

TEXT LISTING

068-001141-01

PROGRAM

6098, 6099, 6100, 6103 MOVING HEAD
DISK/DISKETTE RELIABILITY PROGRAM

TEXT TAPE

097-001141-01

ABSTRACT

THE MOVING HEAD DISK/QUAD DENSITY DISKETTE RELIABILITY PROGRAM IS A MAINTENANCE PROGRAM DESIGNED TO EXERCISE AND TEST THE MODELS 6098, 6099, 6100 AND 6103 MOVING HEAD DISK/DISKETTE CONTROLLER AND ASSOCIATED DRIVES.

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77.0
PROGRAM DESCRIPTION/THEORY OF OPERATION:
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A. RELIABILITY TEST (SA 500)

A RANDOM NUMBER GENERATOR IS USED TO SELECT A
DISK DRIVE, CYLINDER, HEAD, BEGINNING SECTOR,
AND NUMBER OF CONSECUTIVE SECTORS. RANDOM
DATA IS THEN GENERATED, WRITTEN, AND READ.
THE SEQUENCE IS REPEATED INDEFINITELY.

B. RELIABILITY TEST (SA 501) WITH OPTIONS

SAME AS A, EXCEPT THAT OPERATOR IS GIVEN
THE OPTION OF SELECTING DATA PATTERNS (7D II) AND
CHOOSING A CONSTANT CYLINDER, HEAD, SECTOR
OR # OF SECTORS. ANY LETTER RESPONSE TO
CYL, HEAD ETC. GETS RANDOM FUNCTION FOR THAT
VARIABLE. A CARRIAGE RETURN ONLY GETS THE
RANDOM FUNCTION FOR ALL VARIABLES. ALL
INPUTS ARE RANGE CHECKED AND REJECTED IF OUT
OF RANGE.

C. INCREMENTAL DISK ADDRESS TEST (SA 502)

OPERATOR IS GIVEN OPTION ON DATA (SEE 7D II)
AND SURFACE RANGE.

REQUESTED DATA IS FIRST WRITTEN OVER THE
ENTIRE PACK. THEN THE DATA IS READ FROM
ALL SECTORS. THIS INSURES THAT ALL DISK SURFACE
BLOCKS ARE USEABLE AND ARE FORMATTED PROPERLY.
THE TEST IS THEN REPEATED FOR ALL READY DISCS,
AND PASS IS PRINTED. THE SEQUENCE IS REPEATED
INDEFINITELY.

NOTE: SHOULD A WRITE ERROR OCCUR ON THE
WRITE PASS (IE, ADDRESS OR BAD SECTOR ERROR)
WHICH TERMINATES THE WRITE TRANSFER, A
READ ERROR WILL ALSO OCCUR AT THE FAILING
ADDRESS ON THE READ PASS. IN SUCH INSTANCES,
DISCOUNT THE READ ERROR.

#NOTE
SWREG7E1, PROGRAM HALTS AFTER WRITE WITH READ
VERIFICATION ALLOWING OPERATOR TO CHANGE PACKS.
SWREG8E1, PUTS PROGRAM INTO READ ONLY MODE
# SA'S 501,502 ONLY, IF SA 501-DATA MUST
INOT1 BE RANDOM (SEE 7D II)

ALL NUMBERS ENTERED ABOVE MUST BE IN OCTAL.
ANY NON-OCTAL INPUT IS TREATED AS A LETTER.
ANY LETTER INPUT FOR CYL, HEAD, SECTOR, OR
# OF SECTORS GET RANDOM FUNCTION IN THE
RELIABILITY TEST WITH OPTIONS.

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D. COMMAND STRING INTERPRETER (SA 503)

AS A TROUBLE SHOOTING AID THE SERVICE
ENGINEER MAY TYPE IN HIS OWN TEST LOOP.
AFTER STARTING AT 503, THREE ARGUMENTS
MUST BE ENTERED IN RESPONSE TO THREE
PROGRAM QUESTIONS; "UNIT", "DATA", AND
"COMMAND STRING". ALL NUMBERS MUST BE
ENTERED IN OCTAL.
STATISTICS LOGS ARE VALID ONLY FOR THE
COMMAND STRING BEING EXECUTED.

