

DataGeneral

**TECHNICAL
STATEMENT**

TEXT LISTING

068-001138-00

PROGRAM

6096,6101,6102 MOVING HEAD
DISK/FLOPPY RELIABILITY
AND FORMATTER PROGRAM

TEXT TAPE

097-001138-00

ABSTRACT

THE MOVING HEAD DISK RELIABILITY PROGRAM IS A MAINTENANCE PROGRAM
DESIGNED TO EXERCISE AND TEST THE 6096,6101,6102 DISK SYSTEMS.
SA 504 IS A FORMATTER/VERIFY PROGRAM THAT MAY BE USED TO LAY THE
FORMAT AND VERIFY THE DISK SURFACE BY WRITING AND READING A ROTAT-
-ING 155555 PATTERN.


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III.  COMMAND STRING:
OPTIONS 1.  READ HEAD,SECTOR,#SECTORS
2.  WRITE SAME
3.  SEEK CYLINDER
4.  RECALIBRATE
5.  LOOP (GO TO BEGINNING OR LR)
6.  DELAY N (N= DELAY IN MS)
7.  LR (BEGIN LOOP HERE)
8.  ** HARD DISK ONLY **
9.  FORMAT CYL,HD,SEC
10.  BAD(SET BAD SECTOR FLAG) CYL,HEAD,SEC
11.  # NOTE A SEEK IS INCLUDED IN ABOVE 2
12.  RDH HEAD,SECTOR -READ HEADER
13.  **FLOPPY ONLY **
14.  RDH HEAD -READ NEXT HEADER/SECTOR NOT
15.  CONTROLLED.
16.  **HARD DISK ONLY **
17.  RWH HEAD,SECTOR -READ WITHOUT
18.  HEADER CHECK.
19.  NOP -DISK NOP COMMAND
20.  **FLOPPY ONLY**
21.  RPR -READ 8048 PROGRAM REVISION
22.  RST -READ 1791 STATUS REGISTER
23.  ** BOTH HARD DISK/FLOPPY **
24.  TYPE CARRIAGE RETURN TO USE THE
25.  PREVIOUS COMMAND STRING.
26.
27.  NOTE THAT EITHER SPACES OR A COMMA
28.  MAY BE USED AS AN ARGUMENT DELIMITER.
29.  EACH RESPONSE IS TERMINATED BY
30.  TYPING CARRIAGE RETURN. IF MORE
31.  ROOM IS NEEDED ON A LINE, TYPE
32.  LINE FEED TO SPACE TO THE NEXT LINE.
33.  THE WORD "SAME" USED WITH READ, OR WRITE,
34.  WILL CAUSE THE PREVIOUS DISK
35.  ADDRESS PARAMETERS TO BE USED.
36.
37.  AN R TYPED WHILE A STRING IS BEING EXECUTED
38.  WILL CAUSE THE PROGRAM TO RETURN TO THE
39.  COMMAND STRING START. THE ESCAPE KEY WILL
40.  BYPASS THE UNIT AND DATA PROMPTS TO THE
41.  COMMAND STRING PROMPT.
42.
43.  THE FOLLOWING EXAMPLE WOULD CAUSE UNIT
44.  1 TO SEEK CYLINDER 50, THEN REPEATEDLY
45.  WRITE SECTOR 2 OF HEAD 5,
46.  THEN READ IT BACK AND CHECK. DATA IS SPECIFIED
47.  AS ALTERNATE WORDS OF ZEROS THEN ONES.
48.
49.  UNIT: 1
50.  DATA: 0,17777
51.  COMMAND STRING: SEEK 50 LR WRITE 5,2,1 READ SAME LOOP
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E.  FORMAT/VERIFY PROGRAM (SA 504)
THE OPERATOR IS GIVEN THE OPTION TO EITHER FORMAT OR
VERIFY OR DO BOTH. DEFAULT (CR) GETS BOTH OPERATIONS.
IF THE FORMAT OPERATION IS REQUESTED,
THE DISK IS FIRST FORMATTED AFTER WHICH A FORMAT
DONE MESSAGE IS PRINTED. IF A VERIFY WAS REQUESTED,
THEN A 155555 PATTERN IS WRITTEN TO
THE ENTIRE PACK AND READ BACK(4X IF FLOPPY),
AND PASS IS PRINTED, THE DATA PATTERN IS THEN ROTATED
1 BIT AND THE WRITE/READ PROCESS IS REPEATED.
BY THE OPERATOR, A LOG IS PRINTED AND THE DRIVES
ARE RELEASED.
*****
IT IS RECOMMENDED THAT AT LEAST 6 PASSES (W/R)
BE ALLOWED (SEE TIMING 13.0) TO INSURE PACK QUALITY.
IF TIME PERMITS, LONGER RUNS WILL
FURTHER INSURE QUALITY.
*****
ANY HARD DATA OR ADDRESS ERRORS WILL RESULT IN THE
BAD SECTOR FLAG BEING SET IN THAT SECTOR(HARD DISK ONLY).
ANY "SOFT" DATA OR ADDRESS ERROR ADDRESSES ENCOUNTERED
TWICE CAUSE THE BAD SECTOR FLAG TO BE SET(HARD DISK ONLY).
ANY OTHER ERROR WILL CAUSE THE PROGRAM TO PRINT THE
FAILURE, AND THE PROGRAM WILL STOP TESTING
ON THAT UNIT, UNLESS SW14(E)=1. #THIS PROGRAM IS NOT
INTENDED TO BE A RELIABILITY PROGRAM FOR THE DISK SYSTEM
AND IN GENERAL ASSUMES THE CONTROL AND DRIVE TO BE IN
WORKING ORDER.
A HARD ADDRESS ERROR IS DEFINED AS SUCH AFTER TWO
ATTEMPTS HAVE BEEN MADE BOTH RESULTING IN AN ADDRESS
ERROR. A HARD DATA ERROR IS DEFINED AS SUCH AFTER
2 OR MORE OF R. READ RETRY'S HAVE BEEN
UNSUCCESSFUL.

