IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHRKB-E-D
PRODUCT NAME:	RK8E DRIVE CONTROL TEST
DATE CREATED:	JANUARY 15, 1975
MAINTAINER:	DIAGNOSTIC GROUP
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1. ABSTRACT

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

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 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/A, 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)

F. UNFORMATTED OR FORMATTED 2200 BPI-1600 SECTOR PACK(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.

4. 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 Ø 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 @205 CAN BE USED TO RESTART THE PROGRAM AT THE LAST SUBTEST EXECUTED. (NOTE: WATCH YOUR SWITCH SETTINGS.)

5.2 RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE

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

A. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION.

B. TURN AC POWER TO DISK DRIVE ON.

C. VERIFY THAT LIGHT LABELED "PWR" IS ON.

D. WAIT FOR LIGHT LABELED "LOAD" TO COME ON.

E. VERIFY THAT LIGHTS LABELED "RDY", "ON CYL", "FAULT", "WT", AND "RD" ARE OFF.

F. OPEN ACCESS DOOR.

G. INSERT CARTRIDGE.

H. CLOSE ACCESS DOOR.

I. SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.

J. WAIT FOR THE LIGHTS LABELED "RDY" AND "ON CYL" TO COME ON.

K. TOGGLE SWITCH LABELED "WT PROT" AND VERIFY THAT THE LIGHT LABELED "WT PROT" GOES ON AND OFF.

L. TOGGLE SWITCH LABELED "WT PROT" UNTIL THE LIGHT LABELED "WT PROT" GOES OFF.

M. VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

5.3 DRIVE CONTROL TEST (SINGLE DRIVE TESTING)

A. MAKE READY THE DISK DRIVE TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.

B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.

C. VERIFY THAT AC POWER TO ALL DRIVES IS ON.

(5,3 CONT'D)

D, SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.

E, SET THE SWITCH REGISTER TO 0000.

F, SET SWR3=1 TO INDICATE "SINGLE DRIVE TESTING".

G, SET SWR10-11 TO THE DISK DRIVE TO BE TESTED AND START THE COMPUTER RUNNING.

H, THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT THE COMPLETION OF EACH PASS.

"RK8E DRIVE CONTROL TEST PASS COMPLETE"

I, ALWAYS USE SWR4=1 FOR STOPPING THE TEST.

J, IF IT IS DESIRED TO HAVE THE PROGRAM HALT OR STOP AT END OF PROGRAM PASS COMPLETION SET SWR9=1.

K, ANY HALTS OR 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".

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.

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.

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 SWRØ-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 ØØØØ.

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 SWRØ-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 "ST1", (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 PRINT THE FOLLOWING ERROR INFORMATION FOUND AT THE TIME OF THE FAILURE, PERTAINING TO THE FAILURE. POSSIBLE TYPEOUTS ARE AS FOLLOWS.

PC: PROGRAM LOCATION OF THE ACTUAL FAILURE.

GD: REFERS TO THE DATA EXPECTED IN THE REGISTER OR TYPE OF TEST SPECIFIED IN THE "ERROR HEADER".

CR: CONTENTS OF THE CRC REGISTER.

ST: CONTENTS OF THE STATUS REGISTER.

DB: CONTENTS OF THE LOWER DATA REGISTER.

CM: CONTENTS OF THE COMMAND REGISTER.

DA: CONTENTS OF THE DISK ADDRESS REGISTER OR THE CYLINDER, SURFACE, AND SECTOR BITS.

CA: CONTENTS OF THE INITIAL CURRENT ADDRESS

AD: BREAK ADDRESS OF DATA BREAK IN COMPUTER.

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 DT: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 --	
Ø-6	CYLINDER
7	SURFACE (1=UPPER) (Ø=LOWER)
8-11	SECTOR
6744 DLCA	"LOAD CURRENT ADDRESS" LOAD THE CURRENT ADDRESS FROM AC. THE AC IS THEN CLEARED.

AC --	
Ø-11	CURRENT ADDRESS
6745 DRST	"READ STATUS" CLEAR THE AC AND READ THE CONTENTS OF THE STATUS REGISTER INTO THE AC.

AC --	
Ø	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
1Ø	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 RKØ5 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 (TSTØ-TST45) RESULTS IN A PASS COMPLETION. WHEN MULTI-DRIVE TESTING, ONE PASS THROUGH ALL SUBTESTS(TSTØ-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.

1Ø. PROGRAM LISTING

```
                    /
                    /RK8E DRIVE CONTROL TEST
                    /
                    /MAINDEC-08-DWRKB-E-L
                    /
                    /NOTE: LOCATION 0 WILL CONTAIN THE REVISION
                    /LEVEL(IN ASCII) ON PROGRAM LOAD.
                    /
                    /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    WAIT32=JMS I    XWT32
```



```
      4432    SKPWAT=JMS I    XSKWAT
      4427    FIGURE=JMS I    XFGURE
      4437    NERROR=JMS I    XNERRO
      4440    ERROR=JMS I     XERRO
      4441    IONWAT=JMS I    XIONWT
      4442    ACCMP1=JMS I    XCOMP1
      4443    ACCMP2=JMS I    XCOMP2
      4444    RDSTAT=JMS I    XRDST
      4445    RDCMD=JMS I     XRDCM
      4446    RDADD=JMS I     XRDAD
      4452    LDADD=JMS I     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  0305            0305                    /REVISION "E"
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    XLOTRK, LOTRK
0064  7000    XHITRK, HITRK
0065  4500    CYL450, 4500
0066  4520    TRK212, 4520
0067  7000    BGNBUF, WRKBUF
0070  0000    DRIVNO, 0
0071  0000    DRIVSV, 0
0072  0001    K0001,  0001
0073  0002    K0002,  0002
0074  0003    K0003,  0003
0075  0004    K0004,  0004
0076  0005    K0005,  0005
0077  0006    K0006,  0006
0100  0007    K0007,  0007
0101  1234    K1234,  1234
0102  2000    K2000,  2000
0103  3000    K3000,  3000
0104  4000    K4000,  4000
0105  6000    K6000,  6000
0106  7000    K7000,  7000
0107  7760    K7760,  7760
0110  7700    K7700,  7700
0111  0077    K0077,  0077
0112  2525    K2525,  2525
0113  5252    K5252,  5252
0114  5000    K5000,  5000
0115  7771    K7771,  7771
0116  0017    K0017,  0017
0117  0037    K0037,  0037
0120  6201    KCDF,   CDF
```



```
0121  6244    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    ENDTRK, 3240
0173  7777    SOFERR, 7777
0174  0000    SAVPCT, 0
0175  0200    RESTRT, 0200
0176  5617    KTIME,  5617
              /
      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  1123              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
                        /
                        /STATUS AND SELECT TEST
                        /
                        /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
```



```
                        /
                        /SKIP (DSKP) TEST
                        /
                        /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
                        /
                        /INTERRUPT TEST
                        /
                        /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
                        /
                        /FORCE TIMING ERROR
                        /
                        /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
                    /
                    /RESTORE TEST
                    /
                    /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
                    /
                    /HEAD MOTION AND STATUS TEST
                    /
                    /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  0365          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
                    /
                    /VERIFY RESTORE CLEARS ADDRESS BITS
                    /
                    /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 RESTORE CLEARS ADDRESS BITS,
                    /
                    /VERIFY A "RECALIBRATE" FROM 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
                    /
                    /FIND AND SELECT ALL ADDRESSES
                    /
                    /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
                    /
                    /FIND AND SELECT ALL ADDRESSES
                    /
                    /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     T90K                    /YES, TEST O.K,
0504  3136          DCA     TCNTR2                  /CLEAR EXTENDED BIT
0505  5264          JMP     T9R                     /CONTINUE
0506  4437  T90K,   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 RESTORE CLEARS ADDRESS BITS.
                    /
                    /VERIFY 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
                    /
                    /SINGLE DRIVE VIBRATION TEST!!
                    /
                    /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.
                    /
                    /SELECT ERROR TEST
                    /
                    /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
                    /SELECT ERROR TEST
                    /
                    /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  764?          SZA CLA                         /STATUS SHOULD BE 0000
0751  5356          JMP     T13E                    /ERROR, STATUS
0752  2136          ISZ     TCNTR2
0753  2135          ISZ     TCNTR1
0754  532?          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  53??          5300                            /TEXT POINTER
                    /
0761  5762          JMP I   .+1                     /TO NEXT TEST
0762  1000          TST14 -1
                    /
0777  1000
      1000          PAGE
                    /
                    /SELECT ERROR TEST
                    /
                    /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          SKPWAT                          /WAIT FOR DISK SKIP
1033  5260          JMP     T14KE                   /ERROR, SKIP
1034  7330          CLA CLL CML RAR                 /EXPECTED STATUS
1035  3144          DCA     GDREG2
1036  4444          RDSTAT                          /READ STATUS
1037  4442          ACCMP1                          /CHECK RESULTS
1040  7610          SKP CLA                         /STATUS O.K.
1041  5254          JMP     T14SE                   /ERROR, STATUS
1042  1070          TAD     DRIVNO                  /CURRENT DRIVE
```



