

IDENTIFICATION
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PRODUCT CODE: MAINDEC-08-DHKKB-D-D
PRODUCT NAME: RK8E DRIVE CONTROL TEST
DATE CREATED: JANUARY 1, 1974
MAINTAINER: DIAGNOSTIC GROUP
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RK8EDRIV

RSW 0404

DISK TO RUN

CHECK WTRPDT BY TOGGING
AND LEAVE OFF

ONLY 3 TOP WHI LIGHTS SHOULD
BE ON

LSW 0200

8 MODE

I/O PRESET

START LS ca 45 min



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1. ABSTRACT

THE RK8E DRIVE CONTROL TEST IS DESIGNED FOR THE PURPOSE OF CHECKOUT OF THE RK8E DISK CONTROL LOGIC REQUIRING THE USE OF THE DISK DRIVE.

IN GENERAL, THE TEST IS AN INSTRUCTION TEST TO VERIFY BASIC OPERATION OF THE SEEK ONLY, RESTORE, WRITE DATA, READ DATA, WRITE ALL, AND READ ALL FUNCTIONS WITH ALL DRIVES ON THE CONTROL. SIMPLE COMPLEMENT DATA PATTERNS OF 2525 + 5252, 5252 + 2525, AND 0000 + 7777 ARE USED TO VERIFY ADDRESSING AND DATA TRANSFERS TO AND FROM EACH INDIVIDUAL DRIVE.

A MANUAL INTERVENTION TEST IS ALSO INCLUDED (SEE SECTION 5.7), TO ALLOW THE OPERATOR TO SELECT DATA PATTERNS AND COMMAND REGISTER FUNCTIONS VIA THE SWITCH REGISTER.

CONSIDERING NO ERROR CONDITIONS, THE DRIVES THAT HAVE RUN THIS TEST ARE FORMATTED, IF THE PROGRAM WAS STOPPED AT END OF PROGRAM PASS COMPLETION BY SWR9=1.

2. REQUIREMENTS

2.1 HARDWARE

A. PDP-8/E, 8/F, OR 8/M COMPUTER OR OTHER FAMILY OF 8 COMPATIBLE COMPUTER WITH NECESSARY DW8E BUS ADAPTER.

B. AT LEAST 4K OF READ/WRITE MEMORY

C. ASR-33 TELETYPE OR EQUIVALENT

D. RK8E DISK CONTROL

E. RK05 DISK DRIVE(S)

2.2 STORAGE

THE PROGRAM OCCUPIES OR UTILIZES LOCATION 0000 TO LOCATION 7400 OF THE CURRENT FIELD. IF THE CURRENT FIELD IS AN EXTENDED MEMORY FIELD, LOCATIONS 0000 TO 0003 OF FIELD 0, WILL BE USED FOR PROGRAM INTERRUPT SERVICE.

3. PRELIMINARY PROGRAMS

ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS AND THE RK8E DISKLESS CONTROL TEST SHOULD BE RUN PRIOR TO THIS TEST.

1. SWITCH REGISTER SETTINGS

SWR0=1 SCOPE LOOP ON ERROR. AFTER AN ERROR
HALT AT LOCATION "ERHLT9" RAISING THIS
SWITCH AND PRESSING KEY CONTINUE
WILL RESULT IN A SCOPE LOOP ON THE
CURRENT FAILING TEST IF THE TEST CONTINUES
TO FAIL. THE ERROR TIMEOUT AND THE
ERROR HALT AT LOCATION "ERHLT9" WILL
BE INHIBITED. THE TTY BELL WILL RING
INDICATING AN ERROR IF SWR2=0.

SWR1=1 SCOPE LOOP ON CURRENT NON-FAILING TEST.
RAISING THIS SWITCH CAUSES THE PROGRAM
TO LOOP ON THE CURRENT TEST IF THE TEST
IS WORKING CORRECTLY. MAY BE USED IN
CONJUNCTION WITH SWR0=1 FOR INTERMITTENT
PROBLEMS.

SWR2=1 INHIBIT BELL ON SCOPE LOOP. WHEN IN A
SCOPE LOOP DUE TO SWR0=1, RAISING THIS
SWITCH INHIBITS THE SCOPE LOOP ERROR
BELL.

SWR3=1 TEST ON CURRENT DRIVE.
UPON INITIAL START OF PROGRAM, WHEN
"SINGLE DRIVE TESTING", RAISING THIS
SWITCH INDICATES TO THE PROGRAM TO
TEST THE DISK DRIVE IN SWR10-11. WHEN
RUNNING THE PROGRAM AND "MULTI-DRIVE
TESTING", RAISING THIS SWITCH INDICATES
TO THE PROGRAM TO CONTINUE TO TEST THE
CURRENT DRIVE UNDER TEST.

SWR4=1 STOP PROGRAM OR HALT SWITCH. RAISING THIS
SWITCH WILL RESULT IN A PROGRAM STOP
UPON COMPLETION OF THE NEXT NON-FAILING
TEST. IF POSSIBLE, THIS SWITCH SHOULD
ALWAYS BE USED TO STOP THE PROGRAM.

SWR5=1 INHIBIT THE RECOVERABLE ERROR HALT AFTER
A RECOVERABLE ERROR TIMEOUT. AFTER AN
ERROR HALT AT LOCATION "ERHLT9", RAISING
THIS SWITCH AND PRESSING KEY CONTINUE
WILL INHIBIT ALL FUTURE RECOVERABLE ERROR
HALTS. IF SWR1=0 THE PROGRAM WILL PROCEED TO
NEXT TEST AFTER EACH ERROR TIMEOUT. IF SWR1=1
THE PROGRAM WILL PROCEED BACK TO THE SAME
OR CURRENT FAILING TEST.

(4. CONT'D.)

PAGE 3

SWR6=1

RECALIBRATE IN SCOPE LOOPS, RAISING THIS SWITCH WILL RESULT IN A DISK RECALIBRATION WHEN IN A SCOPE LOOP DUE TO SWR0=1, SWR1=1, OR WHEN SWR5=1.

SWR7=1

PROGRAM WAIT LOOP FOR DISK IN SCOPE LOOPS, RAISING THIS SWITCH WILL RESULT IN A PROGRAM WAIT LOOP FOR APPROX. 500 MS WHEN IN A SCOPE LOOP DUE TO SWR0=1, SWR1=1, OR WHEN SWR5=1. IN SOME CASES, THIS MAY BE USEFUL FOR WAITING FOR THE DISK MOVEMENT TO COMPLETE IF CONTROL OR DRIVE ERRORS OCCUR, BEFORE REPEATING THE TEST AGAIN. IN SOME CASES, FAILURE TO WAIT, MAY CAUSE ADDITIONAL ERRORS.

SWR8=1

GET ALL REGISTERS AFTER THE RECOVERABLE ERROR HALT "ERHLT9". AFTER AN ERROR HALT AT LOCATION "ERHLT9", RAISING THIS SWITCH AND PRESSING KEY CONTINUE RESULTS IN AN ERROR TYPEOUT OF THE ACTUAL CONTENTS OF THE CRC, STATUS, COMMAND, LOWER DATA, AND SURFACE AND SECTOR REGISTERS.

SWR9=1

PROGRAM HALT OR STOP AT END OF PROGRAM PASS COMPLETION.

SWR10=11

DISK DRIVE(S) TO TEST, IN MULTI-DRIVE TESTING, INDICATES TO THE PROGRAM THE ACTUAL AMOUNT OF NON-EXISTING DRIVES AND THE AMOUNT OF DRIVES NUMBERED SEQUENTIALLY FROM DISK 0 TO TEST, IN SINGLE DRIVE TESTING, UPON INITIAL START OF PROGRAM, AND IF SWR3=1, INDICATES TO THE PROGRAM THE DRIVE TO TEST.

takes approx 10 minutes in Link, pass

5. OPERATOR AND/OR PROGRAM ACTION

5.1 STANDARD TEST PROCEDURE

- A. START AS SPECIFIED THROUGH OUT THIS DOCUMENTATION IS KEY CLEAR AND THEN KEY CONTINUE ON PDP8/E, PDP8/M, AND PDP8/F COMPUTERS.
- B. LOAD THE PROGRAM INTO ANY R/W MEMORY BANK USING THE STANDARD BINARY LOADER TECHNIQUE.
- C. IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE PROGRAM, FOLLOW THE PROCEDURE IN SECTION 5.8.
- D. RUN THE DRIVE CONTROL TEST WITH ALL DRIVES ON THE DISK SYSTEM BY USING THE SINGLE OR MULTI DRIVE TESTING METHOD, SECTION 5.3 OR SECTION 5.4, RESPECTIVELY.
- E. THE PROGRAM EXECUTION TIME IS APROX. 30 MINUTES PER DISK DRIVE.
- F. RUN THE WRITE PROTECT CHECK TESTS ON ALL DRIVES ON THE DISK SYSTEM BY FOLLOWING THE PROCEDURES IN SECTIONS 5.5 AND 5.6.
- G. MANUAL FUNCTIONS, SECTION 5.7, MAY BE USED FOR TROUBLE SHOOTING, IF DESIRED.
- H. SEEK FROM SWITCHES, SECTION 5.9, MAY BE USED FOR TROUBLE SHOOTING, IF DESIRED.
- I. IF THE PROGRAM WAS STOPPED BY SWF4=1 OR BY "ERHLT9", ADDRESS 0205 CAN BE USED TO RESTART THE PROGRAM AT THE LAST SUBTEST EXECUTED. (NOTE: WATCH YOUR SWITCH SETTINGS.)

5.2 RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE

THE FOLLOWING IS THE CORRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RK05 DISK DRIVE. ANY DEVIATION ENCOUNTERED DURING THIS PROCEDURE WILL BE CONSIDERED AS AN ERROR CONDITION.

- A. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION.
- B. TURN AC POWER TO DISK DRIVE ON.
- C. VERIFY THAT LIGHT LABELED "PWR" IS ON.
- D. WAIT FOR LIGHT LABELED "LOAD" TO COME ON.
- E. VERIFY THAT LIGHTS LABELED "RDY", "ON CYL", "FAULT", "WT", AND "RD" ARE OFF.
- F. OPEN ACCESS DOOR.
- G. INSERT CARTRIDGE.
- H. CLOSE ACCESS DOOR.
- I. SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.
- J. WAIT FOR THE LIGHTS LABELED "RDY" AND "ON CYL" TO COME ON.
- K. TOGGLE SWITCH LABELED "WT PROT" AND VERIFY THAT THE LIGHT LABELED "WT PROT" GOES ON AND OFF.
- L. TOGGLE SWITCH LABELED "WT PROT" UNTIL THE LIGHT LABELED "WT PROT" GOES OFF.
- M. VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

5.3 DRIVE CONTROL TEST (SINGLE DRIVE TESTING)

- A. MAKE READY THE DISK DRIVE TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.
- C. VERIFY THAT AC POWER TO ALL DRIVES IS ON.

(5.3 CONT'D)

- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
 - E. SET THE SWITCH REGISTER TO 0000.
 - F. SET SWR3=1 TO INDICATE "SINGLE DRIVE TESTING".
 - G. SET SWR10=11 TO THE DISK DRIVE TO BE TESTED AND START THE COMPUTER RUNNING.
 - H. THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT THE COMPLETION OF EACH PASS.
"RK8E DRIVE CONTROL TEST PASS COMPLETE"
 - I. ALWAYS USE SWR4=1 FOR STOPPING THE TEST.
 - J. IF IT IS DESIRED TO HAVE THE PROGRAM HALT OR STOP AT END OF PROGRAM PASS COMPLETION SET SWR9=1.
 - K. ANY HALTS OR TIMEOUTS OTHER THAN THE PASS COMPLETE TIMEOUT OR END OF TEST HALT MENTIONED ABOVE WILL BE CONSIDERED AN ERROR CONDITION. IN ALL CASES ACCESS "ERRORS" SECTION 6 IN THIS DOCUMENTATION.
 - L. FOR ABSOLUTE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1 OF THE PROGRAM LISTING.
- 5.4 DRIVE CONTROL TEST (MULTI-DRIVE TESTING)

- A. MAKE READY ALL DISK DRIVES NUMBERED SEQUENTIALLY FROM DRIVE 0 TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
 - B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DISK DRIVES NOT BEING TESTED.

(5.4 CONT'D.)

- C. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000.
- F. SET SWR10-11 TO THE AMOUNT OF EXTRA DISK DRIVES NUMBERED SEQUENTIALLY FROM DISK 0 TO BE TESTED AND START THE COMPUTER RUNNING.
 - SWR10-11=1 2 DISK SYSTEM
 - SWR10-11=2 3 DISK SYSTEM
 - SWR10-11=3 4 DISK SYSTEM
- G. THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT THE COMPLETION OF EACH PASS.

"PK8E DRIVE CONTROL TEST PASS COMPLETE"

- H. ALWAYS USE SWR4=1 FOR STOPPING THE TEST.
- I. IF IT IS DESIRED TO HAVE THE PROGRAM HALT OR STOP AT THE END OF PROGRAM PASS COMPLETION SET SWR9=1.
- J. ANY HALTS OR TYPEOUTS OTHER THAN THE PASS COMPLETE TYPEOUT AND THE END OF TEST HALT MENTIONED ABOVE WILL BE CONSIDERED AN ERROR CONDITION. IN ALL CASES ACCESS "ERRORS" SECTION 6 IN THIS DOCUMENTATION.
- K. FOR ABSOLUTE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1 OF THE PROGRAM LISTING.

5.5 CHECK WRITE PROTECT (MANUAL)

- A. RUN THE REGULAR DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL USING THE SINGLE OR MULTI DRIVE TESTING METHOD, BEFORE RUNNING THIS "WRITE PROTECT" PORTION.
- B. MAKE READY A DRIVE TO TEST USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- C. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL OTHER DRIVES.
- D. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
- E. VERIFY THAT THE LIGHT LABELED "WT PROT" IS "OFF" ON THE CURRENT DRIVE UNDER TEST.

(5.5 CONT'D)

- F. SET THE SWITCH REGISTER TO 0203 AND PRESS LOAD ADDRESS.
- G. SET THE SWITCH REGISTER TO 0000.
- H. SET SWR10-11 TO THE CURRENT DRIVE NUMBER UNDER TEST.
- I. PRESS START AND THE COMPUTER SHOULD HALT AT LOCATION "MPHLT1". **4122**
- J. PRESS SWITCH LABELED "WI PROT" TO TURN "WRITE PROTECT" AND THE LIGHT LABELED "WI PROT" ON.
- K. PRESS KEY CONTINUE AND THE COMPUTER SHOULD HALT AT LOCATION "MPHLT2" INDICATING A SUCCESSFUL TEST.
AL62
- L. FOR ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1 OF THE PROGRAM LISTING.
- M. IF ANY ERRORS ARE ENCOUNTERED OR IF IT IS DESIRED TO TRY THE TEST AGAIN, REPEAT STEPS A-K.
- N. FOR POSSIBLE ERROR TIMEOUTS ACCESS SECTION 6 IN THIS DOCUMENTATION. (NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.)
- O. THE "CHECK WRITE PROTECT PROCEDURE" AS DESCRIBED ABOVE SHOULD BE RUN TWICE WITH ALL DRIVES ON THE CONTROL.

5.6 CHECK WRITE PROTECT (PROGRAM CONTROL)

- A. RUN THE REGULAR DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL USING THE SINGLE OR MULTI DRIVE TESTING METHOD, BEFORE RUNNING THIS "WRITE PROTECT" PORTION.
- B. MAKE READY A DRIVE TO TEST USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- C. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL OTHER DRIVES.
- D. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
- E. VERIFY THAT THE LIGHT LABELED "WI PROT" IS "OFF" ON THE CURRENT DRIVE UNDER TEST.
- F. SET THE SWITCH REGISTER TO 0204 AND PRESS LOAD ADDRESS.
- G. SET THE SWITCH REGISTER TO 0000.
- H. SET SWR10-11 TO THE CURRENT DRIVE NUMBER UNDER TEST.

(5.6 CONT'D)

- I. PRESS START AND THE COMPUTER SHOULD HALT AT LOCATION "APHLT1" INDICATING A SUCCESSFUL TEST.
4776
- J. VERIFY THAT THE WRITE PROTECT LIGHT LABELED "WI PROT" IS ON, ON THE CURRENT DRIVE.
- K. FOR ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1 OF THE PROGRAM LISTING.
- L. IF ANY ERRORS ARE ENCOUNTERED OR IF IT IS DESIRED TO TRY THE TEST AGAIN, REPEAT STEPS A-J.
- M. FOR POSSIBLE ERROR TYPEOUTS ACCESS SECTION 6 IN THIS DOCUMENTATION. (NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.)
- N. THE "CHECK WRITE PROTECT PROCEDURE" AS DESCRIBED ABOVE SHOULD BE RUN TWICE WITH ALL DRIVES ON THE CONTROL.

5.7 MANUAL FUNCTIONS (FOR TROUBLE SHOOTING ONLY)

THE MANUAL FUNCTIONS ENABLES THE OPERATOR TO SELECT FUNCTIONS, DISK ADDRESS, AND DATA PATTERNS VIA THE SWITCH REGISTER. THIS IS NOT PART OF THE REGULAR TEST AND SHOULD ONLY BE USED FOR TROUBLE SHOOTING IF DESIRED.

- A. SET THE SWITCH REGISTER TO 0201 AND PRESS LOAD ADDRESS.
- B. SET THE SWITCH REGISTER TO THE DESIRED FUNCTION TO BE LOADED INTO THE COMMAND REGISTER. (SEE SECTION 8.)
(NOTE: THE EXTENDED MEMORY BITS 6-8, THE ENABLE INTERRUPT BIT 3, AND THE ENABLE SET DONE BIT ON SEEK COMPLETE BIT 4, ARE NOT RECOGNIZED. THIS MANUAL PORTION IS ONLY FLAG DRIVEN AND ALL DATA TRANSFERS ARE TO THE CURRENT FIELD.)
- C. PRESS START AND THE COMPUTER SHOULD HALT.
- D. SET THE SWITCH REGISTER TO THE DESIRED DISK ADDRESS TO BE LOADED INTO THE CYLINDER, SURFACE, AND SECTOR REGISTER. (SEE SECTION 8.)
- E. PRESS START AND THE COMPUTER SHOULD HALT.
- F. SET THE SWITCH REGISTER TO THE COMPLEMENT TYPE DATA PATTERN TO BE WRITTEN ON OR READ FROM THE DISK DEPENDING ON THE FUNCTION PREVIOUSLY LOADED INTO THE COMMAND REGISTER. (NOTE: A SETTING OF 0000 WILL RESULT IN A COMPLEMENT DATA PATTERN OF 0000 + 7777. A SETTING OF 2525 WILL RESULT IN A COMPLEMENT DATA PATTERN OF 2525 + 5252.)
- G. PRESS START AND THE COMPUTER SHOULD HALT.

(5.7 CONT'D)

- H. SET THE SWITCH REGISTER TO 0000, PRESS START, AND THE FUNCTION SELECTED WILL BE EXECUTED.
 - I. IF POSSIBLE, ALWAYS USE SWR4=1 FOR STOPPING PROGRAM.
 - J. IN CASE OF ERRORS OR DESIRED LOOPS, USE THE REGULAR SWITCH REGISTER SETTINGS (SECTION 4.)
 - K. IF A WRITE ALL OR THE WRITE DATA FUNCTION WAS SELECTED, THE DATA PATTERN SELECTED WILL BE WRITTEN ON THE DISK ADDRESS SELECTED.
 - L. IF A READ ALL OR READ DATA FUNCTION WAS SELECTED, THE DATA WILL BE READ OFF THE DISK ADDRESS SELECTED AND COMPARED AGAINST THE DATA PATTERN SELECTED.
 - M. IF A SEEK ONLY FUNCTION WAS SELECTED, A SEEK ONLY WILL BE EXECUTED TO THE DISK ADDRESS SELECTED.
 - N. IF A WRITE LOCK FUNCTION WAS THE SELECTED THE DISK DRIVE SELECTED WILL BE WRITE LOCKED.
- 5.8

CHANGE PROGRAM DEVICE IOT CODES

THE PROGRAM NORMALLY RECOGNIZES DEVICE IOT CODE X74X. TO CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM:
- A. SET THE SWITCH REGISTER TO 0202 AND PRESS LOAD ADDRESS.
 - B. SET THE SWITCH REGISTER TO 0000, SET SWITCH REGISTER BITS 3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS START.
 - C. THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM AND THEN HALT.
 - D. THE REGULAR TESTS CAN THEN BE RUN (SEE SECTIONS 5.3, 5.4, 5.5, OR 5.6).
- 5.9

SEEK FROM SWITCHES (FOR RK05 ALIGNMENT)

THE FOLLOWING SUBTEST WAS REQUESTED BY FIELD SERVICE TO AID IN RK05 ALIGNMENT, THE PROGRAM WILL SEEK ONLY BETWEEN ADDRESSES FROM SWITCH REGISTER.
- A. SET THE SWITCH REGISTER TO 4000 AND PRESS LOAD ADDRESS.
 - B. SET THE SWITCH REGISTER TO 0000.
 - C. SET SWR9-11 TO THE DRIVE NUMBER AND EXTENDED CYLINDER BIT OF THE FIRST SEEK ADDRESS (BITS 9-10 TO DRIVE NUMBER AND BIT 11 TO EXTENDED CYLINDER).

(5.9 CONT'D)

- D. SET SW0-7 TO THE REMAINDER OF THE CYLINDER BITS AND THE SURFACE OF THE FIRST SEEK ADDRESS.
- E. PRESS START AND THE COMPUTER SHOULD HALT.
- F. SET THE SWITCH REGISTER TO 0000.
- G. SET SW9-11 TO THE DRIVE NUMBER AND EXTENDED CYLINDER BIT OF THE SECOND SEEK ADDRESS (BITS 9-10 TO THE DRIVE NUMBER AND BIT 11 TO THE EXTENDED CYLINDER).
- H. SET SW0-7 TO THE CYLINDER BITS AND SURFACE OF THE SECOND SEEK ADDRESS.
- I. PRESS START AND THE DRIVE SHOULD SEEK BETWEEN THE ADDRESSES SPECIFIED BY THE SWITCH REGISTER.
- J. THE SECOND SEEK ADDRESS CAN BE CHANGED AT ANY TIME BY SIMPLY CHANGING THE SWITCH REGISTER TO SELECT A NEW ADDRESS.
- K. CARE SHOULD BE TAKEN TO NOT SELECT A NON-EXISTENT DISK DRIVE OR NON-EXISTENT CYLINDER.
- L. NO ERROR CHECKING IS DONE DURING THIS SUBTEST.
- M. IT IS POSSIBLE TO SEEK TO A CONSTANT ADDRESS BY MAKING THE FIRST AND SECOND ADDRESS EQUAL.

6. ERRORS

6.1 USEFUL ERROR INFORMATION

IN THE REGULAR TEST, THE DISK SKIP IOT IS FIRST CHECKED AND TIMED-OUT USING AN "ISZ" TIME LOOP. IF THE SKIP IOT FAILS, AN ERROR TYPEOUT AND ERROR HALT SHOULD OCCUR, ONCE PROVEN TO WORK, THE IOT IS NOT TIMED-OUT. THE PROGRAM MAY HANG-UP IF THE SKIP IOT FAILS INTERMITTENTLY. (NOTE: THE MANUAL FUNCTIONS, SECTION 5.7, ALWAYS TIMES OUT THE SKIP IOT TO PREVENT HANGING UP.

ALL ERRORS FOUND WHEN RUNNING THIS TEST SHOULD BE CORRECTED BEFORE PROCEEDING ON IN THE TEST.

(6.1 CONT'D)

WHEN AN OPERATOR ENCOUNTERS AN ERROR WHEN RUNNING THIS TEST HE SHOULD, IN ALL CASES, READ THE ERROR TYPEOUT INFORMATION, NOTE THE LOCATION OF THE FAILURE, READ ALL THE INFORMATION UNDER ERRORS IN THIS DOCUMENTATION, AND THEN ACCESS THE PROGRAM LISTING FOR FURTHER INFORMATION.

THE ABSOLUTE LOCATION OF ALL KNOWN HALTS CAN BE FOUND ON PAGE 1 OF THE PROGRAM.

A COMPLEMENT TYPE DATA PATTERN (I.E. 2525 + 5252, 5252 + 2525, OR 0000 + 7777) IS ALWAYS USED IN THIS TEST WHEN DATA IS WRITTEN AND THEN CHECKED. IN SOME CASES, ALL 0'S IS USED IN CHECKING CRC AND STATUS REGISTERS, HOWEVER, THE DATA IS NOT CHECKED.

THE PROGRAM USES THE SAME PROGRAM BUFFER FOR WRITING AND READING DATA, THE BUFFER IS SETUP BEFORE A WRITE FUNCTION AND CLEARED BEFORE THE DATA IS READ AND CHECKED. THE BUFFER OCCUPIES THE CURRENT FIELD FROM THE END OF THE PROGRAM +400 LOCATIONS.

BEFORE DATA IS WRITTEN ON THE DISK, THE FIRST TWO WORDS OF THE BUFFER ARE SET TO THE ABSOLUTE DISK ADDRESS, THE FIRST WORD OF THE BUFFER (BITS 9-11) IS SET TO THE DRIVE NUMBER AND THE EXTENDED CYLINDER BIT, THE SECOND WORD TO THE 12 REMAINDER CYLINDER, SURFACE, AND SECTOR BITS. ALSO THE BUFFER +1 IS SET TO THE DATA WORD OF "1234". AFTER THE WRITE THEN READ, THE WORDS ARE CHECKED FOR CORRECT VALUES, INDICATING THAT THE INFORMATION WAS WRITTEN ON AND READ FROM THE SAME PLACE ON THE DISK AND THAT THE DATA BREAK STOPPED CORRECTLY. WHEN AN ERROR EXISTS WITH THE WORDS AS STATED PREVIOUSLY, THE OPERATOR SHOULD REALIZE THAT THE PROBLEM IS MOST LIKELY ADDRESSING AND SOMETIMES DATA ERRORS.

WHEN DATA IS BEING READ OFF THE DISK AND A CRC ERROR OCCURS THE PROGRAM WILL THEN CHECK THE DATA READ FOR DATA ERRORS. IF NO DATA ERRORS EXIST THE CRC ERROR FOUND WILL BE REPORTED AS A STATUS REGISTER ERROR. IF DATA ERRORS ARE FOUND THE DATA ERRORS WILL BE REPORTED AS DISK DATA ERRORS AND THE CRC STATUS ERROR INDICATED IN THE "STI". (SEE SECTION 6.4 FOR ERROR HEADERS AND TYPEOUTS).

THE ABSOLUTE ADDRESS LOCATIONS OF THE DATA BUFFER CAN BE FOUND ON PAGE 1 OF THE PROGRAM LISTING.

6.2 NON-RECOVERABLE ERROR HALTS

NON-RECOVERABLE ERROR HALTS FOR WHICH THERE ARE NO
TYPEOUTS OR SCOPE LOOPS ARE LISTED AND DEFINED AS FOLLOWS.

- ERHLT1 UNDEFINED INTERRUPT
- ERHLT2 SKIP TRAP FOR IOT "DCLR"
- ERHLT3 SKIP TRAP FOR IOT "DLAG"
- ERHLT4 SKIP TRAP FOR IOT "DLCA"
- ERHLT5 SKIP TRAP FOR IOT "DRST"
- ERHLT6 SKIP TRAP FOR IOT "DLDC"
- ERHLT7 SKIP TRAP FOR IOT "DMAN"

6.3 RECOVERABLE ERROR HALT

ALL RECOVERABLE ERRORS, FOR WHICH THERE ARE SCOPE LOOPS
AND ERROR TYPEOUTS, SHOULD RESULT IN AN ERROR HALT AT
LOCATION "ERHLT9".

- ERHLT9 RECOVERABLE ERROR HALT. READ INFORMATION
TYPEOUT ON TTY AND ACCESS PROGRAM
LISTING AND DOCUMENTATION.

6.4 ERROR TYPEOUTS

WHEN A RECOVERABLE ERROR OCCURS THE PROGRAM WILL
PRINT AN "ERROR HEADER" WHICH WILL SPECIFY THE
PARTICULAR REGISTER OR TYPE OF ERROR FOUND
AT THE TIME OF THE FAILURE.

POSSIBLE "ERROR HEADERS" ARE AS FOLLOWS.

- STATUS REGISTER ERROR
- COMMAND REGISTER ERROR
- DISK ADDRESS REGISTER ERROR
- DISK DATA ERROR
- CRC REGISTER ERROR
- DATA REGISTER ERROR
- DISK SKIP ERROR
- DISK INTERRUPT ERROR

(6,4 CONT'D)

AFTER THE "ERROR HEADER" MENTIONED ABOVE IS TYPED, THE PROGRAM WILL PRINT THE FOLLOWING ERROR INFORMATION FOUND AT THE TIME OF THE FAILURE, PERTAINING TO THE FAILURE. POSSIBLE TYPEOUTS ARE AS FOLLOWS.

- PC: PROGRAM LOCATION OF THE ACTUAL FAILURE.
- GD: REFERS TO THE DATA EXPECTED IN THE REGISTER OR TYPE OF TEST SPECIFIED IN THE "ERROR HEADER".
- CR: CONTENTS OF THE CRC REGISTER.
- ST: CONTENTS OF THE STATUS REGISTER.
- DB: CONTENTS OF THE LOWER DATA REGISTER.
- CM: CONTENTS OF THE COMMAND REGISTER.
- DA: CONTENTS OF THE DISK ADDRESS REGISTER OR THE CYLINDER, SURFACE, AND SECTOR BITS.
- CA: CONTENTS OF THE INITIAL CURRENT ADDRESS
- AD: BREAK ADDRESS OF DATA BREAK IN COMPUTER.
- DI: DATA FOUND DURING DATA BREAK.

THE "GD:" INFORMATION TYPED OUT POINTS TO THE DATA EXPECTED IN THE REGISTER OR TYPE OF ERROR TYPED OUT IN THE "ERROR HEADER".

THE ERROR INFORMATION INDICATOR SUGGESTED BY THE "ERROR HEADER" (I.E. DA: FOR DISK ADDRESS ERROR, CM: FOR COMMAND REGISTER ERROR, CR: FOR CRC REGISTER ERROR, ETC.), IS THE ACTUAL CONTENTS OF THAT PARTICULAR REGISTER. ERROR INFORMATION OTHER THAN THAT SUGGESTED BY THE ERROR HEADER IS THE SOFTWARE VALUE LOADED INTO THAT REGISTER PRIOR TO THE FAILURE.

TO TYPE THE ACTUAL CONTENTS OF THE REGISTERS, SET SWR6=1 AFTER AN ERROR HALT AT LOCATION "ERHLT9", AND PRESS KEY CONTINUE. THE CONTENTS OF THE CRC, STATUS, LOWER DATA, COMMAND, AND SURFACE AND SECTOR REGISTERS WILL THEN BE TYPED.

6.5 SCOPE LOOPS

THERE ARE SCOPE LOOPS AVAILABLE FOR ALL ERRORS RESULTING IN AN ERROR HALT AT LOCATION "ERHLT9".

