

IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-0008-D
PRODUCT NAME: RANDOM AND TEST
DATE CREATED: JUNE 7, 1971
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: MICHAEL DAVIS

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1. ABSTRACT

THIS PROGRAM TESTS THE AND INSTRUCTING OF THE PDP-8E, THE AND INSTRUCTION, INSTRUCTION ADDRESS, OPERAND ADDRESS AND BOTH OPERANDS ARE PRODUCED BY RANDOM NUMBER GENERATORS,

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-8E EQUIPPED WITH AT LEAST 4K OF MEMORY,

TELETYPE,

2.2 STORAGE

THE PROGRAM IS INITIALLY LOADED INTO LOCATIONS 0000 THRU 1177. THE INITIAL TEST AREA IS 1200-7777. WHEN THE PROGRAM RELOCATES, IT OCCUPIES 6600-7777, THE TEST AREA IS THEN 0000-6577.

2.3 PRELIMINARY PROGRAMS

MAINDEC-8E-DBAA, 00BA, D0CA

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING BINARY TAPES IS TO BE USED.

4. STARTING PROCEDURE

4.1 STARTING ADDRESS

0200

4.2 CONTROL SWITCH SETTINGS

SR00#1, SUPPRESS HALT ON ERROR
SR01#1, HALT AT END OF PASS, RESTORE LOADERS
SR02#1, SUPPRESS PROGRAM RELOCATION
SR03#1, SUPPRESS END OF PASS TYPEOUT
SR08#1, HOLD DATA 1 CONSTANT
SR10#1, HOLD DATA 2 CONSTANT
SR11#1, HOLD INSTRUCTION CONSTANT

- 4.3 OPERATOR ACTION
- 4.3.1 SET SR TO 0200
- 4.3.2 PRESS LOAD ADDRESS SWITCH
- 4.3.3 SET SR TO 0000
- 4.3.4 PRESS CLEAR AND CONTINUE SWITCHES
- 5. OPERATING PROCEDURE
- 6. ERRORS
- 6.1 RELOCATION ERROR
- 6.2 DATA ERRORS
- 6.3 ERROR RECOVERY
- 6.3.1 RELOCATION ERROR

SAME AS 4.

IF AN ERROR OCCURS DURING PROGRAM RELOCATION, THE PROGRAM WILL HALT AT 234 OR 634, DEPENDING UPON WHETHER THE PROGRAM IS LOCATED LOW OR HIGH.

IF THE LINK IS SET AFTER COMPLETION OF THE AND INSTRUCTION, OR IF THE RESULTS OF THE AND INSTRUCTION ARE INCORRECT, THE PROGRAM WILL HALT AT 731(7331) WITH DATA1 IN THE AC.

DEPRESS CONTINUE TO DISPLAY DATA2 IN THE AC.
 DEPRESS CONTINUE TO DISPLAY AND INSTRUCTION IN AC.
 DEPRESS CONTINUE TO DISPLAY INSTRUCTION ADDRESS IN AC.
 DEPRESS CONTINUE TO DISPLAY DATA2 ADDRESS IN AC.
 DEPRESS CONTINUE TO DISPLAY INDIRECT POINTER (USED BY INDIRECT AND) IN AC.
 DEPRESS CONTINUE TO RESUME TEST

RELOAD PROGRAM

6.3.2 DATA ERROR

SEE 6.2

6.4 LOOPING

SET SR00=1 TO PREVENT HALT AFTER ERROR,

SET SR02=1 TO PREVENT RELOCATION,

SET SR03=1 TO SUPPRESS END OF PASS TYPEOUT,

SET SR09-SR11=1 TO HOLD INSTRUCTION AND DATA CONSTANT,

7. RESTRICTIONS

NONE

8. EXECUTION TIME

THE PROGRAM PERFORMS 4096 RANDOM TESTS IN APPROXIMATELY 2 SECONDS AND THEN RELOCATES. THE PROGRAM WILL TYPE "A" AFTER EACH 4096 RANDOM TESTS UNLESS SR03=1.