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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
                    /
                    /STATUS TEST
                    /
                    /VERIFY THAT SKIP AND STATUS DOES OCCUR
                    /AFTER 256 WRITE ALL AND READ ALL BREAKS,
                    /THIS SHOULD WRITE ALL ZEROS ON AND
                    /READ ALL ZEROS OFF THE DISK SECTOR 00000.
                    /
1063  4431          KILBUF                          /ZERO WRITE BUFFER
1064  1114  TST15,  TAD     K5000                   /WRITE ALL FUNCTION
1065  3151          DCA     CMREG                   /SETUP COMMAND
1066  4425          DISKGO                          /DISK WRITE ALL
1067  1101          T15T                            /TEXT POINTER
1070  5277          JMP     T15E                    /ERROR, SKIP OR STATUS
1071  1017          TAD     K1000                   /FUNCTION READ ALL
1072  3151          DCA     CMREG                   /SETUP COMMAND REGISTER
1073  4425          DISKGO                          /DISK READ ALL
1074  1101          T15T                            /TEXT POINTER
1075  5277          JMP     T15E                    /ERROR, SKIP OR STATUS
1076  4437          NERROR                          /O.K, TO NEXT TEST
1077  4440  T15E,   ERROR                           /ERROR, WRITE ALL
1100  1064          TST15                           /SCOPE LOOP POINTER
1101  5300  T15T,   5300                            /MODIFIED TEXT POINTER
                    /
                    /STATUS TEST
                    /
                    /VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
                    /128 WRITE ALL AND READ ALL BREAKS,
                    /THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
                    /ALL ZEROS OFF THE DISK SECTOR 00000.
                    /
1102  1114  TST16,  TAD     K5000                   /FUNCTION WRITE ALL
1103  1014          TAD     K0100                   /HALF BIT
1104  3151          DCA     CMREG                   /SETUP COMMAND
1105  4425          DISKGO                          /DISK WRITE ALL
1106  1121          T16T                            /TEXT POINTER
1107  5317          JMP     T16E                    /ERROR, DISK SKIP OR STATUS
1110  1017          TAD     K1000                   /FUNCTION READ ALL
1111  1014          TAD     K0100                   /HALF BIT
```

```
1112  3151          DCA     CMREG                   /SETUP COMMAND
1113  4425          DISKGO                          /DISK READ ALL
1114  1121          T16T                            /TEXT POINTER
1115  5317          JMP     T16E                    /ERROR, SKIP OR STATUS
1116  4437          NERROR                          /O,K, TO NEXT TEST
1117  4440  T16E,   ERROR                           /ERROR, WRITE ALL
1120  1102          TST16                           /SCOPE LOOP POINTER
1121  5300  T16T,   5300                            /MODIFIED TEXT POINTER
                    /
                    /VERIFY ALL SECTORS CAN BE ACCESSED,
                    /
                    /VERIFY A WRITE ALL TO ALL OF CYLINDER Ø
                    /AND USE DATA PATTERN 2525 + 5252,
                    /MAKE THE FIRST TWO WORDS IN THE BUFFER
                    /EQUAL THE DISK ADDRESS. CHECK THE DATA WITH
                    /READ ALL.
                    /
1122  1122  TST17,   TAD     K7740
1123  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
1124  1112  T17S,   TAD     K2525
1125  4430          FILBUF                          /FILL OUTBOUND BUFFER
1126  1114          TAD     K5000                   /FUNCTION WRITE ALL
1127  3151          DCA     CMREG                   /SETUP COMMAND
1130  1135          TAD     TCNTR1
1131  0117          AND     K0037                   /MASK OFF SECTORS
1132  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1133  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
1134  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1135  1463          TAD I   XLOTRK
1136  4425          DISKGO                          /DISK WRITE ALL
1137  1162          T17T                            /TEXT POINTER
1140  5360          JMP     T17E                    /ERROR, SKIP OR STATUS
1141  4431          KILBUF                          /KILL DATA BUFFER
1142  1017          TAD     K1000                   /FUNCTION READ ALL
1143  3151          DCA     CMREG                   /SETUP COMMAND
1144  1135          TAD     TCNTR1
1145  0117          AND     K0037                   /MASK OF SECTORS
1146  4425          DISKGO                          /DISK READ ALL
1147  1162          T17T                            /TEXT POINTER
1150  5360          JMP     T17E                    /ERROR, STATUS OR SKIP
1151  1112          TAD     K2525
1152  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1153  7610          SKP CLA                         /THIS SECTOR O,K,
1154  5360          JMP     T17E                    /ERROR, DATA
1155  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1156  5324          JMP     T17S                    /TRY NEXT SECTOR
1157  4437          NERROR                          /O,K, TO NEXT TEST
1160  4440  T17E,   ERROR                           /ERROR, READ ALL
1161  1122          TST17                           /SCOPE LOOP POINTER
1162  5373  T17T,   5373                            /TEXT POINTER
                    /
1163  5764          JMP I   .+1                     /TO NEXT TEST
1164  1200          TST18
                    /
      1200  PAGE
```



