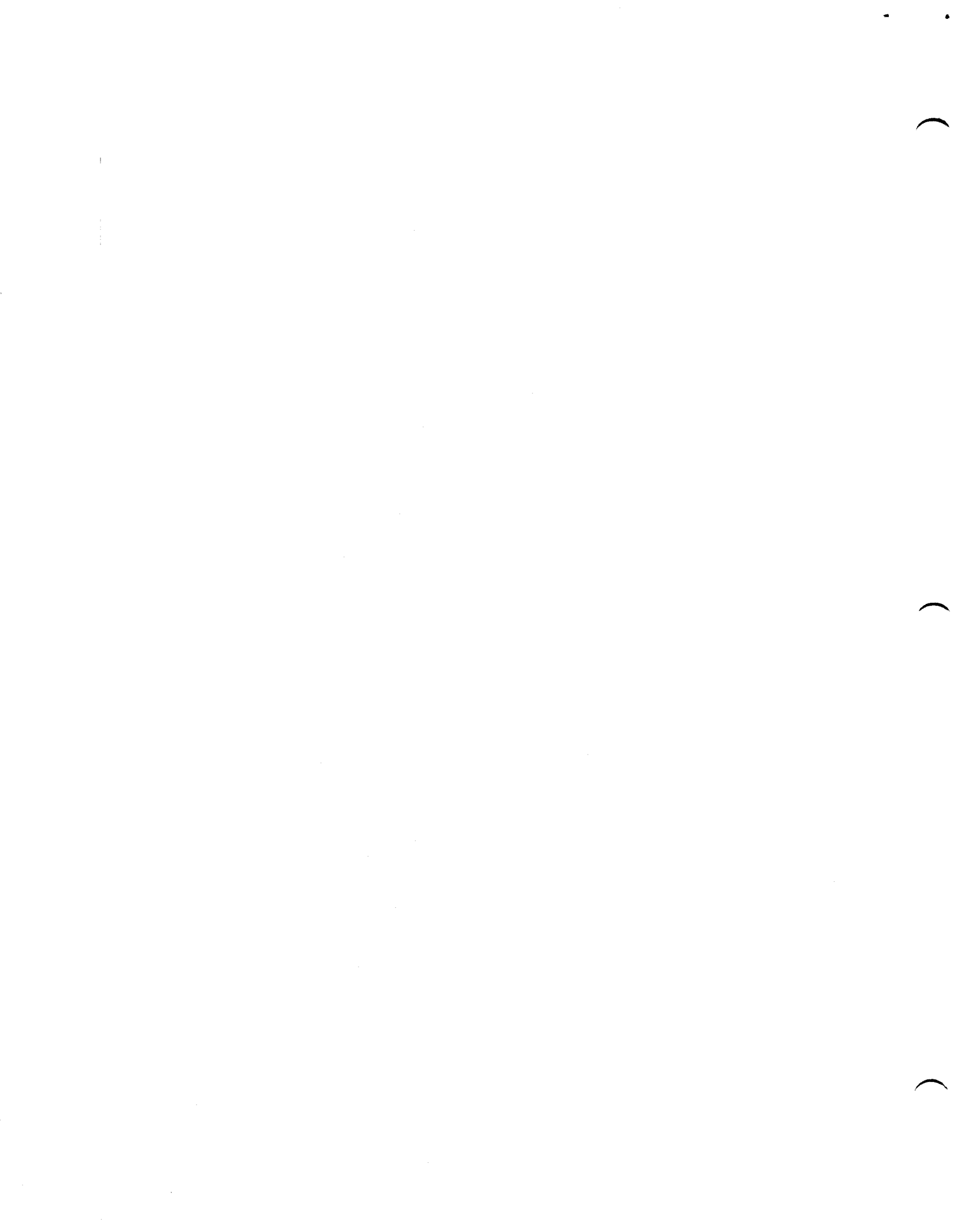


IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-D0EB-D
PRODUCT NAME: RANDOM TAD TEST
DATE CREATED: JUNE 7, 1974
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: MICHAEL DAVIS

COPYRIGHT © 1977
DIGITAL EQUIPMENT CORPORATION



1. ABSTRACT

THIS PROGRAM TESTS THE TAD INSTRUCTING OF THE PDP-8E, THE TAD 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 LOADED INTO LOCATIONS 6600 THRU 7577, THE TEST AREA IS 0000-6577, TEMPORARY STORAGE LOCATIONS ARE LOCATED ON PAGE 0.