9. PROGRAM DESCRIPTION

THE PROGRAM IS INITIALLY LOADED INTO LOCATIONS 0288-1177, WITH TEMPORARY STORAGE LOCATIONS ON PAGE 0. AFTER INITIAL KEYPART, THE PROGRAM WILL SAVE R1M AND 01N LOADERS IN PAGE 0 AND WILL THEN PROCEED TO USE LOCATIONS 1288-7777 AS A TEST AREA.

THE PROGRAM USES SEPARATE RANDOM NUMBER GENERATORS TO GENERATE THE AND INSTRUCTION, INSTRUCTION AND DATA ADDRESSES, AND THE TWO ARGUMENTS TO BE "AND'ED". THE INSTRUCTIONS AND DATA ARE STORED IN THEIR PREVIOUSLY GENERATED ADDRESSES. THE PROGRAM TRANSFERS TO THE LOCATION OF THE INSTRUCTION AND EXECUTES IT. THE PROGRAM THEN TRANSFERS TO A COMPARISON ROUTINE WHERE THE ACTUAL RESULT OF THE AND INSTRUCTION IS COMPARED TO A SIMULATED AND.

AFTER 4096 TESTS, THE PROGRAM TYPES "A", RELOCATES, AND CONTINUES TESTING.

/RANDOM AND TEST
 /COPYRIGHT 1970, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
 /V 82 07552
 /
 /TEMPORARY TRANSFER LOCATIONS ON PAGE 0
 /

0000	*0	TTANDL, 0		
0000	0000	INSTL, JMP		/STORAGE FOR AND INSTRUCTION
0001	5001	INADDL, 2		/STORAGE FOR AND INSTRUCTION ADDRESS
0002	0002	DATADL, 3		/STORAGE FOR DATA ADDRESS
0003	0003	IFLAGL, 3		/STORAGE FOR INSTRUCTION INDIRECT FLAG
0004	0003	PADDL, 0		/STORAGE FOR DATA INDIRECT ADDRESS
0005	0000	LIML, 0		
0006	0000	PAGL, 0		
0007	0000			
0010	*10	PNTRL, 0		
0010	0000			

CAF=6007
 HGA=7501
 HGL=7421
 CNTRL=LOHIL

0020	*20	TEMP3L, 0	
0020	0000		

/INITIALIZATION AND CONTROL ROUTINES

0200	*200	STARTL, CAF		
0200	6007	TAD		/SAVE RIM AND BIN IN PAGE 0
0201	1204	DCA		/ONLY AT INITIAL KEYSTART
0202	3201	JMS		/201 BECOMES JMP SETLKL
0203	4205	JMP		/FOR ALL FUTURE PASSES
0204	5274			

/TRANSFER RIM AND BIN LOADERS TO PAGE 0

0205	0000	SAVBNL, 0		
0206	1374	TAD		/SET AC=-200, NUMBER OF
0207	3266	DCA		/LOCATIONS TO BE TRANSFERRED
0210	1374	TAD		/FIRST "FROM"
0211	3202	DCA		/LOCATION=7600
0212	3203	DCA		/FIRST "TO" LOCATION=0
0213	4225	JMS		/PERFORM TRANSFER
0214	5605	JMP I		/EXIT

```

RESBNL, 0
0215 0000 /
0216 1374 /SET AC=-200, NUMBER OF
0217 3266 /LOCATIONS TO BE TRANSFERRED
0220 3202 /FIRST "FROM" ADDRESS=0
0221 1374 /FIRST "TO"
0222 3203 /ADDRESS=7600
0223 4225 /PERFORM TRANSFER
0224 5615 /EXIT
/
C7600L
CNTR1L
PNTR1L
C7600L
PNTR2L
RELOL
RESBNL
/ DATA TRANSFER ROUTINE
/

```

```

RELOL, 0
0225 0000 /GET DATA
0226 1602 /TRANSFER
0227 3603 /GET DATA
0230 1602 /COMPARE
0231 7041 /TRANSFER ERROR
0232 1603 /NEXT "FROM" LOCATION
0233 7640 /NEXT "TO" LOCATION
0234 7402
0235 2202
0236 7000
0237 2203
0240 7000
0241 2266
0242 5226
0243 5625
/TRANSFER PROGRAM TO UPPER MEMORY
/