```
                    /
                    /
                    /VERIFY ALL SECTORS CAN BE ACCESSED,
                    /
                    /VERIFY A WRITE DATA TO ALL OF CYLINDER Ø
                    /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 HALF BLOCK TRANSFERS,
                    /
                    /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
```

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1243  3464          DCA I   XHITRK                  /MAKE DISK ADDRESS WORD
1244  3463          DCA I   XLOTRK                  /MAKE DISK ADDRESS WORD
1245  1114          TAD     K5000                   /FUNCTION WRITE ALL
1246  1014          TAD     K0100                   /HALF BIT
1247  3151          DCA     CMREG                   /SETUP COMMAND
1250  4425          DISKGO                          /DISK WRITE ALL
1251  1267          T19T                            /TEXT POINTER
1252  5265          JMP     T19E                    /ERROR, SKIP OR STATUS
1253  4453          CLRALL                          /CLEAR STATUS
1254  4431          KILBUF                          /ZERO BUFFER
1255  1017          TAD     K1000                   /FUNCTION READ ALL
1256  3151          DCA     CMREG                   /SETUP COMMAND
1257  4425          DISKGO                          /DISK READ ALL
1260  1267          T19T                            /TEXT POINTER
1261  5265          JMP     T19E                    /ERROR, SKIP OR STATUS
1262  1112          TAD     K2525
1263  4426          HAFCHK                          /WORD BY WORD COMPARE DATA
1264  4437  T190K,  NERROR                          /O,K, TO NEXT TEST
1265  4440  T19E,   ERROR                           /ERROR, DATA BREAK
1266  1240          TST19                           /SCOPE LOOP POINTER
1267  5373  T19T,   5373                            /TEXT POINTER
                    /
                    /VERIFY HALF BLOCK TRANSFERS.
                    /
                    /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  T200K,  NERROR                          /O,K, TO NEXT TEST
1315  4440  T20E,   ERROR                           /ERROR, DATA BREAK
1316  1277          TST20                           /SCOPE LOOP POINTER
1317  5373  T20T,   5373                            /TEXT POINTER
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```
                    /
                    /VERIFY HALF BLOCK TRANSFERS.
                    /
                    /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  T210K,  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 ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
                    /
                    /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
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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 ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
                    /
                    /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  4431          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
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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 ALL SECTORS CAN BE ACCESSED
                    /
                    /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  T24$,   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
```

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1534  7301          CLA CLL IAC                     /EXTENDED BIT
1535  1017          TAD     K1000                   /FUNCTION READ ALL
1536  3151          DCA     CMREG                   /SETUP COMMAND
1537  1135          TAD     TCNTR1                  /SECTOR COUNTER
1540  0117          AND     K0037                   /MASK OFF SECTORS
1541  1065          TAD     CYL450
1542  4425          DISKGO                          /DISK READ ALL
1543  1556          T24T                            /TEXT POINTER
1544  5354          JMP     T24E                    /ERROR, STATUS OR SKIP
1545  1112          TAD     K2525
1546  4427          FIGURE                          /WORD BY WORD COMPARE OF DATA
1547  7610          SKP CLA                         /THIS SECTOR O.K.
1550  5354          JMP     T24E                    /ERROR, DATA
1551  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1552  5313          JMP     T24S                    /TRY NEXT SECTOR
1553  4437          NERROR                          /O.K, TO NEXT TEST
1554  4440  T24E,   ERROR                           /ERROR, READ ALL
1555  1511          TST24                           /SCOPE LOOP POINTER
1556  5373  T24T,   5373                            /TEXT POINTER
                    /
1557  5760          JMP I   .+1                     /TO NEXT TEST
1560  1600          TST25
                    /
      1600  PAGE
                    /
                    /VERIFY ALL SECTORS CAN BE ACCESSED
                    /
                    /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
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1626  0117          AND     K0037                   /MASK OFF SECTORS
1627  1065          TAD     CYL450
1630  4425          DISKGO                          /DISK READ DATA
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 ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
                    /
                    /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
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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
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 ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
                    /
                    /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
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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.
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 CONSECUTIVE SECTORS,
                    /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  2055          T28T                            /TEXT POINTER
2003  5253          JMP     T28E                    /ERROR, DISK SKIP OR STATUS
2004  1170          TAD     K5300
2005  3255          DCA     T28T                    /MODIFY TEXT POINTER
2006  1135  T28R,   TAD     TCNTR1
2007  0072          AND     K0001
2010  7112          CLL RTR
2011  1017          TAD     K1000                   /MAKE READ ALL OR WRITE ALL
2012  1137          TAD     TCNTR3                  /GET FIELD + DRIVE
2013  6746  T28IOA, DLDC                            /LOAD COMMAND REGISTER
2014  1067          TAD     BGNBUF                  /GET BEGINNING OF BUFFER POINTER
2015  6744  T28IOB, DLCA                            /LOAD CURRENT ADDRESS
2016  1135          TAD     TCNTR1
2017  0117          AND     K0037                   /MASK SECTOR BITS
2020  6743  T28IOC, DLAG                            /LOAD AND GO
2021  1176          TAD     KTIME
2022  3136          DCA     TCNTR2                  /TIME COUNTER
2023  6745  T28IOD, DRST                            /READ STATUS REGISTER
2024  1104          TAD     K4000
2025  7451          SNA                             /WAS STATUS 4000
2026  5250          JMP     T28OK                   /YES, GOT TRANSFER DONE
2027  2136          ISZ     TCNTR2                  /UPDATE TIME COUNTER
2030  5223          JMP     T28IOD                  /WAIT FOR GOOD STATUS
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2031  1104          TAD     K4000                   /SUBTRACT, RESET STATUS
2032  3147          DCA     STREG                   /SAVE FOR ERROR PRINTER
2033  1135          TAD     TCNTR1
2034  0072          AND     K0001
2035  7112          CLL RTR
2036  1017          TAD     K1000                   /MAKE READ ALL OR WRITE ALL
2037  3151          DCA     CMREG                   /SAVE FOR ERROR PRINTER
2040  1067          TAD     BGNBUF                  /GET START OF BUFFER
2041  3153          DCA     CAREG                   /SAVE FOR PRINTER
2042  1135          TAD     TCNTR1
2043  0117          AND     K0037                   /MAKE SECTOR ADDRESS
2044  3152          DCA     DAREG                   /SAVE FOR ERROR PRINTER
2045  4447          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2046  5245          JMP     .-1                     /HANG IF NO SKIP
2047  5253          JMP     T28E                    /ERROR, SECTOR RESPONSE NOT FOUND
2050  2135  T28OK,  ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2051  5206          JMP     T28R                    /MORE TO TEST
2052  4437          NERROR                          /O.K. TO NEXT TEST
2053  4440  T28E,   ERROR                           /ERROR, WRITE OR READ  ALL
2054  1773          TST28                           /SCOPE LOOP POINTER
2055  5300  T28T,   5300                            /TEXT POINTER

