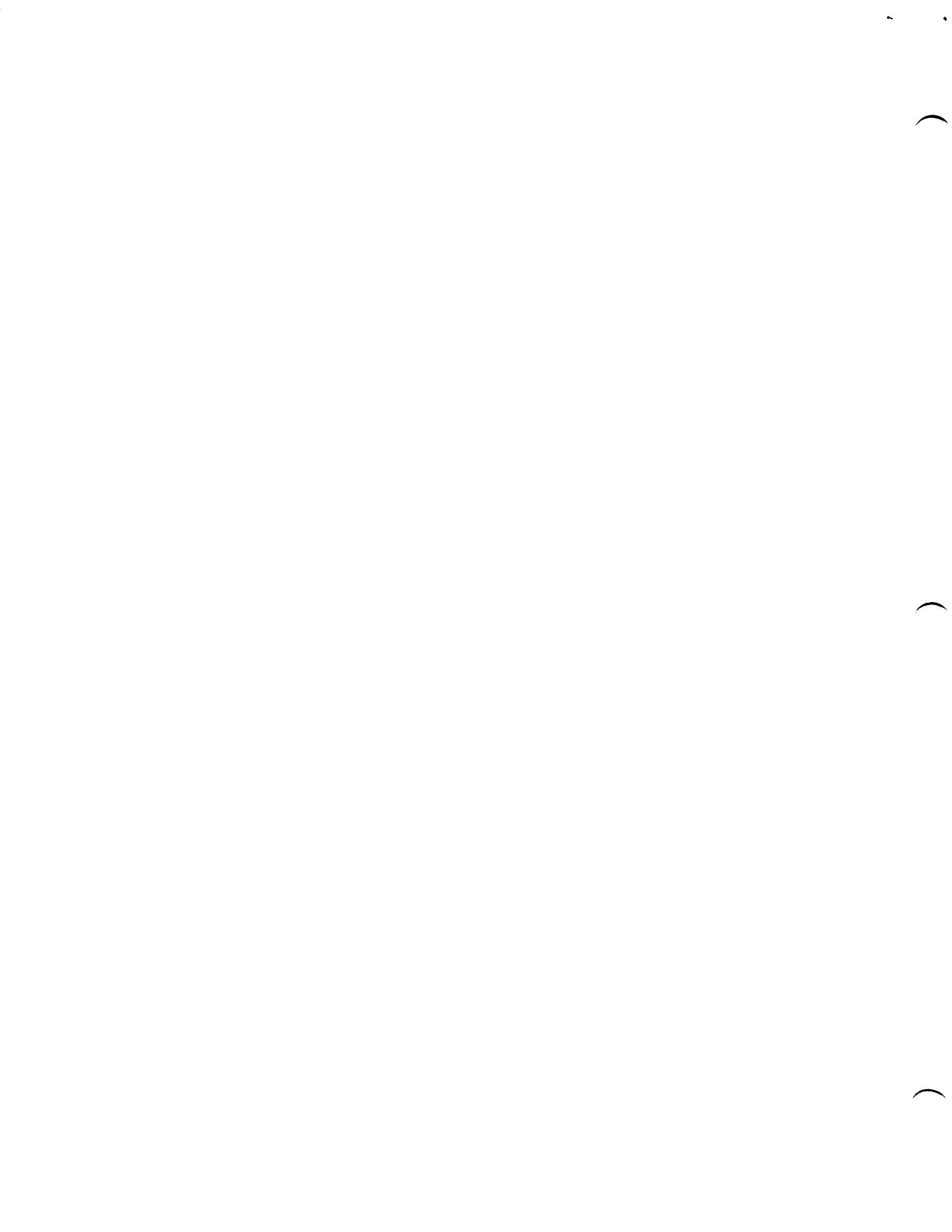


IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-D0FC-D
PRODUCT NAME: RANDOM ISZ TEST
DATE CREATED: JUNE 11, 1971
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: BRUCE HANSEN

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1. ABSTRACT

THIS PROGRAM IS WRITTEN TO TEST THE ISZ INSTRUCTION OF THE PDP-8E. AN ISZ INSTRUCTION IS PLACED IN A FROM LOCATION, AND A TO LOCATION CONTAINS THE OPERAND. PART 1 OF THE PROGRAM SELECTS FROM, TO, AND OPERAND FROM A RANDOM NUMBER GENERATOR, WITH THE OPTION OF HOLDING ANY OR ALL CONSTANT. PART 2 USES A FIXED SET OF FROM, TO, AND OPERAND NUMBERS.

