IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHRKB-D-D
PRODUCT NAME:	RK8E DRIVE CONTROL TEST
DATE CREATED:	JANUARY 1, 1974
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	JOHN VROBEL

RK8EDRIV

RSW 0404

DISK TO RUN

@4EEK WTPROT BY TOGGLING AND LEAVE OFF

ONLY 3 TOP WHT LIGHTS SHOULD BE ON

LSW 0200

& MODE

I/O PRESET

START LS @ 45 min

TABLE OF CONTENTS

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 TYPEOUT 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 TYPEOUT, 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 PROCEDE TO NEXT TEST AFTER EACH ERROR TYPEOUT, IF SWR1=1 THE PROGRAM WILL PROCEDE BACK TO THE SAME OR CURRENT FAILING TEST.

(4, CONT'D.)

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 APROX, 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 SEQUENCIALLY 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.

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 SWR4=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", "WI", 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 "WI PROT" GOES OFF.

M. VERIFY THAT LIGHTS LABELED "FAULT", "WI", "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 TYPEOUTS OTHER THAN THE PASS COMPLETE TYPEOUT OR END OF TEST HALT MENTIONED ABOVE WILL BE CONCIDERED 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 SEQUENCIALLY 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 SEQUENCIALLY 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.

"RK8E 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 CONCIDERED 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 "WT PROT" TO TURN "WRITE PROTECT" AND THE LIGHT LABELED "WT PROT" ON.

K. PRESS KEY CONTINUE AND THE COMPUTER SHOULD HALT AT LOCATION "MPHLT2" INDICATING A SUCCESSFUL TEST.
4162

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 TYPEOUTS 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 "WT 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 "WT 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 RESULTS 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 SWR0-7 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 SWR9-11 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 SWR0-7 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 PREVIOUS, 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 OCCURES 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 "SI:". (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 OCCURRES 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 PPINT 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.

DT: 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 SWR8=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 DI:5250
```

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

```
CRC REGISTER ERROR
PC:2246 GD:116047 CR:116046 CM:1000 DA:7777
```

THE FOLLOWING IS AM 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:0000
CR:000000 ST:2000 DB:0000 CM:5002 DA:0000
```

7. RESTRICTIONS

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

ALL ERRORS SHOULD BE CORRECTED BEFORE PROCEDING 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	CYLINDER
7	SURFACE (1=UPPER) (0=LOWER)
8-11	SECTOR

6744 DLCA — "LOAD CURRENT ADDRESS" LOAD THE CURRENT ADDRESS FROM AC, THE AC IS THEN CLEARED.

AC	
0-11	CURRENT ADDRESS

6745 DRST — "READ STATUS" CLEAR THE AC AND READ THE CONTENTS OF THE STATUS REGISTER INTO THE AC.

AC	
0	TRANSFER DONE
1	READY TO SEEK, READ, OR WRITE.
2	NOT USED
3	SEEK FAIL
4	DISK FILE READY
5	CONTROL BUSY ERROR
6	TIME OUT ERROR
7	WRITE LOCK ERROR
8	CRC ERROR
9	DATA RATE ERROR
10	DRIVE STATUS ERROR
11	CYLINDER ADDRESS ERROR

