	ENL0			
007270	007252	A							
007271	001010	A	216		JAZ	ENM0		CONTINUE	
007272	007276	A							
007273	001200	A	217		JSS2	ENL0			
007274	007252	A							
007275	000022	A	218		HLT	022		ERROR==XBZ	
			219 *						
			220 *						
			221 *						
007276	007400	A	222	ENM0	ROF				
007277	001001	A	223		JDF	ENM1			
007300	007304	A							
007301	007401	A	224		SOF				
007302	001001	A	225		JDF	ENM2			
007303	007307	A							

007304	001200	A	226	ENM1	JSS2	ENM0	
007305	007276	A					
007306	000023	A	227		HLT	023	ERROR--ROF/SOF/JOF
			228 *				
007307	007400	A	229	ENM2	ROF		
007310	001001	A	230		JOF	ENM3	
007311	007314	A					
007312	001000	A	231		JMP	ENM0	CONTINUE
007313	007317	A					
007314	001200	A	232	ENM3	JSS2	ENM2	
007315	007307	A					
007316	000024	A	233		HLT	024	ERROR--ROF/JOF/JMP
			234 *				
			235 *				
			236 *				
007317	014306	A	237	ENM0	LDA	ONES	
007320	002000	A	238		JMPM	ENM1	
007321	007331	A					
007322	001010	A	239		JAZ	ENM5	CONTINUE
007323	007336	A					
007324	001200	A	240		JSS2	ENM0	
007325	007317	A					
007326	000025	A	241		HLT	025	ERROR--JMPM/JMP*
007327	001000	A	242		JMP	ENM5	
007330	007336	A					
			243 *				
007331	000007	A	244	ENM1	DATA	7	ENTR = NONZERO
007332	005001	A	245		TZA		
007333	001000	A	246		JMP*	ENM1	
007334	107331	A					
007335	000026	A	247		HLT	026	ERROR--JMP*
			248 *				
007336	014265	A	249	ENM5	LDA	D052	
007337	004261	A	250		LRLA	17	A=125252
007340	134264	A	251		ERA	D125	
007341	001010	A	252		JAZ	ENM6	
007342	007346	A					
007343	001200	A	253		JSS2	ENM5	
007344	007336	A					
007345	000027	A	254		HLT	027	ERROR--LRLA
			255 *				
007346	005002	A	256	ENM6	TZB		
007347	014254	A	257		LDA	D052	
007350	004557	A	258		LLSR	15	A=0 B=125252
007351	001010	A	259		JAZ	ENM7	
007352	007356	A					
007353	001200	A	260		JSS2	ENM6	
007354	007346	A					
007355	000030	A	261		HLT	030	ERROR--LLSR
			262 *				
007356	005021	A	263	ENM7	TBA		
007357	134245	A	264		ERA	D125	
007360	001010	A	265		JAZ	ENM8	CONTINUE
007361	007365	A					
007362	001200	A	266		JSS2	ENM6	
007363	007346	A					
007364	000031	A	267		HLT	031	ERROR--LLSR
			268 *				
			269 *				
007365	004457	A	270	ENM8	LLRL	15	A=052525 B=0
007366	134235	A	271		ERA	D052	
007367	001010	A	272		JAZ	ENM9	
007370	007374	A					
007371	001200	A	273		JSS2	ENM6	
007372	007346	A					
007373	000032	A	274		HLT	032	ERROR--LLRL
			275 *				
007374	005021	A	276	ENM9	TBA		
007375	001010	A	277		JAZ	ENM0	
007376	007402	A					
007377	001200	A	278		JSS2	ENM6	
007400	007346	A					
007401	000033	A	279		HLT	033	ERROR--LLRL
			280 *				
			281 *				
			282 *				
007402	014220	A	283	ENM0	LDA	D001	
007403	124222	A	284		ADD	ONES	
007404	001010	A	285		JAZ	ENM1	OK
007405	007411	A					
007406	001200	A	286		JSS2	ENM0	
007407	007402	A					
007410	000034	A	287		HLT	034	ERROR--ADD
007411	006120	A	288	ENM1	ADDI	017777	
007412	177777	A					
007413	006110	A	289		ORAI	017777	
007414	177777	A					
007415	006130	A	290		ERAI	017777	
007416	177777	A					
007417	001010	A	291		JAZ	ENM0	CONTINUE
007420	007424	A					
007421	001200	A	292		JSS2	ENM0	
007422	007402	A					
007423	000035	A	293		HLT	035	ERROR--ADDI/ORAI
			294 *				

