IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHRKB-G-D

PRODUCT NAME: RK8E DRIVE CONTROL TEST

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MAINTAINER: DIAGNOSTIC ENGINEERING

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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. AT LEAST 8K OF MEMORY IS NEEDED FOR OPERATION OF THE CONSOLE PACKAGE.

C. ASR-33 TELETYPE OR EQUIVALENT

D. RK8E DISK CONTROL

E. RK05J OR RK05F DISK DRIVE(S)

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

2.2 STORAGE

THE PROGRAM OCCUPIES OR UTILIZES LOCATIONS 0000 TO LOCATION 7577 OF FIELD 0 AND LOCATIONS 0 TO 1377 OF FIELD 1.

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.

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.

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. WHEN RUNNING THE CHECK WRITE PROTECT TEST SECTION 5.4, THE CHECK WRITE PROTECT TEST SECTION 5.5, THE MANUAL FUNCTIONS SECTION 5.6, AND THE THE SEEK FROM SWITCHES SECTION 5.8, THESE SWITCHES INDICATE THE DRIVE NUMBER TO SELECT.

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 FIELD 0 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 (SEE SECTION 5.3).

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 0210 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

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.

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

E. SET THE SWITCH REGISTER TO 0000.

F. PRESS CLEAR AND THEN CONTINUE.

G. THE TTY WILL RESPOND WITH THE FOLLOWING MESSAGE QUESTIONING THE OPERATOR ON THE DISK DRIVES TO TEST. THE RESPONSE SHOULD BE Y FOR YES OR N FOR NO:

```
RK8E DRIVE CONTROL TEST
TEST (Y=YES OR N=NO)?
DISK0? DISK1? DISK2? DISK3?
```

AFTER THE QUESTIONS ARE ANSWERED THE PROGRAM WILL BEGIN TESTING THE DRIVES SPECIFIED.

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 THE ABSOLUE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1-22 OF THE PROGRAM LISTING.

5.4 CHECK WRITE PROTECT (MANUAL)

A. RUN THE DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL 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 0206 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.

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.

5.5 CHECK WRITE PROTECT (PROGRAM CONTROL)

A. RUN THE DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL 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 0207 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 "APHLT1" INDICATING A SUCCESSFUL TEST.

J. VERIFY THAT THE WRITE PROTECT LIGHT LABELED "WT PROT" IS ON, ON THE CURRENT DRIVE.

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.

5.6 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 STANDARD TEST PROCEDURE AND SHOULD ONLY BE USED FOR TROUBLE SHOOTING IF DESIRED.

A. SET THE SWITCH REGISTER TO 0204 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.

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.

5.7 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 0205 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. PRESSING KEY CONTINUE AT THIS TIME WILL RESULT IN A START OF THE PROGRAM AT LOCATION 0200 (SEE SECTIONS 5.3 OR 5.4 FOR OPERATION INSTRUCTIONS).

5.8 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).

D. SET SWR0-7 TO THE REMAINDER OF THE CYLINDER BITS AND THE SURFACE OF THE FIRST SEEK ADDRESS.

E. PRESS START AND THE COMPUTER SHOULD HALT.

F. SET THE SWITCH REGISTER TO 0000.

G. SET SWR9-11 TO THE DRIVE NUMBER AND EXTENDED CYLINDER BIT OF THE SECOND SEEK ADDRESS (BITS 9-10 TO THE DRIVE NUMBER AND BIT 11 TO THE EXTENDED CYLINDER).

H. SET SWR0-7 TO THE CYLINDER BITS AND SURFACE OF THE SECOND SEEK ADDRESS.

I. PRESS START AND THE DRIVE SHOULD SEEK BETWEEN THE ADDRESSES SPECIFIED BY THE SWITCH REGISTER.

J. THE SECOND SEEK ADDRESS CAN BE CHANGED AT ANY TIME BY SIMPLY CHANGING THE SWITCH REGISTER TO SELECT A NEW ADDRESS.

K. CARE SHOULD BE TAKEN TO NOT SELECT A NON-EXISTENT DISK DRIVE OR NON-EXISTENT CYLINDER.

L. NO ERROR CHECKING IS DONE DURING THIS SUBTEST.

M. IT IS POSSIBLE TO SEEK TO A CONSTANT ADDRESS BY MAKING THE FIRST AND SECOND ADDRESS EQUAL.

6. ERRORS

6.1 USEFUL ERROR INFORMATION

IN THE DRIVE CONTROL 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.

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
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 "ST:".
(SEE SECTION 6.4 FOR ERROR HEADERS AND TYPEOUTS).

THE ABSOLUTE ADDRESS LOCATIONS OF THE DATA BUFFER

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

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.

AC	
0-6	CYLINDER
7	SURFACE (1=UPPER) (0=LOWER)
8-11	SECTOR

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

AC
--

0-11 CURRENT ADDRESS

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

AC
--

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

6746 DLDC "LOAD COMMAND" LOAD THE COMMAND REGISTER FROM AC, CLEAR THE AC, AND CLEAR THE STATUS REGISTER.

AC
--

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

6747 DMAN "MAINTENANCE IOT" LOAD THE MAINTENANCE REGISTER FROM THE AC. THE FUNCTION IS REGULATED BY THE AC BITS. MAINTENANCE MODE CAN ONLY BE CLEARED BY DCLR "CLEAR CONTROL".

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

9. PROGRAM DESCRIPTION

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

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

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

10. CONSOLE PACKAGE ADDENDUM

10.1. DESCRIPTION

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL. THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE

PACKAGE . 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE -
THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH
THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO
SWITCH REGISTER,BEFORE CONTINUING WITH EXECUTION OF THE
DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT
THE TERMINAL. NO HALTS WILL BE EXECUTED.
2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE
NORMAL STANDALONE OPERATION OF THE PROGRAM AS DISCRIBED IN
SECTIONS 1 THROUGH 9 OF THIS DOCUMENT.

10.2 RESTRICTIONS

1) RUNNING THE CONSOLE PACKAGE REQUIRES THAT THE
PSEUDO SWITCH REGISTER BE USED.

2) ONCE RUNNING THE CONSOLE PACKAGE NONACTIVE AND
NOW DESIRE TO RUN IT ACTIVE, ONE MUST RELOAD THE DIAGNOSTIC
AND INITILIZE FOR A ACTIVE CONSOLE PACKAGE.

10.3 INITIALIZATION

FOR A ACTIVE CONSOLE PACKAGE

1.) SET LOCATION 21 BIT0=0 TO INDICATE USE PSEUDO SWITCH
REGISTER.

2.) SET LOCATION 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

FOR A NON ACTIVE CONSOLE PACKAGE

1.) SET LOCATION 21 BIT0=1 TO INDICATE NOT TO USE PSEUDO
SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.

2.) SET LOCATION 22 BIT3=0 TO INDICATE CONSOLE PACKAGE NOT
ACTIVE.

10.4 CONTROL CHARACTERS

CONTROL CHARACTERS ARE USED TO GIVE THE OPERATOR THE
ABILITY TO PERFORM THE FOLLOWING FUNCTIONS.
NOTE: THE PROGRAM WILL RESPOND TO THE CONTROL
CHARACTER IN FIVE (5) SECONDS OR LESS.

CONTROL C
THIS WILL START THE LOADER THAT IS
IN LOCATION 7600.

CONTROL R
THIS WILL RESTART THE PROGRAM AND
REASK THE SWITCH REGISTER QUESTION AS
DESCRIBED IN SETION 10.6.

CONTROL E

THIS WILL CONTINUE THE PROGRAM FROM
AN ERROR IF ALLOWED BY THE DIAGNOSTIC
OR FROM A WAITING STATEMENT.

CONTROL L

THIS WILL SWITCH THE TERMINAL MESSAGES
FROM THE DISPLAY TO A LINE PRINTER.
TO RESTORE THE MESSAGES ON THE TERMINAL
CONTROL L MUST BE TYPED AGAIN.IF
NO PRINTER IS AVAIBLE AND CONTROL L
IS TYPED THE RESULT WILL BE THAT THE
CONSOLE PACKAGE WILL WAIT FOR CONTROL C OR R.
THE CONTROL L WILL OUTPUT TO THE LINE
PRINTER AND THE PROGRAM WILL
ATTEMPT TO CONTINUE AS IF A CONTROL E
WAS TYPED IN.

CONTROL O

THIS WILL ALLOW THE ABILITY TO CHANGE
THE SWITCH REGISTER DURING PROGRAM
OPERATION. TYPING THIS CHARACTER WILL RESULT
IN AN INTERIGATION OF THE SWITCH REGISTER
QUESTION AS DESCRIBED IN SECTION 10.6.

CONTROL S

THIS WILL STOP PROGRAM EXECTUION AND WAIT IN A
LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE
WILL BE TO TYPE A CONTROL Q, R OR C .
THIS IS A NONPRINTING CHARACTER.

CONTROL Q

THIS IS TO CONTINUE A PROGRAM AFTER A CONTROL
S IS TYPED.THIS IS A NONPRINTING CHARACTER.

10.5 WAITING MESSAGE

THE WAITING MESSAGE IS USED TO ALLOW THE OPERATOR TIME
TO MAKE A DECISION AS TO WHAT CONTROL CHARACTER
TO TYPE. THIS MESSAGE MAY APPEAR AT THE END
OF PASS MESSAGE IF THE HALT ON PASS BIT IS SET.THE CONTROL
CHARACTERS MAY NOW BE USED TO PERFORM THE NEEDED FUNCTION.

THE WAITING MESSAGE MAY BE PRINTED AFTER A ERROR MESSAGE
IF THE HALT ON ERROR BIT IS SET.HERE AGAIN THE CONTROL
CHARACTERS MAY BE USED.
THE WAITING MESSAGE MAY BE PRINTED IF OPERATOR INTERVENTION
IS REQUIRED.

10.6 SWITCH REGISTER MESSAGE

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER
BEFORE PROGRAM EXECUTION TAKES PLACE.THE SWITCH REGISTER
IS SETUP WHEN THE FOURTH CHARACTER IS ENTERED OR A CARRIAGE
RETURN IS TYPED

```
**************************************************************
SR=0000 4000
        ----

UNDER SCORING INDICATES OPERATOR RESPONCE
```

10.7 END OF PASS

AN INDICATION WILL BE GIVEN WHEN THE DIAGNOSTIC HAS MADE A SUCESSFULL PASS. THE PRINT OUT WILL INDICATE THE DIAGNOSTIC MAINDEC NUMBER THE WORD PASS AND A FOUR DIGIT PASS NUMBER. A PASS WILL BE A TIME PERIOD RATHER THAN A PROGRAM PASS OF THE DIAGNOSTIC. THE TIME PERIOD WILL BE IN THE RANGE OF ONE (1) TO FIVE (5) MINUTES. IF THE DIAGNOSTIC MAKES A PROGRAM PASS IN THE 1 TO 5 MINUTE RANGE THEN THE PASS COUNT WILL BE THE SAME AS THE NUMBER OF PROGRAM PASSES.IF THE PROGRAM MAKES A PROGRAM PASS IN LESS THEN ONE MINUTE THEN THE PASS COUNT WILL NOT BE THE SAME AS THE PASS COUNTER THE PASS COUNTER WILL REFLECT MORE THEN ON PROGRAM PASS.
THE NUMBER OF PROGRAM PASSES REQUIRED FOR "A PASS MESSAGE CAN BE FOUND IN FIELD 1 LOCATION 0246.

IF HALT AT END OF PASS IS SET THEN THE PASS MESSAGE WILL BE PRINTED AND A WAITING STATEMENT WILL ALSO BE PRINTED. A CONTROL CHARACTER IS NEEDED TO CONTINUE FROM THIS MESSAGE. THE FORMAT OF THE END OF PASS MESSAGE IS

```
**************************************************************

NAME PASS 0001

**************************************************************
```

10.8 ERRORS

THE STANDARD ERROR REPORTS AS DESCRIBED IN SECTION 6 OF THIS DOCUMENT WILL BE USED.

10.9 SWITCH REGISTER SETTINGS

THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 4 OF THIS DOCUMENT WILL BE USED.

10.10 PARAMETER CONTROL WORDS

THE CONSOLE PACKAGE USES THE LOCATIONS 20 21 22 FOR THE FOLLOWING PURPOSES.

LOCATION 20

LOCATION 21
HARDWARE IDENTIFIER 1

LOCATION 22
HARDWARE IDENTIFIER 2

LOCATION 0021

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1

11. APT-8 HOOKS

11.1 DESCRIPTION

TWO INTERFACES HAVE BEEN PROVIDED WHICH ALLOW THIS DIAGNOSTIC TO RUN UNDER THE STANDARD APT-8 SYSTEM. THESE INTERFACES ARE:

1. TIMING INTERFACE

2. ERROR INTERFACE

EACH WILL BE EXLPAINED IN DETAIL.

11.2 SETUP

ONLY HARDWARE CONFIGURATION WORD 2, ADDRESS 22, NEED BE ESTABLISHED. THE FOLLOWING INFORMATION MUST BE INDICATED:
1. SINGLE OR MULTIPLE DRIVE TESTING.
2. DRIVE OR DRIVES TO BE TESTED.
3. DIAGNOSTIC RUNNING UNDER APT-8.

IF SINGLE DRIVE TESTING BIT 5 OF ADDRESS 22 MUST BE SET TO A ONE (1) WITH BITS 6-11 CONTAINING THE DRIVE TO BE TESTED. IF MULTIPLE DRIVES ARE TO BE DONE BIT MUST MUST BE SET TO A ZERO (0) AND BIT 6-11 CONTAINING THE HIGHEST NUMBER DRIVE TO BE TESTED. WHEN MULTIPLE DRIVE TESTING ONLY A SPECIFIC NUMBER OF DRIVES CAN BE INDICATED, THE PROGRAM ASSUMES THE DRIVES ARE TO BE DONE BEGINNING WITH DRIVE ZERO (0) AND FINISHING WITH THE HIGHEST DRIVE INDICATED. IF MULTIPLE DRIVES OTHER THAN CONSECUTIVELY NUMBERED DRIVES BEGINNING WITH DRIVE ZERO (0) ARE TO BE DONE, THEY MUST BE DONE AS SINGLE DRIVES AND TESTED INDEPENDANTLY.

THE PROGRAM ALLOWS ONLY DRIVES ZERO (0) THROUGH THREE (3) TO BE TESTED AT THIS TIME.

BIT ZERO OF ADDRESS 22 MUST BE SET TO A ONE TO INDICATE THAT THE PROGRAM WILL RUN UNDER APT-8.

NOTE: IT SHOULD BE NOTED AT THIS TIME THAT WHILE RUNNING UNDER APT-8 THE HARDWARE SWITCH REGISTER IS INOPERATIVE. ONLY THE HALT AND SINGLE STEP SWITCH WILL EFFECT THE PROGRAM RUN.

11.3 APT-8 INTERFACES

11.3.1. TIMING

APT-8 IS NOTIFIED OF PROGRAM RUN BETWEEN .2 SEC
AND 2.0 SEC ON A 1.2 MICROSECOND MEMORY CYCLE. THIS WILL ALLOW
THE DIAGNOSTIC TO RUN WITHOUT CAUSING AN APT-8 TIMEOUT ERROR
IF THE DIAGNOSTIC IS TO BE RUN ON ON THE SLOWER MOS MEMORY.

11.3.2. ERRORS

ONLY THE ERROR PC IS REPORTED TO APT-8
SYSTEM. ERRORS WHICH CAUSE A PROGRAMMED HALT CAUSE A TIMEOUT
ERROR. IF A PROGRAMMED HALT SHOULD OCCUR, THE ERROR PC WILL
APPEAR IN THE AC ON THE DEVICE UNDER TEST. PROGRAMMED HALTS
ARE EXPLAINED EARLIER IN THIS DOCUMENT.