6746 DLDC — "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 SECTOR 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 COMPRISED OF MANY INDIVIDUAL SUBTESTS WHICH ARE AUTOMATICALLY RUN IN A SEQUENCIAL 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(OVRLAP, 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

```
                    /
                    /RK8E 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   HITRK                           /DISK ADDRESS WORD IF BUFFER
0222  7001   LOTRK                           /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     XRESTR
      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   WAITSZ=JMS I    XWTISZ
      4432   SKPWAT=JMS I    XSKWAT
      4427   FIGURE=JMS I    XFGURE
      4437   NERROR=JMS I    XNERRO
      4440   ERROR=JMS I     XERRO
      4441   IONWAI=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     XLDAD
      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   TWOCT=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   XDOUT,  DOUT
0021  4536   XDIN,   DIN
0022  6320   XRNAD,  RNAD
0023  6215   XONLY,  ONLY
0024  6200   XRESTR, RESTOR
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   XWTISZ, WTISZ
0034  5215   INTRQ,  INTADD
0035  0222   THSFLD, PRSFLD
0036  6151   XPRINT, PRINT
```

```
0037  6400    XNERRO, NERRO
0040  5000    XERRO,  ERRO
0041  5200    XIONWT, IONWT
0042  5221    XCOMP1, COMP1
0043  5231    XCOMP2, COMP2
0044  5300    XRDST,  RDST
0045  5412    XRDCM,  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    XLDMN,  LDMN
0056  5400    XRDBF,  RDBF
0057  6111    XPRN,   PRN
0060  6066    XFROCT, FROCT
0061  6036    XTOCT,  TOCT
0062  6053    XCRLF,  UPONE
0063  7001    XLOIRK, 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    KRMF,   RMF
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    ENDIRK, 3240
0173  7777    SOFERR, 7777
0174  0000    SAVPCI, 0
0175  0200    RESTRI, 0200
              /
      0200    *200
              /
0200  5206    BGN,    JMP     .+6             /TO NORMAL TEST
0201  5777*           JMP     MANUAL          /TO MANUAL TEST
0202  5776*           JMP     CHANG           /TO CHANGE IOT DEVICE CODES
0203  5775*           JMP     MANPRO          /CHECK MANUAL WRITE PROTECT
0204  5774*           JMP     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 RMF 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     INTRQ                   /GET ADDRESS RETURN
0221  3474          DCA I   K0003
0222  7402    PRSFLD, HLT                           /MAKE DF=IF
0223  7604          LAS
0224  0074          AND     K0003                   /MASK AMOUNT OF DRIVES
0225  3071          DCA     DRIVSV
                    /
0226  7604          LAS
0227  0016          AND     K0400                   /MASK SWR3
0230  7640          SZA CLA                         /TEST DISK IN 10=11
0231  1071          TAD     DRIVSV                  /YES, GET DISK NO. TO TEST
0232  7104          CLL RAL                         /MAKE IT IN 9=10
0233  3070          DCA     DRIVNO                  /START WITH THIS DRIVE X
0234  3132          DCA     REG0
                    /
                    /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                           /LOAD COMMAND REGISTER
0242  4444          RDSTAT                          /READ STATUS
0243  4442          ACCMP1                          /CHECK RESULTS
0244  7610          SKP CLA                         /O.K. SO FAR
0245  5253          JMP     T0E                     /ERROR STATUS
0246  3144          DCA     GDREG2                  /SETUP COMPARE REGISTER
0247  4453          CLRALL                          /CLEAR STATUS
0250  4444          RDSTAT                          /READ STATUS
0251  7650          SNA CLA                         /SHOULD BE 0000
0252  4437          NERROR                          /O.K. 4096 LOOPS
0253  4440    T0E,    ERROR                         /ERROR, STATUS
0254  0235          TST0                            /SCOPE LOOP POINTER
0255  5200          5200                            /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                           /LOAD COMMAND
0261  4447          DSKSKP                          /DSKP "DISK SKIP IOT"
```



```
0262  5266          JMP     T1E                     /ERROR, NO SKIP
0263  4453          CLRALL                          /CLEAR SKIP FLAG OUT
0264  4447          DSKSKP                          /DSKP "DISK SKIP IOT"
0265  4437          NERROR                          /O.K. 4096 LOOPS
0266  4440    T1E,    ERROR                         /ERROR, DSKP FAILED
0267  0256          TST1                            /SCOPE LOOP POINTER
0270  0006          0006                            /TEXT POINTER
                    /
                    /VERIFY THAT INT. OCCURES 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                           /LOAD COMMAND REGISTER
0275  7240          CLA CMA                         /SOFTWARE FLAG
0276  4441          IONWAT                          /WAIT FOR DISK INTERRUPT
0277  5313          JMP     T2E                     /ERROR, NO INT.
0300  4453          CLRALL                          /CLEAR THE INT. OUT
0301  7240          CLA CMA                         /SOFTWARE FLAG
0302  4441          IONWAT                          /WAIT FOR DISK INTERRUPT
0303  7610          SKP CLA                         /O.K. NO INT.
0304  5313          JMP     T2E                     /ERROR, INT.
0305  1015          TAD     K0200                   /ENABLE SET DONE BIT
0306  1070          TAD     DRIVNO                  /CURRENT DRIVE
0307  4450          LDCMD                           /LOAD COMMAND
0310  7340          CLA CLL CMA                     /SOFTWARE FLAG
0311  4441          IONWAT                          /WAIT FOR DISK INTERRUPT
0312  4437          NERROR                          /O.K. 4096 LOOPS
0313  4440    T2E,    ERROR                         /ERROR, DISK INT.
0314  0271          TST2                            /SCOPE LOOP POINTER
0315  0007          0007                            /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     REG0
0317  1106    TST3,   TAD     K7000
0320  1157          TAD     HOMEMA
0321  1070          TAD     DRIVNO                  /GET CURRENT DRIVE
0322  4450          LDCMD                           /LOAD COMMAND REGISTER
0323  1077          TAD     K0006
0324  3350          DCA     T3T                     /SETUP TEXT POINTER
0325  4452          LDADD                           /DLAG, LOAD DISK ADDRESS
0326  4432          SKPWAT                          /WAIT FOR ERROR SKIP
0327  5346          JMP     T3E                     /ERROR, NO SKIP OCCURRED
0330  1170          TAD     K5300
0331  3350          DCA     T3T                     /SETUP TEXT POINTER
0332  7330          CLA CLL CML RAR
0333  1013          TAD     K0040
0334  3144          DCA     GDREG2                  /SETUP EXPECTED STATUS
0335  4444          RDSTAT                          /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          T5T                             /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          PAGE
                    /
                    /SOMETHING IS WORKING, NOW SEEK ONLY TRACK 312
                    /THEN RECALIBRATE AND CHECK FOR NO ERRORS IN STATUS.
                    /
0400  7301  TST6,   CLA CLL IAC
0401  3151          DCA     CMREG                   /SETUP EXTENDED BIT
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                            /SEQUENCIAL 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                  /SET EXTENDED BIT
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                         /WAS IT LAST TRACK
0452  5233          JMP     T8R                     /NO, CONTINUE
0453  4437          NERROR                          /O.K. TO NEXT TEST
0454  4440  T8E,    ERROR                           /ERROR, STATUS
0455  0431          TST8                            /SCOPE LOOP POINTER
0456  5300  T8T,    5300                            /TEXT POINTER
                    /
                    /VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
                    /312, 311, 310, 307, ETC, CHECK FOR
                    /NO ERRORS IN STATUS REGISTER.
```

```
                        /
0457  1066    TST9,   TAD     TRK212
0460  1116            TAD     K0017
0461  3135            DCA     TCNTR1                  /SETUP LOWER DISK ADDRESS POINT
0462  7301            CLA CLL IAC
0463  3136            DCA     TCNTR2                  /SETUP EXTENDED POINTER
0464  1136    T9R,    TAD     TCNTR2
0465  3151            DCA     CMREG                   /SETUP EXTENDED BIT
0466  1135            TAD     TCNTR1
0467  4423            SEEK                            /DECREMENTAL SEEK ONLY
0470  0511            T9T                             /TEXT POINTER
0471  5307            JMP     T9E                     /ERROR, SKIP OR STATUS
0472  7340            CLA CLL CMA
0473  1135            TAD     TCNTR1
0474  3135            DCA     TCNTR1                  /DECREMENT
0475  7301            CLA CLL IAC
0476  1135            TAD     TCNTR1
0477  7640            SZA CLA                         /FIRST TIME 0 YET
0500  5264            JMP     T9R                     /NO, CONTINUE
0501  1136            TAD     TCNTR2
0502  7650            SNA CLA                         /PAST EXTENDED BIT
0503  5306            JMP     T9OK                    /YES, TEST O.K.
0504  3136            DCA     TCNTR2                  /CLEAR EXTENDED BIT
0505  5264            JMP     T9R                     /CONTINUE
0506  4437    T9OK,   NERROR                          /O.K. TO NEXT TEST
0507  4440    T9E,    ERROR                           /ERROR, SEEK ONLY
0510  0457            TST9                            /SCOPE LOOP POINTER
0511  5300    T9T,    5300                            /TEXT POINTER
                        /
                        /VERIFY A RECALIBRATE FROM ALL
                        /CYLINDERS, CHECK ALL CYLINDERS
                        /BETWEEN 00000-14500.
                        /
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     .+4                     /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                          /CHEAK 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
      1000          PAGE
                    /
                    /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          ACCMP1                          /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          LDCMD                           /LOAD COMMAND
1032  4432          SKPWAI                          /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          ACCMP1                          /CHECK RESULTS
1040  7610          SKP CLA                         /STATUS O.K.
1041  5254          JMP     T14SE                   /ERROR, STATUS
1042  1070          TAD     DRIVNO                  /CURRENT DRIVE
1043  4450          LDCMD                           /LOAD COMMAND
1044  3144          DCA     GDREG2                  /SETUP COMPARE REGISTER
1045  4444          RDSTAT                          /READ STATUS
1046  4442          ACCMP1                          /CHECK RESULTS
1047  7610          SKP CLA                         /STATUS O.K.
1050  5254          JMP     T14SE                   /ERROR
1051  2135          ISZ     TCNTR1
1052  5204          JMP     T14R                    /LOOP
1053  4437          NERROR                          /O.K. TO NEXT TEST
1054  4440  T14SE, ERROR                           /ERROR, DISK CAPACITY EXCEEDED
1055  1001          TST14                           /SCOPE LOOP POINTER
1056  5300          5300                            /MODIFIED TEXT POINTER
1057  5263          JMP     .+4                     /TO NEXT TEST
1060  4440  T14KE, ERROR                           /ERROR, DISK SKIP
1061  1001          TST14                           /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  T5T15, 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  T5T16, 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  T5T17, 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  T17T,   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  T18T,   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  T19OK,  NERROR                          /O.K. TO NEXT TEST
1265  4440  T19E,   ERROR                           /ERROR, DATA BREAK
1266  1240          T5T19                           /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                  /SETUP SECTOR COUNTER
1402  1112          TAD     K2525
1403  4430          FILBUF                          /FILL BUFFER WITH DATA
1404  1135  T22R1,  TAD     TCNTR1
```



```
1405  0117          AND     K0037                   /MASK SECTOR BITS
1406  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1407  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
1410  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1411  1114          TAD     K5000                   /FUNCTION WRITE ALL
1412  3151          DCA     CMREG                   /SETUP COMMAND
1413  1463          TAD I   XLOTRK                  /GET TRACK AND SECTOR
1414  4425          DISKGO                          /DISK WRITE ALL
1415  1444          T22T                            /TEXT POINTER
1416  5242          JMP     T22E                    /ERROR, STATUS OR SKIP
1417  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1420  5204          JMP     T22R1                   /MORE SECTORS TO GO
                    /
                    /VERIFY THAT THE DATA WRITTEN ABOVE
                    /ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.
                    /
1421  1122          TAD     K7740
1422  3135          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
1423  4431  T22R2,  KILBUF                          /CLEAR DATA BUFFER
1424  1017          TAD     K1000                   /READ ALL FUNCTION
1425  3151          DCA     CMREG                   /SETUP COMMAND
1426  1135          TAD     TCNTR1
1427  0117          AND     K0037
1430  4425          DISKGO                          /DISK READ ALL
1431  1444          T22T                            /TEXT POINTER
1432  5242          JMP     T22E                    /ERROR, STATUS OR SKIP
1433  1112          TAD     K2525
1434  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1435  7610          SKP CLA                         /BUFFER O.K.
1436  5242          JMP     T22E                    /ERROR, DATA
1437  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1440  5223          JMP     T22R2                   /MORE SECTORS TO CHECK
1441  4437          NERROR                          /O.K. TO NEXT TEST
1442  4440  T22E,   ERROR                           /ERROR, STATUS
1443  1400          TST22                           /SCOPE LOOP POINTER
1444  5373  T22T,   5373                            /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                  /SETUP SECTOR COUNTER
1447  1113          TAD     K5252
1450  4430          FILBUF                          /FILL BUFFER WITH DATA
1451  1135  T23R1,  TAD     TCNTR1
1452  0117          AND     K0037                   /MASK SECTOR BITS
1453  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1454  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
1455  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1456  1104          TAD     K4000                   /FUNCTION WRITE DATA
1457  3151          DCA     CMREG                   /SETUP COMMAND
1460  1463          TAD I   XLOTRK                  /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
```