TO ENTER SCOPE LOOP, INHIBIT ERROR TYPEOUT, AND INHIBIT ERROR HALT, AFTER AN ERROR HALT AT "ERHLT9", SET SWR0=1 TO INDICATE SCOPE LOOP AND PRESS KEY CONTINUE.

IF THE SCOPE LOOP IS WORKING CORRECTLY AND THE TEST IS STILL FAILING, THE TTY BELL SHOULD RING INDICATING AN ERROR, THEN SET SWR2=1 TO INHIBIT THE TTY ERROR BELL.

SWR1=1 MAY HAVE TO BE USED IN SCOPE LOOPS IN CONJUNCTION WITH SWR0=1, IF THE CURRENT TEST IS WORKING INTERMITTENTLY.

6.6 TYPICAL ERROR TYPEOUTS

THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND TYPEOUT THAT COULD HAVE OCCURRED IF THE DISK SKIP IOT FAILED TO SKIP.

DISK SKIP ERROR
PC:0267

THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND ERROR TYPEOUT THAT COULD HAVE OCCURRED ON A DATA BREAK ERROR. (NOTE CRC IN THE STATUS INDICATOR "ST:")

DISK DATA ERROR
PC:1161 GD:5252 ST:4010 CM:1000 DA:0001 CA:7000 AD:7010 DT:5250

THE FOLLOWING IS A TYPICAL ERROR THAT COULD HAVE OCCURRED WHILE READING THE CRC REGISTER.

CRC REGISTER ERROR
PC:2246 GD:116047 CR:116046 CM:1000 DA:1777

THE FOLLOWING IS AN EXAMPLE OF AN ERROR TYPEOUT THAT COULD HAVE OCCURRED IF THE STATUS REGISTER FAILED. (NOTE: IN THIS CASE THE OPERATOR INDICATED TO THE PROGRAM TO TYPE THE ACTUAL CONTENTS OF THE REGISTERS BY SETTING SWR8=1 AFTER THE ERROR HALT AT LOCATION "ERHLT9" AND PRESSING KEY CONTINUE).

STATUS REGISTER ERROR
PC:1100 GD:4000 ST:2000 CM:5002 DA:1000
CR:000000 ST:2000 DB:0000 CM:5002 DA:1000

7. RESTRICTIONS

ALL DISK DRIVES SHOULD BE SET TO THE LOAD POSITION THAT ARE NOT BEING TESTED.

ALL ERRORS SHOULD BE CORRECTED BEFORE PROCEEDING ON IN THE PROGRAM.

8. TROUBLE SHOOTING INFORMATION

| IOT --- | FUNCTION ----- |
|--------------------|---|
| 6741 DSKP | "SKIP" SKIP IF TRANSFER DONE FLAG OR ERROR FLAG IS SET. |
| 6742 DCLR | "CLEAR" FUNCTION IS REGULATED BY AC BITS 10 AND 11. THE AC IS THEN CLEARED. |
| AC10 AC11 ----- | |
| 0 0 | CLEAR THE AC AND STATUS REGISTER. |
| 0 1 | CLEAR THE AC, CONTROL, AND MAJOR REGISTERS. THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER. THIS IS THE ONLY INSTRUCTION THAT CLEARS MAINTENANCE MODE. |
| 1 0 | CLEAR AC, RECALIBRATE DISK DRIVE, AND CLEAR STATUS REGISTER. |
| 6743 DLAG | "LOAD DISK ADDRESS AND GO" LOAD THE DISK CYLINDER, SURFACE, AND SECTOR FROM THE AC, CLEAR THE AC, AND DO THE COMMAND IN THE COMMAND REGISTER. |

(8. CONT'D)

AC
--

0-6

7

8-11

6744 DLCA

AC
--

0-11

6745 DRST

AC
--

0

1

2

3

4

5

6

7

8

9

10

11

6746 DLDC

CYLINDER
SURFACE (1=UPPER) (0=LOWER)

SECTOR
"LOAD CURRENT ADDRESS" LOAD THE
CURRENT ADDRESS FROM AC. THE AC
IS THEN CLEARED.

CURRENT ADDRESS
"READ STATUS" CLEAR THE AC AND
READ THE CONTENTS OF THE STATUS
REGISTER INTO THE AC.

TRANSFER DONE
READY TO SEEK, READ, OR WRITE.
NOT USED
SEEK FAIL
DISK FILE READY
CONTROL BUSY ERROR
TIME OUT ERROR
WRITE LOCK ERROR
CRC ERROR
DATA RATE ERROR
DRIVE STATUS ERROR
CYLINDER ADDRESS ERROR
"LOAD COMMAND" LOAD THE COMMAND
REGISTER FROM AC, CLEAR THE AC,
AND CLEAR THE STATUS REGISTER.

(8, CONT'D)

| | | |
|-------|---------------------------------------|--|
| AC | | |
| -- | | |
| 0-2=0 | READ DATA | |
| 0-2=1 | READ ALL | |
| 0-2=2 | WRITE LOCK | |
| 0-2=3 | SEEK ONLY | |
| 0-2=4 | WRITE DATA | |
| 0-2=5 | WRITE ALL | |
| 0-2=6 | NOT USED | |
| 0-2=7 | NOT USED | |
| 3 | ENABLE INTERRUPT | |
| 4 | ENABLE SET TRANSFER DONE ON SEEK DONE | |
| 5 | HALF BLOCK 128 WORDS | |
| 6 | EXTENDED MEMORY ADDRESS | |
| 7 | EXTENDED MEMORY ADDRESS | |
| 8 | EXTENDED MEMORY ADDRESS | |
| 9 | UNIT SELECT | |
| 10 | UNIT SELECT | |
| 11 | EXTENDED CYLINDER ADDRESS | |

6747 DMAN

"MAINTENANCE IOT" LOAD THE MAINTENANCE REGISTER FROM THE AC. THE FUNCTION IS REGULATED BY THE AC BITS. MAINTENANCE MODE CAN ONLY BE CLEARED BY DCLR "CLEAR CONTROL".

| | | |
|----|--|--|
| AC | | |
| -- | | |
| 0 | ENTER MAINTENANCE MODE | |
| 1 | ENABLE SHIFT TO LOWER BUFFER | |
| 2 | AC BIT 10, CRC REGISTER, AND THE LOWER DATA BUFFER ARE CONNECTED AS A SHIFT REGISTER. AC BIT 10 DATA SHIFTS TO THE CRC, THE CRC SHIFTS TO THE LOWER DATA BUFFER. | |
| 3 | SHIFT COMMAND REGISTER TO THE LOWER DATA BUFFER. | |
| 4 | SHIFT THE SURFACE AND SECIOR REGISTER TO THE LOWER DATA BUFFER. | |
| 5 | SHIFT AC 10 DATA TO THE UPPER DATA BUFFER, THE UPPER BUFFER SHOULD SINK IN THE SILO WHEN FULL. | |
| 6 | ONE SINGLE CYCLE BREAK REQUEST. DIRECTION IS REGULATED BY FUNCTION IN THE COMMAND REGISTER. | |
| 7 | CLEAR AC THEN READ THE LOWER DATA BUFFER TO THE AC. | |
| 8 | NOT USED. | |
| 9 | NOT USED. | |
| 10 | USED AS DATA WITH OTHER BITS IN THE MAINTENANCE MODE. | |
| 11 | NOT USED | |

9. PROGRAM DESCRIPTION

THE RK8E DRIVE CONTROL TEST VERIFIES BASIC FUNCTIONAL OPERATION OF THE RK8E CONTROL LOGIC WITH THE RK05 DISK DRIVE(S). THE PROGRAM IS COMPISED OF MANY INDIVIDUAL SUBTESTS WHICH ARE AUTOMATICALLY RUN IN A SEQUENTIAL FLOW. ABOVE EACH SUBTEST, IN THE LISTING, IS A BRIEF DESCRIPTION OF EACH SUBTEST.

WHEN SINGLE DRIVE TESTING, ONE PASS THROUGH ALL SUBTESTS (TST0-TST45) RESULTS IN A PASS COMPLETION. WHEN MULTI-DRIVE TESTING, ONE PASS THROUGH ALL SUBTESTS (TST0-TST45) ON ALL DRIVES AND THE RUNNING OF THE OVERLAP SEEK TESTS(OVRDAP, GRONK, AND OVRRED) RESULTS IN A PASS COMPLETION.

CONSIDERING NO ERROR CONDITIONS, THE DRIVES THAT HAVE RUN THIS TEST ARE FORMATTED, IF THE PROGRAM WAS STOPPED AT END OF PROGRAM PASS COMPLETION BY SWR9=1.

10. PROGRAM LISTING

```

/
/RKBE DRIVE CONTROL TEST
/COPYRIGHT (C) 1972,1973,1974 DIGITAL EQUIP. CORP., MAYNARD, MASS.
/
/ALL KNOWN HALTS
/
0200 5217 ERHLT1 /UNDEFINED INTERRUPT
0201 5343 ERHLT2 /SKIP TRAP FOR DCLR
0202 5324 ERHLT3 /SKIP TRAP FOR DLAG
0203 5316 ERHLT4 /SKIP TRAP FOR DLCA
0204 5303 ERHLT5 /SKIP TRAP FOR DRST
0205 5332 ERHLT6 /SKIP TRAP FOR DLDC
0206 5347 ERHLT7 /SKIP TRAP FOR DMAN
0207 5142 ERHLT9 /THE RECOVERABLE ERROR HALT
0210 6410 STPHLT /PROGRAM STOP OR HALT FROM SWR4=1
0211 6555 CHNHLT /IOT CHANGE HALT
0212 4122 MPHLT1 /HALT FOR "CHECK WRITE PROTECT"
0213 4162 MPHLT2 /HALT FOR "CHECK WRITE PROTECT"
0214 4776 APHLT1 /HALT FOR "CHECK WRITE PROTECT"
0215 4072 ENDHLT /END OF TEST HALT FROM SWR9=1
0216 4002 HEDHLT /FROM ALIGNMENT SUBTEST
/
/BUFFER LOCATION INFORMATION
/
0217 7000 WRKBUF /START OF PROGRAM DATA BUFFER
0220 7377 ENDBUF /END OF PROGRAM DATA BUFFER
0221 7000 HTRK /DISK ADDRESS WORD IF BUFFER
0222 7001 LDIRK /DISK ADDRESS WORD IN BUFFER
0223 7400 STPCHK /BUFFER +1 "BREAK STOP CHECK" "1234"
/
6741 DSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
6742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
6743 DLAG=6743 /LOAD ADDRESS AND GO
6744 DLCA=6744 /LOAD CURRENT ADDRESS
6745 DRST=6745 /READ STATUS REGISTER
6746 DLDC=6746 /LOAD COMMAND REGISTER
6747 DMAN=6747 /LOAD MAINTENANCE
/
4420 DSKOUT=JMS I XDOUT
4421 DSKIN=JMS I XDIN
4422 RANADD=JMS I XRNAD
4424 RECAL=JMS I XRSTR
4423 SEEK=JMS I XONLY
4425 DISKGO=JMS I XDISKG
4426 HAFCHK=JMS I XHFCHK
4431 KILBUF=JMS I XKLBUF
4430 FILBUF=JMS I XFLBUF
4433 WATISZ=JMS I XWATISZ
4432 SKPAAT=JMS I XSKWAT
4427 FIGURE=JMS I XFGURE
4437 NERROR=JMS I XNERRO
4440 ERROR=JMS I XERRO
4441 IONWAT=JMS I XIONWT

```

```

4442 ACCMP1=JMS I XCOMP1
4443 ACCMP2=JMS I XCOMP2
4444 RDSTAT=JMS I XRDST
4445 RDCMD=JMS I XRDCM
4446 RDADD=JMS I XRDAD
4452 LDADD=JMS I XLDDAD
4447 DSKSKP=JMS I XSDKP
4450 LDCMD=JMS I XLDCM
4451 LDCUR=JMS I XLDCA
4453 CLRALL=JMS I XCLDR
4454 RDCRC=JMS I XRDCR
4455 LDMAN=JMS I XLDMN
4456 RDBUF=JMS I XRDBF
4457 PRNTER=JMS I XPRN
4460 OCTEL=JMS I XFROCT
4461 TWOCCT=JMS I XTOCT
4436 TYPE=JMS I XPRINT
4462 CRLF=JMS I XCRLF
/
0000 *0
/
0000 0000 0
0001 5001 5001
0002 0002 0002
0003 0003 0003
/
0010 *10
/
0010 0000 AUTO10, 0
/
0011 0010 K0010, 0010
0012 0020 K0020, 0020
0013 0040 K0040, 0040
0014 0100 K0100, 0100
0015 0200 K0200, 0200
0016 0400 K0400, 0400
0017 1000 K1000, 1000
/
0020 *20
/
0020 5553 XDDUT, DDUT
0021 4536 XDIN, DIN
0022 6320 XRNAD, RNAD
0023 6215 XONLY, ONLY
0024 6200 XRSTR, RSTOR
0025 5600 XDISKG, DISKG
0026 6432 XHFCHK, HFCHK
0027 5656 XFGURE, FGURE
0030 5447 XFLBUF, FLBUF
0031 5435 XKLBUF, KLBUF
0032 5261 XSKWAT, SKWAT
0033 5247 XWATISZ, WATISZ
0034 5215 INTRQ, INTADD
0035 0222 THSFLD, PRSFELD
0036 6151 XPRINT, PRINT

```

| | | |
|------|------|----------------|
| 0037 | 6400 | XNERRO, NERRO |
| 0040 | 5000 | XERRO, ERRO |
| 0041 | 5200 | XIONWT, IDNWT |
| 0042 | 5221 | XCOMP1, COMP1 |
| 0043 | 5231 | XCOMP2, COMP2 |
| 0044 | 5300 | XRDST, RDST |
| 0045 | 5412 | XRDCH, RDCM |
| 0046 | 5350 | XRDAD, RDAD |
| 0047 | 5333 | XSDKP, SDKP |
| 0050 | 5325 | XLDCM, LDCM |
| 0051 | 5307 | XLDCA, LDCA |
| 0052 | 5317 | XLDAD, LDAD |
| 0053 | 5340 | XCLDR, CLDR |
| 0054 | 6000 | XRDCR, RDCR |
| 0055 | 5344 | XLDMM, LDMM |
| 0056 | 5400 | XRDBF, RDBF |
| 0057 | 6111 | XPRN, PRN |
| 0060 | 6066 | XPROCT, PROCT |
| 0061 | 6036 | XTOCT, TOCT |
| 0062 | 6053 | XCRLF, UPONE |
| 0063 | 7001 | XLOTRK, LOTRK |
| 0064 | 7000 | XHITRK, HITRK |
| 0065 | 4500 | CYL450, 4500 |
| 0066 | 4520 | TRK212, 4520 |
| 0067 | 7000 | BGNBUF, WRKBUF |
| 0070 | 0000 | DRIVNO, 0 |
| 0071 | 0000 | DRIVSV, 0 |
| 0072 | 0001 | K0001, 0001 |
| 0073 | 0002 | K0002, 0002 |
| 0074 | 0003 | K0003, 0003 |
| 0075 | 0004 | K0004, 0004 |
| 0076 | 0005 | K0005, 0005 |
| 0077 | 0006 | K0006, 0006 |
| 0100 | 0007 | K0007, 0007 |
| 0101 | 1234 | K1234, 1234 |
| 0102 | 2000 | K2000, 2000 |
| 0103 | 3000 | K3000, 3000 |
| 0104 | 4000 | K4000, 4000 |
| 0105 | 6000 | K6000, 6000 |
| 0106 | 7000 | K7000, 7000 |
| 0107 | 7760 | K7760, 7760 |
| 0110 | 7700 | K7700, 7700 |
| 0111 | 0077 | K0077, 0077 |
| 0112 | 2525 | K2525, 2525 |
| 0113 | 5252 | K5252, 5252 |
| 0114 | 5000 | K5000, 5000 |
| 0115 | 7771 | K7771, 7771 |
| 0116 | 0017 | K0017, 0017 |
| 0117 | 0037 | K0037, 0037 |
| 0120 | 6201 | KCDF, CDF |
| 0121 | 6244 | KRF, RF |
| 0122 | 7740 | K7740, 7740 |
| 0123 | 7400 | K7400, 7400 |
| 0124 | 7600 | K7600, 7600 |
| 0125 | 5403 | K5403, 5403 |

| | | |
|------|-------|--------------|
| 0126 | 0770 | K0770, 0770 |
| 0127 | 7007 | K7007, 7007 |
| | | / |
| | | DECIMAL |
| | | / |
| 0130 | 7764 | M12, -12 |
| | | / |
| | | OCTAL |
| | | / |
| 0131 | 7774 | M4, -4 |
| 0132 | 0000 | REG0, 0 |
| 0133 | 0000 | REG1, 0 |
| 0134 | 0000 | SBCNT1, 0 |
| 0135 | 0000 | TCNTR1, 0 |
| 0136 | 0000 | TCNTR2, 0 |
| 0137 | 0000 | TCNTR3, 0 |
| 0140 | 0000 | TCNTR4, 0 |
| 0141 | 0000 | TCNTR5, 0 |
| 0142 | 0000 | TCNTR6, 0 |
| | | / |
| 0143 | 0000 | GDREG1, 0 |
| 0144 | 0000 | GDREG2, 0 |
| 0145 | 0000 | CRREG1, 0 |
| 0146 | 0000 | CRREG2, 0 |
| 0147 | 0000 | STREG, 0 |
| 0150 | 0000 | DBREG, 0 |
| 0151 | 0000 | CMREG, 0 |
| 0152 | 0000 | DAREG, 0 |
| 0153 | 0000 | CAREG, 0 |
| 0154 | 0000 | ADREG, 0 |
| 0155 | 0000 | DTREG, 0 |
| 0156 | 0000 | ACREG, 0 |
| 0157 | 0000 | HOMEMA, 0 |
| 0160 | 0000 | RAPCNT, 0 |
| 0161 | 2200 | STCON, 2200 |
| 0162 | 0011 | CRWRD1, 0011 |
| 0163 | 6047 | CRWRD2, 6047 |
| 0164 | 0000 | DATCNT, 0 |
| 0165 | 0000 | SAVDAT, 0 |
| 0166 | 0306 | K0306, 0306 |
| 0167 | 5373 | K5373, 5373 |
| 0170 | 5300 | K5300, 5300 |
| 0171 | 6304 | K6304, 6304 |
| 0172 | 3240 | ENDTRK, 3240 |
| 0173 | 7777 | SOFERR, 7777 |
| 0174 | 0000 | SAVPCT, 0 |
| 0175 | 0200 | RESTRT, 0200 |
| | | / |
| | | *200 |
| | | / |
| 0200 | 5206 | BGN, JMP |
| 0201 | 5777* | JMP |
| 0202 | 5776* | JMP |
| 0203 | 5775* | JMP |
| 0204 | 5774* | JMP |

| | |
|--------|------------------------------|
| *,+6 | /TO NORMAL TEST |
| MANUAL | /TO MANUAL TEST |
| CHANG | /TO CHANGE IOT DEVICE CODES |
| MANPRO | /CHECK MANUAL WRITE PROTECT |
| AUTPRO | /CHECK PROGRAM WRITE PROTECT |

```

0205 5575      JMP I  RESTRT      /RESTART AFTER PROGRAM STOP
0206 6224      RIF
0207 3157      DCA  HOMEMA
0210 1157      TAD  HOMEMA
0211 1120      TAD  KCDF        /MAKE HOMEDF
0212 3222      DCA  PRSFLD
0213 1121      TAD  KRMF        /GET RWF FOR INT. RETURN
0214 6201      CDF  0          /SWITCH FIELD 0
0215 3472      DCA I  K0001
0216 1125      TAD  K5403      /JMP I 3 FOR LOC. 2
0217 3473      DCA I  K0002
0220 1034      TAD  INTRG      /GET ADDRESS RETURN
0221 3474      DCA I  K0003
0222 7402      PRSFLD, HLT
0223 7604      LAS
0224 0074      AND  K0003      /MAKE DF=IF
0225 3071      DCA  DRIVSV     /MASK AMOUNT OF DRIVES

0226 7604      /
0227 0016      AND  K0400      /MASK SWR3
0230 7640      SZA  CLA
0231 1071      TAD  DRIVSV     /TEST DISK IN 10=11
0232 7104      CLL  RAL
0233 3070      DCA  DRIVNO     /YES, GET DISK NO. TO TEST
0234 3132      DCA  REGO       /MAKE IT IN 9=10
                          /START WITH THIS DRIVE X

```

/VERIFY THAT THE DISK DRIVE IN "DRIVNO" IS
/READY TO SEEK, READ, OR WRITE, STATUS REGISTER
/SHOULD GO TO 4000.

```

0235 7330      TST0, CLA CLL CML RAR      /EXPECTED STATUS
0236 3144      DCA  GDREG2      /SETUP COMPARE REGISTER
0237 1015      TAD  K0200      /ENABLE SET DONE BIT
0240 1070      TAD  DRIVNO     /GET CURRENT DRIVE NUMBER
0241 4450      LDCMD
0242 4444      RDSTAT      /LOAD COMMAND REGISTER
0243 4442      ACCMP1      /READ STATUS
0244 7610      SKP  CLA
0245 5253      JMP  TOE
0246 3144      DCA  GDREG2      /CHECK RESULTS
0247 4453      CLRALL
0250 4444      RDSTAT      /O.K. SO FAR
0251 7650      SNA  CLA
0252 4437      NERROR      /ERROR STATUS
0253 4440      ERROR      /SETUP COMPARE REGISTER
0254 0235      TST0
0255 5200      TST0
                          /CLEAR STATUS
                          /READ STATUS
                          /SHOULD BE 0000
                          /O.K. 4096 LOOPS
                          /ERROR, STATUS
                          /SCOPE LOOP POINTER
                          /TEXT POINTER

```

/VERIFY THAT "DSKP" SKIPS ON TRANSFER DONE FLAG
/WHEN THE DISK DRIVE IS READY.

```

0256 1015      TST1, TAD  K0200      /ENABLE SET DONE BIT
0257 1070      TAD  DRIVNO     /CURRENT DRIVE
0260 4450      LDCMD
0261 4447      DSKSKP      /LOAD COMMAND
                          /DSKP "DISK SKIP IOT"

```

```

0262 5266      JMP  T1E
0263 4453      CLRALL
0264 4447      DSKSKP      /ERROR, NO SKIP
0265 4437      NERROR      /CLEAR SKIP FLAG OUT
0266 4440      ERROR      /DSKP "DISK SKIP IOT"
0267 0256      TST1
0270 0006      0006      /O.K. 4096 LOOPS
                          /ERROR, DSKP FAILED
                          /SCOPE LOOP POINTER
                          /TEXT POINTER

```

/VERIFY THAT INT. OCCURS FROM
/THE TRANSFER DONE FLAG WHEN DISK
/DRIVE UNDER TEST IS READY TO SEEK,
/READ, OR WRITE.

```

0271 1015      TST2, TAD  K0200      /ENABLE SET DONE BIT
0272 1016      TAD  K0400      /ENABLE DISK INT.
0273 1070      TAD  DRIVNO     /GET CURRENT DRIVE
0274 4450      LDCMD
0275 7240      CLA  CMA
0276 4441      IONWAT
0277 5313      JMP  T2E
0300 4453      CLRALL
0301 7240      CLA  CMA
0302 4441      IONWAT
0303 7610      SKP  CLA
0304 5313      JMP  T2E
0305 1015      TAD  K0200      /SOFTWARE FLAG
0306 1070      TAD  DRIVNO     /WAIT FOR DISK INTERRUPT
0307 4450      LDCMD
0310 7340      CLA  CLL CMA
0311 4441      IONWAT
0312 4437      NERROR      /ERROR, NO INT.
0313 4440      ERROR      /CLEAR THE INT. OUT
0314 0271      TST2
0315 0007      0007      /SOFTWARE FLAG
                          /WAIT FOR DISK INTERRUPT
                          /O.K. 4096 LOOPS
                          /ERROR, DISK INT.
                          /SCOPE LOOP POINTER
                          /TEXT POINTER

```

/VERIFY A "TIMING ERROR" DOES OCCUR IN STATUS REGISTER
/IF A DLAG IS ISSUED WITH THE COMMAND REGISTER IS SET TO
/A FUNCTION OF "7".

```

0316 2132      ISZ  REGO
0317 1106      TAD  K7000
0320 1157      TAD  HOMEMA
0321 1070      TAD  DRIVNO     /GET CURRENT DRIVE
0322 4450      LDCMD
0323 1077      TAD  K0006      /LOAD COMMAND REGISTER
0324 3350      DCA  T3T
0325 4452      LDADD
0326 4432      SKPWAT
0327 5346      JMP  T3E
0330 1170      TAD  K5300
0331 3350      DCA  T3T
0332 7330      CLA  CLL CML RAR
0333 1013      TAD  K0040
0334 3144      DCA  GDREG2      /SETUP TEXT POINTER
0335 4444      RDSTAT      /SETUP EXPECTED STATUS
                          /READ STATUS REGISTER

```

```

0336 4442          ACCMP1          /CHECK RESULTS
0337 7610          SKP CLA          /STATUS IS O.K.
0340 5346          JMP T3E          /ERROR STATUS INCORRECT
0341 4453          CLRALL          /CLEAR STATUS
0342 3144          DCA GDREG2       /SETUP EXPECTED STATUS
0343 4444          RDSTAT          /READ STATUS
0344 4442          ACCMP1          /CHECK RESULTS
0345 4437          NERROR          /ALL IS O.K.
0346 4440          T3E, ERROR       /ERROR, TIMING SKIP OR STATUS
0347 0317          TST3           /SCOPE LOOP POINTER
0350 0006          T3T, 0006        /TEXT POINTER
/
/VERIFY THAT "RECALIBRATE" SETS TRANSFER
/DONE THEN DRIVE READY ON SELECTED DRIVE.
/
0351 4424          TST4, RECAL          /*"RECALIBRATE"
0352 0357          T4T           /TEXT POINTER
0353 5355          JMP T4E          /ERROR, SKIP OR STATUS
0354 4437          NERROR          /O.K. TO NEXT TEST
0355 4440          T4E, ERROR       /ERROR, DISK SKIP OR STATUS
0356 0351          TST4           /SCOPE LOOP POINTER
0357 0006          T4T, 0006        /TEXT POINTER
/
/VERIFY THAT "SEEK ONLY" TRACK 312 SETS
/TRANSFER DONE THEN DRIVE IS READY.
/
0360 7301          TST5, CLA CLL IAC          /EXTENDED
0361 3151          DCA CMREG       /SETUP EXTENDED BIT
0362 1066          TAD TRK212      /GET LOWER DISK ADDRESS
0363 4423          SEEK          /SEEK ONLY 312
0364 0371          TST           /TEXT POINTER
0365 5367          JMP T5E          /ERROR, SKIP OR STATUS
0366 4437          NERROR          /O.K. TO NEXT TEST
0367 4440          T5E, ERROR       /ERROR, DISK SKIP OR STATUS
0370 0360          TST5           /SCOPE LOOP POINTER
0371 0006          T5T, 0006        /TEXT POINTER
/
0372 5773          JMP I .+1          /TO NEXT TEST
0373 0400          TST6           /
/
0374 4710
0375 4101
0376 6535
0377 4600
0400 0400          PAGE
/
/SOMETHING IS WORKING. NOW SEEK ONLY TRACK 312
/WHEN RECALIBRATE AND CHECK FOR NO ERRORS IN STATUS.
/
0400 7301          TST6, CLA CLL IAC          /SETUP EXTENDED BIT
0401 3151          DCA CMREG       /
0402 1066          TAD TRK212      /
0403 4423          SEEK          /SEEK ONLY 312
0404 0414          T6T           /TEXT POINTER
0405 5212          JMP T6E          /ERROR, SKIP OR STATUS

```

```

0406 4424          RECAL          /*"RECALIBRATE"
0407 0414          T6T           /TEXT POINTER
0410 5212          JMP T6E          /ERROR, SKIP OR STATUS
0411 4437          NERROR          /O.K. TO NEXT TEST
0412 4440          T6E, ERROR       /ERROR, STATUS
0413 0400          TST6           /SCOPE LOOP POINTER
0414 5300          T6T, 5300        /TEXT POINTER
/
/VERIFY A "RECALIBRATE" FORM CYLINDER,
/SURFACE, AND SECTOR 07777.
/
0415 3151          TST7, DCA CMREG       /CLEAR EXTENDED BIT
0416 7340          CLA CLL CMA
0417 4423          SEEK          /SEEK ONLY
0420 0430          T7T           /TEXT POINTER
0421 5226          JMP T7E          /ERROR, SEEK ONLY
0422 4424          RECAL          /*"RECALIBRATE"
0423 0430          T7T           /TEXT POINTER
0424 5226          JMP T7E          /ERROR, SKIP OR STATUS
0425 4437          NERROR          /O.K. TO NEXT TEST
0426 4440          T7E, ERROR       /ERROR, STATUS
0427 0415          TST7           /SCOPE LOOP POINTER
0430 5300          T7T, 5300        /TEXT POINTER
/
/VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
/INCREMENTAL SEEK TEST, SEEK 0, 1, 2, 3, ETC.
/CHECK TIMING AND NO ERRORS IN STATUS.
/
0431 3135          TST8, DCA TCNTR1
0432 3136          DCA TCNTR2
0433 1135          T8R, TAD TCNTR1
0434 3151          DCA CMREG       /SETUP EXTENDED BIT
0435 1136          TAD TCNTR2      /LOWER DISK ADDRESS BITS
0436 4423          SEEK          /SEQUENTIAL SEEK ONLY
0437 0456          T8T           /TEXT POINTER
0440 5254          JMP T8E          /ERROR, SKIP OR STATUS
0441 2136          ISZ TCNTR2      /UPDATE POINTER
0442 7610          SKP CLA
0443 2135          ISZ TCNTR1
0444 1135          TAD TCNTR1
0445 7650          SNA CLA          /IS EXTENDED BIT SET YET
0446 5233          JMP T8R          /NO, CONTINUE
0447 1136          TAD TCNTR2      /YES
0450 1172          TAD ENDTRK
0451 7640          SZA CLA
0452 5233          JMP T8R          /WAS IT LAST TRACK
0453 4437          NERROR          /NO, CONTINUE
0454 4440          T8E, ERROR       /O.K. TO NEXT TEST
0455 0431          TST8           /ERROR, STATUS
0456 5300          T8T, 5300        /SCOPE LOOP POINTER
/TEXT POINTER
/
/VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
/312, 311, 310, 307, ETC, CHECK FOR
/NO ERRORS IN STATUS REGISTER.

