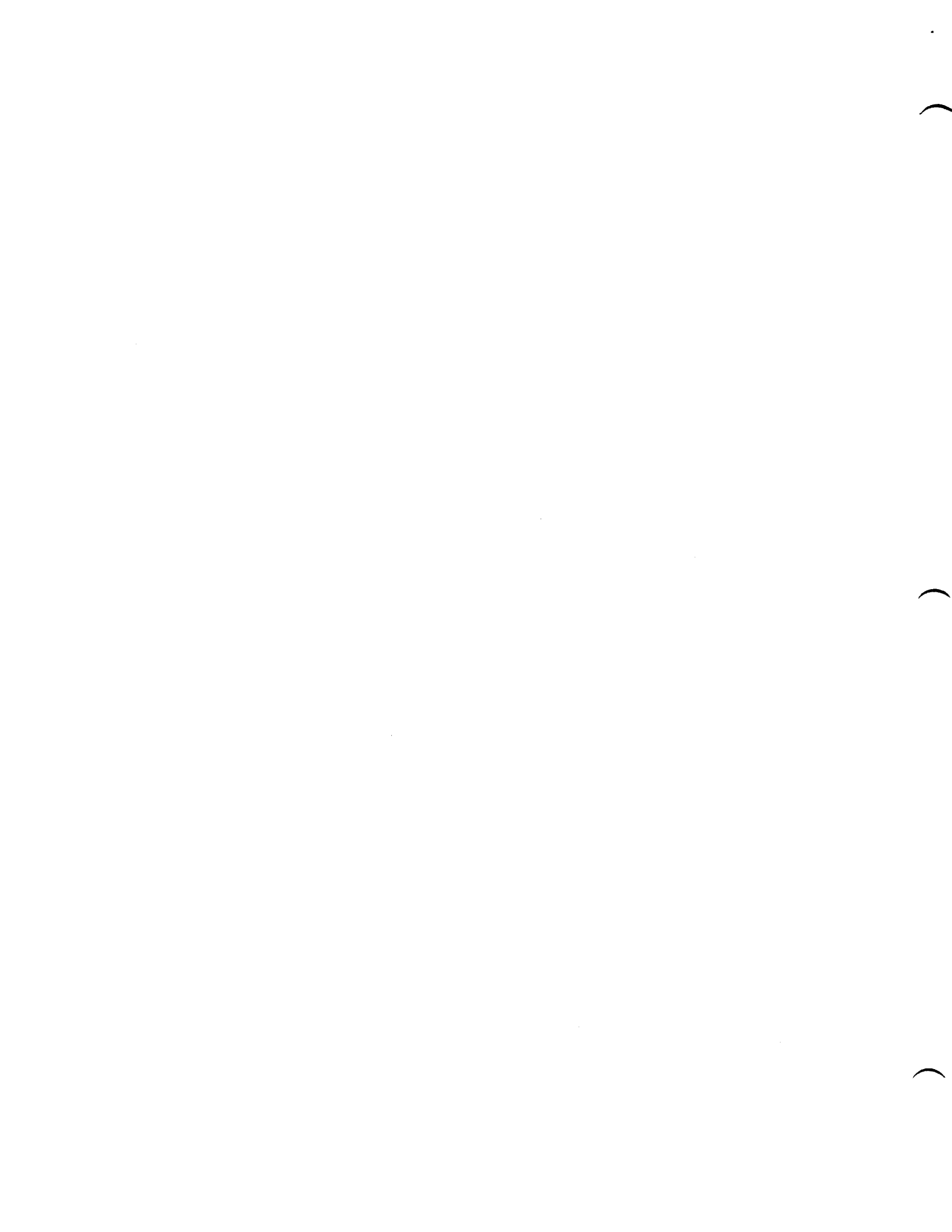


IDENTIFICATION  
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PRODUCT CODE: MAINDEC-8E-DØHC-D  
PRODUCT NAME: RANDOM JMP TEST  
DATE CREATED: JUNE 11, 1971  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: BRUCE HANSEN