11.4. LOADING PRECAUTIONS

THIS PROGRAM SHOULD BE LOADED IN SCRIPT MODE INDICATING
TO APT THAT CROR CHECK SUMS ARE TO BE IGNORED.

```
                        /
                        /RKAE DRIVE CONTROL TEST
                        /
                        /MAINDEC-08-DHRKB-G-L
                        /
                        /COPYRIGHT (C) 1972, 1976 DIGITAL EQUIP. CORP.
                        /
                        /MAYNARD, MASS. 01754
                        /
                0001            FIELD   1
                        /
                        /CONSOL SRC =V2-R0-CONSOLE PACKAGE
                        /
                        /THE PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE TERMINAL
                        /EVERY FIVE(5) SECONDS OR SOONER.

                        /LOCATIONS THAT NEED TO BE SET UP FOR USING THE CONSOLE PACKAGE.

                        /CNTVAL IN XCAPASS    THIS LOCATION DETERMINDS THE NUMBER OF
                        /PROGRAM COMPLETIONS THAT ARE NEEDED BEFORE THE PASS MESSAGE IS TYPED
                        /THE VALUE SHOULD PUT THE PASS MESSAGE OUT IN THE RANGE OF 1 TO 5 MINUTES.
                        /THIS SHOULD BE A POSITIVE NUMBER.

                        /CASTRT   THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
                        /IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
                        /THE RETURN JUMPS TO XDOSW WHICH CONTAINS CASTRT SO PUT THE LABEL CBSTRT
                        /WHERE YOU WANT TO RESTART THE PROGRAM.


                        /SETUP1 IN XCBERR    THIS IS THE MASK BIT FOR HALT ON ERROR
                        /PLACE THE CORRECT BIT IN THIS LOCATION FOR HALTING ON ERRORS.

                        /SETUP2 IN XCAPASS   THIS IS THE MASK FOR HALT A END OF PASS.

                        /THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
                        /TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL=0.
                        /IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
                        /THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.


                0000    CONSOL=0
                6661            PSKF=   6661
                6662            PCLF=   6662
                6663            PSKE=   6663
                6664            PSTB=   6664
                6665            PSIF=   6665
                6004            GTF=    6004
                7701            ACL=    7701
                6007            CAF=    6007
                7421            MQL=    7421
                7501            MQA=    7501
                        /
                0020    *20
                        /
        0020    0000    F1SWR,  0
```



```
        0021    4000    F1OP1,  4000
        0022    0000    F1OP2,  0
                        /
                        IFDEF CONSOL <

                0024    *24

                4424            CBPASS= JMS I   .
        0024    0200                    XCAPAS          /CB PASS COMPLETION ROUTINE
                4425            CBCKSW= JMS I   .
        0025    0262                    XCBSW           /CHECK SW REG SETTING
                4426            CBTTYI= JMS I   .
        0026    0272                    XCBTTY          /FETCH CONSOL CHAR
                4427            CBCNTR= JMS I   .
        0027    0400                    XCBCNT          /CHECK FOR CONTROL CHAR
                4430            CBPRNT= JMS I   .
        0030    0303                    XCBPNT          /CA PRINT A BUFFER
                4431            CBSWIT= JMS I   .
        0031    0656                    XCAPSW          /SET UP PSEUDO SW. REG
                4432            CBOCTA= JMS I   .
        0032    1000                    XCBOCT          /CONVERT TO ASCII AND PRINT
                4433            CACRLF= JMS I   .
        0033    1023                    XCACRL          /DO A CARRIGE RETUR+LINE FEED
                4434            CBECHO= JMS I   .
        0034    1063                    XCBECH          /CHECK INPUT CHAR
                4435            CATYPE= JMS I   .
        0035    1077                    XCBTYP          /CA PRINT ONE CHAR
                4436            CBERR=  JMS I   .
        0036    1207                    XCBERR          /CA ERROR  HANDLER
                4437            CBINQU= JMS I   .
        0037    0635                    XCBINQ          /LOOK FOR OPERATOR INTERVENTION
                4440            CBCKPA= JMS I   .
        0040    1041                    XCBCKP          /CHECK IF CONTROL CHAR
                4441            CAPAUS= JMS I   .
        0041    0337                    XCAPAU          /IF CONSOL PACKAGE RETURN CALL PLUS ONE
                                                        /IF NOT USING CONSOL REPLACE CALL WITH
                                                        /A HLT AND THEN GO TO THE HALT

                        /*********************************************************************
                                /*20                    /PSEUDO SWITCH REGISTER

                                /*21                    /HARDWARE INDICATORS
                                                        /4000=USE FRONT PANEL SWITCH REGISTER
                                                        /0000=USE THE PSEUDO SWITCH REGISTER LOC.20

                                /*22                    /SYSTEM CONFIGURATION
                                                        /400=CONSOL PACKAGE SET ACTIVE
                                                        /0000=CONSOLE PACKAGE SET DEACTIVE

                                /*23                    /RESERVED FOR FUTURE USE
                        >
                        /
                0200    *200
```

```
                        /
                        /**********************************************************************
                        /C8PASS
                        /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
                        /THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
                        /THE PROGRAM TO COMPLETE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
                        /RANGE
                        /       C8PASS=JMS   XC8PAS
                        /EX. OF CALL            C8PASS
                        /               /       HLT             /HALT IF NON CONSOL PACKAGE
                        /               JMP     START1          /CONTINUE RUNNING THIS PROGRAM

                        /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
                        /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
                        /THE LOCATION SETUP2 IS THE MASK BIT FOR THE HALT AT END OF PASS
                        /CHECK THAT IT IS CORRECT FOR THE CURRENT PROGRAM

                        /CALLS USED BY XC8PAS ARE  CHKCLA=XC8CRLF=XC80CTA=XC8SW=XC8PNT=XC8INQ=

0200  0000  XC8PAS, 0
0201  7200          CLA
0202  4777'         JMS     CHKCLA          /IS WORD 22 BIT 3 ACTIVE CONSOLE?
0203  5212          JMP     OOPACK          /IS CLASSIC
0204  4776'         JMS     C8GET           /GET REGISTERS.
0205  4262          JMS     XC8SW           /DEACTIVE CONSOL CHECK SR SETTING
0206  0375          AND     (400            /FOR HALT ON END OF C8PASS
0207  7640          SZA CLA                 /1= HALT 0 CONTINUE
0210  5600          JMP I   XC8PAS          /GO TO HALT
0211  5230          JMP     C8BY1           /CONTINUE ON RUNNING PROGRAM
0212  4232  OOPACK, JMS     CKCOUT          /CLASS CHECK C8PASS COUNT
0213  5230          JMP     C8BY1           /C8PASS COUNT NOT DONE REDO PROGRAM
0214  2250          ISZ     PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
0215  4774'         JMS     XC8CRLF
0216  4303          JMS     XC8PNT          /C8PRNT BUFFER
0217  0253          MESPAS                  /
0220  1250          TAD     PASCNT          /GET NUMBER
0221  4773'         JMS     XC80CTA         /CONVERT IT TO ASCII
0222  4774'         JMS     XC8CRLF         /DO A CARRIAGE RETURN
0223  4776'         JMS     C8GET           /GET REGISTERS.
0224  4262          JMS     XC8SW           /CHECK A HALT AT END OF C8PASS
0225  0375  SETUP2, AND     (400            /MASK BIT
0226  7640          SZA CLA                 /HALT =1 NO SKIP CONTINUE =0
0227  4772'         JMS     XC8INQ          /STOP PROGRAM EXECUTION-LOOK FOR INPUT
0230  2200  C8BY1,  ISZ     XC8PAS          /BUMP RETURN
0231  5600          JMP I   XC8PAS
0232  0000  CKCOUT, 0
0233  1251          TAD     DOSET           /CHECK IF SET UP NEEDED
0234  7640          SZA CLA                 /0=SET UP C8PASS COUNT VALUE
                                            /1=C8PASS COUNT VALUE OK
0235  5242          JMP     NOSET           /C8PASS COUNT VALUE ON
0236  1252          TAD     CNTVAL          /GET COUNT VALUE FOR THIS PROG
0237  7040          CMA                     /SET TO NEGATIVE
0240  3247          DCA     DOCNT           /STORE IN HERE
```



```
0241  2251          ISZ     DOSET           /INDICATE VALUE SET UP
0242  2247  NOSET,  ISZ     DOCNT           /COUNT THE NUMBER OF PASSES
0243  5230          JMP     C8BY1           /EXIT FOR ANOTHER PASS
0244  3251          DCA     DOSET           /SET TO C8PRNT C8PASS
0245  2232          ISZ     CKCOUT          /BUMP RETURN FOR
0246  5632          JMP I   CKCOUT          /C8PASS C8TYPE OUT
0247  0000  DOCNT,  0
0250  0000  PASCNT, 0                       /
0251  0000  DOSET,  0
0252  0000  CNTVAL, 0
0253  0410  MESPAS, TEXT    "DHRKRF  PASS "
0254  2213
0255  0206
0256  4040
0257  2001
0260  2323
0261  4000

                        /**********************************************************************

                        /C8CKSW

                        /THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
                        /ROUTINE THAT WILL CHECK WHERE TO READ THE
                        /C8 SWITCHES FROM IE. FROM PANEL OR PSEUDO SWITCH REGISTER
                        /THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.

                                /C8CKSW=        JMS XC8SW
                                /EX.    JMS     XC8SW           /READ THE C8SWIT REGISTER
                                                                /RETURN WITH THE CONTENTS OF SWITCH REGISTER

                        /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING

                        /CALLS USED ARE-XC8CKPA-


0262  0000  XC8SW,  0
0263  4771'         JMS     XC8CKPA         /GO CHECK THE IF ANY CONTRL
0264  7000          NOP
0265  1021          TAD     21              /GET WD FOR INDICATOR
0266  7710          SPA CLA                 /CHECK IF FROM PANEL 4000
0267  7614          7614                    /DO LAS AND SKIP GET FROM PANEL WITH LAS
0270  1020          TAD     20              /PSEUDO SWITCH
0271  5662          JMP I   XC8SW           /EXIT WITH STATUS BIT IN AC.


                        /**********************************************************************

                        /C8TTYI
                        /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
                        /AND REMOVE ANY PARITY BITS, THEN MAKE IT 8 BIT ASCI.
                        /       C8TTYI= JMS XCATTY
```

```
                        /EX.    JMS     XC8TTYI         /READ CHAR FROM THE CONSOL DEVICE
                                /                       /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR


                        /CALLS USED -NONE-BUT C8CHAR IS OFF PAGE AND IN ROUTINE CALLED XC8ECHO

                        /
                        /
0272  0000  XC8TTY, 0
0273  6031              KSF                     /LOOK FOR KEYBOARD FLAG
0274  5273              JMP     .-1
0275  6036              KRB                     /GET CHAR
0276  0370              AND     (177            /MASK FOR 7 BITS
0277  1367              TAD     (200            /ADD THE EIGTH BIT
0300  3766'             DCA     C8CHAR          /STORE IT
0301  1766'             TAD     C8CHAR
0302  5672              JMP I   XC8TTY          /EXIT


                        /*****************************************************************

                        /C8PRNT

                        /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
                        /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL.   PRINTING OF THE BUFFER
                        /WILL STOP WHEN A 00 CHAR IS DETECTED, CHARACTERS ARE PACKED 2 PER WORD.

                        /       C8PRNT* JMS XC8PNT


                        /EX.    JMS     XC8PNT                  /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
                        /       MESS77                          /LOCATION OF C8PRNT BUFFER

                        /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
                        /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0

                        /CALLS USED ARE-XC8TYPE-XC8PNT


0303  0000  XC8PNT, 0
0304  7300              CLA CLL
0305  1703              TAD I   XC8PNT          /GET C8PRNT BUFFERS STARTING LOCATION
0306  3336              DCA     PTSTOR          /STORE IN PTSTOR
0307  2303              ISZ     XC8PNT          /BUMP RETURN
0310  1736  C8D01, TAD I   PTSTOR               /GET DATA WORD
0311  0365              AND     (7700           /MASK FOR LEFT BYTE
0312  7450              SNA                     /CHECK IF 00 TERMINATE
0313  5703              JMP I   XC8PNT          /EXIT
0314  7500              SMA                     /IS AC MINUS
0315  7020              CML                     /MAKE CHAR A 300 AFTER ROTATE
0316  7001              IAC                     /MAKE CHAR A 200 AFTER ROTATE
0317  7012              RTR
0320  7012              RTR
```



```
0321  7012              RTR                     /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
0322  4764'             JMS     XC8TYPE         /C8PRNT IT ON CONSOLE
0323  1736              TAD I   PTSTOR          /GET DATA WORD
0324  0363              AND     (0077           /MASK FOR RIGHT BYTE
0325  7450              SNA                     /CHECK IF 00 TERMINATOR
0326  5703              JMP I   XC8PNT          //EXIT
0327  1362              TAD     (3740           /ADD FUDGE FACTOR TO DETERMINE IF 200
0330  7500              SMA                     /OR 300 IS TO BE ADD TO CHAR
0331  1361              TAD     (100            /ADD 100
0332  1360              TAD     (240            /ADD 200
0333  4764'             JMS     XC8TYPE         /C8TYPE ONLY BITS 4-11
0334  2336              ISZ     PTSTOR          /BUMP POINTER FOR NEXT WORD
0335  5310              JMP     C8D01           /DO AGAIN
0336  0000  PTSTOR, 0                          /STOR FOR C8PRNT BUFFER
                        /*****************************************************************************


                        /C8PAUS
                        /THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE,IF ACTIVE
                        /IT WILL RETURN TO CALL PLUS ONE AC= 0, AND DO THAT INSTRUCTION.
                        /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
                        /WITH A 7402 HALT AND THEN RETURN TO THE HALT.

                        /       C8PAUS* JMS XC8PAU
                        /
                        /
                        /EX.            JMS     XC8PAUS         /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
                        /               ANYTHING                /RETURN HERE IF ON ACTIVE CONSOL
                        /
                        /


                        /CALLS USED ARE -CHKCLA-


0337  0000  XC8PAU, 0
0340  7300              CLA CLL
0341  4777'             JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
0342  5350              JMP     C8D03           /GO DO CONSOL PART RETURN CALL+1
0343  7040              CMA                     /DEACTIVE CONSOLE PACKAGE PUT HLT IN CALL
0344  1337              TAD     XC8PAU          /GET CORRECT RETURN ADDRS
0345  3337              DCA     XC8PAU          /SET UP RETURN
0346  1357              TAD     (7402           /GET CODE FOR HLT
0347  3737              DCA I   XC8PAU          /PUT HALT IN CALL LOCATION
0350  5737  C8D03, JMP I   XC8PAU              /GO TO HALT OR RETURN TO NEXT LOCATION


0357  7402
0360  0240
0361  0100
0362  3740
0363  0077
0364  1077
0365  7700
0366  1075
```

```
                0367  0200
                0370  0177
                0371  1041
                0372  0635
                0373  1000
                0374  1023
                0375  0400
                0376  0624
                0377  1200
                0400          PAGE
                              /*****************************************************************
                              /C8CNTR
                              /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
                              /IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-L-S
                              /       C8CNTR= JMS XC8CNT
                              /FX.    JMS     XC8CNTR                 /CHECK FOR CONTROL CHARACTER
                              /       JMP     ANYTHING                /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
                              /       JMP     ANYTHING                /LOC. IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
                              /
                              /RETURN IS TO CALL PLUS ONE IF CONTINUE
                              /RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
                              /RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
                              /CONTROL CHAR ..THIS WILL PRINT THE CHARACTER AND A ?
                              /CLEAR THE AC AND RETURN CALL+2.
                              /CALLS USED ARE-CHKCLA-XC8TYPE-XCRCRLF-C8GET-UPAROW-XC8TYI-XC8PSW-
                              /
                              /
                              /
0400  0200    XC8CNT, 0
0401  3777'           DCA     AC8AVE          /SAVE THE AC
0402  4776'           JMS     CHKCLA          /CHECK LOC.22 BIT3 FOR CONSOLE BIT
0403  5206            JMP     .+3             /ON ACTIVE CONSOLE
0404  1777'           TAD     AC8AVE          /DEACTIVE CONSOLEGET AC FOR RETURN
0405  5600            JMP I   XC8CNT          /EXIT NOT ON ACTIVE CONSOLE
0406  6004            GTF
0407  3775'           DCA     FL8AVE
0410  7501            MQA
0411  3774'           DCA     MQ8AVE          /SAVE THE MQ
0412  3255            DCA     INDEXA          /SET DISPLACEMENT INTO TABLE B
0413  1257            TAD     XTABLA          /GET ADDRS OF TABLE A
0414  3256            DCA     GETDAT          /CONTAINS POINTER TO CONTROL CHAR
0415  1656    REDOA,  TAD I   GETDAT          /GET CONTROL CHAR FROM TABLE
0416  7450            SNA                     /CHECK FOR A 0 END OF TABLE
0417  5226            JMP     DONEA           /END OF TABLE NO CONTROL CHAR
0420  1773'           TAD     C8CHAR          /COMPARE CHAR TO CONTROL CHAR
0421  7650            SNA CLA                 /0 IF MATCH
0422  5243            JMP     GOITA           /MATCH
0423  2255            ISZ     INDEXA          /NO MATCH NOT END OF TABLE REDO
0424  2256            ISZ     GETDAT          /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
0425  5215            JMP     REDOA           /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
```



```
0426  1772'    DONEA,  TAD     INMODE          /CHECK IF PROGRAM EXPECTS CHAR
0427  7640            SZA CLA                 /1=CHAR EXPECTED  0= NO CHAR EXPECTED
0430  5240            JMP     EXITA           /CHAR EXPECTED
0431  1773'           TAD     C8CHAR          /GET CHAR =NOT CONTROL+NOT EXPECTED
0432  4771'           JMS     XC8TYPE         /CAPRNT CHAR
0433  1370            TAD     (277            /GET CODE FOR "?"
0434  4771'           JMS     XC8TYPE
0435  4767'           JMS     XC8CRLF
0436  2200            ISZ     XC8CNT          /BUMP RETURN
0437  5600            JMP I   XC8CNT          /EXIT CALL+2
0440  2200    EXITA,  ISZ     XC8CNT          /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
0441  1773'           TAD     C8CHAR          /PUT CHAR IN AC.
0442  5600            JMP I   XC8CNT          /EXIT
0443  1773'    GOITA,  TAD     C8CHAR          /GET THE CONTENTS OF CHAR
0444  1366            TAD     (100            /ADD 100 TO FORM A GOOD ASCII CHARACTER
0445  3773'           DCA     C8CHAR          /RESTORE COFFECT CHAR
0446  1260            TAD     XTABLB          /GET START OF TABLE B
0447  1255            TAD     INDEXA          /GET NOW FAR INTO TABLE
0450  3254            DCA     GOTOA           /STORE IT
0451  1654            TAD I   GOTOA           /GET THE ROUTINE STARTTING ADDRESS
0452  3254            DCA     GOTOA           /STORE IT IN HERE
0453  5654            JMP I   GOTOA           /GOTO CONTROL CHAR ROUTINE
0454  0000    GOTOA,  0000                    /ADD OF CNTRL ROUTINE TO EXECUTE
0455  0000    INDEXA, 0000                    /DISPLACEMENT INTO CNTRL TABLE
0456  0000    GETDAT, 0000                    /LOCATION OF ADDRS OF CONTROL CHAR.
0457  0461    XTABLA, TABLA                   /ADDRS OF TABLEA
0460  0471    XTABLB, TABLB                   /ADDRS OF TABLEB
0461  7575    TABLA,  7575                    /CNTRL C BACK TO MONITOR 203
0462  7564            7564                    /CNTRL L SWITCH ERROR PRINTTING DEVICE 214
0463  7557            7557                    /CNTRL Q START DISPLAYING CHAR. AGAIN 221
0464  7556            7556                    /CNTRL R BACK TO BEGINNING OF PROGRAM 222
0465  7555            7555                    /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
0466  7573            7573                    /CNTRL E CONTINUE WITH PROGRAM 205
0467  7574            7574                    /CONTROL D CHANGE SWITCH REGISTER ON FLY
0470  0000            0000
0471  0551    TABLB,  CNTRLC
0472  0537            CNTRLL
0473  0500            CNTRLQ
0474  0511            CNTRLR
0475  0521            CNTRLS
0476  0545            CNTRLE
0477  0600            CNTRLD
                      /
                      /CONTROL Q
                      /START SENDING CHAR. TO THE DISPLAY
                      /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
                      /THE CALL FOR CONTROL S.
                      /
0500  3772'    CNTRLQ, DCA     INMODE          /SET SOFT FLAG FOR UNEXPECTED CHAR
0501  1335            TAD     CASETS          /CHECK IF CONTROL S TYPED IN
0502  7640            SZA CLA
0503  5306            JMP     BYRETR          /CONTROL S TYPED IN
0504  4765'           JMS     C8GET           /NO CONTROL S TYPED PREVIOUSLY
0505  5600            JMP I   XC8CNTR         /LEAVE VIA CNTR ENTRY ADDRESS
```

```
0506  3335    RYRETR, DCA     CASETS          /CLEAR THE SOFT FLAG
0507  4765'           JMS     CAGET           /RESTORE REGISTERS
0510  5736           JMP I   CARETR          /EXIT TO ADDRESS SET BY CONTROL S
                     /
                     /
                     /CONTROL R
                     /GO TO THE QUESTION CASWIT
0511  3764'  CNTRLR, DCA     TTYLPT          /CLEAR THE TYPE FLAG SET TO TTY
0512  3335           DCA     CASETS          /CLEAR SOFT FLAG FOR CNTRL S
0513  3772'          DCA     INMODE
0514  4763'          JMS     UPAROW          /PRINT THE ^ AND CACHAR
0515  3762'  CABY4,  DCA     CASWST          /CLEAR FLAG FOR CNTRL D OR R
0516  6203           CIF CDF 0
0517  5720           JMP I   XDOSW           /GO TO ADDRS OF CASWIT
0520  0200    XDOSW,  RGN                     /DOSW IS LABEL FOR CASWIT QUESTION
                     /
                     /
                     /CONTROL S
                     /STOP SENDING CHAR. TO DISPLAY UNTIL A ^Q IS RECEIVED
                     /
                     /
0521  1335    CNTRLS, TAD     CASETS          /IF1 DO NOT STORE IN CARETR
0522  7640           SZA CLA
0523  5327           JMP     CADO7           /DONT SET UP CARETR
0524  7001           IAC                     /MAKE RETURN CALL PLUS 2
0525  1200           TAD     XCACNT          /GET RETURN FOR THIS CALL
0526  3336           DCA     CARETR          /STORE IT HERE FOR USE BE CNTROL Q
0527  2335    CADO7,  ISZ     CASETS          /SET FLAG TO SAVE CALL
0530  4761'          JMS     XCATTYI                 /LOOK FOR THE INPUT
0531  4765'          JMS     CAGET           /GET REGISTERS
0532  4200           JMS     XCACNTR                 /CHECK FOR THE CONTROL CHAR
0533  7200           CLA
0534  5321           JMP     CNTRLS          /IF NOT A CNTRL Q R C REASK
0535  0000    CASETS, 0
0536  0000    CARETR, 0
                     /
                     /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER -THE TWO OUTPUTS ARE THE
                     /CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
                     /
                     /
0537  1764'  CNTRLL, TAD     TTYLPT          /GET PRESENT CASWIT INDICATOR
0540  7040           CMA                     /COMPLEMENT IT
0541  3764'          DCA     TTYLPT          /STOR NEW CASWIT
0542  4763'          JMS     UPAROW          /CAPRNT ^ AND CHAR ON NEW DEVICE
0543  4765'          JMS     CAGET           /RESTORE THE REGISTERS
0544  5600           JMP I   XCACNT          /EXIT
                     /
                     /CONTROL E
                     /CONTINUE RUNNING FROM A INQUIRE OR ERROR
                     /
                     /
0545  4763'  CNTRLE, JMS     UPAROW          /PRINT THE CONTROL CHAR
0546  3762'          DCA     CASWST          /CLEAR ENTRY FLAG.
0547  4765'          JMS     CAGET           /GET THE REGISTERS
0550  5600           JMP I   XCACNT          /RETURN TO CALL PLUS ONE
```



```
                     /
                     /CONTROL C
                     /RETURN TO MONITOR CONTROL C
0551  3764'  CNTRLC, DCA     TTYLPT          /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
0552  3762'          DCA     CASWST          /CLEAR ENTRY FLAG.
0553  4763'          JMS     UPAROW          /CAPRNT A^ AND LETTER IN CHAR
0554  6203           CDF CIF                 /GO TO 0 FLD
0555  6007           CAF                     /CLEAR THE WORLD
0556  5760           JMP I   (7600           /GO TO DIAGNOSTIC MONITOR
                     /*****************************************************************
                     /
                     /
                     /
0560  7600
0561  0272
0562  0745
0563  0615
0564  1121
0565  0624
0566  0100
0567  1023
0570  0277
0571  1077
0572  1076
0573  1075
0574  1346
0575  1347
0576  1200
0577  1345
      0600           PAGE
                     /
                             /CONTROL D
                             /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
                             /THE PROGRAM RUNNING.


0600  4215    CNTRLD, JMS     UPAROW
0601  1213           TAD     CASETD          /CHECK IF THE RETURN ADDRS IS SAFE
0602  7640           SZA CLA
0603  5207           JMP     CADO11          /DO NOT CHANGE THE RETURN ADDRS
0604  1777'          TAD     XCACNT          /GET THE RETURN ADDRS AND SAVE IT
0605  3214           DCA     CARETD          /SAVE THE RETURN HERE
0606  2213           ISZ     CASETD          /INDICATE RETURN SAVED DONT DISTROY
0607  4256    CADO11, JMS     XCAPSW                  /GO CHANGE THE SWITCH REGISTER
0610  3213           DCA     CASETD          /CLEAR THE FLAG
0611  4224           JMS     CAGET           /RESTORE THE AC MQ LINK ETC
0612  5614           JMP I   CARETD          /RETURN TO THE PROGRAM
                     /
0613  0000    CASETD, 0
0614  0000    CARETD, 0
```

```
                        /THIS WILL TYPE A UP ARROW AND THE CHAR IN C8CHAR,

0615  0000  UPAROW, 0                      /C8PRNT THE "^" AND THE CHAR C8TYPED IN
0616  1376        TAD     (336            /CODE FOR ^
0617  4775'       JMS     XC8TYPE
0620  1774'       TAD     C8CHAR          /C8TYPE THE CHAR
0621  4775'       JMS     XC8TYPE
0622  4773'       JMS     XC8CRLF
0623  5615        JMP I   UPAROW          /EXIT


                        /**********************************************************

0624  0000  C8GET,  0
0625  7200        CLA
0626  1772'       TAD     MQSAVE
0627  7421        MQL                     /RESTORE MQ
0630  1771'       TAD     FLSAVE
0631  7004        RAL                     /RESTORE THE LINK
0632  7200        CLA
0633  1770'       TAD     ACSAVE          /RESTORE THE AC
0634  5624        JMP I   C8GET           /GET THE REGISTERS


                        /**********************************************************

                        /C8INQU
                        /C8INQU ROUTINE WILL PRINT A WAITING
                        /AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
                        /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
                        /IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
                        /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN,

                        /       C8INQU =        JMS XC8INQ

                        /EX.    JMS     XC8INQ                  /C8 WILL PRINT A WAITINGAND WAIT FOR INPUT
                        /       DO ANYTHING                     /RETURN IS CALL PLUS ONE AC =0 CONTINUE

                        /CALLS USED ARE =CHKCLA=XC8PNT=XC8TYI=C8GET=XC8CNTR=


0635  0000  XC8INQ, 0
0636  7300        CLA CLL
0637  4767'       JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
0640  7410        SKP                     /ACTIVE CONSOLE PACKAGE
0641  5635        JMP I   XC8INQ          /NOT CONSOLE LEAVE
0642  4766'       JMS     XC8PNT
0643  0651        WATMES                  /INQUIR WAITTING
0644  4765'       JMS     XC8TTYI         /GET CHARACTER
0645  4224        JMS     C8GET
0646  4777'       JMS     XC8CNTR         /CHECK IF CONTROL CHARACTER
0647  5635        JMP I   XC8INQ          /EXIT AND CONTINUE
0650  5236        JMP     XC8INQ+1        /REASK
```



```
0651  2701  WATMES, TEXT    "WAITING "
0652  1124
0653  1116
0654  0740
0655  0000


                        /**********************************************************

                        /C8SWIT

                        /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
                        /SW QUESTION , IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
                        /RETURN TO CALL PLUS ONE AC=0,
                        /C8SWIT WILL SET UP THE PSEUDO SWITCH
                        /REGISTER WITH THE NEW DATA ENTERED
                        /
                        /       C8SWIT =        JMS XC8PSW

                        /EX.            JMS     XC8PSW          /SET UP PSEUDO C8SWIT REGISTER IF
                                                                /ON THE CONSOL PACKAGE, RETURN IS CALL PLUS ONE AC = 0

                        /CALLS USED ARE =CHKCLA=XC8PSW=XC8PNT=XC8OCTA=XC8TYPE=


0656  0000  XC8PSW, 0
0657  4767'       JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
0660  7410        SKP                     /ACTIVE CONSOLE
0661  5656        JMP I   XC8PSW          /DEACTIVE CONSOLE PACKAGE
                                          /RETURN WITHOUT ASKING PSEUDO SWITCH
0662  1345        TAD     C8SWST          /IS THE SOFT FLAG SET FOR SWITCH?
0663  7640        SZA CLA                 /SKIP IF ONE ENTRY AT ATIME OK
0664  5764'       JMP     C8BY4           /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
0665  2345        ISZ     C8SWST          /FIRST ENTRY SET FLAG
0666  4766'  C8ROPS, JMS   XC8PNT         /C8PRNT SR=
0667  0747        MESA
0670  1020        TAD     20              /GET CONTENTS OF SW
0671  4763'       JMS     XC8OCTA         /CONVERT IT TO ASCII
0672  1362        TAD     (40             /GET SPACE
0673  4775'       JMS     XC8TYPE
0674  2761'       ISZ     INMODE          /SET FLAG FOR CHAR EXECTED
0675  4760'       JMS     XC8ECHO         /LOOK FOR INPUT
0676  4315        JMS     TSTCHA          /NOT CONTROL TEST IT IS LEGAL
0677  1774'       TAD     C8CHAR          /STORE NEW CHAR IN SW REG
0700  3020        DCA     20

0701  1357        TAD     (-3             /GET A MINUS 3
0702  3346        DCA     TMPCNT          /STORE IN TEMP COUNT
0703  4760'  GETCH1, JMS   XC8ECHO        /GET NEXT CHAR
0704  4315        JMS     TSTCHA          /CHECK IF CR+GOOD CHAR
0705  1020        TAD     20              /GET C8SWIT REGISTER
0706  7106        RTL CLL                 /ROTATE IT LEFT 3 PLACES
0707  7004        RAL
0710  1774'       TAD     C8CHAR          /GET CHAR+ADD IT TO PREVIOUS CONTENTS
0711  3020        DCA     20              /SAVE NEW CONTENTS
```

```
                0712  2346            ISZ     TMPCNT          /BUMP COUNT
                0713  5303            JMP     GETCH1          /JMP BACK+GET NEXT CHAR
                0714  5342            JMP     ENDIT           /END W CHAR CATYPED IN
                0715  0000    TSTCHA, 0
                0716  7041            CIA                     /CMPL CHAR IN AC
                0717  1356            TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
                0720  7650            SNA CLA                 /SKIP IN NOT CR,
                0721  5342            JMP     ENDIT           /WAS CARRIAGE RETURN
                0722  1774'           TAD     CACHAR          /NOT CR, GET CHAR
                0723  1355            TAD     (-260           /CHECK IF IT IS IN RANGE
                0724  7710            SPA CLA                 /IF NOT POSITIVE CAERR CHAR SMALLER THEN 260
                0725  5336            JMP     ERR1            /CAERR =CHAR TOO SMALL
                0726  1774'           TAD     CACHAR          /GET CHAR
                0727  1354            TAD     (-270           /GET A -270+CHECK IF IT IS LARGER THEN 7
                0730  7700            SMA CLA                 /SKIP IF LESS THEN 7
                0731  5336            JMP     ERR1            /CAERR ON CHAR NOT IN RANGE
                0732  1774'           TAD     CACHAR          /GET CHAR
                0733  0353            AND     (7              /MASK FOR RIGHT BYTE
                0734  3774'           DCA     CACHAR          /STORE IN CHAR
                                                              /GET CHAR IN AC
                0735  5715            JMP I   TSTCHA          /EXIT
                0736  1352    ERR1,   TAD     (277            /CAPRNT
                0737  4775'           JMS     XCATYPE         /?
                0740  4773'           JMS     XCACRLF         /
                0741  5266            JMP     CARDPS          /EXIT+ASK AGAIN
                0742  4773'   ENDIT,  JMS     XCACRLF         /DO A CR LF
                0743  3345            DCA     CASWST          /CLEAR THE PSW ENTRY FLAG
                0744  5656            JMP I   XCAPSW          /EXIT ROUTINE
                0745  0000    CASWST, 0

                0746  0000    TMPCNT, 0
                0747  2322    MESA,   TEXT    "SR# "
                0750  7540
                0751  0000

                0752  0277
                0753  0007
                0754  7510
                0755  7520
                0756  0215
                0757  7775
                0760  1063
                0761  1076
                0762  0040
                0763  1200
                0764  0515
                0765  0272
                0766  0303
                0767  1200
                0770  1345
                0771  1347
                0772  1346
                0773  1023
                0774  1275
```



```
                0775  1077
                0776  0336
                0777  0400
                      1000      PAGE

                                /CAOCTA

                                /OCTAL TO ASCII CONVERSION
                                /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
                                /THE RESULT WILL BE PRINTED ON THE CONSOL TERMINAL
                                /       CAOCTA= JMS XCAOCT
                                /
                                /EX,    JMS     XCAOCTA         /AC CONTAINS NUMBER TO BE CHANGE
                                /       RETURN IS TO CALL PLUS ONE AC=0
                                /
                                /CALLS USED ARE =XCATYPE=

                1000  0000    XCAOCT, 0
                1001  7106            CLL RTL
                1002  7006            RTL                     /POSITION THE FIRST CHAR FOR PRINTING
                1003  3221            DCA     CATMP1          /SAVE CORRECT POSITIONED WORD HERE
                1004  1377            TAD     (-4
                1005  3222            DCA     CACKP           /STORE COUNTER IN HERE
                1006  1221    CAOO4,  TAD     CATMP1          /GET FIRST NUMBER
                1007  0376            AND     (0007           /MASK
                1010  1375            TAD     (260            /ADD THE PRINT CONSTANT
                1011  4277            JMS     XCATYPE         /TYPE THE NUMBER
                1012  1221            TAD     CATMP1          /
                1013  7006            RTL
                1014  7004            RAL                     /PUT NEXT NUMBER IN POSITION
                1015  3221            DCA     CATMP1          /STORE IT
                1016  2222            ISZ     CACKP           /DONE YET WITH FOUR NUMBERS
                1017  5206            JMP     CAOO4           /NOT YET DO MORE
                1020  5600            JMP I   XCAOCT          /DONE WITH FOUR
                1021  0000    CATMP1, 0
                1022  0000    CACKP,  0


                                /*****************************************************************

                                /CACRLF
                                /CATYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
                                /
                                /       CACRLF= JMS XCACRL
                                /
                                /EX,    JMS     XCACRLF         /CAPRNT A CR AND LF WITH FILL
                                /                               /RETURN TO CALL PLUS ONE AC =0
                                /CALLS USED ARE =XCATYPE=


                1023  0000    XCACRLF,0
                1024  7300            CLA CLL
                1025  1374            TAD     (215            /GET CODE FOR CR
                1026  4277            JMS     XCATYPE
```

```
                1227  1237            TAD     FILLER
                1230  7040            CMA
                1231  3240            DCA     FILCNT          /STORE FILLER IN MEMP
                1232  1373            TAD     (212            /GET CODE FOR LF
                1233  4277  CA002,    JMS     XC8TYPE
                1234  2240            ISZ     FILCNT          /CHECK ON FILLER CHAR
                1235  5233            JMP     CA002           /TYPE A NON PRINTING CHAR
                1236  5623            JMP I   XCACRL          /EXIT
                1237  0004  FILLER,    0004                    /FILLER SET FOR 4 CHAR
                1240  0000  FILCNT,    0                       /COUNTER FOR FILL


                //*************************************************************
                /CACKPA
                /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
                /TERMINAL. IFTHE FLAG IS SET AND THE CONSOLE PACKAGE IS
                /ACTIVE A CHECK IS MADE TO DETERMIND IF IT IS A CONTROL CHAR.
                /IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
                /IF NOT A CONTROL CHARACTER OR A CONTROL E-O-L-O-IT WILL DO
                /THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
                /A NON CONTROL CHARACTER WILL BE PRINTEDAND A "?" IT WILL RETURN TO
                /CALL PLUS 2.
                /IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
                /CALL PLUS 1.


                /       CACKPA= JMS     XCACKP


                /EX.    JMS     XCACKPA                 /CALL TO CHECK IF CONTROL CHAR SET
                /       ANYTHING(SKIP)          /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
                /       ANYTHING(JMP EXIT SKIP CHAIN)   /RETURN IF NOT CONTROL OR CONTINUE CONTROL


                /CALLS USED ARE -XC8TTYI-XCACNTR-CAGET-


1241  0000      XC8CKP, 0
1242  3772'             DCA     ACSAVE          /SAVE THE AC
1243  6004              GTF                     /SAVE THE FLAGS
1244  3771'             DCA     FLSAVE          /SAVE THE FLAGS
1245  7501              MQA                     /PUT MQ IN AC
1246  3770'             DCA     MQSAVE          /SACE THE MQ
1247  6031              KSF                     /CHECK THE KEYBOARD FLAG
1250  5261              JMP     CABY3           /EXIT TO CALL PLUS 1
1251  4767'             JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
1252  7410              SKP                     /ACTIVE CONSOLE PACKAGE
1253  5261              JMP     CABY3           /EXIT TO CALL PLUS 1
1254  4766'             JMS     XC8TTYI         /GET THE CHAR
1255  4765'             JMS     CAGET           /GET THE FLAGS
1256  4764'             JMS     XCACNTR         /CHECK IF CONTROL  CHAR.
1257  7000              NOP                     /RETURN IF A CONTINUE CHAR.
1260  2241              ISZ     XC8CKP          /BUMP RETURN FOR CALL PLUS 2
1261  4765'   CABY3,    JMS     CAGET           /GET REGISTERS
```



```
1262  5641              JMP I   XCACKP          /SAY GOOD BY

                //*****************************************************************

                /CAECHO
                /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD.  STORE IT IN LOCATION CHAR
                /CHECK IF IT WAS A CONTROL CHARACTER -SET INMODE -PRINT CHARACTER

                /       CAECHO =        JMS XC8ECH
                /EX.    JMS     XC8ECHO         /LOOK FOR CONSOL CHAR CAPRNT IT
                                                /RETURN CALL PLUS ONE AC = CHAR CATYPED IN

                /CALLS USED ARE -XC8TTYI-XCACNTR-CAGET-XC8ECH-XCATTYPE

                /
1263  0000      XCAECH, 0
1264  4766'             JMS     XC8TTYI         /WAIT FOR CHAR FROM KEYBOARD
1265  4765'             JMS     CAGET           /RESTORE THE REGISTERS
1266  2276              ISZ     INMODE          /SET INMODE IDENTIFING THIS AS A EXPECTED CHAR
1267  4764'             JMS     XCACNTR         /GO CHECK IF IT IS A CONTROL CHAR
1270  5663              JMP I   XCAECH          /WAS A CONTROL CHAR -CONTINUE RUNNING
1271  4277              JMS     XC8TYPE         /NOT A CONTROL CHAR CAPRNT IT
1272  3276              DCA     INMODE          /CLEAR FLAG THAT CHAR EXPECTED
1273  1275              TAD     CACHAR          /GET CHAR IN AC
1274  5663              JMP I   XCAECH          /EXIT
1275  0000  CACHAR,    0
1276  0000  INMODE,     0

                /*****************************************************************

                /C8TYPE
                /THIS ROUTINE WILL CAPRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
                /
                /       CATYPE= JMS XC8TYP

                /EX.    JMS     XC8TYPE         /CAPRNT THE CHAR IN THE AC.
                        /                       /RETURN CALL PLUS ONE AC =0000
                                                /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT

                /CALLS USED ARE -C8HANG-XCACNTR-XCAPNT-XCACRLF-XCAINQU-


1277  0000      XC8TYP, 0
1300  3322              DCA     PNTRUF          /STORE CHAR
1301  1321              TAD     TTYLPT          /CHECK O=TTY 7777=LPT
1302  7640              SZA CLA
1303  5312              JMP     XDOLPT          /DO OUT PUT ON LPT
1304  1320              TAD     PNTRUF
1305  6046              TLS
1306  6041              TSF
1307  5306              JMP     .-1
1310  6042              TCF
1311  5316              JMP     CABY5
1312  1320  XDOLPT,     TAD     PNTRUF          /GET CHAR
1313  6666              PSTB    PCLF            /CAPRNT IT
```

```
 866  1114  4322          JMS     C8HANG          /CHECK KEYBOARD IF HUNG
 867  1115  6662          PCLF                    /CLEAR THE FLAG
 868  1116  7600  C8RYS,  7600                    /CLEAR THE AC
 869  1117  5677          JMP I   XCATYP          /EXIT
 870  1120  0000  PNTRUF, 0
 871  1121  0000  TTYLPT, 0
 872
 873
 874  1122  0000  C8HANG, 0
 875  1123  7200          CLA             /
 876  1124  1316          TAD     C8RYS           /GET CONSTANT 7600
 877  1125  3320          DCA     PNTRUF          /PNTRUF IS NOW A COUNTER
 878  1126  6661          PSKF                    /SKIP ON PRINTER DONE
 879  1127  7410          SKP                     /NOT DONE YET
 880  1130  5722          JMP .   C8HANG          /SAW FLAG DONE
 881  1131  2345          ISZ     C8CONT          /FIRST COUNTER FAST ONE
 882  1132  5326          JMP     .-4             /CHECK IF FLAG SET YET
 883  1133  2320          ISZ     PNTRUF          /MADE 4096 COUNTS ON FAST COUNTER
 884  1134  5341          JMP     .+3             /KEEP IT UP FOR 5 SEC
 885  1135  1764*         TAD     XC8CNTR         /GET THE RETURN ADDRESS IN CONTROL
 886  1136  3322          DCA     C8HANG          /SAVE IT IN HANG
 887  1137  3321          DCA     TTYLPT          /ALLOW PRINTING ON TTY
 888  1140  4763*         JMS     XC8PNT
 889  1141  1146          MESHANG                 /LPT ERROR
 890  1142  4223          JMS     XC8CRLF
 891  1143  4762*         JMS     XC8INQU         /PRINT WAITING
 892  1144  5722          JMP .   C8HANG          /CONTINUE TO SAVE ADDRESS
 893  1145  0000  C8CONT, 0                       /COUNTER FOR TIMER
 894  1146  1420  MESHANG,TEXT    "LPT ERROR"
       1147  2040
       1150  0522
       1151  2217
       1152  2240
 895
 896  1162  0635
 897  1163  0323
 898  1164  0430
 899  1165  0624
 900  1166  0272
 901  1167  1200
 902  1170  1346
 903  1171  1347
 904  1172  1345
 905  1173  0212
 906  1174  0215
 907  1175  0260
 908  1176  0207
 909  1177  7774
       1200          PAGE
 910                 /*****************************************************************
 911                 /*****************************************************************
 912
 913                 /THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD.
 914                 /TO SEE IF THE CONSOLE BIT 3 (400) IS SET IF SET THEN RETURN
 915                 /TO CALL PLUS TWO FO A ACTIVE CONSOLE PACKAGE AC=0
```



```
 916                 /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.
 917
 918
 919  1200  0000  CHKCLA, 0
 920  1201  7200          CLA
 921  1202  1022          TAD     22              /GET THE COTENTA OF LOCATION 22
 922  1203  0377          AND     (400            /MASK FOR BIT 3 (400
 923  1204  7650          SNA CLA                 /
 924  1205  2200          ISZ     CHKCLA          /ACTIVE CONSOLE PACKAGE RETURN
 925                                              /CALL PLUS ONE (1) FOR ACTIVE
 926  1206  5600          JMP I   CHKCLA          /DFACTIVE CONSOLE PACKAGE RETURN
 927                                              /CALL PLUS TWO (2)
 928
 929                 /C8ERR
 930                 /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
 931                 /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
 932                 /       C8ERR=  JMS XC8ERR
 933                 /EX.    JMS     XC8ERR          /GO TO C8ERR CALL IF NOT CONSOL
 934                 /                               /RETURN TS CALL PLUS ONE AC =0000
 935
 936                 /CALLS USED ARE -CHKCLA-XC8CRLF-XC8SW-XC8INQU-XC8PNT-XC80CTA-
 937
 938
 939  1207  0000  XC8ERR, 0
 940  1210  6002          IOF
 941  1211  3345          DCA     ACSAVE          /SAVE AC
 942  1212  6004          GTF
 943  1213  3347          DCA     FLSAVE          /SAVE THE FLAGS
 944  1214  7521          MQA
 945  1215  3346          DCA     MQSAVE          /SAVE THE MQ
 946  1216  7340          CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
 947  1217  1207          TAD     XC8ERR          /GET RETTURN LOCATION
 948  1220  3344          DCA     PCSAVE          /SAVE ADD OF C8ERR CALL
 949  1221  6201          CDF
 950  1222  7340          CLA CLL CMA
 951  1223  1776          TAD I   (CLASIK)        /GET REAL PC.
 952  1224  3316          DCA     REALPC          /SAVE IT.
 953  1225  6211          CDF     10
 954  1226  4240          JMS     CHKCLA          /CHECK LOC.22 BIT 3 CONSOL BIT
 955  1227  7410          SKP                     /ACTIVE CONSOLE PACKAGE
 956  1230  5273          JMP     NTCLAS          /NOT CLASSIC SYSTEM
 957  1231  4775*         JMS     C8GET           /GET REGISTERS.
 958  1232  4774*         JMS     XC8SW           /CHECK SWITCH REG FOR BIT THAT INDICATES
 959                                              /NO ERROR MESSAGE
 960  1233  0373  SETUP1, AND     (0000           /MASK FOR BIT FOR NO ERROR PRINTING
 961                                              /IF THIS ERROR MESSAGE IS TO ALWAYS
 962                                              /BE PRINTED LEAVE AND VALUE AT 0000
 963  1234  7440          SZA CLA                 /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
 964  1235  5262          JMP     C8D010          /DO NOT PRINT
 965  1236  4773*         JMS     XC8CRLF
 966  1237  4771*         JMS     XC8PNT
 967  1240  1322          ERRMES                  /PRINT THE ERROR MESSAGE
 968  1241  4771*         JMS     XC8PNT
 969  1242  1333          MESPC                   /PRINT THE PC STSTEMENT
 970  1243  1516          TAD     REALPC          /GET PC
```

```
  971   1244  4770*           JMS     XC80CTA         /CONVERT 4 DIGIT PC TO ASCII
  972   1245  4771*           JMS     XCAPNT
  973   1246  1333           MESAC                    /PRINT THE AC MESS
  974   1247  1345           TAD     ACSAVE
  975   1250  4770*           JMS     XC80CTA
  976   1251  4771*           JMS     XCAPNT
  977   1252  1336           MESMQ                    /PRINT MQ
  978   1253  1346           TAD     MQSAVE
  979   1254  4770*           JMS     XC80CTA
  980   1255  4771*           JMS     XCAPNT
  981   1256  1341           MESFL                    /PRINT FL
  982   1257  1347           TAD     FLSAVE
  983   1260  4770*           JMS     XC80CTA
  984   1261  4772*           JMS     XCACRLF
  985   1262  4775*  C8001C,  JMS     C8GET           /GET REGISTERS,
  986   1263  4774*           JMS     XC8SW           /CHECK SWITCH REGISTER
  987   1264  7610           SKP CLA                  /SKIP IF BIT 0 SET
  988   1265  5320           JMP     C8RY2           /LEAVE
  989   1266  4767*           JMS     XC8INQ          /GO TO THE INQUIRE ROUTINE
  990   1267  5320           JMP     C8RY2           /LEAVE
  991   1270  4775*  NTCLAS,  JMS     C8GET           /GET REGISTERS,
  992   1271  4774*           JMS     XC8SW           /CHECK PSEUDO SWITCH REGISTER
  993                                                 /CHECK THE C8SWIT REGISTER
  994   1272  7610           SKP CLA                  /SKIP IF HALT
  995   1273  5607           JMP I   XC8ERR          /NO HALT CONTINUE
  996   1274  1366           TAD     (7402           /CODE FOR HLT
  997   1275  3744           DCA I   PCSAVE          /PUT IT IN CALL LOC.
  998   1276  4775*           JMS     C8GET
  999   1277  5744           JMP I   PCSAVE          /EXIT  TO CALL AND HALT
 1000   1300  4775*  C8RY2,  JMS     C8GET           /GET THE REGISTERS
 1001   1301  5607           JMP I   XC8ERR
 1002                 /
 1003                 /
 1004   1302  7402  ROUINS,  HLT                     /PUT INSTRUCTION TO EXECUTE HERE.
 1005   1303  7200           NOP
 1006   1304  3317           DCA     MYAC            /SAVE AC
 1007   1305  6231           CDF     0
 1008   1306  1020           TAD     SWR
 1009   1307  3765           DCA I   (SWR)
 1010   1310  1776           TAD I   (CLASIK)
 1011   1311  3315           DCA     CLRTRN
 1012   1312  1317           TAD     MYAC
 1013   1313  6202           CIF     0
 1014   1314  5715           JMP I   CLRTRN          /RETURN TO FIELD 0.
 1015                 /
 1016   1315  0000  CLRTRN,  0
 1017   1316  0000  REALPC,  0
 1018   1317  0000  MYAC,    0
 1019                 /
 1020   1320  0410  ERRMES,  TEXT    "DMPKRF  FAILED "
        1321  2213
        1322  0206
        1323  4040
        1324  0601
        1325  1114
```



```
        1326  0504
        1327  4000
 1021   1330  4040  MESPC,   TEXT    "  PC:"
        1331  2203
        1332  7200
 1022   1333  4040  MESAC,   TEXT    "  AC:"
        1334  2103
        1335  7200
 1023   1336  4040  MESMQ,   TEXT    "  MQ:"
        1337  1521
        1340  7200
 1024   1341  4040  MESFL,   TEXT    "  FL:"
        1342  0614
        1343  7200
 1025   1344  7777  PCSAVE,  7777
 1026   1345  7777  ACSAVE,  7777
 1027   1346  7777  MQSAVE,  7777
 1028   1347  7777  FLSAVE,  7777
 1029                 /
 1030                 /
 1031   1365  0320
 1032   1366  7402
 1033   1367  0635
 1034   1370  1200
 1035   1371  0303
 1036   1372  1223
 1037   1373  0220
 1038   1374  0262
 1039   1375  0624
 1040   1376  5132
 1041   1377  2402
               0000           FIELD 0
```

```
0000  00000000  00000000  11101111  11111111  11000000  00000000  00000000  00000000
0100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  10000001  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111110  11111111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11000000  00111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  00000000  00000111  11111111

1400
1500

1600
1700


2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```



