

TEXT LISTING

068-000222-04

PROGRAM

4231 DISK RELIABILITY PROG.

TEXT TAPE

097-000222-04

ABSTRACT

THE MOVING HEAD DISK RELIABILITY PROGRAM IS A MAINTENANCE PROGRAM DESIGNED TO EXERCISE AND TEST THE 4231 DISK CONTROLLER AND 1-4 DISK DRIVES. THE DISK DRIVES MAY BE SHARED BETWEEN TWO COMPUTERS IN WHICH CASE THIS PROGRAM MAY BE RUNNING IN EACH COMPUTER.

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0001 .MAIN      :MACRO REV 06.30      11:47:23 02/15/79
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*****
:***** AUTO-RUN AUTO-LOAD MODIFIED XX
:1. ABSTRACT
: THE MOVING HEAD DISK RELIABILITY PROGRAM
: IS A MAINTENANCE PROGRAM DESIGNED TO
: EXERCISE AND TEST THE 4231 DISK CONTROLLER
: AND 1-4 DISK DRIVES.  THE DISK DRIVES MAY BE
: SHARED BETWEEN TWO COMPUTERS IN WHICH CASE
: THIS PROGRAM MAY BE RUNNING IN EACH COMPUTER.
: ***** NOTE *****
: ; ONE COMPUTER RUNNING RELIABILITY
: ; TEST (SA 501), THE OTHER (SA 502)
: ; ONLY!!!
: ; THE CONTROL CAN RE DEVICE 33 OR 73.
:
:2. MACHINE REQUIREMENTS
: ; NOVA(EXCEPT MICRO) OR ECLIPSE FAMILY CENTRAL PROCESSOR
: ; 8K READ/WRITE MEMORY
: ; TELETYPE OR CRT TERMINAL
: ; DGC 4231 DISK CONTROL
: ; AND DGC 4231A ADAPTER & 1ST DRIVE
: ; UP TO A MAX. OF 4 DRIVES TOTAL,
: ; DGC DISK PACK TYPE 4231C.
:
:3. OPERATING PROCEDURES
: A. LOAD PROGRAM USING BINARY LOADER OR DIAGNOSTIC
: OPERATING SYSTEM.
: B. IF PROGRAM LOADED FROM PAPER TAPE,
: RESET AND START AT ONE OF THE
: ADDRESSES SHOWN BELOW.
: C. IF LOADED FROM OP. SYS., PROGRAM WILL
: START AT LOCATION 200.
: D. IF LOADED FROM OP. SYS. IN AUTO RUN MODE,
: DEVICE CODE WILL BE SET TO THAT FOUND
: IN EGGS BLOCK IN ALL OTHER CASES,
: START AT ADDRESS 4 OR 5 TO SELECT DESIRED
: DEVICE CODE.

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: NAME: 4231OR.TX      PART NUMBER: 097-000222
:
: DESCRIPTION: 4231 DISK RELIABILITY PROGRAM
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: REVISION HISTORY:
:
: REV.    DATE
: 00      05/02/75
: 01      08/08/75
: 02      12/19/75
: 03      05/21/76
: 04      09/10/76
:
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STARTING ADDRESS
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RUN ALL
SET DISK CONTROL ADDRESS TO 33
SET DISK CONTROL ADDRESS TO 73
RELIABILITY TEST, ALL CYLINDERS (DTOS START)
RELIABILITY TEST, EVEN CYLINDERS
RELIABILITY TEST, ODD CYLINDERS
DISK ADDRESS TEST
NOT USED
COMMAND STRING INTERPRETER
ONES TEST
ZEROS TEST
110110110 TEST
FLOATING ONE TEST
FLOATING ZERO TEST
RUN ALL
SEEK EXERCISER

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E. ERRORS - ERROR STATUS IS PRINTED
WHENEVER ENCOUNTERED. WHEN PROGRAM IS STARTED
THE # OF DATA ERROR TYPEOUTS CAN BE SET INTO THE
CONSOLE SWITCHES IF SWITCH 10 IS A 1.
TO SELECT SWITCH 10 WHEN STARTING, SET
THE STARTING ADDRESS INTO THE SWITCHES,
AND LIFT THE EXAMINE SWITCH. THEN RAISE
SWITCH 10 TO THE "1" POSITION AND PRESS
CONTINUE. THE PROGRAM WILL REQUEST THE
# OF DATA ERROR TYPEOUTS BE PLACED INTO
THE SWITCHES. FOLLOW INSTRUCTIONS AND
HIT ANY TERMINAL KEY TO CONTINUE
THE PROGRAM.