```

```

REHL, 0
0244 4215 /TRANSFER RIM AND BIN LOADERS
0245 1373 /SET AC=-1000, NUMBER OF
0246 3266 /LOCATIONS TO BE TRANSFERRED
0247 1365 /FIRST "FROM"
0250 3202 /ADDRESS=200
0251 1372 /FIRST "TO"
0252 3203 /ADDRESS=6600
0253 4225 /PERFORM TRANSFER
0254 5772 /GO TO PROGRAM START
/TRANSFER PROGRAM TO LOWER MEMORY
/

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RELL, 0
0255 4205 /TRANSFER RIM AND BIN LOADERS
0256 1373 /SET AC=-1000, NUMBER OF
0257 3266 /LOCATIONS TO BE TRANSFERRED
0260 1372 /FIRST "FROM"
0261 3202 /ADDRESS=6600
0262 1365 /FIRST "TO"
0263 3203 /ADDRESS=200
/ PAL-10 17-JUN-71 7:23 PAGE 2-1
0264 4225 /TRANSFER RIM AND BIN LOADERS
0265 5765 /SET AC=-1000, NUMBER OF
/GO TO PROGRAM START
/ PAL-10 17-JUN-71 7:23 PAGE 3

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```

/ DETERMINE IF PROGRAM IS IN LOWER OR UPPER MEMORY
/
LOHIL,
0266 0000 /PC
0267 7330 /SET AC=4000
0270 1266 /ADD PC
0271 7630 /IS LINK=0
0272 1371 /NO, HIGH CORE
0273 5666 /RETURN
/
/ TRANSFER TO LINKAGE GENERATION
/
SETLKL,
0274 7300 /CLEAR PASS COUNTER
0275 3202 /DETERMINE IF PROGRAM IS HIGH OR LOW
0276 4266 /GO TO TEST WITH ADDRESS MODIFIER IN AC
0277 5377
/
/ SIMULATE LOGICAL AND WITH A AND B=NOT((NOTA)OR(NOTB))
/
SANDL,
0300 0000 /NOTA
0301 7040 /SAVE NOTA
0302 3204 /GET B
0303 7501 /NOTB
0304 7040 /SAVE NOTB
0305 7421 /GET NOTA
0306 1204 /DR WITH NOTB
0307 7501 /COMPLEMENT
0310 7040 /EXIT WITH RESULT IN AC
0311 5700
/
/ TEST SWITCHES
/
SWITCL,
0312 0000 /SAVE TEST BIT
0313 7421 /GET SWITCHES
0314 7604 /AND SWITCHES WITH TEST BIT
0315 3300 /IS SWITCH 0
0316 7690 /NO SKIP INSTRUCTION AFTER RETURN
0317 2312
0320 5712
/
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/
/ END OF PASS
/
EPASL,
0321 0000 /END OF PASS ?
0322 2202 /NO, RETURN
0323 5721 /SET AC=4000
0324 7332 /TEST SR03
0325 7012 /SUPPRESS END OF PASS TYPEOUT
0326 4312 /TYPE CARRIAGE RETURN
0327 5336 /TYPE LINEFEED
0330 1366 /TYPE
0331 4337
0332 1367
0333 4337
0334 1370
0335 4337