2. REQUIREMENTS

2.1 EQUIPMENT

ONE PDP-8E EQUIPPED WITH TELETYPE.

2.2 STORAGE

THIS PROGRAM USES LOCATIONS 0000-7600(8). THE BINARY LOADER MUST BE STORED IN THE LAST MEMORY PAGE.

2.3 PRELIMINARY PROGRAM

MAINDEC-0E-D0A(N), AND MAINDEC-8E-D0B(N) MUST HAVE RUN SUCCESSFULLY.

3. LOADING PROCEDURE

THE STANDARD BINARY LOADER IS USED.

4. STARTING PROCEDURE

4.1 SWITCH SETTINGS

SR0(0) = HALT ON ERROR
SR1(1) = ELIMINATE ERROR PRINTOUTS
SR3 = FIXED FROMS (1)
 RANDOM FROMS (0)
SR4 = FIXED TOS (1)
 RANDOM TOS (0)
SR5 = FIXED OPERAND (1)
 RANDOM OPERAND (0)
SR9(0) = DO ONE ISZ ONLY
SR11(1) = DO TEST PART 2 SR3, 4, 5, MUST BE 0'S
SR11(0) = DO TEST PART 1

4.2 STARTING ADDRESS

4.3 OPERATOR ACTION

- A. SET SR (SWITCH REGISTER) TO 0200 AND PRESS LOAD ADDRESS.
- B. SET SR TO DESIRED MODE OF OPERATION; FOR MOST RUNS, SR9=0 ALLOWS THE MOST TESTING IN THE LEAST AMOUNT OF TIME.

FOR FIXED FROM, TO, OR OPERAND USAGE, THE FIXED NUMBER MAY BE SELECTED AND ENTERED INTO THE MEMORY LOCATIONS SHOWN BELOW:

FROM =0002
 TO =0021
 OPERAND =0022

C. PRESS, CLEAR AND THEN CONTINUE.

5. OPERATING PROCEDURE

SAME AS PARAGRAPH 4.

6. ERRORS

6.1 ERROR HALTS AND DESCRIPTION

| C(PC) | CAUSE |
|-------|----------------------|
| 0002 | PERIPHERAL INTERRUPT |
| 0254 | HALT ON ERROR, SR0=0 |

6.2 ERROR PRINTOUTS

| | | | | | | | |
|---|------|---|------|---|------|----|--|
| F | XXXX | T | YYYY | | | | |
| 0 | ZZZZ | F | MMMM | R | NNNN | NS | |

6.2.1 PRINTOUT EXPLANATION

| | | |
|-----------|--------|---|
| (FROM) | F XXXX | -THE ISZ INSTRUCTION IN LOCATION XXXX FAILED. |
| (TO) | T YYYY | -THE OPERAND ADDRESS OF THE ISZ INSTRUCTION WAS YYYY. |
| (OPERAND) | 0 ZZZZ | -THE STARTING COUNT IN THE ISZ LOOP WAS ZZZZ. |
| (FAILED) | F MMMM | -THE FAILURE OCCURRED TRYING TO ISZ THE NUMBER MMMM. |
| (RESULT) | R NNNN | -THE RESULT OF THIS ISZ WAS NNNN. |
| | NS | -NO SKIP OCCURRED |
| | S, | -INDICATES A SKIP. |

6.2.2

EXAMPLES

A. THE FOLLOWING IS A TYPICAL ERROR PRINTOUT.

F 3003 T 5470
0 3705 F 4777 R 5000 S

LINE 1 OF THE PRINTOUT IS A STATEMENT OF THE PROBLEM. IT SAYS THAT LOCATED AT 3003 IS AN ISZ INSTRUCTION INCREMENTING AN OPERAND STORED IN LOCATION 5470. LINE 2 OF THE PRINTOUT GIVES INFORMATION FOR ERROR ANALYSIS. 3705 WAS THE INITIAL OPERAND, 4777 WAS THE OPERAND BEING INCREMENTED WHEN THE ERROR OCCURRED, AND 5000 IS THE OPERAND FOLLOWING THE FAILING INCREMENT. THE S INDICATES THAT THE INCREMENT RESULTED IN A SKIP. THE ERROR HERE IS OBVIOUSLY THAT THE SKIP SHOULD NOT HAVE OCCURRED.