I. UNIT: TYPE UNIT & OR CARRIAGE RETURN
TO USE PREVIOUS ENTRY.

II. DATA: ROT=ROTATED 110110 PATTERN - THIS
DATA OPTION APPLIES TO (SA 502)
INCREMENTAL DISK ADDRESS TEST ONLY
AND RESULTS IN A TOTAL OF 4 PASSES
ACROSS THE PACK ROTATING THE PATTERN
AFTER EACH PASS BEFORE PRINTING THE
MESSAGE="***PASS***". THIS IS TO
INSURE THAT A PEAK PHASE SHIFT IS
EVOKED ACROSS EACH BIT CELL OF THE
PACK.

THIS TEST PATTERN IS RECOMMENDED WHEN
RUNNING ERROR RATES.

RAN=RANDOM
ALQ=ALL ONES
ALZ=ALL ZEROS
PAT=110110 PATTERN
ALT=52525 PATTERN
FLQ=FLOATING ONE PATTERN
FLZ=FLOATING ZERO PATTERN
ADR=ALTERNATING CYLINDER AND
HEAD, SECTOR WORDS
VAR=EXISTING WORDS ENTERED PREVIOUSLY
AS DESCRIBED BELOW:

ALTERNATIVELY ENTER A STRING OF UP TO 7
OCTAL 16 BIT WORDS TO BE USED AS
DATA. THE WORDS ENTERED ARE USED
REPEATEDLY TO MAKE UP A SECTOR BLOCK.
TYPE "CR" TO USE THE PREVIOUS ENTRY.

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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 (NE DELAY IN MS)

7. LR (BEGIN LOOP HERE)

8. BAD (BAD SECTOR) CYL,HD,SECTOR

9. FORMAT CYL,HD,SECTOR

NOTE: ITEMS 8 & 9 INCLUDES THE NECESSARY SEEK &

IS NOT A DISKETTE OPTION.

10. TYPE "CR" TO USE THE PREVIOUS UNIT, DATA

OR COMMAND STRING.

11. TYPE "ESC" TO BYPASS BOTH UNIT & DATA

PROMPT, USING PREVIOUSLY ENTERED UNIT#

& DATA.

12. TYPE "R" TO INTERRUPT EXECUTION OF THE

CURRENT COMMAND AND RETURN TO UNIT# PROMPT

13. TYPE "O" TO ENTER ODT

14. TYPE "S" FOR STATISTICS LOG

15. TYPE "L" FOR ERROR LOGS

NOTE: OPTIONS 13 & 14 ARE VALID ONLY FOR THE

COMMAND STRING BEING EXECUTED; LOGS ARE CLEARED

PRIOR TO EACH COMMAND STRING ENTRY.

THE FOLLOWING EXAMPLE WOULD CAUSE UNIT 1 TO

SEEK CYLINDER 50, THEN REPEATEDLY WRITE SECTORS

2 AND 3 OF HEAD 1, THEN READ IT BACK AND CHECK

DATA IS SPECIFIED AS ALTERNATE WORDS OF ZERES

THEN ONES.

UNIT: 1

DATA: 0,177777

COMMAND STRING: SEEK 50 LR WRITE 1,2,2 READ SAME LOOP

NOTE: 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. A "LF" DOES NOT ELI-

MINATE THE NEED FOR A DELIMITER. THE WORD

"SAME" USED WITH READ, OR WRITE, WILL CAUSE

THE PREVIOUS DISK ADDRESS PARAMETERS TO BE

USED.

SHOULD COMMAND STRING ENTRIES EXCEED INPUT

BUFFER CAPACITY, THE PROGRAM RESPONDS WITH

THE MESSAGE "INPUT OVERFLOW". THE OPERATOR MUST

DEPRESS ONE OR MORE "RUBOUTS" FOLLOWED BY A

"CR" TO POSITION THE BUFFER POINTER TO THE

LAST VALID COMMAND IN THE STRING AND BEGIN

EXECUTION.