```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```

```
                        /
                        /NOTE: LOCATION 0 WILL CONTAIN THE REVISION
                        /LEVEL(IN ASCII) ON PROGRAM LOAD.
                        /
                        /
                        /ALL KNOWN HALTS
                        /
1400  4761  ERHLT1                          /UNDEFINED INTERRUPT
1401  5576  ERHLT2                          /SKIP TRAP FOR DCLR
1402  6173  ERHLT3                          /SKIP TRAP FOR DLAG
1403  4776  ERHLT4                          /SKIP TRAP FOR DLCA
1404  5161  ERHLT5                          /SKIP TRAP FOR DRST
1405  6556  ERHLT6                          /SKIP TRAP FOR DLDC
1406  4136  ERHLT7                          /SKIP TRAP FOR DMAN
1407  5300  ERHLT8                          /THE RECOVERABLE ERROR HALT
1410  6417  STPHLT                          /PROGRAM STOP OR HALT FROM SWR4=1
1411  6625  CHNHLT                          /INT CHANGE HALT
1412  2734  MPHLT1                          /HALT FOR "CHECK WRITE PROTECT"
1413  2776  MPHLT2                          /HALT FOR "CHECK WRITE PROTECT"
1414  5073  APHLT1                          /HALT FOR "CHECK WRITE PROTECT"
1415  4122  ENDHLT                          /END OF TEST HALT FROM SWR9=1
1416  4021  MEDHLT                          /FROM ALIGNMENT SUBTEST
                        /
                        /BUFFER LOCATION INFORMATION
                        /
1417  7177  WRKBUF                          /START OF PROGRAM DATA BUFFER
1420  7576  ENDBUF                          /END OF PROGRAM DATA BUFFER
1421  7177  HITBK                           /DISK ADDRESS WORD IF BUFFER
1422  7200  LOTBK                           /DISK ADDRESS WORD IN BUFFER
1423  7577  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
        7346  NL7775=7346                   /-3 CONSTANT
                        /
        4406  DSKOUT=JMS I    XDOUT
        4407  DSKIN=JMS I     XDIN
        4423  RANADD=JMS I    XRNAD
        4425  RECAL=JMS I     XRESTR
        4424  SEEK=JMS I      XONLY
        4426  DISKGO=JMS I    XDISKG
        4427  MAPCHK=JMS I    XMPCHK
        4432  KILBUF=JMS I    XKLBUF
        4431  FILBUF=JMS I    XFLBUF
        4434  WATISZ=JMS I    XWTISZ
        4433  SKPWAT=JMS I    XSKWAT
        4430  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     XFRDCT
        4461  TWOCT=JMS I     XTOCT
        4435  TYPE=JMS I      XPRINT
        4462  CRLF=JMS I      XCRLF
        4405  CLASIC=JMS I    XCLAS
        4404  LAS=JMS I       XLAS
        4530  TICK=JMS I      XTICK
                        /
        0000  *0
                        /
0000  0307              0307                    /REVISION "G"
0001  5001              5001
0002  0002              0002
0003  0003              0003
                        /
0004  5075  XLAS,   MYLAS
0005  5122  XCLAS,  CLASIC
0006  5553  XDOUT,  DOUT
0007  4530  XDIN,   DIN
                        /
        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  0000  SWR,    0                       /SWITCH REGISTER.
0021  4222  OP1,    4002                    /CONTROL WORD 1
0022  0000  OP2,    0                       /CONTROL WORD 2
                        /
0023  6321  XRNAD,  RNAD
0024  6215  XONLY,  ONLY
0025  6200  XRESTR, RESTOR
```

```
1152  0026  5620  XDISKG, DISKG
1153  0027  6441  XHFCHK, HFCHK
1154  0030  5656  XFGURE, FGURE
1155  0031  5447  XFLBUF, FLBUF
1156  0032  5435  XKLBUF, KLBUF
1157  0033  5134  XSKWAT, SKWAT
1158  0034  4000  XWTISZ, WTISZ
1159  0035  0222  THSFLD, PRSFLD
1160  0036  6151  XPRINT, PRINT
1161  0037  6400  XNERRO, NERRO
1162  0040  5200  XERRO,  ERRO
1163  0041  4727  XIONWT, IONWT
1164  0042  4557  XCOMP1, COMP1
1165  0043  3623  XCOMP2, COMP2
1166  0044  5154  XRDST,  RDST
1167  0045  5413  XRDCM,  RDCM
1168  0046  0142  XRDAD,  RDAD
1169  0047  1120  XSDXP,  SDXP
1170  0050  6546  XLDCM,  LDCM
1171  0051  4765  XLDCA,  LDCA
1172  0052  6164  XLDAD,  LDAD
1173  0053  5571  XCLDR,  CLDR
1174  0054  6000  XRDCR,  RDCR
1175  0055  4131  XLDMN,  LDMN
1176  0056  5400  XRDAF,  RDAF
1177  0057  6111  XPRN,   PRN
1178  0060  6365  XFRDCT, FRDCT
1179  0061  6236  XTDCT,  TDCT
1180  0062  6253  XCRLF,  CRLF
1181  0063  7200  XLDTRK, LDTRK
1182  0064  7177  XHITRK, HITRK
1183  0065  4500  CYL450, 4500
1184  0066  4520  TRK212, 4520
1185  0067  7177  BGNBUF, WRKBUF
1186  0070  0000  DRVHAV, 0
1187  0071  0000  DRVCNT, 0
1188  0072  0000  DRIVNO, 0
1189  0073  0001  K0001,  0001
1190  0074  0002  K0002,  0002
1191  0075  0003  K0003,  0003
1192  0076  0004  K0004,  0004
1193  0077  0005  K0005,  0005
1194  0100  0006  K0006,  0006
1195  0101  0007  K0007,  0007
1196  0102  1234  K1234,  1234
1197  0103  2000  K2000,  2000
1198  0104  3000  K3000,  3000
1199  0105  4000  K4000,  4000
1200  0106  6000  K6000,  6000
1201  0107  7000  K7000,  7000
1202  0110  7760  K7760,  7760
1203  0111  7700  K7700,  7700
1204  0112  0077  K0077,  0077
1205  0113  2525  K2525,  2525
1206  0114  5252  K5252,  5252
```



```
1207  0115  5000  K5000,  5000
1208  0116  7771  K7771,  7771
1209  0117  0017  K0017,  0017
1210  0120  0037  K0037,  0037
1211  0121  6201  KCOF,   COF
1212  0122  7740  K7740,  7740
1213  0123  7400  K7400,  7400
1214  0124  7600  K7600,  7600
1215  0125  1355  XLOAD,  LOADCT
1216              /
1217              DECIMAL
1218              /
1219  0126  7764  M12,    -12
1220              /
1221              OCTAL
1222              /
1223  0127  7103  KAERRO, AERRO
1224  0130  7130  XTICK,  KTICK
1225  0131  0000  REG0,   0
1226  0132  0000  REG1,   0
1227  0133  0000  SRCNT1, 0
1228  0134  0000  TCNTR1, 0
1229  0135  0000  TCNTR2, 0
1230  0136  0000  TCNTR3, 0
1231  0137  0000  TCNTR4, 0
1232  0140  0000  TCNTR5, 0
1233  0141  0000  TCNTR6, 0
1234              /
1235  0142  0000  GDREG1, 0
1236  0143  0000  GDREG2, 0
1237  0144  0000  GBREG1, 0
1238  0145  0000  GBREG2, 0
1239  0146  0000  STREG,  0
1240  0147  0000  DBREG,  0
1241  0150  0000  DMREG,  0
1242  0151  0000  DAREG,  0
1243  0152  0000  DAREG,  0
1244  0153  0000  ADREG,  0
1245  0154  0000  DTREG,  0
1246  0155  0000  ACREG,  0
1247  0156  0000  HOMEM4, 0
1248  0157  0200  STCON,  0200
1249  0160  0011  CRWRD1, 0011
1250  0161  6047  CRWRD2, 6047
1251  0162  0000  DATCNT, 0
1252  0163  0000  SAVDAT, 0
1253  0164  0306  K0306,  0306
1254  0165  5373  K5373,  5373
1255  0166  5300  K5300,  5300
1256  0167  6324  K6324,  6324
1257  0170  3240  ENDTRK, 3240
1258  0171  7777  SDFERR, 7777
1259  0172  0000  SAVPOT, 0
1260  0173  0200  RESTRT, 0200
1261  0174  5617  KTIME,  5617
```

```
1262  0175  7777    KCNT,   -1
1263                /
1264        0200    *200
1265                /
1266  0200  5206    RGN,    JMP     .+6                     /TO NORMAL TEST
1267  0201  5777'           JMP     MANUAL                  /TO MANUAL TEST
1268  0202  5776'           JMP     CHANG                   /TO CHANGE IOT DEVICE CODES
1269  0203  5775'           JMP     MANPRO                  /CHECK MANUAL WRITE PROTECT
1270  0204  5774'           JMP     AUTPRO                  /CHECK PROGRAM WRITE PROTECT
1271  0205  5573           JMP I   RESTRT                  /RESTART AFTER PROGRAM STOP!
1272  0206  6224           RIF
1273  0207  3156           DCA     HOMEMA
1274  0210  1156           TAD     HOMEMA
1275  0211  1121           TAD     KCDF                    /MAKE HOMEDF
1276  0212  3222           DCA     PRSFLD
1277  0213  1362           TAD     KRMF                    /GET RMF FOR INT. RETURN
1278  0214  6201           CDF     0                       /SWITCH FIELD 0
1279  0215  3473           DCA I   K0001
1280  0216  1364           TAD     K5403                   /JMP I 3 FOR LOC. 2
1281  0217  3474           DCA I   K0002
1282  0220  1363           TAD     INTRQ                   /GET ADDRESS RETURN
1283  0221  3475           DCA I   K0003
1284  0222  7402    PRSFLD, HLT                             /MAKE DF=IF
1285  0223  4773           JMS I   (APT8                   /TEST FOR APT SYSTEM
1286  0224  4462           CRLF
1287  0225  4772           JMS I   (SELDSK                 /SETUP DRIVES ON SYSTEM.
1288  0226  1070           TAD     DRVMAV
1289  0227  3071           DCA     DRVCNT                  /COUNTER TO AMOUNT OF DRIVES.
1290  0230  4405           CLASIC                          /CHECK FOR CONSOLE PKG
1291  0231  4431           CASWIT                          /GET SWITCH REGISTER
1292  0232  7200           NOP
1293  0233  1022           TAD     22
1294  0234  0216           AND     K0400
1295  0235  7640           SZA CLA
1296  0236  6007           6007                            /CLEAR FLAGS
1297                /
1298  0237  3131           DCA     REG0
1299                /
1300                /STATUS AND SELECT TEST
1301                /
1302                /VERIFY THAT THE DISK DRIVE IN "DRIVNO" IS
1303                /READY TO SEEK, READ, OR WRITE. STATUS REGISTER
1304                /SHOULD GO TO 4000.
1305                /
1306  0240  7330    TST0,   CLA CLL CML RAR                 /EXPECTED STATUS
1307  0241  3143           DCA     GOREG2                  /SETUP COMPARE REGISTER
1308  0242  1215           TAD     K0200                   /ENABLE SET DONE BIT
1309  0243  1072           TAD     DRIVNO                  /GET CURRENT DRIVE NUMBER
1310  0244  4450           LDCMD                           /LOAD COMMAND REGISTER
1311  0245  4444           RDSTAT                          /READ STATUS
1312  0246  4442           ACCMP1                          /CHECK RESULTS
1313  0247  7610           SKP CLA                         /O.K. SO FAR
1314  0250  5256           JMP     T0E                     /ERROR STATUS
1315  0251  3143           DCA     GOREG2                  /SETUP COMPARE REGISTER
1316  0252  4453           CLRALL                          /CLEAR STATUS
```



```
1317  0253  4444           RDSTAT                          /READ STATUS
1318  0254  7650           SNA CLA                         /SHOULD BE 0000
1319  0255  4437           NERROR                          /O.K. 4096 LOOPS
1320  0256  4440    T0E,    ERROR                           /ERROR, STATUS
1321  0257  0240           TST0                            /SCOPE LOOP POINTER
1322  0260  5200           5200                            /TEXT POINTER
1323                /
1324                /SKIP (DSKP) TEST
1325                /
1326                /VERIFY THAT "DSKP" SKIPS ON TRANSFER DONE FLAG
1327                /WHEN THE DISK DRIVE IS READY.
1328                /
1329  0261  3771           DCA I   (COUNT
1330  0262  1075           TAD     K0003                   /SET UP APT TIMING
1331  0263  7041           CIA                             /GETS -4
1332  0264  3770           DCA I   (CNT                    /STORE IN APT SECTION
1333  0265  1015    TST1,   TAD     K0200                   /ENABLE SET DONE BIT
1334  0266  1072           TAD     DRIVNO                  /CURRENT DRIVE
1335  0267  4450           LDCMD                           /LOAD COMMAND
1336  0270  4447           DSKSKP                          /DSKP "DISK SKIP IOT"
1337  0271  5275           JMP     T1E                     /ERROR, NO SKIP
1338  0272  4453           CLRALL                          /CLEAR SKIP FLAG OUT
1339  0273  4447           DSKSKP                          /DSKP "DISK SKIP IOT"
1340  0274  4437           NERROR                          /O.K. 4096 LOOPS
1341  0275  4440    T1E,    ERROR                           /ERROR, DSKP FAILED
1342  0276  0265           TST1                            /SCOPE LOOP POINTER
1343  0277  0006           0006                            /TEXT POINTER
1344                /
1345                /INTERRUPT TEST
1346                /
1347                /VERIFY THAT INT. OCCURES FROM
1348                /THE TRANSFER DONE FLAG WHEN DISK
1349                /DRIVE UNDER TEST IS READY TO SEEK,
1350                /READ, OR WRITE.
1351                /
1352  0300  2131           ISZ     REG0                    /SET ONE TIME TEST FLAG.
1353  0301  1015    TST2,   TAD     K0200                   /ENABLE SET DONE BIT
1354  0302  1016           TAD     K0400                   /ENABLE DISK INT.
1355  0303  1072           TAD     DRIVNO                  /GET CURRENT DRIVE
1356  0304  4450           LDCMD                           /LOAD COMMAND REGISTER
1357  0305  7240           CLA CMA                         /SOFTWARE FLAG
1358  0306  4441           IONWAT                          /WAIT FOR DISK INTERRUPT
1359  0307  5323           JMP     T2E                     /ERROR, NO INT.
1360  0310  4453           CLRALL                          /CLEAR THE INT. OUT
1361  0311  7240           CLA CMA                         /SOFTWARE FLAG
1362  0312  4441           IONWAT                          /WAIT FOR DISK INTERRUPT
1363  0313  7610           SKP CLA                         /O.K. NO INT.
1364  0314  5323           JMP     T2E                     /ERROR, INT.
1365  0315  1015           TAD     K0200                   /ENABLE SET DONE BIT
1366  0316  1072           TAD     DRIVNO                  /CURRENT DRIVE
1367  0317  4450           LDCMD                           /LOAD COMMAND
1368  0320  7340           CLA CLL CMA                     /SOFTWARE FLAG
1369  0321  4441           IONWAT                          /WAIT FOR DISK INTERRUPT
1370  0322  4437           NERROR                          /O.K. 4096 LOOPS
1371  0323  4440    T2E,    ERROR                           /ERROR, DISK INT.
```

```
1372  0324  0301          TST2                            /SCOPE LOOP POINTER
1373  0325  0007          0007                            /TEXT POINTER
1374                      /
1375                      /FORCE TIMING ERROR
1376                      /
1377                      /VERIFY A "TIMING ERROR" DOES OCCUR IN STATUS REGISTER
1378                      /IF A DLAG IS ISSUED WITH THE COMMAND REGISTER IS SET TO
1379                      /A FUNCTION OF "7".
1380                      /
1381  0326  1107  TST3,   TAD     K7000
1382  0327  1156          TAD     HOMEMA
1383  0330  1072          TAD     DRIVNO                  /GET CURRENT DRIVE
1384  0331  4452          LOCMD                           /LOAD COMMAND REGISTER
1385  0332  1100          TAD     K0006
1386  0333  3357          DCA     T3T                     /SETUP TEXT POINTER
1387  0334  4452          LOADD                           /DLAG, LOAD DISK ADDRESS
1388  0335  4433          SKPWAT                          /WAIT FOR ERROR SKIP
1389  0336  5355          JMP     T3E                     /ERROR, NO SKIP OCCURRED
1390  0337  1166          TAD     K5300
1391  0340  3357          DCA     T3T                     /SETUP TEXT POINTER
1392  0341  7330          CLA CLL CML RAR
1393  0342  1013          TAD     K0040
1394  0343  3143          DCA     GDREG2                  /SETUP EXPECTED STATUS
1395  0344  4444          RDSTAT                          /READ STATUS REGISTER
1396  0345  4442          ACCMP1                          /CHECK RESULTS
1397  0346  7617          SKP CLA                         /STATUS IS O.K.
1398  0347  5355          JMP     T3E                     /ERROR STATUS INCORRECT
1399  0350  4453          CLRALL                          /CLEAR STATUS
1400  0351  3143          DCA     GDREG2                  /SETUP EXPECTED STATUS
1401  0352  4444          RDSTAT                          /READ STATUS
1402  0353  4442          ACCMP1                          /CHECK RESULTS
1403  0354  4437          NERROR                          /ALL IS O.K.
1404  0355  4440  T3E,    ERROR                           /ERROR, TIMING SKIP OR STATUS
1405  0356  0326          TST3                            /SCOPE LOOP POINTER
1406  0357  0006  T3T,    0006                                    /TEXT POINTER
1407  0360  5761          JMP I .+1
1408  0361  0400          TST4
1409                      /
1410  0362  6244  RMF,    RMF
1411  0363  4743  INTRQ,  INTADD
1412  0364  5403  K5403,  5403
1413                      /
1414  0372  7160
1415  0371  7161
1416  0372  4260
1417  0373  7025
1418  0374  5000
1419  0375  2726
1420  0376  6000
1421  0377  4600
            0400  PAGE
1422                      /
1423                      /
1424                      /RESTORE TEST
1425                      /
```



```
1426                      /VERIFY THAT "RECALIBRATE" SETS TRANSFER
1427                      /DONE THEN DRIVE READY ON SELECTED DRIVE.
1428                      /
1429  0400  4425  TST4,   RECAL                           /"RECALIBRATE"
1430  0401  0406          T4T                             /TEXT POINTER
1431  0402  5204          JMP     T4E                     /ERROR, SKIP OR STATUS
1432  0403  4437          NERROR                          /O.K. TO NEXT TEST
1433  0404  4440  T4E,    ERROR                           /ERROR, DISK SKIP OR STATUS
1434  0405  0400          TST4                            /SCOPE LOOP POINTER
1435  0406  0006  T4T,    0006                            /TEXT POINTER
1436  0407  5610          JMP I .+1
1437  0410  0411          TST5
1438                      /
1439                      /
1440                      /HEAD MOTION AND STATUS TEST
1441                      /
1442                      /VERIFY THAT "SEEK ONLY" TRACK 312 SETS
1443                      /TRANSFER DONE THEN DRIVE IS READY.
1444                      /
1445  0411  7301  TST5,   CLA CLL IAC                     /EXTENDED
1446  0412  3152          DCA     CMREG                   /SETUP EXTENDED BIT
1447  0413  1066          TAD     TRK212                  /GET LOWER DISK ADDRESS
1448  0414  4424          SEEK                            /SEEK ONLY 312
1449  0415  0422          T5T                             /TEXT POINTER
1450  0416  5220          JMP     T5E                     /ERROR, SKIP OR STATUS
1451  0417  4437          NERROR                          /O.K. TO NEXT TEST
1452  0420  4440  T5E,    ERROR                           /ERROR, DISK SKIP OR STATUS
1453  0421  0411          TST5                            /SCOPE LOOP POINTER
1454  0422  0006  T5T,    0006                            /TEXT POINTER
1455                      /
1456                      /
1457                      /VERIFY RESTORE CLEARS ADDRESS BITS
1458                      /
1459                      /SOMETHING IS WORKING, NOW SEEK ONLY TRACK 312
1460                      /THEN RECALIBRATE AND CHECK FOR NO ERRORS IN STATUS.
1461                      /
1462  0423  7301  TST6,   CLA CLL IAC
1463  0424  3152          DCA     CMREG                   /SETUP EXTENDED BIT
1464  0425  1066          TAD     TRK212
1465  0426  4424          SEEK                            /SEEK ONLY 312
1466  0427  0437          T6T                             /TEXT POINTER
1467  0430  5235          JMP     T6E                     /ERROR, SKIP OR STATUS
1468  0431  4425          RECAL                           /"RECALIBRATE"
1469  0432  0437          T6T                             /TEXT POINTER
1470  0433  5235          JMP     T6E                     /ERROR, SKIP OR STATUS
1471  0434  4437          NERROR                          /O.K. TO NEXT TEST
1472  0435  4440  T6E,    ERROR                           /ERROR, STATUS
1473  0436  0423          TST6                            /SCOPE LOOP POINTER
1474  0437  5302  T6T,    5302                            /TEXT POINTER
1475                      /
1476                      /
1477                      /VERIFY RESTORE CLEARS ADDRESS BITS.
1478                      /
1479                      /VERIFY A "RECALIBRATE" FROM CYLINDER,
1480                      /SURFACE, AND SECTOR 07777.
```

```
1481                    /
1482    0440  3150  TST7,  DCA     CMREG                   /CLEAR EXTENDED BIT
1483    0441  7340        CLA CLL CMA
1484    0442  4424        SEEK                            /SEEK ONLY
1485    0443  0453        T7T                             /TEXT POINTER
1486    0444  5251        JMP     T7E                     /ERROR, SEEK ONLY
1487    0445  4425        RECAL                           /"RECALIBRATE"
1488    0446  0453        T7T                             /TEXT POINTER
1489    0447  5251        JMP     T7E                     /ERROR, SKIP OR STATUS
1490    0450  4437        NERROR                          /O.K. TO NEXT TEST
1491    0451  4440  T7E,  ERROR                           /ERROR, STATUS
1492    0452  0440        TST7                            /SCOPE LOOP POINTER
1493    0453  5300  T7T,  5300                            /TEXT POINTER
1494                    /
1495                    /FIND AND SELECT ALL ADDRESSES
1496                    /
1497                    /VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
1498                    /INCREMENTAL SEEK TEST. SEEK 0, 1, 2, 3, ETC.
1499                    /CHECK TIMING AND NO ERRORS IN STATUS.
1500                    /
1501    0454  3134  TSTA,  DCA     TCNTR1
1502    0455  3135        DCA     TCNTR2
1503    0456  1134  TAR,   TAD     TCNTR1
1504    0457  3150        DCA     CMREG                   /SETUP EXTENDED BIT
1505    0460  1135        TAD     TCNTR2                  /LOWER DISK ADDRESS BITS
1506    0461  4424        SEEK                            /SEQUENCIAL SEEK ONLY
1507    0462  0501        TAT                             /TEXT POINTER
1508    0463  5277        JMP     TAE                     /ERROR, SKIP OR STATUS
1509    0464  2135        ISZ     TCNTR2                  /UPDATE POINTER
1510    0465  7610        SKP CLA
1511    0466  2134        ISZ     TCNTR1                  /SET EXTENDED BIT
1512    0467  1134        TAD     TCNTR1
1513    0470  7650        SNA CLA                         /IS EXTENDED BIT SET YET
1514    0471  5256        JMP     TAR                     /NO, CONTINUE
1515    0472  1135        TAD     TCNTR2                  /YES
1516    0473  1170        TAD     ENDTRK
1517    0474  7640        SZA CLA                         /WAS IT LAST TRACK
1518    0475  5256        JMP     TAR                     /NO, CONTINUE
1519    0476  4437        NERROR                          /O.K. TO NEXT TEST
1520    0477  4440  TAE,   ERROR                          /ERROR, STATUS
1521    0500  0454        TSTA                            /SCOPE LOOP POINTER
1522    0501  5300  TAT,   5300                           /TEXT POINTER
1523                    /
1524                    /FIND AND SELECT ALL ADDRESSES
1525                    /
1526                    /VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
1527                    /312, 311, 310, 307, ETC. CHECK FOR
1528                    /NO ERRORS IN STATUS REGISTER.
1529                    /
1530    0502  1066  TST9,  TAD     TRK212
1531    0503  1117        TAD     K0017
1532    0504  3134        DCA     TCNTR1                  /SETUP LOWER DISK ADDRESS POINT
1533    0505  7301        CLA CLL IAC
1534    0506  3135        DCA     TCNTR2                  /SETUP EXTENDED POINTER
1535    0507  1135  T9R,   TAD     TCNTR2
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1536    0510  3150        DCA     CMREG                   /SETUP EXTENDED BIT
1537    0511  1134        TAD     TCNTR1
1538    0512  4424        SEEK                            /DECREMENTAL SEEK ONLY
1539    0513  0534        T9T                             /TEXT POINTER
1540    0514  5332        JMP     T9E                     /ERROR, SKIP OR STATUS
1541    0515  7340        CLA CLL CMA
1542    0516  1134        TAD     TCNTR1
1543    0517  3134        DCA     TCNTR1                  /DECREMENT
1544    0520  7301        CLA CLL IAC
1545    0521  1134        TAD     TCNTR1
1546    0522  7640        SZA CLA                         /FIRST TIME 0 YET
1547    0523  5307        JMP     T9R                     /NO, CONTINUE
1548    0524  1135        TAD     TCNTR2
1549    0525  7650        SNA CLA                         /PAST EXTENDED BIT
1550    0526  5331        JMP     T9OK                    /YES, TEST O.K.
1551    0527  3135        DCA     TCNTR2                  /CLEAR EXTENDED BIT
1552    0530  5307        JMP     T9R                     /CONTINUE
1553    0531  4437  T9OK,  NERROR                         /O.K. TO NEXT TEST
1554    0532  4440  T9E,   ERROR                          /ERROR, SEEK ONLY
1555    0533  0502        TST9                            /SCOPE LOOP POINTER
1556    0534  5300  T9T,   5300                           /TEXT POINTER
1557                    /
1558                    /VERIFY RESTORE CLEARS ADDRESS BITS.
1559                    /
1560                    /VERIFY RECALIBRATE FROM ALL
1561                    /CYLINDERS, CHECK ALL CYLINDERS
1562                    /BETWEEN 00000-14500.
1563                    /
1564    0535  1077        TAD     K0005
1565    0536  7041        CIA
1566    0537  3777*       DCA     CNT                     /INITIALIZES APT TIMING FOR A LONGER VALUE
1567    0540  3134  TST10, DCA     TCNTR1
1568    0541  3135        DCA     TCNTR2
1569    0542  1134  T10R,  TAD     TCNTR1                  /GET EXTENDED BIT
1570    0543  3150        DCA     CMREG                   /SETUP EXTENDED BIT
1571    0544  1135        TAD     TCNTR2                  /GET CYLINDER
1572    0545  4424        SEEK                            /SEEK ONLY
1573    0546  0573        T10T                            /TEXT POINTER
1574    0547  5371        JMP     T10E                    /ERROR IN SEEK ONLY
1575    0550  4425        RECAL                           /"RECALIBRATE"
1576    0551  0573        T10T                            /TEXT POINTER
1577    0552  5371        JMP     T10E                    /ERROR, SKIP OR STATUS
1578    0553  7300        CLA CLL
1579    0554  1135        TAD     TCNTR2                  /GET LAST CYLINDER
1580    0555  1713        TAD     K0040                   /UPDATE
1581    0556  3135        DCA     TCNTR2
1582    0557  7430        SZL                             /TIME TO SET EXTENDED?
1583    0560  2134        ISZ     TCNTR1                  /YES
1584    0561  1134        TAD     TCNTR1                  /GET EXTENDED POINTER
1585    0562  7650        SNA CLA                         /SET?
1586    0563  5342        JMP     T10R                    /NO DO THIS CYLINDER
1587    0564  1135        TAD     TCNTR2                  /GET LAST CYLINDER
1588    0565  1170        TAD     ENDTRK                  /GET LAST POINTER!
1589    0566  7640        SZA CLA                         /NON-EXISTENT CYLINDER?
1590    0567  5342        JMP     T10R                    /NO, DO IT
```

