

IDENTIFICATION

Product Code: MAINDEC-08-D5DB-D
Product Name: DF32 MULTI DISK
Date Created: August 22, 1968
Maintainer: Diagnostic Group
Author: E. Haight

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1. ABSTRACT

"MULTI DISK" is a high speed confidence test that exercises the disk system with random data and restores the disk surface to its original state at completion.

2. REQUIREMENTS

PDP-8 or PDP-8/I

DF32 DISK LOGIC

Plus additional slave disks up to three

3. STORAGE

The main body of the program is located between loc. 0 and 1250 in memory.

Three buffers of 2000 words each. Take up the rest of memory up to 7500.

1500 to 3477 Disk Storage Buffer

3500 to 5477 Out Buffer

5500 to 7477 In Buffer

4. LOADING PROCEDURE

The procedure for normal binary tape should be followed.

5. STARTING ADDRESS AND PROCEDURE

5.1 Normal Operation

Starting Address 150 (follow procedure 6.1)

5.2 System Operation

Starting Address 155 (follow procedure 6.2)

6. OPERATING PROCEDURE

6.1 Normal Operation

- a. Load MULTI DISK into memory.
- b. Turn Write Inhibit switches to OFF.
- c. Load address 150.

- d. Set switch register to mode of operation desired.
- e. Press START.
- f. The program will continue to loop upon completion of the system being exercised.
- g. End of test command.

When the end of test command (CONTROL C) is given in the normal mode of operation, the test comes to a halt at the completion of the 2000 word buffer being exercised at the time.

6.2 MULTI DISK Used in Conjunction with the Disk Builder

- a. Call MULTI DISK from the system.
- b. Upon successful loading the program will start automatically.
- c. Set switches to desired mode of operation. Refer to paragraph 7.
- d. End of test command. When the end of test command (CONTROL C) is given in this mode, an exit from MULTI DISK to the system builder is accomplished.

6.3 Printouts

- a. When the program is first initialized it prints out the number of existing disks. Refer to paragraph 8.1.
- b. Error printouts will occur on any disk error or any data error when the read buffer is compared to the write buffer. Refer to paragraphs 8.2 and 8.3.
- c. A report of the number of data errors for each 2000 word buffer may be selected. Refer to paragraph 8.4

6.4 Error Halts

An error halt at loc. 433 will occur when no disk is present.

7. SWITCH REGISTER SETTINGS

0	1	2	3	4	5	6	7	8	9	10	11
				DISK		TRACK SELECTION					
1	0	1		CROSS OVER TEST 7.1							
0	1	0		REPORT NUMBER OF ERRORS PER BUFFER 7.3							
0	0	1		SELECT TRACK FROM SWITCH REGISTER 7.4							
0	0	0		NORMAL							

7.1 SR0 set the test exercises 2000 words starting at disk memory address 7000. The track must be selected by the operator.

7.2 With SR1 set only the number of data errors per 2000/word buffer area is reported.

7.3 SR2 set enables the operator to select the disk and track from the switch register.

8. STATUS REPORTING

8.1 Upon initialization the number of existent disks will be reported. If the number is incorrect, do not press PROGRAM HALT! Type CONTROL C, this will enable the program to restore the disk then halt.

Example:

3 EXISTENT DISK(s)

8.2 When a status register error is detected, only one error in a block will be reported.

Example:

TA0300 DA3124 SR0301
TA = DISK and TRACK
SR = STATUS REGISTER

8.3 Data Errors

All data compare errors will be reported for each block.

Example:

TA0100 WC1021 GD3670 BD3603
TA = DISK and TRACK
WC = WORD COUNT
GD = DATA WRITTEN
BD = DATA READ

8.4 The number of data error can also be reported.

Example:

TA1100 ERROR(S) 0001
TA = DISK and TRACK
ERROR(S) = NUMBER OF DATA ERRORS PER BUFFER

9. DESCRIPTION

MULTI DISK is not a diagnostic it is merely a confidence test, to insure the user the system can transfer data without errors. The test first stores 2000 words of the disk in core, then exercises that 2000 word area with random data. After exercising the disk, the program restores the disk to its original state. Then the test goes on to exercise the next 2000 word block.

Execution Time: 15 seconds per disk.