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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
                    /
      1600          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
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1631  1644          T25T                            /TEXT POINTER
1632  5242          JMP     T25E                    /ERROR, STATUS OR SKIP
1633  1113          TAD     K5252
1634  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1635  7610          SKP CLA                         /THIS SECTOR O.K.
1636  5242          JMP     T25E                    /ERROR, DATA
1637  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1640  5202          JMP     T25S                    /TRY NEXT SECTOR
1641  4437          NERROR                          /O.K. TO NEXT TEST
1642  4440  T25E,   ERROR                           /ERROR, DATA BREAK
1643  1600          TST25                           /SCOPE LOOP POINTER
1644  5373  T25T,   5373                           /TEXT POINTER
                    /
                    /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                  /SETUP SECTOR COUNTER
1647  1113          TAD     K5252
1650  4430          FILBUF                          /FILL BUFFER WITH DATA
1651  1135  T26R1,  TAD     TCNTR1
1652  0117          AND     K0037                   /MASK SECTOR BITS
1653  1065          TAD     CYL450
1654  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1655  7301          CLA CLL IAC
1656  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
1657  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1660  7301          CLA CLL IAC                     /EXTENDED BIT
1661  1114          TAD     K5000                   /FUNCTION WRITE ALL
1662  3151          DCA     CMREG                   /SETUP COMMAND
1663  1463          TAD I   XLOTRK                  /GET TRACK AND SECTOR
1664  4425          DISKGO                          /DISK WRITE ALL
1665  1716          T26T                            /TEXT POINTER
1666  5314          JMP     T26E                    /ERROR, STATUS OR SKIP
1667  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1670  5251          JMP     T26R1                   /MORE SECTORS TO GO
                    /
                    /VERIFY THAT THE DATA WRITTEN ABOVE
                    /ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.
                    /
1671  1122          TAD     K7740
1672  3135          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
1673  4431  T26R2,  KILBUF                          /CLEAR DATA BUFFER
1674  7301          CLA CLL IAC                     /EXTENDED BIT
1675  1017          TAD     K1000                   /READ ALL FUNCTION
1676  3151          DCA     CMREG                   /SETUP COMMAND
1677  1135          TAD     TCNTR1
1700  0117          AND     K0037
1701  1065          TAD     CYL450
1702  4425          DISKGO                          /DISK READ ALL
1703  1716          T26T                            /TEXT POINTER
1704  5314          JMP     T26E                    /ERROR, STATUS OR SKIP
```



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1705  1113          TAD     K5252
1706  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1707  7610          SKP CLA                         /BUFFER O.K.
1710  5314          JMP     T26E                    /ERROR, DATA
1711  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1712  5273          JMP     T26R2                   /MORE SECTORS TO CHECK
1713  4437          NERROR                          /O.K. TO NEXT TEST
1714  4440  T26E,   ERROR                           /ERROR, STATUS
1715  1645          TST26                           /SCOPE LOOP POINTER
1716  5373  T26T,   5373                           /TEXT POINTER
                    /
                    /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                  /SETUP SECTOR COUNTER
1721  1112          TAD     K2525
1722  4430          FILBUF                          /FILL BUFFER WITH DATA
1723  1135  T27R1,  TAD     TCNTR1
1724  0117          AND     K0037                   /MASK SECTOR BITS
1725  1065          TAD     CYL450
1726  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1727  7301          CLA CLL IAC
1730  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
1731  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1732  7301          CLA CLL IAC                     /EXTENDED BIT
1733  1104          TAD     K4000                   /FUNCTION WRITE DATA
1734  3151          DCA     CMREG                   /SETUP COMMAND
1735  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
1736  4425          DISKGO                          /DISK WRITE ALL
1737  1767          T27T                            /TEXT POINTER
1740  5365          JMP     T27E                    /ERROR, STATUS OR SKIP
1741  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1742  5323          JMP     T27R1                   /MORE SECTORS TO GO
                    /
                    /VERIFY THAT THE DATA WRITTEN ABOVE
                    /ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.
                    /
1743  1122          TAD     K7740
1744  3135          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
1745  4431  T27R2,  KILBUF                          /CLEAR DATA BUFFER
1746  7301          CLA CLL IAC                     /FUNCTION READ DATA
1747  3151          DCA     CMREG                   /SETUP COMMAND
1750  1135          TAD     TCNTR1
1751  0117          AND     K0037
1752  1065          TAD     CYL450
1753  4425          DISKGO                          /DISK READ DATA
1754  1767          T27T                            /TEXT POINTER
1755  5365          JMP     T27E                    /ERROR, STATUS OR SKIP
1756  1112          TAD     K2525
1757  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1760  7610          SKP CLA                         /DATA O.K.
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1761  5365          JMP     T27E                    /ERROR, DATA
1762  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1763  5345          JMP     T27R2                   /MORE SECTORS TO CHECK
1764  4437          NERROR                          /O.K. TO NEXT TEST
1765  4440  T27E,   ERROR                           /ERROR, WRITE ALL
1766  1717          TST27                           /SCOPE LOOP POINTER
1767  5373  T27T,   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     HOMEMA
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                   /SECTOR TO GO
2001  4425          DISKGO                          /DISK WRITE ALL
2002  2052          T28T                            /TEXT POINTER
2003  5250          JMP     T28E                    /ERROR, DISK SKIP OR STATUS
2004  1170          TAD     K5300
2005  3252          DCA     T28T                    /MODIFY TEXT POINTER
2006  1135  T28R,   TAD     TCNTR1
2007  7110          CLL RAR
2010  7630          SZL CLA                         /WRITE OR READ ALL?
2011  1104          TAD     K4000                   /HERE IF WRITE ALL!
2012  1017          TAD     K1000
2013  1137          TAD     TCNTR3                  /GET FIELD + DRIVE
2014  3151          DCA     CMREG                   /SAVE FOR ERROR TYPEOUT
2015  1151          TAD     CMREG
2016  6746  T28IOA, DLDC                            /LOAD COMMAND REGISTER
2017  1067          TAD     BGNBUF
2020  3153          DCA     CAREG                   /SAVE FOR ERROR TYPEOUT
2021  1153          TAD     CAREG
2022  6744  T28IOB, DLCA                            /LOAD CURRENT ADDRESS
2023  1135          TAD     TCNTR1
2024  0117          AND     K0037                   /MASK SECTOR BITS
2025  3152          DCA     DAREG                   /SAVE FOR ERROR TYPEOUT
2026  1152          TAD     DAREG
2027  6743  T28IOC, DLAG                            /LOAD AND GO
2030  1105          TAD     K6000
2031  3136          DCA     TCNTR2                  /TIME COUNTER
2032  6745  T28IOD, DRST                            /READ STATUS REGISTER
2033  3147          DCA     STREG                   /SAVE FOR ERROR TYPEOUT
2034  1147          TAD     STREG
2035  1104          TAD     K4000
2036  7650          SNA CLA                         /WAS STATUS 4000
2037  5245          JMP     T28OK                   /YES, GOT TRANSFER DONE
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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                          /O.K. TO NEXT TEST
2050  4440  T28E,   ERROR                           /ERROR, WRITE OR READ  ALL
2051  1773          TST28                           /SCOPE LOOP POINTER
2052  5300  T28T,   5300                            /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                          /DISK READ DATA
2060  2126          T29T                            /TEXT POINTER
2061  5324          JMP     T29E                    /ERROR, SKIP OR STATUS
2062  1170          TAD     K5300
2063  3326          DCA     T29T                    /MODIFY TEXT POINTER
2064  1135  T29R,   TAD     TCNTR1
2065  7110          CLL RAR
2066  7630          SZL CLA                         /READ DATA OR WRITE DATA
2067  1104          TAD     K4000                   /HERE IF WRITE DATA!
2070  1137          TAD     TCNTR3                  /GET FIELD + DRIVE
2071  3151          DCA     CMREG                   /SAVE FOR ERROR TYPEOUT
2072  1151          TAD     CMREG
2073  6746  T29IOA, DLDC                            /LOAD COMMAND REGISTER
2074  1067          TAD     BGNBUF
2075  3153          DCA     CAREG                   /SAVE FOR ERROR TYPEOUT
2076  1153          TAD     CAREG
2077  6744  T29IOB, DLCA                            /LOAD CURRENT ADDRESS
2100  1135          TAD     TCNTR1
2101  0117          AND     K0037                   /MASK SECTOR BITS
2102  3152          DCA     DAREG                   /SAVE FOR ERROR TYPEOUT
2103  1152          TAD     DAREG
2104  6743  T29IOC, DLAG                            /LOAD AND GO
2105  1105          TAD     K6000
2106  3136          DCA     TCNTR2                  /TIME COUNTER
2107  3144          DCA     GDREG2                  /EXPECTED STATUS
2110  6745  T29IOD, DRST                            /READ STATUS REGISTER
2111  3147          DCA     STREG                   /SAVE FOR ERROR TYPEOUT
2112  1147          TAD     STREG
2113  7640          SZA CLA                         /STATUS O.K.?
2114  5324          JMP     T29E                    /ERROR IN STATUS
2115  2136          ISZ     TCNTR2                  /UPDATE TIME COUNTER
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2116  5310          JMP     T291OD                  /WAIT FOR GOOD STATUS
2117  4447          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2120  5317          JMP     .-1                     /HANG IF NO SKIP
2121  2135  T29OK,  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 RREGISTER
2157  3144          DCA     GDREG2                  /STORE IN COMPARE REGISTER
2160  4454          RDCRC                           /READ CRC REGISTER
2161  4443          ACCMP2                  /CHECK RESULTS
2162  7610          SKP CLA                         /O.K.
2163  5367          JMP     T30E                    /ERROR, CRC
2164  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2165  5331          JMP     T30R                    /MORE SECTORS TO TEST
2166  4437          NERROR                          /O.K. TO NEXT TEST
2167  4440  T30E,   ERROR                           /ERROR, CRC
2170  2127          TST30                           /SCOPE LOOP POINTER
2171  6304  T30T,   6304                            /TEXT POINTER
                    /
2172  5773          JMP I   .+1
2173  2200          TST31
                    /
      2200  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 RREGISTER
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                         /O.K.
2241  5245          JMP     T31E                    /ERROR, CRC
2242  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2243  5202          JMP     T31R                    /MORE SECTORS TO TEST
2244  4437          NERROR                          /O.K. TO NEXT TEST
2245  4440  T31E,   ERROR                           /ERROR, CRC
2246  2200          TST31                           /SCOPE LOOP POINTER
2247  6304  T31T,   6304                            /TEXT 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  T32R3,  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  T32R4,  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
                    /
      2400  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     T33R1                   /MORE SECTORS TO GO
                    /
                    /WRITE DATA TO ALL OF CYLINDER 1450
                    /
2422  1122          TAD     K7740
2423  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2424  1112          TAD     K2525
2425  4430          FILBUF                          /FILL BUFFER WITH DATA
2426  7301          CLA CLL IAC
2427  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
2430  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2431  1135  T33R2,  TAD     TCNTR1
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
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
2453  0117          AND     K0037
2454  4425          DISKGO                          /DISK READ DATA
2455  2511          T33T                            /TEXT POINTER
2456  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2457  1113          TAD     K5252
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
2466  3135          DCA     TCNTR1                  /SECTOR COUNTER
2467  4431  T33R4,  KILBUF                         /CLEAR DATA BUFFER
2470  7301          CLA CLL IAC
2471  3151          DCA     CMREG                   /SETUP COMMAND
2472  1135          TAD     TCNTR1
2473  0117          AND     K0037
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
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          NERROR                          /O.K. TO NEXT TEST
2507  4440  T33E,   ERROR                          /ERROR, WRITE DATA
2510  2400          TST33                           /SCOPE LOOP POINTER
2511  5373  T33T,   5373                           /TEXT POINTER
                    /
                    /VERIFY A CYLINDER ADDRESS ERROR IN
                    /STATUS REGISTER, CAN BE CAUSED BY ISSUEING
                    /MAINTENANCE SHIFT CRC AFTER DISK
                    /HAS ACCEPTED THE ADDRESS.
                    /
2512  7301  TST34,  CLA CLL IAC
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
2520  1157          TAD     HOMEMA
2521  1070          TAD     DRIVNO
2522  1104          TAD     K4000                   /TOTAL COMMAND WRITE DATA,
2523  4450          LDCMD                           /LOAD COMMAND REGISTER
2524  7301          CLA CLL IAC
2525  1104          TAD     K4000
2526  3144          DCA     GDREG2                  /EXPECTED STATUS
2527  1066          TAD     THK212
2530  4452          LDADD                           /LOAD AND GO READ
2531  7330          CLA CLL CML RAR
2532  4455          LDMAN                           /ENTER MAINTENANCE
2533  7010          RAR
2534  4455          LDMAN                           /SET DB4 FOR ENABLE SHIFT
2535  7010          RAR
2536  4455          LDMAN                           /SHIFT CRC
2537  4447          DSKSKP                          /WAIT FOR FLAG
2540  5337          JMP     .-1
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
                      /
      2600            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     BGNBUF
2604  4451            LDCUR                           /LOAD CURRENT ADDRESS
2605  1157            TAD     HOMEMA
2606  1070            TAD     DRIVNO
2607  1114            TAD     K5000                   /TOTAL WRITE COMMAND
2610  4450            LDCMD                           /LOAD COMMAND
2611  4452            LDADD                           /LOAD AND GO WRITE ALL
2612  7330            CLA CLL CML RAR
2613  4455            LDMAN                           /ENTER MAINTENANCE
2614  7010            RAR
2615  4455            LDMAN                           /SET DB4 TO ENABLE SHIFT
2616  7010            RAR
2617  1073            TAD     K0002                   /SET AC BIT 10 DATA
2620  4455            LDMAN                           /SHIFT CRC
2621  4447            DSKSKP                          /SKIP ON ERROR FLAG!
2622  5220            JMP     .-2                     /KEEP SHIFTING CRC TILL ERROR
2623  7301            CLA CLL IAC
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     HOMEMA
2633  1070            TAD     DRIVNO
2634  1017            TAD     K1000                   /TOTAL READ ALL COMMAND
2635  4450            LDCMD                           /LOAD COMMAND REGISTER
2636  4452            LDADD                           /LOAD AND GO READ ALL
2637  4447            DSKSKP                          /WAIT AND SKIP ON CRC ERROR!
2640  5237            JMP     .-1
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 ABSULUTE 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     HOMEMA                  /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                   /FOR ERROR PRINTER
2670  1067            TAD     BGNBUF                  /START OF BUFFER
2671  6744  IOT4A1,    DLCA                            /LOAD CURRENT ADDRESS
2672  1151            TAD     CMREG                   /LAST COMMAND
2673  6746  IOT6A1,    DLDC                            /LOAD COMMAND REGISTER
2674  1463            TAD I   XLOTRK                  /SECTOR TO LOAD
2675  6743  IOT3A1,    DLAG                            /LOAD AND GO
2676  6741  IOT1A1,    DSKP                            /DISK SKIP IOT
2677  5276            JMP     .-1                     /WAIT FOR FLAG
2700  6745  IOT5A1,    DRST                            /READ STATUS
2701  3147            DCA     STREG                   /SAVE FOR ERROR PRINTER
2702  1147            TAD     STREG                   /GET IT
2703  1104            TAD     K4000                   /ADD IN FUDGE FACTOR
2704  7640            SZA CLA                         /STATUS O.K.????
2705  5325            JMP     T36E                    /NO, STATUS ERROR
2706  7301            CLA CLL IAC                     /ENABLE CLEAR CONTROL
2707  6742  IOT2A1,    DCLR                            /CLEAR CONTROL
2710  2463            ISZ I   XLOTRK
2711  5314            JMP     .+3                     /DON'T SET EXTENDED TRACK
2712  2151            ISZ     CMREG                   /YES, SET IT
2713  2464            ISZ I   XHITRK                  /SETUP BUFFER ALSO
2714  1464            TAD I   XHITRK                  /GET TRACK WORD
2715  7110            CLL RAR                         /GET EXTENDED BIT TO LINK
2716  7620            SNL CLA                         /WAS IT SET
2717  5264            JMP     T36R                    /NO, CONTINUE
2720  1463            TAD I   XLOTRK                  /GET LOWER TRACK WORD
2721  1172            TAD     ENDTRK                  /ADD IN FUDGE FACTOR
2722  7640            SZA CLA                         /DONE WITH DISK
2723  5264            JMP     T36R                    /NO, MORE TO GO
2724  4437            NERROR                          /O.K. TO NEXT TEST
2725  4440  T36E,     ERROR                           /ERROR, STATUS
2726  2647            TST36                           /SCOPE LOOP POINTER
2727  5300  T36T,     5300                            /TEXT POINTER
                      /
2730  5731            JMP I   .+1                     /TO NEXT TEST
```

```
2731  3000            TST37
                      /
      3000    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.
                      /
                      /
                      /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     HOMEMA                  /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  IOT5A2, 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                         /WAS IT CRC ERROR
3043  5247          JMP     .+4                     /YES CRC ERROR
3044  1170          TAD     K5300                   /GET TEXT POINTER
3045  3277          DCA     T37T                    /SAVE IT
```



