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1 *
2 *
3 *      70/620 TEST EXECUTIVE-PRELIM. TESTS
4 *      AND MAGNETIC TAPE LOADER.
5 *      MAG TAPE CAN OPERATE IN SENSE OR BIC MODE.
6 *
7 *
8 *      ****  ****  ***** *      *** * *
9 *      *  *  *  *  *  *  *  *  *  *  *  *
10 *      ****  ****  *** *  *  *  *  *
11 *      *  *  *  *  *  *  *  *  *
12 *      *  *  *  *  *  *  *  *  *
13 *      *  *  *  ***** ***** *** * *
14 *

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15 *
16 *      THIS LISTING CONTAINS A PRELIMINARY INSTRUCTION TEST AND A
17 *      PRELIMINARY MEMORY TEST FOR THE 70/620 COMPUTER.
18 *

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19 *
20 *      INSTRUCTION TEST
21 *      ONLY A BASIC SET OF INSTRUCTIONS ARE TESTED TO GAIN CONFIDENCE
22 *      THAT STANDARD TEST PROGRAMS CAN BE LOADED.
23 *      MOST OF THE SUBTESTS BUILD FROM PRECEDING SUBTESTS AND ASSUME
24 *      THAT THE INSTRUCTIONS USED PREVIOUSLY ARE WORKING.
25 *

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26 *      MEMORY TEST
27 *      LOCATIONS EMD8 = 017777 ARE EXERCISED WITH THE
28 *      ORIGINAL CONTENTS RESTORED. LOCATIONS 0 = EMD8
29 *      ARE DESTROYED BY THE MEMORY TEST ROUTINE.
30 *

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31 *      SWITCHES
32 *      USE S82 TO LOOP ON ERROR AFTER HALT
33 *      USE S83 TO LOOP ON BOTH PRELIMINARY TESTS
34 *

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

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39 *
40 *
41 *

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42 *
43 *
44 *

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45 *
46 *
47 *

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48 *      INSTRUCTION TEST
49 *

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007000      50      ORG      07000      ORIGIN FOR ABL
51 *      TAPE ACTUALLY STARTS AT 07001
52 *      LOADER EXECUTION AT 07002
007000 001000 A 53      JMP      **2
007001 007002 A
007002 005001 A 54 ENST  TZA
007003 001010 A 55      JAZ      ENA1
007004 007012 A
007005 001200 A 56 ENA0  JSS2  ENST
007006 007002 A
007007 000001 A 57      HLT      01      ERROR--TZA/DAR/JAZ/JAN
007010 001000 A 58      JMP      ENB0
007011 007027 A
007012 005311 A 59 ENA1  DAR
007013 054612 A 60      STA      ONES
007014 001004 A 61      JAN      ENA2
007015 007020 A
007016 001000 A 62      JMP      ENA0
007017 007005 A
007020 014605 A 63 ENA2  LDA      ONES
007021 005111 A 64      IAR
007022 001010 A 65      JAZ      ENB0
007023 007027 A
007024 001200 A 66      JSS2  ENA2
007025 007020 A
007026 000002 A 67      HLT      02      ERROR--LDA/IAR/STA
68 *
69 *
70 *
007027 024576 A 71 ENB0  LDB      ONES
007030 001020 A 72      JBZ      ENB1
007031 007035 A
007032 005002 A 73      TZB
007033 001020 A 74      JBZ      ENB2
007034 007040 A
007035 001200 A 75 ENB1  JSS2  ENB0
007036 007027 A
007037 000003 A 76      HLT      3      ERROR--LDB/JBZ/TZB
007040 005122 A 77 ENB2  IBR
007041 001020 A 78      JBZ      ENB3
007042 007046 A
007043 005322 A 79      DBR
007044 001020 A 80      JBZ      ENC0
007045 007051 A
007046 001200 A 81 ENB3  JSS2  ENB0
007047 007027 A