AUG 26 1968

E. Haught

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/MULTI DISK II
/UF32 IUTS
WC=7750
CA=7751
UCMA=0601
DMAH=0603
DMAW=0605
UCEA=0611
DSAC=0612
DLAL=0615
DLAC=0616
DFSL=0621
DFSC=0622
DMAC=0626
DTCA=0662

/WORD COUNT
/INITIAL ADDRESS
/CLEAR DISK FLAGS
/READ
/WRITE
/CLEAR DISK EXT. ADDRESS
/SKIP ON AUC
/LOAD DISK EXT. ADDRESS
/READ DISK STATUS
/SKIP ON NO ERROR
/SKIP ON COMPLETION FLAG
/READ DISK MEMORY ADDRESS REGISTER
/CLEAR DECTAPE FLAGS

```

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0020      *20
0020 0000      /CONSANTS + TAGS
0021 0000      SAV, 0
0022 0000      SAV1, 0
0023 0000      SAV2, 0
0024 0000      SAV3, 0
0025 0000      BCOUNT, 0
0026 0000      DCCOUNT, 0
0027 0200      K0002, 0002
0028 0200      K0200, 0200
0029 0200      K0200, 0200
0030 0200      K0200, 0200
0031 7600      K7600, 7600
0032 0100      K0100, 0100
0033 0004      K0004, 0004
0034 1000      K1000, 1000
0035 0370      K0370, 0370
0036 3000      K3000, 3000
0037 6000      K6000, 6000
0038 7000      K7000, 7000
0039 1777      K1777, 1777
0040 5477      K5477, 5477
0041 2000      K2000, 2000
0042 3477      K3477, 3477
0043 0003      K0003, 0003
0044 4000      K4000, 4000
0045 0700      K0700, 0700
0046 0070      K0070, 0070
0047 0007      K0007, 0007
0048 1477      K1477, 1477
0049 3777      K3777, 3777
0050 0000      CC, 0
0051 0000      TKA, 0
0052 0203      K0203, 0203
0053 0057      M1, M1
0054 0215      0215
0055 0212      0212
0056 0000      0
0057 0240      0240 /SPACE
0058 0305      0305 /E
0059 0330      0330 /X
0060 0311      0311 /I
0061 0323      0323 /S
0062 0324      0324 /T
0063 0305      0305 /E
0064 0316      0316 /N
0065 0324      0324 /T
0066 0240      0240 /SPACE
0067 0304      0304 /D
0068 0311      0311 /I
0069 0323      0323 /S
0070 0313      0313 /K
0071 0250      0250 /(
0072 0323      0323 /S
0073 0251      0251 /)