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1591  0570  4437          NERROR                          /O.K. TO NEXT TEST
1592  0571  4440  T10E,   ERROR                          /STATUS ERROR
1593  0572  0540          TST10                           /SCOPE LOOP POINTER
1594  0573  5300  T10T,   5300                           /TEXT POINTER
1595                      /
1596  0574  5775          JMP I   .+1                     /TO NEXT TEST
1597  0575  0600          TST11
1598                      /
1599  0577  7160
            2600          PAGE
1600                      /
1601                      /SINGLE DRIVE VIBRATION TEST11
1602                      /
1603                      /SEEK ONLY SEEMS TO BE WORKING. NOW DO
1604                      /A FEW RANDOM SEEKS TO REALLY SHAKE THE
1605                      /DISK DRIVE UNDER TEST.
1606                      /
1607  0600  1122  TST11,  TAD     K7740                   /AMOUNT OF PASSES
1608  0601  3134          DCA     TCNTR1                  /SETUP COUNTER
1609  0602  4423  T11R1,  RANADD                         /GENERATE A RANDOM ADDRESS
1610  0603  3135          DCA     TCNTR2                  /SAVE IT
1611  0604  7004          RAL                             /LINK IS EXTENDED BIT
1612  0605  3136          DCA     TCNTR3                  /SAVE IT
1613  0606  4423          RANADD                          /GENERATE A RANDOM ADDRESS
1614  0607  3137          DCA     TCNTR4                  /SAVE IT
1615  0610  7004          RAL                             /LINK IS EXTENDED BIT
1616  0611  3140          DCA     TCNTR5                  /SAVE IT
1617  0612  4423  T11R2,  RANADD                         /GET A RANDOM NUMBER
1618  0613  0112          AND     K0077                   /MASK OUT
1619  0614  1111          TAD     K7700                   /MAKE COUNT VALUE
1620  0615  3141          DCA     TCNTR6                  /SETUP COUNTER
1621  0616  1136  T11R3,  TAD     TCNTR3                  /GET EXTENDED BIT
1622  0617  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
1623  0620  1135          TAD     TCNTR2
1624  0621  4424          SEEK                            /SEEK ONLY
1625  0622  0641          T11T                            /TEXT POINTER
1626  0623  5237          JMP     T11E                    /ERROR, SKIP OR STATUS
1627  0624  1140          TAD     TCNTR5                  /GET EXTENDED BIT
1628  0625  3150          DCA     CMREG                   /SETUP COMMAND
1629  0626  1137          TAD     TCNTR4
1630  0627  4424          SEEK                            /SEEK ONLY
1631  0630  0641          T11T                            /TEXT POINTER
1632  0631  5237          JMP     T11E                    /ERROR, SKIP OR STATUS
1633  0632  2141          ISZ     TCNTR6                  /UPDATE COUNTER
1634  0633  5216          JMP     T11R3                   /SAME LOOP
1635  0634  2134          ISZ     TCNTR1                  /UPDATE PASS COUNTER
1636  0635  5202          JMP     T11R1                   /MAKE NEW ADDRESS
1637  0636  4437          NERROR                          /O.K. TO NEXT
1638  0637  4440  T11E,   ERROR                          /ERROR, SKIP OR STATUS
1639  0640  0600          TST11                           /SCOPE LOOP POINTER
1640  0641  0000  T11T,   0000                           /MODIFIED TEXT POINTER
1641                      /
1642                      /SELECT ERROR TEST
1643                      /
1644                      /VERIFY A "NOT READY" ON ALL
```



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1645                      /DRIVES NOT ON THE CONTROL.
1646                      /
1647  0642  4525          JMS I   XLOAD
1648  0643  7000          7000
1649  0644  3131          DCA     REG0                    /SETUP FOR 4096 PASSES
1650  0645  7301  TST12,  CLA CLL IAC
1651  0646  4453          CLRALL                          /CLEAR CONTROL
1652  0647  1157          TAD     STCON                   /EXPECTED STATUS
1653  0650  3143          DCA     GDREG2                  /SETUP COMPARE
1654  0651  3135          DCA     TCNTR2                  /TO START WITH DRIVE 0.
1655  0652  1777'         TAD     M4
1656  0653  3134          DCA     TCNTR1                  /COUNTER FOR NO. OF DRIVES.
1657  0654  1135  T12R,   TAD     TCNTR2                  /GET DRIVE POINTER
1658  0655  1776'         TAD     DSKON                   /POINTER TO DISK BUFFER,
1659  0656  3136          DCA     TCNTR3                  /SAVE POINTER TO DISK BUFFER.
1660  0657  1536          TAD I   TCNTR3
1661  0660  7640          SZA CLA                         /DISK ON THE SYSTEM
1662  0661  5273          JMP     T12A                    /NO UPDATE AND TRY NEXT DRIVE.
1663  0662  1135          TAD     TCNTR2
1664  0663  7104          CLL RAL                         /SHIFT TO UNIT BITS
1665  0664  1015          TAD     K0200                   /ENABLE SET DONE
1666  0665  4450          LDCMD                           /LOAD COMMAND
1667  0666  4444          RDSTAT                          /READ STATUS
1668  0667  4442          ACCMP1                          /CHECK RESULTS
1669  0670  7610          SKP CLA                         /O.K.
1670  0671  5277          JMP     T12E                    /ERROR, STATUS
1671  0672  4453          CLRALL                          /CLEAR STATUS
1672  0673  2135  T12A,   ISZ     TCNTR2                  /UPDATE DRIVE NO.
1673  0674  2134          ISZ     TCNTR1                  /WAS IT LAST DRIVE
1674  0675  5254          JMP     T12R                    /NO, MORE TO TEST
1675  0676  4437          NERROR                          /O.K. 4096 LOOPS
1676  0677  4440  T12E,   ERROR                          /ERROR, STATUS
1677  0700  0645          TST12                           /SCOPE LOOP POINTER
1678  0701  5200          5200                            /TEXT POINTER
1679                      /SELECT ERROR TEST
1680                      /
1681                      /VERIFY A DRIVE STATUS ERROR ON ALL DRIVES
1682                      /NOT ON THE CONTROL. ACTUALLY A SELECT ERROR.
1683                      /
1684  0702  7301  TST13,  CLA CLL IAC
1685  0703  4453          CLRALL                          /CLEAR CONTROL
1686  0704  3135          DCA     TCNTR2                  /TO START WITH DRIVE 0.
1687  0705  1777'         TAD     M4
1688  0706  3134          DCA     TCNTR1                  /COUNTER FOR NO. OF DRIVES.
1689  0707  1135  T13R,   TAD     TCNTR2                  /GET DRIVE POINTER
1690  0710  1776'         TAD     DSKON                   /POINTER TO DISK BUFFER,
1691  0711  3136          DCA     TCNTR3                  /SAVE POINTER TO DISK BUFFER.
1692  0712  1536          TAD I   TCNTR3
1693  0713  7640          SZA CLA                         /DISK ON THE SYSTEM
1694  0714  5347          JMP     T13A                    /NO UPDATE AND TRY NEXT DRIVE.
1695  0715  1074          TAD     K0002
1696  0716  1157          TAD     STCON                   /EXPECTED STATUS
1697  0717  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
1698  0720  1135          TAD     TCNTR2                  /GET DRIVE NO.
1699  0721  7104          CLL RAL                         /PUT IN UNIT BITS
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1700  0722  1015          TAD     K0200                   /ENABLE SET DONE
1701  0723  1104          TAD     K3000                   /FUNCTION SEEK ONLY
1702  0724  4450          LOCMD                           /LOAD COMMAND
1703  0725  4452          LOADD                           /LOAD AND GO
1704  0726  4444          RDSTAT                          /READ STATUS
1705  0727  4442          ACCMP1                          /CHECK RESULTS
1706  0730  7610          SKP CLA                         /O.K.
1707  0731  5353          JMP     T13E                    /ERROR, STATUS
1708  0732  4453          CLRALL                          /CLEAR STATUS
1709  0733  1157          TAD     STCON                   /EXPECTED STATUS
1710  0734  3143          DCA     GDREG2                  /SETUP COMPARE
1711  0735  4444          RDSTAT                          /READ STATUS
1712  0736  4442          ACCMP1                          /CHEAK RESULTS
1713  0737  7610          SKP CLA                         /O.K.
1714  0740  5353          JMP     T13E                    /ERROR, STATUS
1715  0741  7301          CLA CLL IAC
1716  0742  4453          CLRALL                          /CLEAR CONTROL
1717  0743  3143          DCA     GDREG2                  /SETUP COMPARE
1718  0744  4444          RDSTAT                          /READ STATUS
1719  0745  7640          SZA CLA                         /STATUS SHOULD BE 0000
1720  0746  5353          JMP     T13E                    /ERROR, STATUS
1721  0747  2135  T13A,   ISZ     TCNTR2
1722  0750  2134          ISZ     TCNTR1
1723  0751  5307          JMP     T13R                    /TRY NEXT DRIVE
1724  0752  4437          NERROR                          /O.K. 4096 LOOPS
1725  0753  4440  T13E,   ERROR                           /ERROR, STATUS
1726  0754  0702          TST13                           /SCOPE LOOP POINTER
1727  0755  5300          5300                            /TEXT POINTER
1728                      /
1729  0756  5757          JMP I   .+1                     /TO NEXT TEST
1730  0757  1005  TST14P, TST14-3
1731                      /
1732  0760  2213  NMES1,   TEXT "RK8E DRIVE CONTROL TEST"
      0761  7005
      0762  4004
      0763  2211
      0764  2605
      0765  4003
      0766  1716
      0767  2422
      0770  1714
      0771  4024
      0772  0523
      0773  2400
1733                      /
1734  0776  4374
1735  0777  6110
            1000  PAGE
1736                      /
1737                      /SUBROUTINE TO ISSUE DSKP DISK SKIP IOT
1738                      /
1739  1000  0000  SDKP,   0
1740  1001  6741  IOT1,   DSKP                            /DISK SKIP IOT
1741  1002  7410          SKP                             /NO FLAG!
1742  1003  2200          ISZ     SDKP                    /UPDATE NO FLAG POINTER.
```



```
1743  1004  5600          JMP I   SDKP                    /RETURN.
1744                      /
1745                      /
1746                      /SELECT ERROR TEST
1747                      /
1748                      /VERIFY THAT DISK CAPACITY EXCEEDED DOES OCCURR
1749                      /
1750  1005  2131          ISZ     REG0                    /SETUP FOR ONE PAS
1751  1006  7346          NL7775                          /-3 CONSTANT
1752  1007  3777'         DCA     CNT
1753  1010  1066  TST14,  TAD     TRK212
1754  1011  1012          TAD     K0020
1755  1012  3134          DCA     TCNTR1                  /ADDRESS POINTER
1756  1013  7301  T14R,   CLA CLL IAC                     /ENABLE CLEAR CONTROL BIT
1757  1014  4453          CLRALL                          /CLEAR CONTROL
1758  1015  7330          CLA CLL CML RAR
1759  1016  1074          TAD     K0002                   /EXPECTED STATUS
1760  1017  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
1761  1020  7301          CLA CLL IAC                     /EXTENDED TRACK BIT
1762  1021  1104          TAD     K3000                   /FUNCTION SEEK ONLY
1763  1022  1072          TAD     DRIVNO                  /CURRENT DRIVE
1764  1023  4450          LOCMD                           /LOAD COMMAND
1765  1024  1134          TAD     TCNTR1
1766  1025  4452          LOADD                           /LOAD AND GO
1767  1026  4433          SKPWAT                          /WAIT FOR SKIP
1768  1027  5267          JMP     T14KE                   /ERROR, NO SKIP
1769  1030  4444          RDSTAT                          /READ STATUS
1770  1031  4442          ACCMP1                          /CHECK RESULTS
1771  1032  7610          SKP CLA                         /STATUS O.K.
1772  1033  5263          JMP     T14SE                   /ERROR, STATUS
1773  1034  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL BIT
1774  1035  4453          CLRALL                          /CLEAR CONTROL
1775  1036  1150          TAD     CMREG                   /GET LAST COMMAND
1776  1037  1015          TAD     K0200                   /GET ENABLE SEEK DONE BIT
1777  1040  4450          LOCMD                           /LOAD COMMAND
1778  1041  4433          SKPWAT                          /WAIT FOR DISK SKIP
1779  1042  5267          JMP     T14KE                   /ERROR, SKIP
1780  1043  7330          CLA CLL CML RAR                 /EXPECTED STATUS
1781  1044  3143          DCA     GDREG2
1782  1045  4444          RDSTAT                          /READ STATUS
1783  1046  4442          ACCMP1                          /CHECK RESULTS
1784  1047  7610          SKP CLA                         /STATUS O.K.
1785  1050  5263          JMP     T14SE                   /ERROR, STATUS
1786  1051  1072          TAD     DRIVNO                  /CURRENT DRIVE
1787  1052  4450          LOCMD                           /LOAD COMMAND
1788  1053  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
1789  1054  4444          RDSTAT                          /READ STATUS
1790  1055  4442          ACCMP1                          /CHECK RESULTS
1791  1056  7610          SKP CLA                         /STATUS O.K.
1792  1057  5263          JMP     T14SE                   /ERROR
1793  1060  2134          ISZ     TCNTR1
1794  1061  5213          JMP     T14R                    /LOOP
1795  1062  4437          NERROR                          /O.K. TO NEXT TEST
1796  1063  4440  T14SE,  ERROR                           /ERROR, DISK CAPACITY EXCEEDED
1797  1064  1010          TST14                           /SCOPE LOOP POINTER
```