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AN "R" TYPED WHILE A STRING IS BEING EXECUTED WILL CAUSE THE PROGRAM TO RETURN TO THE UNIT# PROMPT. THE ESCAPE KEY WILL BYPASS THE UNIT AND DATA PROMPTS TO THE COMMAND STRING PROMPT, USING PREVIOUSLY ENTERED UNIT# AND DATA. AFTER COMPLETION OR TERMINATION OF A COMMAND STRING, TYPING A CARRIAGE RETURN WILL PROMPT USING THE UNIT, DATA, OR COMMAND STRING PREVIOUSLY ENTERED.

TO CHANGE THE CURRENT VALUE OF "SWREG" AND/OR ENTER THE OCTAL DEBUGGER WHILE IN "COMMAND STRING INTERPRETER", THE PROGRAM MUST BE EXECUTING A COMMAND. IF NO COMMAND HAS BEEN ENTERED, PROCEED TO COMMAND STRING PROMPT AND TYPE IN THE LOOP COMMAND.

INPUT VALIDATION:

A. UNIT: THE PROGRAM WILL ACCEPT ONLY THOSE UNIT#'S PREVIOUSLY CONFIGURED BY THE OPERATOR DURING STARTUP. AFTER A "LOSS OF READY" ON A PARTICULAR UNIT THAT UNIT'S # WILL BE REJECTED. UNLESS THE UNIT HAS BEEN RE-INSTATED. SEE SECTION 12 NOTE #1.

B. DATA: THE PROGRAM WILL ACCEPT ONLY THOSE PATTERNS DESCRIBED IN SECTION 5 D. II. SPELLING ERRORS OR NON-RECOGNIZED PATTERNS WILL BE REJECTED.

C. COMMANDS: SA 501 RAN RELI WITH OPTIONS... THE PROGRAM REJECTS ANY UN-RECOGNIZED COMMANDS OR ANY OUT OF RANGE PARAMETERS FOR THE SPECIFIED UNIT. ANY VALID PARAMETERS WHICH WILL RESULT IN AN "EOC" ARE ADJUSTED BY THE PROGRAM TO COMPLETE THE CURRENT CYLINDER.

SA 503 COMMAND STRING INTERPRETER... THE PROGRAM WILL ALLOW ANY INPUT WITHIN THE BIT FIELD BOUNDARIES OF THE APPLICABLE PARAMETER WITH THE EXCEPTION OF THE # OF SECTORS TO BE TRANSFERRED. THE ALLOWABLE RANGE FOR # OF SECTS IS DETERMINED BY THE AVAILABLE BUFFER SIZE AND CANNOT BE ZERO.

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E. QUICK FORMATTER (SA 504)
THE PROGRAM DOES A QUICK FORMAT (NO PACK VALIDATION)
AND BREAKS TO ALLOW OPERATOR TO RESTART PROGRAM.
TO RESTART PROGRAM THE OPERATOR MUST ENTER THE
DESIRED STARTING ADDRESS FOLLOWED BY AN "R".
FOR EXAMPLE: 502R
ANY ERROR ENCOUNTERED IS CONSIDERED
CATASTROPHIC AND THE UNIT IS PLACED "OFFLINE".
THE PROGRAM THEN FORMATS ANY REMAINING UNITS. IT
SHOULD BE NOTED THAT SA 502 ROT SHOULD BE RUN
FOLLOWING QUICK FORMATTER AND BAD SECTOR FLAGS
SET MANUALLY (SA 503) TO INSURE PACK RELIABILITY.