```

```

0104 0000      0      /STOP CODE
0105 0642      RAW,  RANDOM
0106 7750      WGT,  WC
0107 7751      CAT,  CA
0110 0667      ER,   ERROR
0111 0661      RE,   RESTORE
0112 0714      CU,   COMPARE
0113 0421      NU,   0421
0114 0000      BU,   0
0115 0000      GU,   0
0116 0000      SR,   0
0117 0000      DMA,  0
0120 1035      EP1,  SHP
0121 10/1      EP2,  UP
0122 0600      LI,   LIA
0123 0200      MES1, MESSAGE
0124 0204      SETUP, SIXTY
0125 0400      BEG,  BEGIN
0126 0466      DAT,  0A+15
0127 0756      CHK,  ICB
0130 0276      PNT,  SIXTY+12
0131 7600      SYSTEM, /600
0132 0000      AC,   0
0133 0000      LINL, 0
0134 0000      LINK, 0
0135 0000      ECOUNT, 0
0136 1200      SMERTL, SMERT
0137 1000      CLFL, CLF
0140 1135      INZL, INZ

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```

/ WITH DATA FOLLOWING
/ RETURN FOLLOWING END OF MESSAGE
/ CODE (00)
*200
MESSAGE, 0
0200 0000      IOF
0201 6002      CLA CMA      /SET C(AC)=-1
0202 7240      TAU MESSAGE  /ADD LOCATION
0203 1200      UCA 12      /AUTO-INDEX REGISTER
0204 5012      TAU I 12    /FETCH FIRST WORD
0205 1412      UCA MSRGHT  /SAVE IT
0206 3217      TAU MSRGHT
0207 1217      MTR
0210 7012      MTR      /ROTATE 6 BITS RIGHT
0211 7012      MTR
0212 7012      JMS TYPECH  /TYPE IT
0213 4220      TAU MSRGHT  /GET DATA AGAIN
0214 1217      JMS TYPECH  /TYPE RIGHT HALF
0215 4220      JMP MESSAGE+5
0216 5205      MSRGHT, 0   /TEMPORARY STORAGE
0217 0000      TYPECH, 0   /TYPE CHARACTER IN C(AC)6-11
0220 0000      ANU MASK77
0221 0254      SNA      /IS IT END OF MESSAGE?
0222 7450      JMP MTP+5   /YES: EXIT
0223 5251      TAU M40     /SUBTRACT 40
0224 1255      SNA      /<40?
0225 7500      JMP ,+3     /NO
0226 5231      TAU C340    /YES: ADD 300
0227 1256      JMP MTP     /TO CODES <40
0230 5244      TAU M3     /SUBTRACT 3
0231 1257      SZA      /IS IT ZERO?
0232 7440      JMP ,+3     /NO
0233 5236      TAU C212    /YES: CODE 45 IS
0234 1260      JMP MTP     /LINE FEED (212)
0235 5244      TAU M2     /SUBTRACT 2
0236 1261      SZA      /IS IT ZERO?
0237 7440      JMP ,+3     /NO
0240 5243      TAU C215    /YES: CODE 45 IS
0241 1262      JMP MTP     /CARRIAGE-RETURN (215)
0242 5244      TAU C245    /ADD 200 TO OTHERS >40
0243 1263      MTP,  TLF   /TRANSMIT CHARACTER
0244 6046      TSF      /WAIT FOR FLAG
0245 6041      JMP ,=1    /NOT SET YET
0246 5245      CLA      /SET: CLEAR C(AC)
0247 7200      JMP I TYPECH /RETURN
0250 5620      ICF      /CLEAR TELEPRINTER
0251 6042      ION      /TURN INTERRUPT ON
0252 6001      JMP I 12   /RETURN
0253 5412

```



```

0254 0077      /CONSTANTS
0255 7740      MASK77, /7
0256 0340      M40,  -40
0257 7775      C340,  340
0260 0212      M3,    -3
0261 7776      C212,  212
0262 0215      M2,    -2
0263 0245      C215,  215
0264 7402      C245,  245

0264 7402      SIXTY, MLI
0265 7000      NOP
0266 7000      NOP      /STORE INIT NEXT TIME
0267 7200      CLA
0270 1664      TAU I, -4      /ADDRESS OF OPERAND
0271 3273      UCA, +2
0272 5674      JMP I, +2
0273 0000      0      /ADDRESS OF OPERAND
0274 0276      SIXTY+12      /CHANGING REFERENCE (P)
0275 5267      JMP SIXTY+3
0276 1673      TAU I SIXTY+7      /AC (OPERAND)
0277 0051      AND K000/
0280 3344      UCA MASKA      /0000
0281 1673      TAU I SIXTY+7      /AC (OPERAND)
0282 0050      AND K000/
0283 3345      UCA MASKB      /00X0
0284 1673      TAU I SIXTY+7      /AC (OPERAND)
0285 0047      AND K0700
0286 3346      UCA MASKC      /0X00
0287 1673      TAU I SIXTY+7      /AC (OPERAND)
0290 0040      AND K7000
0291 3347      UCA MASKD      /X000
0292 1346      TAU MASKC      /0X00
0293 7112      RTR CLL
0294 7010      RAR      /0X00 RS3 00X0
0295 1347      TAU MASKD      /X0X0
0296 7012      RTR
0297 7010      RAR
0300 1350      TAU MASKD+1      /X0X0 RS3 0X0X
0301 3346      UCA MASKC      /TEMP STORAGE
0302 2264      ISX SIXTY      /INCREMENT FOR STORAGE
0303 4274      JMS SIXTY+10      /FIND STORAGE ADDRESS
0304 1346      TAU MASKC      /6X6X
0305 3673      UCA I SIXTY+7      /STORE OPERAND AS SPECIFIED
0306 1345      TAU MASKB      /00X0
0307 7004      MAL
0310 7006      MTL      /00X0 SL3 0X00
0311 1344      TAU MASKA      /0X00+000X=0X0X
0312 1350      TAU MASKD+1      /0X0X+6060=6X6X
0313 3347      UCA MASKD      /TEMP STORAGE
0314 2264      ISX SIXTY      /INCREMENT FOR STORAGE
0315 4274      JMS SIXTY+10      /FIND STORAGE ADDRESS
0316 1347      TAU MASKD      /6X6X
0317 3673      UCA I SIXTY+7      /STORE OPERAND AS SPECIFIED

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0340 1150      TAU PNT      /HOUSE KEEPING
0341 3274      UCA SIXTY+10
0342 2264      ISX SIXTY      /INCREMENT FOR RETURN
0343 5664      JMP I SIXTY      /RETURN
0344 0000      MASKA, 0
0345 0000      MASKB, 0
0346 0000      MASKC, 0
0347 0000      MASKD, 0
0350 0060      6060