007424	014177	A	295 *					
			296 ENQ0	LDA	0052	CONSTANT=052525		
007425	144176	A	297	SUB	0052			
007426	001010	A	298	JAZ	ENR0	CONTINUE		
007427	007433	A						
007430	001200	A	299	J8S2	ENQ0			
007431	007424	A						
007432	000036	A	300	HLT	036	ERROR--SUB		
			301 *					
			302 *					
			303 *					
007433	005001	A	304 ENR0	TZA				
007434	054172	A	305	STA	T801			
007435	014171	A	306	LDA	T801			
007436	005000	A	307	NOP				
007437	001010	A	308	JAZ	ENS0			
007440	007444	A						
007441	001200	A	309	J8S2	ENR0			
007442	007433	A						
007443	000037	A	310	HLT	037	ERROR--NOP		
			311 *					
			312 *					
			313 *					
007444	014161	A	314 ENS0	LDA	0NES			
007445	024160	A	315	LDB	0NES			
007446	005103	A	316	INCR	03			
007447	005311	A	317	DAR				
007450	005322	A	318	DBR				
007451	001010	A	319	JAZ	ENS2			
007452	007460	A						
007453	001200	A	320 ENS1	J8S2	ENS0			
007454	007444	A						
007455	000040	A	321	HLT	040	ERROR--INCR 03		
007456	001000	A	322	JMP	ENT0			
007457	007464	A						
007460	001020	A	323 ENS2	JBZ	ENT0			
007461	007464	A						
007462	001000	A	324	JMP	ENS1			
007463	007453	A						
			325 *					
			326 *					
			327 *					
007464	005002	A	328 ENTO	TZB				
007465	005302	A	329	DECR	02			
007466	005021	A	330	TBA				
007467	134136	A	331	ERA	0NES			
007470	001010	A	332	JAZ	ENU0			
007471	007475	A						
007472	001200	A	333	J8S2	ENT0			
007473	007464	A						
007474	000041	A	334	HLT	041	ERROR--DECR 02		
			335 *					
			336 *					
			337 *					
007475	005103	A	338 ENU0	INCR	03			
007476	005122	A	339	IRR				
007477	005032	A	340	MERG	032			
007500	005021	A	341	TBA				
007501	006130	A	342	ERAI	03			
007502	000003	A						
007503	001010	A	343	JAZ	ENV0			
007504	007510	A						
007505	001200	A	344	J8S2	ENU0			
007506	007475	A						
007507	000042	A	345	HLT	042	ERROR--MERG 032		
			346 *					
			347 *					
			348 *					
007510	006010	A	349 ENVO	LDAI	0100			
007511	000100	A						
007512	004346	A	350	LSRA	6			
007513	005311	A	351	DAR				
007514	001010	A	352	JAZ	ENW0			
007515	007521	A						
007516	001200	A	353	J8S2	ENVO			
007517	007510	A						
007520	000043	A	354	HLT	043	ERROR--LSRA 6		
			355 *					
			356 *					
			357 *					
007521	006030	A	358 ENW0	LDXI	0125			
007522	007625	A						
007523	005001	A	359	TZA				
007524	015000	A	360	LDA	0,1			
007525	134077	A	361	ERA	0125			
007526	001010	A	362	JAZ	ENX0			
007527	007533	A						
007530	001200	A	363	J8S2	ENW0			
007531	007521	A						
007532	000044	A	364	HLT	044	ERROR--LDA 0,1		
			365 *					
			366 *					
			367 *					
007533	005001	A	368 ENX0	TZA				
007534	054072	A	369	STA	TS01			