```

```

0457 1066 /
0460 1116 TST9, TAD TRK212
0461 3135 TAD K0017
0462 7301 DCA TCNTR1 /SETUP LOWER DISK ADDRESS POINT
0463 3136 CLA CLL IAC
0464 1136 DCA TCNTR2 /SETUP EXTENDED POINTER
0465 3151 T9R, TAD TCNTR2
0466 1135 DCA CMREG /SETUP EXTENDED BIT
0467 4423 TAD TCNTR1
0470 0511 SEEK /DECREMENTAL SEEK ONLY
0471 5307 T9T /TEXT POINTER
0472 7340 JMP T9E /ERROR, SKIP OR STATUS
0473 1135 CLA CLL CMA
0474 3135 TAD TCNTR1
0475 7301 DCA TCNTR1 /DECREMENT
0476 1135 CLA CLL IAC
0477 7640 TAD TCNTR1
0500 5264 SZA CLA /FIRST TIME 0 YET
0501 1136 JMP T9R /NO, CONTINUE
0502 7650 TAD TCNTR2
0503 5306 SNA CLA /PAST EXTENDED BIT
0504 3136 JMP T9OK /YES, TEST O.K.
0505 5264 DCA TCNTR2 /CLEAR EXTENDED BIT
0506 4437 JMP T9R /CONTINUE
0507 4440 T9OK, NERROR /O.K. TO NEXT TEST
0510 0457 T9E, ERROR /ERROR, SEEK ONLY
0511 5300 TST9 /SCOPE LOOP POINTER
T9T, 5300 /TEXT POINTER
/
/VERIFY A RECALIBRATE FROM ALL
/CYLINDERS, CHECK ALL CYLINDERS
/BETWEEN 0000-14500.
/
0512 3135 TST10, DCA TCNTR1
0513 3136 DCA TCNTR2
0514 1135 T10R, TAD TCNTR1 /GET EXTENDED BIT
0515 3151 DCA CMREG /SETUP EXTENDED BIT
0516 1136 TAD TCNTR2 /GET CYLINDER
0517 4423 SEEK /SEEK ONLY
0520 0545 T10T /TEXT POINTER
0521 5343 JMP T10E /ERROR IN SEEK ONLY
0522 4424 RECAL /"RECALIBRATE"
0523 0545 T10T /TEXT POINTER
0524 5343 JMP T10E /ERROR, SKIP OR STATUS
0525 7300 CLA CLL
0526 1136 TAD TCNTR2 /GET LAST CYLINDER
0527 1013 TAD K0040 /UPDATE
0530 3136 DCA TCNTR2
0531 7430 SZL /TIME TO SET EXTENDED?
0532 2135 ISZ TCNTR1 /YES
0533 1135 TAD TCNTR1 /GET EXTENDED POINTER
0534 7650 SNA CLA /SET?
0535 5314 JMP T10R /NO DO THIS CYLINDER
0536 1136 TAD TCNTR2 /GET LAST CYLINDER
0537 1172 TAD ENDTRK /GET LAST POINTER

```

```

0540 7640 SZA CLA /NON-EXISTENT CYLINDER?
0541 5314 JMP T10R /NO, DO IT
0542 4437 NERROR /O.K. TO NEXT TEST
0543 4440 T10E, ERROR /STATUS
0544 0512 TST10 /SCOPE LOOP POINTER
0545 5300 T10T, 5300 /TEXT POINTER
/
0546 5747 JMP I .+1 /TO NEXT TEST
0547 0600 TST11
/
0600 PAGE
/
/SEEK ONLY SEEMS TO BE WORKING, NOW DO
/A FEW RANDOM SEEKS TO REALLY SHAKE THE
/DISK DRIVE UNDER TEST.
/
0600 1122 TST11, TAD K7740 /AMOUNT OF PASSES
0601 3135 DCA TCNTR1 /SETUP COUNTER
0602 4422 T11R1, RANADD /GENERATE A RANDOM ADDRESS
0603 3136 DCA TCNTR2 /SAVE IT
0604 7004 RAL /LINK IS EXTENDED BIT
0605 3137 DCA TCNTR3 /SAVE IT
0606 4422 RANADD /GENERATE A RANDOM ADDRESS
0607 3140 DCA TCNTR4 /SAVE IT
0610 7004 RAL /LINK IS EXTENDED BIT
0611 3141 DCA TCNTR5 /SAVE IT
0612 4422 T11R2, RANADD /GET A RANDOM NUMBER
0613 0111 AND K0077 /MASK OUT
0614 1110 TAD K7700 /MAKE COUNT VALUE
0615 3160 DCA RAPCNT /SETUP COUNTER
0616 1137 T11R3, TAD TCNTR3 /GET EXTENDED BIT
0617 3151 DCA CMREG /SETUP COMMAND REGISTER
0620 1136 TAD TCNTR2
0621 4423 SEEK /SEEK ONLY
0622 0641 T11T /TEXT POINTER
0623 5237 JMP T11E /ERROR, SKIP OR STATUS
0624 1141 TAD TCNTR5 /GET EXTENDED BIT
0625 3151 DCA CMREG /SETUP COMMAND
0626 1140 TAD TCNTR4
0627 4423 SEEK /SEEK ONLY
0630 0641 T11T /TEXT POINTER
0631 5237 JMP T11E /ERROR, SKIP OR STATUS
0632 2160 ISZ RAPCNT /UPDATE COUNTER
0633 5216 JMP T11R3 /SAME LOOP
0634 2135 ISZ TCNTR1 /UPDATE PASS COUNTER
0635 5202 JMP T11R1 /MAKE NEW ADDRESS
0636 4437 NERROR /O.K. TO NEXT
0637 4440 T11E, ERROR /ERROR, SKIP OR STATUS
0640 0600 TST11 /SCOPE LOOP POINTER
0641 0000 T11T, 0000 /MODIFIED TEXT POINTER
/
/NOTE: THE FOLLOWING TWO (2) TESTS WILL NOT BE RUN
/IF SINGLE DRIVE TESTING OTHER THAN DRIVE 0
/OR WHEN MULTI-DRIVE TESTING WITH 4 DRIVES.
/

```

/VERIFY A "NOT READY" ON ALL
/DRIVES NOT ON THE CONTROL.
/

```

0642 3132          DCA  REG0          /SETUP FOR 4096 PASSES
0643 7604          LAS
0644 0016          AND  K0400
0645 7650          SNA CLA          /RUN NEXT TWO TESTS
0646 5252          JMP          /MAYBE
0647 1071          TAD  DRIVSV          /TEST FOR OTHER THAN 0
0650 7640          SZA CLA          /MORE ON SYSTEM
0651 5777          JMP  TST14 -1          /YES, DON'T TEST
0652 7346          CLA CLL CMA RTL          /AC TO 7775
0653 1071          TAD  DRIVSV          /AMOUNT OF DRIVES
0654 7650          SNA CLA          /ARE THERE FOUR
0655 5777          JMP  TST14 -1          /YES, CAN'T TEST
0656 7301          TST12, CLA CLL IAC
0657 4453          CLRALL          /CLEAR CONTROL
0660 1161          TAD  STCON          /EXPECTED STATUS
0661 3144          DCA  GDREG2          /SETUP COMPARE
0662 7346          CLA CLL CMA RTL
0663 1071          TAD  DRIVSV          /AMOUNT OF DRIVES
0664 3135          DCA  TCNTR1          /AMOUNT NOT THERE
0665 7301          CLA CLL IAC
0666 1071          TAD  DRIVSV          /START WITH THIS DRIVE
0667 3136          DCA  TCNTR2
0670 1136          T12R, TAD  TCNTR2
0671 7104          CLL RAL          /SHIFT TO UNIT BITS
0672 1015          TAD  K0200          /ENABLE SET DONE
0673 4450          LDCMD          /LOAD COMMAND
0674 4444          RDSTAT          /READ STATUS
0675 4442          ACCMP1          /CHECK RESULTS
0676 7610          SKP CLA          /O.K.
0677 5305          JMP  T12E          /ERROR, STATUS
0700 4453          CLRALL          /CLEAR STATUS
0701 2136          ISZ  TCNTR2          /UPDATE DRIVE NO.
0702 2135          ISZ  TCNTR1          /WAS IT LAST DRIVE
0703 5270          JMP  T12R          /NO, MORE TO TEST
0704 4437          NERROR          /O.K. 4096 LOOPS
0705 4440          T12E, ERROR          /ERROR, STATUS
0706 0656          TST12          /SCOPE LOOP POINTER
0707 5200          5200          /TEXT POINTER

/VERIFY A DRIVE STATUS ERROR ON ALL DRIVES
/NOT ON THE CONTROL, ACTUALLY A SELECT ERROR,
/

0710 7301          TST13, CLA CLL IAC
0711 4453          CLRALL          /CLEAR CONTROL
0712 7346          CLA CLL CMA RTL
0713 1071          TAD  DRIVSV          /AMOUNT OF DRIVES
0714 3135          DCA  TCNTR1          /SETUP COUNTER
0715 7301          CLA CLL IAC
0716 1071          TAD  DRIVSV          /START WITH THIS DRIVE
0717 3136          DCA  TCNTR2
0720 1073          T13R, TAD  K0002
0721 1161          TAD  STCON          /EXPECTED STATUS
0722 3144          DCA  GDREG2          /SETUP COMPARE REGISTER
    
```

```

0723 1136          TAD  TCNTR2          /GET DRIVE NO.
0724 7104          CLL RAL          /PUT IN UNIT BITS
0725 1015          TAD  K0200          /ENABLE SET DONE
0726 1103          TAD  K3000          /FUNCTION SEEK ONLY
0727 4450          LDCMD          /LOAD COMMAND
0730 4452          LDADD          /LOAD AND GO
0731 4444          RDSTAT          /READ STATUS
0732 4442          ACCMP1          /CHECK RESULTS
0733 7610          SKP CLA          /O.K.
0734 5356          JMP  T13E          /ERROR, STATUS
0735 4453          CLRALL          /CLEAR STATUS
0736 1161          TAD  STCON          /EXPECTED STATUS
0737 3144          DCA  GDREG2          /SETUP COMPARE
0740 4444          RDSTAT          /READ STATUS
0741 4442          ACCMP1          /CHECK RESULTS
0742 7610          SKP CLA          /O.K.
0743 5356          JMP  T13E          /ERROR, STATUS
0744 7301          CLA CLL IAC
0745 4453          CLRALL          /CLEAR CONTROL
0746 3144          DCA  GDREG2          /SETUP COMPARE
0747 4444          RDSTAT          /READ STATUS
0750 7640          SZA CLA          /STATUS SHOULD BE 0000
0751 5356          JMP  T13E          /ERROR, STATUS
0752 2136          ISZ  TCNTR2
0753 2135          ISZ  TCNTR1
0754 5320          JMP  T13R          /TRY NEXT DRIVE
0755 4437          NERROR          /O.K. 4096 LOOPS
0756 4440          T13E, ERROR          /ERROR, STATUS
0757 0710          TST13          /SCOPE LOOP POINTER
0760 5300          5300          /TEXT POINTER

/

0761 5762          JMP I  ,+1          /TO NEXT TEST
0762 1000          TST14 -1

/

0777 1000          PAGE
0777 1000          /

/VERIFY THAT DISK CAPACITY EXCEEDED DOES OCCURR
/

1000 2132          ISZ  REG0          /SETUP FOR ONE PAS
1001 1066          TST14, TAD  TRK212
1002 1012          TAD  K0020
1003 3135          DCA  TCNTR1          /ADDRESS POINTER
1004 7301          T14R, CLA CLL IAC          /ENABLE CLEAR CONTROL BIT
1005 4453          CLRALL          /CLEAR CONTROL
1006 7330          CLA CLL CML RAR
1007 1073          TAD  K0002          /EXPECTED STATUS
1010 3144          DCA  GDREG2          /SETUP COMPARE REGISTER
1011 7301          CLA CLL IAC          /EXTENDED TRACK BIT
1012 1103          TAD  K3000          /FUNCTION SEEK ONLY
1013 1070          TAD  DRIVNO          /CURRENT DRIVE
1014 4450          LDCMD          /LOAD COMMAND
1015 1135          TAD  TCNTR1
1016 4452          LDADD          /LOAD AND GO
1017 4432          SKPWAT          /WAIT FOR SKIP
    
```

```

1020 5260      JMP      T14KE      /ERROR, NO SKIP
1021 4444      RDSTAT      /READ STATUS
1022 4442      ACCMPI      /CHECK RESULTS
1023 7610      SKP CLA      /STATUS O.K.
1024 5254      JMP      T14SE      /ERROR, STATUS
1025 7301      CLA CLL IAC      /ENABLE CLEAR CONTROL BIT
1026 4453      CLRALL      /CLEAR CONTROL
1027 1151      TAD      CMREG      /GET LAST COMMAND
1030 1015      TAD      K0200      /GET ENABLE SEEK DONE BIT
1031 4450      LDCHD      /LOAD COMMAND
1032 4432      SKPWAT      /WAIT FOR DISK SKIP
1033 5260      JMP      T14KE      /ERROR, SKIP
1034 7330      CLA CLL CML RAR      /EXPECTED STATUS
1035 3144      DCA      GDREG2
1036 4444      RDSTAT      /READ STATUS
1037 4442      ACCMPI      /CHECK RESULTS
1040 7610      SKP CLA      /STATUS O.K.
1041 5254      JMP      T14SE      /ERROR, STATUS
1042 1070      TAD      DRIVNO      /CURRENT DRIVE
1043 4450      LDCHD      /LOAD COMMAND
1044 3144      DCA      GDREG2      /SETUP COMPARE REGISTER
1045 4444      RDSTAT      /READ STATUS
1046 4442      ACCMPI      /CHECK RESULTS
1047 7610      SKP CLA      /STATUS O.K.
1050 5254      JMP      T14SE      /ERROR
1051 2135      ISZ      TCNTR1
1052 5204      JMP      T14R
1053 4437      NERROR      /LOOP
1054 4440      T14SE, ERROR      /O.K. TO NEXT TEST
1055 1001      TST14      /ERROR, DISK CAPACITY EXCEEDED
1056 5300      5300      /SCOPE LOOP POINTER
1057 5263      JMP      .+4      /MODIFIED TEXT POINTER
1060 4440      T14KE, ERROR      /TO NEXT TEST
1061 1001      TST14      /ERROR, DISK SKIP
1062 0006      0006      /SCOPE LOOP POINTER
1062 0006      0006      /TEXT POINTER

```

```

/VERIFY THAT SKIP AND STATUS DOES OCCUR
/AFTER 256 WRITE ALL AND READ ALL BREAKS.
/THIS SHOULD WRITE ALL ZEROS ON AND
/READ ALL ZEROS OFF THE DISK SECTOR 00000.

```

```

1063 4431      KILBUF      /ZERO WRITE BUFFER
1064 1114      TST15, TAD      K5000      /WRITE ALL FUNCTION
1065 3151      DCA      CMREG      /SETUP COMMAND
1066 4425      DISKGO      /DISK WRITE ALL
1067 1101      T15T      /TEXT POINTER
1070 5277      JMP      T15E      /ERROR, SKIP OR STATUS
1071 1017      TAD      K1000      /FUNCTION READ ALL
1072 3151      DCA      CMREG      /SETUP COMMAND REGISTER
1073 4425      DISKGO      /DISK READ ALL
1074 1101      T15T      /TEXT POINTER
1075 5277      JMP      T15E      /ERROR, SKIP OR STATUS
1076 4437      NERROR      /O.K. TO NEXT TEST
1077 4440      T15E, ERROR      /ERROR, WRITE ALL
1100 1064      TST15      /SCOPE LOOP POINTER

```

```

1101 5300      T15T, 5300      /MODIFIED TEXT POINTER

```

```

/VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
/128 WRITE ALL AND READ ALL BREAKS.
/THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
/ALL ZEROS OFF THE DISK SECTOR 00000.

```

```

1102 1114      TST16, TAD      K5000      /FUNCTION WRITE ALL
1103 1014      TAD      K0100      /HALF BIT
1104 3151      DCA      CMREG      /SETUP COMMAND
1105 4425      DISKGO      /DISK WRITE ALL
1106 1121      T16T      /TEXT POINTER
1107 5317      JMP      T16E      /ERROR, DISK SKIP OR STATUS
1110 1017      TAD      K1000      /FUNCTION READ ALL
1111 1014      TAD      K0100      /HALF BIT
1112 3151      DCA      CMREG      /SETUP COMMAND
1113 4425      DISKGO      /DISK READ ALL
1114 1121      T16T      /TEXT POINTER
1115 5317      JMP      T16E      /ERROR, SKIP OR STATUS
1116 4437      NERROR      /O.K. TO NEXT TEST
1117 4440      T16E, ERROR      /ERROR, WRITE ALL
1120 1102      TST16      /SCOPE LOOP POINTER
1121 5300      T16T, 5300      /MODIFIED TEXT POINTER

```

```

/VERIFY A WRITE ALL TO ALL OF CYLINDER 0
/AND USE DATA PATTERN 2525 + 5252.
/MAKE THE FIRST TWO WORDS IN THE BUFFER
/EQUAL THE DISK ADDRESS. CHECK THE DATA WITH
/READ ALL.

```

```

1122 1122      TST17, TAD      K7740
1123 3135      DCA      TCNTR1      /SETUP SECTOR COUNTER
1124 1112      T17S, TAD      K2525
1125 4430      FILBUF      /FILL OUTBOUND BUFFER
1126 1114      TAD      K5000      /FUNCTION WRITE ALL
1127 3151      DCA      CMREG      /SETUP COMMAND
1130 1135      TAD      TCNTR1
1131 0117      AND      K0037      /MASK OFF SECTORS
1132 3463      DCA I XLOTRK      /SETUP ADDRESS WORD IN BUFFER
1133 1070      TAD      DRIVNO      /GET DRIVE NUMBER
1134 3464      DCA I XHITRK      /SETUP ADDRESS WORD IN BUFFER
1135 1463      TAD I XLOTRK
1136 4425      DISKGO      /DISK WRITE ALL
1137 1162      T17T      /TEXT POINTER
1140 5360      JMP      T17E      /ERROR, SKIP OR STATUS
1141 4431      KILBUF      /KILL DATA BUFFER
1142 1017      TAD      K1000      /FUNCTION READ ALL
1143 3151      DCA      CMREG      /SETUP COMMAND
1144 1135      TAD      TCNTR1
1145 0117      AND      K0037      /MASK OF SECTORS
1146 4425      DISKGO      /DISK READ ALL
1147 1162      T17T      /TEXT POINTER
1150 5360      JMP      T17E      /ERROR, STATUS OR SKIP
1151 1112      TAD      K2525
1152 4427      FIGURE      /WORD BY WORD COMPARE OF DATA

```

```

1153 7610      SKP CLA      /THIS SECTOR O.K.
1154 5360      JMP      T17E      /ERROR, DATA
1155 2135      ISZ      TCNTR1 /UPDATE SECTOR COUNTER
1156 5324      JMP      T17S      /TRY NEXT SECTOR
1157 4437      NERROR     /O.K, TO NEXT TEST
1160 4440      T17E,  ERROR     /ERROR, READ ALL
1161 1122      TST17     /SCOPE LOOP POINTER
1162 5373      T17I, 5373 /TEXT POINTER
/
1163 5764      JMP I     .+1      /TO NEXT TEST
1164 1200      TST18
/
1200          /PAGE
/
/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/AND USE DATA PATTERN 5252 + 2525.
/MAKE THE FIRST TWO WORDS OF THE BUFFER
/EQUAL THE DISK ADDRESS, CHECK THE
/DATA WITH READ DATA.
/
1200 1122      TST18, TAD      K7740
1201 3135      DCA      TCNTR1 /SECTOR COUNTER
1202 1113      T18S,  TAD      K5252
1203 4430      FILBUF     /FILL OUTBOUND BUFFER
1204 1104      TAD      K4000 /FUNCTION WRITE DATA
1205 3151      DCA      CMREG /SETUP COMMAND
1206 1135      TAD      TCNTR1
1207 0117      AND      K0037 /MASK OF SECTORS
1210 3463      DCA I   XLOTRK /SETUP ADDRESS WORD IN BUFFER
1211 1070      TAD      DRIVNO /GET DRIVE NUMBER
1212 3464      DCA I   XHITRK /SETUP ADDRESS WORD IN BUFFER
1213 1463      TAD I   XLOTRK /GET ADDRESS
1214 4425      DISKGO   /DISK WRITE DATA
1215 1237      T18T     /TEXT POINTER
1216 5235      JMP      T18E /ERROR, STATUS OR SKIP
1217 4431      KILBUF     /CLEAR DATA BUFFER
1220 3151      DCA      CMREG /SETUP COMMAND
1221 1135      TAD      TCNTR1
1222 0117      AND      K0037 /MASK OFF SECTORS
1223 4425      DISKGO   /DISK READ DATA
1224 1237      T18T     /TEXT POINTER
1225 5235      JMP      T18E /ERROR, STATUS OR SKIP
1226 1113      TAD      K5252
1227 4427      FIGURE   /WORD BY WORD COMPARE OF DATA
1230 7610      SKP CLA      /THIS SECTOR O.K.
1231 5235      JMP      T18E /ERROR, DATA
1232 2135      ISZ      TCNTR1 /UPDATE SECTOR COUNTER
1233 5202      JMP      T18S /TRY NEXT SECTOR
1234 4437      NERROR     /O.K, TO NEXT TEST
1235 4440      T18E,  ERROR     /ERROR, DATA BREAK
1236 1200      TST18     /SCOPE LOOP POINTER
1237 5373      T18I, 5373 /TEXT POINTER
/
/VERIFY THAT DISK STOPS BREAK AFTER 128

```

```

/IF THE HALF BIT IS SET, THE REMAINDER OF THE
/THE BUFFER SHOULD BE 0000,
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS,
/THE DATA PATTERN USED IS 2525 + 5252.
/
1240 1112      TST19, TAD      K2525
1241 4430      FILBUF     /FILL BUFFER WITH DATA
1242 1070      TAD      DRIVNO
1243 3464      DCA I   XHITRK /MAKE DISK ADDRESS WORD
1244 3463      DCA I   XLOTRK /MAKE DISK ADDRESS WORD
1245 1114      TAD      K5000 /FUNCTION WRITE ALL
1246 1014      TAD      K0100 /HALF BIT
1247 3151      DCA      CMREG /SETUP COMMAND
1250 4425      DISKGO   /DISK WRITE ALL
1251 1267      T19T     /TEXT POINTER
1252 5265      JMP      T19E /ERROR, SKIP OR STATUS
1253 4453      CLRALL     /CLEAR STATUS
1254 4431      KILBUF     /ZERO BUFFER
1255 1017      TAD      K1000 /FUNCTION READ ALL
1256 3151      DCA      CMREG /SETUP COMMAND
1257 4425      DISKGO   /DISK READ ALL
1260 1267      T19T     /TEXT POINTER
1261 5265      JMP      T19E /ERROR, SKIP OR STATUS
1262 1112      TAD      K2525
1263 4426      HAFCHK     /WORD BY WORD COMPARE DATA
1264 4437      T190K, NERROR /O.K, TO NEXT TEST
1265 4440      T19E,  ERROR /ERROR, DATA BREAK
1266 1240      TST19     /SCOPE LOOP POINTER
1267 5373      T19T, 5373 /TEXT POINTER
/
/VERIFY THAT DISK STOPS BREAK AFTER 128
/IF THE HALF BIT IS SET, THE REMAINDER OF THE
/THE BUFFER SHOULD BE 0000,
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS,
/THE DATA PATTERN USED IS 5252 + 2525.
/
1270 1113      TST20, TAD      K5252
1271 4430      FILBUF     /FILL BUFFER WITH DATA
1272 1070      TAD      DRIVNO
1273 3464      DCA I   XHITRK /MAKE DISK ADDRESS WORD
1274 3463      DCA I   XLOTRK /MAKE DISK ADDRESS WORD
1275 1114      TAD      K5000 /FUNCTION WRITE ALL
1276 3151      DCA      CMREG /SETUP COMMAND
1277 4425      DISKGO   /DISK WRITE ALL
1300 1317      T20T     /TEXT POINTER
1301 5315      JMP      T20E /ERROR, SKIP OR STATUS
1302 4453      CLRALL     /CLEAR STATUS
1303 4431      KILBUF     /CLEAR BUFFER
1304 1017      TAD      K1000 /FUNCTION READ ALL
1305 1014      TAD      K0100 /HALF BIT
1306 3151      DCA      CMREG /SETUP COMMAND
1307 4425      DISKGO   /DISK READ ALL
1310 1317      T20T     /TEXT POINTER

```



```

1311 5315      JMP      T20E      /ERROR, SKIP OR STATUS
1312 1113      TAD      K5252
1313 4426      HAFCHK      /WORD BY WORD COMPARE DATA
1314 4437      T20OK,  NERROR    /O.K. TO NEXT TEST
1315 4440      T20E,    ERROR     /ERROR, DATA BREAK
1316 1270      TST20     /SCOPE LOOP POINTER
1317 5373      T20T,    5373     /TEXT POINTER

```

```

/VERIFY A WRITE ALL THEN READ ALL 128 WORDS.
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS.
/THE DATA PATTERN USED IS 2525 + 5252.

```

```

1320 1112      TST21,  TAD      K2525
1321 4430      FILBUF      /FILL BUFFER WITH DATA
1322 1070      TAD      DRIVNO
1323 3464      DCA I  XHITRK  /MAKE DISK ADDRESS WORD
1324 3463      DCA I  XLOTRK  /MAKE DISK ADDRESS WORD
1325 1114      TAD      K5000  /FUNCTION WRITE ALL
1326 1014      TAD      K0100  /HALF BIT
1327 3151      DCA      CMREG  /SETUP COMMAND
1330 4425      DISKGO     /DISK WRITE ALL
1331 1350      T21T      /TEXT POINTER
1332 5346      JMP      T21E     /ERROR, SKIP OR STATUS
1333 4453      CLRALL    /CLEAR STATUS
1334 4431      KILBUF    /ZERO BUFFER
1335 1017      TAD      K1000  /FUNCTION READ ALL
1336 1014      TAD      K0100  /HALF BIT
1337 3151      DCA      CMREG  /SETUP COMMAND
1340 4425      DISKGO     /DISK READ ALL
1341 1350      T21T      /TEXT POINTER
1342 5346      JMP      T21E     /ERROR, SKIP OR STATUS
1343 1112      TAD      K2525
1344 4426      HAFCHK      /WORD BY WORD COMPARE DATA
1345 4437      T21OK,  NERROR    /O.K. TO NEXT TEST
1346 4440      T21E,    ERROR     /ERROR, DATA BREAK
1347 1320      TST21     /SCOPE LOOP POINTER
1350 5373      T21T,    5373     /TEXT POINTER

```

```

1351 5752      JMP I  ,+1      /TO NEXT TEST
1352 1400      TST22

```

1400 PAGE

```

/VERIFY A WRITE ALL TO ALL OF CYLINDER 0
/USE DATA PATTERN 2525 + 5252
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.

```

```

1400 1122      TST22,  TAD      K7740
1401 3135      DCA      TCNTR1
1402 1112      TAD      K2525
1403 4430      FILBUF
1404 1135      T22R1,  TAD      TCNTR1

```

```

/SETUP SECTOR COUNTER
/FILL BUFFER WITH DATA

```

```

1405 0117      AND      K0037
1406 3463      DCA I  XLOTRK
1407 1070      TAD      DRIVNO
1410 3464      DCA I  XHITRK
1411 1114      TAD      K5000
1412 3151      DCA      CMREG
1413 1463      TAD I  XLOTRK
1414 4425      DISKGO
1415 1444      T22T
1416 5242      JMP      T22E
1417 2135      ISZ      TCNTR1
1420 5204      JMP      T22R1

```

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.

```

```

1421 1122      TAD      K7740
1422 3135      DCA      TCNTR1
1423 4431      T22K2,  KILBUF
1424 1017      TAD      K1000
1425 3151      DCA      CMREG
1426 1135      TAD      TCNTR1
1427 0117      AND      K0037
1430 4425      DISKGO
1431 1444      T22T
1432 5242      JMP      T22E
1433 1112      TAD      K2525
1434 4427      FIGURE
1435 7610      SKP CLA
1436 5242      JMP      T22E
1437 2135      ISZ      TCNTR1
1440 5223      JMP      T22R2
1441 4437      NERROR
1442 4440      T22E,  ERROR
1443 1400      TST22
1444 5373      T22T,  5373

```

```

/COUNTER FOR 37 SECTORS
/CLEAR DATA BUFFER
/READ ALL FUNCTION
/SETUP COMMAND

```

```

/DISK READ ALL
/TEXT POINTER
/ERROR, STATUS OR SKIP

```

```

/WORD BY WORD COMPARE OF DATA
/BUFFER O.K.
/ERROR, DATA
/UPDATE SECTOR COUNTER
/MORE SECTORS TO CHECK
/O.K. TO NEXT TEST
/ERROR, STATUS
/SCOPE LOOP POINTER
/TEXT POINTER

```

```

/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/USE DATA PATTERN 5252 + 2525
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.

```

```

1445 1122      TST23,  TAD      K7740
1446 3135      DCA      TCNTR1
1447 1113      TAD      K5252
1450 4430      FILBUF
1451 1135      T23R1,  TAD      TCNTR1
1452 0117      AND      K0037
1453 3463      DCA I  XLOTRK
1454 1070      TAD      DRIVNO
1455 3464      DCA I  XHITRK
1456 1104      TAD      K4000
1457 3151      DCA      CMREG
1460 1463      TAD I  XLOTRK

```

```

/SETUP SECTOR COUNTER
/FILL BUFFER WITH DATA

```

```

/MASK SECTOR BITS
/SETUP ADDRESS WORD IN BUFFER
/GET DRIVE NUMBER
/SETUP ADDRESS WORD IN BUFFER
/FUNCTION WRITE DATA
/SETUP COMMAND
/SECTOR TO LOAD

```

```

1461 4425          DISKGO          /DISK WRITE ALL
1462 1510          T23T           /TEXT POINTER
1463 5306          JMP           T23E          /ERROR, STATUS OR SKIP
1464 2135          ISZ           TCNTR1        /UPDATE SECTOR COUNTER
1465 5251          JMP           T23R1        /MORE SECTORS TO GO
/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K, CHECK WITH READ DATA.
/
1466 1122          TAD           K7740
1467 3135          DCA           TCNTR1        /COUNTER FOR 37 SECTORS
1470 4431          T23R2, KILBUF          /CLEAR DATA BUFFER
1471 3151          DCA           CMREG          /SETUP COMMAND
1472 1135          TAD           TCNTR1
1473 0117          AND           K0037
1474 4425          DISKGO          /DISK READ DATA
1475 1510          T23T           /TEXT POINTER
1476 5306          JMP           T23E          /ERROR, STATUS OR SKIP
1477 1113          TAD           K5252
1500 4427          FIGURE          /WORD BY WORD COMPARE OF DATA
1501 7610          SKP CLA          /DATA O.K.
1502 5306          JMP           T23E          /ERROR, DATA
1503 2135          ISZ           TCNTR1        /UPDATE SECTOR COUNTER
1504 5270          JMP           T23R2        /MORE SECTORS TO CHECK
1505 4437          NERROR          /O.K. TO NEXT TEST
1506 4440          T23E, ERROR          /ERROR, WRITE ALL
1507 1445          TST23          /SCOPE LOOP POINTER
1510 5373          T23T, 5373          /TEXT POINTER
/
/VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
/AND USE DATA PATTERN 2525 + 5252.
/THE FIRST TWO WORDS OF THE SECTOR SHOULD
/EQUAL THE DISK ADDRESS, CHECK THE DATA
/WITH READ ALL.
/
1511 1122          TST24, TAD      K7740
1512 3135          DCA           TCNTR1        /SETUP SECTOR COUNTER
1513 1112          T24S, TAD      K2525
1514 4430          FILBUF          /FILL OUTBOUND BUFFER
1515 7301          CLA CLL IAC
1516 1070          TAD           DRIVNO          /GET DRIVE NUMBER
1517 3464          DCA I XHITRK          /SETUP ADDRESS WORD IN BUFFER
1520 7301          CLA CLL IAC          /EXTENDED BIT
1521 1114          TAD           K5000          /FUNCTION WRITE ALL
1522 3151          DCA           CMREG          /SETUP COMMAND
1523 1135          TAD           TCNTR1        /SECTOR COUNTER
1524 0117          AND           K0037          /MASK OFF SECTOR BITS
1525 1065          TAD           CYL450          /ADD IN CYLINDER
1526 3463          DCA I XLOTRK          /SETUP ADDRESS WORD IN BUFFER
1527 1463          TAD I XLOTRK
1530 4425          DISKGO          /DISK WRITE ALL
1531 1556          T24T           /TEXT POINTER
1532 5354          JMP           T24E          /ERROR, SKIP OR STATUS
1533 4431          KILBUF          /CLEAR DATA BUFFER
1534 7301          CLA CLL IAC          /EXTENDED BIT

```