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1798    1065  5300            5300                            /MODIFIED TEXT POINTER
1799    1066  5272            JMP     .+4                     /TO NEXT TEST
1800    1067  4440  T14KE,    ERROR                           /ERROR, DISK SKIP
1801    1070  1010            TST14                           /SCOPE LOOP POINTER
1802    1071  0006            0006                            /TEXT POINTER
1803                  /
1804                  /STATUS TEST
1805                  /
1806                  /VERIFY THAT SKIP AND STATUS DOES OCCUR
1807                  /AFTER 256 WRITE ALL AND READ ALL BREAKS.
1808                  /THIS SHOULD WRITE ALL ZEROS ON AND
1809                  /READ ALL ZEROS OFF THE DISK SECTOR 00000.
1810                  /
1811    1072  4432            KILBUF                          /ZERO WRITE BUFFER
1812    1073  1115  TST15,    TAD     K5000                   /WRITE ALL FUNCTION
1813    1074  3150            DCA     CMREG                   /SETUP COMMAND
1814    1075  4426            DISKGO                          /DISK WRITE ALL
1815    1076  1110            T15T                            /TEXT POINTER
1816    1077  5306            JMP     T15E                    /ERROR, SKIP OR STATUS
1817    1100  1017            TAD     K1000                   /FUNCTION READ ALL
1818    1101  3150            DCA     CMREG                   /SETUP COMMAND REGISTER
1819    1102  4426            DISKGO                          /DISK READ ALL
1820    1103  1110            T15T                            /TEXT POINTER
1821    1104  5306            JMP     T15E                    /ERROR, SKIP OR STATUS
1822    1105  4437            NERROR                          /O.K. TO NEXT TEST
1823    1106  4440  T15E,     ERROR                           /ERROR, WRITE ALL
1824    1107  1073            TST15                           /SCOPE LOOP POINTER
1825    1110  5300  T15T,     5300                            /MODIFIED TEXT POINTER
1826                  /
1827                  /STATUS TEST
1828                  /
1829                  /VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
1830                  /128 WRITE ALL AND READ ALL BREAKS.
1831                  /THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
1832                  /ALL ZEROS OFF THE DISK SECTOR 00000.
1833                  /
1834    1111  1115  TST16,    TAD     K5000                   /FUNCTION WRITE ALL
1835    1112  1014            TAD     K0100                   /HALF BIT
1836    1113  3150            DCA     CMREG                   /SETUP COMMAND
1837    1114  4426            DISKGO                          /DISK WRITE ALL
1838    1115  1130            T16T                            /TEXT POINTER
1839    1116  5326            JMP     T16E                    /ERROR, DISK SKIP OR STATUS
1840    1117  1017            TAD     K1000                   /FUNCTION READ ALL
1841    1120  1014            TAD     K0100                   /HALF BIT
1842    1121  3150            DCA     CMREG                   /SETUP COMMAND
1843    1122  4426            DISKGO                          /DISK READ ALL
1844    1123  1130            T16T                            /TEXT POINTER
1845    1124  5326            JMP     T16E                    /ERROR, SKIP OR STATUS
1846    1125  4437            NERROR                          /O.K. TO NEXT TEST
1847    1126  4440  T16E,     ERROR                           /ERROR, WRITE ALL
1848    1127  1111            TST16                           /SCOPE LOOP POINTER
1849    1130  5300  T16T,     5300                            /MODIFIED TEXT POINTER
1850                  /
1851                  /VERIFY ALL SECTORS CAN BE ACCESSED.
1852                  /
```



```
1853                  /VERIFY A WRITE ALL TO ALL OF CYLINDER 0
1854                  /AND USE DATA PATTERN 2525+5252,
1855                  /MAKE THE FIRST TWO WORDS IN THE BUFFER
1856                  /EQUAL THE DISK ADDRESS, CHECK THE DATA WITH
1857                  /READ ALL.
1858                  /
1859    1131  4525            JMS I   XLOAD                   /WILL SET UP COUNTERS FOR NEXT TESTS
1860    1132  7771            7771
1861    1133  1122  TST17,    TAD     K7740
1862    1134  3134            DCA     TCNTR1                  /SETUP SECTOR COUNTER
1863    1135  1113  T17S,     TAD     K2525
1864    1136  4431            FILBUF                          /FILL OUTBOUND BUFFER
1865    1137  1115            TAD     K5000                   /FUNCTION WRITE ALL
1866    1140  3150            DCA     CMREG                   /SETUP COMMAND
1867    1141  1134            TAD     TCNTR1
1868    1142  0120            AND     K0037                   /MASK OFF SECTORS
1869    1143  3463            DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1870    1144  1072            TAD     DRIVNO                  /GET DRIVE NUMBER
1871    1145  3464            DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1872    1146  1463            TAD I   XLOTRK
1873    1147  4426            DISKGO                          /DISK WRITE ALL
1874    1150  1173            T17T                            /TEXT POINTER
1875    1151  5371            JMP     T17E                    /ERROR, SKIP OR STATUS
1876    1152  4432            KILBUF                          /KILL DATA BUFFER
1877    1153  1017            TAD     K1000                   /FUNCTION READ ALL
1878    1154  3150            DCA     CMREG                   /SETUP COMMAND
1879    1155  1134            TAD     TCNTR1
1880    1156  0120            AND     K0037                   /MASK OF SECTORS
1881    1157  4426            DISKGO                          /DISK READ ALL
1882    1160  1173            T17T                            /TEXT POINTER
1883    1161  5371            JMP     T17E                    /ERROR, STATUS OR SKIP
1884    1162  1113            TAD     K2525
1885    1163  4432            FIGURE                          /WORD BY WORD COMPARE OF DATA
1886    1164  7610            SKP CLA                         /THIS SECTOR O.K.
1887    1165  5371            JMP     T17E                    /ERROR, DATA
1888    1166  2134            ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1889    1167  5335            JMP     T17S                    /TRY NEXT SECTOR
1890    1170  4437            NERROR                          /O.K. TO NEXT TEST
1891    1171  4440  T17E,     ERROR                           /ERROR, READ ALL
1892    1172  1133            TST17                           /SCOPE LOOP POINTER
1893    1173  5373  T17T,     5373                            /TEXT POINTER
1894                  /
1895    1174  5775            JMP I   .+1                     /TO NEXT TEST
1896    1175  1202            TST18
1897                  /
1898    1177  7160
              1200    PAGE
1899                  /
1900                  /VERIFY ALL SECTORS CAN BE ACCESSED.
1901                  /
1902                  /VERIFY A WRITE DATA TO ALL OF CYLINDER 0
1903                  /AND USE DATA PATTERN 5252+2525,
1904                  /MAKE THE FIRST TWO WORDS OF THE BUFFER
1905                  /EQUAL THE DISK ADDRESS, CHECK THE
1906                  /DATA WITH READ DATA.
```