SWITCH SETTINGS
SW1=0 FROM ERROR,DU SCOPE LOOP
SW1=1 FROM ERROR,GO TO NEXT TEST
SW2=1 INHIBIT TV OUTPUT
SW5=1 OUTPUT TO LPT
SW6=1 HALT AFTER ERROR
SW7=1 SELECT READ ONLY MODE
SW8=1 INHIBIT BAD SECTORS PRINTOUTS
SW9=1 INHIBIT CHECK WORD AND DATA ERROR MESSAGES
SW10=1 SELECT # DATA ERROR TYPEOUTS
SW11=1 BREAK TO ALLOW DISK INTERCHANGE

F. STATISTICS - TYPE ANY KEY DURING
RANDOM TESTING TO GET A REPORT OF THE
NUMBER OF WORDS WRITTEN AND READ, PLUS
THE NUMBER OF ERRORS.

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10005 *MAIN

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PROGRAM DESCRIPTION

A. RELIABILITY TEST (SA 200)
 A RANDOM NUMBER GENERATOR IS USED TO SELECT A DISK DRIVE, CYLINDER, HEAD, BEGINNING SECTOR, AND NUMBER OF CONSECUTIVE SECTIONS. RANDOM DATA IS THEN GENERATED, WRITTEN, AND READ. THE SEQUENCE IS REPEATED INDEFINITELY.

B. RELIABILITY TEST (SA 501)
 SAME AS A, EXCEPT THAT ONLY EVEN NUMBERED CYLINDERS ARE USED. THIS ALLOWS A TWO COMPUTER SYSTEM TO RUN SIMULTANEOUS RELIABILITY TESTS.

C. RELIABILITY TEST (SA 502)
 SAME AS B. ONLY FOR ODD NUMBERED CYLINDERS.

D. DISK ADDRESS TEST (SA 503)
 RANDOM DATA IS FIRST WRITTEN THEN READ FROM ALL SECTORS ON EACH READY DISK. THIS INSURES THAT ALL DISK PACK SURFACES ARE USEABLE AND THAT THE DISK PACK IS FORMATTED PROPERLY.

E. READ ONLY TESTS
 ALL OF THE DISK PATTERNS TEST (SA 506 - SA 512) CAN BE RUN IN THE READ ONLY MODE BY SETTING CONSOLE SWITCH 7 TO THE "1" POSITION, AFTER THE PROGRAM MESSAGE REQUESTING THIS DATA HAS BEEN PRINTED.

AN ADDITIONAL FEATURE OF THIS TEST IS DISK INTERCHANGE. AT THE COMPLETION OF A READ PASS IF SW1=1 THE PROGRAM BREAKS AND PRINTS "INTERCHANGE DISK". THE DISK PACK MAY THEN BE MOVED TO ANOTHER UNIT FOR READING ONLY. PUSH CONTINUE TO PROCEED.

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F. COMMAND STRING INTERPRETER (SA 505)
 AS A TROUBLE SHOOTING AID THE SERVICE ENGINEER MAY TYPE IN HIS OWN TEST LOOP. AFTER STARTING AT 505, THREE ARGUMENTS MUST BE ENTERED IN RESPONSE TO THREE PROGRAM QUESTIONS: "UNIT", "DATA", AND "COMMAND STRING".

I. UNIT: TYPE UNIT # OR CARRIAGE TO USE THE PREVIOUS ENTRY

II. DATA: RAM=RANDOM
 ALZ=ALL ZEROS
 PAT=110110 PATTERN
 FLZ=FLOATING ONE PATTERN
 FLZ=FLOATING ZERO PATTERN
 ALTERNATIVELY ENTER A STRING OF OCTAL 16-BIT WORDS TO BE USED AS DATA. THE WORDS ENTERED ARE USED REPEATEDLY TO MAKE UP A SECTOR BLOCK.
 TYPE CARRIAGE TO USE THE PREVIOUS ENTRY.

III. COMMAND STRING:
 1. READ HEAD, SECTOR, #SECTORS
 2. WRITE SAME
 3. SEEK CYLINDER
 4. RECALIBRATE
 5. LOOP (GO TO BEGINNING)
 6. DELAY (N) 12.5MS INCREMENTS
 7. TYPE CARRIAGE TO USE THE PREVIOUS COMMAND STRING.

NOTE THAT EITHER SPACES OR A COMMA MAY BE USED AS AN ARGUMENT DELIMITER. EACH RESPONSE IS TERMINATED BY TYPING CARRIAGE RETURN. IF MORE ROOM IS NEEDED ON A LINE, TYPE LINE FEED TO SPACE TO THE NEXT LINE. THE WORD "SAME" USED WITH READ, OR WRITE, WILL CAUSE THE PREVIOUS DISK ADDRESS PARAMETERS TO BE USED.