2.3 PRELIMINARY PROGRAMS

MAINDEC=8E-D0AA, D0BA, D0CA, D0DA

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
SR03=1, SUPPRESS END OF PASS TYPEOUT
SR09=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 ERROR HALT
- 6.2 ERROR RECOVERY

SAME AS 4.

IF THE RESULTS OF THE TAD INSTRUCTION ARE INCORRECT, THAT IS IF THE ACTUAL AND SIMULATED LINKS, OR THE ACTUAL AND SIMULATED SUMS DO NOT AGREE, THE PROGRAM WILL HALT AT 7407 WITH DATA1 IN THE AC.

DEPRESS CONTINUE TO DISPLAY DATA2 IN THE AC,
 DEPRESS CONTINUE TO DISPLAY TAD 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 TAD) IN AC,
 DEPRESS CONTINUE TO RESUME TEST

SEE 6.1

6.3

LOOPING

SET SR00=1 TO PREVENT HALT AFTER ERROR,
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 5 SECONDS. THE PROGRAM WILL TYPE "T" AFTER EACH 4096 RANDOM TESTS UNLESS SR03=1.

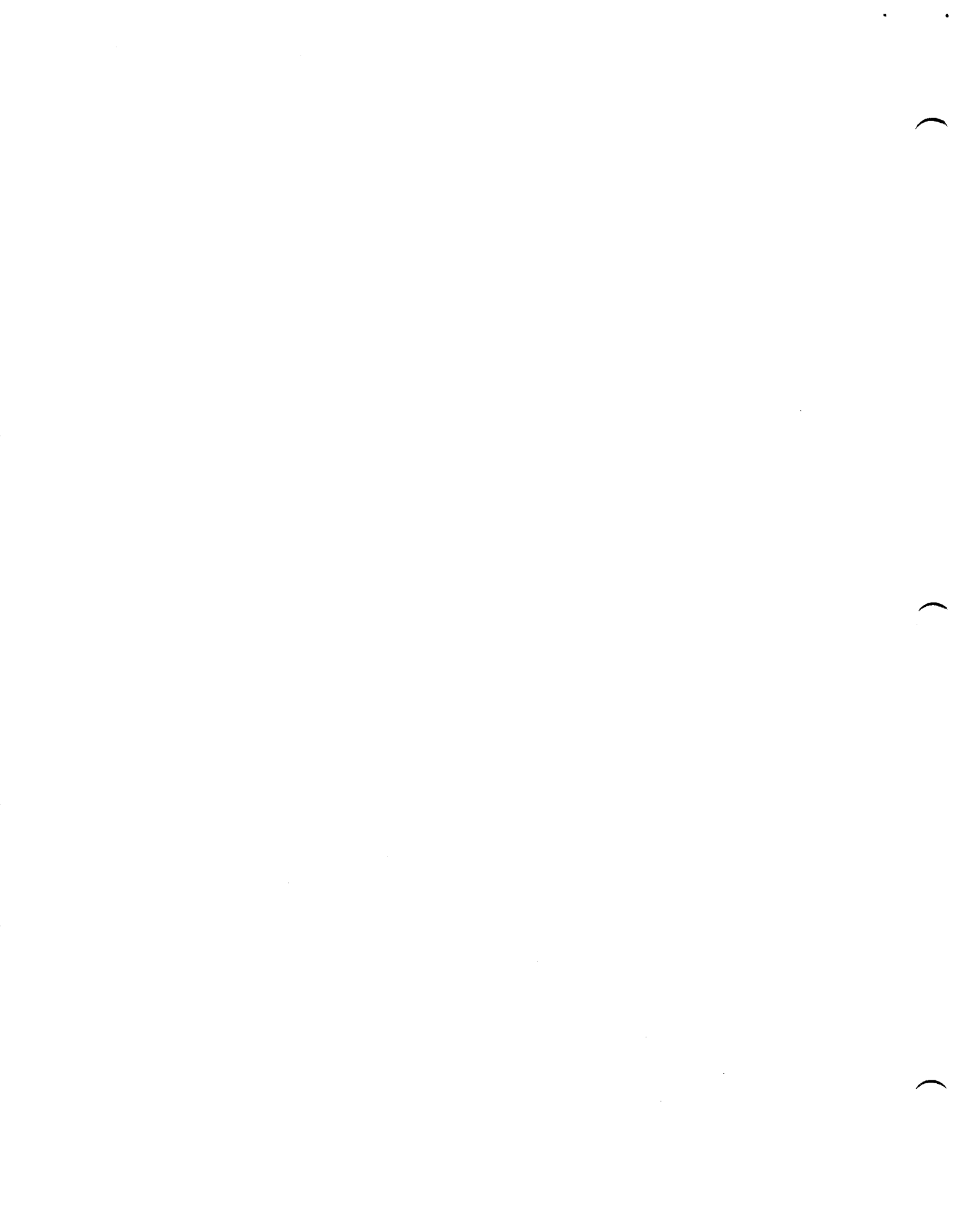
9.