                    /
                    /SECTOR TIMING TEST; VERIFY NON-CONSECUTIVE SECTORS.
                    /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
                    /
2056  1122  TST29,   TAD     K7740
2057  3135          DCA     TCNTR1                  /SECTOR COUNTER
2060  3151          DCA     CMREG                   /SETUP COMMAND
2061  1117          TAD     K0037
2062  4425          DISKGO                          /DISK READ DATA
2063  2133          T29T                            /TEXT POINTER
2064  5331          JMP     T29E                    /ERROR, SKIP OR STATUS
2065  1177          TAD     K5300
2066  3333          DCA     T29T                    /MODIFY TEXT POINTER
2067  3144          DCA     GDREG2                  /EXPECTED STATUS
2070  1135  T29R,   TAD     TCNTR1
2071  0072          AND     K0001
2072  7112          CLL RTR                         /MAKE READ OR WRITE
2073  1137          TAD     TCNTR3                  /GET FIELD + DRIVE
2074  6746  T291OA, DLDC                           /LOAD COMMAND REGISTER
2075  1067          TAD     BGNBUF
2076  6744  T291OB, DLCA                           /LOAD CURRENT ADDRESS
2077  1135          TAD     TCNTR1
2100  0117          AND     K0037                   /MASK SECTOR BITS
2101  6743  T291OC, DLAG                           /LOAD AND GO
2102  1176          TAD     KTIME
2103  3136          DCA     TCNTR2                  /TIME COUNTER
2104  6745  T291OD, DRST                           /READ STATUS REGISTER
2105  7450          SNA                             /STATUS O.K.?
2106  5322          JMP     T29W                    /WAIT FOR CORRECT RESPONSE (0000)
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2107  3147          DCA     STREG                   /NO, SAVE STATUS FOR PRINTER
2110  1135          TAD     TCNTR1
2111  0072          AND     K0001
2112  7112          CLL RTR                         /MAKE READ OR WRITE
2113  3151          DCA     CMREG                   /SAVE FOR ERROR PRINTER
2114  1067          TAD     BGNBUF                  /GET START OF BUFFER
2115  3153          DCA     CAREG                   /SAVE FOR ERROR PRINTER
2116  1135          TAD     TCNTR1
2117  0117          AND     K0037                   /MAKE SECTOR ADDRESS
2120  3152          DCA     DAREG                   /SAVE FOR ERROR PRINTER
2121  5331          JMP     T29E                    /ERROR, SECTOR RESPONSE NOT FOUND
2122  2136  T29W,   ISZ     TCNTR2                  /UPDATE TIME COUNTER
2123  5304          JMP     T291OD                  /WAIT FOR GOOD STATUS
2124  4447          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2125  5324          JMP     .-1                     /HANG IF NO SKIP
2126  2135  T29OK,  ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2127  5270          JMP     T29R                    /MORE TO TEST
2130  4437          NERROR                          /O.K. TO NEXT TEST
2131  4440  T29E,   ERROR                           /ERROR, STATUS
2132  2056          TST29                           /SCOPE LOOP POINTER
2133  5300  T29T,   5300                            /MODIFIED TEXT POINTER
                    /
                    /CRC TEST
                    /
                    /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.
                    /
2134  1107  T30T,   TAD     K7760
2135  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2136  7301  T30R,   CLA CLL IAC
2137  4453          CLRALL                          /CLEAR CONTROL
2140  4431          KILBUF                          /CLEAR BUFFER AREA
2141  1114          TAD     K5000                   /FUNCTION WRITE ALL
2142  3151          DCA     CMREG                   /SETUP COMMAND
2143  1135          TAD     TCNTR1
2144  0116          AND     K0017                   /MASK SECTOR BITS
2145  4425          DISKGO                          /DISK WRITE ALL
2146  2176          T30T                            /TEXT POINTER
2147  5374          JMP     T30E                    /ERROR, STATUS OR SKIP
2150  1017          TAD     K1000                   /FUNCTION READ ALL
2151  3151          DCA     CMREG                   /SETUP COMMAND
2152  1135          TAD     TCNTR1
2153  0116          AND     K0017                   /MASK SECTOR BITS
2154  4425          DISKGO                          /DISK READ ALL
2155  2176          T30T                            /TEXT POINTER
2156  5374          JMP     T30E                    /ERROR, STATUS OR SKIP
2157  1171          TAD     K6304
2160  3376          DCA     T30T                    /MODIFY TEXT POINTER
2161  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
2162  4453          CLRALL                          /AND CLEAR BRK ENABLE FLOP
2163  3143          DCA     GDREG1                  /STORE IN COMPARE RREGISTER
2164  3144          DCA     GDREG2                  /STORE IN COMPARE REGISTER
2165  4454          RDCRC                           /READ CRC REGISTER
2166  4443          ACCMP2                  /CHECK RESULTS
```

```
2167  761x          SKP CLA                         /O.K,
2170  5374          JMP     T30E                    /ERROR, CRC
2171  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2172  5336          JMP     T30R                    /MORE SECTORS TO TEST
2173  4437          NERROR                          /O.K, TO NEXT TEST
2174  4440  T30E,   ERROR                           /ERROR, CRC
2175  2134          TST30                           /SCOPE LOOP POINTER
2176  6304  T30T,   6304                            /TEXT POINTER
                    /
                    /CRC TEST
                    /
                    /VERIFY THAT THE CRC WORD WRITTEN
                    /ON DISK IS CORRECT. COMPARE IT TO
                    /KNOWN VALUE IN CORE. ON A READ ALL THE
                    /CRC READ FROM DISK IS LEFT IN THE CRC BUFFER.
                    /THE CRC SHOULD BE 116047 FOR DATA 2525 + 5252.
                    /
2177  1107  TST31,   TAD     K7760
2200  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2201  7301  T31R,   CLA CLL IAC
2202  4453          CLRALL                          /CLEAR CONTROL
2203  1112          TAD     K2525
2204  4430          FILBUF                          /FILL DATA BUFFER
2205  1114          TAD     K5000                   /FUNCTION WRITE ALL
2206  3151          DCA     CMREG                   /SETUP COMMAND
2207  1135          TAD     TCNTR1
2210  0116          AND     K0017                   /MASK SECTOR BITS
2211  1107          TAD     K7760
2212  4425          DISKGO                          /DISK WRITE ALL
2213  2246          T31T                            /TEXT POINTER
2214  5244          JMP     T31E                    /ERROR, STATUS OR SKIP
2215  1017          TAD     K1000                   /FUNCTION READ ALL
2216  3151          DCA     CMREG                   /SETUP COMMAND
2217  1135          TAD     TCNTR1
2220  0116          AND     K0017                   /MASK SECTOR BITS
2221  1107          TAD     K7760
2222  4425          DISKGO                          /DISK READ ALL
2223  2246          T31T                            /TEXT POINTER
2224  5244          JMP     T31E                    /ERROR, STATUS OR SKIP
2225  1171          TAD     K6304
2226  3246          DCA     T31T                    /MODIFY TEXT POINTER
2227  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL AND
2230  4453          CLRALL                          /CLEAR BRK ENABLE FLOP.
2231  1162          TAD     CRWRD1                  /GET GOOD CRC
2232  3143          DCA     GDREG1                  /STORE IN COMPARE RREGISTER
2233  1163          TAD     CRWRD2                  /GET GOOD CRC
2234  3144          DCA     GDREG2                  /STORE IN COMPARE REGISTER
2235  4454          RDCRC                           /READ CRC REGISTER
2236  4443          ACCMP2                          /CHECK RESULTS
2237  761x          SKP CLA                         /O.K,
2240  5244          JMP     T31E                    /ERROR, CRC
2241  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2242  5201          JMP     T31R                    /MORE SECTORS TO TEST
2243  4437          NERROR                          /O.K, TO NEXT TEST
2244  4440  T31E,   ERROR                           /ERROR, CRC
```