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007050	000004	A	82	HLT	4		ERROR--IBR/DBR
			83 *				
			84 *				
			85 *				
007051	034554	A	86	ENCO	LDX	ONES	
007052	001040	A	87		JXZ	ENC1	
007053	007057	A					
007054	005004	A	88		TZX		
007055	001040	A	89		JXZ	ENC2	CONTINUE
007056	007062	A					
007057	001200	A	90	ENC1	JSS2	ENCO	
007060	007051	A					
007061	000005	A	91	HLT		5	ERROR--LDX/JXZ/TZX
007062	005144	A	92	ENC2	IXR		
007063	001040	A	93		JXZ	ENC3	
007064	007070	A					
007065	005344	A	94		DXR		
007066	001040	A	95		JXZ	ENDO	CONTINUE
007067	007073	A					
007070	001200	A	96	ENC3	JSS2	ENCO	
007071	007051	A					
007072	000006	A	97	HLT		6	ERROR--IXR/DXR
			98 *				
			99 *				
			100 *				
007073	014532	A	101	ENDO	LDA	ONES	
007074	054002	A	102		STA	**3	
007075	005001	A	103		TZA		
007076	006010	A	104		LDAI	1	(ALL ONES)
007077	000001	A					
007100	001010	A	105		JAZ	END1	
007101	007104	A					
007102	001004	A	106		JAN	END2	CONTINUE
007103	007107	A					
007104	001200	A	107	END1	JSS2	ENDO	
007105	007073	A					
007106	000007	A	108	HLT		7	ERROR--LDAI/JAN
			109 *				
007107	134516	A	110	END2	ERA	ONES	
007110	001004	A	111		JAN	END3	
007111	007114	A					
007112	001010	A	112		JAZ	ENE0	CONTINUE
007113	007117	A					
007114	001200	A	113	END3	JSS2	ENDO	
007115	007073	A					
007116	000010	A	114	HLT		010	ERROR--LDAI/ERA/JAN
			115 *				
			116 *				
			117 *				
007117	014506	A	118	ENE0	LDA	ONES	
007120	054002	A	119		STA	**3	
007121	005001	A	120		TZA		
007122	006130	A	121		ERAI	1	(ALL ONES)
007123	000001	A					
007124	001002	A	122		JAP	ENE1	
007125	007131	A					
007126	134471	A	123		ERA	ONES	
007127	001002	A	124		JAP	ENF0	CONTINUE
007130	007134	A					
007131	001200	A	125	ENE1	JSS2	ENE0	
007132	007117	A					
007133	000011	A	126	HLT		011	ERROR--ERAI/JAP
			127 *				
			128 *				
			129 *				
007134	014471	A	130	ENF0	LDA	ONES	
007135	054002	A	131		STA	**3	
007136	005002	A	132		TZB		
007137	006020	A	133		LDRI	1	(ALL ONES)
007140	000001	A					
007141	005021	A	134		TBA		
007142	001002	A	135		JAP	ENF1	
007143	007147	A					
007144	134461	A	136		ERA	ONES	
007145	001010	A	137		JAZ	ENGO	CONTINUE
007146	007152	A					
007147	001200	A	138	ENF1	JSS2	ENF0	
007150	007134	A					
007151	000012	A	139	HLT		012	ERROR--LDBI/TBA
			140 *				
			141 *				
			142 *				
007152	014453	A	143	ENGO	LDA	ONES	
007153	054002	A	144		STA	**3	
007154	005001	A	145		TZA		
007155	006030	A	146		LDXI	1	(ALL ONES)
007156	000001	A					
007157	005041	A	147		TXA		
007160	001002	A	148		JAP	ENG1	
007161	007165	A					
007162	134443	A	149		ERA	ONES	
007163	001010	A	150		JAZ	ENH0	CONTINUE
007164	007170	A					
007165	001200	A	151	ENG1	JSS2	ENGO	
007166	007152	A					

007167	000013	A	152		HLT	013		ERROR--LDXI/TXA
			153 *					
			154 *					
			155 *					
007170	024434	A	156	ENH0	LDB	D125		CONSTANT#125252
007171	005024	A	157		TBX			
007172	001040	A	158		JXZ	ENH1		
007173	007200	A						
007174	005041	A	159		TXA			
007175	134427	A	160		ERA	D125		
007176	001010	A	161		JAZ	ENI0		CONTINUE
007177	007203	A						
007200	001200	A	162	ENH1	JSS2	ENH0		
007201	007170	A						
007202	000014	A	163		HLT	014		ERROR--LDB/TBX
			164 *					
			165 *					
			166 *					
007203	014420	A	167	ENI0	LDA	D052		CONSTANT#052525
007204	134417	A	168		ERA	D052		
007205	001010	A	169		JAZ	ENI1		CONTINUE
007206	007212	A						
007207	001200	A	170		JSS2	ENI0		
007210	007203	A						
007211	000015	A	171		HLT	015		ERROR--LDA/ERA
			172 *					
007212	014412	A	173	ENI1	LDA	D125		CONSTANT#125252
007213	054413	A	174		STA	T801		TEMP STORE
007214	005001	A	175		TZA			
007215	014411	A	176		LDA	T801		
007216	001010	A	177		JAZ	ENI2		
007217	007223	A						
007220	134404	A	178		ERA	D125		
007221	001010	A	179		JAZ	ENJ0		CONTINUE
007222	007226	A						
007223	001200	A	180	ENI2	JSS2	ENI1		
007224	007212	A						
007225	000016	A	181		HLT	016		ERROR--LDA/STA
			182 *					
			183 *					
			184 *					
007226	024375	A	185	ENJ0	LDB	D052		CONSTANT#052525
007227	064377	A	186		STB	T801		TEMP STORE
007230	024376	A	187		LDB	T801		
007231	005021	A	188		TBA			
007232	134371	A	189		ERA	D052		
007233	001010	A	190		JAZ	ENK0		CONTINUE
007234	007240	A						
007235	001200	A	191		JSS2	ENJ0		
007236	007226	A						
007237	000017	A	192		HLT	017		ERROR--LDB/STB
			193 *					
			194 *					
			195 *					
007240	034363	A	196	ENK0	LDX	D052		CONSTANT#052525
007241	074365	A	197		STX	T801		TEMP STORE
007242	034364	A	198		LDX	T801		
007243	005041	A	199		TXA			
007244	134357	A	200		ERA	D052		
007245	001010	A	201		JAZ	ENL0		CONTINUE
007246	007252	A						
007247	001200	A	202		JSS2	ENK0		
007250	007240	A						
007251	000020	A	203		HLT	020		ERROR--LDX/STX
			204 *					
			205 *					
			206 *					
007252	005111	A	207	ENL0	TAR			
007253	005001	A	208		TZA			
007254	005002	A	209		TZB			
007255	003010	A	210		XAZ	ENL0		
007256	007252	A						
007257	006130	A	211		ERAI	1		
007260	000001	A						
007261	001010	A	212		JAZ	ENL1		CONTINUE
007262	007266	A						
007263	001200	A	213		JSS2	ENL0		
007264	007252	A						
007265	000021	A	214		HLT	021		ERROR--XAZ
			215 *					
007266	014337	A	216	ENL1	LDA	ONES		
007267	003020	A	217		XBZ	ENL0		
007270	007252	A						
007271	001010	A	218		JAZ	ENM0		CONTINUE
007272	007276	A						
007273	001200	A	219		JSS2	ENL0		
007274	007252	A						
007275	000022	A	220		HLT	022		ERROR--XBZ
			221 *					
			222 *					
			223 *					
007276	007400	A	224	ENM0	ROF			
007277	001001	A	225		JOF	ENM1		
007300	007304	A						
007301	007401	A	226		SOF			