F. RUNALL (SA 505)
EXECUTES IN "TOP DOWN" FASHION THE FOLLOWING PROGRAMS:
(SA501)RANDOM RELIABILITY
PAT,RAN,F/LZ,FLO
(SA502) INCREMENTAL DISC ADDRESS
ROTI-4,RAN,CAD,ALO,ALZ,ALT
(SA507) RANDOM SEEK EXERCISER

THE OPERATOR IS GIVEN THE OPTION TO RUN "RUNALL"
ON TWO DEVICE CODES WITH THE NUMBER OF PASSES PER
DEVICE CODE SPECIFIED. A "CR" DEFAULTS TO THE
CURRENT DEVICE CODE. IF THE SECOND DEVICE CODE AND
A PASS COUNT ARE ENTERED, THE PROGRAM RUNS "RUNALL"
(N) PASSES AND PRINTS OUT THE ERROR & STATISTICS
LOG FOR EACH DEVICE ALTERNATELY.

G. SEEK EXERCISER (SA 506)
PROGRAM PROVIDES A SEEK SCAN SEQUENCE
CONVERGING FROM THE EXTREME OUTERMOST TRACKS INTO THE
ADJACENT TRACK IN THE CENTER, THEN DIVERGING AGAIN TO
THE EXTREMES.

1. ALL SEKS IN F/G ARE FOLLOWED BY A 1 SECTOR READ AT
RANDOM SECTOR WITH NO DATA CHECK. ALL SEKS ARE TIMED
WITH MAX,MIN, AND AVE. TIMES BEING LOGGED IN MS. SEEK
PATHS FOR MAX,MIN VALUES ARE ALSO LOGGED. INCREMENTAL
DISK ADDRESS TEST (SA 502) SHOULD BE RUN PRIOR TO
RUNNING EITHER SEEK EXERCISER TO AVOID POSSIBLE CHECK-
WORD ERRORS DURING READS.

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H. RANDOM SEEK EXERCISER (SA 507)
PROGRAM PROVIDES A RANDOM SEEK SEQUENCE

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 ZEROES ALL LOGS.

J. MEMORY DUMP ROUTINE (SA 513)
SEE SECTION 11.2.0 FOR DESCRIPTION

K. DIRECT ENTRY ODT (SA 11)
SEE SECTION 11.0. FOR DESCRIPTION

L. CHANGE DEVICE CODE (SA 4)
USER IS REQUESTED TO ENTER THE NEW DEVICE CODE.
THE PROGRAM THEN CHANGES ALL I/O INSTRUCTIONS
FROM THE CURRENT DEVICE CODE TO THE NEW DEVICE
AND RETURNS CONTROL TO THE USER FOR RESTART

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10011 .MAIN
01
02 OPERATING PROCEDURE/OPERATOR INPUT:
03
04 A. VERIFY DRIVE (DRIVES) ARE READY ON=LINE
05 B. LOAD PROGRAM USING BINARY LOADER
06 C. RESET, LOAD ONE OF THE STARTING ADDRESSES
07 SHOWN BELOW INTO THE DATA SWITCHES AND
08 HIT START.
09
10 STARTING ADDRESS
11 4 SET DEVICE CODE TO OTHER THAN 33
12 11 OOT - DIRECT ENTRY ONLY
13 200 RUNALL TESTS
14 500 RELIABILITY TEST, ALL CYLINDERS
15 501 RELIABILITY TEST, (OPTIONS)
16 502 INCREMENTAL DISK ADDRESS TEST
17 503 COMMAND STRING INTERPRETER
18 504 QUICKIE FORMATTER
19 RUN ALL
20 SEEK EXERCISER (CONVERGING, DIVERGING PATTERN)
21 SEEK EXERCISER (RANDOM PATTERN)
22 ERROR COUNT/LOG RECOVERY
23 MEMORY DUMP ROUTINE
24
25 INITIALLY, THE OPERATOR IS REQUESTED TO ENTER A TTY
26 BAUD RATE (NO RTC PRESENT) FOR TIMING, DATE -DAY,
27 MONTH, YEAR, HOUR, & MINUTE (A ICR)
28 RESPONSE WILL IGNORE THIS ROUTINE), & (UNIT#,MIN
29 SURFACE, MAX SURFACE) FOR EACH UNIT TO BE TESTED.
30 EX. 0,0,3 1,F ETC. OR (UNIT#,F) IF FLOPPY.
31 WHEN THE UNIT SPECIFIED IS A FLOPPY, THE MIN/MAX
32 RANGE DEFAULTS TO ALL SURFACES. (0,1)
33 SUBSEQUENT PROGRAM RESTARTS MAY USE PREVIOUSLY ENTERED
34 PARAMETERS FOR UNIT#'S & RANGE BY TYPING A "CR" IN
35 RESPONSE TO MESSAGE PROMPT.
36
37 THE OPERATOR IS THEN ASKED TO RESPOND TO "
38 LOWER/UPPER TEST TRACK LIMIT PAIRS/
39 TYPE L(CR) FOR CURRENT TRACK CONFIGURATION.
40
41 BY TYPING UP TO 5 PAIRS OF NUMBERS TO REPRESENT
42 THE TESTABLE DISK AREAS. FOR EXAMPLE A
43 RESPONSE OF:
44 0,17 24,24 26,46
45
46 WOULD TEST TRACKS 0=17,24, AND 24=46.
47 IF THERE IS NO CHANGE, A CARRIAGE RETURN MAY BE TYPED.
48 UPON LOADING ALL TRACKS ARE TESTABLE. ANY LETTER
49 RESPONSE FOLLOWED BY A CR WILL GET A PRINTOUT OF
50 THE CURRENT TRACK CONFIGURATION.
51
52 THE 1ST NUMBER OF EACH PAIR MUST BE AT LEAST
53 2 GREATER THAN THE 2ND NUMBER OF THE PRECEEDING
54 PAIR. THE 2ND NUMBER OF EACH PAIR MUST BE GREATER
55 THAN OR EQUAL TO THE 1ST NUMBER OF THE PAIR.