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F. RUNALL (SA 505)
PROGRAM ALTERNATES BETWEEN THE PROGRAMS DESCRIBED
IN 7.B(4 DATA PATTERNS -PAT,RAN,FLZ,FLO) AND
7.C(6 DATA PATTERNS -ROT(3X),RAN,ADR,ONES,ZEROS,ALT)
AND 7.H, AND IN THAT ORDER.
G. SEEK EXERCISER (SA 506)
PROGRAM PROVIDES A SEEK SCAM SEQUENCE
CONVERGING FROM THE EXTREME OUTERMOST TRACKS INTO THE
ADJACENT TRACK IN THE CENTER, THEN DIVERGING AGAIN TO
THE EXTREMES.
H. RANDOM SEEK EXERCISER (SA 507)
PROGRAM PROVIDES A RANDOM SEEK SEQUENCE
#G+H ALL SEEKS IN G/H ARE FOLLOWED BY A 1 SECTOR READ
BUT WITH NO DATA CHECK. ALL SEEKS ARE TIMED
WITH MAX,MIN, AND AVE. TIMES BEING LOGGED IN MS.
SEEK PATHS FOR MAX,MIN VALUES ARE ALSO LOGGED.
I. ERROR COUNT/LOG RECOVERY (SA 510)
IN THE EVENT A PROGRAM WAS STOPPED DURING A RUN, THE
ERROR LOGS MAY BE RECOVERED AT THIS STARTING ADDRESS.
***MUST BE DONE BEFORE ANY PROGRAM RESTART AS PROGRAM
INITIALIZATION ZEROS ALL LOGS.

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SWITCH SETTINGS
18.1
LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS
(NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS,
THIS LOCATION WILL BE LOADED BY THE MONITOR,
HOWEVER UNDER STAND ALONE AND PROGRAM LOAD MODES THIS
LOCATION WILL BE SET ACCORDING TO THE ANSWERS SUPPLIED
BY THE OPERATOR. IN ANY CASE THE OPTIONS CAN BE CHANGED
OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC.
A.3
SWITCH OPTIONS
DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
"SWREG" IS AS FOLLOWS:
BIT OCTAL BINARY INTERPRETATION
VALUE VALUE
1 40000 1 LOOP ON ERROR
2 20000 1 SKIP LOOPING ON ERROR
5 02000 1 PRINT TO CONSOLE
6 01000 1 ABORT PRINT OUT TO CONSOLE
8 00200 1 DO NOT PRINT ON THE LINE PRINTER
9 00100 1 PRINT ON THE LINE PRINTER
11(B) 00020 1 DO NOT EXIT ON ERROR
13(D) 00004 1 EXIT TO ODT ON ERROR
14(E) 00002 1 FOR READ ONLY MODE (SA 501,502)
N/A N/A BYPASS DATA CHECK
N/A N/A ENABLE RAD SECTOR PRINTOUTS
N/A N/A PRINT I/O TRACE ON ERROR
(LAST 5 I/O CALL PC'S + COMMANDS)
**(E) APPLIES ONLY TO SA 504/FORMATTER
EXIT ON NON-SURFACE RELATED ERRORS
DO NOT EXIT ON NON-SURFACE RELATED
ERRORS. (IE. CRC,HEADER, OR BAD SECTOR
ARE SURFACE-RELATED ERRORS)