PROGRAM DESCRIPTION

THE PROGRAM IS LOADED INTO LOCATIONS 6600-7577, WITH TEMPORARY STORAGE LOCATIONS ON PAGE 0;

THE PROGRAM USES SEPARATE RANDOM NUMBER GENERATORS TO GENERATE THE TAD INSTRUCTION, INSTRUCTION AND DATA ADDRESSES, AND THE TWO ARGUMENTS TO BE "TADDED". 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 TAD INSTRUCTION IS COMPARED TO A SIMULATED TAD. THE SIMULATOR IS SIMILAR TO THE ONE USED IN MAINDEC-8E-D0CA-D. NO TADS ARE USED IN THE PROGRAM ITSELF.

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



/RANDOM TAD TEST
 /COPYRIGHT 1970, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
 /V 82 07552
 /
 /TEMPORARY STORAGE LOCATIONS
 /

0000 RETURN, 0
 0001 INSTL, JMP
 0002 INADDL, 2
 0003 DATADL, 3
 0004 PADDL, 0
 0005 IFLAGL, 0

7501 MQA=7501
 7421 MQL=7421
 6007 CAF=6007

0200 *200 START, CAF
 0201 5602 JMP I .+1
 0202 6600 STARTL

PAL10 V141 17-JUN-71 7:23 PAGE 2

/GENERATE TEST INSTRUCTION AND DATA
 /

6600 *6600 STARTL, CLA CLL CNTRI /CLEAR PASS COUNTER
 6601 7300 DCA DCA /TEST SR11
 6602 3376 LAS /IS SR11=1
 6603 7604 AND SR11 /SR11=1, DO NOT GENERATE INSTRUCTION
 6604 7640 SZA CLA TDAT1L /GENERATE INSTRUCTION
 6605 5224 JMP TGENL /SAVE INDIRECT FLA
 6606 4746 JMS I TIFLGL /GET INSTRUCTION
 6607 3355 DCA AND /SAVE IT
 6610 7040 CMA AND INADDL /GET INSTRUCTION ADDRESS
 6611 0001 AND AND TADATL /GET DATA ADDRESS
 6612 3353 DCA TINADL /SAVE IT
 6613 7040 CMA AND DATADL /SAVE IT
 6614 0002 AND AND TADATL /GET INSTRUCTION ADDRESS
 6615 3354 DCA TINADL /SAVE IT
 6616 7040 CMA AND DATADL /GET DATA ADDRESS
 6617 0003 AND AND TADATL /SAVE IT
 6620 3356 DCA TINADL /GET INSTRUCTION ADDRESS
 6621 7040 CMA AND DATADL /SAVE IT
 6622 0004 AND AND TADATL /GET DATA ADDRESS
 6623 3357 DCA TINADL /SAVE IT
 6624 7604 LAS TDAT1L, LAS /GET INDIRECT TO DATA
 6625 0372 AND SR10 /TEST SR10

```

6626 7640 SZA CLA /IS SR10=1
6627 5234 JMP TDA2L /SR10=1, DO NOT GENERATE DATA1
6630 7040 CMA /GENERATE RANDOM NUMBER
6631 0360 AND TDA1L
6632 4752 JMS I TRANDL
6633 3360 DCA TDA1L
6634 7624 TDA2L, LAS
6635 0373 AND SR09
6636 7640 SZA CLA /TEST SR09
6637 5244 JMP SETTLE /IS SR09=1
6640 7040 CMA /SR09=1, DO NOT GENERATE DATA2
6641 0361 AND TDA2L /GENERATE RANDOM NUMBER
6642 4752 JMS I TRANDL
6643 3361 DCA TDA2L