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10012 .MAIN
01
02 OPERATOR INPUT CONTROLLED PRINTOUTS ARE AS FOLLOWS:
03
04 L = FIRST 100. BAD SECTORS, DATA, OR ADDRESSES
05 S = SEEK TIMING STATISTICS (506,507 ONLY)
06 W = SECTORS W/R PLUS ERROR COUNTS
07 **NOTE** ANY CHARACTER TYPED WILL END PRINTOUTS AT
08 THE NEXT CHANGE OF DATA TYPE.
09
10 D. OPERATING MODES
11
12 1 OF 3 DIFFERENT MEMORY/INTERRUPT MODES MAY BE IN
13 USE IN THIS PROGRAM AND ARE DESCRIBED AS FOLLOWS:
14
15 1-BACKGROUND ONLY, WAIT ON INTERRUPT
16 MAX # OF SECTORS = ALL OF AVAILABLE CORE (IE NOT TAKEN
17 BY PROGRAM) OR 16 SECTORS MAX. USED FOR SA'S 503,504,
18 506,507
19
20 2-BACKGROUND/FOREGROUND MODES, 2 BUFFERS USED FOR
21 BOTH READ AND WRITE PURPOSES. MAX # OF SECTORS =
22 1/2 OF AVAILABLE CORE OR 16 SECTORS MAX. USED FOR
23 INCREMENTAL ADDRESS TEST, OR RANDOM RELIABILITY
24 WITH CONSTANT DATA PATTERNS (501,502).
25
26 3-BACKGROUND/FOREGROUND MODES, 3 BUFFERS
27
28 PROGRAM OUTPUT/ERROR DESCRIPTION:
29 *****
30
31 ALL ERRORS ARE IDENTIFIED, COUNTED, AND THE
32 PROGRAM IS ROUTED VIA BASE TO A CALL TO
33 CKSW. ON THE BASIS OF SWREG SETTINGS (SEE
34 8.2) THE PROGRAM WILL GO INTO A SCOPE LOOP,
35 OR PROCEED.
36
37 IN ALL TESTS EXCEPT (SA 503) COMMAND STRING
38 INTERPRETER, A "LOSS OF READY" WILL RESULT
39 IN THE FOLLOWING:
40
41 UPON LOSS OF READY AND A SINGLE DRIVE, THE
42 PROGRAM WILL PRINT THE APPROPRIATE ERROR
43 MESSAGE AND WILL HALT. IF MULTIPLE DRIVES
44 EXIST, THE PROGRAM WILL CONTINUE WITH THE
45 REMAINING DRIVES. IF THE DOWN DRIVE IS
46 PLACED BACK ONLINE, THE PROGRAM WILL RESUME
47 TESTING OF THAT DRIVE. SEE 12.1
48
49 A "LOSS OF READY" IN (SA 503) COMMAND STRING
50 INTERPRETER CAUSES THE APPROPRIATE ERROR
51 MESSAGE TO BE PRINTED BUT DOES NOT REMOVE
52 THE FAILING DRIVE FROM TESTING.(ALLOWS LOOP=
53 ING ON "LOSS OF READY" FAILURES)
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55 RECALIBRATE = ANY UNUSUAL STATUS IS REPORTED
IMMEDIATELY AND AN ERROR RETURN IS EXECUTED.