007535	006030	A	370	LDXI	TS01	
007536	007627	A				
007537	014065	A	371	LDA	D125	
007540	055000	A	372	STA	0,1	
007541	134065	A	373	ERA	TS01	
007542	001010	A	374	JAZ	ENY0	
007543	007547	A				
007544	001200	A	375	JSS2	ENX0	
007545	007533	A				
007546	000045	A	376	HLT	045	ERROR--STA 0,1
			377 *			
			378 *			
			379 *			
007547	014056	A	380	ENY0 LDA	ONES	
007550	006150	A	381	ANAI	0125252	
007551	125252	A				
007552	134052	A	382	ERA	D125	
007553	001010	A	383	JAZ	ENZ0	
007554	007560	A				
007555	001200	A	384	JSS2	ENY0	
007556	007547	A				
007557	000046	A	385	HLT	046	ERROR--ANAI
			386 *			
			387 *			
			388 *			
007560	014044	A	389	ENZ0 LDA	D125	
007561	006050	A	390	STAI	01	
007562	000001	A				
007563	006030	A	391	LDXI	*-1	
007564	007562	A				
007565	015000	A	392	LDA	0,1	
007566	134036	A	393	ERA	D125	
007567	001010	A	394	JAZ	EN10	
007570	007574	A				
007571	001200	A	395	JSS2	ENZ0	
007572	007560	A				
007573	000047	A	396	HLT	047	ERROR--STAI
			397 *			
			398 *			
			399 *			
007574	005003	A	400	EN10 MERG	03	
007575	003022	A	401	XIF	022,EN11	
007576	007604	A				
007577	001004	A	402	JAN	EN20	
007600	007605	A				
007601	001200	A	403	JSS2	EN10	
007602	007574	A				
007603	000050	A	404	HLT	050	ERROR--XIF 022
007604	005311	A	405	EN11 DAR		
			406 *			
			407 *			
			408 *			
007605	005001	A	409	EN20 TZA		
007606	007401	A	410	SOF		
007607	001011	A	411	JIF	011,EN22	
007610	007616	A				
007611	001200	A	412	EN21 JSS2	ENCV	
007612	007605	A				
007613	000051	A	413	HLT	051	ERROR--JIF 011
007614	001000	A	414	JMP	EMEM	
007615	007630	A				
007616	007400	A	415	EN22 RDF		
007617	001011	A	416	JIF	011,EN21	
007620	007611	A				
007621	001000	A	417	JMP	EMEM	START OF PRELIMINARY MEMORY TEST
007622	007630	A				
			418 *			
			419 *			
			420 *			
			421 *		DATA TABLE	
			422 *			
007623	000001	A	423	D001 DATA	1	
007624	052525	A	424	D052 DATA	052525	
007625	125252	A	425	D125 DATA	0125252	
007626	000001	A	426	ONES DATA	1	WILL BE MADE ALL ONES
007627	000007	A	427	TS01 DATA	7	TEMP, STORAGE. 7 FOR NON-ZERO BOOTSTRAP
			428 *			FORMAT
			429 *			
			430 *		PRELIMINARY MEMORY TEST	
			431 *			
			432 *		TESTS LOCS, EMDB = 017777 WITH 052525 AND 0125252 PATTERNS	
			433 *		ORIGINAL CONTENTS ARE SAVED AND RESTORED.	
			434 *			
007630	006030	A	435	EMEM LDXI	MEM2+2	START OF TEST ROUTINE
007631	007645	A				
007632	005002	A	436	TZB		TARGET LOCATION
007633	015000	A	437	MEM1 LDA	0,1	
007634	056000	A	438	STA	0,2	
007635	005144	A	439	IXR		
007636	005123	A	440	INCR	023	
007637	006140	A	441	SUBI	EMDB+1	
007640	000044	A				
007641	001010	A	442	JAZ	1	
007642	000001	A				
007643	001000	A	443	MEM2 JMP	MEM1	