```



```

0336 5345 JMP HALT /TEST FOR HALT, RELOCATION
/
/OUTPUT CHARACTER
0337 0000 TYPEL, 0
0340 6046 TLS
0341 6041 TSF
0342 5341 JMP , -1
0343 7200 CLA
0344 5737 JMP I TYPEL

PAL10 V141 17-JUN-71 7:23 PAGE 5

0345 7332 HALTL, /CHECK FOR HALT
0346 4312 CLA CLL CML RTR /SET AC=2000
0347 7410 JMS SWITCL /TEST SR01
0350 5355 SKP /SR01=1, HALT
0351 4266 JMP RRELL /CHECK FOR RELOCATION
0352 7650 JMS LOHIL /DETERMINE IF PROGRAM IS HIGH OR LOW
0353 4215 SNA CLA RESBNL /AC=0, PROGRAM LOW
0354 7402 JMS HLT /PROGRAM LOW, RESTORE LOADERS

0355 7332 RRELL, /CHECK FOR RELOCATION
0356 7010 CLA CLL CML RTR
0357 4312 RAR /SET AC=1000
0360 5721 JMS SWITCL /TEST SR02
0361 4266 JMP I EPASL /SR02=1, DO NOT RELOCATE PROGRAM
0362 7650 JMS LOHIL /DETERMINE IF PROGRAM IS HIGH OR LOW
0363 5244 SNA CLA REHL /AC=0, PROGRAM LOW
0364 5255 JMP RELL /PROGRAM LOW, RELOCATE TO HIGH CORE
0365 0200 C200L, /PROGRAM HIGH, RELOCATE TO LOW CORE
0366 0215 C215L, 215
0367 0212 C212L, 212
0370 0301 A, 301
0371 6400 C6400L, 6400
0372 6600 C6600L, 6600
0373 7000 C7000L, 7000
0374 7600 C7600L, 7600

0377 *377 /
0377 7000 GOSETL, NOP

PAL10 V141 17-JUN-71 7:23 PAGE 6

0400 *400 /SET UP ADDRESS POINTERS AND CONSTANTS AND TRANSFER TO NEXT PAGE
0400 3237 SETAL, DCA /SAVE ADDRESS MODIFIER
0401 1242 TAD TAD /GET POINTER FOR TRANSFER
0402 1257 TAD TEMPL /MODIFY FOR LOW OR HIGH CORE

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0403 3010 PNTRL /SET UP AUTO-INDEX REGISTER
0404 1243 LGENL /GET POINTER TO INSTRUCTION GENERATION
0405 1237 TEMPL /MODIFY FOR LOW OR HIGH CORE
0406 3410 PNTRL /TRANSFER TO NEXT PAGE
0407 1245 TAD DCA I /GET POINTER TO AND SIMULATOR
0410 1237 TAD TEMPL /MODIFY FOR LOW OR HIGH CORE
0411 3410 PNTRL /TRANSFER TO NEXT PAGE
0412 1246 TAD LRETUL /GET POINTER FOR EXECUTION RETURN
0413 1237 TAD TEMPL /MODIFY FOR LOW OR HIGH CORE
0414 3410 PNTRL /TRANSFER TO NEXT PAGE
0415 1247 TAD LSWITL /GET POINTER TO SWITCH SENSING
0416 1237 TAD TEMPL /MODIFY FOR LOW OR HIGH CORE
0417 3410 PNTRL /TRANSFER TO NEXT PAGE
0420 1244 TAD LEPASL /GET POINTER TO END OF PASS
0421 1237 TAD TEMPL /MODIFY FOR LOW OR HIGH CORE
0422 3410 PNTRL /TRANSFER TO NEXT PAGE
0423 1237 TAD TEMPL /GET ADDRESS MODIFIER
0424 7640 SZA CLA /IS TEST IN LOW CORE
0425 5233 JMP LHCICOL /NO,SET UP FOR HIGH CORE
0426 1240 TAD L200L /SET PAGE 0 EXCLUSION BIT
0427 3410 PNTRL /TRANSFER TO NEXT PAGE
0430 1250 TAD L6600L /GET LOW CORE ADDRESS LIMIT
0431 3410 PNTRL /TRANSFER TO NEXT PAGE
0432 5377 JMP GOTSTL /GO TO TEST
0433 3410 DCA I LHCICOL, /CLERA PAGE 0 EXCLUSION BIT
0434 1251 TAD L1201L /GET HIGH CORE ADDRESS LIMIT
0435 3410 PNTRL /TRANSFER TO NEXT PAGE
0436 5377 JMP GOTSTL /GO TO TEST

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PAL10 V141 17-JUN-71 7:23 PAGE 7