007302	001001	A	227	JOF	ENM2		
007303	007307	A					
007304	001200	A	228	ENM1	JSS2	ENM0	
007305	007276	A					
007306	000023	A	229	HLT	023		ERROR==ROF/ROF/JOF
			230 *				
007307	007400	A	231	ENM2	ROF		
007310	001001	A	232	JOF	ENM1		
007311	007314	A					
007312	001000	A	233	JMP	ENNO		(CONTINUE
007313	007317	A					
007314	001200	A	234	ENM3	JSS2	ENM2	
007315	007307	A					
007316	000024	A	235	HLT	024		ERROR==ROF/JOF/JMP
			236 *				
			237 *				
			238 *				
007317	014306	A	239	ENNO	LDA	ONES	
007320	002000	A	240	JMPM	ENN1		
007321	007331	A					
007322	001010	A	241	JAZ	EN05		CONTINUE
007323	007336	A					
007324	001200	A	242	JSS2	ENNO		
007325	007317	A					
007326	000025	A	243	HLT	025		ERROR==JMPM/JMP*
007327	001000	A	244	JMP	EN05		
007330	007336	A					
			245 *				
007331	000007	A	246	ENN1	DATA	7	ENR = NONZERO
007332	005001	A	247	TZA			
007333	001000	A	248	JMP*	ENN1		
007334	107331	A					
007335	000026	A	249	HLT	026		ERROR==JMP*
			250 *				
007336	014265	A	251	EN05	LDA	D052	
007337	004261	A	252	LRLA	17		A=125252
007340	134264	A	253	ERA	D125		
007341	001010	A	254	JAZ	EN06		
007342	007346	A					
007343	001200	A	255	JSS2	EN05		
007344	007336	A					
007345	000027	A	256	HLT	027		ERROR==LRLA
			257 *				
007346	005002	A	258	EN06	TZB		
007347	014254	A	259	LDA	D052		
007350	004557	A	260	LLSR	15		A=0 B=125252
007351	001010	A	261	JAZ	EN07		
007352	007356	A					
007353	001200	A	262	JSS2	EN06		
007354	007346	A					
007355	000030	A	263	HLT	030		ERROR==LLSR
			264 *				
007356	005021	A	265	EN07	TBA		
007357	134245	A	266	ERA	D125		
007360	001010	A	267	JAZ	EN08		CONTINUE
007361	007365	A					
007362	001200	A	268	JSS2	EN06		
007363	007346	A					
007364	000031	A	269	HLT	031		ERROR==LLSR
			270 *				
			271 *				
007365	004457	A	272	EN08	LLRL	15	A=052525 B=0
007366	134235	A	273	ERA	D052		
007367	001010	A	274	JAZ	EN09		
007370	007374	A					
007371	001200	A	275	JSS2	EN06		
007372	007346	A					
007373	000032	A	276	HLT	032		ERROR==LLRL
			277 *				
007374	005021	A	278	EN09	TBA		
007375	001010	A	279	JAZ	ENP0		
007376	007402	A					
007377	001200	A	280	JSS2	EN06		
007400	007346	A					
007401	000033	A	281	HLT	033		ERROR==LLRL
			282 *				
			283 *				
			284 *				
007402	014220	A	285	ENP0	LDA	D001	
007403	124222	A	286	ADD	ONES		
007404	001010	A	287	JAZ	ENP1		OK
007405	007411	A					
007406	001200	A	288	JSS2	ENP0		
007407	007402	A					
007410	000034	A	289	HLT	034		ERROR==ADD
007411	006120	A	290	ENP1	ADDI	0177777	
007412	177777	A					
007413	006110	A	291	ORAI	0177777		
007414	177777	A					
007415	006130	A	292	ERAI	0177777		
007416	177777	A					
007417	001010	A	293	JAZ	EN00		CONTINUE
007420	007424	A					
007421	001200	A	294	JSS2	ENP0		
007422	007402	A					