007644	007633	A			LOC	0		
000000			444	EMTS	DATA	1	TEMPORARY STORAGE	
000001	005002	A	446		TZR			
000002	006030	A	447	EME1	LDXI	EMDB	START LOCATION FOR MEMORY TEST	
000003	000043	A						
000004	015000	A	448	EME2	LDA	0,1		
000005	050000	A	449		STA	EMTS	SAVE CURRENT CONTENTS	
000006	010042	A	450	EME3	LDA	EMDC	CURRENT TEST PATTERN	
000007	055000	A	451		STA	0,1	STORE IT	
000010	005001	A	452		TZA			
000011	015000	A	453		LDA	0,1		
000012	130042	A	454		ERA	EMDC	COMP+RE WORD STORED WITH WORD READ	
000013	001010	A	455		JAZ	**5		
000014	000020	A						
000015	001200	A	456	JSS2	EME3		LOOP ON ERROR	
000016	000006	A						
000017	000077	A	457	HLT	077		COMPARE ERROR HALT	
000020	010000	A	458	LDA	EMTS			
000021	055000	A	459		STA	0,1	RESTORE ORIGINAL CONTENTS	
000022	005145	A	460	INCR	045			
000023	006150	A	461	ANAI	020000			
000024	020000	A						
000025	001010	A	462	JAZ	EME2		GO TO NEXT LOCATION	
000026	000004	A						
000027	001020	A	463	JBZ	EME4			
000030	000035	A						
000031	001400	A	464	JSS3	ENST		REPEAT TESTS	
000032	007002	A						
000033	001000	A	465	JMP	BEGIN		GO MODIFY LOADER	
000034	007742	A						
000035	010043	A	466	EME4	LDA	EMDB		
000036	050042	A	467		STA	EMDC	0125252 DATA PATTERN	
000037	005122	A	468		IBR			
000040	001000	A	469	JMP	EME1		LOOP THRU MEMORY	
000041	000002	A						
000042	052525	A	470	EMDC	DATA	052525	FIRST DATA PATTERN	
000043	125252	A	471	EMDB	DATA	0125252	SECOND DATA PATTERN	
007711			472		LOC	MEM2+EMDB+3		
			473 *					
			474 *					
			475 *					
			476 *					PAPER TAPE
			477 *					
007711	010213	A	478	ROFF	LDA	0213	TURN READER OFF	
007712	004546	A	479		LLSR	6	*	
007713	005001	A	480		TZA		*	
007714	004542	A	481		LLSR	2	*	
007715	005111	A	482		IAR		*	
007716	004547	A	483		LLSR	7	*	
007717	005111	A	484		IAR		*	
007720	004457	A	485		LLRL	15	*	
007721	054000	A	486		STA	**1	*	
007722	100400	A	487		SEL	0400	* TURN OFF HSPT	
007723	004546	A	488		LLSR	6	*	
007724	005101	A	489		INCR	01	*	
007725	004543	A	490		LLSR	3	*	
007726	005111	A	491		IAR		*	
007727	004541	A	492		LLSR	1	*	
007730	005111	A	493		IAR		*	
007731	004545	A	494		LLSR	5	*	
007732	005111	A	495		IAR		*	
007733	004457	A	496		LLRL	15	*	
007734	054001	A	497		STA	**2	*	
007735	014003	A	498		LDA	BEGIN-1	*	
007736	103100	A	499		OAR	00	* TURN OFF TTY	
007737	001000	A	500		JMP	ENST	*	
007740	007002	A						
007741	000223	A	501		DATA	0223	*****	
			502 *				UPDATE LOADER TO TYPE OF INPUT	
007742	006020	A	503	BEGIN	LDBI	CONT		
007743	010004	A						
007744	010213	A	504		LDA	0213		
007745	006150	A	505		ANAI	077		
007746	000077	A						
007747	050474	A	506		STA	0474		
007750	010213	A	507		LDA	0213		
007751	006150	A	508		ANAI	0100		
007752	000100	A						
007753	001010	A	509	JAZ	**4			
007754	007757	A						
007755	006020	A	510	LDBI	CONT+9			
007756	010015	A						
007757	006030	A	511	LDXI	END+3			
007760	010041	A						
007761	074003	A	512	STX	**4			
007762	034002	A	513	LDX	**3			
007763	015000	A	514	LDA	0,1			
007764	006050	A	515	STAI	1			
007765	000001	A						
007766	005341	A	516	DECR	041			
007767	001010	A	517	JAZ	BEG1			
007770	007776	A						
007771	016000	A	518	LDA	0,2			
007772	055000	A	519	STA	0,1			

