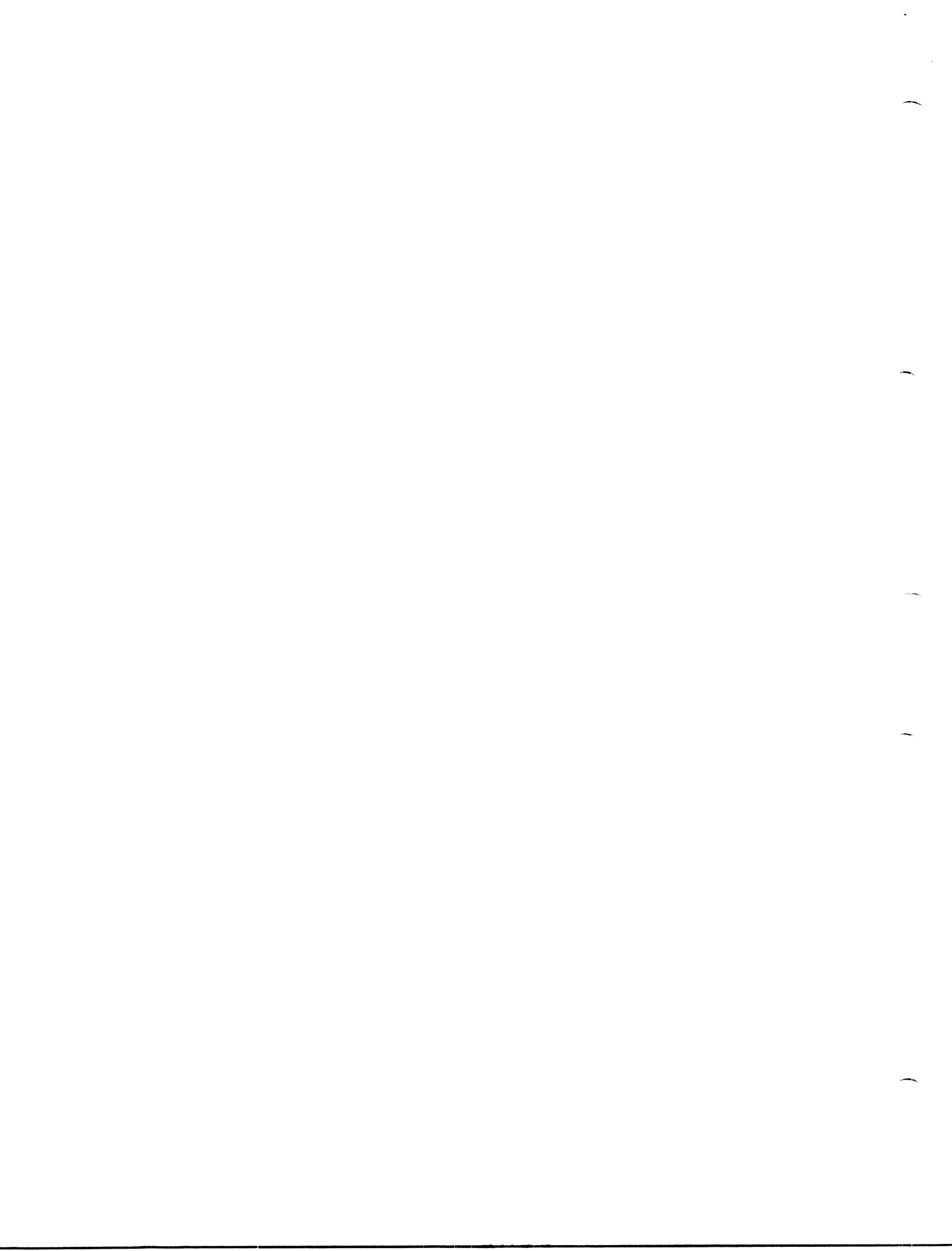


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IDENTIFICATION  
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PRODUCT CODE: MAINDEC-8E-D0HB-D  
PRODUCT NAME: RANDOM JMP TEST  
DATE CREATED: DECEMBER 10, 1970  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: BRUCE HANSEN



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  
-----

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-D0AA, AND MAINDEC-8E-D0BA 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

4.3 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 WWWW:WWW = 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 (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  
-----

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: 0400<RANDOM ADDRESS <7600. THE AREA BETWEEN 0400 AND 7600 IS FILLED WITH HLT INSTRUCTIONS IN CASE THE INTERRUPT FAILS. A "HB" IS PRINTED AFTER EACH GROUP OF 72,000 TESTS.