1. ABSTRACT  
-----

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  
-----

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

2.3 PRELIMINARY PROGRAMS  
-----

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 WWWWIWWW = 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  
4.3.8). RESTART THE PROGRAM WITH SR2 AND SR3 SET, AFTER  
ALLOWING IT TO RUN FOR A MOMENT PUSH HALT, ENTER (3520) 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! 0400KRANDOM 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			
0001	5001	JMP 1		/FOR SCOPE MODE INSERT
0002	0002	2		/JMP I FROM1 (5520) INTO LOC: I
0003	0003	3		
0004	0000	0		
0005	0000	0		
0006	7640	SEA CLA		
0007	5534	JMP I AER		
0010	1115	TAD HALT		
0011	3517	DCA I FROM		
0012	1115	TAD HALT		
0013	3520	DCA I FROM1		
0014	3000	DCA 0		
0015	7001	IAC		
0016	1140	TAD CT		
0017	3140	DCA CT		
0020	1140	TAD CT		
0021	7640	SEA CLA		
0022	5027	JMP LOOP		
0023	5424	JMP I I+1		
0024	0316	SUP		
0025	1142	TAD M17		
0026	3141	DCA CTI		

/CHECK FOR CONSTANT FROM

0027	7604	LAS	
0030	7004	RAL	
0031	7006	RTL	
0032	7630	SZL CLA	
0033	5057	JMP LOOP1	

/SELECT RANDOM FROM

0034	1121	GETRAN, TAD RANUM	
0035	7104	RAL CLL	
0036	7430	SZL	
0037	1122	TAD THREE	
0040	3121	DCA RANUM	
0041	7100	CLL	
0042	1121	TAD RANUM	
0043	1124	TAD LIMHI	
0044	7630	SZL CLA	
0045	5034	JMP GETRAN	
0046	1121	TAD RANUM	
0047	1123	TAD LIMLO	
0050	7620	SNL CLA	
0051	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  
 RTL  
 SEL 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  
 SEL  
 TAD THREE  
 DCA RANUM  
 CLL  
 TAD RANUM  
 TAD LIMHI  
 SEL 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 1,1

/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  
 RANUM, 2525  
 THREE, 3  
 LIMLO, -400  
 LIMHI, -7600  
 JMP I TO  
 ION, 260  
 TW6, 7  
 MSK7, 0  
 SAVE, 0  
 ER, 0  
 WORK, 0  
 M207, -207  
 AMSG1, MSG1  
 CT, 0  
 CT1, 0  
 M17, -17

/TTY MESSAGE

MSG1,	215	/CR
	212	/LF
	212	/LF
	306	/F FROM ADDRESS
	240	/SPACE
INS1,	0	/X
INS2,	0	/X
INS3,	0	/X
INS4,	0	/X
	240	/SPACE
	324	/T JMP TO
	240	/SPACE
INS5,	0	/X
INS6,	0	/X
INS7,	0	/X
INS8,	0	/X
	215	/CR
	212	/LF
	377	/RUBOUT
	332	/Z LOCATION ZERO
	240	/SPACE
	275	/=
	240	/SPACE
INS9,	0	/X
INS10,	0	/X
INS11,	0	/X
INS12,	0	/X
	207	/STOPPER

/SPREAD HALTS THROUGH MEMORY

/TAD LIMLO

JMP I PATCH

0200 5770  
 0201 7041  
 0202 3116  
 0203 1115  
 0204 3516  
 0205 1116  
 0206 7001  
 0207 3116  
 0210 1116  
 0211 1124  
 0212 7640  
 0213 5203  
 0214 1367  
 0215 3141  
 0216 3140  
 0217 5027

CIA TO  
 DCA TO  
 TAD HALT  
 DCA I TO  
 TAD TO  
 IAC  
 DCA TO  
 TAD TO  
 TAD LIMHI  
 SZA CLA  
 JMP GON  
 TAD M15  
 DCA CTI  
 DCA CT  
 JMP LOOP