```

PAL10 V141 17-JUN-71 7:23 PAGE 3

```

/SET UP INSTRUCTION AND DATA AT TEST ADDRESS
/ALONG WITH RETURN TO THIS ROUTINE
/
SETTL, CLA CLL CMA /GET INSTRUCTION
AND TINSTL /STORE IN TEST LOCATION
DCA I TINADL
CMA
AND TIFLGL /GET INDIRECT FLAG
SNA CLA /IS INSTRUCTION INDIRECT
JMP DIRL /NO, GET DATA
CMA
AND TDATA1 /ADDRESS IS INDIRECT
AND T7760 /IS ADDRESS AUTO-INDEX REGISTER
SZA CLA /NO
JMP NOTAUT
CMA
AND TDATA1
AND K10
SNA CLA NOTAUT
JMP NOTAUT
CMA
AND TPADDL /ADDRESS IS AUTO-INDEX REGISTER
CIA /DECREMENT POINTER TO DATA
CMA
DCA I TDATA1 /STORE IN TEST LOCATION
CMA
AND TDA1L /GET DATA
DCA I TPADDL /STORE IN TEST LOCATION
JMP DOTSTL
CMA
AND TPADDL
DCA I TDATA1
.-7
JMP
CMA
AND TDA1L /GET DATA
DCA I TDATA1 /STORE IN TEST LOCATION
DIRL,
AND
DCA I TDATA1
/SIMULATE "TAD"
DOTSTL, CLA CLL CMA
7340

```


706 0360
6707 7421
6710 7040
6711 0361
6712 4751
6713 3363
6714 7010
6715 3362

PAL10

V141

17-JUN-71

7:23

PAGE 4

AND TDA1L /GET /A1
MQL /SAVE IN MQ
CMA
AND TDA2L /GET DATA2
JMS I TSIMAD /DO SIMULATION
DCA TSIMAC /SAVE ANSWER
RAR
DCA TSIML /SAVE LINK

6716 7040
6717 0347
6720 3000
6721 7040
6722 0354
6723 7001
6724 7450
6725 5202
6726 3345
6727 7040
6730 0366
6731 3745
6732 7140
6733 0361
6734 5754

DOANDL,

/GO TO TEST

TRETTL /GET RETURN ADDRESS
RETURN /SAVE
TINADL /GET INSTRUCTION ADDRESS
/INCREMENT
/IS IT 0
/YES, GENERATE NEW INFORMATION
/NO, SAVE
TESTIL /GET RETURN INSTRUCTION
TEMP2L /PUT IN TEST LOCATION
T5400L /GET DATA2
TEMP2L /EXECUTE "TAD"
TDA2L
TINADL
/RETURN HERE AFTER EXECUTION

6735 3364
6736 7010
6737 3365
6740 4774
6741 2376
6742 5202
6743 4750
6744 5202

TRETUL,

DCA TAC /SAVE AC
RAR
DCA TLINK /SAVE LINK
JMS I TCOMAD /COMPARE REAL AND SIMULATED ADDITIONS
ISZ CNTR1
JMP TEST1L
JMS I TEPASL /END OF PASS, 4096 TEST COMPLETE
JMP TEST1L

PAL10

V141

17-JUN-71

7:23

PAGE 5

6745 0000
6746 7000
6747 6735
6750 7442
6751 7200
6752 7430
6753 0000
6754 0000
6755 0000
6756 0000
6757 0000

TEMP2L, 0
TGENL, GENL
TRETTL, TRETUL
TERROR,
TEPASL, EPASL
TSIMAD, RSIMAD
TRANDL, RANDL
TINSTL, 0
TINADL, 0
TIFLGL, 0
TDTAL, 0
TPADDL, 0