B. THE FOLLOWING IS ANOTHER TYPICAL ERROR PRINTOUT.

F 3003 T 5470
0 3705 F 4777 R 5020 NS

THIS IS IDENTICAL TO EXAMPLE (A) EXCEPT THAT A DIFFERENT TYPE OF ERROR HAS OCCURRED. THE RESULT OF INCREMENTING 4777 SHOULD BE 5000, NOT 5020.

6.3 ERROR RECOVERY

THE PROGRAM CONTINUES ON, FOLLOWING AN ERROR PRINTOUT UNLESS SR0=0. AFTER A HALT ON ERROR, PUSH CONTINUE TO RESUME TESTING. WHEN ERRORS EXIST, A FAILING CONDITION CHOSEN FROM THOSE TYPED OUT MUST BE USED WITH THE SCOPE MODE. FOR THE SCOPE MODE, PERFORM THE FOLLOWING STEPS:

- A. STOP THE PROGRAM.
- B. INSERT CHOSEN FROM INTO LOCATION 0002.
- C. INSERT CHOSEN TO INTO LOCATION 0021.
- D. INSERT CHOSEN FAILING OPERAND INTO LOCATION 0022
- E. RESTART PROGRAM WITH CONTROL SWITCHES 1,3,4,5. SET TO 1 AND 9 SET TO A 0.

NOTE: BY SETTING SR0 TO A 0, THE PROGRAM HALTS FOLLOWING THE ERROR PRINTOUT. THE OPERATOR MAY AT THIS TIME SET SWITCHES 1, 3, 4, 5, TO A 1 AND 9 TO A 0 AND PUSH CONTINUE. THE PROGRAM ENTERS A SCOPE MODE USING THE FAILING CONDITIONS JUST PRINTED.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

NONE.

7.2 OPERATING RESTRICTIONS

THE INTERRUPT IS ENABLED DURING PROGRAM OPERATION. ANY ATTACHED
DEVICE WHICH MIGHT CAUSE SPURIOUS INTERRUPTS, MUST BE DISABLED.

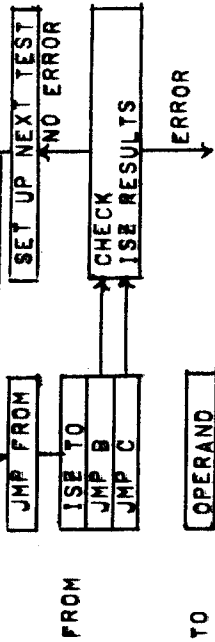
8. MISCELLANEOUS

8.1 EXECUTION TIME

SR9 = 1. 11,000 ISZ OPERATIONS/SECOND.
SR9 = 0. 3,500 ISZ OPERATIONS/SECOND.

9. PROGRAM DESCRIPTION

THE TEST LOOP IS SHOWN BELOW:



PART 1 OF THE PROGRAM USES A RANDOM NUMBER GENERATOR TO SELECT THE FROM, TO, AND OPERAND NUMBERS. ONCE SELECTED, THE OPERAND IS INCREMENTED UNTIL IT REACHES ZERO. EACH ISE IS CHECKED BY DUPLICATING ISE WITH TAD, IAC, DCA. EACH ITERATION IS ALSO CHECKED FOR THE PROPER SKIP OR NO-SKIP CONDITION.

