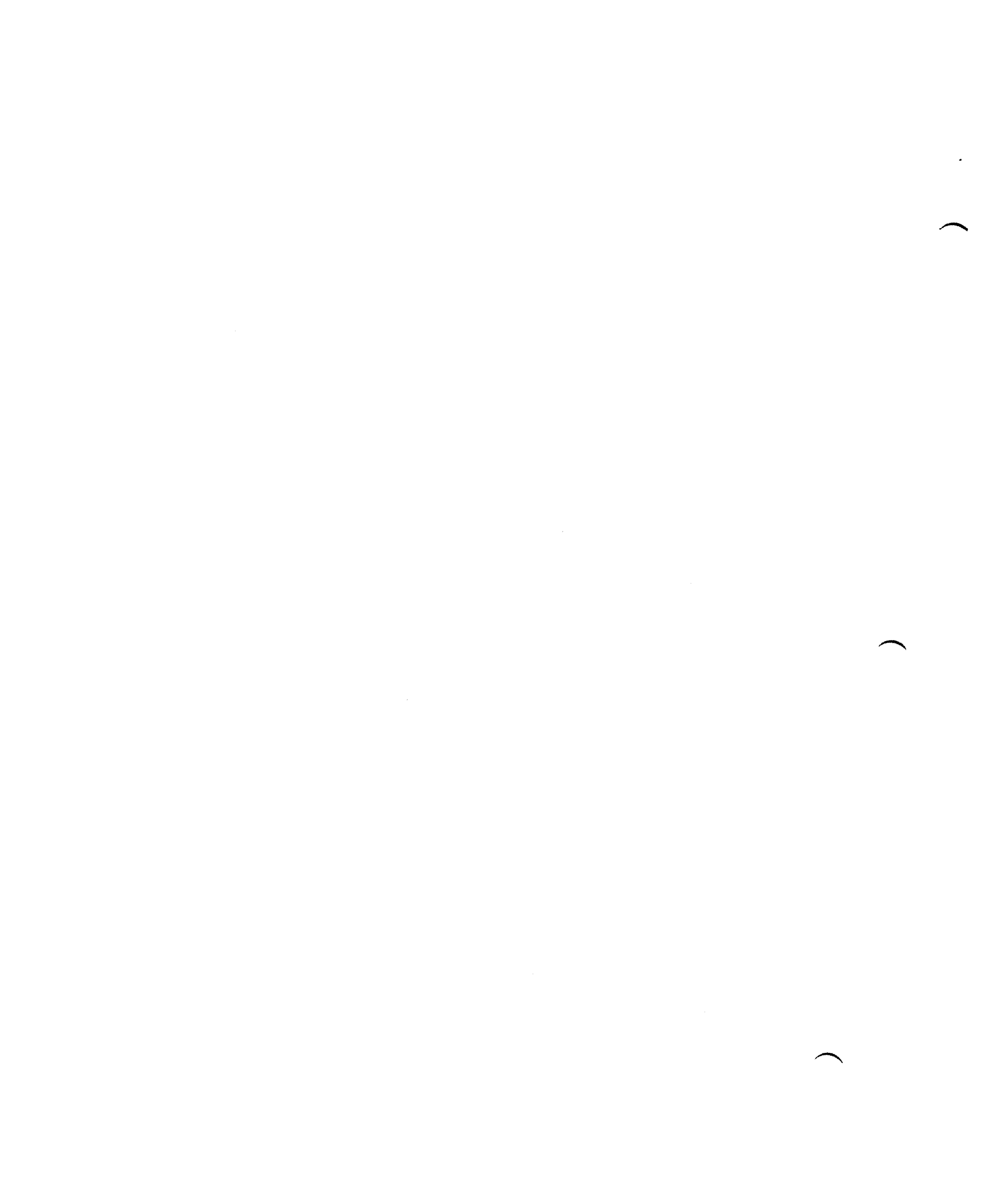


IDENTIFICATION  
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PRODUCT CODE: MAINDEC-8E-DØHC-D  
PRODUCT NAME: RANDOM JMP TEST  
DATE CREATED: JUNE 11, 1971  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: BRUCE HANSEN



1. ABSTRACT  
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THIS PROGRAM TESTS THE JMP INSTRUCTION OF THE PDP-8E, MOST OF MEMORY IS USED AS A JUMP FIELD WITH A RANDOM NUMBER GENERATOR SELECTING EACH JUMP FROM AND JUMP TO LOCATION.