/RANDOM JMP TEST

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

0000	0	/FOR SCOPE MODE INSERT
0001	JMP 1	/JMP I FROM1 (5520) INTO LOC. 1
0002	2	
0003	3	
0004	0	
0005	0	
0006	SEA CLA	
0007	JMP I AER	
0010	TAD HALT	
0011	DCA I FROM	
0012	TAD HALT	
0013	DCA I FROM1	
0014	DCA 0	
0015	IAC	
0016	TAD CT	
0017	DCA CT	
0020	TAD CT	
0021	SEA CLA	
0022	JMP LOOP	
0023	JMP I .+1	
0024	SUP	
0025	TAD M17	
0026	DCA CT1	

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0000	0000
0001	5001
0002	0002
0003	0003
0004	0000
0005	0000
0006	7640
0007	5534
0010	1115
0011	3517
0012	1115
0013	3520
0014	3000
0015	7001
0016	1140
0017	3140
0020	1140
0021	7640
0022	5027
0023	5424
0024	0316
0025	1142
0026	3141

/CHECK FOR CONSTANT FROM

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

/SELECT RANDOM FROM

0034	1121	GETRAN, TAD RANUM
0035	7104	RAL CLL
0036	7430	SEL
0037	1122	TAD THREE
0040	3121	DCA RANUM
0041	7100	CLL
0042	1121	TAD RANUM
0043	1124	TAD LIMHI
0044	7630	SEL 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 7004  
0060 7006  
0061 7006  
0062 7630  
0063 0104

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 0064  
0076 1121  
0077 1123  
0100 7620  
0101 0064  
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 0041  
0111 0046  
0112 0041  
0113 5112

TSF  
TFS  
TSF  
JMP .-1

/DO IT

0114 5520  
0115 7402

JMP I FROM1  
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

```

```

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

```

```

0143 0215
0144 0212
0145 0212
0146 0306
0147 0240
0150 0000
0151 0000
0152 0000
0153 0000
0154 0240
0155 0324
0156 0240
0157 0000
0160 0000
0161 0000
0162 0000
0163 0215
0164 0212

```