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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     T37R                    /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 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.
                      /
                      /READ ALL SECTORS ON THE DISK AND CHECK
                      /THE STATUS, IF STATUS ERROR OCCURRES 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
3101  3173          DCA     SOFERR                  /SETUP CRC ERROR POINTER
3102  3135          DCA     TCNTR1                  /SETUP LOWER ADDRESS
3103  3136          DCA     TCNTR2                  /SETUP EXTENDED
3104  1017          TAD     K1000                   /FUNCTION READ ALL
3105  1070          TAD     DRIVNO                  /CURRENT DRIVE
3106  1157          TAD     HOMEMA                  /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
```

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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 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.
                    /
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     HOMEMA                  /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
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
                    /
                    /DO A RANDOM 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  T40S,   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                           /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 RANDON 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 BUFFER
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  T41E,   ERROR                           /ERROR
3371  3301          TST41                           /SCOPE LOOP POINTER
3372  5373  T41T,   5373                            /TEXT POINTER
                    /
3373  5774          JMP I   .+1                     /TO NEXT TEST
3374  3400          TST42
                    /
      3400  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     T42P                    /LOOP
3446  4437          NERROR                          /O.K. TO NEXT TEST
3447  4440  T42E,   ERROR                           /ERROR
3450  3400          TST42                           /SCOPE LOOP POINTER
3451  5373  T42T,   5373                            /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  4423          SEEK                            /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          NERROR                          /P.K. TO NEXT TEST
3512  4440  T43E,   ERROR                           /ERROR, SKIP, STATUS, OR 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          LDCUR                           /LOAD CURRENT ADDRESS
3526  1151          TAD     CMREG                   /LAST COMMAND ISSUED
3527  4450          LDCMD                           /LOAD COMMAND
3530  1135          TAD     TCNTR1                  /LOWER ADDRESS
3531  4452          LDADD                           /LOAD AND GO
3532  4447          DSKSKP                          /DISK SKIP IOT
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     ENDTRK                  /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,  NERROR                          /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
                    /
      3600  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  TST45,  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 RTL
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     DRIVNO                  /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
3652  1074        TAD     K0003                   /UPDATE SECTOR POINTER
3653  3142        DCA     TCNTR6
3654  2136        ISZ     TCNTR2                  /UPDATE SECTOR COUNTER
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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 RTL
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
3726  1076        TAD     K0005                   /UPDATE SECTOR POINTER
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
```

```
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           ENDTST
                     /
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  SWSEK,   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           RDSTAT                   /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           RDSTAT                   /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 SWR3=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
```



```
                     /
4040  7604  ENDTST,  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  7041           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   XOVRRD           /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   XHITRK           /SETUP ADDRESS WORD IN BUFFER
4114  3463           DCA I   XLOTRK           /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           TMPROI                   /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   XMITRK                  /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     STREG                   /GET STATUS READ
4141  4442          ACCMP1                          /CHECK RESULTS
4142  7610          SKP CLA                         /STATUS O,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  4427          FIGURE                          /CHECK DATA READ
4156  4437          NERROR                          /ALL O,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,   OVRLAP
4166  4400  XOVRRD, OVRRED
                    /
      4200          PAGE
                    /
                    /ROUTINE TO DO OVERLAP SEEKS ON EXISTING DRIVES
                    /AFTER ALL HAVE RUN THE COMPLETE DIAGNOSTIC
                    /
4200  0000  OVRLAP, 0
4201  1104          TAD     K4000
4202  3141          DCA     TCNTR5                  /PASS COUNTER
4203  1071  OVRR1,  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  OVRR2,  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     OVRR2                   /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  OVRR3,  TAD     TCNTR3
4226  4421          DSKIN                           /CHECK FOR DRIVE DONE
4227  5232          JMP     NOTDON                  /DRIVE NOT DONE
4230  5240          JMP     OVROK                   /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     OVRR3                   /NO, DO REST
4237  5221          JMP     OVRR3 -4                /YES, RESET
4240  7340  OVROK,  CLA CLL CMA
4241  3140          DCA     TCNTR4
4242  2141          ISZ     TCNTR5                  /UPDATE PASS COUNTER, DONE ?
4243  5207          JMP     OVRR2                   /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          NERROR                          /O,K, TO NEXT
4261  4440  OVRERR, ERROR                           /ERROR, OVERLAP SEEKS
4262  4201          OVRLAP +1                       /SCOPE LOOP POINTER
4263  5300          5300                            /TEXT POINTER
4264  5600          JMP I   OVRLAP                  /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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4272  3140          DCA     TCNTR4                  /SETUP POINTER
4273  3137          DCA     TCNTR3                  /START WITH 0
4274  1137  GRNKR1, TAD     TCNTR3
4275  7104          CLL RAL
4276  3070          DCA     DRIVNO                  /SETUP DRIVE NO, POINTER
4277  1137          TAD     TCNTR3
4300  1777'         TAD     DSKPOT                  /GET ADDRESS POINTER
4301  3136          DCA     TCNTR2                  /SAVE IT
4302  1536          TAD I   TCNTR2                  /GET LAST VALUE
4303  7110          CLL RAR
4304  7630          SZL CLA                         /EXT, BIT SET?
4305  5311          JMP     .+4                     /YES, GO TO OTHER THAN 312
4306  1066          TAD     TRK212
4307  7121          CLL CML IAC                     /SET INDICATORS
4310  5315          JMP     .+5                     /SAVE AND SEND DRIVE OUT
4311  1137          TAD     TCNTR3                  /GET SAVE POINTER
4312  4422          RANADD                          /GET RANDOM ADDRESS
4313  0370          AND     A7776                   /CLEAR EXT, BIT
4314  7100          CLL
4315  3536          DCA I   TCNTR2                  /RESET IT
4316  1536          TAD I   TCNTR2                  /GET ADDRESS
4317  4420          DSKOUT                          /SEND DRIVE OUT
4320  4453          CLRALL                          /CLEAR STATUS
4321  2137          ISZ     TCNTR3                  /UPDATE POINTER
4322  2140          ISZ     TCNTR4                  /UPDATE COUNTER
4323  5274          JMP     GRNKR1                  /MORE TO SEND OUT
4324  3137          DCA     TCNTR3                  /START CHECK AT 0
4325  1071          TAD     DRIVSV
4326  7040          CMA
4327  3140          DCA     TCNTR4                  /SETUP AMOUNT COUNTER
4330  1137  GRNKR2, TAD     TCNTR3
4331  4421          DSKIN                           /CHECK FOR DRIVE DONE
4332  5335          JMP     NTGRNK                  /DRIVE NOT DONE
4333  5343          JMP     GRNKOK                  /DONE SEND BACK OUT
4334  5364          JMP     GRNKER                  /DRIVE ERRORS
4335  2137  NTGRNK, ISZ     TCNTR3                  /UPDATE DRIVE NO, POINTER
4336  1140          TAD     TCNTR4
4337  1137          TAD     TCNTR3
4340  7640          SZA CLA                         /LAST ONE YET?
4341  5330          JMP     GRNKR2                  /NO
4342  5324          JMP     GRNKR2 -4               /YES, RESET POINTER
4343  7340  GRNKOK, CLA CLL CMA
4344  3140          DCA     TCNTR4                  /SETUP POINTER
4345  2141          ISZ     TCNTR5                  /UPDATE PASS COUNTER
4346  5274          JMP     GRNKR1                  /NOT DONE YET
4347  3137          DCA     TCNTR3
4350  1071          TAD     DRIVSV
4351  7040          CMA
4352  3140          DCA     TCNTR4
4353  1137  GRNKR3, TAD     TCNTR3
4354  4421          DSKIN                           /CHECK FOR DISK DONE
4355  5353          JMP     GRNKR3                  /WAIT FOR DRIVE
4356  7610          SKP CLA                         /WAIT FOR NEXT ONE
4357  5364          JMP     GRNKER                  /DRIVE ERRORS
4360  2137          ISZ     TCNTR3
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4361  2140          ISZ     TCNTR4
4362  5353          JMP     GRNKR3          /MORE TO WAIT FOR
4363  4437          NERROR                          /O.K. TO NEXT TEST
4364  4440  GRNKER, ERROR                          /OVERLAP SEEK ERRORS
4365  4266          GRONK +1                        /SCOPE LOOP POINTER
4366  5300          5300                            /TEXT POINTER
4367  5665          JMP I   GRONK                   /EXIT
                    /
4370  777o  A7776,  7776
                    /
4377  4535
      4400          PAGE
                    /
                    /ROUTINE TO PERFORM RANDOM OVERLAP SEEKS, WRITES AND,
                    /READS ON ALL EXISTING DRIVES AFTER THEY HAVE RUN THE
                    /COMPLETE DIAGNOSTIC.
                    /
4400  0000  OVRRED, 0
4401  7330          CLA CLL CML RAR
4402  3141          DCA     TCNTR5                  /PASS COUNTER
4403  1071  OVRRD1, TAD     DRIVSV                  /GET AMOUNT OF DRIVES
4404  7040          CMA
4405  3140          DCA     TCNTR4                  /SETUP COUNTER
4406  3137          DCA     TCNTR3                  /START WITH DRIVE 0
4407  1137  OVRRD2, TAD     TCNTR3
4410  7104          CLL RAL
4411  3070          DCA     DRIVNO                  /SETUP DRIVE POINTER
4412  1137          TAD     TCNTR3
4413  4422          RANADD                          /SELECT A RANDOM ADDRESS
4414  4420          DSKOUT                          /SEND DISK OUT
4415  4453          CLRALL                          /CLEAR STATUS
4416  2137          ISZ     TCNTR3                  /UPDATE DISK NUMBER
4417  2140          ISZ     TCNTR4                  /UPDATE DISK COUNTER
4420  5207          JMP     OVRRD2                  /DO ALL EXISTING DISKS
4421  3137          DCA     TCNTR3                  /CLEAR FOR 0
4422  1071          TAD     DRIVSV                  /GET AMOUNT OF DRIVES
4423  7040          CMA
4424  3140          DCA     TCNTR4                  /SETUP COUNTER
4425  1137  OVRRD3, TAD     TCNTR3
4426  4421          DSKIN                           /CHECK THIS DRIVE
4427  5234          JMP     CHKNEX                  /CHECK FOR NEXT DRIVE
4430  5242          JMP     OVRDOK                  /DONE AND NO ERRORS
4431  1170  POLERR, TAD     K5300
4432  3332          DCA     TOVRDT                  /SETUP TEXT POINTER
4433  5330          JMP     OVRDER                  /ERRORS
4434  2137  CHKNEX, ISZ     TCNTR3                  /UPDATE DISK NUMBER
4435  1137          TAD     TCNTR3
4436  1140          TAD     TCNTR4
4437  7640          SZA CLA                         /LAST EXISTING DRIVE
4440  5225          JMP     OVRRD3                  /NO, DO REST
4441  5221          JMP     OVRRD3 -4               /YES, RESET
4442  1335  OVRDOK, TAD     DSKPOT                  /GET STORAGE POINTER
4443  1137          TAD     TCNTR3                  /ADD IN DRIVE NUMBER
4444  3334          DCA     DSKADD                  /MAKE ADDRESS
4445  1734          TAD I   DSKADD                  /GET DISK ADDRESS
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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          FILBUF                          /FILL DATA BUFFER
4457  1734          TAD I   DSKADD                  /GET EXTENDED BIT
4460  1070          TAD     DRIVNO                  /ADD IN DRIVE NUMBER
4461  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
4462  1136          TAD     TCNTR2                  /GET CYL,, SURFACE, AND SECTOR
4463  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
4464  1464          TAD I   XHITRK                  /GET EXTENDED BIT
4465  1104          TAD     K4000                   /ADD IN WRITE FUNCTION
4466  3151          DCA     CMREG                   /SETUP COMMAND POINTER
4467  1463          TAD I   XLOTRK                  /GET ADDRESS
4470  4425          DISKGO                          /DISK WRITE DATA
4471  4532          TOVRDT                          /TEXT POINTER
4472  5330          JMP     OVRDER                  /ERROR, WRITE SKIP OR 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     CHKNEX                  /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                           /CHECK THIS DRIVE
4521  5317          JMP     REDBAK                  /WAIT FOR DRIVE
4522  7610          SKP CLA                         /CHECK FOR NEXT
4523  5231          JMP     POLERR                  /ERROR
4524  2137          ISZ     TCNTR3
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          OVRRED +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

4536  0000  DIN,     0
4537  7104          CLL RAL                         /MAKE DRIVE NO,
4540  4450          LDCMD                           /FIRST SELECT DRIVE
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
                    /
      4600          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
                    /INCASE 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  6224          RIF                             /USE CURRENT FIELD
4606  1135          TAD     TCNTR1
4607  3135          DCA     TCNTR1                  /ACTUAL FUNCTION
```

```
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     .+5                     /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
```



```
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, NERROR                          /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  AUTPRO, 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 COMMADN 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          NOP
4750  7326          CLA CLL CML RTL
4751  1012          TAD     K0020                   /MAKE EXPECTED STATUS
4752  3144  APA1,   DCA     GDREG2                  /SETUP COMPARE REGISTER
4753  1170          TAD     K5300
4754  3375          DCA     TAPROT                  /SETUP TEXT POINTER
4755  1147          TAD     STREG                   /GET STATUS READ
4756  4442          ACCMP1                          /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     CMREG              /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          APR1
4775 0000 TAPROT,  0000                       /TEXT POINTER
4776 7402 APHLT1,  HLT                        /SUCCESSFUL WRITE PROTECT
4777 5310          JMP     AUTPRO             /REPEAT
                   /
     5000          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     RESTRT             /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          RTL
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               /NEXT TEST POINTER
5024 3357          DCA     INHIBT             /STORE FOR SPECIAL RETURN
5025 4462          CRLF
5026 4462          CRLF
5027 1600          TAD I   ERRO               /GET TEXT POINTER
5030 0100          AND     K0007              /MASK 9-11
5031 1365          TAD     HEDIAD             /MAKE ERROR HEADER TAD
5032 3233          DCA     .+1
5033 7402          HLT                        /MODIFIED HEADER IAD
5034 3236          DCA     .+2
5035 4457          PRNTER                     /MODIFIED HEADER POINTER
5036 7402          HLT
5037 4462          CRLF
```



```
5040 4457          PRNTER                     /PRINT PC:
5041 5750          TEXPC
5042 7340          CLA CLL CMA
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     NTGD               /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          SKP CLA
5064 3200 NTGD,        DCA     ERRO
5065 1200          TAD     ERRO               /GET TEXT POINTER
5066 7104          CLL RAL
5067 7420          SNL
5070 5301          JMP     NTCRC
5071 3200          DCA     ERRO
5072 4457          PRNTER                     /PRINT CR:
5073 5754          TEXCR
5074 1145          TAD     CRREG1
5075 4461          TWOCT                      /PRINT
5076 1146          TAD     CRREG2
5077 4460          OCTEL                      /PRINT FOUR OCTAL
5100 7610          SKP CLA
5101 3200 NTCRC,   DCA     ERRO
5102 1361          TAD     XTEXT
5103 3364          DCA     PCNTR2
5104 1362          TAD     XREG
5105 3010          DCA     AUTO10
5106 1115          TAD     K7771
5107 3363          DCA     PCNTR1             /COUNTER FOR    # OF HEADS
5110 1200 STRAUT,  TAD     ERRO               /GET TEXT POINTER
5111 7500          SMA
5112 5346          JMP     NOTEX              /NOT THIS ONE
5113 7104          CLL RAL
5114 3200          DCA     ERRO
5115 1364          TAD     PCNTR2             /GET TEXT MESSAGE POINTER
5116 2364          ISZ     PCNTR2
5117 2364          ISZ     PCNTR2
5120 3322          DCA     .+2                /STORE FOR PRNTER
5121 4457          PRNTER                     /PRINT XX:
5122 7402          HLT                        /MODIFIED TEXT POINTER
5123 1410          TAD I   AUTO10
5124 4460          OCTEL                      /PRINT FOUR OCTAL
```