```
2245  2177          TST31                           /SCOPE LOOP POINTER
2246  6304  T31T,   6304                            /TEXT POINTER
                    /
                    /VERIFY HEAD MOTION AND CAPABILITY
                    /OF SELECTING TWO TRACKS INDIVIDUALLY.
                    /
                    /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
                    /
2247  1122  TST32,   TAD     K7740
2250  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2251  1113          TAD     K5252
2252  4430          FILBUF                          /FILL BUFFER WITH DATA
2253  7301          CLA CLL IAC
2254  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
2255  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2256  1135  T32R1,  TAD     TCNTR1
2257  0117          AND     K0037                   /MASK SECTOR BITS
2260  1065          TAD     CYL450                  /LOWER CYLINDER
2261  3463          DCA I   XLOTRK                  /SETUP WORD IN BUFFER
2262  7301          CLA CLL IAC
2263  1114          TAD     K5000                   /FUNCTION WRITE ALL
2264  3151          DCA     CMREG                   /SETUP COMMAND
2265  1463          TAD I   XLOTRK                  /SECTOR TO GO
2266  4425          DISKGO                          /DISK WRIT ALL
2267  2361          T32T                            /TEXT POINTER
2270  5357          JMP     T32E                    /ERROR, STATUS OR SKIP
2271  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2272  5256          JMP     T32R1                   /MORE SECTORS TO GO
                    /
                    /WRITE ALL TO ALL OF CYLINDER 0
                    /
2273  1122          TAD     K7740
2274  3135          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2275  1112          TAD     K2525
2276  4430          FILBUF                          /FILL BUFFER WITH DATA
2277  1135  T32R2,  TAD     TCNTR1
2300  0117          AND     K0037                   /MASK SECTOR BITS
2301  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2302  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
2303  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2304  1114          TAD     K5000                   /FUNCTION WRITE ALL
2305  3151          DCA     CMREG                   /SETUP COMMAND
2306  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2307  4425          DISKGO                          /DISK WRITE ALL
2310  2361          T32T                            /TEXT POINTER
2311  5357          JMP     T32E                    /ERROR, SKIP OR STATUS
2312  2135          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2313  5277          JMP     T32R2                   /MORE SECTORS TO GO
```

```
                        /
                        /VERIFY THAT THE DATA WRITTEN ABOVE
                        /ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.
                        /
2314  1122              T32R3,  TAD     K7740
2315  3135                      DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2316  4431                      KILBUF                          /CLEAR DATA BUFFER
2317  7301                      CLA CLL IAC
2320  1017                      TAD     K1000                   /READ ALL FUNCTION
2321  3151                      DCA     CMREG                   /SETUP COMMAND
2322  1135                      TAD     TCNTR1
2323  0117                      AND     K0037
2324  1065                      TAD     CYL450                  /ADD IN CYLINDER
2325  4425                      DISKGO                          /DISK READ ALL
2326  2361                      T32T                            /TEXT POINTER
2327  5357                      JMP     T32E                    /ERROR, STATUS OR SKIP
2330  1113                      TAD     K5252
2331  4427                      FIGURE                          /WORD BY WORD COMPARE OF DATA
2332  7610                      SKP CLA                         /DATA O.K.
2333  5357                      JMP     T32E                    /ERROR, DATA
2334  2135                      ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2335  5316                      JMP     T32R3                   /MORE SECTORS TO CHECK
                        /
                        /VERIFY THAT THE DATA WRITTEN ABOVE
                        /ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.
                        /
2336  1122              T32R4,  TAD     K7740
2337  3135                      DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2340  4431                      KILBUF                          /CLEAR DATA BUFFER
2341  1017                      TAD     K1000                   /READ ALL FUNCTION
2342  3151                      DCA     CMREG                   /SETUP COMMAND
2343  1135                      TAD     TCNTR1
2344  0117                      AND     K0037
2345  4425                      DISKGO                          /DISK READ ALL
2346  2361                      T32T                            /TEXT POINTER
2347  5357                      JMP     T32E                    /ERROR, STATUS OR SKIP
2350  1112                      TAD     K2525
2351  4427                      FIGURE                          /WORD BY WORD COMPARE OF DATA
2352  7610                      SKP CLA                         /DATA O.K.
2353  5357                      JMP     T32E                    /ERROR, DATA
2354  2135                      ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2355  5340                      JMP     T32R4                   /MORE SECTORS TO CHECK
2356  4437                      NERROR                          /O.K, TO NEXT TEST
2357  4440              T32E,   ERROR                           /ERROR, WRITE ALL
2360  2247                      TST32                           /SCOPE LOOP POINTER
2361  5373              T32T,   5373                            /TEXT POINTER
                        /
2362  5763                      JMP I   .+1                     /TO NEXT TEST
2363  2400                      TST33
                        /
      2400              PAGE
                        /
                        /VERIFY HEAD MOTION AND CAPABILITY
                        /OF SELECTING TWO TRACKS INDIVIDUALLY.
                        /
```



```
                        /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
                    /
                    /FORCE CYLINDER ADDRESS ERROR
                    /
                    /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                    /CLEAR CONTROL
2513  4453          CLRALL                          /SEEK ONLY TRACK 0
2514  4423          SEEK                            /TEXT POINTER
2515  2546          T34T                            /ERROR,SKIP OR STATUS
2516  5344          JMP     T34E
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     TRK212
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
                    /
                    /FORCE CRC ERROR
                    /
                    /VERIFY A CRC ERROR BY ENTERING MAINTENANCE
                    /AND SHIFTING CRC IN WRITE ALL MODE,
                    /
2600  7301  TST35,   CLA CLL IAC                    /CLEAR CONTROL
2601  4453          CLRALL                          /CLEAR BUFFER AREA
2602  4431          KILBUF
2603  1067          TAD     BGNBUF                  /LOAD CURRENT ADDRESS
2604  4451          LDCUR
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
```

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2627  3144          DCA     GDREG2                  /EXPECTED STATUS REGISTER
2630  1067          TAD     BGNBUF
2631  4451          LOCUR                           /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          ROSTAT                          /READ STATUS REGISTER
2642  4442          ACCMP1                          /CHECK RESULTS
2643  4437          NERROR                          /O.K, TO NEXT TEST
2644  4440  T35E,   ERROR                           /ERROR, CRC ERROR
2645  2600          TST35                           /SCOPE POINTER
2646  5300          5300                            /TEXT POINTER
                    /
                    /BIG ADDRESSING TEST
                    /FORMAT THE COMPLETE DISK SURFACE WITH
                    /WRITE ALL. USE DATA PATTERN 2525 + 5252
                    /MAKE FIRST TWO WORDS OF EVERY SECTOR
                    /EQUAL TO ABSOLUTE ADDRESS OF SECTOR.
                    /
2647  7301  TST36,   CLA CLL IAC
2650  4453          CLRALL                          /CLEAR CONTROL
2651  1112          TAD     K2525
2652  4430          FILBUF                          /FILL BUFFER WITH DATA
2653  3463          DCA I   XLOTRK                  /COUNTER + TRACK WORD
2654  1070          TAD     DRIVNO                  /GET DRIVE NUMBER
2655  3464          DCA I   XHITRK                  /COUNTER + TRACK WORD
2656  1070          TAD     DRIVNO                  /CURRENT DRIVE
2657  1157          TAD     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  1067          TAD     BGNBUF                  /START OF BUFFER
2667  6744  IOT4A1, DLCA                            /LOAD CURRENT ADDRESS
2670  1151          TAD     CMREG                   /LAST COMMAND
2671  6746  IOT6A1, DLDC                            /LOAD COMMAND REGISTER
2672  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2673  6743  IOT3A1, DLAG                            /LOAD AND GO
2674  6741  IOT1A1, DSKP                            /DISK SKIP IOT
2675  5274          JMP     .-1                     /WAIT FOR FLAG
2676  6745  IOT5A1, DRST                            /READ STATUS
2677  1104          TAD     K4000                   /ADD IN FUDGE FACTOR
2700  7440          SZA                             /STATUS O.K.????
2701  5317          JMP     T36E                    /NO, STATUS ERROR
2702  2463          ISZ I   XLOTRK
2703  5306          JMP     .+3                     /DON'T SET EXTENDED TRACK
2704  2151          ISZ     CMREG                   /YES, SET IT
2705  2464          ISZ I   XHITRK                  /SETUP BUFFER ALSO
2706  1464          TAD I   XHITRK                  /GET TRACK WORD
```