```

0437 0000 TEMPL, 0 /
0440 0200 L200L, 200 /
0441 7000 L7000L, 7000 /
0442 0753 LISTL, TGENL-1
0443 1000 LGENL, GENL
0444 0321 LEPASL, EPASL
0445 0300 LSANGL, SANDL
0446 0712 LRETUL, TRETUL
0447 0312 LSWITL, SWITCL
0450 6600 L6600L, 6600
0451 1201 L1201L, 1201
0577 0577 *577
0577 7000 GOTSTL, NOP

```

PAL10 V141 17-JUN-71 7:23 PAGE 8

```

0600 0600 /GENERATE TEST INSTRUCTION AND DATA
0601 7300 TEST1L, CLA CLL /
0602 1355 TAD TANDL /GET POINTER TO SIMULATED AND
0603 3000 DCA TANDL /PLACE IN TRANSFER LOCATION
0604 7001 IAC /SET
0604 4757 JMS I TSWITL /TEST

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0605 5224 JMP TDAT1L
0606 1362 TAD TLIML
0607 3026 DCA LIML
0610 1361 TAD TPAGBL
0611 3027 DCA PAGL
0612 4754 JMS I TGENL
0613 3365 DCA TIFLGL
0614 1021 TAD INSTL
0615 3363 DCA TINSTL
0616 1022 TAD INADDL
0617 3364 DCA TINADL
0620 1023 TAD DATADL
0621 3366 DCA TDATAL
0622 1025 TAD PADDL
0623 3367 DCA TPADDL
0624 7125 DCA CLL IAC RAL
0625 4757 JMS I TSWITL
0626 5234 JMP TDAT2L
0627 1370 TAD TDA1L
0630 7124 CLL RAL
0631 7430 SZL
0632 1374 TAD
0633 3370 DCA
0634 7307 CLA CLL IAC RTL
0635 4757 JMS I TSWITL
0636 5244 JMP SETTL
0637 1371 TAD TDA2L
0640 7124 CLL RAL
0641 7430 SZL
0642 1374 TAD
0643 5371 DCA

```

```

/SR , DO NOT GENERATE INSTRUCTION
/NO T ADDRESS LIMIT
/SAVE
/GET PAGE EXCLUSION BIT
/GENERATE INSTRUCTION
/SAVE INDIRECT FLA
/GET INSTRUCTION
/SAVE IT
/GET INSTRUCTION ADDRESS
/SAVE IT
/GET DATA ADDRESS
/SAVE IT
/GET INDIRECT TO DATA
/SAVE IT
/SET AC=2
/TEST SR10
/SR10=1, DO NOT GENERATE DATA1
/GENERATE RANDOM NUMBER

```

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/SET AC=4
/TEST SR09
/SR09=1, DO NOT GENERATE DATA2
/GENERATE RANDOM NUMBER

```

PAL10 V141 17-JUN-71 7:23 PAGE 9

```

0644 7300 SETTL, CLA CLL
0645 1363 TAD TINSTL
0646 3764 DCA I TINADL
0647 1365 TAD TIFLGL
0650 7650 SNA CLA
0651 5267 JMP DURL
0652 1366 TAD TDATAL
0653 1375 TAD T7760
0654 7630 SZL CLA
0655 5262 JMP .+5
0656 1366 TAD TDATAL
0657 1376 TAD T7770
0660 7630 SEL CLA
0661 7040 CMA
0662 1367 TAD TPADDL
0663 3766 DCA I TDATAL
0664 1370 TAD TDA1L
0665 1370 DCA I TPADDL
0666 5271 JMP DOTSTL
0667 1370 TAD TDA1L

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```

/SET UP INSTRUCTION AND DATA AT TEST ADDRESS
/ALONG WITH RETURN TO THIS ROUTINE

```

```

/GET INSTRUCTION
/STORE IN TEST LOCATION
/GET INDIRECT FLAG
/IS INSTRUCTION INDIRECT
/NO, GET DATA
/INDIRECT, IS ADDRESS
/AUTO-INDEX REGISTER
/NO, USE POINTER AS IS

```

```

/ADDRESS IS AUTO-INDEX REGISTER
/GET INDIRECT ADDRESS
/STORE IN TEST LOCATION
/GET DATA
/STORE IN TEST LOCATION
/GET DATA