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5125  2363  AGAIN,  ISZ     PCNTR1
5126  5310          JMP     STRAUT                  /CHECK FOR NEXT XX1
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     INHIBT                  /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, SCOPE
5156  0000  RETRN2, 0
5157  0000  INHIBT, 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     COMP1                   /SETUP COUNTER
5204  7240          CLA CMA
5205  3231          DCA     COMP2                   /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          IOF                             /TURN IT OFF
5214  5600          JMP I   IONWT                       /NO INT OCCURED
5215  2200  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 O.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
5240  5245          JMP     CRERR                   /NOT THE SAME
5241  1146          TAD     CRREG2
5242  7041          CIA
5243  1144          TAD     GDREG2
5244  7640          SZA CLA
5245  2231  CRERR,  ISZ     COMP2                   /ERROR, NOT THE SAME
5246  5631          JMP I   COMP2
                    /
                    /ROUTINE TO WAIT FOR 500 MS.
                    /
5247  0000  WIISZ,  0
5250  7300          CLA CLL
5251  1122          TAD     K7740                   /GET TIME CONSTANT
5252  3221          DCA     COMP1
5253  3231          DCA     COMP2
5254  2231          ISZ     COMP2
5255  5254          JMP     .-1
5256  2221          ISZ     COMP1
5257  5254          JMP     .-3
5260  5647          JMP I   WIISZ                   /EXIT
                    /
                    /ROUTINE TO WAIT FOR DISK SKIPS
                    /
```