0021
0037
0000
0000
0000
0000
0000
5422
7762
7772
1
2
4
COMAD
10
0

TDA1L,
TDA2L,
TSIML,
TSIMAC,
TAC,
TLINK,
T5422L,
T7762,
T7772,
SR11,
SR10,
SR09,
TCOMAD,
K10,
CNTR1,

21
37
0
0
0
0
0
5422
7762
7772
1
2
4
COMAD
10
0

VI41
PAL10

17-JUN-71
7:23

PAGE 6

```

/GENERATE INSTRUCTIONS AND ADDRESSES
/
PAGE 7000
GENL 0000

/GENERATE "AND" INSTRUCTION
/
GANDL,
7001 CMA
7002 AND
7003 JMS I
7004 DCA
7005 CMA
7006 AND
7007 MQL
7010 CMA
7011 AND
7012 MGA
7013 AND
7014 DCA
7015 CMA
7016 AND
7017 AND
7020 DCA

/GENERATE ADDRESS FOR INSTRUCTION
/
GANADL,
7021 CMA
7022 AND
7023 JMS I
7024 DCA
7025 CMA
7026 AND
7027 JMS
7030 JMP
7031 CMA
7032 AND
7033 AND
7034 AND
7035 SZA CLA
7040 JMP
CMA

R1L
SRANDL
R1L
R1L
R1L
K1000
K1777
INSTL
INSTL
K0177L
TEMP3L

/GENERATE RANDOM NUMBER
/SAVE NUMBER

/GENERATE OP CODE

/SAVE INSTRUCTION

/GET INSTRUCTION
/EXTRACT PAGE ADDRESS OF INSTRUCTION
/SAVE PAGE ADDRESS OF INSTRUCTION

R2L
SRANDL
R2L
R2L
LIMIT
GANADL
R2L
P0L
SEA CLA
PAGADL

/IS ADDRESS WITHIN LIMITS
/NO, GENERATE NEW ADDRESS

/IS ADDRESS ON PAGE 0
/NO

```

/GET PAGE ADDRESS OF INSTRUCTION
 /GET DIFFERENCE BETWEEN PAGE ADDRESSES
 /IS DIFFERENCE >2
 /NO

7:23 PAGE 7

17-JUN-71

V141

PAL10

7044 7040
 7045 0001
 7046 0357
 7047 7650
 7050 5255
 7051 7040
 7052 0353
 7053 0355
 7054 5240
 7055 7040
 7056 0361
 7057 7650
 7060 5201
 7061 7040
 7062 0353
 7063 3002

PAGADL, CMA
 AND INSTL
 AND K200L
 SNA CLA PAL
 JMP PAL
 CMA R2L
 AND K0177L
 AND PAGAL
 JMP TEMP3L
 CMA SNA CLA
 AND GANDL
 AND R2L
 DCA INADDL

/GET INSTRUCTION
 /IS PAGE BIT SET
 /NO, USE ADDRESS AS IS
 /PAGE BIT SET, EXTRACT PAGE ADDRESS FOR INSTRUCTION
 /TEST FOR INTERFERENCE
 /MAKE SURE DATA WILL
 /NOT BE STORED IN LOCATION 0
 /LOCATION ZERO, TRY AGAIN
 /USE ADDRESS AS IS

7:23 PAGE 8

17-JUN-71

V141

PAL10

/GENERATE ADDRESS FOR DATA

7064 7040
 7065 0001
 7066 0357
 7067 7650
 7070 5307
 7071 7040
 7072 0002
 7073 0354
 7074 7421
 7075 7040
 7076 0361
 7077 7501
 7100 3003
 7101 7040
 7102 0001
 7103 0356
 7104 7640
 7105 5313
 7106 5600
 7107 7040
 7110 0361
 7111 3003
 7112 5301

DAADL, CMA
 AND INSTL
 AND K200L
 SNA CLA P0AL
 JMP CMA
 AND INADDL
 AND P0L
 MQL CMA
 AND TEMP3L
 MGA DCA
 DCA DATADL
 CMA INSTL
 AND K400L
 SZA CLA
 JMP PADL
 JMP I GENL
 CMA TEMP3L
 AND DATADL
 DCA INDIRL
 JMP INDIRL

/GET INSTRUCTION
 /IS PAGE BIT OF INSTRUCTION SET
 /NO, USE PAGE ADDRESS BITS OF INSTRUCTION FOR DATA ADDRESS
 /EXTRACT PAGE OF INSTRUCTION ADDRESS
 /"OR" TOGETHER TO GET
 /DATA ADDRESS
 /IS INSTRUCTION INDIRECT
 /YES, INSTRUCTION IS INDIRECT
 /EXIT
 /USE PAGE ADDRESS OF INSTRUCTION
 /AS DAT ADDRESS

/GENERATE INDIRECT ADDRESS FOR DATA

```

7113 7040  CMA  PADL,  /GENERATE RANDOM NUMBER
7114 0360  AND  R3L
7115 4762  JMS I  SRANDL
7116 3360  DCA  R3L
7117 7040  CMA
7120 0360  AND  R3L
7121 4777* JMS  LIMIT
7122 5313  JMP  PADL
7123 7040  CMA
7124 0022  AND  INADDL
7125 4775* JMS  ABSL1
7126 7700  SMA CLA
7127 5313  JMP  PADL
7130 7040  CMA
7131 0023  AND  DATADL
7132 4775* JMS  ABSL1
7133 7700  SMA CLA
7134 5313  JMP  PADL
7135 7040  CMA
7136 0360  AND  R3L
7137 7041  CIA
7140 7040  CMA
7141 7650  SNA CLA