```

0000 0000
0000 0000
0001 5537

0002 0000
0003 5525
0004 6002
0005 5402

```
*0
INT, 0
/      JMP I CLFL      /GO SERVICE INTERRUPT
/
CCSU, 0
      JMP I BEG        /ENTER MAIN ROUTINE
      JOP
      JMP I CCSU
```

0400

0400 6601
0401 7200
0402 3054
0403 3021
0404 3025
0405 6615
0406 7200
0407 6616
0410 0026
0411 7440
0412 5230
0413 1025
0414 7001
0415 3025
0416 1021
0417 1034
0420 3021
0421 1025
0422 7041
0423 1033
0424 7050
0425 5230
0426 1021
0427 5205
0430 7200
0431 1025
0432 7450
0433 7402
0434 1030
0435 3062
0436 1057
0437 3010
0440 6042
0441 7200
0442 1410
0443 7450
0444 5251
0445 6046
0446 6041
0447 5246
0450 5240
0451 7200
0452 6611
0453 6601
0454 6001
0455 3024
0456 3055
0457 1040
0460 1021
0461 1047
0462 7040

```
*400
/ROUTINE TO DETERMINE # OF DISK'S
/ON EACH SYSTEM
BEGIN, UCMA
      CLA
      UCA CC
      UCA SAV1      /DISK ADDRESS
      UCA DCOUNT   /# COUNT OF DISK
      DEAL
      CLA
      DEAC
      AND K0002      /TEST FOR NON-EXTSTENT
      SZA
      JMP ,+16
      TAU DCOUNT
      IAC      /*+1 DISK COUNT
      UCA DCOUNT
      TAU SAV1
      TAU K1000      /SELECT NEXT DISK
      UCA SAV1
      TAU DCOUNT
      CIA
      TAU K0004
      SNA CLA
      JMP ,+3
      TAU SAV1      /NEXT DISK
      JMP BEGIN+5
      CLA
      TAU DCOUNT
      SNA
      MLT      /NO DISK PRESENT
      TAU K0200
      UCA M1+3      /ASCII CODE
      TAU M1
      UCA 10
      TCF
      CLA
      TAU I 10      /AUTO INDEX
      SNA      /END OF MESSAGE
      JMP DA      /YES
      TLS
      TST
      JMP ,+1
      JMP ,+10
      CLA
      UCLL      /DATA TEST
      UCMA      /CLEAR DISK EXT, ADDRESS
      IQN      /CLEAR DISK FLAGS
      UCA BCOUNT /TURN INTERRUPT ON
      UCA TKA
      TAU K7000      /MINUS 1000
      TAU SAV1
      TAU K0700      /MAX, AMOUNT OF STORAGE PER DISK
      CMA
```