007423	000035	A	295	HLT	035	ERROR--ADD/DRAI	
			296 *				
			297 *				
007424	014177	A	298	ENQ0	LDA	D052	CONSTANT=052525
007425	144176	A	299		SUB	D052	
007426	001010	A	300		JAZ	ENQ0	CONTINUE
007427	007433	A					
007430	001200	A	301		JSS2	ENQ0	
007431	007424	A					
007432	000036	A	302	HLT	036	ERROR--SUB	
			303 *				
			304 *				
			305 *				
007433	005001	A	306	ENQ0	TZA		
007434	054172	A	307		STA	TS01	
007435	014171	A	308		LDA	TS01	
007436	005000	A	309		NOP		
007437	001010	A	310		JAZ	ENQ0	
007440	007444	A					
007441	001200	A	311		JSS2	ENQ0	
007442	007433	A					
007443	000037	A	312	HLT	037	ERROR--NOP	
			313 *				
			314 *				
			315 *				
007444	014161	A	316	ENQ0	LDA	ONQ0	
007445	024160	A	317		LDB	ONQ0	
007446	005103	A	318		INCR	03	
007447	005311	A	319		DAR		
007450	005322	A	320		DBR		
007451	001010	A	321		JAZ	ENQ0	
007452	007460	A					
007453	001200	A	322	ENS1	JSS2	ENS0	
007454	007444	A					
007455	000040	A	323	HLT	040	ERROR--INCR 03	
007456	001000	A	324		JMP	ENT0	
007457	007464	A					
007460	001020	A	325	ENS2	JRZ	ENT0	
007461	007464	A					
007462	001000	A	326		JMP	ENS1	
007463	007453	A					
			327 *				
			328 *				
			329 *				
007464	005002	A	330	ENT0	TZR		
007465	005302	A	331		DECR	02	
007466	005021	A	332		TBA		
007467	134136	A	333		ERA	ONES	
007470	001010	A	334		JAZ	ENU0	
007471	007475	A					
007472	001200	A	335		JSS2	ENT0	
007473	007464	A					
007474	000041	A	336	HLT	041	ERROR--DECR 02	
			337 *				
			338 *				
			339 *				
007475	005103	A	340	ENU0	INCR	03	
007476	005122	A	341		IBR		
007477	005032	A	342		MERG	032	
007500	005021	A	343		TBA		
007501	006130	A	344		ERAI	03	
007502	000003	A					
007503	001010	A	345		JAZ	ENV0	
007504	007510	A					
007505	001200	A	346		JSS2	ENU0	
007506	007475	A					
007507	000042	A	347	HLT	042	ERROR--MERG 032	
			348 *				
			349 *				
			350 *				
007510	006010	A	351	ENV0	LDAI	0100	
007511	000100	A					
007512	004346	A	352		LSRA	6	
007513	005311	A	353		DAR		
007514	001010	A	354		JAZ	ENW0	
007515	007521	A					
007516	001200	A	355		JSS2	ENV0	
007517	007510	A					
007520	000043	A	356	HLT	043	ERROR--LSRA 6	
			357 *				
			358 *				
			359 *				
007521	006030	A	360	ENW0	LDXI	D125	
007522	007625	A					
007523	005001	A	361		TZA		
007524	015000	A	362		LDA	0,1	
007525	134077	A	363		ERA	D125	
007526	001010	A	364		JAZ	ENX0	
007527	007533	A					
007530	001200	A	365		JSS2	ENW0	
007531	007521	A					
007532	000044	A	366	HLT	044	ERROR--LDA 0,1	
			367 *				
			368 *				
			369 *				