```
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                          /DSKP "DISK SKIP IOT"
5267  7610        SKP CLA                         /NO SKIP OCCURRED YET
5270  5276        JMP     .+6                     /GOT THE SKIP
5271  2231        ISZ     COMP2
5272  5266        JMP     .-4
5273  2221        ISZ     COMP1
5274  5266        JMP     .-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     STREG                   /SAVE RESULTS
5305  1147        TAD     STREG
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,  DLAG                          /LOAD DISK ADDRESS REGISTER
5323  5717        JMP 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
```



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

```
5402  4455          LDMAN
5403  1012          TAD     K0020
5404  4455          LDMAN                           /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          LDMAN                           /LOAD MAINTENANCE
5420  7010          RAR
5421  4455          LDMAN                           /LOAD MAINTENANCE
5422  7300          CLA CLL
5423  1016          TAD     K0400                   /ENABLE BIT FOR SHIFT COMMAND
5424  4455          LDMAN                           /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          LDMAN                           /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                  /START OF BUFFER -1
5440  3010          DCA     AUTO10                  /SETUP AUTO INDEX
5441  1123          TAD     K7400
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                  /START OF BUFFER -1
5453  3010          DCA     AUTO10                  /SETUP AUTO INDEX
5454  1124          TAD     K7600
5455  3164          DCA     DATCNT                  /SETUP COUNTER
```