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2707  7110          CLL RAR                         /GET EXTENDED BIT TO LINK
2710  7620          SNL CLA                         /WAS IT SET
2711  5264          JMP     T36R                    /NO, CONTINUE
2712  1463          TAD I   XLOTRK                  /GET LOWER TRACK WORD
2713  1172          TAD     ENDTRK                  /ADD IN FUDGE FACTOR
2714  7640          SZA CLA                         /DONE WITH DISK
2715  5264          JMP     T36R                    /NO, MORE TO GO
2716  5324          JMP     T36N                    /DONE
2717  1104  T36E,   TAD     K4000                   /RESET STATUS
2720  3147          DCA     STREG                   /SAVE FOR ERROR PRINTER
2721  1463          TAD I   XLOTRK                  /GET ADDRESS
2722  3152          DCA     DAREG                   /FOR ERROR PRINTER
2723  7410          SKP                             /REPORT ERROR!
2724  4437  T36N,   NERROR                          /O.K, TO NEXT TEST
2725  4440          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
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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     GOREG2          /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
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     ENDTRK          /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
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
```

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                        /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
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  4442  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.
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 RANDOM NUMBER
3304  0116        AND     K0017
3305  1107        TAD     K7760
3306  3160        DCA     RAPCNT                  /SAVE COUNTER
3307  4422        RANADD                          /RANDOM SEEK DISK ADDRESS
3310  3135        DCA     TCNTR1                  /SAVE
3311  7004        RAL                             /LINK IS EXTENDED BIT
3312  3136        DCA     TCNTR2                  /SAVE
3313  4422        RANADD                          /RANDOM SEEK/WRITE DISK ADDRESS
3314  3137        DCA     TCNTR3                  /SAVE
3315  7004        RAL                             /LINK IS EXTENDED BIT
3316  3140        DCA     TCNTR4                  /SAVE IT
3317  1112  T41S, TAD     K2525
3320  4430        FILBUF                          /FILL BUFFER
3321  1140        TAD     TCNTR4                  /GET EXTENDED BIT
3322  1070        TAD     DRIVNO                  /GET DRIVE NUMBER
3323  3464        DCA I   XHITRK                  /DISK ADDRESS WORD IN 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
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3331  4423          SEFK                        /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
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
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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
3434  1135          TAD     TCNTR1              /DISK ADDRESS
3435  4425          DISKGO                      /DISK READ DATA
3436  3451          T42T                        /TEXT POINTER
3437  5247          JMP     T42E                /ERROR, SKIP OR STATUS
3440  1112          TAD     K2525
3441  4427          FIGURE                      /WORD BY WORD COMPARE OF DATA
3442  7610          SKP CLA                     /DATA O.K.
3443  5247          JMP     T42E                /DATA ERROR
3444  2141          ISZ     TCNTR5              /PASS COUNTER
3445  5202          JMP     T42R                /LOOP
3446  4437          NERROR                      /O.K, TO NEXT TEST
3447  4440  T42E,   ERROR                       /ERROR
3450  3400          TST42                       /SCOPE LOOP POINTER
3451  5373  T42T,   5373                        /TEXT POINTER
                    /
                    /SINGLE DRIVE VIBRATION TEST
                    /
                    /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
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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 0,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
                   /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     SOFERR                  /SETUP CRC ERROR POINTER
3517 3135          DCA     TCNTR1                  /SETUP LOWER ADDRESS
3520 3136          DCA     TCNTR2                  /SETUP EXTENDED
3521 1170          TAD     DRIVNO                  /CURRENT DRIVE
3522 1157          TAD     HOMEMA                  /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
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3552 5324          JMP     T44R                    /NO, MORE TO GO
3553 5364          JMP     T440K                   /ALL 0,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  T440K,  NERROR                          /0,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
                   /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
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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
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
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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
```

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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  6740          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
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                    /
                    /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          TMPROT                          /TEXT POINTER
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   XHITRK                  /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
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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
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
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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  4400  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
                    /
                    /SYSTEM VIBRATION 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
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
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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
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  7776  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
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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
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  4432          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
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4506 1137          TAD     TCNTR3
4507 4422          RANADD                      /GENERATE RANDOM ADDRESS
4510 4423          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 7617          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
                   /
4534 0000 DSKADD,  0
4535 6365 DSKPOT,  DSK0A
                   /
                   /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
                   /
                   PAGE
                   /
                   /MANUAL FUNCTION TEST
```



```
                   /LOAD ADDRESS 0201 0R "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     REG0                /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  0103          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  1142          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  1142          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
```



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4730  5373          JMP     APERR                   /ERROR, STAIUS
4731  1102  APR1,   TAD     K2000                   /FUNCTION WRITE PROTECT
4732  1070          TAD     DRIVNO                  /CURRENT DRIVE
4733  4450          LDCMD                           /LOAD COMMAQN 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, STAIUS
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
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, WRIIE 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  7717            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     HEDTAD          /MAKE ERROR HEADER TAD
5032  3233            DCA     .+1
5033  7402            HLT                     /MODIFIED HEADER TAD
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 GO: REGISTER

5051  3200            DCA     ERRO
5052  4457            PRNTER                  /PRINT GO:
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
5125  2363  AGAIN,    ISZ     PCNTR1
5126  5310            JMP     STRAUT          /CHECK FOR NEXT XX:
5127  7624            LAS                     /GET SWITCH 5
5130  7006            RTL                     /SHIFT FOR TESTING
5131  0016            AND     K0400           /MASK
5132  7658            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 6614    HEDLST, ERTX1
5167 6627            ERTX2
5170 6643            ERTX3
5171 6661            ERTX4
5172 6671            ERTX5
5173 6703            ERTX6
5174 6715            ERTX7
5175 6725            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
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
```



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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    WTISZ,  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   WTISZ                /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    RDST,   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 RTL         /ENABLE RECALIBRATE
5507 4453           CLRALL                  /RECALIBRATE
5510 4432           SKPWAT                  /WAIT FOR FIRST DONE
5511 7000           NOP
5512 1151           TAD     CMREG           /LAST COMMAND
```



```
5513 1015           TAD     K0200
5514 4450           LDCMD                   /LOAD COMMAND
5515 4432           SKPWAT                  /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           RDSTAT                  /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 1073           TAD     DRIVNO          /GET CURRENT DRIVE
5557 4451           LDCMD                   /LOAD COMMAND REGISTER
5560 1151           TAD     CMREG           /GET LAST COMMAND ISSUED
5561 1123           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
                    /
                    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  4452          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          SKPWAT                          /WAIT FOR DISK SKIP
5621  5234          JMP     SKPERR                  /ERROR, NO SKIP
5622  7330          CLA CLL CML RAR                 /EXPECTED STATUS
5623  3144          DCA     GDREG2                  /SETUP COMPARE REGISTER
5624  4444          RDSTAT                          /READ STATUS
5625  1104          TAD     K4000
5626  7640          SZA CLA                         /WAS STATUS 4000
5627  5236          JMP     STAERR                  /ERROR, STATUS
5630  1167          TAD     K5373                   /TEXT POINTER
5631  2200          ISZ     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  0211          AND     K0010                   /MASK OUT CRC ERRORS
5640  7652          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  5237          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  0107          AND     K0007                   /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  0107          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 MESS
```