```

1535 1017          TAD           K1000          /FUNCTION READ ALL
1536 3151          DCA           CMREG          /SETUP COMMAND
1537 1135          TAD           TCNTR1        /SECTOR COUNTER
1540 0117          AND           K0037          /MASK OFF SECTORS
1541 1065          TAD           CYL450
1542 4425          DISKGO          /DISK READ ALL
1543 1556          T24T           /TEXT POINTER
1544 5354          JMP           T24E          /ERROR, STATUS OR SKIP
1545 1112          TAD           K2525
1546 4427          FIGURE          /WORD BY WORD COMPARE OF DATA
1547 7610          SKP CLA          /THIS SECTOR O.K.
1550 5354          JMP           T24E          /ERROR, DATA
1551 2135          ISZ           TCNTR1        /UPDATE SECTOR COUNTER
1552 5313          JMP           T24S          /TRY NEXT SECTOR
1553 4437          NERROR          /O.K. TO NEXT TEST
1554 4440          T24E, ERROR          /ERROR, READ ALL
1555 1511          TST24          /SCOPE LOOP POINTER
1556 5373          T24T, 5373          /TEXT POINTER
/
1557 5760          JMP I      ,+1          /TO NEXT TEST
1560 1600          TST25          /
/ PAGE
/
/VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
/AND USE DATA PATTERN 5252 + 2525.
/THE FIRST TWO WORDS OF THE SECTOR SHOULD
/EQUAL THE DISK ADDRESS, CHECK THE DATA
/WITH READ DATA.
/
1600 1122          TST25, TAD      K7740
1601 3135          DCA           TCNTR1        /SETUP SECTOR COUNTER
1602 1113          T25S, TAD      K5252
1603 4430          FILBUF          /FILL OUTBOUND BUFFER
1604 7301          CLA CLL IAC
1605 1070          TAD           DRIVNO          /GET DRIVE NUMBER
1606 3464          DCA I XHITRK          /SETUP ADDRESS WORD IN BUFFER
1607 7301          CLA CLL IAC          /EXTENDED BIT
1610 1104          TAD           K4000          /FUNCTION WRITE DATA
1611 3151          DCA           CMREG          /SETUP COMMAND
1612 1135          TAD           TCNTR1        /SECTOR COUNTER
1613 0117          AND           K0037          /MASK OFF SECTOR BITS
1614 1065          TAD           CYL450          /ADD IN CYLINDER
1615 3463          DCA I XLOTRK          /SETUP ADDRESS WORD IN BUFFER
1616 1463          TAD I XLOTRK
1617 4425          DISKGO          /DISK WRITE DATA
1620 1644          T25T           /TEXT POINTER
1621 5242          JMP           T25E          /ERROR, SKIP OR STATUS
1622 4431          KILBUF          /CLEAR DATA BUFFER
1623 7301          CLA CLL IAC          /EXTENDED BIT
1624 3151          DCA           CMREG          /SETUP COMMAND
1625 1135          TAD           TCNTR1        /SECTOR COUNTER
1626 0117          AND           K0037          /MASK OFF SECTORS
1627 1065          TAD           CYL450
1630 4425          DISKGO          /DISK READ DATA

```

```

1631 1644      T25T
1632 5242      JMP      T25E
1633 1113      TAD      K5252
1634 4427      FIGURE
1635 7610      SKP CLA
1636 5242      JMP      T25E
1637 2135      ISZ     TCNTR1
1640 5202      JMP      T25S
1641 4437      NERROR
1642 4440      T25E,  ERROR
1643 1600      TST25
1644 5373      T25T,  5373
    
```

```

/VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
/USE DATA PATTERN 5252 + 2525
/CHECK FOR NO ERRORS IN STATUS,
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR,
    
```

```

1645 1122      TST26,  TAD      K7740
1646 3135      DCA     TCNTR1
1647 1113      TAD      K5252
1650 4430      FILBUF
1651 1135      T26R1,  TAD      TCNTR1
1652 0117      AND     K0037
1653 1065      TAD     CYL450
1654 3463      DCA I   XLOTRK
1655 7301      CLA CLL IAC
1656 1070      TAD     DRIVNO
1657 3464      DCA I   XHITRK
1660 7301      CLA CLL IAC
1661 1114      TAD     K5000
1662 3151      DCA     CMREG
1663 1463      TAD I   XLOTRK
1664 4425      DISKGO
1665 1716      T26T
1666 5314      JMP      T26E
1667 2135      ISZ     TCNTR1
1670 5251      JMP      T26R1
    
```

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL,
    
```

```

1671 1122      TAD      K7740
1672 3135      DCA     TCNTR1
1673 4431      T26R2,  KILBUF
1674 7301      CLA CLL IAC
1675 1017      TAD     K1000
1676 3151      DCA     CMREG
1677 1135      TAD     TCNTR1
1700 0117      AND     K0037
1701 1065      TAD     CYL450
1702 4425      DISKGO
1703 1716      T26T
1704 5314      JMP      T26E
    
```

```

1705 1113      TAD      K5252
1706 4427      FIGURE
1707 7610      SKP CLA
1710 5314      JMP      T26E
1711 2135      ISZ     TCNTR1
1712 5273      JMP      T26R2
1713 4437      NERROR
1714 4440      T26E,  ERROR
1715 1645      TST26
1716 5373      T26T,  5373
    
```

```

/VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
/USE DATA PATTERN 2525 + 5252
/CHECK FOR NO ERRORS IN STATUS,
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR,
    
```

```

1717 1122      TST27,  TAD      K7740
1720 3135      DCA     TCNTR1
1721 1112      TAD      K2525
1722 4430      FILBUF
1723 1135      T27R1,  TAD      TCNTR1
1724 0117      AND     K0037
1725 1065      TAD     CYL450
1726 3463      DCA I   XLOTRK
1727 7301      CLA CLL IAC
1730 1070      TAD     DRIVNO
1731 3464      DCA I   XHITRK
1732 7301      CLA CLL IAC
1733 1104      TAD     K4000
1734 3151      DCA     CMREG
1735 1463      TAD I   XLOTRK
1736 4425      DISKGO
1737 1767      T27T
1740 5365      JMP      T27E
1741 2135      ISZ     TCNTR1
1742 5323      JMP      T27R1
    
```

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA,
    
```

```

1743 1122      TAD      K7740
1744 3135      DCA     TCNTR1
1745 4431      T27R2,  KILBUF
1746 7301      CLA CLL IAC
1747 3151      DCA     CMREG
1750 1135      TAD     TCNTR1
1751 0117      AND     K0037
1752 1065      TAD     CYL450
1753 4425      DISKGO
1754 1767      T27T
1755 5365      JMP      T27E
1756 1112      TAD     K2525
1757 4427      FIGURE
1760 7610      SKP CLA
    
```

```

1761 5365      JMP      T27E      /ERROR, DATA
1762 2135      ISZ      TCNTR1  /UPDATE SECTOR COUNTER
1763 5345      JMP      T27R2    /MORE SECTORS TO CHECK
1764 4437      NEPROR          /O.K. TO NEXT TEST
1765 4440      T27E,  ERROR    /ERROR, WRITE ALL
1766 1717      TST27          /SCOPE LOOP POINTER
1767 5373      T27I,  5373    /TEXT POINTER
/
/SECTOR TIMING TEST
/VERIFY THAT WRITE AND READ ALL ARE ACTUALLY DOING CONSECUTIVE
/SECTORS, WHEN DOING CONSECUTIVE SECTORS IN WRITE OR READ
/ALL MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY 2.5 MILLI-
/SECONDS, THE PROGRAM WILL REPORT A STATUS ERROR OF
/NO DONE FLAG IF THIS DOES NOT OCCUR.
/
1770 1157      TAD      HOMEHA
1771 1070      TAD      DRIVNO
1772 3137      DCA      TCNTR3      /SAVE FIELD + DRIVE
1773 1122      TST28,  TAD      K7740
1774 3135      DCA      TCNTR1      /SETUP SECTOR COUNTER
1775 1114      TAD      K5000        /FUNCTION WRITE ALL
1776 3151      DCA      CMREG      /SETUP COMMAND
1777 7340      CLA      CLL CMA
2000 1117      TAD      K0037
2001 4425      DISKGO
2002 2052      T28I
2003 5250      JMP      T28E
2004 1170      TAD      K5300
2005 3252      DCA      T28T
2006 1135      T28R,  TAD      TCNTR1  /MODIFY TEXT POINTER
2007 7110      CLL      RAR
2010 7630      SZL      CLA
2011 1104      TAD      K4000
2012 1017      TAD      K1000
2013 1137      TAD      TCNTR3
2014 3151      DCA      CMREG      /GET FIELD + DRIVE
2015 1151      TAD      CMREG      /SAVE FOR ERROR TYPEOUT
2016 6746      T28IDA, DLDC
2017 1067      TAD      BGNBUF      /LOAD COMMAND REGISTER
2020 3153      DCA      CAREG      /SAVE FOR ERROR TYPEOUT
2021 1153      TAD      CAREG
2022 6744      T28IOB, DLCA
2023 1135      TAD      TCNTR1      /LOAD CURRENT ADDRESS
2024 0117      AND      K0037
2025 3152      DCA      DAREG      /MASK SECTOR BITS
2026 1152      TAD      DAREG      /SAVE FOR ERROR TYPEOUT
2027 6743      T28IOC, DLAG
2030 1105      TAD      K6000
2031 3136      DCA      TCNTR2
2032 6745      T28IOD, DRST
2033 3147      DCA      STREG      /READ STATUS REGISTER
2034 1147      TAD      STREG      /SAVE FOR ERROR TYPEOUT
2035 1104      TAD      K4000
2036 7650      SNA      CLA
2037 5245      JMP      T28OK      /WAS STATUS 4000
/YES, GOT TRANSFER DONE

```

```

2040 2136      ISZ      TCNTR2  /UPDATE TIME COUNTER
2041 5232      JMP      T28IOD    /WAIT FOR GOOD STATUS
2042 4447      DSKSKP          /ERROR, HAVE TO WAIT FOR FLAG
2043 5242      JMP      .-1     /HANG IF NO SKIP
2044 5250      JMP      T28E    /ERROR, WRITE ALL
2045 2135      T28OK,  ISZ      TCNTR1  /UPDATE SECTOR COUNTER
2046 5206      JMP      T28R    /MORE TO TEST
2047 4437      NERROR
2050 4440      T28E,  ERROR    /O.K. TO NEXT TEST
2051 1773      TST28          /ERROR, WRITE OR READ ALL
2052 5300      T28T,  5300    /SCOPE LOOP POINTER
/TEXT POINTER
/
/SECTOR TIMING TEST
/VERIFY THAT READ AND WRITE DATA ARE NOT DOING CONSECUTIVE
/SECTORS, WHEN TRYING TO DO CONSECUTIVE SECTORS IN READ DATA
/OR WRITE DATA MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY DISK
/REVOLUTION, APROX, EVERY 40 MILLISECONDS, THE PROGRAM WILL
/REPORT AN ERROR OF A DONE FLAG IF THIS DOES NOT OCCUR
/
2053 1122      TST29,  TAD      K7740
2054 3135      DCA      TCNTR1      /SECTOR COUNTER
2055 3151      DCA      CMREG      /SETUP COMMAND
2056 1117      TAD      K0037
2057 4425      DISKGO
2060 2126      T29I
2061 5324      JMP      T29E
2062 1170      TAD      K5300
2063 3326      DCA      T29T
2064 1135      T29R,  TAD      TCNTR1  /MODIFY TEXT POINIER
2065 7110      CLL      RAR
2066 7630      SZL      CLA
2067 1104      TAD      K4000
2070 1137      TAD      TCNTR3
2071 3151      DCA      CMREG      /READ DATA OR WRITE DATA
2072 1151      TAD      CMREG      /HERE IF WRITE DATA
2073 6746      T29IDA, DLDC
2074 1067      TAD      BGNBUF      /GET FIELD + DRIVE
2075 3153      DCA      CAREG      /SAVE FOR ERROR TYPEOUT
2076 1153      TAD      CAREG
2077 6744      T29IOB, DLCA
2078 1135      TAD      TCNTR1      /LOAD COMMAND REGISTER
2079 0117      AND      K0037
2080 3152      DCA      DAREG      /LOAD CURRENT ADDRESS
2081 1152      TAD      DAREG      /MASK SECTOR BITS
2082 6743      T29IOC, DLAG
2083 1105      TAD      K6000
2084 3136      DCA      TCNTR2
2085 3144      DCA      GDREG2
2086 6745      T29IOD, DRST
2087 3147      DCA      STREG      /TIME COUNTER
2088 1147      TAD      STREG      /EXPECTED STATUS
2089 7640      SZA      CLA
2090 5324      JMP      T29E      /READ STATUS REGISTER
2091 2136      ISZ      TCNTR2  /SAVE FOR ERROR TYPEOUT
/STATUS O.K.?
/ERROR IN STATUS
/UPDATE TIME COUNTER

```

```

2116 5310      JMP      T2910D      /WAIT FOR GOOD STATUS
2117 4447      DSKSKP           /ERROR, HAVE TO WAIT FOR FLAG
2120 5317      JMP      ,=-1      /HANG IF NO SKIP
2121 2135      T290K, ISZ TCNTR1 /UPDATE SECTOR COUNTER
2122 5264      JMP      T29R      /MORE TO TEST
2123 4437      NERROR      /O.K. TO NEXT TEST
2124 4440      T29E, ERROR    /ERROR, STATUS
2125 2053      TST29      /SCOPE LOOP POINTER
2126 5300      T29T, 5300      /MODIFIED TEXT POINTER
/
/ DATA TRANSFER IS WORKING, NOW CHECK CRC WORD IN
/ THE CRC REGISTER AFTER A READ ALL, THE CRC SHOULD BE
/ ALL 0'S FOR ALL 0'S DATA PATTERN.
/
2127 1107      TST30, TAD      K7760
2130 3135      DCA      TCNTR1      /SETUP SECTOR COUNTER
2131 7301      T30R, CLA CLL IAC
2132 4453      CLRALL           /CLEAR CONTROL
2133 4431      KILBUF        /CLEAR BUFFER AREA
2134 1114      TAD      K5000      /FUNCTION WRITE ALL
2135 3151      DCA      CMREG      /SETUP COMMAND
2136 1135      TAD      TCNTR1
2137 0116      AND      K0017      /MASK SECTOR BITS
2140 4425      DISKGO       /DISK WRITE ALL
2141 2171      T30T           /TEXT POINTER
2142 5367      JMP      T30E      /ERROR, STATUS OR SKIP
2143 1017      TAD      K1000      /FUNCTION READ ALL
2144 3151      DCA      CMREG      /SETUP COMMAND
2145 1135      TAD      TCNTR1
2146 0116      AND      K0017      /MASK SECTOR BITS
2147 4425      DISKGO       /DISK READ ALL
2150 2171      T30T           /TEXT POINTER
2151 5367      JMP      T30E      /ERROR, STATUS OR SKIP
2152 1171      TAD      K6304
2153 3371      DCA      T30T           /MODIFY TEXT POINTER
2154 7301      CLA CLL IAC      /ENABLE CLEAR CONTROL
2155 4453      CLRALL           /AND CLEAR BRK ENABLE FLOP
2156 3143      DCA      GDREG1      /STORE IN COMPARE REGISTER
2157 3144      DCA      GDREG2      /STORE IN COMPARE REGISTER
2160 4454      RDCRC           /READ CRC REGISTER
2161 4443      ACCMP2          /CHECK RESULTS
2162 7610      SKP CLA
2163 5367      JMP      T30E      /O.K.
2164 2135      ISZ      TCNTR1      /ERROR, CRC
2165 5331      JMP      T30R      /UPDATE SECTOR COUNTER
2166 4437      NERROR      /MORE SECTORS TO TEST
2167 4440      T30E, ERROR    /O.K. TO NEXT TEST
2170 2127      TST30      /ERROR, CRC
2171 6304      T30T, 6304      /SCOPE LOOP POINTER
/
/
2172 5773      JMP I      ,+1      /TEXT POINTER
2173 2200      TST31
/
PAGE
/

```

```

/VERIFY THAT THE CRC WORD WRITTEN
/ON DISK IS CORRECT, COMPARE IT TO
/KNOWN VALUE IN CORE, ON A READ ALL THE
/CRC HEAD FROM DISK IS LEFT IN THE CRC BUFFER,
/ THE CRC SHOULD BE 116047 FOR DATA 2525 + 5252.
/
2200 1107      TST31, TAD      K7760
2201 3135      DCA      TCNTR1      /SETUP SECTOR COUNTER
2202 7301      T31R, CLA CLL IAC
2203 4453      CLRALL           /CLEAR CONTROL
2204 1112      TAD      K2525
2205 4430      FILBUF        /FILL DATA BUFFER
2206 1114      TAD      K5000      /FUNCTION WRITE ALL
2207 3151      DCA      CMREG      /SETUP COMMAND
2210 1135      TAD      TCNTR1
2211 0116      AND      K0017      /MASK SECTOR BITS
2212 1107      TAD      K7760
2213 4425      DISKGO       /DISK WRITE ALL
2214 2247      T31T           /TEXT POINTER
2215 5245      JMP      T31E      /ERROR, STATUS OR SKIP
2216 1017      TAD      K1000      /FUNCTION READ ALL
2217 3151      DCA      CMREG      /SETUP COMMAND
2220 1135      TAD      TCNTR1
2221 0116      AND      K0017      /MASK SECTOR BITS
2222 1107      TAD      K7760
2223 4425      DISKGO       /DISK READ ALL
2224 2247      T31T           /TEXT POINTER
2225 5245      JMP      T31E      /ERROR, STATUS OR SKIP
2226 1171      TAD      K6304
2227 3247      DCA      T31T           /MODIFY TEXT POINTER
2230 7301      CLA CLL IAC      /ENABLE CLEAR CONTROL AND
2231 4453      CLRALL           /CLEAR BRK ENABLE FLOP.
2232 1162      TAD      CRWRD1      /GET GOOD CRC
2233 3143      DCA      GDREG1      /STORE IN COMPARE REGISTER
2234 1163      TAD      CRWRD2      /GET GOOD CRC
2235 3144      DCA      GDREG2      /STORE IN COMPARE REGISTER
2236 4454      RDCRC           /READ CRC REGISTER
2237 4443      ACCMP2          /CHECK RESULTS
2240 7610      SKP CLA
2241 5245      JMP      T31E      /O.K.
2242 2135      ISZ      TCNTR1      /ERROR, CRC
2243 5202      JMP      T31R      /UPDATE SECTOR COUNTER
2244 4437      NERROR      /MORE SECTORS TO TEST
2245 4440      T31E, ERROR    /O.K. TO NEXT TEST
2246 2200      TST31      /ERROR, CRC
2247 6304      T31T, 6304      /SCOPE LOOP POINTER
/
/
/REALLY PROVE THE HEADS ARE MOVING.
/VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
/AND THEN CYLINDER 0, USE DATA PATTERN 5252 + 2525 ON
/CYLINDER 1450 AND 2525 + 5252 ON CYLINDER 0.
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/

```

```

/FIRST WRITE CYLINDER 1450
/
2250 1122 TST32, TAD K7740
2251 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2252 1113 TAD K5252
2253 4430 FILBUF /FILL BUFFER WITH DATA
2254 7301 CLA CLL IAC
2255 1070 TAD DRIVNO /GET DRIVE NUMBER
2256 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2257 1135 T32R1, TAD TCNTR1
2260 0117 AND K0037 /MASK SECTOR BITS
2261 1065 TAD CYL450 /LOWER CYLINDER
2262 3463 DCA I XLOTRK /SETUP WORD IN BUFFER
2263 7301 CLA CLL IAC
2264 1114 TAD K5000 /FUNCTION WRITE ALL
2265 3151 DCA CMREG /SETUP COMMAND
2266 1463 TAD I XLOTRK /SECTOR TO GO
2267 4425 DISKGO /DISK WRIT ALL
2270 2362 T32T /TEXT POINTER
2271 5360 JMP T32E /ERROR, STATUS OR SKIP
2272 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2273 5257 JMP T32R1 /MORE SECTORS TO GO

```

/WRITE ALL TO ALL OF CYLINDER 0

```

2274 1122 TAD K7740
2275 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2276 1112 TAD K2525
2277 4430 FILBUF /FILL BUFFER WITH DATA
2300 1135 T32R2, TAD TCNTR1
2301 0117 AND K0037 /MASK SECTOR BITS
2302 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
2303 1070 TAD DRIVNO /GET DRIVE NUMBER
2304 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2305 1114 TAD K5000 /FUNCTION WRITE ALL
2306 3151 DCA CMREG /SETUP COMMAND
2307 1463 TAD I XLOTRK /SECTOR TO LOAD
2310 4425 DISKGO /DISK WRITE ALL
2311 2362 T32T /TEXT POINTER
2312 5360 JMP T32E /ERROR, SKIP OR STATUS
2313 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2314 5300 JMP T32R2 /MORE SECTORS TO GO

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.

```

2315 1122 TAD K7740
2316 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
2317 4431 KILBUF /CLEAR DATA BUFFER
2320 7301 CLA CLL IAC
2321 1017 TAD K1000 /READ ALL FUNCTION
2322 3151 DCA CMREG /SETUP COMMAND
2323 1135 TAD TCNTR1
2324 0117 AND K0037
2325 1065 TAD CYL450 /ADD IN CYLINDER

```

```

2326 4425 DISKGO /DISK READ ALL
2327 2362 T32T /TEXT POINTER
2330 5360 JMP T32E /ERROR, STATUS OR SKIP
2331 1113 TAD K5252
2332 4427 FIGURE /WORD BY WORD COMPARE OF DATA
2333 7610 SKP CLA /DATA O.K.
2334 5360 JMP T32E /ERROR, DATA
2335 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2336 5317 JMP T32R3 /MORE SECTORS TO CHECK

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.

```

2337 1122 TAD K7740
2340 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
2341 4431 KILBUF /CLEAR DATA BUFFER
2342 1017 TAD K1000 /READ ALL FUNCTION
2343 3151 DCA CMREG /SETUP COMMAND
2344 1135 TAD TCNTR1
2345 0117 AND K0037
2346 4425 DISKGO /DISK READ ALL
2347 2362 T32T /TEXT POINTER
2350 5360 JMP T32E /ERROR, STATUS OR SKIP
2351 1112 TAD K2525
2352 4427 FIGURE /WORD BY WORD COMPARE OF DATA
2353 7610 SKP CLA /DATA O.K.
2354 5360 JMP T32E /ERROR, DATA
2355 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2356 5341 JMP T32R4 /MORE SECTORS TO CHECK
2357 4437 NERROR /O.K. TO NEXT TEST
2360 4440 T32E, ERROR /ERROR, WRITE ALL
2361 2250 TST32 /SCOPE LOOP POINTER
2362 5373 T32T, 5373 /TEXT POINTER
/
2363 5764 JMP I ,+1 /TO NEXT TEST
2364 2400 TST33
/
PAGE
/

```

/REALLY PROVE HEADS ARE MOVING.
/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/THEN CYLINDER 1450, USE DATA PATTERN 2525 + 5252 ON
/CYLINDER 1450 AND 5252 + 2525 ON CYLINDER 0.
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/FIRST WRITE DATA TO CYLINDER 0.
/

```

2400 1122 TST33, TAD K7740
2401 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2402 1113 TAD K5252
2403 4430 FILBUF /FILL BUFFER WITH DATA
2404 7300 T33R1, CLA CLL
2405 1135 TAD TCNTR1

```

```

2406 0117      AND      K0037      /MASK OFF SECTOR BITS
2407 3463      DCA I   XLOTRK     /SETUP ADDRESS WORD IN BUFFER
2410 1070      TAD      DRIVNO     /GET DRIVE NUMBER
2411 3464      DCA I   XHITRK     /SETUP ADDRESS WORD IN BUFFER
2412 1104      TAD      K4000     /FUNCTION WRITE DATA
2413 3151      DCA      CMREG      /SETUP COMMAND
2414 1463      TAD I   XLOTRK     /SECTOR TO LOAD
2415 4425      DISKGO  /DISK WRITE DATA
2416 2511      T33T     /TEXT POINTER
2417 5307      JMP      T33E     /ERROR, STATUS OR SKIP
2420 2135      ISZ     TCNTR1    /UPDATE SECTOR COUNTER
2421 5204      JMP      T33F1    /MORE SECTORS TO GO

```

/WRITE DATA TO ALL OF CYLINDER 1450

```

2422 1122      TAD      K7740     /SETUP SECTOR COUNTER
2423 3135      DCA     TCNTR1    /SETUP SECTOR COUNTER
2424 1112      TAD      K2525     /SETUP SECTOR COUNTER
2425 4430      FILBUF   /FILL BUFFER WITH DATA
2426 7301      CLA CLL IAC      /SETUP COMMAND
2427 1070      TAD      DRIVNO     /GET DRIVE NUMBER
2430 3464      DCA I   XHITRK     /SETUP ADDRESS WORD IN BUFFER
2431 1135      T33R2, TAD      TCNTR1    /SETUP SECTOR COUNTER
2432 0117      AND      K0037     /MASK OFF SECTOR BITS
2433 1065      TAD      CYL450    /ADD IN CYLINDER
2434 3463      DCA I   XLOTRK     /SETUP ADDRESS WORD IN BUFFER
2435 7301      CLA CLL IAC      /EXTENDED TRACK BIT
2436 1104      TAD      K4000     /FUNCTION WRITE DATA
2437 3151      DCA      CMREG      /SETUP COMMAND
2440 1463      TAD I   XLOTRK     /SECTOR TO LOAD
2441 4425      DISKGO  /DISK WRITE DATA
2442 2511      T33T     /TEXT POINTER
2443 5307      JMP      T33E     /ERROR, STATUS OR SKIP
2444 2135      ISZ     TCNTR1    /UPDATE SECTOR COUNTER
2445 5231      JMP      T33R2    /MORE SECTORS TO GO

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K. CHECK WITH READ DATA.

```

2446 1122      TAD      K7740     /COUNTER FOR 37 SECTORS
2447 3135      DCA     TCNTR1    /COUNTER FOR 37 SECTORS
2450 4431      T33R3, KILBUF   /CLEAR DATA BUFFER
2451 3151      DCA      CMREG      /SETUP COMMAND
2452 1135      TAD      TCNTR1    /SETUP SECTOR COUNTER
2453 0117      AND      K0037     /MASK OFF SECTOR BITS
2454 4425      DISKGO  /DISK READ DATA
2455 2511      T33T     /TEXT POINTER
2456 5307      JMP      T33E     /ERROR, STATUS OR SKIP
2457 1113      TAD      K5252     /SETUP SECTOR COUNTER
2460 4427      FIGURE   /WORD BY WORD COMPARE OF DATA
2461 7610      SKP CLA   /DATA O.K.
2462 5307      JMP      T33E     /ERROR, DATA
2463 2135      ISZ     TCNTR1    /UPDATE SECTOR COUNTER
2464 5250      JMP      T33R3    /MORE SECTORS TO CHECK

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.

```

2465 1122      TAD      K7740     /SECTOR COUNTER
2466 3135      DCA     TCNTR1    /SECTOR COUNTER
2467 4431      T33R4, KILBUF   /CLEAR DATA BUFFER
2470 7301      CLA CLL IAC      /SETUP COMMAND
2471 3151      DCA      CMREG      /SETUP COMMAND
2472 1135      TAD      TCNTR1    /SETUP SECTOR COUNTER
2473 0117      AND      K0037     /MASK OFF SECTOR BITS
2474 1065      TAD      CYL450    /ADD IN CYLINDER
2475 4425      DISKGO  /DISK READ DATA
2476 2511      T33T     /TEXT POINTER
2477 5307      JMP      T33E     /ERROR, STATUS OR SKIP
2500 1112      TAD      K2525     /SETUP SECTOR COUNTER
2501 4427      FIGURE   /WORD BY WORD COMPARE OF DATA
2502 7610      SKP CLA   /DATA O.K.
2503 5307      JMP      T33E     /ERROR, DATA
2504 2135      ISZ     TCNTR1    /UPDATE SECTOR COUNTER
2505 5267      JMP      T33R4    /MORE SECTORS TO CHECK
2506 4437      HERROR   /O.K. TO NEXT TEST
2507 4440      T33E,  ERROR     /ERROR, WRITE DATA
2510 2400      TSTJ3    /SCOPE LOOP POINTER
2511 5373      T33T,  5373     /TEXT POINTER

```

/VERIFY A CYLINDER ADDRESS ERROR IN
/STATUS REGISTER, CAN BE CAUSED BY ISSUING
/MAINTENANCE SHIFT CRC AFTER DISK
/HAS ACCEPTED THE ADDRESS.