0403 3020
0404 1020
0405 3021
0406 7004
0407 3022

UCA SAV
TAU SAV
UCA SAV1
LAS /SELECT MODE OF OPERATION
UCA SAV2
/

0470 1025	TK,	TAU TKA	/TRACK
0471 6615		DEAL	/LOAD DISK AND TRACK
0472 7200		CLA	/
0473 4505		JMS I RAW	/GENERATE RANDOM WORD
0474 1022		TAU SAV2	/FETCH MODE
0475 7000		NOP	
0476 0034		ANU K1000	/COMPARE FOR TRACK SELECT
0477 7450		SNA	
0500 5322		JMP RA1	/NO
0501 7200		CLA	/YES
0502 1022		TAU SAV2	
0503 0035		ANU K0370	
0504 7006		NTL	
0505 7004		NAL	
0506 3025		UCA TKA	
0507 1025		TAU TKA	
0510 6615		DEAL	/LOAD TRACK ADDRESS
0511 7200		CLA	
0512 1022		TAU SAV2	/COMPARE FOR CROSSOVER
0513 7000		NOP	
0514 0046		ANU K4000	
0515 7450		SNA	
0516 5322		JMP ,+4	/EXERCISE TRACK
0517 7200		CLA	
0520 1040		TAU K7000	/CROSSOVER ADDRESS
0521 3024		UCA BCOUNT	
0522 1037	RA1,	TAU K6000	
0523 3506		UCA I WCT	/
0524 1052		TAU K1477	
0525 3507		UCA I CAT	/LOAD CURRENT ADDRESS
0526 1024		TAU BCOUNT	
0527 6603		UMAR	/SAVE DISK CONTENTS
0530 7000		NOP	
0531 5331		JMP ,	
0532 4511	WA1,	JMS I RE	/RESTORE ORG, TRACK
0533 1037		TAU K6000	/2000 TRANSFERS
0534 3506		UCA I WCT	
0535 1044		TAU K3477	/WRITE BUFFER=1
0536 3507		UCA I CAT	
0537 1024		TAU BCOUNT	
0540 6605		UMAR	/WRITE
0541 7000		NOP	
0542 5342		JMP ,	
0543 4511	RA2,	JMS I RE	/RESTORE ORG TRACK
0544 1037		TAU K6000	
0545 3506		UCA I WCT	
0546 1042		TAU K3477	/READ BUFFER=1
0547 3507		UCA I CAT	
0550 1024		TAU BCOUNT	
0551 6603		UMAR	/READ
0552 7000		NOP	
0553 5353		JMP ,	
0554 4512		JMS I CO	/COMPARE DATA

```

0005 4511
0006 7200
0007 1037
0008 3506
0009 1052
0010 3507
0011 1024
0012 6605
0013 7000
0014 5366
0015 4511
0016 5522

```

```

WA2, JMS I RE
CLA
TAU K0000
UCA I WCT /LOAD W.C.
TAU K1477
UCA I CAT /LOAD C.A.
TAU BCOUNT
UMAW /WRITE
NOP
JMP I /CHECK FOR ERROR
JMS I RE /RESTORE ORG, TRACK.
JMP I LI

```

```

0000 0600
0001 7200
0002 1054
0003 7041
0004 1056
0005 7650
0006 5004
0007 1024

```

```

*000
LIA, CLA
TAU CC
CIA
TAU K0203 /COMPARE FOR COMPLETION COMMAND
SNA CLA /YES EXIT
JMP CCSU+2 /NO CONTINUE
IBT, TAU BCOUNT
/
CIA
TAU K0000
SNA
JMP ,+6 /INCREMENT TRACK
CLA
TAU BCOUNT
TAU K2000
UCA BCOUNT
JMP I DAT
CLA
UCA BCOUNT /ZERO BUFFER COUNT
TAU TKA
TAU K0100
UCA TKA
TAU SAV1
CMA
SZA CLA
SKP
JMP ,+5
TAU SAV1
TAU K0100
UCA SAV1
JMP I DAT
TAU SAV
UCA SAV1 /SET UP FOR NEXT PASS
UCA TKA
JMP I DAT

```

```

0007 7041
0008 1037
0009 7450
0010 5220
0011 7200
0012 1024
0013 1043
0014 3024
0015 5526
0016 7200
0017 3024
0018 1055
0019 1032
0020 3055
0021 1021
0022 7040
0023 7640
0024 7410
0025 5236
0026 1021
0027 1032
0028 3021
0029 5526
0030 1020
0031 3021
0032 3055
0033 5526
0034 1044
0035 3011
0036 1113
0037 7104
0038 7430
0039 1045
0040 3113
0041 1113
0042 3411
0043 2023
0044 5247
0045 5642

```

```

RANDOM, 0
TAU K0000 /2000 TRANSFERS
UCA SAV3 /OUT PUT BUFFER-1
TAU K3477
UCA 11 /AUTO INDEX
TAU NU /RANDOM#
MAL CLL
SEL
TAU K0003
UCA NU
TAU NU
UCA I 11 /FILL BUFFER
ISE SAV3 /DONE
JMP ,+10 /NO
JMP I RANDOM /YES
/