007773	005122	A	520	IBR				
007774	001000	A	521	JMP	**=10			
007775	007762	A						
007776	006010	A	522	BEG1	LDAI	LOAD		
007777	010057	A						
010000	054027	A	523	STA	LHLT+2			
010001	005101	A	524	INCR	01			
010002	001000	A	525	JMP	LHLT+1			
010003	010027	A						
	010004	A	526	CONT	EGU	*		
			527	*				
010026			528	ORG	CONT+18			
010026	000007	A	529	LHLT	MLT	7	OPERATOR SETS MODE	
010027	002000	A	530	CALL	ROFF-1		RDR OFF /// WILL = (LOAD)	
010030	007710	A						
010031	001000	A	531	JMP	**=3		HALT FOR OPERATOR	
010032	010026	A						
			532	*				
			533	*	BINARY LOAD ROUTINE			
			534	*				
010033	007400	A	535	ROF	ROF			
010034	005002	A	536	TZB	TZB			
010035	074002	A	537	STX	DATA	074002	= ,STX ,LOAD	
010036	014142	A	538	END	LDA	CKBM		
010037	001011	A	539	JIF	011,LRCO		(GOOD LOAD RCD)	
010040	010064	A						
010041	010042	A	540	DATA	**+1,**+1,**+1		READER OFF	
010042	010043	A						
010043	010044	A						
010044	010061	A	541	DATA	LOAD+2			
010045	005302	A	542	DECR	2			
010046	003010	A	543	XAZ	TZB			
010047	010034	A						
010050	014132	A	544	LDA	MODE			
010051	001010	A	545	JAZ	**+4			
010052	010055	A						
010053	003022	A	546	XIF	022,STX		SET RETURN IF GOOD EXEC RCD	
010054	010035	A						
010055	034124	A	547	LDX	FRST		SET LAST ADDR READ	
010056	001000	A	548	JMP	*		RETURN,OR EXECUTE PROGRAM	
010057	010056	A						
			549	*			INIT SET TO PRELIM TEST	
010057			550	LOAD	BES	0	*ENTRY POINT	
010060	054122	A	551	STA	MODE		SAVE LOAD MODE	
010061	010062	A	552	DATA	**+1,**+1,IN		READER ON	
010062	010063	A						
010063	010157	A						
010064	007401	A	553	LRCO	SOF		*LOAD A RCD	
010065	002000	A	554	CALL	INPT		FIND RCD MARK	
010066	010161	A						
010067	004547	A	555	LLSR	7		LOOK FOR LEADER	
010070	001010	A	556	JAZ	**=3		*	
010071	010065	A						
010072	002000	A	557	CALL	INPT		*	
010073	010161	A						
010074	001010	A	558	JAZ	**+4			
010075	010100	A						
010076	001000	A	559	JMP	**=4		*	
010077	010072	A						
010100	054100	A	560	STA	CKBM		RESET CHECKSUM	
010101	002000	A	561	CALL	LWRD		GET RCD LENGTH	
010102	010130	A						
010103	064100	A	562	STB	RCOL		IF 0	
010104	003020	A	563	XBZ	ROF		SET EXEC FLAG	
010105	010033	A						
010106	002000	A	564	CALL	LWRD		GET ADDR	
010107	010130	A						
010110	005024	A	565	TRX				
010111	064070	A	566	STB	FRST		SAVE ADDR	
010112	002000	A	567	LDATA	CALL	LWRD	GET DATA OR CHECKSUM	
010113	010130	A						
010114	014067	A	568	LDA	RCOL			
010115	001010	A	569	JAZ	END		(END OF RCD)	
010116	010036	A						
010117	005311	A	570	DAR				
010120	054063	A	571	STA	RCOL		COUNT WORDS READ	
010121	014061	A	572	LDA	MODE			
010122	001004	A	573	JAN	**+3			
010123	010125	A						
010124	065000	A	574	STB	0,1			
010125	005144	A	575	IXR			SET NEXT ADDR	
010126	001000	A	576	JMP	LDATA			
010127	010112	A						
			577	*				
			578	*	READ AND CHECKSUM BINARY WORD			
			579	*				
010130	000007	A	580	LWRD	DATA	7	ENTR POINT, DATA FOR LOADING PURPOSES ONLY	
010131	005103	A	581	INCR	3			
010132	005111	A	582	IAR				
010133	054044	A	583	LWR1	STA	TEMP	SET LOOP COUNTER	
010134	002000	A	584	CALL	INPT		GET SIX BITS	
010135	010161	A						
010136	144036	A	585	SUB	K40		REMOVE CODE	
010137	134035	A	586	ERA	K40			
010140	004005	A	587	ASLB	5			