007533	005001	A	370	ENX0	TZA		
007534	054072	A	371		STA	T801	
007535	006030	A	372		LDXI	T801	
007536	007627	A					
007537	014065	A	373		LDA	D125	
007540	055000	A	374		STA	0,1	
007541	134065	A	375		ERA	T801	
007542	001010	A	376		JAZ	ENY0	
007543	007547	A					
007544	001200	A	377		JSS2	ENX0	
007545	007533	A					
007546	000045	A	378		HLT	045	ERROR--STA 0,1
			379 *				
			380 *				
			381 *				
007547	014086	A	382	ENY0	LDA	ONES	
007550	006150	A	383		ANAI	0125252	
007551	125252	A					
007552	134052	A	384		ERA	D125	
007553	001010	A	385		JAZ	ENZ0	
007554	007560	A					
007555	001200	A	386		JSS2	ENY0	
007556	007547	A					
007557	000046	A	387		HLT	046	ERROR--ANAI
			388 *				
			389 *				
			390 *				
007560	014044	A	391	ENZ0	LDA	D125	
007561	006050	A	392		STAI	01	
007562	000001	A					
007563	006030	A	393		LDXI	**1	
007564	007562	A					
007565	015000	A	394		LDA	0,1	
007566	134036	A	395		ERA	D125	
007567	001010	A	396		JAZ	EN10	
007570	007574	A					
007571	001200	A	397		JSS2	ENZ0	
007572	007560	A					
007573	000047	A	398		HLT	047	ERROR--STAI
			399 *				
			400 *				
			401 *				
007574	005003	A	402	EN10	MERG	03	
007575	003022	A	403		XIF	022,EN11	
007576	007604	A					
007577	001004	A	404		JAN	EN20	
007600	007605	A					
007601	001200	A	405		JSS2	EN10	
007602	007574	A					
007603	000050	A	406		HLT	050	ERROR--XIF 022
007604	005311	A	407	EN11	DAR		
			408 *				
			409 *				
			410 *				
007605	005001	A	411	EN20	TZA		
007606	007401	A	412				
007607	001011	A	413		JIF	011,EN22	
007610	007616	A					
007611	001200	A	414	EN21	JSS2	EN20	
007612	007605	A					
007613	000051	A	415		HLT	051	ERROR--JIF 011
007614	001000	A	416		JMP	EMEM	
007615	007630	A					
007616	007400	A	417	EN22	ROF		
007617	001011	A	418		JIF	011,EN21	
007620	007611	A					
007621	001000	A	419		JMP	EMEM	START OF PRELIMINARY MEMORY TEST
007622	007630	A					
			420 *				
			421 *				
			422 *				
			423 *		DATA TABLE		
			424 *				
007623	000001	A	425	D001	DATA	1	
007624	052525	A	426	D052	DATA	052525	
007625	125252	A	427	D125	DATA	0125252	
007626	000001	A	428	ONES	DATA	1	WILL BE MADE ALL ONES
007627	000007	A	429	T801	DATA	7	TEMP. STORAGE, 7 FOR NON-ZERO BOOTSTRAP FORMAT
			430 *				
			431 *				
			432 *		PRELIMINARY MEMORY TEST		
			433 *				
			434 *		TESTS LOCS. EMDB = 017777 WITH 052525 AND 0125252 PATTERNS		
			435 *		ORIGINAL CONTENTS ARE SAVED AND RESTORED.		
			436 *				
007630	006030	A	437	EMEM	LDXI	MEM2+2	START OF TEST ROUTINE
007631	007645	A					
007632	005002	A	438		TZB		TARGET LOCATION
007633	015000	A	439	MEM1	LDA	0,1	
007634	056000	A	440		STA	0,2	
007635	005144	A	441		IXR		
007636	005123	A	442		INCR	023	
007637	006140	A	443		SUBI	EMDB+1	
007640	000044	A					
007641	001010	A	444		JAZ	1	