```
1907                    /
1908    1200  7000      NOP
1909    1201  7000      NOP
1910    1202  1122  TST18,  TAD     K7748
1911    1203  3134      DCA     TCNTR1                  /SECTOR COUNTER
1912    1204  1114  T18S,   TAD     K5252
1913    1205  4431      FILBUF                          /FILL OUTBOUND BUFFER
1914    1206  1105      TAD     K4000                   /FUNCTION WRITE DATA
1915    1207  3150      DCA     CMREG                   /SETUP COMMAND
1916    1210  1134      TAD     TCNTR1
1917    1211  0120      AND     K0037                   /MASK OF SECTORS
1918    1212  3463      DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1919    1213  1072      TAD     DRIVNO                  /GET DRIVE NUMBER
1920    1214  3464      DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
1921    1215  1463      TAD I   XLOTRK                  /GET ADDRESS
1922    1216  4426      DISKGO                          /DISK WRITE DATA
1923    1217  1241      T18T                            /TEXT POINTER
1924    1220  5237      JMP     T18E                    /ERROR, STATUS OR SKIP
1925    1221  4432      KILBUF                          /CLEAR DATA BUFFER
1926    1222  3150      DCA     CMREG                   /SETUP COMMAND
1927    1223  1134      TAD     TCNTR1
1928    1224  0120      AND     K0037                   /MASK OFF SECTORS
1929    1225  4426      DISKGO                          /DISK READ DATA
1930    1226  1241      T18T                            /TEXT POINTER
1931    1227  5237      JMP     T18E                    /ERROR, STATUS OR SKIP
1932    1230  1114      TAD     K5252
1933    1231  4430      FIGURE                          /WORD BY WORD COMPARE OF DATA
1934    1232  7610      SKP CLA                         /THIS SECTOR O.K.
1935    1233  5237      JMP     T18E                    /ERROR, DATA
1936    1234  2134      ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
1937    1235  5204      JMP     T18S                    /TRY NEXT SECTOR
1938    1236  4437      NERROR                          /O.K. TO NEXT TEST
1939    1237  4440  T18E,   ERROR                       /ERROR, DATA BREAK
1940    1240  1202      TST18                           /SCOPE LOOP POINTER
1941    1241  5373  T18T,   5373                        /TEXT POINTER
1942                    /
1943                    /VERIFY HALF BLOCK TRANSFERS.
1944                    /
1945                    /VERIFY THAT DISK STOPS BREAK AFTER 128
1946                    /IF THE HALF BIT IS SET, THE REMAINDER OF THE
1947                    /THE BUFFER SHOULD BE 0000.
1948                    /THE FIRST TWO WORDS OF THE BUFFER SHOULD
1949                    /EQUAL THE ABSOLUTE DISK ADDRESS.
1950                    /THE DATA PATTERN USED IS 2525+5252.
1951                    /
1952    1242  1113  TST19,  TAD     K2525
1953    1243  4431      FILBUF                          /FILL BUFFER WITH DATA
1954    1244  1072      TAD     DRIVNO
1955    1245  3464      DCA I   XHITRK                  /MAKE DISK ADDRESS WORD
1956    1246  3463      DCA I   XLOTRK                  /MAKE DISK ADDRESS WORD
1957    1247  1115      TAD     K5000                   /FUNCTION WRITE ALL
1958    1250  1014      TAD     K0100                   /HALF BIT
1959    1251  3150      DCA     CMREG                   /SETUP COMMAND
1960    1252  4426      DISKGO                          /DISK WRITE ALL
1961    1253  1271      T19T                            /TEXT POINTER
```



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1962    1254  5267      JMP     T19E                    /ERROR, SKIP OR STATUS
1963    1255  4453      CLRALL                          /CLEAR STATUS
1964    1256  4432      KILBUF                          /ZERO BUFFER
1965    1257  1017      TAD     K1000                   /FUNCTION READ ALL
1966    1260  3150      DCA     CMREG                   /SETUP COMMAND
1967    1261  4426      DISKGO                          /DISK READ ALL
1968    1262  1271      T19T                            /TEXT POINTER
1969    1263  5267      JMP     T19E                    /ERROR, SKIP OR STATUS
1970    1264  1113      TAD     K2525
1971    1265  4427      HAFCHK                          /WORD BY WORD COMPARE DATA
1972    1266  4437  T19OK,  NERROR                      /O.K. TO NEXT TEST
1973    1267  4440  T19E,   ERROR                       /ERROR, DATA BREAK
1974    1270  1242      TST19                           /SCOPE LOOP POINTER
1975    1271  5373  T19T,   5373                        /TEXT POINTER
1976                    /
1977                    /VERIFY HALF BLOCK TRANSFERS.
1978                    /
1979                    /VERIFY THAT DISK STOPS BREAK AFTER 128
1980                    /IF THE HALF BIT IS SET, THE REMAINDER OF THE
1981                    /THE BUFFER SHOULD BE 0000.
1982                    /THE FIRST TWO WORDS OF THE BUFFER SHOULD
1983                    /EQUAL THE ABSOLUTE DISK ADDRESS.
1984                    /THE DATA PATTERN USED IS 5252+2525.
1985                    /
1986    1272  1114  TST20,  TAD     K5252
1987    1273  4431      FILBUF                          /FILL BUFFER WITH DATA
1988    1274  1072      TAD     DRIVNO
1989    1275  3464      DCA I   XHITRK                  /MAKE DISK ADDRESS WORD
1990    1276  3463      DCA I   XLOTRK                  /MAKE DISK ADDRESS WORD
1991    1277  1115      TAD     K5000                   /FUNCTION WRITE ALL
1992    1300  3150      DCA     CMREG                   /SETUP COMMAND
1993    1301  4426      DISKGO                          /DISK WRITE ALL
1994    1302  1321      T20T                            /TEXT POINTER
1995    1303  5317      JMP     T20E                    /ERROR, SKIP OR STATUS
1996    1304  4453      CLRALL                          /CLEAR STATUS
1997    1305  4432      KILBUF                          /CLEAR BUFFER
1998    1306  1017      TAD     K1000                   /FUNCTION READ ALL
1999    1307  1014      TAD     K0100                   /HALF BIT
2000    1310  3150      DCA     CMREG                   /SETUP COMMAND
2001    1311  4426      DISKGO                          /DISK READ ALL
2002    1312  1321      T20T                            /TEXT POINTER
2003    1313  5317      JMP     T20E                    /ERROR, SKIP OR STATUS
2004    1314  1114      TAD     K5252
2005    1315  4427      HAFCHK                          /WORD BY WORD COMPARE DATA
2006    1316  4437  T20OK,  NERROR                      /O.K. TO NEXT TEST
2007    1317  4440  T20E,   ERROR                       /ERROR, DATA BREAK
2008    1320  1272      TST20                           /SCOPE LOOP POINTER
2009    1321  5373  T20T,   5373                        /TEXT POINTER
2010                    /
2011                    /VERIFY HALF BLOCK TRANSFERS.
2012                    /
2013                    /VERIFY A WRITE ALL THEN READ ALL 128 WORDS,
2014                    /THE FIRST TWO WORDS OF THE BUFFER SHOULD
2015                    /EQUAL THE ABSOLUTE DISK ADDRESS.
2016                    /THE DATA PATTERN USED IS 2525+5252.
```

```
2017                    /
2018    1322  1113      TST21,  TAD     K2525
2019    1323  4431              FILBUF                          /FILL BUFFER WITH DATA
2020    1324  1072              TAD     DRIVNO
2021    1325  3464              DCA I   XHITRK                  /MAKE DISK ADDRESS WORD
2022    1326  3463              DCA I   XLOTRK                  /MAKE DISK ADDRESS WORD
2023    1327  1115              TAD     K5000                   /FUNCTION WRITE ALL
2024    1330  1014              TAD     K0100                   /HALF BIT
2025    1331  3150              DCA     CMREG                   /SETUP COMMAND
2026    1332  4426              DISKGO                          /DISK WRITE ALL
2027    1333  1352              T21T                            /TEXT POINTER
2028    1334  5350              JMP     T21E                    /ERROR, SKIP OR STATUS
2029    1335  4453              CLRALL                          /CLEAR STATUS
2030    1336  4432              KILBUF                          /ZERO BUFFER
2031    1337  1217              TAD     K1000                   /FUNCTION READ ALL
2032    1340  1214              TAD     K2100                   /HALF BIT
2033    1341  3150              DCA     CMREG                   /SETUP COMMAND
2034    1342  4426              DISKGO                          /DISK READ ALL
2035    1343  1352              T21T                            /TEXT POINTER
2036    1344  5350              JMP     T21E                    /ERROR, SKIP OR STATUS
2037    1345  1113              TAD     K2525
2038    1346  4427              MAFCHK                          /WORD BY WORD COMPARE DATA
2039    1347  4437      T210K,  NERROR                          /O.K. TO NEXT TEST
2040    1350  4440      T21E,   ERROR                           /ERROR, DATA BREAK
2041    1351  1322              TST21                           /SCOPE LOOP POINTER
2042    1352  5373      T21T,   5373                            /TEXT POINTER
2043                    /
2044    1353  5754              JMP I   .+1                     /TO NEXT TEST
2045    1354  1400              TST22
2046                    /
2047                    /
2048                    /WILL LOAD THE PROPER COUNTS FOR TEST 17 & 18
2049                    /
2050    1355  2355      LOADCT, 0
2051    1356  1755              TAD I   LOADCT                  /GET VALUE
2052    1357  3366              DCA     CONST1                  /STORE FOR FUTURE USE
2053    1360  1366              TAD     CONST1
2054    1361  3777*             DCA     COUNT
2055    1362  1366              TAD     CONST1
2056    1363  3776*             DCA     CLKCNT
2057    1364  2355              ISZ     LOADCT
2058    1365  5755              JMP I   LOADCT
2059                    /
2060    1366  7000      CONST1, 0
2061                    /
2062    1376  7162
2063    1377  7161
              1400      PAGE
2064                    /
2065                    /VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
2066                    /
2067                    /VERIFY A WRITE ALL TO ALL OF CYLINDER 0
2068                    /USE DATA PATTERN 2525+5252
2069                    /CHECK FOR NO ERRORS IN STATUS.
2070                    /MAKE FIRST TWO WORDS OF EVERY SECTOR
```



```
2071                    /EQUAL TO ADDRESS OF SECTOR.
2072                    /
2073    1400  1122      TST22,  TAD     K7740
2074    1401  3134              DCA     TCNTR1                  /SETUP SECTOR COUNTER
2075    1402  1113              TAD     K2525
2076    1403  4431              FILBUF                          /FILL BUFFER WITH DATA
2077    1404  1134      T22R1,  TAD     TCNTR1
2078    1405  0120              AND     K0037                   /MASK SECTOR BITS
2079    1406  3463              DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2080    1407  1072              TAD     DRIVNO                  /GET DRIVE NUMBER
2081    1410  3464              DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2082    1411  1115              TAD     K5000                   /FUNCTION WRITE ALL
2083    1412  3150              DCA     CMREG                   /SETUP COMMAND
2084    1413  1463              TAD I   XLOTRK                  /GET TRACK AND SECTOR
2085    1414  4426              DISKGO                          /DISK WRITE ALL
2086    1415  1444              T22T                            /TEXT POINTER
2087    1416  5242              JMP     T22E                    /ERROR, STATUS OR SKIP
2088    1417  2134              ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2089    1420  5204              JMP     T22R1                   /MORE SECTORS TO GO
2090                    /
2091                    /VERIFY THAT THE DATA WRITTEN ABOVE
2092                    /ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.
2093                    /
2094    1421  1122              TAD     K7740
2095    1422  3134              DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2096    1423  4432      T22R2,  KILBUF                          /CLEAR DATA BUFFER
2097    1424  1217              TAD     K1000                   /READ ALL FUNCTION
2098    1425  3150              DCA     CMREG                   /SETUP COMMAND
2099    1426  1134              TAD     TCNTR1
2100    1427  0120              AND     K0037
2101    1430  4426              DISKGO                          /DISK READ ALL
2102    1431  1444              T22T                            /TEXT POINTER
2103    1432  5242              JMP     T22E                    /ERROR, STATUS OR SKIP
2104    1433  1113              TAD     K2525
2105    1434  4433              FIGURE                          /WORD BY WORD COMPARE OF DATA
2106    1435  7610              SKP CLA                         /BUFFER O.K.
2107    1436  5242              JMP     T22E                    /ERROR, DATA
2108    1437  2134              ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2109    1440  5223              JMP     T22R2                   /MORE SECTORS TO CHECK
2110    1441  4437              NERROR                          /O.K. TO NEXT TEST
2111    1442  4440      T22E,   ERROR                           /ERROR, STATUS
2112    1443  1400              TST22                           /SCOPE LOOP POINTER
2113    1444  5373      T22T,   5373                            /TEXT POINTER
2114                    /
2115                    /VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
2116                    /
2117                    /VERIFY A WRITE DATA TO ALL OF CYLINDER 0
2118                    /USE DATA PATTERN 5252+2525
2119                    /CHECK FOR NO ERRORS IN STATUS.
2120                    /MAKE FIRST TWO WORDS OF EVERY SECTOR
2121                    /EQUAL TO ADDRESS OF SECTOR.
2122                    /
2123    1445  1122      TST23,  TAD     K7740
2124    1446  3134              DCA     TCNTR1                  /SETUP SECTOR COUNTER
2125    1447  1114              TAD     K5252
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2126  1450  4431          FILBUF                        /FILL BUFFER WITH DATA
2127  1451  1134  T23R1,  TAD     TCNTR1
2128  1452  0120          AND     K0037                 /MASK SECTOR BITS
2129  1453  3463          DCA I   XLOTRK                /SETUP ADDRESS WORD IN BUFFER
2130  1454  1072          TAD     DRIVNO                /GET DRIVE NUMBER
2131  1455  3464          DCA I   XHITRK                /SETUP ADDRESS WORD IN BUFFER
2132  1456  1105          TAD     K4000                 /FUNCTION WRITE DATA
2133  1457  3150          DCA     CMREG                 /SETUP COMMAND
2134  1460  1463          TAD I   XLOTRK                /SECTOR TO LOAD
2135  1461  4426          DISKGO                        /DISK WRITE ALL
2136  1462  1510          T23T                          /TEXT POINTER
2137  1463  5306          JMP     T23E                  /ERROR, STATUS OR SKIP
2138  1464  2134          ISZ     TCNTR1                /UPDATE SECTOR COUNTER
2139  1465  5251          JMP     T23R1                 /MORE SECTORS TO GO
2140                      /
2141                      /VERIFY THAT THE DATA WRITTEN ABOVE
2142                      /ON CYLINDER 0 WAS O.K. CHECK WITH READ DATA.
2143                      /
2144  1466  1122          TAD     K7740
2145  1467  3134          DCA     TCNTR1                /COUNTER FOR 37 SECTORS
2146  1470  4432  T23R2,  KILBUF                       /CLEAR DATA BUFFER
2147  1471  3150          DCA     CMREG                 /SETUP COMMAND
2148  1472  1134          TAD     TCNTR1
2149  1473  0120          AND     K0037
2150  1474  4426          DISKGO                        /DISK READ DATA
2151  1475  1510          T23T                          /TEXT POINTER
2152  1476  5306          JMP     T23E                  /ERROR, STATUS OR SKIP
2153  1477  1114          TAD     K5252
2154  1500  4430          FIGURE                        /WORD BY WORD COMPARE OF DATA
2155  1501  7610          SKP CLA                       /DATA O.K.
2156  1502  5306          JMP     T23E                  /ERROR, DATA
2157  1503  2134          ISZ     TCNTR1                /UPDATE SECTOR COUNTER
2158  1504  5270          JMP     T23R2                 /MORE SECTORS TO CHECK
2159  1505  4437          NERROR                        /O.K. TO NEXT TEST
2160  1506  4440  T23E,   ERROR                        /ERROR, WRITE ALL
2161  1507  1445          TST23                         /SCOPE LOOP POINTER
2162  1510  5373  T23T,   5373                         /TEXT POINTER
2163                      /
2164                      /VERIFY ALL SECTORS CAN BE ACCESSED
2165                      /
2166                      /VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
2167                      /AND USE DATA PATTERN 2525+5252.
2168                      /THE FIRST TWO WORDS OF THE SECTOR SHOULD
2169                      /EQUAL THE DISK ADDRESS. CHECK THE DATA
2170                      /WITH READ ALL.
2171                      /
2172  1511  1122  T24A,   TAD     K7740
2173  1512  3134          DCA     TCNTR1                /SETUP SECTOR COUNTER
2174  1513  1113  T24B,   TAD     K2525
2175  1514  4431          FILBUF                        /FILL OUTBOUND BUFFER
2176  1515  7301          CLA CLL IAC
2177  1516  1072          TAD     DRIVNO                /GET DRIVE NUMBER
2178  1517  3464          DCA I   XHITRK                /SETUP ADDRESS WORD IN BUFFER
2179  1520  7301          CLA CLL IAC                   /EXTENDED BIT
2180  1521  1115          TAD     K5000                 /FUNCTION WRITE ALL
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2181  1522  3150          DCA     CMREG                 /SETUP COMMAND
2182  1523  1134          TAD     TCNTR1                /SECTOR COUNTER
2183  1524  0120          AND     K0037                 /MASK OFF SECTOR BITS
2184  1525  1065          TAD     CYL450                /ADD IN CYLINDER
2185  1526  3463          DCA I   XLOTRK                /SETUP ADDRESS WORD IN BUFFER
2186  1527  1463          TAD I   XLOTRK
2187  1530  4426          DISKGO                        /DISK WRITE ALL
2188  1531  1556          T24T                          /TEXT POINTER
2189  1532  5354          JMP     T24E                  /ERROR, SKIP OR STATUS
2190  1533  4432          KILBUF                        /CLEAR DATA BUFFER
2191  1534  7301          CLA CLL IAC                   /EXTENDED BIT
2192  1535  1017          TAD     K1000                 /FUNCTION READ ALL
2193  1536  3150          DCA     CMREG                 /SETUP COMMAND
2194  1537  1134          TAD     TCNTR1                /SECTOR COUNTER
2195  1540  0120          AND     K0037                 /MASK OFF SECTORS
2196  1541  1065          TAD     CYL450
2197  1542  4426          DISKGO                        /DISK READ ALL
2198  1543  1556          T24T                          /TEXT POINTER
2199  1544  5354          JMP     T24E                  /ERROR, STATUS OR SKIP
2200  1545  1113          TAD     K2525
2201  1546  4430          FIGURE                        /WORD BY WORD COMPARE OF DATA
2202  1547  7610          SKP CLA                       /THIS SECTOR O.K.
2203  1550  5354          JMP     T24E                  /ERROR, DATA
2204  1551  2134          ISZ     TCNTR1                /UPDATE SECTOR COUNTER
2205  1552  5313          JMP     T24S                  /TRY NEXT SECTOR
2206  1553  4437          NERROR                        /O.K. TO NEXT TEST
2207  1554  4440  T24E,   ERROR                        /ERROR, READ ALL
2208  1555  1511          TST24                         /SCOPE LOOP POINTER
2209  1556  5373  T24T,   5373                         /TEXT POINTER
2210                      /
2211  1557  5760          JMP I   .+1                   /TO NEXT TEST
2212  1560  1600          TST25
2213                      /
2214  1561  0000  DISK0,   0
2215  1562  0000  DISK1,   0
2216  1563  0000  DISK2,   0
2217  1564  0000  DISK3,   0
2218  1565  0000  DISK4,   0
2219  1566  0000  DISK5,   0
2220  1567  0000  DISK6,   0
2221  1570  0000  DISK7,   0
2222                      /
2223        1600  PAGE
2224                      /
2225                      /VERIFY ALL SECTORS CAN BE ACCESSED
2226                      /
2227                      /VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
2228                      /AND USE DATA PATTERN 5252+2525.
2229                      /THE FIRST TWO WORDS OF THE SECTOR SHOULD
2230                      /EQUAL THE DISK ADDRESS. CHECK THE DATA
2231                      /WITH READ DATA.
2232                      /
2233  1600  1122  TST25,  TAD     K7740
2234  1601  3134          DCA     TCNTR1                /SETUP SECTOR COUNTER
2235  1602  1114  T25S,   TAD     K5252
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2236  1603  4431          FILBUF                          /FILL OUTBOUND BUFFER
2237  1604  7301          CLA CLL IAC
2238  1605  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2239  1606  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2240  1607  7301          CLA CLL IAC                     /EXTENDED BIT
2241  1610  1105          TAD     K4000                   /FUNCTION WRITE DATA
2242  1611  3150          DCA     CMREG                   /SETUP COMMAND
2243  1612  1134          TAD     TCNTR1                  /SECTOR COUNTER
2244  1613  0127          AND     K0037                   /MASK OFF SECTOR BITS
2245  1614  1065          TAD     CYL450                  /ADD IN CYLINDER
2246  1615  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2247  1616  1463          TAD I   XLOTRK
2248  1617  4426          DISKGO                          /DISK WRITE DATA
2249  1620  1644          T25T                            /TEXT POINTER
2250  1621  5242          JMP     T25E                    /ERROR, SKIP OR STATUS
2251  1622  4432          KILBUF                          /CLEAR DATA BUFFER
2252  1623  7301          CLA CLL IAC                     /EXTENDED BIT
2253  1624  3150          DCA     CMREG                   /SETUP COMMAND
2254  1625  1134          TAD     TCNTR1                  /SECTOR COUNTER
2255  1626  0127          AND     K0037                   /MASK OFF SECTORS
2256  1627  1065          TAD     CYL450
2257  1630  4426          DISKGO                          /DISK READ DATA
2258  1631  1644          T25T                            /TEXT POINTER
2259  1632  5242          JMP     T25E                    /ERROR, STATUS OR SKIP
2260  1633  1114          TAD     K5252
2261  1634  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2262  1635  7610          SKP CLA                         /THIS SECTOR O.K.
2263  1636  5242          JMP     T25E                    /ERROR, DATA
2264  1637  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2265  1640  5202          JMP     T25S                    /TRY NEXT SECTOR
2266  1641  4437          NERROR                          /O.K. TO NEXT TEST
2267  1642  4440  T25E,   ERROR                           /ERROR, DATA BREAK
2268  1643  1600          TST25                           /SCOPE LOOP POINTER
2269  1644  5373  T25T,   5373                            /TEXT POINTER
2270                      /
2271                      /VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
2272                      /
2273                      /VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
2274                      /USE DATA PATTERN 5252+2525
2275                      /CHECK FOR NO ERRORS IN STATUS.
2276                      /MAKE FIRST TWO WORDS OF EVERY SECTOR
2277                      /EQUAL TO ADDRESS OF SECTOR.
2278                      /
2279  1645  1122  T25T6,  TAD     K7740
2280  1646  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2281  1647  1114          TAD     K5252
2282  1650  4431          FILBUF                          /FILL BUFFER WITH DATA
2283  1651  1134  T26R1,  TAD     TCNTR1
2284  1652  0127          AND     K0037                   /MASK SECTOR BITS
2285  1653  1065          TAD     CYL450
2286  1654  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2287  1655  7301          CLA CLL IAC
2288  1656  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2289  1657  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2290  1660  7301          CLA CLL IAC                     /EXTENDED BIT
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2291  1661  1115          TAD     K5000                   /FUNCTION WRITE ALL
2292  1662  3150          DCA     CMREG                   /SETUP COMMAND
2293  1663  1463          TAD I   XLOTRK                  /GET TRACK AND SECTOR
2294  1664  4426          DISKGO                          /DISK WRITE ALL
2295  1665  1716          T26T                            /TEXT POINTER
2296  1666  5314          JMP     T26E                    /ERROR, STATUS OR SKIP
2297  1667  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2298  1670  5251          JMP     T26R1                   /MORE SECTORS TO GO
2299                      /
2300                      /VERIFY THAT THE DATA WRITTEN ABOVE
2301                      /ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.
2302                      /
2303  1671  1122          TAD     K7740
2304  1672  3134          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2305  1673  4432  T26R2,  KILBUF                          /CLEAR DATA BUFFER
2306  1674  7301          CLA CLL IAC                     /EXTENDED BIT
2307  1675  1017          TAD     K1000                   /READ ALL FUNCTION
2308  1676  3150          DCA     CMREG                   /SETUP COMMAND
2309  1677  1134          TAD     TCNTR1
2310  1700  0120          AND     K0037
2311  1701  1065          TAD     CYL450
2312  1702  4426          DISKGO                          /DISK READ ALL
2313  1703  1716          T26T                            /TEXT POINTER
2314  1704  5314          JMP     T26E                    /ERROR, STATUS OR SKIP
2315  1705  1114          TAD     K5252
2316  1706  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2317  1707  7610          SKP CLA                         /BUFFER O.K.
2318  1710  5314          JMP     T26E                    /ERROR, DATA
2319  1711  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2320  1712  5273          JMP     T26R2                   /MORE SECTORS TO CHECK
2321  1713  4437          NERROR                          /O.K. TO NEXT TEST
2322  1714  4440  T26E,   ERROR                           /ERROR, STATUS
2323  1715  1645          TST26                           /SCOPE LOOP POINTER
2324  1716  5373  T26T,   5373                            /TEXT POINTER
2325                      /
2326                      /VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
2327                      /
2328                      /VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
2329                      /USE DATA PATTERN 2525+5252
2330                      /CHECK FOR NO ERRORS IN STATUS.
2331                      /MAKE FIRST TWO WORDS OF EVERY SECTOR
2332                      /EQUAL TO ADDRESS OF SECTOR.
2333                      /
2334  1717  1122  T27T,   TAD     K7740
2335  1720  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2336  1721  1113          TAD     K2525
2337  1722  4431          FILBUF                          /FILL BUFFER WITH DATA
2338  1723  1134  T27R1,  TAD     TCNTR1
2339  1724  0120          AND     K0037                   /MASK SECTOR BITS
2340  1725  1065          TAD     CYL450
2341  1726  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2342  1727  7301          CLA CLL IAC
2343  1730  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2344  1731  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2345  1732  7301          CLA CLL IAC                     /EXTENDED BIT
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2346  1733  1105          TAD     K4000                   /FUNCTION WRITE DATA
2347  1734  3150          DCA     CMREG                   /SETUP COMMAND
2348  1735  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2349  1736  4426          DISKGO                          /DISK WRITE ALL
2350  1737  1767          T27T                            /TEXT POINTER
2351  1740  5365          JMP     T27E                    /ERROR, STATUS OR SKIP
2352  1741  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2353  1742  5323          JMP     T27R1                   /MORE SECTORS TO GO
2354                      /
2355                      /VERIFY THAT THE DATA WRITTEN ABOVE
2356                      /ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.
2357                      /
2358  1743  1122          TAD     K7740
2359  1744  3134          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2360  1745  4432  T27R2,  KILBUF                         /CLEAR DATA BUFFER
2361  1746  7301          CLA CLL IAC                     /FUNCTION READ DATA
2362  1747  3150          DCA     CMREG                   /SETUP COMMAND
2363  1750  1134          TAD     TCNTR1
2364  1751  0120          AND     K0037
2365  1752  1065          TAD     CYL450
2366  1753  4426          DISKGO                          /DISK READ DATA
2367  1754  1767          T27T                            /TEXT POINTER
2368  1755  5365          JMP     T27E                    /ERROR, STATUS OR SKIP
2369  1756  1113          TAD     K2525
2370  1757  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2371  1760  7610          SKP CLA                         /DATA O.K.
2372  1761  5365          JMP     T27E                    /ERROR, DATA
2373  1762  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2374  1763  5345          JMP     T27R2                   /MORE SECTORS TO CHECK
2375  1764  4437          NERROR                          /O.K. TO NEXT TEST
2376  1765  4440  T27E,   ERROR                          /ERROR, WRITE ALL
2377  1766  1717          TST27                           /SCOPE LOOP POINTER
2378  1767  5373  T27T,   5373                           /TEXT POINTER
2379                      /
2380                      /SECTOR TIMING TEST; VERIFY CONSECUTIVE SECTORS.
2381                      /VERIFY THAT WRITE AND READ ALL ARE ACTUALLY DOING CONSECUTIVE
2382                      /SECTORS. WHEN DOING CONSECUTIVE SECTORS IN WRITE OR READ
2383                      /ALL MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY 2.5 MILLI-
2384                      /SECONDS. THE PROGRAM WILL REPORT A STATUS ERROR OF
2385                      /NO DONE FLAG IF THIS DOES NOT OCCUR.
2386                      /
2387  1770  1156          TAD     HOMEMA
2388  1771  1072          TAD     DRIVNO
2389  1772  3136          DCA     TCNTR3                  /SAVE FIELD+DRIVE
2390  1773  4525  T28R,   JMS I   XLOAD
2391  1774  7700          7700
2392  1775  1122          TAD     K7740
2393  1776  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2394  1777  1115          TAD     K5000                   /FUNCTION WRITE ALL
2395  2000  3150          DCA     CMREG                   /SETUP COMMAND
2396  2001  7340          CLA CLL CMA
2397  2002  1120          TAD     K0037                   /SECTOR TO GO
2398  2003  4426          DISKGO                          /DISK WRITE ALL
2399  2004  2057          T28T                            /TEXT POINTER
2400  2005  5255          JMP     T28E                    /ERROR, DISK SKIP OR STATUS
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2401  2006  1166          TAD     K5300
2402  2007  3257          DCA     T28T                    /MODIFY TEXT POINTER
2403  2010  1134  T28R,   TAD     TCNTR1
2404  2011  0073          AND     K0001
2405  2012  7112          CLL RTR
2406  2013  1017          TAD     K1000                   /MAKE READ ALL OR WRITE ALL
2407  2014  1136          TAD     TCNTR3                  /GET FIELD+DRIVE
2408  2015  6746  T28IOA, DLDC                           /LOAD COMMAND REGISTER
2409  2016  1067          TAD     BGNBUF                  /GET BEGINNING OF BUFFER POINTER
2410  2017  6744  T28IOB, DLCA                           /LOAD CURRENT ADDRESS
2411  2020  1134          TAD     TCNTR1
2412  2021  0120          AND     K0037                   /MASK SECTOR BITS
2413  2022  6743  T28IOC, DLAG                           /LOAD AND GO
2414  2023  1174          TAD     KTIME
2415  2024  3135          DCA     TCNTR2                  /TIME COUNTER
2416  2025  6745  T28IOD, DRST                           /READ STATUS REGISTER
2417  2026  1105          TAD     K4000
2418  2027  7450          SNA                             /WAS STATUS 4000
2419  2030  5252          JMP     T28OK                   /YES, GOT TRANSFER DONE
2420  2031  2135          ISZ     TCNTR2                  /UPDATE TIME COUNTER
2421  2032  5225          JMP     T28IOD                  /WAIT FOR GOOD STATUS
2422  2033  1105          TAD     K4000                   /SUBTRACT, RESET STATUS
2423  2034  3146          DCA     STREG                   /SAVE FOR ERROR PRINTER
2424  2035  1134          TAD     TCNTR1
2425  2036  0073          AND     K0001
2426  2037  7112          CLL RTR
2427  2040  1017          TAD     K1000                   /MAKE READ ALL OR WRITE ALL
2428  2041  3150          DCA     CMREG                   /SAVE FOR ERROR PRINTER
2429  2042  1067          TAD     BGNBUF                  /GET START OF BUFFER
2430  2043  3152          DCA     CAREG                   /SAVE FOR PRINTER
2431  2044  1134          TAD     TCNTR1
2432  2045  0120          AND     K0037                   /MAKE SECTOR ADDRESS
2433  2046  3151          DCA     DAREG                   /SAVE FOR ERROR PRINTER
2434  2047  4447          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2435  2050  5247          JMP     .-1                     /HANG IF NO SKIP
2436  2051  5255          JMP     T28E                    /ERROR, SECTOR RESPONSE NOT FOUND
2437  2052  2134  T28OK,  ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2438  2053  5210          JMP     T28R                    /MORE TO TEST
2439  2054  4437          NERROR                          /O.K. TO NEXT TEST
2440  2055  4440  T28E,   ERROR                          /ERROR, WRITE OR READ  ALL
2441  2056  1773          TST28                           /SCOPE LOOP POINTER
2442  2057  5300  T28T,   5300                           /TEXT POINTER
2443
2444                      /
2445                      /SECTOR TIMING TEST; VERIFY NON-CONSECUTIVE SECTORS.
2446                      /VERIFY THAT READ AND WRITE DATA ARE NOT DOING CONSECUTIVE
2447                      /SECTORS. WHEN TRYING TO DO CONSECUTIVE SECTORS IN READ DATA
2448                      /OR WRITE DATA MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY DISK
2449                      /REVOLUTION, APROX. EVERY 40 MILLISECONDS. THE PROGRAM WILL
2450                      /REPORT AN ERROR OF A DONE FLAG IF THIS DOES NOT OCCUR
2451                      /
2452  2060  4525          JMS I   XLOAD
2453  2061  7775          7775
2454  2062  1122  T29R,   TAD     K7740
2455  2063  3134          DCA     TCNTR1                  /SECTOR COUNTER
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2456  2064  3150          DCA     CMREG                   /SETUP COMMAND
2457  2065  1122          TAD     K0037
2458  2066  4426          DISKGO                          /DISK READ DATA
2459  2067  2137          T29T                            /TEXT POINTER
2460  2070  5335          JMP     T29E                    /ERROR, SKIP OR STATUS
2461  2071  1166          TAD     K5300
2462  2072  3337          DCA     T29T                    /MODIFY TEXT POINTER
2463  2073  3143          DCA     GDREG2                  /EXPECTED STATUS
2464  2074  1134  T29R,   TAD     TCNTR1
2465  2075  0073          AND     K2001
2466  2076  7112          CLL RTR                         /MAKE READ OR WRITE
2467  2077  1136          TAD     TCNTR3                  /GET FIELD+DRIVE
2468  2100  6746  T29IOA, DLDC                          /LOAD COMMAND REGISTER
2469  2101  1067          TAD     AGNBUF
2470  2102  6744  T29IOB, DLCA                          /LOAD CURRENT ADDRESS
2471  2103  1134          TAD     TCNTR1
2472  2104  0122          AND     K0037                   /MASK SECTOR BITS
2473  2105  6743  T29IOC, DLAC                          /LOAD AND GO
2474  2106  1174          TAD     KTIME
2475  2107  3135          DCA     TCNTR2                  /TIME COUNTER
2476  2110  6745  T29IOD, DWST                          /READ STATUS REGISTER
2477  2111  7450          SNA                             /STATUS O.K.?
2478  2112  5326          JMP     T29W                    /WAIT FOR CORRECT RESPONSE (0000)
2479  2113  3146          DCA     STREG                   /NO, SAVE STATUS FOR PRINTER
2480  2114  1134          TAD     TCNTR1
2481  2115  0073          AND     K0001
2482  2116  7112          CLL RTR                         /MAKE READ OR WRITE
2483  2117  3150          DCA     CMREG                   /SAVE FOR ERROR PRINTER
2484  2120  1067          TAD     AGNBUF                  /GET START OF BUFFER
2485  2121  3152          DCA     CAREG                   /SAVE FOR ERROR PRINTER
2486  2122  1134          TAD     TCNTR1
2487  2123  0122          AND     K0037                   /MAKE SECTOR ADDRESS
2488  2124  3151          DCA     DAREG                   /SAVE FOR ERROR PRINTER
2489  2125  5335          JMP     T29E                    /ERROR, SECTOR RESPONSE NOT FOUND
2490  2126  2135  T29W,   ISZ     TCNTR2                  /UPDATE TIME COUNTER
2491  2127  5331          JMP     T29IOD                  /WAIT FOR GOOD STATUS
2492  2130  6447          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2493  2131  5332          JMP     .-1                     /HANG IF NO SKIP
2494  2132  2134  T29OK,  ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2495  2133  5274          JMP     T29R                    /MORE TO TEST
2496  2134  4437          NERROR                          /O.K. TO NEXT TEST
2497  2135  4440  T29E,   ERROR                           /ERROR, STATUS
2498  2136  2062          TST29                           /SCOPE LOOP POINTER
2499  2137  5300  T29T,   5300                            /MODIFIED TEXT POINTER
2500                      /
2501                      /CRC TEST
2502                      /
2503                      /DATA TRANSFER IS WORKING, NOW CHECK CRC WORD IN
2504                      /THE CRC REGISTER AFTER A READ ALL. THE CRC SHOULD BE
2505                      /ALL 0'S FOR ALL 0'S DATA PATTERN.
2506                      /
2507  2140  1112  TST30,  TAD     K7740
2508  2141  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2509  2142  7301  T30R,   CLA CLL IAC
2510  2143  4453          CLRALL                          /CLEAR CONTROL
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2511  2144  4432          KILBUF                          /CLEAR BUFFER AREA
2512  2145  1115          TAD     K5000                   /FUNCTION WRITE ALL
2513  2146  3150          DCA     CMREG                   /SETUP COMMAND
2514  2147  1134          TAD     TCNTR1
2515  2150  0117          AND     K0017                   /MASK SECTOR BITS
2516  2151  4426          DISKGO                          /DISK WRITE ALL
2517  2152  2211          T30T                            /TEXT POINTER
2518  2153  5777*         JMP     T30E                    /ERROR, STATUS OR SKIP
2519  2154  1017          TAD     K1000                   /FUNCTION READ ALL
2520  2155  3150          DCA     CMREG                   /SETUP COMMAND
2521  2156  1134          TAD     TCNTR1
2522  2157  0117          AND     K0017                   /MASK SECTOR BITS
2523  2160  4426          DISKGO                          /DISK READ ALL
2524  2161  2211          T30T                            /TEXT POINTER
2525  2162  5777*         JMP     T30E                    /ERROR, STATUS OR SKIP
2526  2163  1167          TAD     K6304
2527  2164  3776*         DCA     T30T                    /MODIFY TEXT POINTER
2528  2165  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
2529  2166  4453          CLRALL                          /AND CLEAR ARK ENABLE FLOP
2530  2167  3142          DCA     GDREG1                  /STORE IN COMPARE RREGISTER
2531  2170  3143          DCA     GDREG2                  /STORE IN COMPARE REGISTER
2532  2171  5772          JMP I .+1
2533  2172  2200          T30D
2534  2176  2211
2535  2177  2207
                  2200    PAGE
2536  2200  4454  T30D,   RDCRC                           /READ CRC REGISTER
2537  2201  4443          ACCMP2                          /CHECK RESULTS
2538  2202  7610          SKP CLA                         /O.K.
2539  2203  5207          JMP     T30F                    /ERROR, CRC
2540  2204  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2541  2205  5777*         JMP     T30R                    /MORE SECTORS TO TEST
2542  2206  4437          NERROR                          /O.K. TO NEXT TEST
2543  2207  4440  T30E,   ERROR                           /ERROR, CRC
2544  2210  2140          TST30                           /SCOPE LOOP POINTER
2545  2211  6304  T30T,   6304                            /TEXT POINTER
2546                      /
2547                      /CRC TEST
2548                      /
2549                      /VERIFY THAT THE CRC WORD WRITTEN
2550                      /ON DISK IS CORRECT, COMPARE IT TO
2551                      /KNOWN VALUE IN CORE, ON A READ ALL THE
2552                      /CRC READ FROM DISK IS LEFT IN THE CRC BUFFER.
2553                      /THE CRC SHOULD BE 114047 FOR DATA 2525+5252.
2554                      /
2555  2212  1110  TST31,  TAD     K7760
2556  2213  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2557  2214  7301  T31R,   CLA CLL IAC
2558  2215  4453          CLRALL                          /CLEAR CONTROL
2559  2216  1113          TAD     K2525
2560  2217  4431          FILBUF                          /FILL DATA BUFFER
2561  2220  1115          TAD     K5000                   /FUNCTION WRITE ALL
2562  2221  3150          DCA     CMREG                   /SETUP COMMAND
2563  2222  1134          TAD     TCNTR1
2564  2223  0117          AND     K0017                   /MASK SECTOR BITS
```