```

```

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

```

```

7142 5313  JMP  PADL  /YES, GENERATE NEW POINTER
7143 7040  CMA
7144 0360  AND  R3L
7145 3004  DCA  PADDL
7146 7040  CMA
7147 5600  JMP I  GENL  /EXIT

```

```

7150 0001  R1L,
7151 0003  K3L,
7152 1777  K1777,
7153 0005  R2L,
7154 7600  P0L,
7155 0177  K0177L,
7156 0400  K400L,
7157 0200  K200L,
7160 0015  R3L,
7161 0000  TEMP3L,
7162 7430  SRANDL, RANDL
7163 7200  SRIMAD, RSIMAD
7164 1201  LIML,
7165 1000  K1000,

```

```

/ PAL10 V141 17-JUN-71 7:23 PAGE 10

```

```

/ / /SIMULATED ADDITION

```

176 7474
7177 7303
7200
7201 0000
7202 3344
7203 7501
7203 3343

PAGE
RSIMAD,

0 ARG2 /SAVE ARGUMENTS
DCA ARG1
MQA
DCA
/

/SIMULATE ADDITION BY SIMULATED GENERATEION OF SUM
/AND CARRY BITS
/

/FORM OR OF ARG1 WITH ARG2
/

SIMAD,

7204 7340
7205 0343
7206 7421
7207 7040
7210 0344
7211 7501
7212 3345

CLA CLL CMA
AND ARG1 /LOAD AC WITH ARG1
MQL /PLACE IN MQ
CMA
AND ARG2 /LOAD AC WITH ARG2
MQA /FORM ARG1 OR ARG2
DCA A10RA2 /SAVE ARG1 OR ARG2

/FORM XOR(EXCLUSIVE OR) OF ARG1 WITH ARG2
/BY A XOR B=(A AND NOTB)OR(NOTA AND B)
/

7213 7501
7214 7040
7215 0344
7216 7421
7217 7040
7220 0344
7221 7040
7222 0343
7223 7501
7224 3346
7225 3347

MQA /GET ARG1 FROM MQ
CMA /FORM NOTARG1
AND ARG2 /AND WITH ARG2 TO GET ARG2 AND NOTARG1
MQL /SAVE IN MQ
CMA
AND ARG2 /LOAD AC WITH ARG2
CMA /FORM NOTARG2
AND ARG1 /AND WITH ARG1 TO GET ARG1 AND NOTARG2
MQA /OR WITH ARG2 AND NOTARG1
DCA SIMAC /TO GET ARG1 XOR ARG2
DCA SIMLNK

PAL10

V141

17-JUN-71

7:23

PAGE 11

/AND ARG1 WITH ARG2
/TEST FOR CARRIES
/IF THERE ARE NO BITS IN COMMON BETWEEN ARG1 AND ARG2
/THERE WILL BE NO CARRIES GENERATED
/

7226 7040
7227 0343
7230 0344
7231 7450
7232 5274

CMA
AND ARG1 /LOAD AC WITH ARG1
AND ARG2 /AND WITH ARG2
SNA /ARE THERE ANY CARRIES
JMP ENDSIM /NO, TERMINATE SIMULATION
/

/GENERATE CARRIES
/

7233 7421
7234 7521
7235 0345
7236 7450

NXTCAR, MQL MQL
AND AND A10RA2
SNA

/SAVE FIRST CARRIES
/GET CARRIES FROM MQ
/AND WITH A10RA2 TO SEE IF MORE CARRIES ARE GENERATED
/ARE THERE ANY MORE CARRIES

/ARE THERE ANY MORE CARRIES

```

7237 5244 JMP ENCAR
7240 7104 CLL RAL
7241 7521 MGA MQL
7242 7501 MGA
7243 5234 JMP NXTCAR
/
/TEST FOR CARRY INTO LINK
/
/NO, END SIMULATION OF CARRIES
/PROPAGATE CARRIES
/GET PREVIOUS CARRIES FROM MQ, SAVE NEW CARRIES
/OR NEW CARRIES WITH PREVIOUS CARRIES
/CONTINUE