```
5456  1165    LPDAT, TAD    SAVDAT                  /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
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  3326    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     K0040                           /MASK
5477  7650          SNA CLA                         /IS IT CLEAR DISK
5500  5322          JMP     NOCLR                   /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    NOCLR, 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 READ DATA BREAK.)
                    /
5527  0000    GTREG, 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   GTREG                   /NO, GO BACK
5534  2327          ISZ     GTREG                   /YES, UPDATE POINTER
5535  4444          RDSTAI                          /READ STATUS
5536  4456          RDBUF                           /READ LOWER BUFFER
5537  7300          CLA CLL
5540  4451          LDCUR                           /SET CA TO 0 FOR BREAK
5541  7332          CLA CLL CML RTR                 /ENABLE SHIFT TO LOWER BUFFER
5542  4455          LDMAN                           /BREAK IF LAST BREAK WAS A READ
5543  4454          RDCRC                           /READ CRC
5544  4446          RDADD                           /READ TRACK
5545  4445          RDCMD                           /READ COMMAND
5546  4462          CRLF
5547  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
5550  4453          CLRALL                          /CLEAR CONTROL
5551  1124          TAD     K7600
5552  5727          JMP I GTREG                     /EXIT
                    /
                    /ROUTINE TO SEND DRIVES ON AN OVERLAP SEEK
                    /
5553  0000    DOUT, 0
5554  3327          DCA     GTREG                   /SAVE ADDRESS
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     HOMEMA                  /ADD IN CURRENT FIELD
5563  4450          LDCMD                           /LOAD COMMAND REGISTER
5564  1327          TAD     GTREG                   /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    DISKG, 0
5601  3254          DCA     SAVTRK                  /SAVE TRACK ADDRESS
5602  7340          CLA CLL CMA
5603  3173          DCA     SOFERR                  /SET CRC ERROR FLAG
5604  1600          TAD I   DISKG                   /GET TEXT POINTER
5605  3174          DCA     SAVPCT                  /SAVE IT
5606  2200          ISZ     DISKG                   /UPDATE POINTER
5607  1151          TAD     CMREG                   /GET COMMAND
5610  0255          AND     K7501                   /MASK OFF
5611  1157          TAD     HOMEMA                  /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          SKPWAI          To 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          RDSTAI                          /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     DISKG                   /UPDATE FOR GOOD RETURN
5632  3574    RETRN, DCA I  SAVPCT                  /STORE IN TEXT POINTER
5633  5600          JMP I   DISKG                   /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     SOFERR                  /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    FGURE,  0
5657  3144          DCA     GDREG2                  /SAVE FOR ERROR PRINTER
5660  1067          TAD     BGNBUF                  /GET START OF BUFFER
5661  3154          DCA     ADREG                   /SAVE FOR ERROR PRINTER
5662  1151          TAD     CMREG                   /GET DISK NO. AND EXT. BIT
5663  0100          AND     K0007           0007    /MASK THEM
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
```

```
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     DATCNT                  /SETUP COUNTER
5706  2154  LPFIG,    ISZ     ADREG                   /UPDATE ADDRESS
5707  1554            TAD I   ADREG                   /GET DATA WORD
5710  7041            CIA
5711  1144            TAD     GDREG2                  /COMPARE TO GOOD ONE
5712  7640            SZA CLA                         /WAS WORD O.K.?
5713  5344            JMP     DTERR +1                /NO, DATA ERROR
5714  1144            TAD     GDREG2                  /GET GOOD DATA
5715  7040            CMA
5716  3144            DCA     GDREG2                  /IT IS A COMPLEMENT DATA PATTERN
5717  2164            ISZ     DATCNT                  /UPDATE BUFFER COUNTER
5720  5306            JMP     LPFIG                   /MORE TO CHECK
5721  2154            ISZ     ADREG                   /UPDATE ADDRESS
5722  1101            TAD     K1234
5723  7041            CIA
5724  1554            TAD I   ADREG                   /GET WORD IN BUFFER +1
5725  7650            SNA CLA                         /WAS IT O.K.
5726  5331            JMP     .+3                     /YES ALL DATA O.K.
5727  1101            TAD     K1234
5730  5343            JMP     DTERR                   /WORD LOST IN BUFFER +1
5731  7330            CLA CLL CML RAR                 /EXPECTED STATUS
5732  3144            DCA     GDREG2                  /SETUP COMPARE REGISTER
5733  1173            TAD     SOFERR                  /GET CRC ERROR FLAG
5734  7640            SZA CLA                         /WAS IT SET
5735  5656            JMP I   FGURE                   /NO THE BUFFER IS O.K.
5736  7340            CLA CLL CMA                     /SETUP CRC FLAG
5737  3173            DCA     SOFERR                  /RESET FLAG
5740  1170            TAD     K5300                   /TEXT "ESS
5741  3574            DCA I   SAVPCT                  /SETUP TEXT POINTER
5742  7330            CLA CLL CML RAR                 /EXPECTED STATUS
5743  3144  DTERR,    DCA     GDREG2                  /SETUP COMPARE
5744  1554            TAD I   ADREG                   /GET BAD WORD
5745  3155            DCA     DTREG                   /SAVE FOR PRINTER
5746  2256            ISZ     FGURE                   /UPDATE FOR ERROR RETURN
5747  5656            JMP I   FGURE
                      /
5750  2003  TEXPC,    TEXT    "PC:"
5751  7200
5752  0704  TEXGD,    TEXT    "GD:"
5753  7200
5754  0322  TEXCR,    TEXT    "CR:"
5755  7200
5756  2324  TEXST,    TEXT    "ST:"
5757  7200
5760  0402  TEXDB,    TEXT    "DB:"
5761  7200
5762  0315  TEXCM,    TEXT    "CM:"
5763  7200
5764  0401  TEXDA,    TEXT    "DA:"
5765  7200
5766  0301  TEXCA,    TEXT    "CA:"
```



```
5767  7200
5770  0104  TEXAD,    TEXT    "AD:"
5771  7200
5772  0424  TEXDT,    TEXT    "DT:"
5773  7200
                      /
      6000            PAGE
                      /
                      /SUBROUTINE TO SHIFT CRC REGISTER TO DATA
                      /BUFFER THEN READ IT.
                      /
6000  0000  RDCR,     0
6001  7300            CLA CLL
6002  1130            TAD     M12
6003  3134            DCA     SBCNT1                  /12 SHIFTER
6004  7330            CLA CLL CML RAR
6005  4455            LDMAN                           /LOAD MAINTENANCE
6006  7010            RAR
6007  4455            LDMAN                           /LOAD MAINTENANCE
6010  7010            RAR
6011  4455            LDMAN                           /LOAD AND GO
6012  2134            ISZ     SBCNT1
6013  5211            JMP     .-2                     /12 BIT SHIFT
6014  7300            CLA CLL
6015  1012            TAD     K0020                   /ENABLE READ BUFFER
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                           /LOAD MAINTENANCE
6024  7010            RAR
6025  4455            LDMAN                           /LOAD AND GO
6026  2134            ISZ     SBCNT1
6027  5225            JMP     .-2                     /12 BIT SHIFT

6030  7300            CLA CLL
6031  1012            TAD     K0020                   /ENABLE READ BUFFER
6032  4455            LDMAN
6033  0116            AND     K0017
6034  3145            DCA     CRREG1                  /SAVE OTHER HALF
6035  5600            JMP I   RDCR                    /EXIT
                      /
                      /SUBROUTINE TO PRINT TWO OCTAL
                      /
6036  0000  TOCT,     0
6037  3134            DCA     SBCNT1                  /SAVE AC
6040  1134            TAD     SBCNT1
6041  7010            RAR
6042  7012            RTR
6043  0100            AND     K0007
6044  1264            TAD     K0260
6045  4436            TYPE                            /PRINT FIRST BYTE
6046  1134            TAD     SBCNT1
```

```
6047  0100          AND     K0007
6050  1264          TAD     K0260
6051  4436          TYPE                          /PRINT SECOND BIT
6052  5636          JMP I   TUCT                  /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          RTL
6070  7006          RTL
6071  3253          DCA     UPONE
6072  1131          TAD     M4
6073  3236          DCA     TOCT
6074  1253          TAD     UPONE
6075  0100          AND     K0007
6076  1264          TAD     K0260
6077  4436          TYPE
6100  1253          TAD     UPONE
6101  7006          RTL
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
```



```
6120  7450          SNA
6121  5345          JMP     EXIT
6122  7500          SMA
6123  7020          CML
6124  7001          IAC
6125  7012          RTR
6126  7012          RTR
6127  7012          RTR
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          SMA
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          TLS
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     HOMEMA                /CURRENT FIELD
6211  4450          LDCMD                         /LOAD COMMAND
6212  7326          CLA CLL CML RTL               /ENABLE RECALIBRATE BIT
6213  4453          CLRALL                        /"RECALIBRATE"
```