010141	004041	A	588	LRLB	1			
010142	005032	A	589	MERG	032	ASSEMBLE DATA WORD		
010143	004346	A	590	LSRA	6			
010144	005311	A	591	DAR				
010145	001002	A	592	JAP	END+3	ERROR		
010146	010041	A						
010147	124030	A	593	ADD	TEMP			
010150	001002	A	594	JAP	LWR1			
010151	010133	A						
010152	005021	A	595	TBA				
010153	134025	A	596	ERA	CKSM	CALCULATE CHECKSUM		
010154	054024	A	597	STA	CKSM			
010155	001000	A	598	JMP*	LWRD			
010156	110130	A						
			599 *					
			600 *	INPUT PAPER TAPE				
			601 *					
010157	010162	A	602	IN DATA	INPT+1	CIA		
010160	001000	A	603	JMP	*	RETURN		
010161	010160	A						
010161			604	INPT	BES	0	*ENTRY	
010162	000001	A	605	DATA	1,IN	SEN IBFR RDY		
010163	010157	A						
010164	001000	A	606	JMP	**2			
010165	010162	A						
010166	103101	A	607	OUT	DAR	01		
010167	001000	A	608	JMP	*			
010170	010167	A						
010170			609	OTPT	BES	0		
010171	101101	A	610	SEN	0101,OUT			
010172	010166	A						
010173	001000	A	611	JMP	**2			
010174	010171	A						
			612 *					
010175	000040	A	613	K40	DATA	040		
010176	000221	A	614	XON	DATA	0221	READER ON	
010177	000223	A	615	XOFF	DATA	0223	READER OFF	
010200	000001	A	616	TEMP	DATA	1		
010201	000000	A	617	CKSM	DATA	0	LOAD CHECKSUM	
	010202	A	618	ELDR	EGU	*	END OF LOADER	
010202			619	FRST	BSS	1	INITIAL DUMP ADDR	
010203			620	MODE	BSS	1		
010204			621	RCDL	BSS	1	RCD LENGTH	
			622 *				RELOCATED INSTRUCTIONS	
010004			623	ORG	CONT			
010041			624	LOC	END+3			
010041	014135	A	625	I001	LDA	XOFF	READER OFF	*** TTY DA=01
010042	002000	A	626	CALL	OTPT	*		
010043	010170	A						
010044	014134	A	627	LDA	CKSM	*		
010010			628	ORG	CONT+4			
010061			629	LOC	LOAD+2			
010061	014114	A	630	LDA	XON		READER ON	
010062	002000	A	631	CALL	OTPT	*		
010063	010170	A						
010064	102501	A	632	CIA	01		INPUT TO (A)	
010065	101201	A	633	DATA	0101201		SEN IBFR RDY	
010015			634	ORG	CONT+9			
010041			635	LOC	END+3			
010041	100437	A	636	I037	SEL	0437	READER OFF	*** HSPT DA=37
010042	005000	A	637	NOP		*		
010043	005000	A	638	NOP		*		
010044	005000	A	639	NOP		*		
010021			640	ORG	CONT+13			
010061			641	LOC	LOAD+2			
010061	100537	A	642	SEL	0537		READER ON	
010062	005000	A	643	NOP		*		
010063	005000	A	644	NOP		*		
010064	102537	A	645	CIA	037		INPUT TO (A)	
010065	101537	A	646	DATA	0101537		SEN IBFR RDY	
			648 *					
			649 *	PRELIMINARY DUMPER				
			650 *					
010202			651	ORG	CKSM+1			
010202	006030	A	652	DUMP	LDXI	07000		
010203	007000	A						
010204	015000	A	653	D1	LDA	0,1		
010205	004354	A	654	LSRA	12			
010206	002000	A	655	CALL	D4			
010207	010224	A						
010210	015000	A	656	LDA	0,1			
010211	004346	A	657	LSRA	6			
010212	002000	A	658	CALL	D4			
010213	010224	A						
010214	015000	A	659	D2	LDA	0,1		
010215	002000	A	660	CALL	D4			
010216	010224	A						
010217	015000	A	661	D3	LDA	0,1		
010220	005144	A	662	IXR				
010221	001016	A	663	JANZ	D1			
010222	010204	A						
010223	000000	A	664	HLT				
010224	000000	A	665	D4	ENTR			
010225	006150	A	666	ANAI	077			
010226	000077	A						

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010227 134001 A 667 ERA 040
010230 006120 A 668 ADDI 040
010231 000040 A
010231 A 669 040 EQU **=1
010232 101537 A 670 D5 SEN 0537,D6
010233 010236 A
010234 001000 A 671 JMP D5
010235 010232 A
010236 103137 A 672 D6 DAR 037
010237 001000 A 673 JMP* D4
010240 110224 A
        674 *
010202 A 675 END DUMP
    