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2565  2224  1110          TAD     K7760
2566  2225  4426          DISKGO                          /DISK WRITE ALL
2567  2226  2261          T31T                            /TEXT POINTER
2568  2227  5257          JMP     T31E                    /ERROR, STATUS OR SKIP
2569  2230  1017          TAD     K1000                   /FUNCTION READ ALL
2570  2231  3150          DCA     CMREG                   /SETUP COMMAND
2571  2232  1134          TAD     TCNTR1
2572  2233  0117          AND     K0017                   /MASK SECTOR BITS
2573  2234  1110          TAD     K7760
2574  2235  4426          DISKGO                          /DISK READ ALL
2575  2236  2261          T31T                            /TEXT POINTER
2576  2237  5257          JMP     T31E                    /ERROR, STATUS OR SKIP
2577  2240  1167          TAD     K6304
2578  2241  3261          DCA     T31T                    /MODIFY TEXT POINTER
2579  2242  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL AND
2580  2243  4453          CLRALL                          /CLEAR BRK ENABLE FLOP.
2581  2244  1160          TAD     CRWRD1                  /GET GOOD CRC
2582  2245  3142          DCA     GOREG1                  /STORE IN COMPARE REGISTER
2583  2246  1161          TAD     CRWRD2                  /GET GOOD CRC
2584  2247  3143          DCA     GOREG2                  /STORE IN COMPARE REGISTER
2585  2250  4454          RDCRC                           /READ CRC REGISTER
2586  2251  4443          ACCMP2                          /CHECK RESULTS
2587  2252  7610          SKP CLA                         /O.K.
2588  2253  5257          JMP     T31E                    /ERROR, CRC
2589  2254  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2590  2255  5214          JMP     T31R                    /MORE SECTORS TO TEST
2591  2256  4437          NERROR                          /O.K. TO NEXT TEST
2592  2257  4440  T31E,   ERROR                           /ERROR, CRC
2593  2260  2212          TST31                           /SCOPE LOOP POINTER
2594  2261  6304  T31T,   6304                            /TEXT POINTER
2595                      /
2596                      /VERIFY HEAD MOTION AND CAPABILITY
2597                      /OF SELECTING TWO TRACKS INDIVIDUALLY.
2598                      /
2599                      /VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
2600                      /AND THEN CYLINDER 0, USE DATA PATTERN 5252+2525 ON
2601                      /CYLINDER 1450 AND 2525+5252 ON CYLINDER 0.
2602                      /CHECK FOR NO ERRORS IN STATUS.
2603                      /MAKE FIRST TWO WORDS OF EVERY SECTOR
2604                      /EQUAL TO ADDRESS OF SECTOR.
2605                      /
2606                      /FIRST WRITE CYLINDER 1450
2607                      /
2608  2262  1122  T5T32,  TAD     K7740
2609  2263  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2610  2264  1114          TAD     K5252
2611  2265  4431          FILBUF                          /FILL BUFFER WITH DATA
2612  2266  7301          CLA CLL IAC
2613  2267  1172          TAD     DRIVNO                  /GET DRIVE NUMBER
2614  2270  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2615  2271  1134  T32R1,  TAD     TCNTR1
2616  2272  0120          AND     K0037                   /MASK SECTOR BITS
2617  2273  1065          TAD     CYL450                  /LOWER CYLINDER
2618  2274  3463          DCA I   XLOTRK                  /SETUP WORD IN BUFFER
2619  2275  7301          CLA CLL IAC
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2620  2276  1115          TAD     K5000                   /FUNCTION WRITE ALL
2621  2277  3150          DCA     CMREG                   /SETUP COMMAND
2622  2300  1463          TAD I   XLOTRK                  /SECTOR TO GO
2623  2301  4426          DISKGO                          /DISK WRIT ALL
2624  2302  2374          T32T                            /TEXT POINTER
2625  2303  5372          JMP     T32E                    /ERROR, STATUS OR SKIP
2626  2304  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2627  2305  5271          JMP     T32R1                   /MORE SECTORS TO GO
2628                      /
2629                      /WRITE ALL TO ALL OF CYLINDER 0
2630                      /
2631  2306  1122          TAD     K7740
2632  2307  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2633  2310  1113          TAD     K2525
2634  2311  4431          FILBUF                          /FILL BUFFER WITH DATA
2635  2312  1134  T32R2,  TAD     TCNTR1
2636  2313  0120          AND     K0037                   /MASK SECTOR BITS
2637  2314  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2638  2315  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2639  2316  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2640  2317  1115          TAD     K5000                   /FUNCTION WRITE ALL
2641  2320  3150          DCA     CMREG                   /SETUP COMMAND
2642  2321  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2643  2322  4426          DISKGO                          /DISK WRITE ALL
2644  2323  2374          T32T                            /TEXT POINTER
2645  2324  5372          JMP     T32E                    /ERROR, SKIP OR STATUS
2646  2325  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2647  2326  5312          JMP     T32R2                   /MORE SECTORS TO GO
2648                      /
2649                      /VERIFY THAT THE DATA WRITTEN ABOVE
2650                      /ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.
2651                      /
2652  2327  1122          TAD     K7740
2653  2330  3134          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2654  2331  4432  T32R3,  KILBUF                          /CLEAR DATA BUFFER
2655  2332  7301          CLA CLL IAC
2656  2333  1017          TAD     K1000                   /READ ALL FUNCTION
2657  2334  3150          DCA     CMREG                   /SETUP COMMAND
2658  2335  1134          TAD     TCNTR1
2659  2336  0120          AND     K0037
2660  2337  1065          TAD     CYL450                  /ADD IN CYLINDER
2661  2340  4426          DISKGO                          /DISK READ ALL
2662  2341  2374          T32T                            /TEXT POINTER
2663  2342  5372          JMP     T32E                    /ERROR, STATUS OR SKIP
2664  2343  1114          TAD     K5252
2665  2344  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2666  2345  7610          SKP CLA                         /DATA O.K.
2667  2346  5372          JMP     T32E                    /ERROR, DATA
2668  2347  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2669  2350  5331          JMP     T32R3                   /MORE SECTORS TO CHECK
2670                      /
2671                      /VERIFY THAT THE DATA WRITTEN ABOVE
2672                      /ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.
2673                      /
2674  2351  1122          TAD     K7740
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2675   2352  3134          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2676   2353  4432  T32R4,  KILBUF                         /CLEAR DATA BUFFER
2677   2354  1017          TAD     K1000                   /READ ALL FUNCTION
2678   2355  3150          DCA     CMREG                   /SETUP COMMAND
2679   2356  1134          TAD     TCNTR1
2680   2357  0120          AND     K0037
2681   2360  4426          DISKGO                          /DISK READ ALL
2682   2361  2374          T32T                            /TEXT POINTER
2683   2362  5372          JMP     T32E                    /ERROR, STATUS OR SKIP
2684   2363  1113          TAD     K2525
2685   2364  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2686   2365  7610          SKP CLA                         /DATA O.K.
2687   2366  5372          JMP     T32E                    /ERROR, DATA
2688   2367  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2689   2370  5353          JMP     T32R4                   /MORE SECTORS TO CHECK
2690   2371  4437          NERROR                          /O.K. TO NEXT TEST
2691   2372  4440  T32E,   ERROR                          /ERROR, WRITE ALL
2692   2373  2262          TST32                           /SCOPE LOOP POINTER
2693   2374  5373  T32T,   5373                            /TEXT POINTER
2694                       /
2695   2375  5776          JMP I   .+1                     /TO NEXT TEST
2696   2376  2400          TST33
2697                       /
2698   2377  2142
             2400          PAGE
2699                       /
2700                       /VERIFY HEAD MOTION AND CAPABILITY
2701                       /OF SELECTING TWO TRACKS INDIVIDUALLY.
2702                       /
2703                       /VERIFY A WRITE DATA TO ALL OF CYLINDER 0
2704                       /THEN CYLINDER 1450. USE DATA PATTERN 2525+5252 ON
2705                       /CYLINDER 1450 AND 5252+2525 ON CYLINDER 0.
2706                       /CHECK FOR NO ERRORS IN STATUS.
2707                       /MAKE FIRST TWO WORDS OF EVERY SECTOR
2708                       /EQUAL TO ADDRESS OF SECTOR.
2709                       /
2710                       /FIRST WRITE DATA TO CYLINDER 0,
2711                       /
2712   2400  1122  TST33,  TAD     K7740
2713   2401  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2714   2402  1114          TAD     K5252
2715   2403  4431          FILBUF                          /FILL BUFFER WITH DATA
2716   2404  7300  T33R1,  CLA CLL
2717   2405  1134          TAD     TCNTR1
2718   2406  0120          AND     K0037                   /MASK OFF SECTOR BITS
2719   2407  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2720   2410  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2721   2411  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2722   2412  1105          TAD     K4000                   /FUNCTION WRITE DATA
2723   2413  3150          DCA     CMREG                   /SETUP COMMAND
2724   2414  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2725   2415  4426          DISKGO                          /DISK WRITE DATA
2726   2416  2511          T33T                            /TEXT POINTER
2727   2417  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2728   2420  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
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2729   2421  5204          JMP     T33R1                   /MORE SECTORS TO GO
2730                       /
2731                       /WRITE DATA TO ALL OF CYLINDER 1450
2732                       /
2733   2422  1122          TAD     K7740
2734   2423  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2735   2424  1113          TAD     K2525
2736   2425  4431          FILBUF                          /FILL BUFFER WITH DATA
2737   2426  7301          CLA CLL IAC
2738   2427  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2739   2430  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2740   2431  1134  T33R2,  TAD     TCNTR1
2741   2432  0120          AND     K0037                   /MASK OFF SECTOR BITS
2742   2433  1065          TAD     CYL450                  /ADD IN CYLINDER
2743   2434  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2744   2435  7301          CLA CLL IAC                     /EXTENDED TRACK BIT
2745   2436  1105          TAD     K4000                   /FUNCTION WRITE DATA
2746   2437  3150          DCA     CMREG                   /SETUP COMMAND
2747   2440  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2748   2441  4426          DISKGO                          /DISK WRITE DATA
2749   2442  2511          T33T                            /TEXT POINTER
2750   2443  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2751   2444  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2752   2445  5231          JMP     T33R2                   /MORE SECTORS TO GO
2753                       /
2754                       /VERIFY THAT THE DATA WRITTEN ABOVE
2755                       /ON CYLINDER 0 WAS O.K. CHECK WITH READ DATA.
2756                       /
2757   2446  1122          TAD     K7740
2758   2447  3134          DCA     TCNTR1                  /COUNTER FOR 37 SECTORS
2759   2450  4432  T33R3,  KILBUF                         /CLEAR DATA BUFFER
2760   2451  3150          DCA     CMREG                   /SETUP COMMAND
2761   2452  1134          TAD     TCNTR1
2762   2453  0120          AND     K0037
2763   2454  4426          DISKGO                          /DISK READ DATA
2764   2455  2511          T33T                            /TEXT POINTER
2765   2456  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2766   2457  1114          TAD     K5252
2767   2460  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2768   2461  7610          SKP CLA                         /DATA O.K.
2769   2462  5307          JMP     T33E                    /ERROR, DATA
2770   2463  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2771   2464  5250          JMP     T33R3                   /MORE SECTORS TO CHECK
2772                       /
2773                       /VERIFY THAT THE DATA WRITTEN ABOVE
2774                       /ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.
2775                       /
2776   2465  1122          TAD     K7740
2777   2466  3134          DCA     TCNTR1                  /SECTOR COUNTER
2778   2467  4432  T33R4,  KILBUF                         /CLEAR DATA BUFFER
2779   2470  7301          CLA CLL IAC
2780   2471  3150          DCA     CMREG                   /SETUP COMMAND
2781   2472  1134          TAD     TCNTR1
2782   2473  0120          AND     K0037
2783   2474  1065          TAD     CYL450                  /ADD IN CYLINDER
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2784    2475  4426          DISKGO                          /DISK READ DATA
2785    2476  2511          T33T                            /TEXT POINTER
2786    2477  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2787    2500  1113          TAD     K2525
2788    2501  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2789    2502  7610          SKP CLA                         /DATA O.K.
2790    2503  5307          JMP     T33E                    /ERROR, DATA
2791    2504  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2792    2505  5267          JMP     T33R4                   /MORE SECTORS TO CHECK
2793    2506  4437          NERROR                          /O.K. TO NEXT TEST
2794    2507  4440  T33E,   ERROR                           /ERROR, WRITE DATA
2795    2510  2400          TST33                           /SCOPE LOOP POINTER
2796    2511  5373  T33T,   5373                            /TEXT POINTER
2797                        /
2798                        /FORCE CYLINDER ADDRESS ERROR
2799                        /
2800                        /VERIFY A CYLINDER ADDRESS ERROR IN
2801                        /STATUS REGISTER. CAN BE CAUSED BY ISSUEING
2802                        /MAINTENANCE SHIFT CRC AFTER DISK
2803                        /HAS ACCEPTED THE ADDRESS.
2804                        /
2805    2512  4525          JMS I   XLOAD
2806    2513  0001          1
2807    2514  7301  TST34,  CLA CLL IAC
2808    2515  4453          CLRALL                          /CLEAR CONTROL
2809    2516  4424          SEEK                            /SEEK ONLY TRACK 0
2810    2517  2550          T34T                            /TEXT POINTER
2811    2520  5346          JMP     T34E                    /ERROR,SKIP OR STATUS
2812    2521  7301          CLA CLL IAC
2813    2522  1156          TAD     HOMEMA
2814    2523  1072          TAD     DRIVNO
2815    2524  1105          TAD     K4000                   /TOTAL COMMAND WRITE DATA.
2816    2525  4450          LDCMD                           /LOAD COMMAND REGISTER
2817    2526  7301          CLA CLL IAC
2818    2527  1105          TAD     K4000
2819    2530  3143          DCA     GOREG2                  /EXPECTED STATUS
2820    2531  1066          TAD     TRK212
2821    2532  4452          LDADD                           /LOAD AND GO READ
2822    2533  7330          CLA CLL CML RAR
2823    2534  4455          LOMAN                           /ENTER MAINTENANCE
2824    2535  7010          RAR
2825    2536  4455          LOMAN                           /SET DR4 FOR ENABLE SHIFT
2826    2537  7010          RAR
2827    2540  4455          LOMAN                           /SHIFT CRC
2828    2541  4447          DSKSKP                          /WAIT FOR FLAG
2829    2542  5341          JMP     .-1
2830    2543  4444          RDSTAT                          /READ STATUS REGISTER
2831    2544  4442          ACCMP1                          /CHECK RESULTS
2832    2545  4437          NERROR                          /O.K. TO NEXT TEST
2833    2546  4440  T34E,   ERROR                           /ERROR, CYLINDER ADDRESS
2834    2547  2514          TST34                           /SCOPE LOOP POINTER
2835    2550  5300  T34T,   5300                            /TEXT POINTER
2836                        /
2837                        /
2838                        /FORCE CRC ERROR
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2839                        /
2840                        /VERIFY A CRC ERROR BY ENTERING MAINTENANCE
2841                        /AND SHIFTING CRC IN WRITE ALL MODE.
2842                        /
2843    2551  7301  TST35,  CLA CLL IAC
2844    2552  4453          CLRALL                          /CLEAR CONTROL
2845    2553  4432          KILBUF                          /CLEAR BUFFER AREA
2846    2554  1067          TAD     BGNBUF
2847    2555  4451          LDCUR                           /LOAD CURRENT ADDRESS
2848    2556  1156          TAD     HOMEMA
2849    2557  1072          TAD     DRIVNO
2850    2560  1115          TAD     K5000                   /TOTAL WRITE COMMAND
2851    2561  4450          LDCMD                           /LOAD COMMAND
2852    2562  4452          LDADD                           /LOAD AND GO WRITE ALL
2853    2563  7330          CLA CLL CML RAR
2854    2564  4455          LOMAN                           /ENTER MAINTENANCE
2855    2565  7010          RAR
2856    2566  4455          LOMAN                           /SET DR4 TO ENABLE SHIFT
2857    2567  7010          RAR
2858    2570  1074          TAD     K0002                   /SET AC BIT 10 DATA
2859    2571  4455          LOMAN                           /SHIFT CRC
2860    2572  4447          DSKSKP                          /SKIP ON ERROR FLAG!
2861    2573  5371          JMP     .-2                     /KEEP SHIFTING CRC TILL ERROR
2862    2574  7301          CLA CLL IAC
2863    2575  4453          CLRALL                          /CLEAR CONTROL
2864    2576  7330          CLA CLL CML RAR
2865    2577  1011          TAD     K0010
2866    2600  3143          DCA     GOREG2                  /EXPECTED STATUS REGISTER
2867    2601  1067          TAD     BGNBUF
2868    2602  4451          LDCUR                           /LOAD CURRENT ADDRESS
2869    2603  1156          TAD     HOMEMA
2870    2604  1072          TAD     DRIVNO
2871    2605  1017          TAD     K1000                   /TOTAL READ ALL COMMAND
2872    2606  4450          LDCMD                           /LOAD COMMAND REGISTER
2873    2607  4452          LDADD                           /LOAD AND GO READ ALL
2874    2610  4447          DSKSKP                          /WAIT AND SKIP ON CRC ERROR!
2875    2611  5210          JMP     .-1
2876    2612  4444          RDSTAT                          /READ STATUS REGISTER
2877    2613  4442          ACCMP1                          /CHECK RESULTS
2878    2614  4437          NERROR                          /O.K. TO NEXT TEST
2879    2615  4440  T35E,   ERROR                           /ERROR, CRC ERROR
2880    2616  2551          TST35                           /SCOPE POINTER
2881    2617  5300          5300                            /TEXT POINTER
2882                        /
2883                        /BIG ADDRESSING TEST
2884                        /FORMAT THE COMPLETE DISK SURFACE WITH
2885                        /WRITE ALL, USE DATA PATTERN 2525+5252
2886                        /MAKE FIRST TWO WORDS OF EVERY SECTOR
2887                        /EQUAL TO ABSOLUTE ADDRESS OF SECTOR.
2888                        /
2889    2620  4525          JMS I   XLOAD
2890    2621  7700          7700
2891    2622  7301  TST36,  CLA CLL IAC
2892    2623  4453          CLRALL                          /CLEAR CONTROL
2893    2624  1113          TAD     K2525
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2894  2625  4431          FILBUF                          /FILL BUFFER WITH DATA
2895  2626  3463          DCA I   XLOTRK                  /COUNTER+TRACK WORD
2896  2627  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2897  2630  3464          DCA I   XHITRK                  /COUNTER+TRACK WORD
2898  2631  1072          TAD     DRIVNO                  /CURRENT DRIVE
2899  2632  1156          TAD     HOMEMA                  /CURRENT FIELD
2900  2633  1115          TAD     K5000                   /FUNCTION WRITE ALL
2901  2634  3150          DCA     CMREG                   /SETUP COMMAND
2902  2635  1067          TAD     BGNBUF                  /GET START OF BUFFER
2903  2636  3152          DCA     CAREG                   /FOR ERROR PRINTER
2904  2637  4530  T36R,   TICK                                  /APT TIMING
2905  2640  7330          CLA CLL CML RAR
2906  2641  3143          DCA     GOREG2                  /SETUP EXPECTED STATUS COMPARE
2907  2642  1067          TAD     BGNBUF                  /START OF BUFFER
2908  2643  6744  IOT4A1, DLCA                           /LOAD CURRENT ADDRESS
2909  2644  1150          TAD     CMREG                   /LAST COMMAND
2910  2645  6746  IOT6A1, DLDC                           /LOAD COMMAND REGISTER
2911  2646  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2912  2647  6743  IOT3A1, DLAG                           /LOAD AND GO
2913  2650  6741  IOT1A1, DSKP                           /DISK SKIP IOT
2914  2651  5250          JMP     .-1                     /WAIT FOR FLAG
2915  2652  6745  IOT5A1, DRST                           /READ STATUS
2916  2653  1125          TAD     K4000                   /ADD IN FUDGE FACTOR
2917  2654  7440          SZA                             /STATUS O.K.????
2918  2655  5273          JMP     T36E                    /NO, STATUS ERROR
2919  2656  2463          ISZ I   XLOTRK
2920  2657  5262          JMP     .+3                     /DON'T SET EXTENDED TRACK
2921  2660  2150          ISZ     CMREG                   /YES, SET IT
2922  2661  2464          ISZ I   XHITRK                  /SETUP BUFFER ALSO
2923  2662  1464          TAD I   XHITRK                  /GET TRACK WORD
2924  2663  7110          CLL RAR                         /GET EXTENDED BIT TO LINK
2925  2664  7620          SNL CLA                         /WAS IT SET
2926  2665  5237          JMP     T36R                    /NO, CONTINUE
2927  2666  1463          TAD I   XLOTRK                  /GET LOWER TRACK WORD
2928  2667  1170          TAD     ENDTRK                  /ADD IN FUDGE FACTOR
2929  2670  7640          SZA CLA                         /DONE WITH DISK
2930  2671  5237          JMP     T36R                    /NO, MORE TO GO
2931  2672  5300          JMP     T36N                    /DONE
2932  2673  1125  T36E,   TAD     K4000                   /RESET STATUS
2933  2674  3146          DCA     STREG                   /SAVE FOR ERROR PRINTER
2934  2675  1463          TAD I   XLOTRK                  /GET ADDRESS
2935  2676  3151          DCA     DAREG                   /FOR ERROR PRINTER
2936  2677  7410          SKP                             /REPORT ERROR!
2937  2700  4437  T36N,   NERROR                          /O.K. TO NEXT TEST
2938  2701  444C          ERROR                           /ERROR, STATUS
2939  2702  2622          TST36                           /SCOPE LOOP POINTER
2940  2703  5300  T36T,   5300                            /TEXT POINTER
2941  2704  5705          JMP I   .+1
2942  2705  3000          TST37-2
2943                      /
2944                      /THE FOLLOWING IS A ROUTINE TO CHECK THE WRITE PROTECT
2945                      /FUNCTION WHEN IT IS MANUALLY SET BY THE OPERATOR.
2946                      /NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.
2947                      /
2948  2706  4405  MANPRO, CLASIC                          /CHECK FOR CLASSIC.
```