10007 *MAIN

10008 *HAID

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02 THE FOLLOWING EXAMPLE WOULD CAUSE UNIT
03 1 TO REPEATEDLY SEEK CYLINDER
04 50, WRITE SECTORS 2 AND 3 WITH HEAD 5,
05 THEN READ IT BACK AND CHECK. DATA IS SPECIFIED
06 AS ALTERNATE WORDS OF ZEROS THEN ONES.
07
08 UNIT: 1
09 DATA: 0,177777
10 COMMAND STRING: SEEK 50 WRITE 5,2,2 READ SAME LOOP
11
12
13 G. ONES TEST (DATA = ALL 1'S)
14 ZEROS TEST (DATA = ALL 0'S)
15 110110 TEST (DATA = WORDS OF 1101101101101)
16 FLOATING ONE TEST (EACH SUCCESSIVE WORD
17 CONTAINS ONE 1 BIT WHICH IS MOVED
18 RIGHT ONE BIT EACH WORD)
19 FLOATING ZERO TEST (COMPLEMENT OF THE
20 FLOATING 1 TEST)
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22 EACH OF THE ABOVE USE THE BASIC DISK ADDRESS
23 TEST, SUBSTITUTING THE APPROPRIATE DATA.
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3. ADDRESS ERROR

- 3.1 FIRST TIME - INCREMENT ADDRESS ERROR COUNT AND REPEAT THE WRITE.
- 3.2 SECOND SUCCESSIVE FAILURE - INCREMENT PERMANENT ADDRESS ERROR COUNT AND DO A ERROR RETURN.

4. ENDING MEMORY ADDRESS - INCREMENT THE MISC ERROR COUNTER, PRINT THE ERROR MESSAGE, SET THE FATAL FLAG, AND GO TO 5.

5. ENDING DISK ADDRESS - INCREMENT THE MISC ERROR COUNTER, PRINT THE ERROR MESSAGE, SET THE FATAL FLAG, AND GO TO 6.

6. NO FURTHER CHECKS

- 6.1 FATAL SWITCH ON - DO A ERROR RETURN.
- 6.2 OTHERWISE - DO A NORMAL RETURN.

READ - FOLLOWING "DONE" ON A READ, ERRORS ARE CHECKED IN THE SEQUENCE SHOWN BELOW. ERROR RECOVERY PROCEDURE IS OUTLINED FOR EACH CASE. IF THE ERROR IS NOT PRESENT THE NEXT CHECK IS MADE.

1. READ/WRITE DONE STATUS - IF NONE, INCREMENT THE MISC ERROR COUNT, PRINT ILLEGAL STATUS MESSAGE AND DO AN ERROR RETURN.

2. MISC STATUS BITS - (ANY SEEK DONE, ANY SEEKING BIT, SEEK ERROR, END CYLINDER, OR DATA LATE). IF ANY ERROR INCREMENT THE MISC ERROR COUNT, PRINT THE ILLEGAL STATUS, AND DO AN ERROR RETURN.

3. ADDRESS ERROR

- 3.1 FIRST TIME - INCREMENT ADDRESS ERROR COUNT AND REPEAT THE READ.
- 3.2 SECOND SUCCESSIVE FAILURE - INCREMENT PERMANENT ADDRESS ERROR COUNT AND DO A ERROR RETURN.

4. CHECK WORD ERROR

- 4.1 FIRST TIME - INCREMENT THE CHECK WORD ERROR COUNT AND SET THE RETRY FLAG. PRINT "CHECK WORD ERROR" AND GO TO 5.
- 4.2 SECOND SUCCESSIVE FAILURE - INCREMENT THE PERMANENT CHECK WORD ERROR COUNTER AND SET THE FATAL FLAG. PRINT "CHECK WORD ERROR" AND GO TO 5.

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**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

5. DATA ERROR
5.1 FIRST TIME - SET THE RETRY FLAG AND PRINT
  ERROR REPORT.
5.1.1 CHECK WORD ERROR - DECREMENT THE
  CHECK WORD ERROR COUNTER AND INCREMENT
  THE CHECK WORD & DATA ERROR COUNTER.
  GO TO 6.
5.1.2 NO CHECK WORD ERROR - INCREMENT
  THE DATA ERROR COUNTER AND GO TO 6.
5.2 SECOND SUCCESSIVE ERROR - SET THE FATAL
  FLAG AND PRINT THE ERROR REPORT.
5.2.1 CHECK WORD ERROR - DECREMENT
  THE PERMANENT CHECK WORD ERROR COUNTER
  AND INCREMENT THE PERMANENT CHECK WORD
  & DATA ERROR COUNTER. GO TO 6.
5.2.2 NO CHECK WORD ERROR - INCREMENT
  THE PERMANENT DATA ERROR COUNTER.
  GO TO 6.

6. ENDING MEMORY ADDRESS - INCREMENT THE MISC ERROR
  COUNTER, PRINT THE ERROR MESSAGE, SET THE FATAL FLAG,
  AND GO TO 7.

7. ENDING DISK ADDRESS - INCREMENT THE MISC ERROR
  COUNTER, PRINT THE ERROR MESSAGE, SET THE FATAL FLAG,
  AND GO TO 8.

8. NO FURTHER CHECKS
8.1 RETRY SWITCH ON - PRINT "TRY AGAIN"
  AND REPEAT THE TEST.
8.2 FATAL SWITCH ON - DO A ERROR RETURN.
8.3 NO SWITCHES ON - DO A NORMAL RETURN.

.EOT

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