```
6214 5232          JMP     CHECK                   /CHECK FOR ERRORS
                   /
6215 0000  ONLY,   0
6216 3316          DCA     SAVTO                   /SAVE LOWER TRACK BITS
6217 1615          TAD I   ONLY                    /GET TEXT POINTER
6220 3315          DCA     SAVPC                   /SAVE FOR ERROR
6221 2215          ISZ     ONLY
6222 1151          TAD     CMREG                   /GET COMMAND
6223 0072          AND     K0001                   /MASK OFF EXTENDED BIT
6224 1157          TAD     HOMEMA                  /CURRENT FIELD
6225 1070          TAD     DRIVNO                  /CURRENT DRIVE
6226 1103          TAD     K3000                   /SEEK ONLY FUNCTION
6227 4450          LDCMD                           /LOAD COMMAND
6230 1316          TAD     SAVTO                   /GET POSITION
6231 4452          LDADD                           /LOAD AND GO
6232 4432  CHECK,  SKPWAT                         /WAIT FOR FIRST DONE FLAG
6233 5313          JMP     SEKER1                  /ERROR, NO SKIP
6234 7330          CLA CLL CML RAR                 /EXPECTED STATUS
6235 3144          DCA     GDREG2                  /SETUP COMPARE REGISTER
6236 1122          TAD     K7740
6237 3320          DCA     RNAD                    /SETUP SKIP TIMER
6240 4444          RDSTAT                          /READ STATUS
6241 1104          TAD     K4000
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     STREG                   /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     RNAD
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          RDSTAT                          /READ STATUS
6306 7650          SNA CLA                         /WAS STATUS 0000?
6307 2215          ISZ     ONLY                    /UPDATE PC
6310 1170  SEKER2, TAD     K5300
6311 3715  GOBAK,  DCA I   SAVPC                   /SETUP TEXT POINTER
6312 5615          JMP I   ONLY                    /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     ENDTRK                  /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 RAR                         /SHIFT
6356 1364          TAD     RNWRD4                  /GET WORD
6357 5720          JMP I   RNAD                    /EXIT
                   /
6360 0000  SAVPOT, 0
6361 6365  DSKSAV, DSK0A
6362 1234  RNWRD1, 1234
6363 2345  RNWRD2, 2345
```

```
6364 0000 RNWRD4, 0
6365 0000 DSK0A,  0
6366 0000 DSK1A,  0
6367 0000 DSK2A,  0
6370 0000 DSK3A,  0
6371 0000 DSK0B,  0
6372 0000 DSK1B,  0
6373 0000 DSK2B,  0
6374 0000 DSK3B,  0
          /
     6400 PAGE
          /
          /SUBROUTINE FOR "NO ERRORS" AND SCOPE
          /LOOPS, UPDATE UP COUNTER "REG1" ON EVERY ENTRY.
          /
6400 0000 NERRO,  0
6401 2200         ISZ     NERRO
6402 7300         CLA CLL
6403 1600         TAD I   NERRO                 /GET RESTART ADDRESS
6404 3175         DCA     RESTRT                /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         SMA 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   RESTRT                /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 5470 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
```



```
6444 1151         TAD     CMREG
6445 0100         AND     K0007
6446 5330         JMP     HFERR                 /NO
6447 2154         ISZ     ADREG                 /UPDATE ADDRESS
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 RTL
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                 /SETUP COUNTER
6477 3164         DCA     DATCNT                /REST OF BUFFER SHOULD BE 0000
6500 3144         DCA     GDREG2
6501 1554 HFR2,   TAD I   ADREG                 /WAS IT 0
6502 7640         SZA CLA                       /ERROR
6503 5330         JMP     HFERR
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
6524 3173         DCA     SOFERR                /RESET CRC ERROR FLAG
6525 1170         TAD     K5300                 /TEXT
6526 3574         DCA I   SAVPC1                /SET UP POINTER
6527 7330         CLA CLL CML RAR               /EXPECTED STATUS
6530 3144 HFERR,  DCA     GDREG2                /SETUP COMPARE
6531 1554         TAD I   ADREG                 /GET BAD WORD
6532 3155         DCA     DIREG                 /SAVE FOR PRINTER
```

```
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  CHANGR,   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
6555  7402  CHNHLT,   HLT                             /DEVICE CODES CHANGED
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            T281OA
6606  2022            T281OB
6607  2027            T281OC
6610  2032            T281OD
6611  2073            T291OA
6612  2077            T291OB
6613  2104            T291OC
6614  2110            T291OD
                      /
```



```
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
```

```
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      STKCHK=. +400
                /
                        $$$
```

```
0000  11110000  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  00000000  00000000  00000000

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11100000  00000001

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11100000  00000000  00000000

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  10000000  00000000

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  10000000  00000000  00000000

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11000000  00000000  00000000  00000000  00000000

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000000

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000000

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  10000000  00000000  00000000
```



```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000001

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000

6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000000

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

7000
7100

7200
7300

7400
7500

7600
7700
```

A7577	6317	DRST	6745	GOTSKP	6273	K0020	0012
A7776	4370	DSK0A	6365	GRNKER	4364	K0037	0117
ACCMP1	4442	DSK0B	6371	GRNKOK	4343	K0040	0013
ACCMP2	4443	DSK1A	6366	GRNKR1	4274	K0077	0111
ACREG	0156	DSK1B	6372	GRNKR2	4330	K0100	0014
ADREG	0154	DSK2A	6367	GRNKR3	4353	K0200	0015
AGAIN	5125	DSK2B	6373	GRONK	4265	K0207	5154
ALLBAK	4250	DSK3A	6370	GTREG	5527	K0212	6063
APA1	4752	DSK3B	6374	HAFCHK	4426	K0215	6062
APERR	4773	DSKADD	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	K0400	0016
AUTPRO	4710	DSKPOT	4535	HFERR	6530	K0770	0126
BGN	0200	DSKSAV	6361	HFR1	6463	K1000	0017
BGNBUF	0067	DSKSKP	4447	HFR2	6501	K1234	0101
CAREG	0153	DTERR	5743	HITRK	7000	K2000	0102
CCNTR1	6560	DTREG	0155	HOMEMA	0157	K2525	0112
CHANG	6535	ENDBUF	7377	HRDERR	5652	K3000	0103
CHANGR	6544	ENDHLT	4072	INHIBT	5157	K3740	6150
CHECK	6232	ENDTRK	0172	INTADD	5215	K4000	0104
CHKNEX	4434	ENDTST	4040	INTRQ	0034	K4100	6147
CHKSKP	6257	ERHLT1	5217	IONWAT	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	ERRO	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
DBREG	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
DOUT	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
LUTRK	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	RDSTAT	4444	T14R	1004	T29E	2124
MANPRO	4101	RECAL	4424	T14SE	1054	T29IOA	2073
MANUAL	4600	REDBAK	4517	T15E	1077	T29IOB	2077
MPERR	4157	REG0	0132	T15T	1101	T29IOC	2104
MPHLT1	4122	REG1	0133	T16E	1117	T29IOD	2110
MPHLT2	4162	RESEK	4003	T16T	1121	T29OK	2121
MPR1	4123	RESTOR	6200	T17E	1160	T29R	2064
NDIN	4561	RESTRT	0175	T17S	1124	T29T	2126
NERRO	6400	RETRN	5632	T17T	1162	T2E	0313
NERROR	4437	RETRN2	5156	T18E	1235	T30E	2167
NEXDSK	4073	RNAD	6320	T18S	1202	T30R	2131
NEXTST	6424	RNWRD1	6362	T18T	1237	T30T	2171
NOCLR	5522	RNWRD2	6363	T19E	1265	T31E	2245
NOTDON	4232	RNWRD4	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	SAVPCL	0174	T20OK	1314	T32R2	2300
NTGRNK	4335	SAVPOT	6360	T20T	1317	T32R3	2317
NTSEK	4647	SAVTO	6316	T21E	1346	T32R4	2341
OCTEL	4460	SAVTRK	5654	T21OK	1345	T32T	2362
ONLY	6215	SBCNT1	0134	T21T	1350	T33E	2507
OVRDER	4530	SCOPE	5470	T22E	1442	T33R1	2404
OVRDOK	4442	SDKP	5333	T22R1	1404	T33R2	2431
OVRERR	4261	SEEK	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	T0E	0253	T26R2	1673	T38E	3140
PRNTER	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        XRDCR   0054
T40S    3261        TEXCR   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        TIMSTP  3536        TST6    0400
T43E    3512        TMANE   4703        TST7    0415
T43R1   3454        TMANOK  4702        TST8    0431
T43R2   3461        TMANS   4624        TST9    0457
T43T    3514        TMANT   4705        TSTSEK  4060
T44E    3554        TMPROT  4161        TWOCT   4461
T440K   3564        TOCT    6036        TYPE    4436
T44R    3524        TOTST   5526        UPONE   6053
T44T    3567        TOVRDT  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   0656        XCRLF   0062
T45R4   3701        TST13   0710        XDIN    0021
T45SC   3604        TST14   1001        XDISKG  0025
T45T    3745        TST15   1064        XDOUT   0020
T4E     0355        TST16   1102        XERRO   0040
T4T     0357        TST17   1122        XFGURE  0027
T5E     0367        TST18   1200        XFLBUF  0030
T5T     0371        TST19   1240        XFROCT  0060
T6E     0412        TST2    0271        XGRONK  4164
T6T     0414        TST20   1270        XGTREG  5160
T7E     0426        TST21   1320        XHFCHK  0026
T7T     0430        TST22   1400        XHITRK  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
T90K    0506        TST27   1717        XLDCA   0051
T9R     0464        TST28   1773        XLDCM   0050
T9T     0511        TST29   2053        XLDMN   0055
TAPROT  4775        TST3    0317        XLOTRK  0063
TCNTR1  0135        TST30   2127        XNERRO  0037
TCNTR2  0136        TST31   2200        XONLY   0023
TCNTR3  0137        TST32   2250        XOVRRD  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
```