2. REQUIREMENTS  
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2.1 EQUIPMENT  
-----

PDP-8E EQUIPPED WITH TELETYPE.

2.2 STORAGE  
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0000,0421, THE BINARY LOADER MUST BE STORED IN THE LAST MEMORY PAGE.

2.3 PRELIMINARY PROGRAMS  
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IT IS ASSUMED THAT MAINDEC=8E-D0A(N), AND MAINDEC=8E-D0B(N) HAVE RUN SUCCESSFULLY.

3. LOADING PROCEDURE  
-----

3.1 METHOD  
-----

USE STANDARD BINARY LOADER.

4. STARTING PROCEDURE  
-----

4.1 CONTROL SWITCH SETTINGS  
-----

SR0(0) HALT ON ERROR,

SR2 HOLD JUMP FROM ADDRESSES CONSTANT, (1)  
SELECT RANDOM JUMP FROM ADDRESSES, (0)

SR3 HOLD JUMP TO ADDRESSES CONSTANT, (1)  
SELECT RANDOM JUMP TO ADDRESSES, (0)

4.2 STARTING ADDRESS  
-----

0200

RESTART ADDRESS  
-----

0214

4.5

OPERATOR ACTION  
-----

- A. SET SR TO 0200 AND PRESS LOAD ADDRESS.
- B. SET SR TO DESIRED MODE; IF A PARTICULAR MEMORY LOCATION IS DESIRED FOR EITHER A "CONSTANT FROM" OR "CONSTANT TO", THIS MEMORY ADDRESS IS ENTERED INTO ONE OF THE LOCATIONS SHOWN BELOW:

FROM 1 ADDRESS = 0120  
FROM ADDRESS = 0117  
TO ADDRESS = 0116

NOTE! ALWAYS MAKE (FROM 1) = (FROM) +1

IF SR2 OR SR3 IS SET AFTER THE PROGRAM HAS BEEN STARTED, THE LAST ADDRESS TAKEN FROM THE RANDOM NUMBER GENERATOR IS USED REPEATEDLY.

- C. PRESS CLEAR THEN CONTINUE.

5. OPERATING PROCEDURE  
-----

SAME AS SECTION 4.

6. ERRORS  
-----

6.1 ERROR HALTS  
-----

ALL UNUSED MEMORY LOCATIONS ARE LOADED WITH HLT ORDERS, IF THE PROGRAM EXECUTES ONE OF THESE BACKGROUND HLTS, IT IS PROBABLE THAT THE INTERRUPT FAILED TO OCCUR FOLLOWING THE JMP INSTRUCTION.

6.2

ERROR PRINTOUTS  
-----

F WWWW TO XXXX

Z = YYYY

(FROM) F WWWWMMMM = THE ADDRESS OF THE JMP INSTRUCTION.  
(TO) T XXXX: XXXX = THE ADDRESS THAT THE JMP INSTRUCTION IS JUMPING TO;  
(LOC 0000) Z = YYYY: YYYY = THE ADDRESS STORED IN LOCATION  
0000 DURING THE INTERRUPT.

NOTE THAT YYYY SHOULD EQUAL XXXX.

EXAMPLE! THE FOLLOWING IS A TYPICAL ERROR PRINTOUT:

F 4252 TO 7020  
Z = 7000

LINE 1 OF THE PRINTOUT IS A STATEMENT OF THE PROBLEM. A JMP  
INSTRUCTION IS PLACED AT LOCATION 4252. THIS JMP INSTRUCTION IS  
TRYING TO JUMP TO LOCATION 7020. LINE 2 OF THE PRINTOUT INDICATES  
THE ERROR. THE TO ADDRESS (7020) WAS TO HAVE BEEN STORED IN  
LOCATION 0000 BUT INSTEAD A 7000 WAS STORED. THUS BIT 7 WAS  
DROPPED.