```
5741  3574          DCA I   SAVPCT          /SETUP TEXT POINTER
5742  7330          CLA CLL CML RAR         /EXPECTED STATUS
5743  3144  JTERR,  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  1137          TAD     M12
6003  3134          DCA     SBCNT1          /12 SHIFTER
6004  7331          CLA CLL CML RAR
6005  4455          LDMAN                   /LOAD MAINTENANCE
6006  7210          RAR
6007  4455          LDMAN                   /LOAD MAINTENANCE
6010  7210          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  1137          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   TOCT            /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     TOCT
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  4453          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 4457          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 7337  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 5311          JMP     SEKER2                  /NO, ERROR STATUS
6301 1151          TAD     CMREG                   /GET LAST COMMAND
6302 0317          AND     A7577                   /MASK OUT
6303 4457          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 1173  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 3362          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 7423          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 3762          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
6477  3164          DCA     DATCNT                  /SETUP COUNTER
6500  3144          DCA     GDREG2                  /REST OF BUFFER SHOULD BE 0000
6501  1554  HFR2,   TAD I   ADREG
6502  7640          SZA CLA                         /WAS IT 0
6503  5330          JMP     HFERR                   /ERROR
```



```
6504  2154          ISZ     ADREG
6505  2164          ISZ     DATCNT
6506  5301          JMP     HFR2                    /MORE TO CHECK
6507  1554          TAD I   ADREG                   /GET WORD IN BUFFER +1
6510  7041          CIA
6511  1101          TAD     K1234
6512  7650          SNA CLA                         /WAS IT O.K.?
6513  5316          JMP     .+3                     /YES
6514  1101          TAD     K1234
6515  5330          JMP     HFERR                   /ERROR, BUFFER +1
6516  7330          CLA CLL CML RAR                 /EXPECTED STATUS
6517  3144          DCA     GDREG2                  /SETUP COMPARE REGISTER
6520  1173          TAD     SOFERR                  /GET CRC ERROR FLAG
6521  7640          SZA CLA                         /WAS IT SET
6522  5632          JMP I   HFCHK                   /NO ERRORS
6523  7340          CLA CLL CMA
6524  3173          DCA     SOFERR                  /RESET CRC ERROR FLAG
6525  1170          TAD     K5300                   /TEXT
6526  3574          DCA I   SAVPCT                  /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     DTREG                   /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  1362          TAD     CONTR1
6541  3200          DCA     NERRO
6542  1361          TAD     CHNPOT
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  7746  CONTR1, 7746
6561  6562  CHNPOT, CHNPOT +1
6562  5334          IOT1
6563  5341          IOT2
6564  5322          IOT3
6565  5314          IOT4
6566  5301          IOT5
```

```
6567 5330          IOT6
6570 5345          IOT7
6571 2674          IOT1A1
6572 2673          IOT3A1
6573 2667          IOT4A1
6574 2676          IOT5A1
6575 2671          IOT6A1
6576 3026          IOT1A2
6577 3052          IOT2A2
6600 3025          IOT3A2
6601 3021          IOT4A2
6602 3032          IOT5A2
6603 3023          IOT6A2
6604 2013          T28I0A
6605 2015          T28I0B
6606 2020          T28I0C
6607 2023          T28I0D
6610 2074          T29I0A
6611 2076          T29I0B
6612 2101          T29I0C
6613 2104          T29I0D
                   /
6614 2324  ERTX1,  TEXT   "STATUS REGISTER ERROR"
6615 0124
6616 2523
6617 4022
6620 0507
6621 1123
6622 2405
6623 2240
6624 0522
6625 2217
6626 2200
6627 0317  ERTX2,  TEXT   "COMMAND REGISTER ERROR"
6630 1515
6631 0116
6632 0440
6633 2205
6634 0711
6635 2324
6636 0522
6637 4005
6640 2222
6641 1722
6642 0000
6643 0411  ERTX3,  TEXT   "DISK ADDRESS REGISTER ERROR"
6644 2313
6645 4001
6646 0404
6647 2205
6650 2323
6651 4022
6652 0507
6653 1123
6654 2405
```



```
6655 2240
6656 0522
6657 2217
6660 2200
6661 0411  ERTX4,  TEXT   "DISK DATA ERROR"
6662 2313
6663 4004
6664 0124
6665 0140
6666 0522
6667 2217
6670 2200
6671 0322  ERTX5,  TEXT   "CRC REGISTER ERROR"
6672 0340
6673 2205
6674 0711
6675 2324
6676 0522
6677 4005
6700 2222
6701 1722
6702 0000
6703 0401  ERTX6,  TEXT   "DATA REGISTER ERROR"
6704 2401
6705 4022
6706 0507
6707 1123
6710 2405
6711 2240
6712 0522
6713 2217
6714 2200
6715 0411  ERTX7,  TEXT   "DISK SKIP ERROR"
6716 2313
6717 4023
6720 1311
6721 2040
6722 0522
6723 2217
6724 2200
6725 0411  ERTX8,  TEXT   "DISK INTERRUPT ERROR"
6726 2313
6727 4011
6730 1624
6731 0522
6732 2225
6733 2024
6734 4005
6735 2222
6736 1722
6737 0000
                   /
6740 2213  TEXEND, TEXT   "RK8E DRIVE CONTROL TEST PASS COMPLETE"
6741 7005
6742 4004
```

```
6743  2211
6744  2605
6745  4003
6746  1716
6747  2422
6750  1714
6751  4024
6752  0523
6753  2440
6754  2001
6755  2323
6756  4003
6757  1715
6760  2014
6761  0524
6762  0500
                /
      7000      *7000
                /
      7000      WRKBUF=.
                /
      7000      HITRK=.
      7001      LOTRK=. +1
                /
      7377      ENDBUF=. +377
                /
      7400      STPCHK=. +400
                /
                        $$$
```



```
0000  11110000  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110

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  11000000  00000001

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11000000  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  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11110000  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  11100000  00000000