PART 2 OF THE PROGRAM IS ACTUALLY PART 1, WITH THE RANDOM NUMBER GENERATED REPLACED BY A FIXED NUMBER GENERATOR. SEQUENCING OF EVENTS IS AS FOLLOWS:

(NOTE: 621(8) < MEMORY TEST AREA < 7600(8)):

- A. FROM = 621 TO = 624 TEST A SET OF 24 SELECTED OPERANDS. TO SAVE TIME IT IS SUGGESTED THAT SR9 = 0, SO THAT THE ISE IS PERFORMED ON EACH OPERAND ONLY ONCE INSTEAD OF INCREMENTING IT UNTIL THE ISE INSTRUCTION SKIPS.
- B. FROM = 621 TO = 625 REPEAT THE SET OF OPERANDS USED IN (A) ABOVE.

THIS SEQUENCE CONTINUES UNTIL IT REACHES THE UPPER LIMIT OF THE MEMORY TEST AREA. FROM IS THEN INCREMENTED BY 1 AND THE PROCESS IS REPEATED. WHEN FROM REACHES THE UPPER LIMIT OF THE MEMORY TEST AREA, THE TEST IS COMPLETE.

IDEALLY, IT IS DESIRABLE TO ISE EVERY LOCATION FROM EVERY OTHER LOCATION IN THE TEST AREA AND, IN DOING SO, USE ALL 24 OF THE SELECTED WORST CASE OPERANDS FOR EACH SET OF ADDRESSES. THIS IS WHAT PART 2 DOES, BUT IT TAKES MANY DAYS TO COMPLETE THE TEST. IT IS FOR THIS REASON THAT THE PROGRAM USES THE RANDOM NUMBER GENERATOR SYSTEM OF PART 1. PART 2 IS AN ADDITIONAL FEATURE OF THE PROGRAM WITH VERY LIMITED USE.

A FC IS PRINTED AFTER EACH GROUP OF 32,000 TESTS.



/PDP-8E ISZ TEST
/COPYRIGHT 1970, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
/
/CONSTANTS AND VARIABLES

```

0000
0000
0001 5001
0002 0002
0003 0003
0004 0000
0005 0000
0006 0202
0007 0547
0010 0007
0011 0000
0012 0000
0013 7401
0014 3607
0015 0003

      JMP 1
FRMLC, 2
LIMLO, 3
      0
      0
LIMHI, -7576
ASUC, SUC
MSK7, 0007
WORK, 0
WORK1, 0
M377, -377
NUM, 3607
THREE, 3

      /PERIPHERAL INTERRUPT
      /ISZ TEST INSTRUCTION LOCATION
      /LOW LIMIT TEST AREA

      /HIGH LIMIT TEST AREA

      /OCTAL CONVERSION MASK
      /IR0
      /IR1

      /THE RANDOM NUMBER LOCATION

```

```

0016 2421
0017 5116
0020 5141
0021 0000
0022 0000
0023 0000
0024 0000
0025 0004
0026 0400
0027 0200
0030 0100
0031 0000
0032 0257
0033 0201
0034 0206
0035 0413
0036 1014
0037 0600

ISZ I TOLOC
JMP I TOLOC
JMP BACK
JMP BAKBRN
TOLC, 0
PATRN, 0
BEFOR, 0
AFTER, 0
K4, 4
K0400, 0400
K0200, 0200
K0100, 0100
NOTE, 0
PRINT, INF1-1
AERR1, ERR1
AERR2, ERR2
APDR, PDR
ITADNM, TAD NUM
ATFCLF, TFCLF

      /MOVING ISZ
      /TEST INSTRUCTION
      /GROUP,
      /LOCATION TO BE ISZ'D
      /STARTING ISZ PATTERN
      /FAILING PATTERN BEFORE FAILING ISZ
      /PREDICTED RESULTS OF EACH ISZ
      /SWITCH REGISTER MASKS

      /7'S=ERROR WITH NO SKIP
      /0'S=ERROR WITH SKIP

```

```

/SR0(0)=HALT AFTER ERROR PRINTOUT
/SR1(1)=NO PRINTOUTS
/SR3(1) = HOLD FROM CONSTANT
/SR4(1) = HOLD TO CONSTANT
/SR5(1) = HOLD PATTERN CONSTANT
/SR9(0) = 00 ONE ISZ ONLY
/SR11(1) = 00 TEST PART 2
/
/