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"CR" THE RETURN KEY IS USED TO CLOSE THE OPEN CELL
"LF" LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR
WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING
CELL.
^ CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION
/ AND OPEN THE PRECEDING CELL
+ "ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
- "ADR"/ OPEN THE OPEN CELL WITHOUT MODIFICATION, AND
MODIFICATION OF A CELL
11.1.3.2 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 EX-
PRESSION 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 " " OR " " OCTAL EXPRESS-
ION". 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.
11.1.3.3 OTHER ODT COMMANDS
RUBOUT 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 CELLS
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 AA.
"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
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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11.2.0 MEMORY DUMP UTILITY (SAS13)
11.2.0.1 THIS UTILITY AFFORDS THE USER THE CAPABILITY
OF DISPLAYING; IN OCTAL FORMAT; THE CONTENTS
OF CONTIGUOUS MEMORY LOCATIONS OF VARIABLE BLOCK
LENGTHS.
11.2.0.2 BLOCKS OF CONTIGUOUS MEMORY THAT ARE IDENTICAL
AND GREATER THAN 64 ENTRIES IN LENGTH ARE OUT-
PUT IN AN ABBREVIATED FORMAT. (SEE PAR. 11.3.2).
THIS FEATURE WILL CONSERVE HARD COPY AND EXECUTION
TIME.
11.2.0.3 THE USER MAY ALSO SPECIFY A SEARCH WORD. THE
TOTAL NUMBER OF ENTRIES FOUND; MATCHING THIS
WORD; WILL BE DISPLAYED AT THE END OF THE PRINTOUT
AND WILL ALSO BE SAVED IN LOCATION MD370.
11.2.0.4 THIS PROGRAM MAY BE MANUALLY STARTED AT LOCATION
" (SAS13) " SYMBOLIC (I.E. THE FIRST ADDRESS OF
THE UTILITY); OR DYNAMICALLY CALLED BY A USER
PROGRAM VIA THE D?MP MACRO.
11.2.1 DIALOGUE
11.2.1.1 PROGRAM DIALOGUE TERMINATED BY A "?" REQUIRES A
USER RESPONSE BEFORE PROGRAM EXECUTION CAN CON-
TINUE. IN THE FOLLOWING DIALOGUE USER RESPONSE IS
INDICATED BY " "
WD? "AAAAAA"
FST ADR? "888888"
LST ADR? "CCCCCC"
WHERE:
"AAAAAA" IS ANY OCTAL NUMBER IN THE RANGE OF 000000
THRU 177777.
"888888" IS ANY OCTAL NUMBER IN THE RANGE OF 000000
THRU 077776; AND EQUAL TO, OR LESS THAN "CCCCCC".
"CCCCCC" IS ANY OCTAL NUMBER IN THE RANGE OF 000001
THRU 077777; AND EQUAL TO, OR GREATER THAN "AAAAAA".
11.2.1.2 A RESPONSE OF "0", "CR", "LF", "TAB", OR "SPACE"
TO ANY REQUEST WILL BE INTERPRETED AS A "0" RE-
SPONSE.