```

```

ENCAR, 7244 7501 /GET CARRIES
AND 7245 0345 /AND WITH A10RA2
AND 7246 0350 /TEST BIT 00
SNA 7247 7450 /IS BIT 00 1
JMP 7250 5253 /NO, CARRIES DID NOT PROPAGATE INTO LINK
DCA 7251 3347 /YES, SAVE CARRY INTO LINK
JMP 7252 5260 /COMPLETE SIMULATION
CLL CML RAR /SET AC=4000
AND ARG1 /AND WITH ARG1
AND ARG2 /AND WITH ARG2 TO SEE IF ORIGINAL
SZA /NUMBERS GENERATED CARRY INTO LINK
DCA 7257 3347 /SAVE SIMULATED LINK

```

PAL10 V141 17-JUN-71 7:23 PAGE 12

```

/FORM XOR OF ARG1, ARG2, AND CARRIES
/TO GET FINAL SIMULATED SUM
/
XORALL, 7260 7501 /SAVE SIMULATED CARRIES
DCA 7261 3351 CARRY
MGA 7262 7501 MGA
CMA 7263 7040 CMA
AND 7264 0346 AND
MQL 7265 7421 MQL
CMA 7266 7040 CMA
AND 7267 0346 AND
CMA 7270 7040 CMA
AND 7271 0351 AND
MGA 7272 7501 MGA
DCA 7273 3346 DCA
CLA CLL CMA /FORM A10RA2 AND NOTCARRY
AND SIMLNK /SAVE IN MQ
SEA CLA /FORM CARRY AND NOTA10RA2
CML 7276 7640 /OR WITH CONTENTS OF MQ
7277 7020 CML
7300 7040 CMA
7301 0346 AND
7302 5600 JMP I RSIMAD
/TEST ADDRESS
/
LIMIT, 7303 0000
7304 7421 MQL
7305 7040 CMA
7306 2777 AND
7307 4200 JMS
7310 7620 SNL CLA
7311 2303 ISZ
7312 5705 JMP I

```

```

ENDSIM, 7274 7340 CLA CLL CMA
7275 0347 AND SIMLNK
7276 7640 SEA CLA
7277 7020 CML
7300 7040 CMA
7301 0346 AND
7302 5600 JMP I RSIMAD
/TEST ADDRESS
/
LIMIT, 7303 0000
7304 7421 MQL
7305 7040 CMA
7306 2777 AND
7307 4200 JMS
7310 7620 SNL CLA
7311 2303 ISZ
7312 5705 JMP I

```

```

/SAVE ARGUMENT IN MQ
/LOAD AC WITH LIMIT
/DO ADDITION
/LINK SET IF NUMBER TO LARGE
/NUMBER OK

```

```

7313 0000 COMAD,
7314 7340
7315 0776'
7316 7640
7317 7020
7320 7040
7321 0775'
7322 7640
7323 7020
7324 7430
7325 5341
7326 7340
7327 0774'
7330 7040
7331 0773'

7332 7440
7333 5341
7334 7040
7335 0773'
7336 7040
7337 0774'
7340 7640
7341 4752
7342 5713
7343 0000
7344 0000
7345 0000
7346 0000
7347 0000
7350 4000
7351 0000
7352 7400

/COMPARE SIMULATED AND REAL RESULT
/
0
CLA CLL CMA
AND TSIML
SZA CLA
CML
CMA
AND TLINK
SZA CLA
CML
SZL
JMP ERROR1
CLA CLL CMA
AND TAC
CMA
AND TSIMAC

SZA
JMP ERROR1
CMA
AND TSIMAC
CMA
AND TAC
SZA CLA
JMS I ERRORS
JMP I COMAD
0
0
ARG1,
ARG2,
A1ORA2, 0
SIMAC, 0
SIMLNK, 0
K4000, 4000
CARRY, 0
ERRORS, ERROR

/COMPARE TO COMPLEMENT OF REAL ADDITION
/NOT 0, ERROR
/GET SIMULATION RESULT
/COMPARE TO COMPLEMENT OF REAL ADDITION

```

```

7373 6763
7374 6764
7375 6765
7376 6762
7377 7164
7400 0000
7401 7604
7402 0267
7403 7640
7404 5600
7405 7240

PAGE
ERROR,
0
LAS
AND SR00
SZA CLA
JMP I ERROR
CLA CMA

/ERROR HANDLER
/
/TEST SR00
/IS SR00=1
/YES, DO NOT HALT