```

```

0040 4441
0041 0614
0042 0015

/PROGRAM START
START, JMS I ,+1 /ION
      PATCH /LAS
      AND THREE

```

0043 7640 SZA CLA /SKIP IF PART 1
 0044 5426 JMP I K0400 /GO TO PART 2
 0045 1036 TAD ITADNM
 0046 3165 DCA RANUM+1
 /CHECK FOR FIXED PATTERN
 CHEK1, LAS
 0047 7604 AND K0100
 0050 0030 SZA
 0051 7440 JMP CHEK2
 0052 5055

0053 4164 /SELECT THE PATTERN
 0054 3022 JMS RANUM
 DCA PATRN

CHEK2, /CHECK FOR FIXED TO
 0055 7604 LAS
 0056 0027 AND K0200
 0057 7640 SZA CLA
 0060 5065 JMP CHEK3

SELTO, /SELECT THE TO LOCATION
 0061 4164 JMS RANUM
 0062 3021 DCA TOLOC
 0063 1021 TAD TOLOC
 0064 4151 JMS LIMTST

CHEK3, /CHECK FOR FIXED FROM
 0065 7604 LAS
 0066 0026 AND K0400
 0067 7640 SZA CLA
 0070 5075 JMP PLCINT

SELFRM, /SELECT THE FROM LOCATION
 0071 4164 JMS RANUM
 0072 3002 DCA FRMLOC
 0073 1002 TAD FRMLOC
 0074 4151 JMS LIMTST

PLCINT, /PLACE FROM INSTRUCTIONS
 0075 7240 CLA GMA
 0076 1002 TAD FRMLOC
 0077 3011 DCA WORK
 0100 1016 TAD ISZ1
 0101 3411 DCA I WORK
 0102 1017 TAD JMP1
 0103 3411 DCA I WORK
 0104 1020 TAD JMP2
 0105 3411 DCA I WORK

0106 1022 /DEPOSIT PATTERN IN TO LOCATION
 0107 3421 TAD PATRN
 DCA I TOLOC

```

0110 1022 /STORE PREDICTED ISZ RESULT
0111 3023 TAD PATRN
0112 1023 DCA BEFOR
0113 7001 TAD BEFOR
0114 3024 IAC
0115 5407 DCA AFTER
                                JMP I ASUC

BACK,
0116 7604 /RETURN FOR NO SKIP CONDITION
0117 7004 LAS
0120 7710 RAL
0121 5132 SPA CLA
0122 1421 JMP LAS1
0123 7041 TAD I TOLOC
0124 1024 CIA
0125 7640 TAD AFTER
0126 5433 SEA CLA
0127 1421 JMP I AERR1
0130 7650 TAD I TOLOC
0131 5433 SNA CLA
0132 7604 JMP I AERR1
                                /ERROR IN ISZ SKIP DETECTION
LAS1,
0133 0025 LAS
0134 7650 AND K4
0135 5047 SNA CLA
0136 7001 JMP CHEK1
0137 1023 IAC
0140 5111 TAD BEFOR
                                JMP LUPI-1

BAKBRN,
0141 7604 /RETURN FOR SKIP CONDITION
0142 7004 LAS
0143 7710 RAL
0144 5047 SPA CLA
0145 1421 JMP CHEK1
0146 7640 TAD I TOLOC
0147 5434 SEA CLA
0150 5047 JMP I AERR2
                                /SKIP IF TO LOCATION OK
                                /ERROR IN ISZ LOCATION

/TEST HIGH-LOW LIMITS
LIMITS, 0
0151 0000 SPA
0152 7510 JMP +5
0153 5160 TAD LIMLO
0154 1003 SMA CLA
0155 7700 JMP I LIMITST
0156 5551 JMP RANUM+1
0157 5165 TAD LIMHI
0160 1006 SMA CLA
0161 7700 JMP RANUM+1
0162 5165 JMP I LIMITST
0163 5551