007642	000001	A							
007643	001000	A	445	MEM2	JMP	MEM1			
007644	007633	A							
000000			446		LDC	0			
000000	000001	A	447	EMTS	DATA	1		TEMPORARY STORAGE	
000001	005002	A	448		TZB				
000002	006030	A	449	EME1	LDXI	EMDB		START LOCATION FOR MEMORY TEST	
000003	000043	A							
000004	015000	A	450	EME2	LDA	0,1			
000005	050000	A	451		STA	EMTS		SAVE CURRENT CONTENTS	
000006	010042	A	452	EME3	LDA	EMDC		CURRENT TEST PATTERN	
000007	055000	A	453		STA	0,1		STORE IT	
000010	005001	A	454		TZA				
000011	015000	A	455		LDA	0,1			
000012	130042	A	456		ERA	EMDC		COMP+RE WORD STORED WITH WORD READ	
000013	001010	A	457		JAZ	++5			
000014	000020	A							
000015	001200	A	458		JSS2	EME3		LOOP ON ERROR	
000016	000006	A							
000017	000077	A	459		HLT	077		COMPARE ERROR HALT	
000020	010000	A	460		LDA	EMTS			
000021	055000	A	461		STA	0,1		RESTORE ORIGINAL CONTENTS	
000022	005145	A	462		INCR	045			
000023	006150	A	463		ANAI	020000			
000024	020000	A							
000025	001010	A	464		JAZ	EME2		GO TO NEXT LOCATION	
000026	000004	A							
000027	001020	A	465		JBZ	EME4			
000030	000035	A							
000031	001400	A	466		JSS3	ENST		REPEAT TESTS	
000032	007002	A							
000033	001000	A	467		JMP	BEGIN		GO MODIFY LOADER	
000034	007711	A							
000035	010043	A	468	EME4	LDA	EMDB			
000036	050042	A	469		STA	EMDC		0125252 DATA PATTERN	
000037	005122	A	470		IBR				
000040	001000	A	471		JMP	EME1		LOOP THRU MEMORY	
000041	000002	A							
000042	052525	A	472	EMDC	DATA	052525		FIRST DATA PATTERN	
000043	125252	A	473	EMDB	DATA	0125252		SECOND DATA PATTERN	
007711			474		LDC	MEM2+EMDB+3			
			475 *						
			476 *			LOADER FOLLOWS			
			477 *						
			478 *					MAGNETIC TAPE	
			479 *					LOADER EXAMINES BOOTSTRAP, AND WILL	
			480 *					USE BIC OR SENSE MODE ACCORDINGLY,	
			481 *						
	000010	A	482	MT	EQU	010			
	000026	A	483	BIC	EQU	026			
	000200	A	484	BICDA	EQU	0200		BIC DA IN BOOT-IF USED	
	000213	A	485	MTDA	EQU	0213		MT DA IN BOOT	
	000474	A	486	QADR	EQU	0474		OBJECT MEDIA DA-FOR EXEC	
			487 *						
007711	010213	A	488	BEGIN	LOA	MTDA			
007712	006150	A	489		ANAI	077			
007713	000077	A							
007714	050474	A	490		STA	QADR			
007715	010200	A	491		LDA	BICDA		SEE IF BIC WAS USED	
007716	006150	A	492		ANAI	077			
007717	000077	A							
007720	130474	A	493		FRA	QADR		COMPARE WITH MT DA	
007721	001010	A	494		JAZ	++3		STORE 0 IF NO BIC	
007722	007724	A							
007723	130474	A	495		FRA	QADR		RESTORE BIC DA	
007724	054223	A	496		STA	BADR		SAVE BIC DA, OR 0 IF NO BIC	
007725	001000	A	497		JMP	LOAM			
007726	007743	A							
007727	000001	A	498	SET	DATA	1		SET PROPER DEVICE ADDRESSES	
			499 *						
007730	025000	A	500		LDB	0,1			
007731	001020	A	501		JBZ*	SET			
007732	107727	A							
007733	016000	A	502		LDA	0,2			
007734	006150	A	503		ANAI	0177700			
007735	177700	A							
007736	114146	A	504		ORA	DA			
007737	056000	A	505		STA	0,2			
007740	005144	A	506		IXR				
007741	001000	A	507		JMP	SET+1			
007742	007730	A							
	007743	A	508	LOAM	EQU	*			
007743	010474	A	509		LDA	QADR		GET MT DA	
007744	054140	A	510		STA	DA		SAVE DA	
007745	006030	A	511		LDXI	MT00			
007746	010055	A							
007747	002000	A	512		CALL	SET		SET DRIVE NUMBER	
007750	007727	A							
007751	014176	A	513		LDA	BADR		GET BIC DA-IF USED	
007752	001010	A	514		JAZ	RMT+2		USE SENSE MODE IF NO BIC	
007753	007766	A							
007754	054130	A	515		STA	DA			
007755	006030	A	516		LDXI	BICO			
007756	010073	A							
007757	002000	A	517		CALL	SET		SET BIC DEVICE ADDRESSES	