GON,

/ERROR ROUTINES  
 ER,  
 TAD FROM  
 JMS SLOC  
 DCA INS1  
 TAD SAVE  
 AND MSK7  
 TAD TW6  
 DCA INS2  
 TAD SAVE+1  
 AND MSK7  
 TAD TW6  
 DCA INS3  
 TAD SAVE+2  
 AND MSK7  
 TAD TW6  
 DCA INS4  
 TAD TO  
 JMS SLOC  
 DCA INS5  
 TAD SAVE  
 AND MSK7  
 TAD TW6  
 DCA INS6  
 TAD SAVE+1  
 AND MSK7  
 TAD TW6  
 DCA INS7  
 TAD SAVE+2  
 AND MSK7  
 TAD TW6  
 DCA INS8  
 TAD 0  
 JMS SLOC  
 DCA INS9

0220 1117  
 0221 4341  
 0222 3150  
 0223 1131  
 0224 0130  
 0225 1127  
 0226 3151  
 0227 1132  
 0230 0130  
 0231 1127  
 0232 3152  
 0233 1133  
 0234 0130  
 0235 1127  
 0236 3153  
 0237 1116  
 0240 4341  
 0241 3157  
 0242 1131  
 0243 0130  
 0244 1127  
 0245 3160  
 0246 1132  
 0247 0130  
 0250 1127  
 0251 3161  
 0252 1133  
 0253 0130  
 0254 1127  
 0255 3162  
 0256 1000  
 0257 4341  
 0 3172

0261 1131  
 0262 0130  
 0263 1127  
 0264 3173  
 0265 1132  
 0266 0130  
 0267 1127  
 0270 3174  
 0271 1133  
 0272 0130  
 0273 1127  
 0274 3175

TAD SAVE  
 AND MSK7  
 TAD TW6  
 DCA INS10  
 TAD SAVE+1  
 AND MSK7  
 TAD TW6  
 DCA INS11  
 TAD SAVE+2  
 AND MSK7  
 TAD TW6  
 DCA INS12

/PRINT ERROR MESSAGE

0275 1137  
 0276 3135  
 0277 1535  
 0300 6046  
 0301 6041  
 0302 5301  
 0303 7201  
 0304 1135  
 0305 3135  
 0306 1535  
 0307 1136  
 0310 7640  
 0311 5277  
 0312 7604  
 0313 7700  
 0314 7402  
 0315 5010

TAD AMMSG1  
 DCA WORK  
 TAD I WORK  
 TLS  
 TSF  
 JMP I=1  
 CLA IAC  
 TAD WORK  
 DCA WORK  
 TAD I WORK  
 TAD M207  
 SEA CLA  
 JMP LP  
 LAS  
 SMA CLA  
 HLT  
 JMP 10

/HALT ON ERROR

0316 1141  
 0317 7001  
 0320 3141  
 0321 1141  
 0322 7640  
 0323 5027

TAD CTI  
 IAC  
 DCA CTI  
 TAD CTI  
 SEA CLA  
 JMP LOOP

SUP,

0324 1361  
 0325 3135  
 0326 1135  
 0327 7001  
 0330 3135  
 0331 1535  
 0332 6046  
 0333 6041  
 0334 5333  
 0335 1366  
 0336 7640  
 0337 5326  
 0340 5025

TAD AMMSG2  
 DCA WORK  
 TAD WORK  
 IAC  
 DCA WORK  
 TAD I WORK  
 TLS  
 TSF  
 JMP I=1  
 TAD M303  
 SEA CLA  
 JMP LP1  
 JMP LOOP=2

LP1,

0341 0000

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	MSG2:	1	/CR
0362	0215		215	/LF
0363	0212		212	/H
0364	0310		310	/C
0365	0303		303	

0366	7475	MS03:	-303
0367	7763	M15:	-15
0370	0400	PATCH:	XPATCH

0400	0400	*400	DCA 0	/RESTORE 0,1,2,3 AND 00
0401	1215	XPATCH:	TAD X1	/AWAY
0402	3001		DCA 1	
0403	1216		TAD X2	
0404	3002		DCA 2	
0405	1217		TAD X3	
0406	3003		DCA 3	
0407	1220		TAD X4	
0410	3021		DCA I X5	
0411	7300		CLA CLL	
0412	3004		DCA 4	
0413	3005		DCA 5	
0414	5621		JMP I X5	

0415	1116	X1:	1116	/TAD TO
0416	7041	X2:	CIA	
0417	1000	X3:	1000	/TAD 0
0420	1123	X4:	TAD LIMLO	
0421	0200	X5:	200	