```

```

0164 0000
0165 1014
0166 7104
0167 7430
0170 1015
0171 3014
0172 1014
0173 5564
/AC=NEW RANDOM NUMBER

0174 1000
0175 0000
RANUM, K1000,
KP, 0

0200 0200
0201 1340
0202 3332
0203 7040
0204 3031
0205 5210
JMP START
/ERROR ROUTINE 1
TAD SKPDAT+6
DCA SKPDAT
CMA
DCA NOTE
JMP KPGO

0206 1331
0207 3332
0210 1002
0211 3011
0212 1370
0213 4342
/ERROR ROUTINE 2
TAD SKPDAT-1
DCA SKPDAT
TAD FRMLC
DCA WORK
TAD A3
JMS SETUP

0214 1021
0215 3011
0216 1371
0217 4342
TAD TOLOC
DCA WORK
TAD A4
JMS SETUP

0220 1022
0221 3011
0222 1372
0223 4342
0224 1023
0225 3011
0226 1373
0227 4342
TAD PATRN
DCA WORK
TAD A5
JMS SETUP
TAD BEFOR
DCA WORK
TAD A6
JMS SETUP

0230 1421
0231 3011
0232 1374
0233 4342
TAD I TOLOC
DCA WORK
TAD A7
JMS SETUP

0234 6002
0235 1032
0236 3011
0237 1411
/TTY PRINT ROUTINE
IOF
TAD PRINT
DCA WORK
TAD I WORK

```

0240 6046
 0241 6041
 0242 5241
 0243 1013
 0244 7640
 0245 5237
 0246 6042
 0247 6001
 0250 7604
 0251 7700
 0252 7402

0253 1031
 0254 7650
 0255 9047
 0256 3031
 0257 5132

/HALT AFTER ERROR (SR0)

/RETURN TO NO SKIP ROUTINE

```

/ERROR PRINTOUT LINE 1
INF1, 0306 /F FROM (INSTRUCTION LOCATION)
0261 0240 /SPACE
0262 0000 /X LOCATION
INDATA, 0 /X
0263 0000 /X
0264 0000 /X
0265 0000 /X
0266 0240 /SPACE
0267 0240 /SPACE
0270 0324 /T TO (OPERAND ADDRESS)
0271 0240 /SPACE
ONDATA, 0 /X ADDRESS
0272 0000 /X
0273 0000 /X
0274 0000 /X
0275 0000 /X
0276 0215 /CR
0277 0212 /LF
0300 0215 /CR
0301 0215 /CR

```

```

/ERROR PRINTOUT LINE 2
0302 0317 /O OPERAND (STARTING COUNT)
0303 0240 /SPACE
0304 0000 /X PATTERN
0305 0000 /X
0306 0000 /X
0307 0000 /X
0310 0240 /SPACE
0311 0240 /SPACE
0312 0306 /F FAILING COUNT
0313 0240 /SPACE
FLDATA, 0 /X PATTERN BEFORE FAILING ISZ
0314 0000 /X
0315 0000 /X
0316 0000 /X
0317 0000 /X
0320 0240 /SPACE

```

0321 0240
0322 0322
0323 0240

240 /SPACE
322 /R
240 /SPACE

RESULT AFTER FAILURE

0324 0000
0325 0000
0326 0000
0327 0000
0330 0240
0331 0240
0332 0316
0333 0323
0334 0215
0335 0212
0336 0212
0337 0377
0340 0316
0341 0323

RSDATA, 0 /X
0 /X
0 /X
0 /X
240 /SPACE
240 /SPACE
SKPDAT, 316 /N
323 /S
215 /CR
212 /LF
212 /LF
377 /RUBOUT
316 /N
323 /S

PATTERN AFTER FAILING ISZ

NO
SKIP

0342 0000
0343 3012
0344 1011
0345 7006
0346 7006
0347 4362
0350 7012
0351 7012
0352 7012
0353 4362
0354 7012
0355 7010
0356 4362
0357 4362
0360 7200
0361 5742
0362 0000
0363 0010
0364 1375
0365 3412
0366 1011
0367 5762

SETUP, 0
DCA WORK1
TAD WORK
RTL
RTL JMS MORSU
RTR
RTR
RTR JMS MORSU
RTR
RAR
JMS MORSU
JMS MORSU
CLA
JMP I SETUP
MORSU, 0
AND MSK7
TAD TW6
DCA I WORK1
TAD WORK
JMP I MORSU