```

```

0001 0000      RESTORE,      0
0002 7200      CLA
0003 1055      TAU TKA
0004 6615      DEAL          /LOAD TK
0005 7200      CLA
0006 5601      JMP I RESTORE

0007 7200      ERROR,      CLA
0008 6621      DFSE
0009 5300      JMP ,+7
0010 6622      DFSC
0011 5207      JMP ,+4
0012 6611      UCLA
0013 6601      UCMA          /NO ERROR'S
0014 6001      ION
0015 5400      JMP I INT
0016 7200      CLA
0017 1024      TAU HCOUNT
0018 3117      UCA DMA          /STORE
0019 6616      DEAC          /READ STATUS
0020 7000      NOP
0021 3116      UCA SR          /STORE
0022 6622      DFSC          /SKIP ON COMPLETION
0023 5306      JMP ,+1
0024 6611      UCLA
0025 6601      UCMA          /CLEAR THE WORLD
0026 4520      JMS I EP1       /PRINT ERROR
0027 5400      JMP I INT       /CONTINUE
0028 0000      COMPARE,      0          /COMPARE FOR DATA ERROR
0029 7200      CLA
0030 3135      UCA ECOUNT       /ZERO ERROR COUNT
0031 1044      TAU K3477        /OUT BUFFER-1

0032 3010      UCA 10          /AUTO INDEX
0033 1042      TAU K5477        /IN BUFFER-1
0034 3011      UCA 11          /AUTO INDEX
0035 1037      TAU K6000        /MINUS 2000
0036 3025      UCA DCOUNT
0037 1410      TAU I 10
0038 3115      UCA GD          /GOOD WORD (OUT BUFFER)
0039 1411      TAU I 11
0040 3114      UCA BD          /BAD WORD (IN BUFFER)
0041 1115      TAU GD
0042 7041      CIA
0043 1114      TAU BD
0044 7640      SEA CLA
0045 5341      JMP ,+4          /ERROR
0046 2025      ICB,          ISE DCOUNT
0047 5325      JMP COMPARE+11   /FETCH NEXT WORD
0048 5354      JMP ERXT        /DONE
0049 7604      LAS
0050 0043      AND K2000
0051 7640      SEA CLA

```

```

0052 5352      JMP ,+6
0053 1025      TAU DCOUNT
0054 0041      AND K1777
0055 7000      NOP
0056 3117      UCA DMA          /DISK ADDRESS
0057 5305      JMP ,+14
0058 2155      ISE ECOUNT       /+1 ERROR COUNT
0059 5356      JMP ICB          /FETCH NEXT WORD
0060 7604      ERXT,          LAS          /COMPARE FOR AC BIT 1
0061 0043      AND K2000
0062 7450      SNA
0063 5714      JMP I COMPARE       /NORMAL TYPE OUT
0064 7200      CLA
0065 1135      TAU ECOUNT
0066 7440      SEA
0067 4536      JMS I SHERTL
0068 5714      JMP I COMPARE       /RETURN TO ROUTINE
0069 4521      JMS I EP2          /PRINT DATA ERROR
0070 5356      JMP ICB

```

```

1000          *1000
/
/ROUTINE TO SERVICE INTERRUPTS
/
/
CLF,          UCA AC          /STORE AC
              RAK
              UCA LINK        /STORE LINK
              ISF             /SKIP ON TELEPRINTER FLAG
              JMP ,+3         /NO FLAG
              ICF             /CLEAR FLAG
              JMP EXIT        /EXIT SERVICE
              ASF             /SKIP ON KEYBOARD FLAG
              JMP ,+4         /NO FLAG
              KRB
              UCA CC          /STORE CHARACTER
              JMP EXIT        /EXIT SERVICE
              CLA
              TAU K000/
              CMA
              UCA ECOUNT
              ISF ECOUNT
              JMP , -1
              OFSC            /SKIP ON DISK COMPLETION
              JMP ,+3
              ISF INT
              JMP I ER
              JMP I IR2L      /REPORT UNDEFINED INTERRUPT
EXIT,          CLA
              TAU LINK        /FETCH LINK
              HAL             /RESTORE LINK
              TAU AC          /FETCH AC
              ION             /TURN INTERRUPT ON
              JMP I INT       /RETURN
SMP,           0
              JMS I SETUP
              IKA
              ,+15
              ,+15
              JMS I SETUP
              UMA
              ,+15
              ,+15
              JMS I SETUP
              SR
              ,+15
              ,+15
              JMS I MES1
              4543
              2401          /TA (TRACK ADDRESS)
/
1000 3132
1001 7010
1002 3134
1003 0041
1004 520/
1005 0042
1006 5227
1007 0031
1010 5214
1011 0036
1012 3054
1013 5227
1014 7200
1015 1051
1016 7040
1017 3135
1020 2135
1021 5220
1022 6622
1023 5226
1024 2000
1025 5210
1026 5540
1027 7200
1030 1134
1031 7004
1032 1132
1033 0001
1034 5400
1035 0000
1036 4524
1037 0055
1040 1055
1041 1056
1042 4524
1043 0117
1044 1061
1045 1062
1046 4524
1047 0116
1050 1065
1051 1066
1052 4523
1053 4543
1054 2401
4000
4000
4000
4004
/
/DISK MEMORY ADDRESS