```

2512 7301      TST34, CLA CLL IAC      /CLEAR CONTROL
2513 4453      CLRALL   /CLEAR CONTROL
2514 4423      SEEK     /SEEK ONLY TRACK 0
2515 2546      T34T     /TEXT POINTER
2516 5344      JMP      T34E     /ERROR, SKIP OR STATUS
2517 7301      CLA CLL IAC      /SETUP COMMAND
2520 1157      TAD      HOMEWA    /SETUP SECTOR COUNTER
2521 1070      TAD      DRIVNO     /GET DRIVE NUMBER
2522 1104      TAD      K4000     /FUNCTION WRITE DATA
2523 4450      LDCMD   /LOAD COMMAND REGISTER
2524 7301      CLA CLL IAC      /SETUP COMMAND
2525 1104      TAD      K4000     /SETUP SECTOR COUNTER
2526 3144      DCA     GDREG2    /EXPECTED STATUS
2527 1066      TAD      TRK212    /SETUP SECTOR COUNTER
2530 4452      LDADD   /LOAD AND GO READ
2531 7330      CLA CLL CML RAR   /SETUP COMMAND
2532 4455      LDMAN   /ENTER MAINTENANCE
2533 7010      RAR     /ENTER MAINTENANCE
2534 4455      LDMAN   /SET DB4 FOR ENABLE SHIFT
2535 7010      RAR     /ENTER MAINTENANCE
2536 4455      LDMAN   /SHIFT CRC
2537 4447      DSKSKP  /WAIT FOR FLAG
2540 5337      JMP      .-1      /WAIT FOR FLAG
2541 4444      RDSTAT  /READ STATUS REGISTER
2542 4442      ACCMP1 /CHECK RESULTS

```

```

2543 4437          NERROR          /O.K. TO NEXT TEST
2544 4440          T34E, ERROR        /ERROR, CYLINDER ADDRESS
2545 2512          TST34          /SCOPE LOOP POINTER
2546 5300          T34T, 5300         /TEXT POINTER
/
2547 5750          JMP I .+1          /TO NEXT TEST
2550 2600          TST35
/
/ PAGE
/
/VERIFY A CRC ERROR BY ENTERING MAINTENANCE
/AND SHIFTING CRC IN *WRITE ALL MODE.
/
2600 7301          TST35, CLA CLL IAC
2601 4453          CLRALL          /CLEAR CONTROL
2602 4431          KILBUF          /CLEAR BUFFER AREA
2603 1067          TAD          RGNBUF
2604 4451          LDCUR          /LOAD CURRENT ADDRESS
2605 1157          TAD          HOMEWA
2606 1070          TAD          DRIVNO
2607 1114          TAD          K5000
2610 4450          LDCMD          /TOTAL WRITE COMMAND
2611 4452          LDADD          /LOAD COMMAND
2612 7330          CLA CLL CML RAR
2613 4455          LDMAN          /LOAD AND GO WRITE ALL
2614 7010          RAR          /ENTER MAINTENANCE
2615 4455          LDMAN          /SET DB4 TO ENABLE SHIFT
2616 7010          RAR
2617 1073          TAD          K0002
2620 4455          LDMAN          /SET AC BIT 10 DATA
2621 4447          DSKSKP          /SHIFT CRC
2622 5220          JMP .+2          /SKIP ON ERROR FLAG!
2623 7301          CLA CLL IAC          /KEEP SHIFTING CRC TILL ERROR
2624 4453          CLRALL          /CLEAR CONTROL
2625 7330          CLA CLL CML RAR
2626 1011          TAD          K0010
2627 3144          DCA          GDREG2          /EXPECTED STATUS REGISTER
2630 1067          TAD          BGNBUF
2631 4451          LDCUR          /LOAD CURRENT ADDRESS
2632 1157          TAD          HOMEWA
2633 1070          TAD          DRIVNO
2634 1017          TAD          K1000
2635 4450          LDCMD          /TOTAL READ ALL COMMAND
2636 4452          LDADD          /LOAD COMMAND REGISTER
2637 4447          DSKSKP          /LOAD AND GO READ ALL
2640 5237          JMP .+1          /WAIT AND SKIP ON CRC ERROR!
2641 4444          RDSTAT          /READ STATUS REGISTER
2642 4442          ACCMP1          /CHECK RESULTS
2643 4437          NERROR          /O.K. TO NEXT TEST
2644 4440          T35E, ERROR        /ERROR, CRC ERROR
2645 2600          TST35          /SCOPE POINTER
2646 5300          5300          /TEXT POINTER
/
/BIG ADDRESSING TEST
/FORMAT THE COMPLETE DISK SURFACE WITH

```

```

/WRITE ALL, USE DATA PATTERN 2525 + 5252
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ABSOLUTE ADDRESS OF SECTOR.
/
2647 7301          TST36, CLA CLL IAC
2650 4453          CLRALL          /CLEAR CONTROL
2651 1112          TAD          K2525
2652 4430          FILBUF          /FILL BUFFER WITH DATA
2653 3463          DCA I XLOTRK          /COUNTER + TRACK WORD
2654 1070          TAD          DRIVNO          /GET DRIVE NUMBER
2655 3464          DCA I XHITRK          /COUNTER + TRACK WORD
2656 1070          TAD          DRIVNO          /CURRENT DRIVE
2657 1157          TAD          HOMEWA          /CURRENT FIELD
2660 1114          TAD          K5000          /FUNCTION WRITE ALL
2661 3151          DCA          CMREG          /SETUP COMMAND
2662 1067          TAD          BGNBUF          /GET START OF BUFFER
2663 3153          DCA          CAREG          /FOR ERROR PRINTER
2664 7330          T36R, CLA CLL CML RAR
2665 3144          DCA          GDREG2          /SETUP EXPECTED STATUS COMPARE
2666 1463          TAD I XLOTRK
2667 3152          DCA          DAREG
2670 1067          TAD          BGNBUF
2671 6744          IOT4A1, DLCA
2672 1151          TAD          CMREG
2673 6746          IOT6A1, DLDC
2674 1463          TAD I XLOTRK
2675 6743          IOT3A1, DLG
2676 6741          IOT1A1, DSKP
2677 5276          JMP .-1
2700 6745          IOT5A1, DRST
2701 3147          DCA          STREG
2702 1147          TAD          STREG
2703 1104          TAD          K4000
2704 7640          SZA CLA
2705 5325          JMP          T36E
2706 7301          CLA CLL IAC
2707 6742          IOT2A1, DCLR
2710 2463          ISZ I XLOTRK
2711 5314          JMP          .+3
2712 2151          ISZ          CMREG          /DON'T SET EXTENDED TRACK
2713 2464          ISZ I XHITRK          /YES, SET IT
2714 1464          TAD I XHITRK          /SETUP BUFFER ALSO
2715 7110          CLL RAR          /GET TRACK WORD
2716 7620          SNL CLA          /GET EXTENDED BIT TO LINK
2717 5264          JMP          T36H          /WAS IT SET
2720 1463          TAD I XLOTRK          /NO, CONTINUE
2721 1172          TAD          ENDTRK          /GET LOWER TRACK WORD
2722 7640          SZA CLA          /ADD IN FUDGE FACTOR
2723 5264          JMP          T36R          /DONE WITH DISK
2724 4437          NERROR          /NO, MORE TO GO
2725 4440          T36E, ERROR        /O.K. TO NEXT TEST
2726 2647          TST36          /ERROR, STATUS
2727 5300          T36T, 5300         /SCOPE LOOP POINTER
/TEXT POINTER
/
2730 5731          JMP I .+1          /TO NEXT TEST

```



```

2731 3000      TST37
3000      PAGE
/
/BIG ADDRESSING CHECK1
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR
/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
/SHOULD REALIZE THAT THE PROBLEM COULD BE
/ADDRESSING.
/
/
/VERIFY THAT THE DATA ON DISK IS CORRECT
/CHECK THE COMPLETE SURFACE
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3000 3135      TST37, DCA      TCNTR1
3001 1017      TAD      K1000      /FUNCTION READ ALL
3002 1157      TAD      HOME MA  /CURRENT FIELD
3003 1070      TAD      DRIVNO    /CURRENT DRIVE
3004 3151      DCA      CMREG     /SETUP COMMAND
3005 1207      TAD      ,+2       /GET TEXT POINTER
3006 7410      SKP
3007 3077      T37T
/TEXT POINTER
3010 3174      DCA      SAVPCT    /SAVE FOR CRC ERROR
3011 1067      TAD      BGNBUF    /GET START OF BUFFER
3012 3153      DCA      CAREG     /SAVE FOR ERROR PRINTER
3013 7340      T37R,  CLA CLL  CMA
3014 3173      DCA      SOFERR    /SETUP CRC ERROR POINTER
3015 4431      KILBUF
/CLEAR DATA BUFFER
3016 1135      TAD      TCNTR1   /LOWER DISK ADDRESS
3017 3152      DCA      DAREG     /SAVE FOR PRINTER
3020 1067      TAD      BGNBUF    /GET START OF BUFFER
3021 6744      IOT4A2, DLCA
/LOAD CURRENT ADDRESS
3022 1151      TAD      CMREG     /GET COMMAND
3023 6746      IOT6A2, DLDC
/LOAD COMMAND REGISTER
3024 1135      TAD      TCNTR1   /GET DISK ADDRESS
3025 6743      IOT3A2, DLAG
/LOAD DISK ADDRESS AND GO
3026 6741      IOT1A2, DSKP
/DISK SKIP IOT
3027 5226      JMP      ,=1
/WAIT FOR DISK SKIP
3030 6745      IOTS A2, DRST
/READ STATUS
3031 3147      DCA      STREG     /SAVE FOR ERROR PRINTER
3032 1147      TAD      STREG
3033 1104      TAD      K4000
/ADD IN FUDGE FACTOR
3034 7650      SNA CLA
/STATUS O.K.
3035 5251      JMP      T37A
/NO STATUS ERRORS
3036 7330      CLA CLL  CML RAR
/EXPECTED STATUS
3037 3144      DCA      GDREG2
/SETUP COMPARE REGISTER
3040 1147      TAD      STREG     /GET STATUS READ
3041 0011      AND      K0010
/MASK FOR CRC
3042 7640      SZA CLA
/AS IT CRC ERROR
3043 5247      JMP      ,+4
/YES CRC ERROR
3044 1170      TAD      K5300
/GET TEXT POINTER
3045 3277      DCA      T37T
/SAVE IT

```

```

3046 5275      JMP      T37E
/STATUS ERROR NOT CRC
3047 3173      DCA      SOFERR
/SET CRC ERROR POINTER
3050 5253      JMP      ,+3
/DON'T CLEAR CONTROL
3051 7301      T37A,  CLA CLL  IAC
/ENABLE CLEAR CONTROL
3052 6742      IOT2A2, DCLR
/CLEAR CONTROL
3053 1167      TAD      K5373
3054 3277      DCA      T37T
/SETUP TEXT POINTER
3055 1112      TAD      K2525
/GET EXPECTED DATA
3056 4427      FIGURE
/CHECK DATA READ
3057 7610      SKP CLA
/THIS ONE O.K.
3060 5275      JMP      T37E
/ERROR, DATA
3061 2135      ISZ      TCNTR1
/UPDATE LOWER DISK ADDRESS
3062 7610      SKP CLA
3063 2151      ISZ      CMREG
/SET EXTENDED BIT
3064 1151      TAD      CMREG
3065 0072      AND      K0001
3066 7650      SNA CLA
/IS EXTENDED SET
3067 5213      JMP
/NO, CONTINUE
3070 1135      TAD      TCNTR1
3071 1172      TAD      ENDIRK
/ADD IN FUDGE FACTOR
3072 7640      SZA CLA
/DONE WITH DISK
3073 5213      JMP      T37R
/NO, MORE TO GO
3074 4437      NERROR
/O.K. TO NEXT TEST
3075 4440      T37E,  ERROR
/ERROR, STATUS
3076 3000      TST37
/SCOPE LOOP POINTER
3077 5300      T37T,  5300
/TEXT POINTER
/
/BIG ADDRESSING CHECK1
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR
/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
/SHOULD REALIZE THAT THE PROBLEM COULD BE
/ADDRESSING.
/
/
/READ ALL SECTORS ON THE DISK AND CHECK
/THE STATUS. IF STATUS ERROR OCCURES THEN CHECK THE DATA.
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3100 7340      TST38,  CLA CLL  CMA
/SETUP CRC ERROR POINTER
3101 3173      DCA      SOFERR
/SETUP LOWER ADDRESS
3102 3135      DCA      TCNTR1
/SETUP EXTENDED
3103 3136      DCA      TCNTR2
/SETUP EXTENDED
3104 1017      TAD      K1000
/FUNCTION READ ALL
3105 1070      TAD      DRIVNO
/CURRENT DRIVE
3106 1157      TAD      HOME MA
/CURRENT FIELD
3107 3151      DCA      CMREG
/SETUP COMMAND
3110 1067      T38R,  TAD      BGNBUF
/START OF BUFFER
3111 4451      LDCUR
/LOAD CURRENT
3112 1151      TAD      CMREG
/LAST COMMAND ISSUED
3113 4450      LDCMD
/LOAD COMMAND
3114 1135      TAD      TCNTR1
/LOWER ADDRESS
3115 4452      LDADD
/LOAD AND GO
3116 4447      DSKSKP
/DISK SKIP IOT
3117 5316      JMP      ,=1
/HANG IF NO SKIP

```

```

3120 4444 RDSTAT /READ STATUS
3121 1104 TAD K4000 /SHOULD ONLY BE DONE
3122 7640 SZA CLA /JUST DONE FLAG ?
3123 5340 JMP T38E /STATUS ERROR
3124 2135 ISZ TCNTR1 /UPDATE ADDRESS
3125 5330 JMP ,+3 /DON'T SET EXTENDED TRACK
3126 2151 ISZ CMREG /YES, SET IT
3127 2136 ISZ TCNTR2
3130 1136 TAD TCNTR2
3131 7650 SNA CLA /IS EXTENDED SET
3132 5310 JMP T38R /NO, CONTINUE
3133 1135 TAD TCNTR1
3134 1172 TAD ENDTRK /ADD IN FUDGE FACTOR
3135 7640 SZA CLA /DONE WITH DISK
3136 5310 JMP T38R /NO, MORE TO GO
3137 5350 JMP T38OK /ALL O.K.
3140 1112 T38E, TAD K2525
3141 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3142 5345 JMP ,+3 /ERROR, JUST THE STATUS
3143 1167 TAD K5373 /TEXT POINTER
3144 7410 SKP /DATA ERROR
3145 1170 TAD K5300 /STATUS TEXT POINTER
3146 3353 DCA T38T /SETUP
3147 7610 SKP CLA /STATUS ERROR
3150 4437 T38OK, NERROR /O.K. TO NEXT TEST
3151 4440 T38DE, ERROR /ERROR, READ DATA
3152 3100 TST38 /SCOPE LOOP POINTER
3153 5300 T38T, 5300 /TEXT POINTER
/
3154 5755 JMP I ,+1 /TO NEXT TEST
3155 3200 TST39
/
3200 PAGE
/
/BIG ADDRESSING CHECK!
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR
/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
/SHOULD REALIZE THAT THE PROBLEM COULD BE
/ADDRESSING.
/
/CHECK DISK HEADER WORD WITH READ DATA
/IF STATUS ERROR OCCURES THEN CHECK DATA,
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3200 7340 TST39, CLA CLL CMA
3201 3173 DCA SOFERR /NO SOFT ERRORS
3202 3135 DCA TCNTR1 /SETUP LOWER ADDRESS
3203 3136 DCA TCNTR2 /SETUP EXTENDED
3204 1070 TAD DRIVNO /CURRENT DRIVE
3205 1157 TAD HOMEWA /CURRENT FIELD
3206 3151 DCA CMREG /SETUP COMMAND
3207 1067 T39R, TAD BGNBUF /START OF BUFFER
3210 4451 LDCUR /LOAD CURRENT

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```

3211 1151 TAD CMREG /LAST COMMAND
3212 4450 LDCMD /LOAD COMMAND
3213 1135 TAD TCNTR1 /LOWER ADDRESS
3214 4452 LDADD /LOAD AND GO
3215 4447 DSKSKP /DISK SKIP IOT
3216 5215 JMP , -1 /HANG IF NO SKIP
3217 4444 RDSTAT /READ STATUS
3220 1104 TAD K4000 /SHOULD ONLY BE DONE
3221 7640 SZA CLA /JUST DONE FLAG ?
3222 5237 JMP T39E /STATUS ERROR
3223 2135 ISZ TCNTR1 /UPDATE ADDRESS
3224 5227 JMP ,+3 /DON'T SET EXTENDED TRACK
3225 2151 ISZ CMREG /YES, SET IT
3226 2136 ISZ TCNTR2
3227 1136 TAD TCNTR2
3230 7650 SNA CLA /IS EXTENDED SET
3231 5207 JMP T39R /NO, CONTINUE
3232 1135 TAD TCNTR1
3233 1172 TAD ENDTRK /ADD IN FUDGE FACTOR
3234 7640 SZA CLA /DONE WITH DISK
3235 5207 JMP T39R /NO, MORE TO GO
3236 5247 JMP T39OK /ALL O.K.
3237 1112 T39E, TAD K2525
3240 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3241 5244 JMP ,+3 /ERROR, JUST STATUS
3242 1167 TAD K5373 /TEXT POINTER
3243 7410 SKP /ERROR
3244 1170 TAD K5300 /STATUS ERROR POINTER
3245 3252 DCA T39T /SETUP
3246 7610 SKP CLA /STATUS ERROR
3247 4437 T39OK, NERROR /O.K. TO NEXT TEST
3250 4440 T39DE, ERROR /ERROR, READ DATA
3251 3200 TST39 /SCOPE LOOP POINTER
3252 5300 T39T, 5300 /TEXT POINTER
/
/DD A RANDDM READ DATA
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3253 1106 TST40, TAD K7000
3254 3141 DCA TCNTR5 /LENGTH OF TIME FOR THIS TEST
3255 4422 T40R, RANADD /GET AN ADDRESS FOR SEEK/READ
3256 3137 DCA TCNTR3 /SAVE IT
3257 7004 RAL /LINK IS EXTENDED
3260 3140 DCA TCNTR4 /SAVE IT
3261 1140 TAD TCNTR4
3262 3151 DCA CMREG /SETUP COMMAND
3263 1137 TAD TCNTR3
3264 4425 DISKGO /DISK READ DATA
3265 3300 T40T /TEXT POINTER
3266 5276 JMP T40E /ERROR, SKIP OR STATUS
3267 1112 TAD K2525
3270 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3271 7610 SKP CLA /DATA O.K.

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3272 5276      JMP      T40E      /DATA ERROR
3273 2141      ISZ     TCNTR5
3274 5255      JMP     T40R      /LOOP
3275 4437      NERROR   /O.K. TO NEXT TEST
3276 4440      T40E,  ERROR     /ERROR, READ
3277 3253      TST40, TST40    /SCOPE LOOP POINTER
3300 0000      T40T,  0000     /TEXT POINTER
/
/RANDOM SEEK THEN WRITE THEN SEEK THEN READ TEST
/THE DATA WRITTEN IS 2525 + 5252 AND THE TWO
/FIRST WORDS OF THE SECTOR ARE SET TO THE DISK ADDRESS.
/
3301 1110      TST41, TAD      K7700
3302 3141      DCA     TCNTR5      /PASS COUNTER
3303 4422      T41R,  RANADD   /GENERATE RANDOM NUMBER
3304 0116      AND     K0017
3305 1107      TAD     K7760
3306 3160      DCA     RAPCNT     /SAVE COUNTER
3307 4422      RANADD   /RANDOM SEEK DISK ADDRESS
3310 3135      DCA     TCNTR1     /SAVE
3311 7004      RAL     /LINK IS EXTENDED BIT
3312 3136      DCA     TCNTR2     /SAVE
3313 4422      RANADD   /RANDOM SEEK/WRITE DISK ADDRESS
3314 3137      DCA     TCNTR3     /SAVE
3315 7004      RAL     /LINK IS EXTENDED BIT
3316 3140      DCA     TCNTR4     /SAVE IT
3317 1112      T41S,  TAD      K2525
3320 4430      FILBUF   /FILL BUFFER
3321 1140      TAD     TCNTR4     /GET EXTENDED BIT
3322 1070      TAD     DRIVNO    /GET DRIVE NUMBER
3323 3464      DCA I   XHITRK   /DISK ADDRESS WORD IN RUFFER
3324 1137      TAD     TCNTR3     /LOWER DISK ADDRESS
3325 3463      DCA I   XLOTRK   /DISK ADDRESS WORD IN BUFFER
3326 1136      TAD     TCNTR2     /GET EXTENDED BIT
3327 3151      DCA     CMREG     /SETUP COMMAND
3330 1135      TAD     TCNTR1     /DISK ADDRESS
3331 4423      SEEK     /SEEK ONLY
3332 3372      T41T     /TEXT POINTER
3333 5370      JMP     T41E     /ERROR SKIP OR STATUS
3334 1140      TAD     TCNTR4     /EXTENDED BIT
3335 1104      TAD     K4000     /FUNCTION WRITE DATA
3336 3151      DCA     CMREG     /SETUP COMMAND
3337 1137      TAD     TCNTR3     /DISK ADDRESS
3340 4425      DISKGO   /DISK WRITE DATA
3341 3372      T41T     /TEXT POINTER
3342 5370      JMP     T41E     /ERROR SKIP OR STATUS
3343 1136      TAD     TCNTR2     /GET EXTENDED BIT
3344 3151      DCA     CMREG     /SETUP COMMAND REGISTER
3345 1135      TAD     TCNTR1     /GET DISK ADDRESS
3346 4423      SEEK     /GO SEEK ONLY
3347 3372      T41T     /TEXT POINTER
3350 5370      JMP     T41E     /ERROR, SEEK SKIP OR STATUS
3351 1140      TAD     TCNTR4     /GET EXTENDED BIT
3352 3151      DCA     CMREG     /SETUP READ DATA COMMAND
3353 1137      TAD     TCNTR3     /DISK ADDRESS

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3354 4425      DISKGO   /DISK READ DATA
3355 3372      T41T     /TEXT POINTER
3356 5370      JMP     T41E     /ERROR, SKIP OR STATUS
3357 1112      TAD     K2525
3360 4427      FIGURE   /WORD BY WORD COMPARE OF DATA
3361 7610      SKP CLA   /DATA O.K.
3362 5370      JMP     T41E     /DATA ERROR
3363 2160      ISZ     RAPCNT     /COUNT TO SAME TRACKS
3364 5317      JMP     T41S     /REPEAT
3365 2141      ISZ     TCNTR5     /PASS COUNTER
3366 5303      JMP     T41R     /LOOP
3367 4437      NERROR   /O.K. TO NEXT TEST
3370 4440      T41L,  ERPROP   /ERROR
3371 3301      TST41, TST41    /SCOPE LOOP POINTER
3372 5373      T41T,  5373    /TEXT POINTER
/
3373 5774      JMP I   .+1     /TO NEXT TEST
3374 3400      TST42, TST42
/
PAGE
/
/VERIFY A RECALIBRATE THEN A RANDOM WRITE DATA,
/THEN A RECALIBRATE THEN RANDOM READ DATA.
/THE DATA PATTERN WRITTEN IS 2525 + 5252 AND
/THE FIRST TWO WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3400 1110      TST42, TAD      K7700
3401 3141      DCA     TCNTR5      /PASS COUNTER
3402 4422      T42R,  RANADD   /RANDOM DISK ADDRESS
3403 3135      DCA     TCNTR1     /SAVE
3404 7004      RAL     /LINK IS EXTENDED BIT
3405 3136      DCA     TCNTR2     /SAVE
3406 1112      T42S,  TAD      K2525
3407 4430      FILBUF   /FILL BUFFER
3410 1136      TAD     TCNTR2     /GET EXTENDED BIT
3411 1070      TAD     DRIVNO    /GET DRIVE NUMBER
3412 3464      DCA I   XHITRK   /DISK ADDRESS WORD IN BUFFER
3413 1135      TAD     TCNTR1     /LOWER DISK ADDRESS
3414 3463      DCA I   XLOTRK   /DISK ADDRESS WORD IN BUFFER
3415 4424      RECAL    /RESTORE DRIVE
3416 3451      T42T     /TEXT POINTER
3417 5247      JMP     T42E     /ERROR SKIP OR STATUS
3420 1136      TAD     TCNTR2     /EXTENDED BIT
3421 1104      TAD     K4000     /FUNCTION WRITE DATA
3422 3151      DCA     CMREG     /SETUP COMMAND
3423 1135      TAD     TCNTR1     /DISK ADDRESS
3424 4425      DISKGO   /DISK WRITE DATA
3425 3451      T42T     /TEXT POINTER
3426 5247      JMP     T42E     /ERROR SKIP OR STATUS
3427 4424      RECAL    /RESTORE DRIVE
3430 3451      T42T     /TEXT POINTER
3431 5247      JMP     T42E     /ERROR, SKIP OR STATUS
3432 1136      TAD     TCNTR2     /GET EXTENDED BIT
3433 3151      DCA     CMREG     /SETUP READ DATA COMMAND

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3434 1135 TAD TCNTR1 /DISK ADDRESS
3435 4425 DISKGO /DISK READ DATA
3436 3451 T42T /TEXT POINTER
3437 5247 JMP T42E /ERROR, SKIP OR STATUS
3440 1112 TAD K2525
3441 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3442 7610 SKP CLA /DATA O.K.
3443 5247 JMP T42E /DATA ERROR
3444 2141 ISZ TCNTR5 /PASS COUNTER
3445 5202 JMP T42R /LOOP
3446 4437 NEPROR /O.K. TO NEXT TEST
T42E, ERROR /ERROR
3450 3400 TST42 /SCOPE LOOP POINTER
3451 5373 T42T, 537J /TEXT POINTER
/
/TRY TO CAUSE CYLINDER ADDRESS ERRORS BY
/DOING A FEW RANDOM SEEKS THEN A READ DATA.
/
3452 1336 TST43, TAD TIMSTP
3453 3141 DCA TCNTR5 /SETUP PASS COUNTER
3454 4431 T43R1, KILBUF /CLEAR BUFFER
3455 4422 RANADD /GET RANDOM NUMBER
3456 0117 AND K0037
3457 1122 TAD K7740
3460 3140 DCA TCNTR4 /SETUP COUNTER FOR SEEKS
3461 4422 T43R2, RANADD /GET RANDOM SEEK ADDRESS
3462 3137 DCA TCNTR3 /SAVE IT
3463 7004 RAL /LINK IS EXTENDED BIT
3464 3136 DCA TCNTR2 /SAVE IT
3465 1136 TAD TCNTR2
3466 3151 DCA CMREG /SETUP COMMAND
3467 1137 TAD TCNTR3
3470 442J SEFK /SEEK ONLY A RANDOM TRACK
3471 3514 T43T /TEXT POINTER
3472 5312 JMP T43E /ERROR, SKIP OR STATUS
3473 2140 ISZ TCNTR4 /COUNT NUMBER TO DO
3474 5261 JMP T43R2
3475 1136 TAD TCNTR2
3476 3151 DCA CMREG /SETUP FOR READ DATA
3477 1137 TAD TCNTR3
3500 4425 DISKGO /LOAD AND GO READ DATA
3501 3514 T43T /TEXT POINTER
3502 5312 JMP T43E /ERROR SKIP OR STATUS
3503 1112 TAD K2525
3504 4427 FIGURE /CHECK DATA READ
3505 7610 SKP CLA /ALL O.K.
3506 5312 JMP T43E /ERROR, DATA
3507 2141 ISZ TCNTR5
3510 5254 JMP T43R1 /MORE TO TEST
3511 4437 NEPROR /P.K. TO NEXT TEST
3512 4440 T43E, ERROR /ERROR, SKIP, STATUS, CF DATA
3513 3452 TST43 /SCOPE LOOP POINTER
3514 0000 T43T, 0000 /TEXT POINTER
/
/CHECK DISK HEADER WORDS WITH READ DATA

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/IF STATUS ERROR OCCURRES THEN CHECK DATA.
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3515 7340 TST44, CLA CLL CMA
3516 3173 DCA SUFERR /SETUP CRC ERROR POINTER
3517 3135 DCA TCNTR1 /SETUP LOWER ADDRESS
3520 3136 DCA TCNTR2 /SETUP EXTENDED
3521 1070 TAD DRIVNO /CURRENT DRIVE
3522 1157 TAD HUMEMA /CURRENT FIELD
3523 3151 DCA CMREG /SETUP COMMAND
3524 1067 T44R, TAD BGNBUF /START OF BUFFER
3525 4451 LDCUP /LOAD CURRENT ADDRESS
3526 1151 TAD CMREG /LAST COMMAND ISSUED
3527 4450 LDCHD /LOAD COMMAND
3530 1135 TAD TCNTR1 /LOWER ADDRESS
3531 4452 LDADD /LOAD AND GO
3532 4447 DSKSKP /DISK SKIP 10T
3533 5332 JMP , -1 /HANG IF NO SKIP
3534 4444 RDSTAT /READ STATUS
3535 1104 TAD K4000 /SHOULD ONLY BE DONE
3536 7640 TIMSTP, SZA CLA /JUST DONE FLAG ?
3537 5354 JMP T44E /STATUS ERROR
3540 2135 ISZ TCNTR1 /UPDATE ADDRESS
3541 5344 JMP , +3 /DON'T SET EXTENDED TRACK
3542 2151 ISZ CMREG /YES, SET IT
3543 2136 ISZ TCNTR2
3544 1136 TAD TCNTR2
3545 7650 SNA CLA /IS EXTENDED SET
3546 5324 JMP T44R /NO, CONTINUE
3547 1135 TAD TCNTR1
3550 1172 TAD ENDRK /ADD IN FUDGE FACTOR
3551 7640 SZA CLA /DONE WITH DISK
3552 5324 JMP T44R /NO, MORE TO GO
3553 5364 JMP T44OK /ALL O.K.
3554 1112 T44E, TAD K2525
3555 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3556 5361 JMP , +3 /ERROR, JUST STATUS
3557 1167 TAD K5373 /TEXT POINTER
3560 7410 SKP /ERROR
3561 1170 TAD K5300 /STATUS ERROR POINTER
3562 3367 DCA T44T /SETUP
3563 7610 SKP CLA
3564 4437 T44OK, NEPROR /O.K. TO NEXT TEST
3565 4440 ERROR /ERROR, READ DATA
3566 3515 TST44 /SCOPE LOOP POINTER
3567 5300 T44T, 5300 /TEXT POINTER
/
3570 5771 JMP I , +1 /TO NEXT TEST
3571 3600 TST45
/
PAGE
/
/VERIFY THAT WRITING ON A TRACK DOES NOT AFFECT

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/AN ADJACENT TRACK. THE TEST SEQUENCE IS AS FOLLOWS:
/WRITE TRACKS 00000-00100-00040 THEN READ AND CHECK
/TRACKS 00040-00000-00100, WRITE TRACKS 00020-00120-00060
/THEN READ AND CHECK TRACKS 00060-00020-00120, ETC.
/THE CENTER TRACK IS SET TO A DATA PATTERN OF
/2525 + 5252. THE LOWER AND UPPER TRACKS ARE
/SET TO A DATA PATTERN OF 5252 + 2525. THE FIRST TWO
/WORDS OF EVERY SECTOR ARE SET TO THE ABSOLUTE
/DISK ADDRESS.
/
3600 1012 T45, TAD K0020 /GET STARTING POINTER
3601 3135 DCA TCNTR1 /SAVE IT
3602 1350 TAD K7156
3603 3141 DCA TCNTR5 /COUNTER FOR TRACKS TO DO
3604 7346 T45SC, CLA CLL CMA RIL
3605 3140 DCA TCNTR4 /THREE TRACK COUNTER POINTER
3606 1135 TAD TCNTR1
3607 3137 DCA TCNTR3 /WRITE CENTER TRACK FIRST
3610 1112 TAD K2525 /DATA PATTERN FOR CENTER TRACK
3611 5222 JMP T45A1 /GO WRITE CENTER TRACK
3612 1140 T45R1, TAD TCNTR4 /GET POINTER
3613 7110 CLL RAR
3614 7630 SZL CLA /WRITE UPPER OR LOWER????
3615 1122 TAD K7740 /DO LOWER
3616 1012 TAD K0020
3617 1135 TAD TCNTR1 /REDUCE OR UPDATE
3620 3137 DCA TCNTR3 /SAVE TRACK TO DO
3621 1113 TAD K5252 /USE COMPLEMENT OF CENTER TRACK
3622 4430 T45A1, FILBUF /FILL BUFFER WITH DATA
3623 1107 TAD K7760 /GET SECTOR COUNTER POINTER
3624 3136 DCA TCNTR2 /SETUP COUNTER
3625 3142 DCA TCNTR6 /START WITH 0
3626 1142 T45R2, TAD TCNTR6 /GET SECTOR POINTER
3627 0116 AND K0017 /MASK SECTORS
3630 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
3631 1137 TAD TCNTR3 /GET DISK ADDRESS
3632 7104 CLL RAL /PUT EXTENDED BIT IN LINK
3633 0107 AND K7760
3634 1463 TAD I XLOTRK /ADD IN SECTORS
3635 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
3636 7630 SZL CLA /SET EXTENDED BIT????
3637 7001 IAC /YES!!!
3640 1070 TAD DRVNO /ADD IN CURRENT DRIVE
3641 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
3642 1464 TAD I XHITRK /GET EXTENDED BIT
3643 1104 TAD K4000 /FUNCTION WRITE DATA
3644 3151 DCA CMREG /SETUP COMMAND REGISTER POINTER
3645 1463 TAD I XLOTRK /GET CYL., SURFACE, AND SECTOR
3646 4425 DISKGO /WRITE ALL
3647 3745 T45T /TEXT POINTER
3650 5343 JMP T45E /ERROR, WRITE SKIP OR STATUS
3651 1142 TAD TCNTR6 /UPDATE SECTOR POINTER
3652 1074 TAD K0003 /UPDATE SECTOR COUNTER
3653 3142 DCA TCNTR6
3654 2136 ISZ TCNTR2