7000
7100

7200
7300

7400
7500

7600
7700
```



```
A7577   6317        DRST    6745        GOTSKP  6273        K0037   0117
A7776   4372        DSK0A   6365        GRNKER  4364        K0040   0013
ACCMP1  4442        DSK0B   6371        GRNKOK  4343        K0077   0111
ACCMP2  4443        DSK1A   6366        GRNKR1  4274        K0100   0014
ACREG   0156        DSK1B   6372        GRNKR2  4330        K0200   0015
ADREG   0154        DSK2A   6367        GRNKR3  4353        K0207   5154
AGAIN   5125        DSK2B   6373        GRONK   4265        K0212   6063
ALLBAK  4250        DSK3A   6370        GTREG   5527        K0215   6062
APA1    4752        DSK3B   6374        HAFCHK  4426        K0240   6065
APERR   4773        DSKADD  4534        HEDHLT  4002        K0260   6064
APHLT1  4776        DSKIN   4421        HEDLST  5166        K0306   0166
APR1    4731        DSKOUT  4420        HEDTAD  5165        K0400   0016
AUTO10  0010        DSKP    6741        HFCHK   6432        K0770   0126
AUTPRO  4717        DSKPOT  4535        HFERR   6530        K1000   0017
BGN     0200        DSKSAV  6361        HFR1    6463        K1234   0101
BGNBUF  0067        DSKSKP  4447        HFR2    6501        K2000   0102
CAREG   0153        DTERR   5743        HITRK   7000        K2525   0112
CCNTR1  6560        DTREG   0155        HOMEMA  0157        K3000   0103
CHANG   6535        ENDBUF  7377        HRDERR  5652        K3740   6150
CHANGR  6544        ENDHLT  4072        INHIBT  5157        K4000   0104
CHECK   6232        ENDTRK  0172        INTADD  5215        K4100   6147
CHKNEX  4434        ENDTST  4040        INTRQ   0034        K5000   0114
CHKSKP  6257        ERHLT1  5217        IONWAT  4441        K5252   0113
CHNHLT  6555        ERHLT2  5343        IONWT   5200        K5300   0170
CHNPOT  6561        ERHLT3  5324        IOT1    5334        K5373   0167
CLDR    5340        ERHLT4  5316        IOT1A1  2674        K5403   0125
CLRALL  4453        ERHLT5  5303        IOT1A2  3026        K6000   0105
CMREG   0151        ERHLT6  5332        IOT2    5341        K6304   0171
CNGSAV  6557        ERHLT7  5347        IOT2A2  3052        K7000   0106
COMP1   5221        ERHLT9  5142        IOT3    5322        K7007   0127
COMP2   5231        ERRA1   5017        IOT3A1  2673        K7156   3750
CRERR   5245        ERRO    5000        IOT3A2  3025        K7400   0123
CRLF    4462        ERROR   4440        IOT4    5314        K7501   5655
CRREG1  0145        ERTX1   6614        IOT4A1  2667        K7577   5525
CRREG2  0146        ERTX2   6627        IOT4A2  3021        K7600   0124
CRWRD1  0162        ERTX3   6643        IOT5    5301        K7700   0110
CRWRD2  0163        ERTX4   6661        IOT5A1  2676        K7707   4707
CYL450  0065        ERTX5   6671        IOT5A2  3030        K7740   0122
DAREG   0152        ERTX6   6703        IOT6    5330        K7760   0107
DATCNT  0164        ERTX7   6715        IOT6A1  2671        K7771   0115
DBREG   0150        ERTX8   6725        IOT6A2  3023        KCDF    0120
DCLR    6742        ESCOPE  5155        IOT7    5345        KILBUF  4431
DIN     4536        EXIT    6145        K0001   0072        KLBUF   5435
DISKG   5600        FGURE   5656        K0002   0073        KRMF    0121
DISKGO  4425        FIGURE  4427        K0003   0074        KTIME   0176
DLAG    6743        FILBUF  4430        K0004   0075        LDAD    5317
DLCA    6744        FLBUF   5447        K0005   0076        LDADD   4452
DLDC    6746        FROCT   6066        K0006   0077        LDCA    5307
DMAN    6747        GDREG1  0143        K0007   0100        LDCM    5325
DOUT    5553        GDREG2  0144        K0010   0011        LDCMD   4450
DRIVNO  0070        GOBAK   6311        K0017   0116        LDCUR   4451
DRIVSV  0071        GOTADD  6341        K0020   0012        LDMAN   4455
```

```
LOMN    5344        RDCM    5412        T12E    0705        T28IOC  2020
LOTRK   7001        RDCMD   4445        T12R    0670        T28IOD  2023
LPDAT   5456        RDCR    6000        T13E    0756        T28OK   2050
LPFIG   5706        RDCRC   4454        T13R    0720        T28R    2006
M12     0130        RDST    5300        T14KE   1060        T28T    2055
M4      0131        RDSTAT  4444        T14R    1004        T29E    2131
MANPRO  4101        RECAL   4424        T14SE   1054        T29IOA  2074
MANUAL  4600        REDBAK  4517        T15E    1077        T29IOB  2076
MPERR   4157        REG0    0132        T15T    1101        T29IOC  2101
MPHLT1  4122        REG1    0133        T16E    1117        T29IOD  2104
MPHLT2  4162        RESEK   4003        T16T    1121        T29OK   2126
MPR1    4123        RESTOR  6200        T17E    1160        T29R    2070
NOIN    4561        RESTRT  0175        T17S    1124        T29T    2133
NERRO   6400        RETRN   5632        T17T    1162        T29W    2122
NERROR  4437        RETRN2  5156        T18E    1235        T2E     0013
NEXDSK  4073        RNAD    6320        T18S    1202        T30E    2174
NEXTST  6424        RNWRD1  6362        T18T    1237        T30R    2136
NOCLR   5522        RNWRD2  6363        T19E    1265        T30T    2176
NOTDON  4232        RNWRD4  6364        T19OK   1264        T31E    2244
NOTEX   5146        SAMDSK  4064        T19T    1267        T31R    2201
NSCOPE  6431        SAVDAT  0165        T1E     0266        T31T    2246
NTCRC   5101        SAVPC   6315        T20E    1315        T32E    2357
NTGD    5264        SAVPCT  0174        T20OK   1314        T32R1   2256
NTGRNK  4335        SAVPOT  6360        T20T    1317        T32R2   2277
NTSEK   4647        SAVTD   6316        T21E    1346        T32R3   2316
OCTEL   4463        SAVTRK  5654        T21OK   1345        T32R4   2340
ONLY    6215        SBCNT1  0134        T21T    1350        T32T    2361
OVRDER  4532        SCOPE   5470        T22E    1442        T33E    2507
OVRDOK  4442        SDKP    5333        T22R1   1404        T33R1   2404
OVRERR  4261        SEEK    4423        T22R2   1423        T33R2   2431
OVRLAP  4200        SEKER1  6313        T22T    1444        T33R3   2450
OVROK   4240        SEKER2  6310        T23E    1506        T33R4   2467
OVRR1   4203        SKPERR  5634        T23R1   1451        T33T    2511
OVRR2   4207        SKPWAT  4432        T23R2   1470        T34E    2544
OVRR3   4225        SKWAT   5261        T23T    1510        T34T    2546
OVRRD1  4403        SOFERR  0173        T24E    1554        T35E    2644
OVRRD2  4407        STAERR  5636        T24S    1513        T36E    2717
OVRRD3  4425        STCON   0161        T24T    1556        T36N    2724
OVRRED  4407        STPCHK  7400        T25E    1642        T36R    2664
PCNTR1  5163        STPHLT  6410        T25S    1602        T36T    2727
PCNTR2  5164        STRAUT  5110        T25T    1644        T37A    3051
POLERR  4431        STREG   0147        T26E    1714        T37E    3075
PRINT   6151        SWSEK   4000        T26R1   1651        T37R    3013
PRN     6111        T0E     0253        T26R2   1673        T37T    3077
PRNTER  4457        T10E    0543        T26T    1716        T38DE   3151
PRSFLD  0222        T10R    0514        T27E    1765        T38E    3140
RANADD  4422        T10T    0545        T27R1   1723        T38OK   3150
RAPCNT  0162        T11E    0637        T27R2   1745        T38R    3110
RDAD    5350        T11R1   0602        T27T    1767        T38T    3153
RDADD   4446        T11R2   0612        T28E    2053        T39DE   3250
RDBF    5400        T11R3   0616        T28IOA  2013        T39E    3237
RDBUF   4456        T11T    0641        T28IOB  2015        T39OK   3247
```



```
T39R    3207        TCNTR4  0140        TST33   2400        XPRINT  0036
T39T    3252        TCNTR5  0141        TST34   2512        XPRN    0057
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  6740        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
T44OK   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   2056        XLOMN   0055
TAPROT  4775        TST3    0317        XLOTRK  0063
TCNTR1  0135        TST30   2134        XNERRO  0037
TCNTR2  0136        TST31   2177        XONLY   0023
TCNTR3  0137        TST32   2247        XOVRRD  4166
```

ERRORS DETECTED: 0

LINKS GENERATED: 7

RUN-TIME: 25 SECONDS

3K CORE USED