6.3

ERROR RECOVERY  
-----

THE PROGRAM CONTINUES TESTING FOLLOWING AN ERROR PRINTOUT. WHEN  
ENOUGH INFORMATION HAS BEEN GATHERED FROM THE ERROR PRINTOUTS,  
A FROM AND TO ADDRESS IS SELECTED FOR USE IN THE SCOPE MODE LOOP.  
ENTER THE CHOSEN ADDRESSES INTO PROPER LOCATIONS (SEE SECTION  
4.3.B). RESTART THE PROGRAM WITH SR2 AND SR3 SET. AFTER  
ALLOWING IT TO RUN FOR A MOMENT PUSH HALT, ENTER (5520) INTO  
LOCATION 1, AND RESTART THE PROGRAM AT LOCATION 0027 WITH SR2  
AND SR3 SET. THE SCOPE MODE LOOP IS

LOCATION	CODING
0000	
0001	JMP I FROM 1
XXXX	A, ION
XXXX	JMP I TO
0120	FROM 1, A

WHEN IT IS DESIRED TO DISCONTINUE THE SCOPE MODE LOOP, RESTORE  
THE ORIGINAL CONTENT 1116 INTO LOCATION 1, AND RESTART THE PROGRAM.

7.

RESTRICTIONS  
-----

(NONE)

8. MISCELLANEOUS  
-----

8.1 EXECUTION TIME  
-----

7200 RANDOM TEST/SECOND

9. PROGRAM DESCRIPTION  
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THE JMP INSTRUCTION IS CHECKED THROUGH THE USE OF THE INTERRUPT FUNCTION. A RANDOM NUMBER GENERATOR SELECTS A FROM AND A TO ADDRESS. AN ION INSTRUCTION IS THEN PLACED AT FROM-1 AND THE JMP INSTRUCTION AT FROM. THE JMP INSTRUCTION JUMPS TO THE ADDRESS SPECIFIED BY TO. AFTER EXECUTING THESE TWO ORDERS, AN INTERRUPT OCCURS STARTING THE PROGRAM COUNTER AT LOCATION 1. A CHECKING ROUTINE LOCATED HERE VERIFIES THAT THE OPERATION WAS SUCCESSFUL BEFORE STARTING THE NEXT TEST.

RANDOM ADDRESSES ARE RESTRICTED AS FOLLOWS: 0400K RANDOM ADDRESS <7600. THE AREA BETWEEN 0400 AND 7600 IS FILLED WITH HLT INSTRUCTIONS IN CASE THE INTERRUPT FAILS. A "HC" IS PRINTED AFTER EACH GROUP OF 72,000 TESTS.

/RANDOM JMP TEST  
 /SR0(0)=HALT ON ERROR  
 /SR2(1)=CONSTANT FROM ADDRESS  
 /SR3(1)=CONSTANT TO ADDRESS

0000	0000	0			
0001	0001	JMP 1			/FOR SCOPE MODE INSERT
0002	5001	2			/JMP I FROM1 (5520) INTO LOC. 1
0003	0002	3			
0004	0003	0			
0005	0004	0			
0006	0005	0			
0007	7640	SEA CLA			
0008	5934	JMP I AER			
0009	1115	TAD HALT			
0010	3517	DCA I FROM			
0011	1115	TAD HALT			
0012	1115	TAD HALT			
0013	3520	DCA I FROM1			
0014	3000	DCA 0			
0015	7001	IAC			
0016	1140	TAD CT			
0017	1140	DCA CT			
0018	1140	TAD CT			
0019	1140	TAD CT			
0020	1140	TAD CT			
0021	7640	SEA CLA			
0022	5027	JMP LOOP			
0023	5424	JMP I 1:1			
0024	0316	SUP			
0025	1142	TAD M17			
0026	3141	DCA CT1			

/CHECK FOR CONSTANT FROM

0027	7604	LAS			
0028	7004	RAL			
0029	7006	RTL			
0030	7630	SEL CLA			
0031	5057	JMP LOOP1			

/SELECT RANDOM FROM

0032	1121	GETRAN, TAD RANUM			
0033	7104	RAL CLL			
0034	7430	SEL			
0035	1122	TAD THREE			
0036	3121	DCA RANUM			
0037	7100	CLL			
0038	1121	TAD RANUM			
0039	1124	TAD LIMHI			
0040	7630	SEL CLA			
0041	5034	JMP GETRAN			
0042	1121	TAD RANUM			
0043	1123	TAD RANUM			
0044	7620	TAD LIMLO			
0045	5051	SNL CLA			
0046	5034	JMP GETRAN			
0047	1123	TAD RANUM			
0048	7620	TAD LIMLO			
0049	5051	SNL CLA			
0050	5034	JMP GETRAN			