```

ENTRY NAMES
EXTERNAL NAMES
SYMBOLS

```

007776 A BEG1 007742 A BEGIN 010201 A CKSM 010004 A CONT
007623 A D001 007624 A D052 010204 A D1 007625 A D125
010214 A D2 010217 A D3 010224 A D4 010232 A D5
010236 A D6 010202 A DUMP 010202 A ELDR 000043 A EMDB
000042 A EMDC 000002 A EME1 000004 A EME2 000006 A EME3
000035 A EME4 007630 A EMEM 000000 A EMTS 007574 A EN10
007604 A EN11 007605 A EN20 007611 A EN21 007616 A EN22
007005 A ENA0 007012 A ENA1 007020 A ENA2 007027 A ENB0
007035 A ENB1 007040 A ENB2 007046 A ENB3 007051 A ENC0
007057 A ENC1 007062 A ENC2 007070 A ENC3 010036 A END
007073 A ENDO 007104 A END1 007107 A END2 007114 A END3
007117 A ENE0 007131 A ENE1 007134 A ENF0 007147 A ENF1
007152 A ENGO 007165 A ENG1 007170 A ENH0 007200 A ENH1
007203 A ENI0 007212 A ENI1 007223 A ENI2 007226 A ENJ0
007240 A ENK0 007252 A ENL0 007266 A ENL1 007276 A ENM0
007304 A ENM1 007307 A ENM2 007314 A ENM3 007317 A ENN0
007331 A ENN1 007336 A ENO5 007346 A ENO6 007356 A ENO7
007365 A ENO8 007374 A ENO9 007402 A ENP0 007411 A ENP1
007424 A ENQ0 007433 A ENR0 007444 A ENS0 007453 A ENS1
007460 A ENS2 007002 A ENST 007464 A ENT0 007475 A ENU0
007510 A ENV0 007521 A ENW0 007533 A ENX0 007547 A ENY0
007560 A ENZ0 010202 A FRST 010157 A IN 010161 A INPT
010041 A IO01 010041 A IO37 010175 A K40 010112 A LDATA
010026 A LHLT 010057 A LOAD 010064 A LRCD 010133 A LWR1
010130 A LWRD 007633 A MEM1 007643 A MEM2 010203 A MODE
010231 A O40 007626 A ONES 010170 A DTPT 010166 A OUT
010204 A RCDL 010033 A ROF 007711 A ROFF 010035 A STX
010200 A TEMP 007627 A TS01 010034 A TZB 010177 A XOFF
010176 A XON
    
```

0 ERRORS ASSEMBLY COMPLETE

LITERALS
POINTERS

** UNREFERENCED SYMBOLS **

659 D2 661 D3 618 ELDR 625 I001 636 I037

** PROGRAM / SUBROUTINE ENTRY POINTS **

```

665 D4 -LD= 655 658 660 673
244 ENN1 -LD= 238 246
804 INP1 -LD= 554 557 504 502
580 LWRD -LD= 561 564 567 598
609 DTPT -LD= 626 631
478 ROFF -LD= 51 530
    
```

** REFERENCED SYMBOLS **

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522 BEG1 -LD= 517
503 BEGIN -LD= 465 498
617 CKSM -ST= 560 597 -LD= 538 596 627 651
526 CONT -LD= 503 510 528 623 628 634 640
423 D001 -LD= 283
424 D052 -LD= 165 166 183 187 194 198 249 257 271 296 297
653 D1 -LD= 663
425 D125 -LD= 154 158 171 176 251 264 358 361 371 382 389 393
665 D4 -LD= 655 658 660 673
670 D5 -LD= 671
672 D6 -LD= 670
652 DUMP -LD= 675
471 EMDB -LD= 441 447 466 472
470 EMDC -ST= 467 -LD= 450 454
447 EME1 -LD= 469
448 EME2 -LD= 462
450 EME3 -LD= 456
466 EME4 -LD= 463
435 EMEM -LD= 414 417
445 EMTS -ST= 449 -LD= 458
400 EN10 -LD= 394 403
405 EN11 -LD= 401
409 EN20 -LD= 402 412
412 EN21 -LD= 416
415 EN22 -LD= 411
54 ENA0 -LD= 60
57 ENA1 -LD= 53
61 ENA2 -LD= 59 64
69 ENB0 -LD= 56 63 73 79
73 ENB1 -LD= 70
75 ENB2 -LD= 72
79 ENB3 -LD= 76
    
```