```

```

1000 0140 0140
1001 6060 6060
1002 6060 6060
1003 4023 4023 /SWITCH REGISTER
1004 2240 2240
1005 6060 6060
1006 6060 6060
1007 0000 0
1008 0635 JMP I SRP
/
/ DATA PRINT OUT ROUTINE
/
1001 0000 UP, 0
1002 4524 JMS I SETUP
1003 0055 IKA
1004 1115 ,+21
1005 1116 ,+21
1006 4524 JMS I SETUP
1007 0117 DMA
/
/
1100 1121 ,+21
1101 1122 ,+21
1102 4524 JMS I SETUP
1103 0115 GU /GOOD DATA
1104 1125 ,+21
1105 1126 ,+21

```

```

1106 4524      JMS I SETUP
1107 0114      BD /BAD DATA
1110 1131      ,+21
1111 1132      ,+21
1112 4523      JMS I MES1
1113 4543      4543
1114 2401      2401 /TA (TRACK ADDRESS
1115 4000      4000
1116 0000      0000
1117 4027      4027 /WORDCOUNT
1120 0340      0340
1121 0000      0000
1122 0000      0000
1123 4007      4007 /GD (GOOD DATA)
1124 0440      0440
1125 0000      0000
1126 0000      0000
1127 4002      4002 /BD (BAD DATA)
1130 0440      0440
1131 0000      0000
1132 0000      0000
1133 0000      0
1134 5671      JMP I DP
                        /ERROR MESSAGE FOR UNDEFINED
                        /INTERRUPT
                        /
1135 4523      IN2, JMS I MES1 /GO TO PRINTOUT ROUTINE
1136 4543      4543 /CARRIAGE RETURN*LINE FEED
                        /CHARACTERS
1137 2516      2516 /U AND N
1140 0405      0405 /U AND E
1141 0656      0656 /F AND
1142 4011      4011 /SPACE AND I
1143 1624      1624 /N AND T
1144 5640      5640 /, AND SPACE
1145 0000      0 /STOP CODE
1146 7402      HLT
/
/PRINTOUT ROUTINE FOR DATA ERROR'S
/PRINTS # OF ERROR'S
*1200
1200 0000      SHERT, 0
1201 4524      JMS I SETUP
1202 0055      TKA
1203 1215      ,+12
1204 1216      ,+12
1205 4524      JMS I SETUP /SETUP WORD FOR PRINTOUT
1206 0135      LCOUNT /#OF DATA ERRORS
1207 1225      ,+16
1210 1226      ,+16
1211 4523      JMS I MES1 /PRINT REPORT
1212 4543      4543
1213 4024      4024

```

```

1214 0140      0140
1215 0000      0000
1216 0000      0000
1217 4040      4040
1220 0522      0522
1221 2217      2217
1222 2250      2250
1223 2351      2351
1224 7240      7240
1225 0000      0000
1226 0000      0000
1227 0000      0 /STOP CODE
1230 5600      JMP I SHERT /RETURN
*150
0150 4002      START1, JMS CCSU
0151 7402      HLT
*155
0155 0012      START2, HRR /CLEAR READER FLAG
0156 0022      PCF /CLEAR PUNCH FLAG
0157 0762      UTCA /CLEAR DECTAPE FLAG
0160 7000      NOP
0161 7000      NOP
0162 7000      NOP
0163 4002      JMS CCSU
0164 5531      JMP I SYSTEM