/PAGE 1 CONSTANTS

0370 0261
0371 0271
0372 0303
0373 0313
0374 0323
0375 0260

A3, /PAGE 1 CONSTANTS
A4, INDATA-1
A5, ONDATA-1
A6, STDATA-1
A7, FLDATA-1
TW6, RSDATA-1
0260

0400 1003
0400 1003

/PART 2 INITIALIZATION ROUTINE
*400

TAD LIMLO

0401 7041
 0402 3310
 0403 1003
 0404 7040
 0405 3311
 0406 1346
 0407 3313
 0410 1314
 0411 3165

CIA FROM
 TAD LIMLO
 CMA
 DCA TO
 TAD AD
 DCA PATCYC
 TAD INST1
 DCA RANUM+1

/LOW LIMIT TO FROM

0412 5047

JMP CHEK1

/GO TO PAGE 0 START

0413 1164
 0414 7041
 0415 1305
 0416 7650
 0417 5303
 0420 1164
 0421 7041
 0422 1306
 0423 7650
 0424 5301
 0425 5226

/PATH DECISION ROUTINE
 TAD RANUM
 CIA
 TAD GFROM
 SNA CLA
 JMP FRUT
 TAD RANUM
 CIA
 TAD GTO
 SNA CLA
 JMP TORUT
 JMP PRUT

/SKIP IF NOT REQUESTING FROM
 /GO TO FROM ADDRESS ROUTINE

/SKIP IF NOT REQUESTING TO
 /GO TO TO ADDRESS ROUTINE
 /GO TO PATTERN ROUTINE

0426 1713
 0427 3312
 0430 1312
 0431 7450
 0432 5240
 0433 7201
 0434 1313
 0435 3313
 0436 1312
 0437 5564

/SELECT PATTERN AND OTHER THINGS
 TAD I PATCYC
 DCA PATT
 TAD PATT
 SNA .+6
 JMP IAC
 CLA IAC
 TAD PATCYC
 DCA PATCYC
 TAD PATT
 JMP I RANUM

/NO SKIP IF END OF PATTERN TABLE
 /END PATTERN TABLE LOOK AROUND

/RETURN, AC=NEW PATTERN

0440 1345
 0441 3313
 0442 7001
 0443 1311
 0444 3311
 0445 1311
 0446 7041
 0447 1310
 0450 7640
 0451 5255
 0452 1311
 0453 1015
 0454 3311
 0455 1311
 0456 7500
 0457 5276

TAD AK7776
 DCA PATCYC
 IAC
 TAD TO
 DCA TO
 TAD TO
 CIA
 TAD FROM
 SZA CLA
 JMP .+4
 TAD TO
 TAD THREE
 DCA TO
 TAD TO
 SMA
 JMP GOUT

/RESTOR START ADDRESS OF PATT, TABLE

/INCREMENT TO

/SKIP IF TO = FROM

/SKIP AROUND FROM

0460 1006
 0461 7710
 0462 5276
 0463 7201
 0464 1310
 0465 3310
 0466 1003
 0467 7041
 0470 3311
 0471 1310
 0472 1006
 0473 7710
 0474 5276
 0475 5200
 0476 7200
 0477 1312
 0500 5564

TAD LIMHI
 SPA CLA
 JMP GOUT
 CLA IAC
 TAD FROM
 DCA FROM
 TAD LIMLO
 CIA TO
 DCA TO
 TAD FROM
 TAD LIMHI
 SPA CLA
 JMP GOUT
 JMP 400
 CLA
 TAD PATT
 JMP I RANUM

/SKIP IF END TEST AREA
 /ADVANCE FROM
 /RESET TO ADDRESS

GOUT,

/SELECT TO ROUTINE
 TAD TO
 JMP I RANUM

TORUT,

0501 1311
 0502 5564

/SELECT FROM ROUTINE
 TAD FROM
 JMP I RANUM

FRUT,

0503 1310
 0504 5564

/PAGE 3 CONSTANTS
 SELFRM+1

GFROM,

0505 0072

SELTO+1

GTO,

0506 0062

SELPAT+1

GPAT,

0507 0054

0
 0
 0
 0

FROM,

0510 0000

0
 0
 0

TO,

0511 0000

0
 0

PATT,

0512 0000

0
 0

PATCYC,

0513 0000

JMP I APDR

INST1,

0514 5435

7776
 7775
 7773
 7767
 7757
 7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