```

```

0670 3/66 DCA I TDATA1 /STORE IN TEST LOCATION
/
/SIMULATE "AND"
/
0671 7300 DOTSTL, CLA CLL /GET DATA1
0672 1370 TAD TDA1L /SAVE IN MQ
0673 7421 MQL /GET DATA2
0674 1371 TAD TDA2L /DO SIMULATION
0675 4755 JMS I TANL /SAVE ANSWER
0676 3372 DCA /
/GO TO TEST
/
0677 1356 DOANDL, TAD TRETLL /GET RETURN ADDRESS
0700 3000 DCA TTANDL /SAVE
0701 1364 TAD TINADL /GET INSTRUCTION ADDRESS
0702 7001 IAC /INCREMENT
0703 7450 SNA /IS IT 0
0704 5200 JMP /YES, GENERATE NEW INFORMATION
0705 3353 DCA /NO, SAVE
0706 1373 TAD T5400L /GET RETURN INSTRUCTION
0707 3753 DCA I TEMP2L /PUT IN TEST LOCATION
0710 1371 TAD TDA2L /GET DATA2
0711 5764 JMP I TINADL /EXECUTE "AND"
/
PAL10 V141 17-JUN-71 7:23 PAGE 10

```

```

/RETURN HERE AFTER EXECUTION
/
0377 3377 TRETUL, DCA TRACL /SAVE AC
0713 7430 SEL /IS LINK=1
0714 4324 JMS ERROR /LINK=1, ERROR
0715 1372 TAD TSIML /GET SIMULATION RESULT
0716 7041 CIA /ADD REAL RESULT
0717 1377 TAD TAD CLA /ARE THEY THE SAME
0720 7640 SEA CLA /NO, ERROR
0721 4324 JMS ERROR /END OF PASS
0722 4760 JMS I TEPASL
0723 5200 JMP TEST1L /
/ERROR HANDLER
/
0000 0000 ERROR, /
0724 0000 /
0725 7330 CLA CLL CML RAR /SET AC=4000
0726 4757 JMS I TSWITL /TEST SR00
0727 5351 JMP TEXTITL /SR00=1, DO NOT HALT ON ERROR
0730 1370 TAD TDA1L /DISPLAY DATA1 IN AC
0731 7402 HLT /
0732 7200 CLA TDA2L /DISPLAY DATA2 IN AC
0733 1371 TAD HLT /
0734 7402 HLT /
0735 7200 CLA INSTL /DISPLAY INSTRUCTION IN AC
0736 1001 TAD HLT /
0737 7402 CLA TAD /DISPL INSTRUCTION ADDRESS IN AC
0740 7200 TAD /
)41

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```

0742 7422 HLT
0743 7200 CLA
0744 1366 TAD
0745 7422 HLT
0746 7200 CLA
0747 1367 TAD
0750 7422 HLT
0751 7322 TEXTL, CLA CLL
0752 5724 JMP I ERROR
/
/
/
0753 0020 TEMP2L, 0
0754 0000 TGENL, 0
0755 0000 TANDL, 0
0756 0000 TRETTL, 0
0757 0000 TSWITL, 0
0760 0000 TEPASL, 0
0761 0000 TPAGBL, 0
0762 0000 TLIHL, 0
0763 0000 TINSTL, 0
0764 0000 TINADL, 0
0765 0000 TIFLGL, 0
/
/
/
PAL10 V141 17-JUN-71 7123 PAGE 10-1

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0766 0000 TDATA, 0
0767 0000 TPADDL, 0
0770 0021 TDA1L, 21
0771 0037 TDA2L, 37
0772 0000 TSIML, 0
0773 5400 T5400L, 5400
0774 0003 T3L, 3
0775 7760 T7760, 7760
0776 7770 T7770, 7770
0777 0000 TRACL, 0
/
/
/
PAL10 V141 17-JUN-71 7123 PAGE 11