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;11.2.2 ERRORS
;11.2.2.1 AN ILLEGAL RESPONSE TO A REQUEST, (I.E. A NON-
; OCTAL CHARACTER), WILL RESULT IN A REPEAT OF THAT
; REQUEST.
;11.2.2.2 A RANGE ERROR RESPONSE, (I.E. FIRST ADDRESS
; GREATER THAN LAST ADDRESS), WILL RESULT IN THE RE-
; START OF THE PROGRAM IF ENTERED MANUALLY; OR A
; RETURN TO PC +3 IF ENTERED DYNAMICALLY.

;11.2.3 TYPICAL PROGRAM RESPONSE
;ADR? 0 1 2 3 4 5 6 7
;0 NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN
;10 NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN
;SAME NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN
;100 NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN
;110 NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN NN=NN
;WD'S FOUND= MM=MM
;
;11.2.3.1 WHERE:
; THE "NN=NN" ENTRIES ABOVE CORRESPOND TO THE CON-
; TENTS OF THE ASSOCIATED ADDRESSES.
; THE "MM=MM" ENTRY ABOVE REPRESENTS THE TOTAL NUMBER OF
; WORDS (OCTAL) FOUND MATCHING THE SEARCH WORD.
;11.2.3.2 IN THE EXAMPLE ABOVE IT IS ASSUMED THAT THE
; CONTENTS OF LOCATIONS 10 THRU 107 INCLUSIVE ARE IDENTICAL.
; THEREFORE THE ABBREVIATED OUTPUT. (I.E. LOCATIONS 20
; THRU 107 INCLUSIVE ARE REPLACED BY THE TEXT MESSAGE
; "SAME").
;
; NOTE:
; FOR MANUAL MODE OF OPERATION SWITCH "2" IN LOCATION
; "SRREG" MUST BE "0" OR THE PROGRAM WILL HANG IN A
; LOOP.

10020 .MAIN
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;11.4 INSTRUCTION SET:
DOA: SPECIFY COMMAND AND CYLINDER
-----
BITS NAME
-----
0-4 CLEAR
CONTENTS/FUNCTION
-----
ANY OF THESE BITS = 1 WILL SET
THE FOLLOWING = 0 FOR ANY AND
ALL DEVICES CONNECTED TO THE
CONTROLLER: R/W (DEVICE) DONE,
SEEK DONE, DIA ERROR STATUS
BITS 7, 8, 10-15.
5-6 COMMAND
-----
SPECIFY THE DISK COMMAND FOR
THE SELECTED DRIVE AS FOLLOWS:
5 6 NORMAL MODE COMMAND
-----
0 0 READ
0 1 WRITE
1 0 SEEK
1 1 RECALIBRATE
7-15 CYLINDER
-----
SPECIFY DESIRED CYLINDER FOR
A SEEK OR READ/WRITE OPERATION.
CYLINDER #'S ARE AS FOLLOWS:
NON-REMOVABLE: 0-277 (OCTAL)
DISKETTE: 0-114
DOB: SPECIFY MEMORY ADDRESS
-----
BITS 1-15 SPECIFY THE STARTING MEMORY ADDRESS FOR A
DATA CHANNEL OPERATION. BIT 0 IS THE MAP SELECT BIT
(0 = MAP A, 1 = MAP B).
DOC: SPECIFY DISK ADDRESS AND SECTOR COUNT
-----
BITS NAME
-----
0-1 DRIVE
-----
2 FORMAT
MODE
IF = 1, PLACE CONTROLLER IN
FORMAT MODE.
3 DIAGNOSTIC
COMMAND
ENABLE
IF = 1, DIAGNOSTIC COMMANDS ARE
ENABLED. THE DIAGNOSTIC COMMAND
IS SPECIFIED IN BITS 11-15 OF
THE DOA COMMAND REGISTER.

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10023 .MAIN

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4-6 CURRENT HEAD INDICATES THE HEAD # SELECTED FOR THE NEXT SECTOR TRANSFER. *

7-11 CURRENT SECTOR INDICATES THE SECTOR NUMBER SELECTED FOR THE NEXT SECTOR TRANSFER. *

12-15 SECTOR COUNT INDICATES THE # OF SECTORS REMAINING FOR DATA TRANSFER (TWO'S COMPLEMENT).