007760	007727	A						
007761	044123	A	518	INR	DA		SET BIC+1 DA	
007762	006030	A	519	LOXI	BIC1			
007763	010100	A						
007764	002000	A	520	RMT	CALL	SET	SET BIC+1 DEVICE ADDRESSES	
007765	007727	A						
007766	002000	A	521	CALL	MTI		INPUT RECORD	
007767	010016	A						
007770	005001	A	522	TZA				
007771	054061	A	523	STA	CNTR		RESET WORD COUNTER	
007772	014156	A	524	LDA	MTBF		IS IT EXECUTION RECORD	
007773	001004	A	525	JAN	RMT2			
007774	010014	A						
			526 *				RELOCATE DATA AS DIRECTED ON TAPE	
007775	034056	A	527	LDX	BUFR			
007776	005144	A	528	IXR				
007777	025000	A	529	LDB	0,1		GET STORE POINTER	
010000	005144	A	530	IXR			SET LOAD POINTER	
010001	015000	A	531	RMT1	LDA	0,1	GET WORD	
010002	056000	A	532	STA	0,2		STORE WORD	
010003	044047	A	533	INR	CNTR		COUNT WORDS	
010004	014046	A	534	LDA	CNTR			
010005	144143	A	535	SUB	MTBF		DONE YET	
010006	005144	A	536	IXR				
010007	005122	A	537	IBR				
010010	001004	A	538	JAN	RMT1		NO	
010011	010001	A						
010012	001000	A	539	JMP	RMT+2		READ ANOTHER RECORD	
010013	007766	A						
010014	001000	A	540	RMT2	JMP*	MTBF+1	-EXECUTE-	
010015	110152	A						
			541 *				MAG TAPE INPUT	
			542 *				USE SENSE OR BIC MODE, SAME AS BOOT.	
			543 *				INPUTS TO COMMON BUFFER AND RELOCATES DATA.	
010016	000001	A	544	MTI	DATA	1	ENTRY	
010017	014130	A	545	LDA	BADR		IS BIC USED?	
010020	001010	A	546	JAZ	SENM		IF NOT USE SENSE MODE	
010021	010036	A						
010022	100027	A	547	BI11	EXC	BIC+1	INITIALIZE BIC (DA-MODIFIED)	
010023	014030	A	548	LDA	BUFR		GET STRT ADDR	
010024	103126	A	549	BI01	OPR	BIC	SET INIT ADDR (DA-MODIFIED)	
010025	005301	A	550	DECR	01		A=177777	
010026	103127	A	551	BI12	OPR	BIC+1	SET FINAL ADDR=MAX (DA-MODIFIED)	
010027	100026	A	552	BI02	EXC	BIC	ACTIVATE BIC (DA-MODIFIED)	
010030	100010	A	553	MT01	EXC	MT	READ RECORD (DA-MODIFIED)	
010031	101210	A	554	MT02	SEN*	0200+MT,MTI	RETURN WHEN READY (DA-MODIFIED)	
010032	110016	A						
010033	005000	A	555	NOP			END OF RECORD WILL STOP BIC	
010034	001000	A	556	JMP	MT02		WAIT TILL RECORD COMPLETE	
010035	010031	A						
			557 *					
			558 *				SENSE MODE	
010036	034015	A	559	SENM	LOX	BUFR	GET BUFFER ADDR	
010037	100010	A	560	MT03	SEL	MT	READ BINARY RECD. (DA-MODIFIED)	
010040	101110	A	561	MT04	SEN	0100+MT,MT06	BUFFER READY? (DA-MODIFIED)	
010042	101210	A	562	MT05	SEN*	0200+MT,MTI	RECORD DONE? (DA-MODIFIED)	
010043	110016	A						
010044	001000	A	563	JMP	MT04		LOOP	
010045	010040	A						
010046	102510	A	564	MT06	CIA	MT	INPUT WORD (DA-MODIFIED)	
010047	055000	A	565	STA	0,1		STORE	
010050	005144	A	566	IXR			COUNT	
010051	001000	A	567	JMP	MT04			
010052	010040	A						
010053	000001	A	568	CNTR	DATA	1		
010054	010151	A	569	BUFR	DATA	MTBF		
010055	010030	A	570	MT00	DATA	MT01,MT02,MT03,MT04,MT05,MT06,MT07,MT08,MT09		
010056	010031	A						
010057	010037	A						
010060	010040	A						
010061	010042	A						
010062	010046	A						
010063	010112	A						
010064	010122	A						
010065	010123	A						
010066	010132	A	571	DATA		MT10,MT11,MT12,MT13,0		
010067	010133	A						
010070	010134	A						
010071	010141	A						
010072	000000	A						
010073	010024	A	572	BIC0	DATA	BI01,BI02,BI03,BI04,0		
010074	010027	A						
010075	010115	A						
010076	010121	A						
010077	000000	A						
010100	010022	A	573	BIC1	DATA	BI11,BI12,BI13,BI14,0		
010101	010026	A						
010102	010111	A						
010103	010120	A						
010104	000000	A						
010105	000010	A	574	DA	DATA	010	TEMP DA	
			576 *				DUMP OF PRELIM AVAILABLE AS A CONVICIENCE ONLY	
			577 *					
010106	014041	A	578	DUMP	LDA	BADR	BIC USED?	