```

```

1000 1000 /GENERATE INSTRUCTIONS AND ADDRESSES
1000 0000 /
1000 0000 /GENERATE "AND" INSTRUCTION
1001 1367 TAD R1L
1002 4340 JMS RANDL /GENERATE RANDOM NUMBER
1003 3367 DCA R1L /SAVE NUMBER
1004 1367 TAD R1L
1005 7421 MQL PAGL
1006 1007 TAD
1007 7501 MQA
1008 7421 MQL
1009 1371 TAD K0777
1010 4400 JMS I TTANDL
1011 3001 DCA INSTL
1012 1001 TAD INSTL
1013 1001 TAD
1014 1001 TAD
/ OR RANDOM NUMBER WITH EXCLUSION BIT
/MASK OFF 3MSB
/TO GET "0" OP CODE
/SAVE INSTRUCTION
/GET INSTRUCTION

```

```

1015 4354 JMS AND17L /EXTRACT PAGE ADDRESS OF INSTRUCTION
1016 3020 DCA TEMP3L /SAVE PAGE ADDRESS OF INSTRUCTION
/
/GENERATE ADDRESS FOR INSTRUCTION
/
GANADL,
1017 1372 R2L /GENERATE RANDOM NUMBER
1020 4340 JMS RANDL /SAVE NUMBER
1021 3372 DCA R2L /SET UP TO TEST ADDRESS LIMITS
1022 4345 JMS CLIML
1023 1372 R2L
1024 7620 SNL CLA /IS ADDRESS WITHIN LIMITS
1025 5217 JMP GANADL /NO, GENERATE NEW ADDRESS
1026 1372 TAD R2L
1027 1373 TAD P0L /IS ADDRESS ON PAGE 0
1030 7620 SNL CLA /NO
1031 5246 JMP PAGADL /GET PAGE ADDRESS OF INSTRUCTION
1032 1020 TAD TEMP3L
1033 7041 CIA
1034 1372 TAD R2L /SUBTRACT ADDRESS
1035 4361 JMS ABSL /IS DIFFERENCE >2
1036 7700 SMA CLA /NO
1037 5217 JMP GANADL /GET PAGE ADDRESS OF INSTRUCTION
1040 1020 TAD TEMP3L /DOES INSTRUCTION REFERENCE LOCATION 0
1041 7650 SNA CLA /YES, GENERATE NEW INSTRUCTION
1042 5201 JMP GANDL /YES, USE ADDRESS
1043 1372 TAD R2L /GENERATE ADDRESS FOR DATA
1044 3002 DCA INADDL /GET INSTRUCTION
1045 5261 JHP DAADL /MASK CURRENT PAGE BIT
1046 1001 TAD INSTL /IS PAGE BIT SET
1047 7421 MQL K200L /NO, USE ADDRESS AS IS
1050 1376 TAD I TTANDL
1051 4400 JMS I
1052 7650 SNA CLA
1053 5240 JMP PAL
/
PAL10 V141 17-JUN-71 7:23 PAGE 11-1
1054 1372 TAD R2L
1055 4354 JMS AND17L
1056 7041 CIA
1057 1020 TAD TEMP3L
1060 5235 JMP PAGAL
/
PAL10 V141 17-JUN-71 7:23 PAGE 12
/GENERATE ADDRESS FOR DATA
/
DAADL,
1061 1001 TAD INSTL /GET INSTRUCTION
1062 7421 MQL
1063 1376 TAD K200L
1064 4400 JMS I TTANDL /DOES INSTRUCTION REFERENCE PAGE 0
1065 7650 SNA CLA
1066 5306 JMP P0AL /YES
1067 1002 TAD INADDL
1070 7421 MQL
1071 1373 TAD P0L

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1072 4400 JMS I TTANDL /EXIT PAGE OF ADDRESS
1073 7421 MQL TAD /"OR" TOGETHER TO GET
1074 1020 TAD TEMP3L /DATA ADDRESS
1075 7501 MGA DATADL
1076 3003 DCA INSTL
1077 1021 TAD INSTL
1100 7421 MQL K400L
1101 1375 TAD TTANDL
1102 4400 JMS I SZA CLA
1103 7640 JMP I PADL
1104 5311 JMP I GENL
1105 5600 TAD TEMP3L
1106 1020 P0AL, TAD DATADL
1107 3003 DCA DATADL
1110 5277 JMP INDIRL, INDIRL,
1111 1377 PADL, TAD R3L
1112 4340 JMS RANDL /GENERATE RANDOM NUMBER
1113 3377 DCA R3L
1114 4345 JMS CLIML
1115 1377 TAD R3L
1116 7620 SNL CLA /IS ADDRESS WITHIN LIMITS
1117 5311 JMP PADL /NO, TRY AGAIN
1120 1002 TAD INADDL /GET INSTRUCTION ADDRESS
1121 7041 CIA R3L
1122 1377 TAD ABSL /SUBSTRACT INDIRECT
1123 4361 JMS ABSL /GENERATE -ABSOLUTE VALUE
1124 7700 SMA CLA /DO INSTRUCTION AND ADDRESS INTERFERE
1125 5311 JMP PADL /YES
1126 1003 TAD DATADL
1127 7041 CIA R3L
1130 1377 TAD ABSL
1131 4361 JMS SMA CLA
1132 7700 JMP PADL
1133 5311 TAD R3L
1134 1377 TAD PADDL /NO
1135 3005 DCA
1136 7040 CMA

/ PAL10 V141 17-JUN-71 7:23 PAGE 12-1
1137 5600 JMP I GENL /EXIT

/ PAL10 V141 17-JUN-71 7:23 PAGE 13

1140 0000 RANDL, 0 CLL RAL
1141 7104 SZL
1142 7430 TAD K3L
1143 1370 JMP I RANDL
1144 5740 /

1145 0000 CLLIML, 0 TAD PAGL
1146 1007 /
1147 7100 CLL