```

S

THERE ARE NO ERRORS

SYMBOL TABLE

AC	0132
BGOUNT	0024
BU	0114
BEG	0125
BEGIN	0400
CA	7751
CAT	0107
CC	0054
CUSU	0002
CHK	0127
CLF	1000
CLFL	0137
CU	0112
CUMPAR	0714
C212	0260
C215	0262
C245	0263
C340	0256
DA	0451
DAT	0126
DEEA	0611
DEMA	0601
DEOUNT	0025
DEAC	0616
DEAL	0615
DFSC	0622
DFSE	0621
UMA	0117
UMAC	0626
UMAR	0603
UMAW	0605
UP	1071
USAC	0612
UICA	0762
EQOUNT	0135
EP1	0120
EP2	0121
EN	0110
ENRUR	0667
ENXI	0754
EXIT	1027
GU	0115
IBT	0606
ICB	0736
INT	0000
IM2	1135
IM2L	0140
K0002	0026
K0003	0045
K0004	0033
K0007	0051
K0070	0050
K0100	0032

SYMBOL TABLE

K0200	0027
K0203	0056
K0200	0030
K0370	0035
K0700	0047
K1000	0034
K1477	0052
K1777	0041
K2000	0043
K3000	0036
K3477	0044
K3777	0053
K4000	0046
K5477	0042
K6000	0037
K7000	0040
K7600	0031
LINK	0134
LINL	0133
LI	0122
LIA	0600
MASKA	0344
MASKB	0345
MASKC	0346
MASKD	0347
MASK77	0254
MESSAGE	0200
MES1	0123
MORGH	0217
MTP	0244
M1	0057
M2	0201
M3	0257
M40	0255
NU	0113
PNT	0130
RANUOM	0642
RAW	0125
RA1	0522
RA2	0543
RE	0111
RESTOP	0661
SAV	0020
SAV1	0021
SAV2	0022
SAV3	0023
SETUP	0124
SMERT	1200
SMERTL	0136
SIXTY	0264
SM	0116
SMP	1035
STANT1	0150

SYMBOL TABLE

START2	0155
SYSTEM	0131
TA	0470
TRA	0055
TYPECH	0220
MA1	0532
MA2	0555
ML	7750
MCT	0106

SYMBOL TABLE

INT	0000
CUSU	0022
SAV	0020
SAV1	0021
SAV2	0022
SAV3	0023
BUOUNT	0024
UOUNT	0025
K0002	0026
K0200	0027
K0260	0030
K1600	0031
K0100	0032
K0004	0033
K1000	0034
K0370	0035
K3000	0036
K0000	0037
K1000	0040
K1777	0041
K0477	0042
K2000	0043
K0477	0044
K0003	0045
K4000	0046
K0700	0047
K0070	0050
K0007	0051
K1477	0052
K0777	0053
CU	0054
TRA	0055
K0203	0056
M1	0057
MAW	0105
MCT	0106
UAT	0107
EM	0110
ML	0111
CU	0112
NU	0113
BU	0114
GU	0115
SK	0116
DMA	0117
EP1	0120
EP2	0121
L1	0122
MES1	0123
SETUP	0124
BEG	0125
UAT	0126
CHK	0127

SYMBOL TABLE

PNT	0130
SYSTEM	0131
AC	0132
LINK	0133
LINK	0134
ELCOUNI	0135
SMENTL	0136
CLFL	0137
INZL	0140
SIART1	0150
SIART2	0155
MESSAGE	0200
MORGH	0217
ITPECH	0220
MIP	0244
MASK77	0254
M40	0255
U340	0256
U3	0257
U412	0260
MZ	0261
U415	0262
U445	0263
SIXTY	0264
MASKA	0344
MASKB	0345
MASKC	0346
MASKD	0347
BEGIN	0400
UA	0451
TK	0470
MA1	0522
MA1	0532
MA2	0543
MA2	0555
LJA	0600
IST	0606
HANDOM	0642
HESTON	0661
ENROR	0667
CUMPAH	0714
ICB	0736
EMXT	0754
CLF	1000
EXIT	1027
SHP	1035
UP	1071
IM2	1135
SMENT	1200
UOMA	6601
UMAH	6603
UMAH	6605
UCEA	6611

SYMBOL TABLE

USAC	6612
UEAL	6615
UEAC	6616
UPSE	6621
UPSC	6622
UMAC	6626
UICA	6762
UC	7750
CA	7751