* UNLESS THE OPERATION TERMINATES WITH THE ADDRESS ERROR STATUS BIT SET = 1, THE HEAD & SECTOR #'S INDICATE THE NEXT LOGICAL SECTOR FOR A DATA TRANSFER.

CONTROL PULSE FUNCTIONS:

```

-----
PULSE ACTION TAKEN
-----
NIOB (START) SET DONE, READ/WRITE DONE AND SEEK
DONE FLAGS = 0. SET ALL ERROR STATUS
BITS (7-8 & 10-15) = 0. SET BUSY = 1
AND START A PREVIOUSLY DEFINED READ
OR WRITE OPERATION.

NIOC (CLEAR) SET BUSY, DONE, READ/WRITE DONE, SEEK
DONE = 0. SET ALL ERROR STATUS BITS
(7-8 & 10-15) = 0. TERMINATES ANY
OPERATION IN PROGRESS.

NIOP (IDPLS) SET DONE, READ/WRITE DONE, SEEK DONE
FLAGS = 0. SET ALL ERROR STATUS BITS
(7-8 & 10-15) = 0. START A PREVIOUSLY
DEFINED SEEK OR RECALIBRATION OPERA-
TION. DOES NOT AFFECT BUSY.

IORST (RESET) PERFORMS SAME FUNCTIONS AS NIOC. IN
ADDITION, SET INTERRUPT DISABLE FLOP
= 0, SET MEMORY ADDRESS REGISTER = 0,
SET INITIAL PROGRAM LOAD FLAG = 1.
TRACK POSITION INFORMATION FOR ALL
DRIVES IS LOST. HOWEVER, IF A SEEK IS
ISSUED AFTER AN IORST, A RECALIBRATION
IS PERFORMED, FOLLOWED BY THE SEEK.

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10024 .MAIN

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12.0 SPECIAL NOTES/SPECIAL FEATURES:

12.1 "LOSS OF READY" - SEVERAL CONSIDERATIONS ARE GIVEN TO LOSS OF READY STATUS DURING PROGRAM EXECUTION AS FOLLOWS:

(1.A) DURING INITIAL RECAL OF CONFIGURED DRIVES- A LOSS OF READY RESULTS IN AN ERROR MESSAGE AND PROGRAM RESUMES RECAL OF REMAINING DRIVES. THIS ALLOWS THE OPERATOR TO RECONFIGURE "OFFLINE" DRIVES FOR FUTURE TESTING BY CONFIGURING DRIVES THAT ARE NOT READY AT START UP TIME. SUCH DRIVES WILL BE CONFIGURED WITH AN "OFFLINE" STATUS.

(1.B) ANY LOSS OF READY DURING PROGRAM EXECUTION- RESULTS IN THE APPLICABLE DRIVE BEING PLACED IN AN OFFLINE STATUS. AN ERROR MESSAGE IS PRINTED AND TESTING RESUMES ON THE REMAINING DRIVES. IF ALL CONFIGURED DRIVES ARE "OFFLINE" THE PROGRAM PRINTS A MESSAGE TO THAT EFFECT & PAUSES. PROGRAM MUST THEN BE RESTARTED AS PER SECTION 3 (OPERATING PROCEDURES).

(1.C) "OFFLINE" DRIVES - ANY DRIVE INITIALLY CON- FIGURED BUT SUBSEQUENTLY OFFLINE AS DEFINED IN SECTION 10.4 (LOSS OF RDI) MAY BE PLACED ONLINE WITH THE FOLLOWING CONSIDERATIONS:

(1.C.1) SINGLE PROCESSOR MODE - ANY DRIVE COMING READY WILL BE RE-INSTATED AT THE COMPLETION OF THE CURRENT PASS AND TESTING WILL THEN RESUME ON THAT DRIVE.

ALL DRIVES NOT PREVIOUSLY CONFIGURED AT START OF PROGRAM ARE IGNORED.

12.2 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.

0027 .MAIN

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