```

```

7406 0777' /HALT WITH DATA1 IN AC
7407 7402 HLT TDA1L
7410 7240 CLA CMA TDA2L
7411 0776' /HALT WITH DATA2 IN AC
7412 7402 HLT
7413 7240 CLA CMA TINSTL
7414 0775' /HALT WITH INSTRUCTION IN AC
7415 7402 HLT
7416 7240 CLA CMA TINADL
7417 0774' /HALT WITH INSTRUCTION ADDRESS IN AC
7420 7402 HLT
7421 7240 CLA CMA TDATA1
7422 0773' /HALT WITH DATA ADDRESS IN AC
7423 7402 HLT
7424 7240 CLA CMA TPADDL
7425 0772' /HALT WITH INDIRECT IN AC
7426 7402 HLT
7427 5600 JMP I ERROR

```

/RANDOM NUMBER GENERATOR

```

7430 0000 RANDL,
7431 7104 0
7432 7420 CLL RAL
7433 5240 SNL
7434 7421 JMP ENRAN
7435 7040 MQL
7436 0241 CMA
7437 4771' AND K3
7440 5630 JMS RSIMAD
7441 0003 JMP I RANDL

```

PAL10 V141 17-JUN-71 7:23 PAGE 15

```

7442 0000 EPASL,
7443 7604 0
7444 0270 AND SR03
7445 7640 SZA CLA
7446 5642 JMP I EPASL
7447 7040 CMA
7450 0271 AND C215
7451 4261 JMS TYPE
7452 7040 CMA
7453 0272 AND C212
7454 4261 JMS TYPE
7455 7040 CMA
7456 0273 AND C324
7457 4261 JMS TYPE
7460 5642 JMP I EPASL

```

```

7461 0000 TYPE,
7462 6046 0
7463 6041 TLS
TSF

```


7464 5263
7465 7200
7466 5661

JMP .-1
CLA
JMP I TYPE

7467 4000
7470 0400
7471 0215
7472 0212
7473 0324

SR00,
SR03,
C215,
C212,
C324,

/TEST FOR PROPER DIFFERENCE

7474 0000
7475 7041
7476 7421
7477 7040
7500 0770'
7501 4771'
7502 7500
7503 7041
7504 7001
7505 7001
7506 5674

ABSL.
CIA
MQL
CMA
AND
JMS
SMA
CIA
IAC
IAC
JMP I ABSL

TEMP3L
RSIMAD

PAL10

V141

17-JUN-71

7:23

PAGE 16

7507 0000
7510 7041
7511 7421
7512 7040
7513 0767'
7514 4771'
7515 7500
7516 7041
7517 7001
7520 7001
7521 5707

ABSL1.

CIA
MQL
CMA
AND
JMS
SMA
CIA
IAC
IAC
JMP I ABSL1

R3L
RSIMAD

7567 7160
7570 7161
7571 7200
7572 6757
7573 6756
7574 6754
7575 6753
7576 6761
7577 6760

PAL10

V141

17-JUN-71

7:23

PAGE 16-1

DATA	0023	SR03	7470
DIRL	6702	SR09	6773
DOANDL	6716	SR10	6772
DOTSTL	6705	SR11	6771
ENCAR	7244	SRANDL	7162
ENCARI	7253	SRIMAD	7163
ENDSIM	7274	START	0200
ENRAN	7440	STARTL	6600
EPASL	7442	T5400L	6766
ERROR	7400	T7760	6767
ERROR1	7341	T7770	6770
ERRORS	7352	TAC	6764
GANADL	7021	TCOMAD	6774
GANDL	7001	TDA1L	6760
GENL	7000	TDA2L	6761
IFLAGL	0005	TDA11L	6624
INADDL	0002	TDA21L	6634
INDIRL	7101	TDATA1L	6756
INSTL	0001	TEMP2L	6745
K0177L	7155	TEMP3L	7161
K10	6775	TEPASL	6750
K1000	7165	TERROR	6750
K1777	7152	TESTIL	6602
K200L	7157	TGENL	6746
K3	7441	TIFLGL	6755
K3L	7151	TINADL	6754
K4000	7350	TINSTL	6753
K400L	7156	TLINK	6765
LIMIT	7303	TPADDL	6757
LIML	7164	TRANDL	6752
MGA	7501	TRETTL	6747
MQL	7421	TRETUL	6735
NOTAUT	6676	TSIMAC	6763
NXTCAR	7234	TSIMAD	6751
P0AL	7107	TSIML	6762
P0L	7154	TYPE	7461
PADDL	0004	XORALL	7260
PADL	7113		
PAGADL	7044		

ERRORS DETECTED: 0

LINKS GENERATED: 23

RUN-TIME: 5 SECONDS

2K CORE USED