0052 1121  
 0053 3117  
 0054 7040  
 0055 1117  
 0056 3120

TAD RANUM  
 DCA FROM  
 CMA  
 TAD FROM  
 DCA FROM1

/CHECK FOR CONSTANT TO ADDRESS

0057 7604  
 0060 7006  
 0061 7006  
 0062 7630  
 0063 5104

LOOP1, LAS  
 RTL  
 SZL CLA  
 JMP JPLP

/SELECT RANDOM TO ADDRESS

0064 1121  
 0065 7104  
 0066 7430  
 0067 1122  
 0070 3121  
 0071 7100  
 0072 1121  
 0073 1124  
 0074 7630  
 0075 5064  
 0076 1121  
 0077 1123  
 0100 7620  
 0101 5064  
 0102 1121  
 0103 3116

GTRAN1, TAD RANUM  
 RAL CLL  
 SZL THREE  
 TAD RANUM  
 CLL  
 TAD RANUM  
 TAD LIMHI  
 SZL CLA  
 JMP GTRAN1  
 TAD RANUM  
 TAD LIMLO  
 SNL CLA  
 JMP GTRAN1  
 TAD RANUM  
 DCA TO

/PLACE INSTRUCTIONS

0104 1125  
 0105 3517  
 0106 1126  
 0107 3520

JPLP, TAD JMP1  
 DCA I FROM  
 TAD ITON  
 DCA I FROM1

/RAISE FLAG

0110 6041  
 0111 6046  
 0112 6041  
 0113 5112

TSF  
 TLS  
 TSF  
 JMP 111

/DO IT

0114 5520  
 0115 7402

JMP I FROM1  
 HALT, HLT

/JUMP FAILED

/CONSTANTS, VARIABLES, AND SUCH



0116 0000  
 0117 0000  
 0120 0000  
 0121 2525  
 0122 0003  
 0123 7400  
 0124 0200  
 0125 5516  
 0126 6001  
 0127 0260  
 0130 0007  
 0131 0000  
 0132 0000  
 0133 0000  
 0134 0220  
 0135 0000  
 0136 7571  
 0137 0143  
 0140 0000  
 0141 0000  
 0142 7761

PAL10 V141  
 TO, 0  
 FROM, 0  
 FROM1, 0  
 RANUM, 2525  
 THREE, 3  
 LIMLO, -400  
 LIMHI, -7600  
 JMP1, JMP 1 TO  
 ION, ION  
 TW6, 260  
 MSK7, 7  
 SAVE, 0  
 0  
 0  
 0  
 0  
 ER  
 WORK, 0  
 M207, -207  
 AMSG1, MSG1  
 CT, 0  
 CT1, 0  
 M17, -17

/TTY MESSAGE

0143	0215	MSG1,	215	/CR
0144	0212		212	/LF
0145	0212		212	/LF
0146	0306		306	/F FROM ADDRESS
0147	0240		240	/SPACE
0150	0000	INS1,	0	/X
0151	0000	INS2,	0	/X
0152	0000	INS3,	0	/X
0153	0000	INS4,	0	/X
0154	0240		240	/SPACE
0155	0324		324	/T JMP TO
0156	0240		240	/SPACE
0157	0000	INS5,	0	/X
0160	0000	INS6,	0	/X
0161	0000	INS7,	0	/X
0162	0000	INS8,	0	/X
0163	0215		215	/CR
0164	0212		212	/LF
0165	0377		377	/RUBOUT
0166	0332		332	/Z LOCATION ZERO
0167	0240		240	/SPACE
0170	0275		275	/=
0171	0240		240	/SPACE
0172	0000	INS9,	0	/X
0173	0000	INS10,	0	/X
0174	0000	INS11,	0	/X
0175	0000	INS12,	0	/X
0176	0207		207	/STOPPER

/SPREAD HALTS THROUGH MEMORY

0200	5770	JMP I PATCH	/TAD LIMLO
0201	7041	CIA TO	
0202	3116	DCA TO	
0203	1115	TAD HALT	
0204	3516	DCA I TO	
0205	1116	TAD TO	
0206	7001	IAC	
0207	3116	DCA TO	
0210	1116	TAD TO	
0211	1124	TAD LIMHI	
0212	7640	SZA CLA	
0213	5203	JMP GON	
0214	1367	TAD H13	
0215	3141	DCA CTI	
0216	3140	DCA CT	
0217	5027	JMP LOOP	