010107	001010	A	579	JAZ	DUMS	USE SENSE MODE IF NOT
010110	010130	A				
010111	100027	A	580	BI13	EXC BIC+1	INIT BIC (DA-MOD)
010112	104110	A	581	MT07	EXC2 0100+MT	SEL 1ST MT (DA-MOD)
010113	006010	A	582	LDAI	07001	SET START ADDR OF PRELIM TAPE
010114	007001	A				
010115	103126	A	583	BI03	OAR BIC	SET INIT REG (DA-MOD)
010116	006010	A	584	LDAI	LAST	SET LAST ADDR
010117	010150	A				
010120	103127	A	585	BI14	OAR BIC+1	SET FINAL ADDR (DA-MOD)
010121	100026	A	586	BI04	EXC BIC	ACTIVATE BIC (DA-MOD)
010122	100210	A	587	MT08	EXC 0200+MT	WRITE RECORD (DA-MOD)
010123	101210	A	588	MT09	SEN 0200+MT,STOP	SEN RECORD COMPLETE (DA-MOD)
010124	010147	A				
010125	005000	A	589	NOP		
010126	001000	A	590	JMP	MT09	WAIT TILL COMPLETION
010127	010123	A				
			591 *			
010130	006030	A	592	DUMS	LDXI 07001	SET START ADDR FOR SENSE MODE
010131	007001	A				
010132	104110	A	593	MT10	EXC2 0100+MT	SEL UNIT 1 (DA-MOD)
010133	100210	A	594	MT11	EXC 0200+MT	WRITE BINARY RECORD (DA-MOD)
010134	101110	A	595	MT12	SEN 0100+MT,D2	SEN BUFFER READY (DA-MOD)
010135	010140	A				
010136	001000	A	596	JMP	MT12	
010137	010134	A				
010140	015000	A	597	D2	LDA 0,1	
010141	103110	A	598	MT13	OAR MT	WRITE WORD TO MT (DA-MOD)
010142	005145	A	599	INCR	045	
010143	006140	A	600	SUBI	LAST	
010144	010150	A				
010145	001016	A	601	JANZ	MT12	
010146	010134	A				
010147	000000	A	602	STOP	HLT	
	010150	A	603	LAST	EGU *	
010150	000000	A	604	BADR	DATA 0	BIC DA, IF USED (SET FOR SEN MODE)
	010151	A	605	MTBF	EGU *	MAG TAPE BUFFER
			606 *			
	010106	A	607	END	DUMP	BOOTSTRAP FORCES EXECUTION AT 07002

ENTRY NAMES

EXTERNAL NAMES

SYMBOLS

010150	A	BADR	007711	A	BEGIN	010024	A	BI01	010027	A	BI02
010115	A	BI03	010121	A	BI04	010022	A	BI11	010026	A	BI12
010111	A	BI13	010120	A	BI14	000026	A	BIC	010073	A	BIC0
010100	A	BIC1	000200	A	BICDA	010054	A	BUFR	010053	A	CNTR
007623	A	D001	007624	A	D052	007625	A	D125	010140	A	D2
010105	A	DA	010106	A	DUMP	010130	A	DUMS	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	007073	A	END0
007104	A	END1	007107	A	END2	007114	A	END3	007117	A	ENE0
007131	A	ENE1	007134	A	ENF0	007147	A	ENF1	007152	A	ENG0
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	ENNO	007331	A	ENN1
007336	A	EN05	007346	A	EN06	007356	A	EN07	007365	A	EN08
007374	A	EN09	007402	A	ENP0	007411	A	ENP1	007424	A	ENQ0
007433	A	ENR0	007444	A	ENB0	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
010150	A	LAST	007743	A	LDAM	007633	A	MEM1	007643	A	MEM2
000010	A	MT	010055	A	MT00	010030	A	MT01	010031	A	MT02
010037	A	MT03	010040	A	MT04	010042	A	MT05	010046	A	MT06
010112	A	MT07	010122	A	MT08	010123	A	MT09	010132	A	MT10
010133	A	MT11	010134	A	MT12	010141	A	MT13	010151	A	MTBF
000213	A	MTDA	010016	A	MTI	000474	A	QADR	007626	A	ONES
007764	A	RMT	010001	A	RMT1	010014	A	RMT2	010036	A	SENM
007727	A	SET	010147	A	STOP	007627	A	TS01			

0 ERRORS ASSEMBLY COMPLETE

LITERALS

POINTERS

* * PROGRAM / SUBROUTINE ENTRY POINTS * *

246	ENN1	-LD=	240	248			
544	MTI	-LD=	521	554	562		
498	SET	-LD=	501	507	512	517	520

* * REFERENCED SYMBOLS * *

604	BADR	-ST=	496	-LD=	513	545	578
488	BEGIN	-LD=	467				
549	BI01	-LD=	572				
552	BI02	-LD=	572				
583	BI03	-LD=	572				
586	BI04	-LD=	572				
547	BI11	-LD=	573				
551	BI12	-LD=	573				
580	BI13	-LD=	573				
585	BI14	-LD=	573				
483	BIC	-LD=	547	549	551	552	580 583 585 586

588	MT09	-LD-	570	590															
593	MT10	-LD-	571																
594	MT11	-LD-	571																
595	MT12	-LD-	571	596	601														
598	MT13	-LD-	571																
605	MTRF	-LD-	524	535	540	569													
485	MTDA	-LD-	488																
544	MTI	-LD-	521	554	562														
486	OADR	-ST-	490	-LD-	493	495	509												
428	ONES	-ST-	60	-LD-	63	71	86	101	110	118	123	130	136	143	149				
			216	239	286	316	317	333	382										
520	RMT	-LD-	514	539															
531	RMT1	-LD-	538																
540	RMT2	-LD-	525																
559	SENM	-LD-	546																
49A	SET	-LD-	501	507	512	517	520												
602	STOP	-LD-	588																
429	TS01	-ST-	174	186	197	307	371	-LD-	176	187	198	308	372	375					