```

/TTY MESSAGE
MSG1,
212
212
212
306
240
0
0
0
0
0
240
324
240
0
0
0
0
215
212

```

```

/CR
/LF
/LF
/F FROM ADDRESS
/SPACE
/X
/X
/X
/X
/SPACE
/T JMP TO
/SPACE
/X
/X
/X
/X
/CR
/LF

```

```

INS1,
INS2,
INS3,
INS4,
INS5,
INS6,
INS7,
INS8,

```

```

/RUBOUT
/Z LOCATION ZERO
/SPACE
/=
/SPACE
/X
/X
/X
/X
/STOPPER

```

```

377
332
240
275
240
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0

```

/SPREAD HALTS THROUGH MEMORY

0200	0770	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 TO	
0207	3116	DCA TO	
0210	1116	TAD TO	
0211	1124	TAD LIMHI	
0212	7640	SHA CLA	
0213	0203	JMP GON	
0214	1367	TAD M15	
0215	3141	DCA CT1	
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 TW6	
0227	1132	DCA INS2	
0230	0130	TAD SAVE+1	
0231	1127	AND MSK7	
0232	3152	TAD TW6	
0233	1133	DCA INS3	
0234	0130	TAD SAVE+2	
0235	1127	AND MSK7	
0236	3153	TAD TW6	
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 TW6	
0246	1132	DCA INS6	
0247	0130	TAD SAVE+1	
0250	1127	AND MSK7	
0251	3161	TAD TW6	
0252	1133	DCA INS7	
0253	0130	TAD SAVE+2	
0254	1127	AND MSK7	
0255	3162	TAD TW6	
0256	1000	DCA INS8	
0257	4341	TAD 0	
0260	3172	JMS SLOC	
		DCA INS9	

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 0046  
 0301 0041  
 0302 5001  
 0303 7201  
 0304 1135  
 0305 3135  
 0306 1535  
 0307 1136  
 0310 7640  
 0311 5277  
 0312 7604  
 0313 7700  
 0314 7402  
 0315 5010

TAD AMSG1  
 DCA WORK  
 TAD I WORK  
 TLS  
 TSF  
 JMP --1  
 CLA IAC  
 TAD WORK  
 DCA WORK  
 TAD I WORK  
 TAD M207  
 SZA CLA  
 JMP LP  
 LAS CLA  
 SZA CLA  
 HLT  
 JMP 10

/HALT ON ERROR

SUP.

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

TAD CT1  
 IAC  
 DCA CT1  
 TAD CT1  
 SZA CLA  
 JMP LOOP

LP1.

0324 1361  
 0325 3135  
 0326 1135  
 0327 7001  
 0330 3135  
 0331 1535  
 0332 0046  
 0333 0041  
 0334 5333  
 0335 1366  
 0336 7640  
 0337 5326  
 0340 5025

TAD AMSG2  
 DCA WORK  
 TAD WORK  
 IAC  
 DCA WORK  
 TAD I WORK  
 TLS  
 TSF  
 JMP --1  
 TAD M302  
 SZA CLA  
 JMP LP1  
 JMP LOOP-2

SLOC.

0

0342 0343 0344 0345 0346 0347 0350 0351 0352 0353 0354 0355 0356 0357 0360  
DCA SAVE+2  
TAD SAVE+2  
RTR  
RAR  
DCA SAVE+1  
TAD SAVE+1  
RTR  
RAR  
DCA SAVE  
TAD SAVE  
RTR  
RAR  
AND MSK7  
TAD TM6  
JMP I SLOC

0361 0362 0363 0364 0365  
0366 0367  
0370  
AMSG2,  
215 /CR  
212 /LF  
310 /H  
302 /B  
-302  
-15  
M302,  
M15,  
PATCH,  
XPATCH

0400 0401 0402 0403 0404 0405 0406 0407 0410 0411 0412 0413 0414  
XPATCH,  
DCA 0  
TAD X1  
DCA 1  
TAD X2  
DCA 2  
TAD X3  
DCA 3  
TAD X4  
DCA I X5  
CLA CLL  
DCA 4  
DCA 5  
JMP I X5  
/RESTORE 0.1.2.3 AND GO  
/AWAY  
0415 0416 0417 0420 0421  
X1,  
X2,  
X3,  
X4,  
X5,  
1116  
CIA  
1000  
TAD LIMLO  
200  
/TAD TO  
/TAD 0



4000  
4100

4200  
4300

4400  
4500

4600  
4700

5000  
5100

5200  
5300

5400  
5500

5600  
5700

6000  
6100

6200  
6300

6400  
6500

6600  
6700

7000  
7100

7200  
7300

7400  
7500

7600  
7700

X5 0421  
XPATCH 0400

R	0134
AMSG1	0137
AMSG2	0361
CT	0140
CT1	0141
ER	0220
FROM	0117
FROM1	0120
GETRAN	0034
GON	0203
GTRAN1	0064
HALT	0115
INS1	0150
INS10	0173
INS11	0174
INS12	0175
INS2	0151
INS3	0152
INS4	0153
INS5	0157
INS6	0160
INS7	0161
INS8	0162
INS9	0172
ITON	0126
JMP1	0125
JPLP	0104
LIMHI	0124
LIMLO	0123
LOOP	0027
LOOP1	0057
LP	0277
LP1	0326
M15	0367
M17	0142
M207	0136
M302	0366
MSG1	0143
MSK7	0130
PATCH	0370
RANUM	0121
SAVE	0131
SLOC	0341
SUP	0316
THREE	0122
TO	0116
TW6	0127
WORK	0135
X1	0415
X2	0416
X3	0417
X4	0420