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3655 5226 JMP T45R2 /DO REST OF TRACK
3656 2140 ISZ TCNTR4 /UPDATE TRACK COUNTER
3657 5212 JMP T45R1 /DO OTHERS
/
3660 7340 CLA CLL CMA
3661 3145 DCA CRREG1 /SETUP FIRST TIME POINTER
3662 7346 CLA CLL CMA RIL
3663 3140 DCA TCNTR4 /TRACK COUNTER POINTER
3664 1135 TAD TCNTR1
3665 3137 DCA TCNTR3 /SETUP FOR READ CENTER FIRST
3666 5276 JMP T45A2 /READ AND CHECK CENTER TRACK
3667 1140 T45R3, TAD TCNTR4 /POINTER
3670 7110 CLL RAR
3671 7630 SZL CLA /CHECK UPPER OR LOWER
3672 1122 TAD K7740 /CHECK LOWER
3673 1012 TAD K0020
3674 1135 TAD TCNTR1 /REDUCE OR UPDATE
3675 3137 DCA TCNTR3 /SAVE THE TRACK TO READ
3676 1107 T45A2, TAD K7760 /AMOUNT OF SURFACE SECTORS
3677 3136 DCA TCNTR2 /SETUP SECTOR COUNTER
3700 3142 DCA TCNTR6 /START WITH 0
3701 1137 T45R4, TAD TCNTR3 /GET DISK ADDRESS
3702 7104 CLL RAL /PUT EXTENDED BIT IN LINK
3703 0107 AND K7760
3704 3146 DCA CRREG2 /SAVE RESULTS
3705 7630 SZL CLA /SET EXTENDED BIT
3706 7001 IAC /YES
3707 3151 DCA CMREG /SETUP COMMAND FOR READ DATA
3710 1142 TAD TCNTR6 /GET SECTOR POINTER
3711 0116 AND K0017 /MASK
3712 1146 TAD CRREG2 /ADD IN TRACK
3713 4425 DISKGO /READ DATA
3714 3745 T45T /TEXT POINTER
3715 5343 JMP T45E /ERROR, READ SKIP OR STATUS
3716 1145 TAD CRREG1 /GET FIRST TIME POINTER
3717 7650 SNA CLA /FIRST TIME????
3720 1112 TAD K2525 /NO
3721 1112 TAD K2525
3722 4427 FIGURE /CHECK DATA READ
3723 7610 SKP CLA /DATA ALL O,K,
3724 5343 JMP T45E /ERROR, DATA
3725 1142 TAD TCNTR6 /UPDATE SECTOR POINTER
3726 1076 TAD K0005
3727 3142 DCA TCNTR6
3730 2136 ISZ TCNTR2 /UPDATE SECTOR COUNTER
3731 5301 JMP T45R4 /DO REST OF SURFACE
3732 3145 DCA CRREG1 /CLEAR FIRST TIME FLAG
3733 2140 ISZ TCNTR4 /UPDATE TRACK COUNTER
3734 5267 JMP T45R3 /DO OTHER TRACKS
3735 1135 TAD TCNTR1 /GET CURRENT TRACK POINTER
3736 1011 TAD K0010 /UPDATE
3737 3135 DCA TCNTR1 /SAVE IT
3740 2141 ISZ TCNTR5 /UPDATE TOTAL AMOUNT TO DO
3741 5204 JMP T45SC /MORE TO DO
3742 4437 NERROR /ALL O,K, TO END OF TEST

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3743 4440 T45E, ERROR /ERROR, TRACKS AFFECTED
3744 3600 TST45 /SCOPE LOOP POINTER
3745 0000 T45T, 0000 /MODIFIED TEXT POINTER
/
3746 5747 JMP I ,+1 /TO END OF TEST
3747 4040 ENDIST
/
3750 7156 K7156, 7156
/
4000 PAGE
/
/PROGRAM TO AID IN HEAD ALIGNMENT,
/GET TWO SEPARATE SEEK ADDRESS FROM
/THE SWITCH REGISTER AND SEEK ONLY BETWEEN
/THEM. SECOND ADDRESS MAY BE CHANGED AT ANY TIME.
/
4000 7604 S=SEK, LAS /GET FIRST ADDRESS
4001 3135 DCA TCNTR1 /SAVE IT
4002 7402 HEDHLT, HLT /WAIT FOR SECOND ADDRESS
4003 7604 RESEK, LAS /GET SECOND ADDRESS
4004 3136 DCA TCNTR2 /SAVE IT
4005 1136 TAD TCNTR2
4006 0100 AND K0007 /MASK DRIVE + EXT. BIT
4007 1103 TAD K3000 /GET SEEK FUNCTION
4010 4450 LDCMD /LOAD COMMAND REGISTER
4011 1136 TAD TCNTR2
4012 0107 AND K7760 /MASK OFF CYLINDER + SURFACE
4013 4452 LDADD /GO SEEK ONLY
4014 4447 DSKSKP /SKIP ON DONE
4015 5214 JMP ,*-1
4016 4453 CLRALL /CLEAR STATUS
4017 4444 RDSTAI /READ STATUS
4020 7640 SZA CLA /DRIVE DONE?
4021 5216 JMP ,*-3 /NO, WAIT
4022 1135 TAD TCNTR1 /GET FIRST ADDRESS
4023 0100 AND K0007 /MASK DRIVE + EXT. BIT
4024 1103 TAD K3000 /GET SEEK FUNCTION
4025 4450 LDCMD /LOAD COMMAND REGISTER
4026 1135 TAD TCNTR1
4027 0107 AND K7760 /MASK OFF CYLINDER AND SURFACE
4030 4452 LDADD /LOAD AND GO SEEK
4031 4447 DSKSKP /WAIT FOR DONE
4032 5231 JMP ,*-1
4033 4453 CLRALL /CLEAR STATUS
4034 4444 RDSTAI /READ STATUS
4035 7640 SZA CLA /DRIVE DONE?
4036 5233 JMP ,*-3 /NO, WAIT
4037 5203 JMP RESEK /CHECK FOR NEW ADDRESS
/
/CONTAINS END OF TEST TYPE OUT AND A CHECK ON S=3=1
/WHICH IS CONTINUE TO TEST CURRENT DISK.
/ALSO IF THERE IS MORE THAN 1 DISK ON THE SYSTEM
/AND THEY HAVE ALL RUN THE COMPLETE TEST, RUN OVERLAP
/SEEKS AND OVERLAP SEEKS, WRITE, AND READ DATA ON ALL
/DRIVES

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/
4040 7604 ENDIST, LAS
4041 0016 AND K0400 /MASK SWITCH 3
4042 7640 SZA CLA /LOOP ON SAME DISK
4043 5264 JMP SAMDSK /YES
4044 1071 TAD DRIVSV
4045 7450 SNA /WAS THERE AND EXTRA
4046 5264 JMP SAMDSK /NO, ONLY DISK 0
4047 7104 CLL RAL
4050 7641 CIA
4051 1070 TAD DRIVNO /CURRENT DRIVE
4052 7650 SNA CLA /START OVER YET
4053 5260 JMP TSTSEK /YES, TEST OVERLAP SEEKS
4054 7326 CLA CLL CML RTL
4055 1070 TAD DRIVNO
4056 3070 DCA DRIVNO /UPDATE DRIVE NUMBER
4057 5273 JMP NEXDSK /TEST NEXT DISK DRIVE
4060 4765 TSTSEK, JMS I XLAP /PERFORM OVERLAP SEEKS
4061 4764 JMS I XGRONK /PERFORM OVERLAP SEEKS
4062 4766 JMS I XQVRRD /OVERLAP SEEKS + WRITES + READS
4063 3070 DCA DRIVNO /SETUP DRIVE NO.
4064 4462 SAMDSK, CRLF
4065 4457 PRNTER /PRINT PASS COMPLETE
4066 6741 TEXEND
4067 7604 LAS
4070 0075 AND K0004
4071 7640 SZA CLA /SWITCH 9 SET?
4072 7402 ENDHLT, HLT /YES, STOP PROGRAM
4073 7301 NEXDSK, CLA CLL IAC
4074 4453 CLRALL /DCLR
4075 3132 DCA REG0
4076 3133 DCA REG1
4077 5700 JMP I ,+1 /LOOP ON PROGRAM
4100 0235 TST0
/
/THE FOLLOWING IS A ROUTINE TO CHECK THE WRITE PROTECT
/FUNCTION WHEN IT IS MANUALLY SET BY THE OPERATOR.
/NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.
/
4101 7604 MANPRO, LAS /GET THE SWITCHES
4102 7104 CLL RAL
4103 0077 AND K0006 /MASK DRIVE NUMBER
4104 3070 DCA DRIVNO /SAVE DRIVE NUMBER
4105 1110 TAD K7700
4106 3133 DCA REG1 /SETUP PASS COUNTER
4107 3132 DCA REG0 /SETUP FLAG POINTER
4110 1112 TAD K2525 /DATA PATTERN TO WRITE
4111 4430 FILBUF /FILL OUTBOUND BUFFER
4112 1070 TAD DRIVNO
4113 3464 DCA I XH1PK /SETUP ADDRESS WORD IN BUFFER
4114 3463 DCA I XL0TRK /SETUP ADDRESS WORD IN BUFFER
4115 1114 TAD K5000 /WRITE ALL FUNCTION
4116 3151 DCA CMREG /SETUP COMMAND
4117 4425 DISKGO /WRITE ALL TO SECTOR 0
4120 4161 IMPROT /TEXT POINTER

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4121 5357 JMP MPERR /ERROR, STATUS
4122 7402 MPHLT1, HLT /HALT AND WAIT FOR OPERATOR
/
4123 4431 MPR1, KILBUF /CLEAR OUTBOUND BUFFER
4124 1070 TAD DRIVNO
4125 3464 DCA I XHTRK /SETUP ADDRESS WORD IN BUFFER
4126 1114 TAD K5000 /WRITE ALL FUNCTION
4127 3151 DCA CMREG /SETUP COMMAND REGISTER
4130 4425 DISKGO /WRITE ALL TO SECTOR 0
4131 4161 TMPROT /TEXT POINTER
4132 7000 NOP
4133 7326 CLA CLL CML RTL
4134 1012 TAD K0020 /MAKE EXPECTED STATUS
4135 3144 DCA GDREG2 /SETUP COMPARE REGISTER
4136 1170 TAD K5300
4137 3361 DCA TMPROT /SETUP TEXT POINTER
4140 1147 TAD SIREG /GET STATUS READ
4141 4442 ACCMP1 /CHECK RESULTS
4142 7610 SKP CLA /STATUS 0,K,
4143 5357 JMP MPERR /ERROR, WRITE PROTECT
4144 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
4145 4453 CLRALL /CLEAR CONTROL
4146 4431 KILBUF /CLEAR DATA BUFFER
4147 1017 TAD K1000 /FUNCTION READ ALL
4150 3151 DCA CMREG /SETUP COMMAND
4151 4425 DISKGO /READ ALL SECTOR 0
4152 4161 TMPROT /TEXT POINTER
4153 5357 JMP MPERR /ERROR
4154 1112 TAD K2525 /EXPECTED PATTERN
4155 4277 FIGURE /CHECK DATA READ
4156 4437 NERRDR /ALL 0,K, GO LOOP 64 TIMES
4157 4440 MPERR, ERROR /ERROR, WRITE PROTECT
4160 4123 MPR1
4161 0000 TMPROT, 0000 /TEXT POINTER
4162 7402 MPHLT2, HLT /SUCCESSFUL WRITE PROTECT
4163 5301 JMP MANPRO /REPEAT
/
4164 4265 XGRONK, GRONK
4165 4200 XLAP, OVR LAP
4166 4400 XOVRRD, OVRRED
/
4200 PAGE
/
/ROUTINE TO DO OVERLAP SEEKS ON EXISTING DRIVES
/AFTR ALL HAVE RUN THE COMPLETE DIAGNOSTIC
/
4200 0000 OVR LAP, 0
4201 1104 TAD K4000
4202 3141 DCA TCNTR5 /PASS COUNTER
4203 1071 OVRP1, TAD DRIVSV /GET AMOUNT OF DRIVES
4204 7040 CMA
4205 3140 DCA TCNTR4 /SETUP COUNTER
4206 3137 DCA TCNTR3 /START WITH DRIVE 0
4207 1137 OVRP2, TAD TCNTR3
4210 7104 CLL RAL

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4211 3070 DCA DRIVNO /DISK NO. POINTER
4212 1137 TAD TCNTR3
4213 4422 RANADD /SELECT A RANDOM ADDRESS
4214 4420 DSKOUT /SEND DISK OUT
4215 4453 CLRALL /CLEAR STATUS
4216 2137 ISZ TCNTR3 /UPDATE DRIVE NUMBER
4217 2140 ISZ TCNTR4 /UPDATE DISK COUNTER
4220 5207 JMP OVRP2 /DO ALL EXISTING DISKS
4221 3137 DCA TCNTR3 /CLEAR FOR 0
4222 1071 TAD DRIVSV /GET AMOUNT OF DRIVES
4223 7040 CMA
4224 3140 DCA TCNTR4 /SETUP COUNTER
4225 1137 OVRP3, TAD TCNTR3
4226 4421 DSKIN /CHECK FOR DRIVE DONE
4227 5232 JMP NOTDON /DRIVE NOT DONE
4230 5240 JMP OVR0K /DRIVE DONE AND NO ERRORS
4231 5261 JMP OVRERR /DRIVE ERRORS
4232 2137 NOTDON, ISZ TCNTR3 /UPDATE DISK NUMBER
4233 1137 TAD TCNTR3
4234 1140 TAD TCNTR4
4235 7640 SZA CLA /LAST EXISTING DRIVE
4236 5225 JMP OVRP3 /NO, DO REST
4237 5221 JMP OVRP3 -4 /YES, RESET
4240 7340 OVR0K, CLA CLL CMA
4241 3140 DCA TCNTR4
4242 2141 ISZ TCNTR5 /UPDATE PASS COUNTER, DONE ?
4243 5207 JMP OVRP2 /NO, SEND OUT
4244 3137 DCA TCNTR3 /SET FOR 0
4245 1071 TAD DRIVSV
4246 7040 CMA
4247 3140 DCA TCNTR4
4250 1137 ALLBAK, TAD TCNTR3
4251 4421 DSKIN /CHECK FOR DRIVE DONE
4252 5250 JMP ALLBAK /WAIT FOR THIS DRIVE
4253 7610 SKP CLA /WAIT FOR NEXT
4254 5261 JMP OVRERR /DRIVE ERRORS
4255 2137 ISZ TCNTR3
4256 2140 ISZ TCNTR4 /LAST DRIVE HOME YET
4257 5250 JMP ALLBAK /WAIT FOR ALL
4260 4437 NERRDR /O,K, TO NEXT
4261 4440 OVRERR, ERROR /ERROR, OVERLAP SEEKS
4262 4201 OVR LAP +1 /SCOPE LOOP POINTER
4263 5300 S300 /TEXT POINTER
4264 5600 JMP I OVR LAP /TO NEXT TEST
/
/ROUTINE TO DO OVERLAP SEEKS AND
/REALLY SHAKE THE DRIVES
/ALL DRIVES PERFORM "SEEK ONLY" BETWEEN TRACK
/312 AND SOME RANDOM TRACK,
/
4265 0000 GRONK, 0
4266 1105 TAD K6000
4267 3141 DCA TCNTR5 /CLEAR PASS COUNTER
4270 1071 TAD DRIVSV /AMOUNT OF DRIVES
4271 7040 CMA

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4446 3136 DCA TCNTR2 /SAVE IT
4447 1334 TAD DSKADD /GET POINTER
4450 1075 TAD K0004 /ADD IN FUDGE FACTOR
4451 3334 DCA DSKADD /MAKE ADDRESS
4452 1137 TAD TCNTR3 /GET DISK NUMBER POINTER
4453 7104 CLL RAL
4454 3070 DCA DRIVNO /MAKE DISK NUMBER
4455 1113 TAD K5252 /GET DATA PATTERN TO USE
4456 4430 FILHUF /FILL DATA BUFFER
4457 1734 TAD I DSKADD /GET EXTENDED BIT
4460 1070 TAD DRIVNO /ADD IN DRIVE NUMBER
4461 3464 DCA I XHITR /SETUP ADDRESS WORD IN BUFFER
4462 1136 TAD TCNTR2 /GET CYL., SURFACE, AND SECTOR
4463 3463 DCA I XLOTR /SETUP ADDRESS WORD IN BUFFER
4464 1464 TAD I XHITR /GET EXTENDED BIT
4465 1104 TAD K4000 /ADD IN WRITE FUNCTION
4466 3151 DCA CMREG /SETUP COMMAND POINTER
4467 1463 TAD I XLOTR /GET ADDRESS
4470 4425 DISKGO /DISK WRITE DATA
4471 4532 TOVRDT /TEXT POINTER
4472 5330 JMP OVRDER /ERROR, WRITE SKIP OP STATUS
4473 4431 KILBUF /CLEAR DATA BUFFER
4474 1734 TAD I DSKADD /GET EXTENDED BIT
4475 3151 DCA CMREG /SETUP COMMAND REGISTER
4476 1136 TAD TCNTR2 /GET DISK ADDRESS
4477 4425 DISKGO /GO, READ DATA
4500 4532 TOVRDT /TEXT POINTER
4501 5330 JMP OVRDER /ERROR
4502 1113 TAD K5252
4503 4427 FIGURE /WORD BY WORD COMPARE DATA
4504 7610 SKP CLA /DATA O,K, CONTINUE
4505 5330 JMP OVRDER /DATA ERROR
4506 1137 TAD TCNTR3
4507 4422 RANADD /GENERATE RANDOM ADDRESS
4510 4420 DSKOUT /SEND DRIVE BACK OUT
4511 2141 ISZ TCNTR5 /UPDATE PASS COUNTER, DONE ?
4512 5234 JMP CHRNEK /CHECK FOR NEXT DRIVE
4513 3137 DCA TCNTR3 /SET FOR 0
4514 1071 TAD DRIVSV
4515 7040 CMA
4516 3140 DCA TCNTR4
4517 1137 REDBAK, TAD TCNTR3
4520 4421 DSKIN
4521 5317 JMP REDBAK /CHECK THIS DRIVE
4522 7610 SKP CLA /WAIT FOR DRIVE
4523 5231 JMP POLERR /CHECK FOR NEXT
4524 2137 ISZ TCNTR3 /ERROR
4525 2140 ISZ TCNTR4 /LAST DRIVE HOME YET
4526 5317 JMP REDBAK /WAIT FOR ALL
4527 4437 NERROR /O,K, TO NEXT
4530 4440 OVRDER, ERROR /OVERLAP SEEKS + READ DATA
4531 4401 TOVRDT, OVPRED +1 /SCOPE LOOP POINTER
4532 5300 TOVRDT, 5300 /TEXT POINTER
4533 5600 JMP I OVRRED /TO NEXT TEST

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4534 0000 DSKADD, 0
4535 6365 DSKPOI, DSKOA
/
/ROUTINE TO CHECK DRIVE IN AC
DIN, 0
4536 0000 /MAKE DRIVE NO.
4537 7104 CLL RAL /FIRST SELECT DRIVE
4540 4450 LDCMD
4541 1151 TAD CMREG
4542 1015 TAD K0200 /ENABLE SET DONE BIT
4543 4450 LDCMD /LOAD COMMAND
4544 7332 CLA CLL CML RTR /MAYBE EXPECTED STATUS
4545 3144 DCA GDREG2 /SETUP COMPARE REGISTER
4546 4444 RDSTAT /READ STATUS
4547 4447 DSKSKP /CHECK FOR SKIP
4550 5361 JMP NDIN /CHECK FOR NOT DONE
4551 7330 CLA CLL CML RAR /EXPECTED STATUS
4552 3144 DCA GDREG2 /SETUP COMPARE REGISTER
4553 4444 RDSTAT /READ STATUS
4554 1104 TAD K4000 /ADD IN FUDGE FACTOR
4555 7640 SZA CLA /O,K,????
4556 2336 ISZ DIN /ERROR!!!!
4557 2336 ISZ DIN
4560 5736 JMP I DIN /EXIT
4561 1105 NDIN, TAD K6000
4562 7640 SZA CLA /SKIP IF NO ERROR
4563 5356 JMP ,=5 /ERROR EXIT
4564 5736 JMP I DIN /EXIT
/
PAGE
/
/MANUAL FUNCTION TEST
/LOAD ADDRESS 0201 OR "MANUAL".
/SET SWITCHES TO FUNCTION
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO DISK ADDRESS
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO COMPLEMENT DATA PATTERN
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO 0000
/PRESS START
/INCREASE OF FAILURES USE NORMAL SCOPE SWITCHES
/IF LOOP IS DESIRED USE NORMAL SCOPE SWITCHES
/
4600 7604 *MANUAL, LAS
4601 0307 AND K7707 /MASK
4602 3135 DCA TCNTR1 /SAVE FUNCTION
4603 7340 CLA CLL CMA
4604 3132 DCA REGO /SETUP FOR ONE PASS
4605 6274 RIF /USE CURRENT FIELD
4606 1135 TAD TCNTR1
4607 3135 DCA TCNTR1 /ACTUAL FUNCTION

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4610 1135 TAD TCNTR1
4611 0077 AND K0006 /MASK DISK DRIVE
4612 3070 DCA DRIVNO /ACTUAL DRIVE
4613 7402 HLT /WAIT FOR DISK ADDR. IN SWITCHES
4614 7604 LAS
4615 3136 DCA TCNTR2 /SAVE DISK ADDRESS
4616 7402 HLT /WAIT FOR COMPLEMENT DATA
4617 7604 LAS
4620 3137 DCA TCNTR3 /SAVE IT
4621 7402 HLT /WAIT FOR OPERATOR TO CONTINUE
4622 1137 TAD TCNTR3
4623 4430 FILBUF /FILL BUFFER WITH DATA
4624 7300 TMANS, CLA CLL
4625 1135 TAD TCNTR1 /GET FUNCTION
4626 0106 AND K7000 /MASK
4627 1105 TAD K6000
4630 7630 SZL CLA /WAS IT A READ
4631 7340 CLA CLL CMA /NO, SET A FLAG
4632 3140 DCA TCNTR4 /READ FLAG
4633 1135 TAD TCNTR1 /GET FUNCTION
4634 0106 AND K7000 /MASK
4635 1114 TAD K5000
4636 7640 SZA CLA /WAS IT A SEEK
4637 5247 JMP NTSEK /NOT A SEEK
4640 1135 TAD TCNTR1 /YES
4641 3151 DCA CMREG /SETUP COMMAND
4642 1136 TAD TCNTR2 /DISK ADDRESS
4643 4423 SEEK /SEEK ONLY
4644 4705 TMANT /TEXT POINTER
4645 5303 JMP TMANE /ERROR, SKIP OR STATUS
4646 5302 JMP TMANOK /TO HANDLER
4647 1135 NTSEK, TAD TCNTR1 /GET FUNCTION
4650 0100 AND K0007 /MASK
4651 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4652 1135 TAD TCNTR1 /FUNCTION
4653 3151 DCA CMREG /SETUP COMMAND
4654 1136 TAD TCNTR2 /DISK ADDRESS
4655 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
4656 1140 TAD TCNTR4 /GET READ FLAG
4657 7650 SNA CLA /WAS IT A READ
4660 4431 KILBUF /YES, CLEAR BUFFER
4661 1136 TAD TCNTR2 /GET DISK ADDRESS
4662 4425 DISKGO /DISK GO
4663 4705 TMANT /TEXT POINTER
4664 5303 JMP TMANE /ERROR
4665 1140 TAD TCNTR4 /GET READ FLAG
4666 7640 SZA CLA /WAS IT A READ
4667 5302 JMP TMANOK /WAS A WRITE, TO HANDLER
4670 1151 TAD CMREG /GET LAST COMMAND
4671 0014 AND K0100 /MASK OUT HALF BIT
4672 7650 SNA CLA /WAS IT HALF BLOCK TRANSFERS
4673 5300 JMP *.S /NO, COMPARE WHOLE BLOCK
4674 1137 TAD TCNTR3 /GET GOOD WORD POINTER
4675 4426 HAFCHK /CHECK FOR HALF BLOCK
4676 5302 JMP TMANOK /O.K. NO ERRORS

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4677 5303 JMP TMANE /DATA ERROR
4700 1137 TAD TCNTR3 /WAS A READ
4701 4427 FIGURE /WORD BY WORD COMPARE OF DATA
4702 4437 TMANOK, NEPROR /NO ERRORS
4703 4440 TMANE, ERROR /ERROR IN FUNCTION SELECTED
4704 4624 TMANS /SCOPE LOOP POINTER
4705 5373 TMANT, 5373 /TEXT POINTER
/
4706 5224 JMP TMANS / LOOP
/
4707 7707 K7707, 7707
/
/ROUTINE TO CHECK THE WRITE PROTECT FUNCTION
/WHEN IT IS SET UNDER PROGRAM CONTROL
/NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST
/
4710 7604 AUTPRG, LAS /GET THE SWITCHES
4711 7104 CLL RAL
4712 0077 AND K0006 /MASK DRIVE NUMBER
4713 3070 DCA DRIVNO /SAVE DRIVE NUMBER
4714 7344 CLA CLL CMA RAL
4715 3133 DCA REG1 /SETUP REPEAT POINTER
4716 3132 DCA REG0
4717 1112 TAD K2525 /DATA PATTERN TO WRITE
4720 4430 FILBUF /FILL OUTBOUND BUFFER
4721 1070 TAD DRIVNO
4722 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4723 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
4724 1114 TAD K5000 /WRITE ALL FUNCTION
4725 3151 DCA CMREG /SETUP COMMAND
4726 4425 DISKGO /WRITE ALL TO SECTOR 0
4727 4775 TAPROT /TEXT POINTER
4730 5373 JMP APERR /ERROR, STATUS
4731 1102 APR1, TAD K2000 /FUNCTION WRITE PROTECT
4732 1070 TAD DRIVNO /CURRENT DRIVE
4733 4450 LDCMD /LOAD COMMAND REGISTER
4734 4452 LDADD /LOAD AND GO
4735 4444 RDSTAT /READ STATUS REGISTER
4736 7640 SZA CLA /SHOULD BE 0000 ???
4737 5352 JMP APA1 /ERROR, STATUS
4740 4431 KILBUF /CLEAR OUTBOUND BUFFER
4741 1070 TAD DRIVNO
4742 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4743 1114 TAD K5000 /WRITE ALL FUNCTION
4744 3151 DCA CMREG /SETUP COMMAND REGISTER
4745 4425 DISKGO /WRITE ALL TO SECTOR 0
4746 4775 TAPROT /TEXT POINTER
4747 7000 NUP
4750 7326 CLA CLL CML RAL /MAKE EXPECTED STATUS
4751 1012 TAD K0020 /SETUP COMPARE REGISTER
4752 3144 APA1, DCA GOREG2
4753 1170 TAD K5300
4754 3375 DCA TAPROT /SETUP TEXT POINTER
4755 1147 TAD STREG /GET STATUS READ
4756 4442 ACCMPI /CHECK RESULTS

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4757 7610          SKP CLA          /STATUS O.K.
4760 5373          JMP APERR         /ERROR, WRITE PROTECT
4761 7301          CLA CLL IAC       /ENABLE CLEAR CONTROL
4762 4453          CLRALL          /CLEAR CONTROL
4763 1017          TAD K1000        /FUNCTION READ ALL
4764 3151          DCA CHREG       /SETUP COMMAND
4765 4425          DISKGO          /READ ALL SECTOR 0
4766 4775          TAPROT         /TEXT POINTER
4767 5373          JMP APERR         /ERROR
4770 1112          TAD K2525        /EXPECTED PATTERN
4771 4427          FIGURE          /CHECK DATA READ
4772 4437          NERROR         /ALL O.K., DO ONE MORE TIME
4773 4440          APERR, ERROR     /ERROR, WRITE PROTECT
4774 4731          TAPROT, APR1
4775 0000          TAPROT, 0000      /TEXT POINTER
4776 7402          APLT1, HLT       /SUCCESSFUL WRITE PROTECT
4777 5310          JMP AUTPRO       /REPEAT

/
PAGE
/
/SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
/ERROR TYPEOUTS.
/
5000 0000          ERRO, 0
5001 7300          CLA CLL
5002 1600          TAD I ERRO       /GET RESTART ADDRESS
5003 3175          DCA RESTRI      /STORE
5004 7604          LAS            /GET SWITCH 0
5005 7700          SMA CLA        /IS IT SCOPE LOOP
5006 5217          JMP ERRA1      /NO, CONTINUE
5007 7604          LAS            /GET SWR2
5010 7006          RIL
5011 7710          SPA CLA        /INHIBIT BELL????
5012 5215          JMP ,+3        /YES
5013 1354          TAD K0207
5014 4436          TYPE
5015 1600          TAD I ERRO
5016 5755          JMP I ESCOPE     /CHECK FOR BELL
5017 1600          ERRA1, TAD I ERRO
5020 3356          DCA RETRN2     /STORE FOR RETURN
5021 2200          ISZ ERRO
5022 7301          CLA CLL IAC
5023 1200          TAD ERRO
5024 3357          DCA INHIBT     /NEXT TEST POINTER
5025 4462          CRLF          /STORE FOR SPECIAL RETURN
5026 4462          CRLF
5027 1600          TAD I ERRO
5030 0100          AND K0007      /GET TEXT POINTER
5031 1365          TAD HEDTAD     /MASK 9=11
5032 3234          DCA ,+1        /MAKE ERROR HEADER TAD
5033 7402          HLT
5034 3236          DCA ,+2        /MODIFIED HEADER IAD
5035 4457          PRNTER         /MODIFIED HEADER POINTER
5036 7402          HLT
5037 4462          CRLF