```


1400
1500
1600
1700

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700

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

	PAL10	V141	17-JUN-71	7:23	PAGE 13-3
A	0370		PADDL	0005	TSIML 0772
ABSL	1161		PADL	1111	TSMITL 0757
AND17L	1154		PAGADL	1046	TTANDL 0000
C200L	0365		PAGAL	1035	TYPEL 0337
C212L	0367		PAGL	0007	
C215L	0366		PAL	1040	
C6400L	0371		PNTR1L	0202	
C6600L	0372		PNTR2L	0203	
C7000L	0373		PNTRL	0010	
C7600L	0374		R1L	1167	
CAF	6007		R2L	1172	
CLIML	1145		R3L	1177	
CNTR1L	0266		RANDL	1140	
DAADL	1061		REHL	0244	
DATADL	0003		RELL	0255	
DIRL	0667		RELOL	0225	
DOANDL	0677		RESBNL	0215	
DOTSTL	0671		RRELL	0355	
EPASL	0321		SANDL	0300	
ERROR	0724		SAVBNL	0205	
GANADL	1017		SETAL	0400	
GANDL	1001		SETLKL	0274	
GENL	1000		SETTL	0644	
GOSETL	0377		STARTL	0200	
GOTSTL	0577		SWITCL	0312	
HALTL	0345		T3L	0774	
IFLAGL	0024		T5400L	0773	
INADDL	0002		T7760	0775	
INDIRL	1077		T7770	0776	
INSTL	0001		TANDL	0755	
	1174		TDA1L	0770	
	1171		TDA2L	0771	

KZ	1176	TDAT1L	0624
KL	1170	TDAT2L	0634
K400L	1175	TDATA1	0766
L1201L	0451	TEMP1L	0204
L200L	0440	TEMP2L	0753
L6600L	0450	TEMP3L	0020
L7000L	0441	TEMPL	0437
LEPASL	0444	TEPASL	0760
LGENTL	0443	TEST1L	0600
LHICOL	0433	TEXT1L	0751
LIML	0026	TGENL	0754
LISL	0442	TIFLGL	0765
LOHIL	0266	TINADL	0764
LRETUL	0446	TINSTL	0763
LSANDL	0445	TLIML	0762
LSMITL	0447	TPADDL	0767
MDA	7501	TPAG8L	0761
MOL	7421	TRACL	0777
P0AL	1106	TRETTL	0756
P0L	1173	TRETUL	0712

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PA110

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 5 SECONDS

2K CORE USED