10009 .MAIN

10010 .MAIN

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01 SWITCH COMMANDS
02
03 18.3 ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF
04 THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE
05 PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS.
06 EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIAT-
07 ED WITH IT, THUS HIT 4 CAN BE ALTERED BY HITTING KEY 4.
08 SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0.
09 (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0)
10
11 18.4 OTHER COMMANDS (" = CONTROL KEY)
12
13 "CR" A "RETURN" CAN BE TYPED TO CONTINUE THE PROGRAM
14 AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE
15
16 "D THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWREG"
17 TO DEFAULT MODE AND RESTART THE PROGRAM.
18
19 "R THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE
20 PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY
21 HAD BEFORE THE COMMAND WAS ISSUED.
22
23 "O THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE
24 PROGRAM CONTROL TO GO TO ODT (NOTE: THIS IS AN
25 OPTIONAL COMMAND AND IS AVAILABLE ONLY IF
26 ODTPK IS PRESENT)
27
28 M THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
29 CURRENT OPERATING MODES.
30
31 0 THIS COMMAND GIVEN AT ANY TIME WILL LOCK THE
32 PROGRAM INTO SWITCH MODIFICATION MODE WHERE
33 MORE THAN 1 BIT CAN BE CHANGED.
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01 OPERATING PROCEEDURE/OPERATOR INPUT:
02
03 A. VERIFY DRIVE (DRIVES) ARE READY ON-LINE
04 B. LOAD PROGRAM USING DTOS,DOOS, OR THE BINARY LOADER
05 C. RESET ,LOAD ONE OF THE STARTING ADDRESSES
06 SHOWN BELOW INTO THE DATA SWITCHES AND HIT
07 START.
08
09 STARTING ADDRESS
10 4
11 SET DISK CONTROL ADDRESS TO OTHER THAN 26
12 ODT - DIRECT ENTRY ONLY
13
14 RUNALL TESTS
15 200
16 RELIABILITY TEST, ALL CYLINDERS
17 500
18 RELIABILITY TEST, (OPTIONS)
19 501
20 INCREMENTAL DISK ADDRESS TEST
21 502
22 COMMAND STRING INTERPRETER
23 503
24 FORMATTER/VERIFY
25 504
26 RUN ALL
27 505
28 SEEK EXERCISER (CONVERGING,DIVERGING PATTERN)
29 506
30 SEEK EXERCISER (RANDOM PATTERN)
31 507
32 ERROR COUNT/LOG RECOVERY
33 510
34
35 OPERATOR IS REQUESTED TO SET SMPAK AS PER
36 SECTION 8.0, THE DATE ,DAY, MONTH
37 YEAR (I.E. 77..), HOUR, & MINUTE (A [CR]
38 RESPONSE WILL IGNORE THIS ROUTINE). HE IS THEN
39 ASKED TO SIZE THE SYSTEM AS 12 OR 1 TO DESCRIBE
40 THE 12.5 MBYTE HARD DISK DRIVES OR FLOPPY(1).
41
42 FOR EACH UNIT:
43
44 THE OPERATOR IS ASKED TO ENTER MIN,MAX
45 HEAD LIMITS. 2 NUMBERS ARE EXPECTED WITH THE 2ND
46 BEING >= TO THE FIRST AND LESS THAN THE ACTUAL
47 MAX. A (CR) GETS 0 AND THE ACTUAL MAX HEAD.
48
49 THE OPERATOR IS THEN ASKED TO RESPOND TO -
50 LOWER/UPPER TEST TRACK LIMIT PAIRS/
51 TYPE L(CR) FOR CURRENT TRACK CONFIGURATION.
52
53 BY TYPING UP TO 5 PAIRS OF NUMBERS TO REPRESENT
54 THE TESTABLE DISK AREAS. FOR EXAMPLE A
55 RESPONSE OF
56 0.17 24,24 26,46
57
58 WOULD TEST TRACKS 0-17,24, AND 26-46
59 IF NO CHANGE A CR MAY BE TYPED.
60 UPON LOADING ALL TRACKS ARE TESTABLE. ANY LETTER
61 RESPONSE FOLLOWED BY A CR WILL GET A PRINTOUT OF
62 THE CURRENT TRACK CONFIGURATION.
63
64 THE 1ST NUMBER OF EACH PAIR MUST BE AT LEAST
65 2 GREATER THAN THE 2ND NUMBER OF THE PRECEDING
66 PAIR. THE 2ND NUMBER OF EACH PAIR MUST BE GREATER THAN
67 OR EQUAL TO THE 1ST NUMBER OF THE PAIR.