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5040 4457          PRNTER         /PRINT PC:
5041 5750          TEXPC
5042 7340          CLA CLL CHA
5043 1200          TAD ERRO       /GET PC POINTER
5044 4460          OCTEL          /PRINT PC STORED
5045 1600          TAD I ERRO     /GET TEXT POINTER
5046 7104          CLL RAL
5047 7420          SNL
5050 5264          JMP NIGD       /NOT GD: REGISTER

5051 3200          DCA ERRO
5052 4457          PRNTER         /PRINT GD:
5053 5752          TEXGD
5054 1200          TAD ERRO
5055 7700          SMA CLA        /WAS IT A 6 BIT OCTAL BYTE
5056 5261          JMP ,+3        /NO
5057 1143          TAD GDREG1     /GET DATA
5060 4461          TWOCT          /PRINT TWO OCTAL
5061 1144          TAD GDREG2
5062 4460          OCTEL          /PRINT FOUR OCTAL
5063 7610          NIGD, SKP CLA  DCA ERRO
5064 3200          TAD ERRO       /GET TEXT POINTER
5065 1200          CLL RAL
5066 7104          SNL
5067 7420          JMP NTCRC
5070 5301          DCA ERRO
5071 3200          PRNTER         /PRINT CR:
5072 4457          TEXCR
5073 5754          TAD CRREG1
5074 1145          TWOCT          /PRINT
5075 4461          TAD CRREG2
5076 1146          OCTEL          /PRINT FOUR OCTAL
5077 4460          SKP CLA
5100 7610          NTCRC, DCA ERRO
5101 3200          TAD ERRO       /GET TEXT MESSAGE POINTER
5102 1361          DCA XTEXT
5103 3364          DCA PCNTR2
5104 1362          TAD XREG
5105 3010          DCA AUTO10
5106 1115          TAD K7771
5107 3363          DCA PCNTR1
5110 1200          STRAUT, TAD ERRO /COUNTER FOR # OF HEADS
5111 7500          SMA
5112 5346          JMP NOTEX     /GET TEXT POINTER
5113 7104          CLL RAL
5114 3200          DCA ERRO
5115 1364          TAD PCNTR2
5116 2364          ISZ PCNTR2
5117 2364          ISZ PCNTR2
5120 3322          DCA ,+2
5121 4457          PRNTER         /STORE FOR PRNTER
5122 7402          HLT           /PRINT XX:
5123 1410          TAD I AUTO10   /MODIFIED TEXT POINTER
5124 4460          OCTEL          /PRINT FOUR OCTAL

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5125 2363 AGAIN, ISZ PCNTR1
5126 5310 JMP STRAUT /CHECK FOR NEXT XX:
5127 7604 LAS /GET SWITCH 5
5130 7006 RTL /SHIFT FOR TESTING
5131 0016 AND K0400 /MASK
5132 7650 SNA CLA /WAS IT INHIBIT HALT
5133 5342 JMP ERHLT9 /NO HALT
5134 7630 SZL CLA /SAME OR NEXT TEST
5135 5340 JMP ,+3 /SAME TEST
5136 1357 TAD INHIBI /GET RETURN
5137 5755 JMP I ESCOPE /CHECK FOR BELL
5140 1356 TAD RETRN2 /GET RETURN
5141 5755 JMP I ESCOPE /CHECK FOR BELL
5142 7402 ERHLT9, HLT /ALL RECOVERABLE ERROR HALTS
5143 4760 JMS I XGTREG /CHECK FOR GET ALL REGISTERS
5144 5756 JMP I RETRN2 /NO, TRY SAME TEST AGAIN
5145 5264 JMP NTGD /DUMP
5146 7104 NOTEX, CLL RAL
5147 3200 DCA ERRO
5150 2364 ISZ PCNTR2
5151 2364 ISZ PCNTR2
5152 2010 ISZ AUTO10
5153 5325 JMP AGAIN

/
5154 0207 K0207, 0207
5155 5470 ESCOPE, SSCOPE
5156 0000 RETRN2, 0
5157 0000 INHIBI, 0
5160 5527 XGTREG, GTREG
5161 5756 XTEXT, TEXST
5162 0146 XREG, CRREG2
5163 0000 PCNTR1, 0
5164 0000 PCNTR2, 0
5165 1366 HEDTAD, TAD HEDLST
5166 6615 HEDLST, ERTX1
5167 6630 ERTX2
5170 6644 ERTX3
5171 6662 ERTX4
5172 6672 ERTX5
5173 6704 ERTX6
5174 6716 ERTX7
5175 6726 ERTX8

/
5200 PAGE
/
/SUBROUTINE TO WAIT FOR INTERRUPTS
/IF INTERRUPT OCCURES GO BACK +1
/
5200 0000 IONWT, 0
5201 7450 SNA /FAST OR SLOW
5202 1122 TAD K7740 /GET SLOW CONSTANT
5203 3221 DCA CUMP1 /SETUP COUNTER
5204 7240 CLA CMA
5205 3231 DCA CUMP2 /SETUP COUNTER
5206 6001 ION /TURN IT ON

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5207 2231 ISZ COMP2
5210 5207 JMP ,+1
5211 2221 ISZ COMP1
5212 5207 JMP ,+3
5213 6002 IGF /TURN IT OFF
5214 5600 JMP I IONWT /NO INT OCCURED
5215 2400 INTADD, ISZ IONWT
5216 4447 DSKSKP /DISK SKIP IOT
5217 7402 ERHLT1, HLT /ERROR, ILLEGAL INTERRUPT
5220 5600 JMP I IONWT /EXIT

/
/ROUTINE TO COMPARE AC TO GDREG2
/
5221 0000 COMP1, 0
5222 3156 DCA ACREG
5223 1156 TAD ACREG /SAVE AC
5224 7041 CIA
5225 1144 TAD GDREG2
5226 7640 SZA CLA /SKIP IF 0,K
5227 2221 ISZ COMP1 /ERROR, DON'T COMPARE
5230 5621 JMP I COMP1

/
/ROUTINE TO COMPARE CRREG1 AND CRREG2 TO
/GDREG1 AND GDREG2,
/
5231 0000 COMP2, 0
5232 7300 CLA CLL
5233 1143 TAD GDREG1
5234 0116 AND K0017
5235 7041 CIA
5236 1145 TAD CRREG1
5237 7640 SZA CLA /NOT THE SAME
5240 5245 JMP CRERR
5241 1146 TAD CRREG2
5242 7041 CIA
5243 1144 TAD GDREG2
5244 7640 SZA CLA /ERROR, NOT THE SAME
5245 2231 CRERR, ISZ COMP2
5246 5631 JMP I COMP2

/
/ROUTINE TO WAIT FOR 500 MS.
/
5247 0000 WTISZ, 0
5250 7300 CLA CLL
5251 1122 TAD K7740 /GET TIME CONSTANT
5252 3221 DCA COMP1
5253 3231 DCA COMP2
5254 2231 ISZ CUMP2
5255 5254 JMP ,+1
5256 2221 ISZ COMP1
5257 5254 JMP ,+3
5260 5647 JMP I WTISZ /EXIT

/
/ROUTINE TO WAIT FOR DISK SKIPS
/

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```

5261 0000 SKWAT, 0
5262 7300 CLA CLL
5263 1122 TAD K7740 /GET TIME CONSTANT
5264 3221 DCA COMP1
5265 3231 DCA COMP2
5266 4447 DSKSKP * 5333 /DSKP "DISK SKIP IOT"
5267 7610 SKP CLA /NO SKIP OCCURRED YET
5270 5276 JHP ,+6 /GOT THE SKIP
5271 2231 ISZ COMP2
5272 5266 JHP ,=4
5273 2221 ISZ COMP1
5274 5266 JHP ,=6
5275 7610 SKP CLA /NO SKIP OCCURRED
5276 2261 ISZ SKWAT
5277 5661 JMP I SKWAT /EXIT

/SUBROUTINE TO READ STATUS REGISTER
/
5300 0000 RDSI, 0
5301 6745 IOT5, DRST /READ STATUS IOT
5302 7410 SKP
5303 7402 ERHLT5, HLT /SKIP TRAP
5304 3147 DCA SIREG /SAVE RESULTS
5305 1147 TAD SIREG
5306 5700 JMP I RDST /EXIT

/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
5307 0000 LDCA, 0
5310 3154 DCA ADREG /SAVE IN ADDRESS
5311 1154 TAD ADREG
5312 3153 DCA CAREG /SETUP INITIAL CURRENT ADDRESS
5313 1154 TAD ADREG
5314 6744 IOT4, DLCA /LOAD CURRENT ADDRESS IOT
5315 5707 JMP I LDCA /EXIT

5316 7402 ERHLT4, HLT /SKIP TRAP
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
5317 0000 LDAD, 0
5320 3152 DCA DAREG /SAVE OUTBOUND DATA
5321 1152 TAD DAREG
5322 6743 IOT3, DLG /LOAD DISK ADDRESS REGISTER
5323 5717 JHP I LDAD /EXIT
5324 7402 ERHLT3, HLT /SKIP TRAP
/
/SUBROUTINE TO LOAD COMMAND REGISTER
/
5325 0000 LDCM, 0
5326 3151 DCA CMREG /SAVE OUTBOUND DATA
5327 1151 TAD CMREG
5330 6746 IOT6, DLDC /LOAD COMMAND REGISTER

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5331 5725 JMP I LDCM /EXIT
5332 7402 ERHLT6, HLT /SKIP TRAP
/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
/
5333 0000 SDKP, 0
5334 6741 IOT1, DSKP /DISK SKIP IOT
5335 7410 SKP /DID NOT SKIP
5336 2333 ISZ SDKP
5337 5733 JMP I SDKP /EXIT

/SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
/
5340 0000 CLDR, 0
5341 6742 IOT2, DCLR /DCLR "CLEAR IOT"
5342 5740 JMP I CLDR /EXIT
5343 7402 ERHLT2, HLT /SKIP TRAP
/
/SUBROUTINE TO ISSUE "DMAN" MAINTENANCE IOT
/
5344 0000 LDMN, 0
5345 6747 IOT7, DMAN /"DMAN" MAINTENANCE IOT
5346 5744 JHP I LDMN /EXIT
5347 7402 ERHLT7, HLT /SKIP TRAP
/
/SUBROUTINE TO SHIFT, THEN READ DISK ADDRESS
/INTO DATA BUFFER, 12 SHIFTS
/
5350 0000 RDAD, 0
5351 7300 CLA CLL
5352 1130 TAD M12
5353 3134 DCA SBCNT1
5354 7330 CLA CLL CML RAR /SET MAIN(1) ENABLE BIT
5355 4455 LDMAN /LOAD MAINTENANCE
5356 7010 RAR
5357 4455 LDMAN /LOAD MAINTENANCE
5360 7300 CLA CLL
5361 1015 TAD K0200 /SHIFT TRACK ADDRESS BIT
5362 4455 LDMAN /LOAD MAINTENANCE IOT
5363 2134 ISZ SBCNT1
5364 5362 JHP ,=2 /SHIFT 12 BITS
5365 7300 CLA CLL
5366 1012 TAD K0020
5367 4455 LDMAN /READ DATA BUFFER
5370 3152 DCA DAREG /SAVE RESULTS
5371 1152 TAD DAREG
5372 5750 JMP I RDAD /EXIT

/
PAGE
/
/SUBROUTINE TO READ DATA BUFFER TO AC
/
5400 0000 RDBF, 0
5401 7330 CLA CLL CML RAR

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5402 4455 LDMA
5403 1012 TAD K0020
5404 4455 LDMA /LOAD MAINTENANCE
5405 3150 DCA DBREG
5406 1150 TAD DBREG
5407 3155 DCA DTREG
5410 1155 TAD DTREG
5411 5600 JMP I RDBF /EXIT

/SUBROUTINE TO SHIFT COMMAND REGISTER TO
/ DATA BUFFER THEN READ DATA BUFFER
/
5412 0000 RDCM, 0
5413 7300 CLA CLL
5414 1130 TAD M12
5415 3134 DCA SBCNT1 /12 BIT SHIFT
5416 7330 CLA CLL CML RAR
5417 4455 LDMA /LOAD MAINTENANCE
5420 7010 RAR
5421 4455 LDMA /LOAD MAINTENANCE
5422 7300 CLA CLL
5423 1016 TAD K0400 /ENABLE BIT FOR SHIFT COMMAND
5424 4455 LDMA /LOAD AND GO
5425 2134 ISZ SBCNT1
5426 5224 JMP ,=2 /SHIFT 12
5427 7300 CLA CLL
5430 1012 TAD K0020 /ENABLE READ BUFFER
5431 4455 LDMA /LOAD AND GO
5432 3151 DCA CMREG /SAVE IT
5433 1151 TAD CMREG
5434 5612 JMP I RDCM /EXIT

/ROUTINE TO ZERO WORK BUFFER
/
5435 0000 KLBUF, 0
5436 7340 CLA CLL CMA
5437 1067 TAD BGNBUF 7000 /START OF BUFFER -1
5440 3010 DCA AUTO10 /SETUP AUTO INDEX
5441 1123 TAD K7400 7400
5442 3164 DCA DATCNT /SETUP COUNTER
5443 3410 DCA I AUTO10 /CLEAR BUFFER
5444 2164 ISZ DATCNT /UPDATE COUNTER
5445 5243 JMP ,=2 /NOT ALL CLEARED YET
5446 5635 JMP I KLBUF /BUFFER CLEARED

/ROUTINE TO FILL THE WORK BUFFER WITH
/ THE COMPLEMENT DATA THATS IN THE AC.
/
5447 0000 FLBUF, 0
5450 3165 DCA SAVDAT /SAVE DATA WORD
5451 7340 CLA CLL CMA
5452 1067 TAD BGNBUF 7000 /START OF BUFFER -1
5453 3010 DCA AUTO10 /SETUP AUTO INDEX
5454 1124 TAD K7600 7600
5455 3164 DCA DATCNT /SETUP COUNTER

```

```

5456 1165 LPDAT, TAD SAVDAT 7527 /GET FIRST WORD
5457 3410 DCA I AUTO10 /STORE IN BUFFER
5460 1165 TAD SAVDAT /GET SECOND WORD
5461 7040 CMA /COMPLEMENT IT
5462 3410 DCA I AUTO10 /STORE IN BUFFER
5463 2164 ISZ DATCNT /UPDATE COUNTER
5464 5256 JMP LPDAT /MORE WORDS TO GO
5465 1101 TAD K1234 1234
5466 3410 DCA I AUTO10 /MAKE WORD IN BUFFER + 1
5467 5647 JMP I FLBUF /BUFFER FULL

/ROUTINE TO CHECK FOR WAIT AND RECALIBRATE
/
5470 3320 SCOPE, DCA TOTST /SAVE SCOPE LOOP POINTER
5471 7604 LAS /GET SWITCH 7
5472 0012 AND K0020 /MASK
5473 7640 SZA CLA /WAIT LOOP?
5474 4433 WATISZ /YES
5475 7604 LAS /GET SWITCH 6
5476 0013 AND /MASK
5477 7650 SNA CLA /IS IT CLEAR DISK
5500 5322 JMP NOCLP /NO, DON'T
5501 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
5502 4453 CLRALL /CLEAR CONTROL
5503 1151 TAD CMREG /GET LAST COMMAND
5504 0325 AND K7577 /MASK OUT SET DONE
5505 4450 LDCMD /LOAD COMMAND
5506 7326 CLA CLL CML RIL /ENABLE RECALIBRATE
5507 4453 CLRALL /RECALIBRATE
5510 4432 SKPWAI /WAIT FOR FIRST DONE
5511 7000 NOP
5512 1151 TAD CMREG /LAST COMMAND
5513 1015 TAD K0200
5514 4450 LDCMD /LOAD COMMAND
5515 4432 SKPWAI /WAIT FOR SECOND DONE
5516 7000 NOP
5517 1151 TAD CMREG
5520 0325 AND K7577 /MASK SET DONE
5521 3151 DCA CMREG
5522 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
5523 4453 CLRALL /CLEAR CONTROL
5524 5726 JMP I TOTST /GO TO TEST

/
5525 7577 K7577, 7577
5526 0000 TOTST, 0

/ROUTINE TO GET ALL REGISTERS
/(NOTE: THIS ROUTINE WILL CAUSE ONE MAINTENANCE
/ DATA BREAK TO LOCATION 0 IF THE LAST PREVIOUS
/ FUNCTION EXECUTED WAS A HEAD DATA BREAK.)
/
5527 0000 GIPEG, 0
5530 7604 LAS /GET SWITCH 8
5531 0011 AND K0010 /MASK
5532 7650 SNA CLA /WAS IT GET ALL REGISTERS

```

```

5533 5727      JMP I  GIREG      /NO, GO BACK
5534 2327      ISZ   GIREG      /YES, UPDATE POINTER
5535 4444      RDSTAT      /READ STATUS
5536 4456      RDBUF      /READ LOWER BUFFER
5537 7300      CLA CLL      /SET CA TO 0 FOR BREAK
5540 4451      LDCUR      /ENABLE SHIFT TO LOWER BUFFER
5541 7332      CLA CLL CML RTR /BREAK IF LAST BREAK WAS A READ
5542 4455      LDMAN      /READ CRC
5543 4454      RDCRC      /READ TRACK
5544 4446      RDADD      /READ COMMAND
5545 4445      RUCMD      /ENABLE CLEAR CONTROL
5546 4462      CMLF      /CLEAR CONTROL
5547 7301      CLA CLL IAC
5550 4453      CLRALL
5551 1124      TAD    K7600
5552 5727      JMP I  GTREG      /EXIT

```

/ROUTINE TO SEND DRIVES ON AN OVERLAP SEEK

```

5553 0000      DOUT, 0      /SAVE ADDRESS
5554 3327      DCA    GIREG
5555 7004      RAL
5556 1070      TAD    DRIVNO    /GET CURRENT DRIVE
5557 4450      LDCMD      /LOAD COMMAND REGISTER
5560 1151      TAD    CMREG      /GET LAST COMMAND ISSUED
5561 1103      TAD    K3000      /ADD IN SEEK ONLY FUNCTION
5562 1157      TAD    HOMEWA      /ADD IN CURRENT FIELD
5563 4450      LDCMD      /LOAD COMMAND REGISTER
5564 1327      TAD    GIREG      /GET SAVED ADDRESS
5565 4452      LDADD      /LOAD AND GO
5566 4447      DSKSKP      /WAIT FOR FIRST DONE FLAG
5567 5366      JMP     ,+1      /HANG IF NO SKIP
5570 5753      JMP I  DOUT      /DISK IS OUT

```

5600 PAGE

/ROUTINE TO READ OR WRITE ON DISK
/RETURN +1 SKIP OR STATUS ERROR
/RETURN +2 O.K.

```

5600 0000      DISK, 0      /SAVE TRACK ADDRESS
5601 3254      DCA    SAVTRK
5602 7340      CLA CLL CHA
5603 3173      DCA    SFPERR      /SET CRC ERROR FLAG
5604 1600      TAD I  DISK      /GET TEXT POINTER
5605 3174      DCA    SAVPCT      /SAVE IT
5606 2200      ISZ   DISK      /UPDATE POINTER
5607 1151      TAD    CMREG      /GET COMMAND
5610 0255      AND   K7501      /MASK OFF
5611 1157      TAD    HOMEWA      /CURRENT FIELD
5612 1070      TAD    DRIVNO      /CURRENT DRIVE
5613 4450      LDCMD      /LOAD COMMAND
5614 1067      TAD    BGNBUF      /GET BEGINNING OF BUFFER
5615 4451      LDCUR      /LOAD CURRENT ADDRESS
5616 1254      TAD    SAVTRK      /GET TRACK + SECTOR

```

```

5617 4452      LDADD      /LOAD AND GO
5620 4432      SKPWA I 5261 /WAIT FOR DISK SKIP
5621 5234      JMP     SKPERR      /ERROR, NO SKIP
5622 7330      CLA CLL CML RAR /EXPECTED STATUS
5623 3144      DCA    GDREG2      /SETUP COMPARE REGISTER
5624 4444      RDSTAT      /READ STATUS
5625 1104      TAD    K4000
5626 7640      SZA CLA      /WAS STATUS 4000
5627 5236      JMP     STAERR      /ERROR, STATUS
5630 1167      TAD    K5373      /TEXT POINTER
5631 2200      ISZ   DISK      /UPDATE FOR GOOD RETURN
5632 3574      RETRN, DCA I SAVPCT /STORE IN TEXT POINTER
5633 5600      JMP I  DISK      /EXIT
5634 1166      SKPERR, TAD K0306 /SKIP TEXT POINTER
5635 5232      JMP     RETRN      /EXIT
5636 1147      STAERR, TAD STREG /GET STATUS JUST READ
5637 0011      AND   K0010      /MASK OUT CRC ERRORS
5640 7650      SNA CLA /WERE THERE ANY
5641 5252      JMP     HRDERR      /NO, OTHERS
5642 7300      CLA CLL
5643 1151      TAD    CMREG      /GET LAST COMMAND
5644 0106      AND   K7000      /MASK FUNCTION
5645 1105      TAD    K6000      /ADD IN FUDGE FACTOR
5646 7630      SZL CLA /WAS IT A READ ALL OR READ
5647 5252      JMP     HRDERR      /NO, MUST BE A WRITE
5650 3173      DCA    SFPERR      /SET CRC ERROR FLAG
5651 5230      JMP     RETRN -2 /GO CHECK DATA OR RETURN
5652 1170      HRDERR, TAD K5300
5653 5232      JMP     RETRN      /EXIT

```

5654 0000 SAVTRK, 0
5655 7501 K7501, 7501
/ROUTINE TO COMPARE WORDS IN BUFFER TO
/KNOWN DATA PATTERN IN THE AC.

```

5656 0000      FIGURE, 0      /SAVE FOR ERROR PRINTER
5657 3144      DCA    GDREG2      /GET START OF BUFFER
5660 1067      TAD    BGNBUF      /SAVE FOR ERROR PRINTER
5661 3154      DCA    ADREG      /GET DISK NO. AND EXT. BIT
5662 1151      TAD    CMREG      /MASK THEM
5663 0100      AND   K0007
5664 7041      CIA
5665 1554      TAD I  ADREG      /GET FIRST TRACK WORD
5666 7650      SNA CLA /WAS IT O.K. ?
5667 5273      JMP     ,+4      /YES, CHECK NEXT TRACK WORD
5670 1151      TAD    CMREG      /GET DISK NO. AND EXT. BIT
5671 0100      AND   K0007      /MASK THEM
5672 5343      JMP     DTERR      /DATA ERROR
5673 2154      ISZ   ADREG      /UPDATE ADDRESS
5674 1554      TAD I  ADREG      /GET SECOND WORD
5675 7041      CIA
5676 1152      TAD    DAREG      /COMPARE TO ADDRESS
5677 7650      SNA CLA /WAS SECOND TRACK WORD O.K.
5700 5303      JMP     ,+3      /YES, NOW CHECK DATA

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5701 1152      TAD      DAREG      /GET GOOD INFO
5702 5343      JMP      DTERR      /DATA ERROR
5703 7326      CLA CLL  CML RTL
5704 1123      TAD      K7400
5705 3164      DCA      DATCNI      /SETUP COUNTER
5706 2154      LPPFIG, ISZ      ADREG      /UPDATE ADDRESS
5707 1554      TAD I    ADREG      /GET DATA WORD
5710 7041      CIA
5711 1144      TAD      GDREG2
5712 7640      SZA CLA
5713 5344      JMP      DTERR +1
5714 1144      TAD      GDREG2
5715 7040      CMA
5716 3144      DCA      GDREG2
5717 2164      ISZ      DATCNI
5720 5306      JMP      LPPFIG
5721 2154      ISZ      ADREG      /UPDATE ADDRESS
5722 1101      TAD      K1234
5723 7041      CIA
5724 1554      TAD I    ADREG
5725 7650      SNA CLA
5726 5331      JMP      .+3
5727 1101      TAD      K1234
5730 5343      JMP      DTERR
5731 7330      CLA CLL  CML PAR
5732 3144      DCA      GDREG2
5733 1173      TAD      SOFERR
5734 7640      SZA CLA
5735 5656      JMP I    FGURE
5736 7340      CLA CLL  CMA
5737 3173      DCA      SOFERR
5740 1170      TAD      K5300
5741 3574      DCA I    SAVPCI
5742 7330      CLA CLL  CML PAR
5743 3144      DIERR, DCA      GDREG2
5744 1554      TAD I    ADREG
5745 3155      DCA      DTREG
5746 2256      ISZ      FGURE
5747 5656      JMP I    FGURE

5750 2003      /
5751 7200      TEXPC, TEXT  "PC:"
5752 0704      TEXGD, TEXT  "GD:"
5753 7200
5754 0322      TEXCR, TEXT  "CR:"
5755 7200
5756 2324      TEXST, TEXT  "ST:"
5757 7200
5760 0402      TEXDR, TEXT  "DR:"
5761 7200
5762 0315      TEXCM, TEXT  "CM:"
5763 7200
5764 0401      TEXDA, TEXT  "DA:"
5765 7200
5766 0301      TEXCA, TEXT  "CA:"

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5767 7200
5770 0104      TEXAD, TEXT  "AD:"
5771 7200
5772 0424      TEXDT, TEXT  "DT:"
5773 7200

/
PAGE
/SUBROUTINE TO SHIFT CRC REGISTER TO DATA
/BUFFER THEN READ IT.
/
6000 0000      RDCH, 0
6001 7300      CLA CLL
6002 1130      TAD      M12
6003 3134      DCA      SBCNT1      /12 SHIFTER
6004 7330      CLA CLL  CML PAR
6005 4455      LDMAN
6006 7010      RAR
6007 4455      LDMAN
6010 7010      RAR
6011 4455      LDMAN
6012 2134      ISZ      SBCNT1
6013 5211      JMP      .-2
6014 7300      CLA CLL
6015 1012      TAD      K0020
6016 4455      LDMAN
6017 3146      DCA      CRREG2      /SAVE IT
6020 1130      TAD      M12
6021 3134      DCA      SBCNT1      /12 BIT SHIFTER
6022 7332      CLA CLL  CML RTR
6023 4455      LDMAN
6024 7010      RAR
6025 4455      LDMAN
6026 2134      ISZ      SBCNT1
6027 5225      JMP      .-2

6030 7300      CLA CLL
6031 1012      TAD      K0020
6032 4455      LDMAN
6033 0116      AND      K0017
6034 3145      DCA      CRREG1
6035 5600      JMP I    RDCH      /SAVE OTHER HALF
/EXIT

/SUBROUTINE TO PRINT TWO OCTAL
/
6036 0000      /
6037 3134      TOCT, 0
6040 1134      DCA      SBCNT1
6041 7010      RAR
6042 7012      RTR
6043 0100      AND      K0007
6044 1264      TAD      K0260
6045 4436      TYPE
6046 1134      TAD      SBCNT1      /PRINT FIRST BYTE

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6047 0100      AND      K0007
6050 1264      TAD      K0260
6051 4436      TYPE
6052 5636      JMP I   TUCT          /PRINT SECOND BIT
                          /EXIT
/
/
/ROUTINE TO DO CRLF
6053 0000      UPONE,  0
6054 7300      CLA CLL
6055 1262      TAD      K0215
6056 4436      TYPE
6057 1263      TAD      K0212
6060 4436      TYPE
6061 5653      JMP I   UPONE
/
6062 0215      K0215, 0215
6063 0212      K0212, 0212
6064 0260      K0260, 0260
6065 0240      K0240, 0240
/
/ROUTINE TO PRINT FOUR OCTAL
/
6066 0000      FROCT,  0
6067 7006      RIL
6070 7006      RIL
6071 3253      DCA      UPONE
6072 1131      TAD      M4
6073 3236      DCA      TUCT
6074 1253      TAD      UPONE
6075 0100      AND      K0007
6076 1264      TAD      K0260
6077 4436      TYPE
6100 1253      TAD      UPONE
6101 7006      RIL
6102 7004      RAL
6103 3253      DCA      UPONE
6104 2236      ISZ      TUCT
6105 5274      JMP      .-11
6106 1265      TAD      K0240
6107 4436      TYPE
6110 5666      JMP I   FROCT
/
/SUBROUTINE TO PRINT TEXT
6111 0000      PRN,   0
6112 7300      CLA CLL
6113 1711      TAD I   PRN          /GET POINTER
/
6114 2311      ISZ      PRN
6115 3266      DCA      FROCT
6116 1666      TAD I   FROCT
6117 0110      AND      K7700

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```

6120 7450      SNA
6121 5345      JMP      EXIT
6122 7500      SNA
6123 7020      CML
6124 7001      IAC
6125 7012      R1R
6126 7012      R1R
6127 7012      R1R
6130 4436      TYPE
6131 1666      TAD I   FROCT
6132 0111      AND      K0077
6133 7450      SNA
6134 5345      JMP      EXIT
6135 1350      TAD      K3740
6136 7500      SNA
6137 1347      TAD      K4100
6140 1265      TAD      K0240
6141 4436      TYPE
6142 2266      ISZ      FROCT
6143 7300      CLA CLL
6144 5316      JMP      PRN+5
6145 7300      EXIT,  CLA CLL
6146 5711      JMP I   PRN
/
6147 4100      K4100, 4100
6150 3740      K3740, 3740
/
/ROUTINE TO TYPE
/
6151 0000      PRINT,  0
6152 6046      TLF
6153 6041      TSF
6154 5353      JMP      .-1
6155 6042      TCF
6156 7200      CLA
6157 5751      JMP I   PRINT
/
6200      PAGE
/
/ROUTINE TO RECALIBRATE SELECTED DRIVE OR
/SEEK ONLY POSITION IN AC ON SELECTED DRIVE.
/
6200 0000      RESTOR, 0
6201 7300      CLA CLL
6202 1600      TAD I   RESTOR          /GET TEXT POINTER
6203 3315      DCA      SAVPC          /SAVE FOR ERROR
6204 2200      ISZ      RESTOR          /UPDATE PC
6205 1200      TAD      RESTOR          /GET PC
6206 3215      DCA      ONLY          /SAVE FOR END OF SEEK ROUTINE
6207 1070      TAD      DRIVNO          /CURRENT DRIVE
6210 1157      TAD      HOMEWA          /CURRENT FIELD
6211 4450      LDCMD          /LOAD COMMAND
6212 7326      CLA CLL CML RTL          /ENABLE RECALIBRATE BIT
6213 4453      CLRALL          /"RECALIBRATE"