K7776,

0515 7776

7775
 7773
 7767
 7757
 7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0516 7775

7773
 7767
 7757
 7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0517 7773

7767
 7757
 7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0520 7767

7757
 7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0521 7757

7737
 7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0522 7737

7677
 7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0523 7677

7577
 7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0524 7577

7377
 6777
 5777
 3777
 0001
 0003
 0007
 0017

0525 7377

6777
 5777
 3777
 0001
 0003
 0007
 0017

0526 6777

5777
 3777
 0001
 0003
 0007
 0017

0527 5777

3777
 0001
 0003
 0007
 0017

0530 3777

0001
 0003
 0007
 0017

0531 0001

0003
 0007
 0017

0532 0003

0007
 0017

0533 0007

0017

0534 0017

/STORED RETURN ADDRESS WHEN
 /RANDOM FROM IS REQUESTED
 /STORED RETURN ADDRESS WHEN
 /RANDOM TO IS REQUESTED
 /STORED RETURN ADDRESS WHEN
 /RANDOM PATTERN IS REQUESTED
 /CURRENT FROM ADDRESS
 /CURRENT TO ADDRESS
 /CURRENT PATTERN
 /CURRENT PATTERN ADDRESS

0535 0037
 0536 0077
 0537 0177
 0540 0377
 0541 0777
 0542 1777
 0543 3777
 0544 0000
 0545 0515
 0546 0544

K3777, 3777
 0
 AK7776, K7776
 A0, K3777+1

0547 1375
 0550 7001
 0551 3375
 0552 1375
 0553 7640
 0554 9437
 0555 1175
 0556 1174
 0557 3175
 0560 1175
 0561 7640
 0562 5437
 0563 6002
 0564 1376
 0565 3011
 0566 5767
 0567 7602
 0570 0215
 0571 0212
 0572 0306
 0573 0303
 0574 0377
 0575 0000
 0576 0567

SUC, TAD CT
 IAC
 DCA CT
 TAD CT
 SZA CLA
 JMP I ATFCLF
 TAD KP
 TAD K1000
 DCA KP
 TAD KP
 SZA CLA
 JMP I ATFCLF
 IOF
 TAD INF2
 DCA WORK
 JMP I .+1
 7602
 215
 212
 306
 303
 377
 0
 567

CT, INF2, 567

0600 *600

/CHECK FOR TO=FROM CONFLICT

0600 1021
 0601 7041
 0602 1002
 0603 7450
 0604 5055
 0605 7001
 0606 7450
 0607 5055
 0610 7001
 0611 7650
 0612 5055

TFCLF, TAD TOLOC
 CIA
 TAD FRMLC
 SNA
 JMP CHEK2
 IAC
 SNA
 JMP CHEK2
 IAC
 SNA CLA
 JMP CHEK2

0613 5402

JMP I FRMLOC

0614 0000

0 DCA 0

PATCH, /RESTORE THEN GO AWAY

0615 3000

TAD X

0616 1232

DCA 1

0617 3001

TAD X1

0620 1233

DCA 2

0621 3002

TAD X2

0622 1234

DCA 3

0623 3003

TAD X3

0624 1235

DCA START

0625 3040

TAD X4

0626 1236

DCA START+1

0627 3041

ION

0630 6001

JMP I PATCH

0631 5614

0632 7402

X, 7402

0633 0000

X1, 0

0634 7157

X2, 7157

0635 6001

X3, ION

0636 7604

X4, LAS

7602

*7602

7602 1411

TAD I WORK

7603 6046

TLS

7604 6041

TSF

7605 5204

JMP --1

7606 1013

TAD M377

7607 7640

SZA CLA

7610 5202

JMP --6

7611 5217

JMP OVR

7617

*7617

7617 6042

OVR, TCF

7620 6001

ION

7621 5437

JMP I ATFCLF

S