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"LF" WITH OR WITHOUT MODIFICATION.
WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING CELL.
CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION AND OPEN THE PRECEDING CELL
/ OPEN THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS.
+"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS + "ADR".
-"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS - "ADR".

:11.3.2 MODIFICATION OF A CELL
ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF". IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EXPRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR SUBTRACTED FROM THE OLD CONTENTS OF THE CELL. THE ADDRESS ITSELF OR AN EXPRESSION RELATIVE TO THE ADDRESS CAN BE DEPOSITED BY TYPING A ".n" OR ".n./-OCTAL EXPRESSION". A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.

:11.3.3 OTHER ODT COMMANDS
THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED DIGITS. EACH TIME THE KEY IS PRESSED THE RIGHT MOST DIGIT IS DELETED AND ECHOED ON THE TERMINAL IF THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A CELL THEN IT DELETES THE RIGHT MOST DIGIT OF THE CELL CONTENTS. THIS ALLOWS THE MODIFICATION OF THE CELL AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE KEY WAS PRESSED.
"ADR"B INSERT A BREAK POINT AT LOCATION "ADR".
ONLY ONE BREAK POINT CAN BE INSERTED AND ANY ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL CAUSE IT TO BE DELETED.
D DELETE THE BREAK POINT IF ANY.
P RESTART THE EXECUTION OF THE PROGRAM AT LOCATION POINTED BY 4A.
"ADR"R START EXECUTING THE PROGRAM AT "ADR" AFTER AN IO-RESET.
K KILL THE STRING TYPED SO FAR. THE ODT RESPONDS WITH A "?". AND THE OPEN CELL IS CLOSED WITHOUT MODIFICATION.
= PRINT THE OCTAL VALUE OF THE INPUT ONLY.
THIS WILL CLOSE ANY OPEN CELLS WITHOUT MODIFICATION AND WILL NOT OPEN A CELL

NOTE: IN PROGRAMS WHICH RELOCATE THEMSELVES THE USER SHOULD PLACE BREAK POINTS ONLY IN THE ORIGINAL PROGRAM AREA. IF A BREAK POINT IS PLACED OUTSIDE THIS AREA THE RESULTS WILL BE UNPREDICTABLE.

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SPECIAL NOTES/SPECIAL FEATURES:
1. THE PROGRAM WILL ACCOUNT FOR UP TO A MAX. OF 2**31 SECTORS WRITTEN OR READ. SPECIAL TEST RUNS EXCEEDING THIS FACILITY WILL REQUIRE AN OPERATOR'S TEST LOG TO AUGMENT SOFTWARE ACCOUNTING. 2**31 SECTORS = APPROX. 5.5* 10**11 WORDS.
2. SMPAKR1, PUTS PROGRAM INTO READ ONLY MODE # SA'S 501, 502 ONLY. IF SA 501-DATA MUST INOT! BE VARIABLE. START AT THE ABOVE SELECTED ADDRESS.
3. ALL NUMBERS ENTERED IN 7.0 MUST BE IN OCTAL. ANY NON-OCTAL INPUT IS TREATED AS A LETTER. ANY LETTER INPUT FOR CYL,HEAD,SECTOR, OR # OF SECTORS GETS RANDOM FUNCTION IN THE RELIABILITY TEST WITH OPTIONS.
PROGRAM RUNTIME:
RUNTIME IS DEFINED AS TIME FROM START TO A "PASS" MESSAGE. TYPICAL RUNTIMES:
APPROXIMATE TIMES (MIN/SEC) FOR PASSING ARE AS FOLLOWS:
SA DATA 12MBYTE 25MBYTE FLOPPY
500 RAN 1:20 1:20 6:20
501 PAT 1:20 1:20 6:20
RAN 1:20 1:20 6:20
FLZ 1:20 1:20 6:20
FLO 1:20 1:20 6:20
502 PAT 3:10 6:15 5:20 ***
RAN 3:10 6:15 5:20
ADR 3:10 6:15 5:20
ALZ 3:10 6:15 5:20
ALO 3:10 6:15 5:20
ALT 3:10 6:15 5:20
504 FORMAT 1:40 3:10 0:51
504 VERIFY 3:10 6:15 5:20
505 RUNALL 29:00 51:00 72:00
506 2:30 2:30 2:30
507 1:05 1:05 3:20
*** FLOPPY PACKS ARE WRITTEN/READ 4 TIMES PER 502 PASS, (11X FOR THE HARD DISKS). IF UNITS ARE MIXED, TIMES WILL VARY FROM THE TIMES ABOVE.

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**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

0020 .MAIN

0?DTD 001520 MC 16/02