GON,

0220	1117	/ERROR ROUTINES	
0221	4341	TAD FROM	
0222	3150	JMS SLOC	
0223	1131	DCA INS1	
0224	0130	TAD SAVE	
0225	1127	AND MSK7	
0226	3151	TAD TH6	
0227	1132	DCA INS2	
0230	0130	TAD SAVE+1	
0231	1127	AND MSK7	
0232	3152	TAD TH6	
0233	1133	DCA INS3	
0234	0130	TAD SAVE+2	
0235	1127	AND MSK7	
0236	3153	TAD TH6	
0237	1116	DCA INS4	
0240	4341	TAD TO	
0241	3157	JMS SLOC	
0242	1131	DCA INS5	
0243	0130	TAD SAVE	
0244	1127	AND MSK7	
0245	3160	TAD TH6	
0246	1132	DCA INS6	
0247	0130	TAD SAVE+1	
0250	1127	AND MSK7	
0251	3161	TAD TH6	
0252	1133	DCA INS7	
0253	0130	TAD SAVE+2	
0254	1127	AND MSK7	
0255	3162	TAD TH6	
0256	1000	DCA INS8	
0257	4341	TAD 0	
0	3172	JMS SLOC	
		DCA INS9	

0261 1131 TAD SAVE  
 0262 0130 AND MSK7  
 0263 1127 TAD TW6  
 0264 3173 DCA INS10  
 0265 1132 TAD SAVE+1  
 0266 0130 AND MSK7  
 0267 1127 TAD TW6  
 0270 3174 DCA INS11  
 0271 1133 TAD SAVE+2  
 0272 0130 AND MSK7  
 0273 1127 TAD TW6  
 0274 3175 DCA INS12

/PRINT ERROR MESSAGE

0275 1137 TAD MSG1  
 0276 3135 DCA WORK  
 0277 1535 TAD I WORK  
 0300 6046 TLS  
 0301 6041 TSF  
 0302 5301 JMP I=1  
 0303 7201 CLA IAC  
 0304 1135 TAD WORK  
 0305 3135 DCA WORK  
 0306 1535 TAD I WORK  
 0307 1136 TAD M207  
 0310 7640 SEA CLA  
 0311 5277 JMP LP  
 0312 7604 LAS  
 0313 7700 SMA CLA  
 0314 7402 HLT  
 0315 5010 JMP 10

/HALT ON ERROR

0316 1141 SUP, TAD CTI  
 0317 7001 IAC  
 0320 3141 DCA CTI  
 0321 1141 TAD CTI  
 0322 7640 SEA CLA  
 0323 5027 JMP LOOP  
 0324 1361 TAD MSG2  
 0325 3135 DCA WORK  
 0326 1135 TAD WORK  
 0327 7001 IAC  
 0330 3135 DCA WORK  
 0331 1535 TAD I WORK  
 0332 6046 TLS  
 0333 6041 TSF  
 0334 5333 JMP I=1  
 0335 1366 TAD M303  
 0336 7640 SEA CLA  
 0337 5326 JMP LP1  
 0340 5025 JMP LOOP=2

SLOC, 0

0342 3133 DCA SAVE+2  
 0343 1133 TAD SAVE+2  
 0344 7012 RTR  
 0345 7010 RAR  
 0346 3132 DCA SAVE+1  
 0347 1132 TAD SAVE+1  
 0350 7012 RTR  
 0351 7010 RAR  
 0352 3131 DCA SAVE  
 0353 1131 TAD SAVE  
 0354 7012 RTR  
 0355 7010 RAR  
 0356 0130 AND HSK7  
 0357 1127 TAD TWA  
 0360 5741 JMP I SLOC

0361 0361 .  
 0362 0215 /CR  
 0363 0212 /LF  
 0364 0310 /H  
 0365 0303 /C

0366 7475 M303.  
 0367 7763 M15.

0370 0400 PATCH, XPATCH

0400 0400 \*400 /RESTORE 011,2,3 AND 00  
 0401 1215 XPATCH, DCA 0 /AWAY  
 0402 3001 TAD X1  
 0403 1216 DCA 1  
 0404 3002 TAD X2  
 0405 1217 DCA 2  
 0406 3003 TAD X3  
 0407 1220 DCA 3  
 0410 3621 TAD X4  
 0411 7300 DCA I X5  
 0412 3004 CLA CLL  
 0413 3005 DCA 4  
 0414 5621 DCA 5  
 0415 1116 JMP I X5  
 0416 7041 1116 /TAD TO  
 0417 1000 CIA  
 0420 1123 1000 /TAD 0  
 0421 0200 TAD LIMLO  
 200