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6214 5232 / JMP CHECK /CHECK FOR ERRORS
/ ONLY, 0
6215 0000 DCA SAVTO /SAVE LOWER TRACK BITS
6216 3316 TAD I ONLY /GET TEXT POINTER
6217 1615 DCA SAVPC /SAVE FOR ERROR
6221 2215 ISZ DNLY /GET COMMAND
6222 1151 TAD CMREG /MASK OFF EXTENDED BIT
6223 0072 AND K0001 /CURRENT FIELD
6224 1157 TAD HOMEBA /CURRENT DRIVE
6225 1070 TAD DRIVND /SEEK ONLY FUNCTION
6226 1103 TAD K3000 /LOAD COMMAND
6227 4450 LDCMD /GET POSITION
6230 1316 TAD SAVTO /LOAD AND GO
6231 4452 LDADD /WAIT FOR FIRST DONE FLAG
6232 4432 CHECK, SKPWAT /ERROR, NO SKIP
6233 5313 JMP SEKER1 /EXPECTED STATUS
6234 7330 CLA CLL CML RAR /SETUP COMPARE REGISTER
6235 3144 DCA GDREG2
6236 1122 TAD K7740
6237 3320 DCA RNAD
6240 4444 RDSTAT /SETUP SKIP TIMER
6241 1104 TAD K4000 /READ STATUS
6242 7650 SNA CLA /WAS DRIVE DONE?
6243 5252 JMP +7 /YES
6244 1105 TAD K6000 /NO, DRIVE MUST BE BUSY
6245 3144 DCA GDREG2 /EXPECTED STATUS
6246 1147 TAD SIREG /GET STATUS READ
6247 1102 TAD K2000 /ADD IN FUDGE FACTOR
6250 7640 SZA CLA /WAS DRIVE BUSY
6251 5310 JMP SEKER2 /NO, ERROR
6252 1015 TAD K0200 /ENABLE SET SECOND DONE FLAG
6253 1151 TAD CMREG /ORIGINAL COMMAND
6254 4450 LDCMD /LOAD COMMAND
6255 7332 CLA CLL CML RTR
6256 3144 DCA GDREG2 /EXPECTED STATUS
6257 4444 CHKSKP, RDSTAT /READ STATUS
6260 4447 DSKSKP /FLAG SET?
6261 7410 SKP /NO
6262 5273 JMP GOTSKP /YES GOT IT!
6263 1105 TAD K6000
6264 7640 SZA CLA /DRIVE BUSY?
6265 5310 JMP SEKER2 /NO, ERROR
6266 2364 ISZ RNWRD4
6267 5257 JMP CHKSKP
6270 2320 ISZ PHAD
6271 5257 JMP CHKSKP
6272 5313 JMP SEKER1 /ERROR, NO SKIP
6273 7330 GOTSKP, CLA CLL CML RAR
6274 3144 DCA GDREG2 /SETUP EXPECTED STATUS
6275 4444 RDSTAT /READ STATUS
6276 1104 TAD K4000
6277 7640 SZA CLA /WAS IT ONLY DONE FLAG
6300 5310 JMP SEKER2 /NO, ERROR STATUS
6301 1151 TAD CMREG /GET LAST COMMAND

```

```

6302 0317 AND A7577 /MASK OUT
6303 4450 LDCMD /CLEAR STATUS
6304 3144 DCA GDREG2 /SETUP COMPARE REGISTER
6305 4444 PUSTAT /READ STATUS
6306 7650 SNA CLA /WAS STATUS 0000?
6307 2215 ISZ DNLY /UPDATE PC
6310 1170 SEKER2, TAD K5300
6311 3715 GOBAK, DCA I SAVPC /SETUP TEXT POINTER
6312 5615 JMP I DNLY /BACK TO TEST
6313 1166 SEKER1, TAD K0306 /SKIP TEXT POINTER
6314 5311 JMP GOBAK /EXIT
/
6315 0000 SAVPC, 0
6316 0000 SAVTO, 0
6317 7577 A7577, 7577
/
/ROUTINE TO GET A RANDOM DISK ADDRESS
/
6320 0000 RNAD, 0
6321 3360 DCA SAVPOT /SAVE DISK NO, POINTER
6322 7101 CLL IAC
6323 1362 TAD RNWRD1
6324 1363 TAD RNWRD2
6325 7106 CLL RTL
6326 3362 DCA RNWRD1
6327 1363 TAD RNWRD2
6330 7012 RTR
6331 1362 TAD RNWRD1
6332 3363 DCA RNWRD2
6333 1363 TAD RNWRD2
6334 7420 SNL
6335 5341 JMP GOTADD /USE THIS AS DISK ADDRESS
6336 1172 TAD ENDRK /HAVE TO CHECK BOUNDARIES
6337 7200 CLA
6340 1363 TAD RNWRD2 /GET SAME
6341 3364 GOTADD, DCA RNWRD4 /SAVE WORD
6342 1361 TAD DSKSAV /GET POINTER
6343 1360 TAD SAVPOT /ADD IN DRIVE NUMBER
6344 3360 DCA SAVPOT /MAKE ADDRESS
6345 1364 TAD RNWRD4 /GET WORD
6346 3760 DCA I SAVPOT /STORE IT
6347 1360 TAD SAVPOT
6350 1075 TAD K0004 /ADD IN FUDGE FACTOR
6351 3360 DCA SAVPOT /MAKE ADDRESS
6352 7004 RAL /GET THE LINK
6353 3760 DCA I SAVPOT /SAVE EXTENDED BIT
6354 1760 TAD I SAVPOT /GET IT
6355 7110 CLL RAP /SHIFT
6356 1344 TAD RNWRD4 /GET WORD
6357 5720 JMP I RNAD /EXIT
/
6360 0000 SAVPOT, 0
6361 6365 DSKSAV, DSKOA
6362 1234 RNWRD1, 1234
6363 2345 RNWRD2, 2345

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6364 0000 RNWRD4, 0
6365 0000 DSK0A, 0
6366 0000 DSK1A, 0
6367 0000 DSK2A, 0
6370 0000 DSK3A, 0
6371 0000 DSKUR, 0
6372 0000 DSK1R, 0
6373 0000 DSK2R, 0
6374 0000 DSK3R, 0
/
6400 /PAGE
/
/SUBROUTINE FOR "NO ERRORS" AND SCOPE
/LOOPS, UPDATE UP COUNTER "REG1" ON EVERY ENTRY.
/
6400 0000 NERRO, 0
6401 2290 ISZ NERRO
6402 7300 CLA CLL
6403 1600 TAD I NERRO /GET RESTART ADDRESS
6404 3175 DCA RSTRT /STORE
6405 7604 LAS /GET SWITCH 4
6406 0015 AND K0200 /MASK
6407 7640 SZA CLA /PROGRAM HALT
6410 7402 STPHLT, HLT /STOP HALT FROM SWR4#1
6411 7604 LAS /GET SWITCH 1
6412 7004 RAL
6413 7700 SNA CLA /IS IT SCOPE LOOP
6414 5217 JMP ,+3 /NO
6415 1600 TAD I NERRO /GET RETURN POINTER
6416 5631 JMP I NSCOPE /CHECK FOR WAIT AND RETURN
6417 1132 TAD REG0
6420 7640 SZA CLA /1 OR 4096 PASSES
6421 5224 JMP NEXTST /1 PASS PER TEST
6422 2133 ISZ REG1 /UPDATE UPCOUNTER
6423 5575 JMP I RSTRT /BACK TO SAME TEST
6424 7301 NEXTST, CLA CLL IAC /ENABLE CLEAR CONTROL
6425 4453 CLRALL /CLEAR CONTROL
6426 2200 ISZ NERRO /UPDATE PC STORE
6427 2200 ISZ NERRO /UPDATE PC STORE
6430 5600 JMP I NERRO /TO NEXT SEQUENTIAL TEST
/
6431 8470 NSCOPE, SCOPE
/
/ROUTINE TO DO HALF BLOCK DATA CHECKS
/
6432 0000 HFCHK, 0
6433 3144 DCA GDREG2 /SETUP FOR ERROR PRINTER
6434 1067 TAD BGNBUF /GET START OF BUFFER
6435 3154 DCA ADREG /FOR ERROR PRINTER
6436 1151 TAD CMREG
6437 0100 AND K0007
6440 7041 CIA
6441 1554 TAD I ADREG /COMPARE TO BUFFER WORD
6442 7650 SNA CLA /SAME ?
6443 5247 JMP ,+4 /YES

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```

6444 1151 TAD CMREG
6445 0100 AND K0007 /NO
6446 5330 JMP HFERR /UPDATE ADDRESS
6447 2154 ISZ ADREG
6450 1554 TAD I ADREG
6451 7041 CIA
6452 1152 TAD DAREG /COMPARE TO DISK ADDRESS
6453 7650 SNA CLA /SAME????
6454 5257 JMP ,+3 /YES
6455 1152 TAD DAREG
6456 5330 JMP HFERR /NO
6457 2154 ISZ ADREG /UPDATE ADDRESS
6460 7326 CLA CLL CML RIL
6461 1124 TAD K7600
6462 3164 DCA DATCNT /SETUP COUNTER FOR FIRST HALF
6463 1554 HFR1, TAD I ADREG
6464 7041 CIA
6465 1144 TAD GDREG2 /COMPARE TO GOOD VALUE
6466 7640 SZA CLA /WERE THEY THE SAME
6467 5331 JMP HFERR +1 /ERROR, DATA BREAK
6470 2154 ISZ ADREG /UPDATE ADDRESS POINTER
6471 1144 TAD GDREG2
6472 7040 CMA
6473 3144 DCA GDREG2 /NEXT WORD IS COMPLEMENT
6474 2164 ISZ DATCNT
6475 5263 JMP HFR1 /MORE TO TEST IN FIRST HALF
6476 1124 TAD K7600
6477 3164 DCA DATCNT /SETUP COUNTER
6500 3144 DCA GDREG2 /REST OF BUFFER SHOULD BE 0000
6501 1554 HFR2, TAD I ADREG
6502 7640 SZA CLA /WAS IT 0
6503 5330 JMP HFERR /ERROR
6504 2154 ISZ ADREG
6505 2164 ISZ DATCNT
6506 5301 JMP HFR2 /MORE TO CHECK
6507 1554 TAD I ADREG /GET WORD IN BUFFER +1
6510 7041 CIA
6511 1101 TAD K1234
6512 7650 SNA CLA /WAS IT O.K.?
6513 5316 JMP ,+3 /YES
6514 1101 TAD K1234
6515 5330 JMP HFERR /ERROR, BUFFER +1
6516 7330 CLA CLL CML RAR /EXPECTED STATUS
6517 3144 DCA GDREG2 /SETUP COMPARE REGISTER
6520 1173 TAD SOFERR /GET CRC ERROR FLAG
6521 7640 SZA CLA /WAS IT SET
6522 5632 JMP I HFCHK /NO ERRORS
6523 7340 CLA CLL CMA /RESET CRC ERROR FLAG
6524 3173 DCA SOFERR
6525 1170 TAD K5300 /TEXT
6526 3574 DCA I SAVPCT /SET UP POINTER
6527 7330 CLA CLL CML RAR /EXPECTED STATUS
6530 3144 HFEHR, DCA GDREG2 /SETUP COMPARE
6531 1554 TAD I ADREG /GET BAD WORD
6532 3155 DCA DREG /SAVE FOR PRINTER

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6533 2232      ISZ  HFCHK
6534 5632      JMP I  HFCHK
/ROUTINE TO CHANGE PROGRAM DEVICE CODES
/
6535 7604      CHANG, LAS
6536 0126      AND  K0770
6537 3232      DCA  HFCHK           /SAVE DESIRED CODE
6540 1360      TAD  CCNTR1
6541 3200      DCA  NERRO
6542 1361      TAD  CHNPOI
6543 3357      DCA  CNGSAV
6544 1757      CHANGH, TAD I CNGSAV      /GET ADDRESS POINTER
6545 3000      DCA  0           /SAVE IT
6546 1400      TAD I  0           /GET OLD IOT CODE
6547 0127      AND  K7007      /MASK
6550 1232      TAD  HFCHK      /ADD IN DESIRED
6551 3400      DCA I  0           /CHANGE CORE
6552 2357      ISZ  CNGSAV      /UPDATE ADDRESS POINTER
6553 2200      ISZ  NERRO      /UPDATE CHANGE COUNTER
6554 5344      JMP  CHANGR      /DEVICE CODES CHANGED
6555 7402      CHNHLL, HLT
6556 5355      JMP  .-1
/
6557 0000      CNGSAV, 0
6560 7745      CCNTR1, 7745
6561 6562      CHNPOI, CHNPOI +1
6562 5334      IOT1
6563 5341      IOT2
6564 5322      IOT3
6565 5314      IOT4
6566 5301      IOT5
6567 5330      IOT6
6570 5345      IOT7
6571 2676      IOT1A1
6572 2707      IOT2A1
6573 2675      IOT3A1
6574 2671      IOT4A1
6575 2700      IOT5A1
6576 2673      IOT6A1
6577 3026      IOT1A2
6600 3052      IOT2A2
6601 3025      IOT3A2
6602 3021      IOT4A2
6603 3030      IOT5A2
6604 3023      IOT6A2
6605 2016      T2810A
6606 2022      T2810b
6607 2027      T2810C
6610 2032      T2810D
6611 2073      T2910A
6612 2077      T2910b
6613 2104      T2910C
6614 2110      T2910D

```

```

6615 2324      ERTX1, TEXT  "STATUS REGISTER ERROR"
6616 0124
6617 2523
6620 4022
6621 0507
6622 1123
6623 2405
6624 2240
6625 0522
6626 2217
6627 2200
6630 0317      ERTX2, TEXT  "COMMAND REGISTER ERROR"
6631 1515
6632 0116
6633 0440
6634 2205
6635 0711
6636 2324
6637 0522
6640 4005
6641 2222
6642 1722
6643 0000
6644 0411      ERTX3, TEXT  "DISK ADDRESS REGISTER ERROR"
6645 2313
6646 4001
6647 0404
6650 2205
6651 2323
6652 4022
6653 0507
6654 1123
6655 2405
6656 2240
6657 0522
6660 2217
6661 2200
6662 0411      ERTX4, TEXT  "DISK DATA ERROR"
6663 2313
6664 4004
6665 0124
6666 0140
6667 0522
6670 2217
6671 2200
6672 0322      ERTX5, TEXT  "CRC REGISTER ERROR"
6673 0340
6674 2205
6675 0711
6676 2324
6677 0522
6700 4005
6701 2222
6702 1722
6703 0000

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6704 0401 ERTX6, TEXT "DATA REGISTER ERROR"
6705 2401
6706 4022
6707 0507
6710 1123
6711 2405
6712 2240
6713 0522
6714 2217
6715 2200
6716 0411 ERTX7, TEXT "DISK SKIP ERROR"
6717 2313
6720 4023
6721 1311
6722 2040
6723 0522
6724 2217
6725 2200
6726 0411 ERTX8, TEXT "DISK INTERRUPT ERROR"
6727 2313
6730 4011
6731 1624
6732 0522
6733 2225
6734 2024
6735 4005
6736 2222
6737 1722
6740 0000

/
6741 2213 TEXEND, TEXT "RK8E DRIVE CONTROL TEST PASS COMPLETE"
6742 7005
6743 4004
6744 2211
6745 2605
6746 4003
6747 1716
6750 2422
6751 1714
6752 4024
6753 0523
6754 2440
6755 2001
6756 2323
6757 4003
6760 1715
6761 2014
6762 0524
6763 0500

/
7000 *7000
/
7000 WRKBUF=,
/
7000 HITRK=,

7001 LOTRK=,+1
/
7377 ENDBUF=,+377
/
7400 SHPCBK=,+400
/

| | | | | | | | |
|--------|------|--------|------|--------|------|--------|------|
| A7577 | 6317 | DRST | 6745 | GOTSKP | 6273 | K0020 | 0012 |
| A7776 | 4370 | DSKOA | 6365 | GRNKR | 4364 | K0037 | 0117 |
| ACCMF1 | 4442 | DSKOB | 6371 | GRNKOK | 4343 | K0040 | 0013 |
| ACCMF2 | 4443 | DSK1A | 6366 | GRNKR1 | 4274 | K0077 | 0111 |
| ACPEG | 0156 | DSK1B | 6372 | GRNKP2 | 4330 | K0100 | 0014 |
| ADREG | 0154 | DSK2A | 6367 | GRNKR3 | 4353 | K0200 | 0015 |
| AGAIN | 5125 | DSK2B | 6373 | GRONK | 4265 | K0207 | 5154 |
| ALLHAK | 4250 | DSK3A | 6370 | GIREG | 5527 | K0212 | 6063 |
| APA1 | 4752 | DSK3B | 6374 | MAFCHK | 4426 | K0215 | 6062 |
| APERR | 4773 | DSKADU | 4534 | HEDHLT | 4002 | K0240 | 6065 |
| APHLT1 | 4776 | DSKIN | 4421 | HEDLST | 5166 | K0260 | 6064 |
| APR1 | 4731 | DSKOUT | 4420 | HEDTAD | 5165 | K0306 | 0166 |
| AUTO10 | 0010 | DSKP | 6741 | HFCHK | 6432 | KL400 | 0016 |
| AUTPRU | 4710 | DSKDOT | 4535 | HFERR | 6530 | K0770 | 0126 |
| BGN | 0200 | DSKSAV | 6361 | HFR1 | 6463 | K1000 | 0017 |
| BGNBUF | 0067 | DSKSKP | 4447 | HFR2 | 6501 | K1234 | 0101 |
| CAPEG | 0153 | DIERR | 5743 | HITRK | 7000 | K2000 | 0102 |
| CCNTR1 | 6560 | DIREG | 0155 | HOMEMA | 0157 | K2525 | 0112 |
| CHANG | 6535 | ENDBUF | 7377 | HRDERR | 5652 | K3000 | 0103 |
| CHANGR | 6544 | ENDHLT | 4072 | INHIBI | 5157 | K3740 | 6150 |
| CHECK | 6232 | ENDTRK | 0172 | INTADD | 5215 | K4000 | 0104 |
| CHKNEX | 4434 | ENDTST | 4040 | INTRQ | 0034 | K4100 | 6147 |
| CHKSKP | 6257 | ERHLT1 | 5217 | IGNWAT | 4441 | K5000 | 0114 |
| CHNHLT | 6555 | ERHLT2 | 5343 | IONWT | 5200 | K5252 | 0113 |
| CHNPOT | 6561 | ERHLT3 | 5324 | IOT1 | 5334 | K5300 | 0170 |
| CLDR | 5340 | ERHLT4 | 5316 | IOT1A1 | 2676 | K5373 | 0167 |
| CLRALL | 4453 | ERHLT5 | 5303 | IOT1A2 | 3026 | K5403 | 0125 |
| CMREG | 0151 | ERHLT6 | 5332 | IOT2 | 5341 | K6000 | 0105 |
| CNGSAV | 6557 | ERHLT7 | 5347 | IOT2A1 | 2707 | K6304 | 0171 |
| COMP1 | 5221 | ERHLT9 | 5142 | IOT2A2 | 3052 | K7000 | 0106 |
| COMP2 | 5231 | ERRA1 | 5017 | IOT3 | 5322 | K7007 | 0127 |
| CRERR | 5245 | ERRD | 5000 | IOT3A1 | 2675 | K7156 | 3750 |
| CRLF | 4462 | ERROR | 4440 | IOT3A2 | 3025 | K7400 | 0123 |
| CRREG1 | 0145 | ERTX1 | 6615 | IOT4 | 5314 | K7501 | 5655 |
| CRREG2 | 0146 | ERTX2 | 6630 | IOT4A1 | 2671 | K7577 | 5525 |
| CRWRD1 | 0162 | ERTX3 | 6644 | IOT4A2 | 3021 | K7600 | 0124 |
| CRWRD2 | 0163 | ERTX4 | 6662 | IOT5 | 5301 | K7700 | 0110 |
| CYL450 | 0065 | ERTX5 | 6672 | IOT5A1 | 2700 | K7707 | 4707 |
| DAREG | 0152 | ERTX6 | 6704 | IOT5A2 | 3030 | K7740 | 0122 |
| DATCNT | 0164 | ERTX7 | 6716 | IOT6 | 5330 | K7760 | 0107 |
| DEPEG | 0150 | ERTX8 | 6726 | IOT6A1 | 2673 | K7771 | 0115 |
| DCLR | 6742 | ESCOPE | 5155 | IOT6A2 | 3023 | KCDF | 0120 |
| DIN | 4536 | EXIT | 6145 | IOT7 | 5345 | KILBUF | 4431 |
| DISKG | 5600 | FGURE | 5656 | K0001 | 0072 | KLBUF | 5435 |
| DISKGO | 4425 | FIGURE | 4427 | K0002 | 0073 | KRMF | 0121 |
| DLAG | 6743 | FILBUF | 4430 | K0003 | 0074 | LDAD | 5317 |
| DLCA | 6744 | FLBUF | 5447 | K0004 | 0075 | LDADD | 4452 |
| DLDC | 6746 | FROCT | 6066 | K0005 | 0076 | LDCA | 5307 |
| DMAN | 6747 | GDREG1 | 0143 | K0006 | 0077 | LDCM | 5325 |
| DDUT | 5553 | GDREG2 | 0144 | K0007 | 0100 | LDCMD | 4450 |
| DRIVNO | 0070 | GOBAK | 6311 | K0010 | 0011 | LDCUR | 4451 |
| DRIVSV | 0071 | GOTADD | 6341 | K0017 | 0116 | LDMAN | 4455 |

| | | | | | | | |
|---------|------|--------|------|--------|------|--------|------|
| LDMN | 5344 | RDCM | 5412 | T12E | 0705 | T28IOC | 2027 |
| LOTRK | 7001 | RDCMD | 4445 | T12R | 0670 | T28IOD | 2032 |
| LPDAT | 5456 | RDCR | 6000 | T13E | 0756 | T28OK | 2045 |
| LPFIG | 5706 | RDCRC | 4454 | T13R | 0720 | T28R | 2006 |
| M12 | 0130 | RDST | 5300 | T14KE | 1060 | T28T | 2052 |
| M4 | 0131 | RSTAT | 4444 | T14R | 1004 | T29E | 2124 |
| MANPRO | 4101 | RECAL | 4424 | T14SE | 1054 | T29IOA | 2073 |
| MANUAL | 4600 | REDBAK | 4517 | T15E | 1077 | T29IOB | 2077 |
| MPERR | 4157 | REGO | 0132 | T15T | 1101 | T29IOC | 2104 |
| MPHLT1 | 4122 | REG1 | 0133 | T16E | 1117 | T29IOD | 2110 |
| MPHLT2 | 4162 | RESEK | 4003 | T16T | 1121 | T29OK | 2121 |
| MPP1 | 4123 | RESTOR | 6200 | T17E | 1160 | T29R | 2064 |
| NDIN | 4561 | RESTR1 | 0175 | T17S | 1124 | T29T | 2126 |
| NERR0 | 6400 | RETRN | 5632 | T17I | 1162 | T2E | 0313 |
| NERROR | 4437 | RETRN2 | 5156 | T18E | 1235 | T30E | 2167 |
| NEXDSK | 4073 | RNAD | 6320 | T18S | 1202 | T30R | 2131 |
| NEXTST | 6424 | RNRD1 | 6362 | T18T | 1237 | T30T | 2171 |
| NOCLR | 5522 | RNRD2 | 6363 | T19E | 1265 | T31E | 2245 |
| NOTDOO | 4232 | RNRD4 | 6364 | T19OK | 1264 | T31R | 2202 |
| NOTEX | 5146 | SAMDSK | 4064 | T19T | 1267 | T31T | 2247 |
| NSCOPE | 6431 | SAVDAT | 0165 | T1E | 0266 | T32E | 2360 |
| NICRC | 5101 | SAVPC | 6315 | T20E | 1315 | T32R1 | 2257 |
| NTGD | 5064 | SAVPCI | 0174 | T20OK | 1314 | T32R2 | 2300 |
| NTGRNK | 4335 | SAVPOT | 6360 | T20T | 1317 | T32R3 | 2317 |
| NISEK | 4647 | SAVIO | 6316 | T21E | 1346 | T32R4 | 2341 |
| OCTEL | 4460 | SAVIRK | 5654 | T21OK | 1345 | T32T | 2362 |
| ONLY | 6215 | SBCNT1 | 0134 | T21T | 1350 | T33E | 2507 |
| OVDRDK | 4530 | SCOPE | 5470 | T22E | 1442 | T33R1 | 2404 |
| OVRDOK | 4442 | SDKP | 5333 | T22R1 | 1404 | T33R2 | 2431 |
| OVRERR | 4261 | SEK | 4423 | T22R2 | 1423 | T33R3 | 2450 |
| OVRLAP | 4200 | SEKER1 | 6313 | T22T | 1444 | T33R4 | 2467 |
| OVROK | 4240 | SEKER2 | 6310 | T23E | 1506 | T33T | 2511 |
| OVRR1 | 4203 | SKPERR | 5634 | T23R1 | 1451 | T34E | 2544 |
| OVRR2 | 4207 | SKPWAT | 4432 | T23R2 | 1470 | T34T | 2546 |
| OVRR3 | 4225 | SKWAT | 5261 | T23T | 1510 | T35E | 2644 |
| OVRRD1 | 4403 | SOFERR | 0173 | T24E | 1554 | T36E | 2725 |
| OVRRD2 | 4407 | STAERR | 5636 | T24S | 1513 | T36R | 2664 |
| OVRRD3 | 4425 | STCON | 0161 | T24T | 1556 | T36T | 2727 |
| OVRRED | 4400 | STPCHK | 7400 | T25E | 1642 | T37A | 3051 |
| PCNTR1 | 5163 | STPHLT | 6410 | T25S | 1602 | T37E | 3075 |
| PCNTR2 | 5164 | STRAUT | 5110 | T25T | 1644 | T37R | 3013 |
| POLERR | 4431 | STREG | 0147 | T26E | 1714 | T37T | 3077 |
| PRINT | 6151 | SWSEK | 4000 | T26R1 | 1651 | T38DE | 3151 |
| PRN | 6111 | TOE | 0253 | T26R2 | 1673 | T38E | 3140 |
| PRINTER | 4457 | T10E | 0543 | T26T | 1716 | T38OK | 3150 |
| PRSFLD | 0222 | T10R | 0514 | T27E | 1765 | T38R | 3110 |
| RANADD | 4422 | T10T | 0545 | T27R1 | 1723 | T38T | 3153 |
| RAPCNT | 0160 | T11E | 0637 | T27R2 | 1745 | T39DE | 3250 |
| RDAD | 5350 | T11R1 | 0602 | T27T | 1767 | T39E | 3237 |
| RDADD | 4446 | T11R2 | 0612 | T28E | 2050 | T39OK | 3247 |
| RDBF | 5400 | T11R3 | 0616 | T28IOA | 2016 | T39R | 3207 |
| RDBUF | 4456 | T11T | 0641 | T28IOB | 2022 | T39T | 3252 |

| | | | | | | | |
|--------|------|--------|------|--------|------|--------|------|
| T3E | 0346 | TCNTR6 | 0142 | TST35 | 2600 | XRDAD | 0046 |
| T3T | 0350 | TEXAD | 5770 | TST36 | 2647 | XRDBF | 0056 |
| T40E | 3276 | TEXCA | 5766 | TST37 | 3000 | XRDCM | 0045 |
| T40R | 3255 | TEXCM | 5762 | TST38 | 3100 | XRDCP | 0054 |
| T40S | 3261 | TEXCP | 5754 | TST39 | 3200 | XRDST | 0044 |
| T40T | 3300 | TEXDA | 5764 | TST4 | 0351 | XREG | 5162 |
| T41E | 3370 | TEXDB | 5760 | TST40 | 3253 | XRESTR | 0024 |
| T41R | 3303 | TEXDT | 5772 | TST41 | 3301 | XRNAD | 0022 |
| T41S | 3317 | TEXEND | 6741 | TST42 | 3400 | XSDKP | 0047 |
| T41T | 3372 | TEXGD | 5752 | TST43 | 3452 | XSKWAT | 0032 |
| T42E | 3447 | TEXPC | 5750 | TST44 | 3515 | XTEXT | 5161 |
| T42R | 3402 | TEXST | 5756 | TST45 | 3600 | XTOCT | 0061 |
| T42S | 3406 | THSFLD | 0035 | TST5 | 0360 | XWTISZ | 0033 |
| T42T | 3451 | THMSTP | 3536 | TST6 | 0400 | | |
| T43E | 3512 | THANE | 4703 | TST7 | 0415 | | |
| T43R1 | 3454 | THANGK | 4702 | TST8 | 0431 | | |
| T43R2 | 3461 | THANS | 4624 | TST9 | 0457 | | |
| T43T | 3514 | THANT | 4705 | TSTSEK | 4060 | | |
| T44E | 3554 | THPROT | 4161 | TWOCT | 4461 | | |
| T44OK | 3564 | TOCT | 6036 | TYPE | 4436 | | |
| T44R | 3524 | TOTST | 5526 | UPONE | 6053 | | |
| T44T | 3567 | TQVRDT | 4532 | WATISZ | 4433 | | |
| T45A1 | 3622 | TRK212 | 0066 | WRKBUF | 7000 | | |
| T45A2 | 3676 | TST0 | 0235 | WTISZ | 5247 | | |
| T45E | 3743 | TST1 | 0256 | XCLDR | 0053 | | |
| T45R1 | 3612 | TST10 | 0512 | XCOMP1 | 0042 | | |
| T45R2 | 3626 | TST11 | 0600 | XCOMP2 | 0043 | | |
| T45R3 | 3667 | TST12 | 0658 | XCLRF | 0062 | | |
| T45R4 | 3701 | TST13 | 0710 | XDIN | 0021 | | |
| T45SC | 3604 | TST14 | 1001 | XDISKG | 0025 | | |
| T45T | 3745 | TST15 | 1064 | XDOU | 0020 | | |
| T4E | 0355 | TST16 | 1102 | XERRO | 0040 | | |
| T4T | 0357 | TST17 | 1122 | XFGURE | 0027 | | |
| T5E | 0367 | TST18 | 1200 | XFLBUF | 0030 | | |
| T5T | 0371 | TST19 | 1240 | XPROCT | 0060 | | |
| T6E | 0412 | TST2 | 0271 | XGRONK | 4164 | | |
| T6T | 0414 | TST20 | 1270 | XGTREG | 5160 | | |
| T7E | 0426 | TST21 | 1320 | XHFCHK | 0026 | | |
| T7T | 0430 | TST22 | 1400 | XHIRK | 0064 | | |
| T8E | 0454 | TST23 | 1445 | XIONWT | 0041 | | |
| T8R | 0433 | TST24 | 1511 | XKLBUF | 0031 | | |
| T8T | 0456 | TST25 | 1600 | XLAP | 4165 | | |
| T9E | 0507 | TST26 | 1645 | XLDAD | 0052 | | |
| T9OK | 0506 | TST27 | 1717 | XLDCA | 0051 | | |
| T9R | 0464 | TST28 | 1773 | XLDGM | 0050 | | |
| T9T | 0511 | TST29 | 2053 | XLDMN | 0055 | | |
| TAPROT | 4775 | TST3 | 0317 | XLOTRK | 0063 | | |
| TCNTR1 | 0135 | TST30 | 2127 | XNERRD | 0037 | | |
| TCNTR2 | 0136 | TST31 | 2200 | XONLY | 0023 | | |
| TCNTR3 | 0137 | TST32 | 2250 | XOVRD | 4166 | | |
| TCNTR4 | 0140 | TST33 | 2400 | XPRINT | 0036 | | |
| TCNTR5 | 0141 | TST34 | 2512 | XPRN | 0057 | | |

ERRORS DETECTED: 0
 LINKS GENERATED: 7
 RUN-TIME: 23 SECONDS
 3K CORE USED