```
2949  2707  4431          C8SWIT                          /ROUTINE TO EXECUTE.
2950  2710  7000          NOP
2951  2711  4404          LAS                             /GET THE SWITCHES
2952  2712  7104          CLL RAL
2953  2713  0100          AND     K0006                   /MASK DRIVE NUMBER
2954  2714  3072          DCA     DRIVNO                  /SAVE DRIVE NUMBER
2955  2715  1111          TAD     K7700
2956  2716  3132          DCA     REG1                    /SETUP PASS COUNTER
2957  2717  3131          DCA     REG0                    /SETUP FLAG POINTER
2958  2720  1113          TAD     K2525                   /DATA PATTERN TO WRITE
2959  2721  4431          FILBUF                          /FILL OUTBOUND BUFFER
2960  2722  1072          TAD     DRIVNO
2961  2723  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2962  2724  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2963  2725  1115          TAD     K5000                   /WRITE ALL FUNCTION
2964  2726  3150          DCA     CMREG                   /SETUP COMMAND
2965  2727  4426          DISKGO                          /WRITE ALL TO SECTOR 0
2966  2730  2773          TMPROT                          /TEXT POINTER
2967  2731  5371          JMP     MPERR                   /ERROR, STATUS
2968  2732  4405          CLASIC
2969  2733  4436          CAERR
2970  2734  7402  MPHLT1, HLT                             /HALT AND WAIT FOR OPERATOR
2971                                                      /IF ON CLASSIC CONSOLE PACKAGE
2972                                                      /HIT CONTROL E. IF NOT THEN
2973                                                      /PRESS KEY CONTINUE.
2974                      /
2975  2735  4432  MPR1,   KILBUF                          /CLEAR OUTBOUND BUFFER
2976  2736  1072          TAD     DRIVNO
2977  2737  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2978  2740  1115          TAD     K5000                   /WRITE ALL FUNCTION
2979  2741  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
2980  2742  4426          DISKGO                          /WRITE ALL TO SECTOR 0
2981  2743  2773          TMPROT                          /TEXT POINTER
2982  2744  7200          NOP
2983  2745  7326          CLA CLL CML RTL
2984  2746  1012          TAD     K0020                   /MAKE EXPECTED STATUS
2985  2747  3143          DCA     GOREG2                  /SETUP COMPARE REGISTER
2986  2750  1166          TAD     K5300
2987  2751  3373          DCA     TMPROT                  /SETUP TEXT POINTER
2988  2752  1146          TAD     STREG                   /GET STATUS READ
2989  2753  4442          ACCMP1                          /CHECK RESULTS
2990  2754  7610          SKP CLA                         /STATUS O.K.
2991  2755  5371          JMP     MPERR                   /ERROR, WRITE PROTECT
2992  2756  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
2993  2757  4453          CLRALL                          /CLEAR CONTROL
2994  2760  4432          KILBUF                          /CLEAR DATA BUFFER
2995  2761  1017          TAD     K1000                   /FUNCTION READ ALL
2996  2762  3150          DCA     CMREG                   /SETUP COMMAND
2997  2763  4426          DISKGO                          /READ ALL SECTOR 0
2998  2764  2773          TMPROT                          /TEXT POINTER
2999  2765  5371          JMP     MPERR                   /ERROR
3000  2766  1113          TAD     K2525                   /EXPECTED PATTERN
3001  2767  4430          FIGURE                          /CHECK DATA READ
3002  2770  4437          NERROR                          /ALL O.K. GO LOOP 64 TIMES
3003  2771  4440  MPERR,  ERROR                           /ERROR, WRITE PROTECT
```

```
3004    2772  2735            MPR1
3005    2773  0000    TMPROT, 0000                    /TEXT POINTER
3006    2774  4405            CLASIC
3007    2775  4436            CSERR
3008    2776  7402    MPHLT2, HLT                     /SUCCESSFUL WRITE PROTECT
3009                                                  /TO REPEAT TEST: IF ON
3010                                                  /CLASSIC CONSOLE PACKAGE
3011                                                  /HIT CONTROL E, IF NOT THEN
3012                                                  /PRESS KEY CONTINUE.
3013    2777  5306            JMP     MANPRO          /REPEAT
3014          3000    PAGE
3015                  /
3016                  /BIG ADDRESSING CHECK!
3017                  /IF A DATA ERROR SHOULD HAPPEN TO OCCUR
3018                  /WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
3019                  /SHOULD REALIZE THAT THE PROBLEM COULD BE
3020                  /ADDRESSING.
3021                  /
3022                  /
3023                  /VERIFY THAT THE DATA ON DISK IS CORRECT
3024                  /CHECK THE COMPLETE SURFACE
3025                  /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3026                  /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
3027                  /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3028                  /
3029    3000  4525            JMS I   XLOAD
3030    3001  7770            7770
3031    3002  3134    T37T,   DCA     TCNTR1
3032    3003  1017            TAD     K1000           /FUNCTION READ ALL
3033    3004  1156            TAD     HOMEMA          /CURRENT FIELD
3034    3005  1072            TAD     DRIVNO          /CURRENT DRIVE
3035    3006  3150            DCA     CMREG           /SETUP COMMAND
3036    3007  1211            TAD     .+2             /GET TEXT POINTER
3037    3010  7410            SKP
3038    3011  3102            T37T                    /TEXT POINTER
3039    3012  3172            DCA     SAVPCT          /SAVE FOR CRC ERROR
3040    3013  1067            TAD     BGNBUF          /GET START OF BUFFER
3041    3014  3152            DCA     CAREG           /SAVE FOR ERROR PRINTER
3042    3015  4530    T37R,   TICK                            /APT TIMING
3043    3016  7340            CLA CLL CMA
3044    3017  3171            DCA     SOFERR          /SETUP CRC ERROR POINTER
3045    3020  4432            KILBUF                  /CLEAR DATA BUFFER
3046    3021  1134            TAD     TCNTR1          /LOWER DISK ADDRESS
3047    3022  3151            DCA     DAREG           /SAVE FOR PRINTER
3048    3023  1067            TAD     BGNBUF          /GET START OF BUFFER
3049    3024  6744    IOT4A2, DLCA                    /LOAD CURRENT ADDRESS
3050    3025  1150            TAD     CMREG           /GET COMMAND
3051    3026  6746    IOT6A2, DLDC                    /LOAD COMMAND REGISTER
3052    3027  1134            TAD     TCNTR1          /GET DISK ADDRESS
3053    3030  6743    IOT3A2, DLAG                    /LOAD DISK ADDRESS AND GO
3054    3031  6741    IOT1A2, DSKP                    /DISK SKIP IOT
3055    3032  5231            JMP     .-1             /WAIT FOR DISK SKIP
3056    3033  6745    IOT5A2, DRST                    /READ STATUS
3057    3034  3146            DCA     STREG           /SAVE FOR ERROR PRINTER
3058    3035  1146            TAD     STREG
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3059    3036  1105            TAD     K4000           /ADD IN FUDGE FACTOR
3060    3037  7650            SNA CLA                 /STATUS O.K.
3061    3040  5254            JMP     T37A            /NO STATUS ERRORS
3062    3041  7330            CLA CLL CML RAR         /EXPECTED STATUS
3063    3042  3143            DCA     GOREG2          /SETUP COMPARE REGISTER
3064    3043  1146            TAD     STREG           /GET STATUS READ
3065    3044  0011            AND     K0010           /MASK FOR CRC
3066    3045  7640            SZA CLA                 /WAS IT CRC ERROR
3067    3046  5252            JMP     .+4             /YES CRC ERROR
3068    3047  1166            TAD     K5300           /GET TEXT POINTER
3069    3050  3302            DCA     T37T            /SAVE IT
3070    3051  5300            JMP     T37E            /STATUS ERROR NOT CRC
3071    3052  3171            DCA     SOFERR          /SET CRC ERROR POINTER
3072    3053  5256            JMP     .+3             /DON'T CLEAR CONTROL
3073    3054  7301    T37A,   CLA CLL IAC             /ENABLE CLEAR CONTROL
3074    3055  6742    IOT2A2, DCLR                    /CLEAR CONTROL
3075    3056  1165            TAD     K5373
3076    3057  3302            DCA     T37T            /SETUP TEXT POINTER
3077    3060  1113            TAD     K2525           /GET EXPECTED DATA
3078    3061  4430            FIGURE                  /CHECK DATA READ
3079    3062  7610            SKP CLA                 /THIS ONE O.K.
3080    3063  5300            JMP     T37E            /ERROR, DATA
3081    3064  2134            ISZ     TCNTR1          /UPDATE LOWER DISK ADDRESS
3082    3065  7610            SKP CLA
3083    3066  2150            ISZ     CMREG           /SET EXTENDED BIT
3084    3067  1150            TAD     CMREG
3085    3070  0073            AND     K0001
3086    3071  7650            SNA CLA                 /IS EXTENDED SET
3087    3072  5215            JMP     T37R            /NO, CONTINUE
3088    3073  1134            TAD     TCNTR1
3089    3074  1170            TAD     ENDTRK          /ADD IN FUDGE FACTOR
3090    3075  7640            SZA CLA                 /DONE WITH DISK
3091    3076  5215            JMP     T37R            /NO, MORE TO GO
3092    3077  4437            NERROR                  /O.K. TO NEXT TEST
3093    3100  4440    T37E,   ERROR                   /ERROR, STATUS
3094    3101  3002            T3T37                   /SCOPE LOOP POINTER
3095    3102  5300    T37T,   5300
3096                  /
3097                  /
3098                  /BIG ADDRESSING CHECK!
3099                  /IF A DATA ERROR SHOULD HAPPEN TO OCCUR
3100                  /WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
3101                  /SHOULD REALIZE THAT THE PROBLEM COULD BE
3102                  /ADDRESSING.
3103                  /
3104                  /READ ALL SECTORS ON THE DISK AND CHECK
3105                  /THE STATUS. IF STATUS ERROR OCCURRES THEN CHECK THE DATA.
3106                  /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3107                  /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
3108                  /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3109                  /
3110    3103  4525            JMS I   XLOAD
3111    3104  7770            7770
3112    3105  7340    T3T38,  CLA CLL CMA
3113    3106  3171            DCA     SOFERR          /SETUP CRC ERROR POINTER
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3114  3107  3134          DCA     TCNTR1                  /SETUP LOWER ADDRESS
3115  3110  3135          DCA     TCNTR2                  /SETUP EXTENDED
3116  3111  1017          TAD     K1000                   /FUNCTION READ ALL
3117  3112  1072          TAD     DRIVNO                  /CURRENT DRIVE
3118  3113  1156          TAD     HOMEMA                  /CURRENT FIELD
3119  3114  3150          DCA     CMREG                   /SETUP COMMAND
3120  3115  4530  T38R,   TICK                            /APT TIMING
3121  3116  1067          TAD     BGNBUF                  /START OF BUFFER
3122  3117  4451          LDCUR                           /LOAD CURRENT
3123  3120  1150          TAD     CMREG                   /LAST COMMAND ISSUED
3124  3121  4450          LDCMD                           /LOAD COMMAND
3125  3122  1134          TAD     TCNTR1                  /LOWER ADDRESS
3126  3123  4452          LDADD                           /LOAD AND GO
3127  3124  4447          DSKSKP                          /DISK SKIP IOT
3128  3125  5324          JMP     .-1                     /HANG IF NO SKIP
3129  3126  4444          RDSTAT                          /READ STATUS
3130  3127  1105          TAD     K4000                   /SHOULD ONLY BE DONE
3131  3130  7640          SZA CLA                         /JUST DONE FLAG ?
3132  3131  5346          JMP     T38E                    /STATUS ERROR
3133  3132  2134          ISZ     TCNTR1                  /UPDATE ADDRESS
3134  3133  5336          JMP     .+3                     /DON'T SET EXTENDED TRACK
3135  3134  2150          ISZ     CMREG                   /YES, SET IT
3136  3135  2135          ISZ     TCNTR2
3137  3136  1135          TAD     TCNTR2
3138  3137  7650          SNA CLA                         /IS EXTENDED SET
3139  3140  5315          JMP     T38R                    /NO, CONTINUE
3140  3141  1134          TAD     TCNTR1
3141  3142  1170          TAD     ENDTRK                  /ADD IN FUDGE FACTOR
3142  3143  7640          SZA CLA                         /DONE WITH DISK
3143  3144  5315          JMP     T38R                    /NO, MORE TO GO
3144  3145  5356          JMP     T38OK                   /ALL O.K.
3145  3146  1113  T38E,   TAD     K2525
3146  3147  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3147  3150  5353          JMP     .+3                     /ERROR, JUST THE STATUS
3148  3151  1165          TAD     K5373                   /TEXT POINTER
3149  3152  7410          SKP                             /DATA ERROR
3150  3153  1166          TAD     K5300                   /STATUS TEXT POINTER
3151  3154  3361          DCA     T38T                    /SETUP
3152  3155  7610          SKP CLA                         /STATUS ERROR
3153  3156  4437  T38OK,  NERROR                         /O.K. TO NEXT TEST
3154  3157  4440  T38DE,  ERROR                          /ERROR, READ DATA
3155  3160  3105          TST38                           /SCOPE LOOP POINTER
3156  3161  5300  T38T,   5300                            /TEXT POINTER
3157                    /
3158                    /
3159                    /BIG ADDRESSING CHECK;
3160                    /IF A DATA ERROR SHOULD HAPPEN TO OCCUR
3161                    /WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
3162                    /SHOULD REALIZE THAT THE PROBLEM COULD BE
3163                    /ADDRESSING.
3164                    /
3165                    /CHECK DISK HEADER WORD WITH READ DATA
3166                    /IF STATUS ERROR OCCURRES THEN CHECK DATA.
3167                    /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3168                    /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
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3169                    /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3170                    /
3171  3162  4525          JMS I   XLOAD
3172  3163  7776          7776
3173  3164  7340  T39T,   CLA CLL CMA
3174  3165  3171          DCA     SOFERR                  /NO SOFT ERRORS
3175  3166  3134          DCA     TCNTR1                  /SETUP LOWER ADDRESS
3176  3167  3135          DCA     TCNTR2                  /SETUP EXTENDED
3177  3170  1072          TAD     DRIVNO                  /CURRENT DRIVE
3178  3171  1156          TAD     HOMEMA                  /CURRENT FIELD
3179  3172  3150          DCA     CMREG                   /SETUP COMMAND
3180  3173  4530  T39R,   TICK                            /APT TIMING
3181  3174  1067          TAD     BGNBUF                  /START OF BUFFER
3182  3175  4451          LDCUR                           /LOAD CURRENT
3183  3176  1150          TAD     CMREG                   /LAST COMMAND
3184  3177  4450          LDCMD                           /LOAD COMMAND
3185  3200  1134          TAD     TCNTR1                  /LOWER ADDRESS
3186  3201  4452          LDADD                           /LOAD AND GO
3187  3202  4447          DSKSKP                          /DISK SKIP IOT
3188  3203  5202          JMP     .-1                     /HANG IF NO SKIP
3189  3204  4444          RDSTAT                          /READ STATUS
3190  3205  1105          TAD     K4000                   /SHOULD ONLY BE DONE
3191  3206  7640          SZA CLA                         /JUST DONE FLAG ?
3192  3207  5224          JMP     T39E                    /STATUS ERROR
3193  3210  2134          ISZ     TCNTR1                  /UPDATE ADDRESS
3194  3211  5214          JMP     .+3                     /DON'T SET EXTENDED TRACK
3195  3212  2150          ISZ     CMREG                   /YES, SET IT
3196  3213  2135          ISZ     TCNTR2
3197  3214  1135          TAD     TCNTR2
3198  3215  7650          SNA CLA                         /IS EXTENDED SET
3199  3216  5777*         JMP     T39R                    /NO, CONTINUE
3200  3217  1134          TAD     TCNTR1
3201  3220  1170          TAD     ENDTRK                  /ADD IN FUDGE FACTOR
3202  3221  7640          SZA CLA                         /DONE WITH DISK
3203  3222  5777*         JMP     T39R                    /NO, MORE TO GO
3204  3223  5234          JMP     T39OK                   /ALL O.K.
3205  3224  1113  T39E,   TAD     K2525
3206  3225  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3207  3226  5231          JMP     .+3                     /ERROR, JUST STATUS
3208  3227  1165          TAD     K5373                   /TEXT POINTER
3209  3230  7410          SKP                             /ERROR
3210  3231  1166          TAD     K5300                   /STATUS ERROR POINTER
3211  3232  3237          DCA     T39T                    /SETUP
3212  3233  7610          SKP CLA
3213  3234  4437  T39OK,  NERROR                         /O.K. TO NEXT TEST
3214  3235  4440  T39DE,  ERROR                          /ERROR, READ DATA
3215  3236  3164          TST39                           /SCOPE LOOP POINTER
3216  3237  5300  T39T,   5300                            /TEXT POINTER
3217                    /
3218                    /DO A RANDOM READ DATA
3219                    /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3220                    /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
3221                    /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3222                    /
3223  3240  1107  TST40,  TAD     K7000
```

```
3224  3241  3140          DCA     TCNTR5                  /LENGTH OF TIME FOR THIS TEST
3225  3242  4423  T40R,   RANADD                         /GET AN ADDRESS FOR SEEK/READ
3226  3243  3136          DCA     TCNTR3                  /SAVE IT
3227  3244  7004          RAL                             /LINK IS EXTENDED
3228  3245  3137          DCA     TCNTR4                  /SAVE IT
3229  3246  1137  T40S,   TAD     TCNTR4
3230  3247  3150          DCA     CMREG                   /SETUP COMMAND
3231  3250  1136          TAD     TCNTR3
3232  3251  4426          DISKGO                          /DISK READ DATA
3233  3252  3265          T40T                            /TEXT POINTER
3234  3253  5263          JMP     T40E                    /ERROR, SKIP OR STATUS
3235  3254  1113          TAD     K2525
3236  3255  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3237  3256  7610          SKP CLA                         /DATA O.K.
3238  3257  5263          JMP     T40E                    /DATA ERROR
3239  3260  2140          ISZ     TCNTR5
3240  3261  5242          JMP     T40R                    /LOOP
3241  3262  4437          NERROR                          /O.K. TO NEXT TEST
3242  3263  4440  T40E,   ERROR                          /ERROR, READ
3243  3264  3240          TST40                           /SCOPE LOOP POINTER
3244  3265  0000  T40T,   0000                            /TEXT POINTER
3245                      /
3246                      /RANDOM SEEK THEN WRITE THEN SEEK THEN READ TEST
3247                      /THE DATA WRITTEN IS 2525+5252  AND THE TWO
3248                      /FIRST WORDS OF THE SECTOR ARE SET TO THE DISK ADDRESS.
3249                      /
3250  3266  4525          JMS I   XLOAD
3251  3267  3777          3777
3252  3270  1111  TST41,  TAD     K7700
3253  3271  3140          DCA     TCNTR5                  /PASS COUNTER
3254  3272  4423  T41R,   RANADD                         /GENERATE RANDOM NUMBER
3255  3273  0117          AND     K0017
3256  3274  1110          TAD     K7760
3257  3275  3141          DCA     TCNTR6                  /SAVE COUNTER
3258  3276  4423          RANADD                          /RANDOM SEEK DISK ADDRESS
3259  3277  3134          DCA     TCNTR1                  /SAVE
3260  3300  7004          RAL                             /LINK IS EXTENDED BIT
3261  3301  3135          DCA     TCNTR2                  /SAVE
3262  3302  4423          RANADD                          /RANDOM SEEK/WRITE DISK ADDRESS
3263  3303  3136          DCA     TCNTR3                  /SAVE
3264  3304  7004          RAL                             /LINK IS EXTENDED BIT
3265  3305  3137          DCA     TCNTR4                  /SAVE IT
3266  3306  1113  T41S,   TAD     K2525
3267  3307  4431          FILBUF                          /FILL BUFFER
3268  3310  1137          TAD     TCNTR4                  /GET EXTENDED BIT
3269  3311  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
3270  3312  3464          DCA I   XMITRK                  /DISK ADDRESS WORD IN BUFFER
3271  3313  1136          TAD     TCNTR3                  /LOWER DISK ADDRESS
3272  3314  3463          DCA I   XLOTRK                  /DISK ADDRESS WORD IN BUFFER
3273  3315  1135          TAD     TCNTR2                  /GET EXTENDED BIT
3274  3316  3150          DCA     CMREG                   /SETUP COMMAND
3275  3317  1134          TAD     TCNTR1                  /DISK ADDRESS
3276  3320  4424          SEEK                            /SEEK ONLY
3277  3321  3361          T41T                            /TEXT POINTER
3278  3322  5357          JMP     T41E                    /ERROR SKIP OR STATUS
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3279  3323  1137          TAD     TCNTR4                  /EXTENDED BIT
3280  3324  1105          TAD     K4000                   /FUNCTION WRITE DATA
3281  3325  3150          DCA     CMREG                   /SETUP COMMAND
3282  3326  1136          TAD     TCNTR3                  /DISK ADDRESS
3283  3327  4426          DISKGO                          /DISK WRITE DATA
3284  3330  3361          T41T                            /TEXT POINTER
3285  3331  5357          JMP     T41E                    /ERROR SKIP OR STATUS
3286  3332  1135          TAD     TCNTR2                  /GET EXTENDED BIT
3287  3333  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
3288  3334  1134          TAD     TCNTR1                  /GET DISK ADDRESS
3289  3335  4424          SEEK                            /GO SEEK ONLY
3290  3336  3361          T41T                            /TEXT POINTER
3291  3337  5357          JMP     T41E                    /ERROR, SEEK SKIP OR STATUS
3292  3340  1137          TAD     TCNTR4                  /GET EXTENDED BIT
3293  3341  3150          DCA     CMREG                   /SETUP READ DATA COMMAND
3294  3342  1136          TAD     TCNTR3                  /DISK ADDRESS
3295  3343  4426          DISKGO                          /DISK READ DATA
3296  3344  3361          T41T                            /TEXT POINTER
3297  3345  5357          JMP     T41E                    /ERROR, SKIP OR STATUS
3298  3346  1113          TAD     K2525
3299  3347  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3300  3350  7610          SKP CLA                         /DATA O.K.
3301  3351  5357          JMP     T41E                    /DATA ERROR
3302  3352  2141          ISZ     TCNTR6                  /COUNT TO SAME TRACKS
3303  3353  5306          JMP     T41S                    /REPEAT
3304  3354  2140          ISZ     TCNTR5                  /PASS COUNTER
3305  3355  5272          JMP     T41R                    /LOOP
3306  3356  4437          NERROR                          /O.K. TO NEXT TEST
3307  3357  4440  T41E,   ERROR                          /ERROR
3308  3360  3270          TST41                           /SCOPE LOOP POINTER
3309  3361  5373  T41T,   5373                            /TEXT POINTER
3310  3362  5763          JMP I   .+1
3311  3363  3400          TST42
3312                      /
3313                      /
3314                      /VERIFY A RECALIBRATE THEN A RANDOM WRITE DATA,
3315                      /THEN A RECALIBRATE THEN RANDOM READ DATA.
3316                      /THE DATA PATTERN WRITTEN IS 2525+5252 AND
3317                      /THE FIRST TWO WORDS OF EVERY SECTOR
3318                      /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3319                      /
3320                      /
3321  3377  3173
            3400  PAGE
3322                      /
3323  3400  1111  TST42,  TAD     K7700
3324  3401  3140          DCA     TCNTR5                  /PASS COUNTER
3325  3402  4423  T42R,   RANADD                         /RANDOM DISK ADDRESS
3326  3403  3134          DCA     TCNTR1                  /SAVE
3327  3404  7004          RAL                             /LINK IS EXTENDED BIT
3328  3405  3135          DCA     TCNTR2                  /SAVE
3329  3406  1113  T42S,   TAD     K2525
3330  3407  4431          FILBUF                          /FILL BUFFER
3331  3410  1135          TAD     TCNTR2                  /GET EXTENDED BIT
3332  3411  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
```

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3333  3412  3464          DCA I   XHITRK                  /DISK ADDRESS WORD IN BUFFER
3334  3413  1134          TAD     TCNTR1                  /LOWER DISK ADDRESS
3335  3414  3463          DCA I   XLOTRK                  /DISK ADDRESS WORD IN BUFFER
3336  3415  4425          RECAL                           /RESTORE DRIVE
3337  3416  3451          T42T                            /TEXT POINTER
3338  3417  5247          JMP     T42E                    /ERROR SKIP OR STATUS
3339  3420  1135          TAD     TCNTR2                  /EXTENDED BIT
3340  3421  1125          TAD     K4000                   /FUNCTION WRITE DATA
3341  3422  3150          DCA     CMREG                   /SETUP COMMAND
3342  3423  1134          TAD     TCNTR1                  /DISK ADDRESS
3343  3424  4426          DISKGO                          /DISK WRITE DATA
3344  3425  3451          T42T                            /TEXT POINTER
3345  3426  5247          JMP     T42E                    /ERROR SKIP OR STATUS
3346  3427  4425          RECAL                           /RESTORE DRIVE
3347  3430  3451          T42T                            /TEXT POINTER
3348  3431  5247          JMP     T42E                    /ERROR, SKIP OR STATUS
3349  3432  1135          TAD     TCNTR2                  /GET EXTENDED BIT
3350  3433  3150          DCA     CMREG                   /SETUP READ DATA COMMAND
3351  3434  1134          TAD     TCNTR1                  /DISK ADDRESS
3352  3435  4426          DISKGO                          /DISK READ DATA
3353  3436  3451          T42T                            /TEXT POINTER
3354  3437  5247          JMP     T42E                    /ERROR, SKIP OR STATUS
3355  3440  1113          TAD     K2525
3356  3441  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3357  3442  7610          SKP CLA                         /DATA O.K.
3358  3443  5247          JMP     T42E                    /DATA ERROR
3359  3444  2140          ISZ     TCNTR5                  /PASS COUNTER
3360  3445  5202          JMP     T42R                    /LOOP
3361  3446  4437          NERROR                          /O.K. TO NEXT TEST
3362  3447  4440  T42E,   ERROR                           /ERROR
3363  3450  3400          TST42                           /SCOPE LOOP POINTER
3364  3451  5373  T42T,   5373                            /TEXT POINTER
3365                      /
3366                      /SINGLE DRIVE VIBRATION TEST
3367                      /
3368                      /TRY TO CAUSE CYLINDER ADDRESS ERRORS BY
3369                      /DOING A FEW RANDOM SEEKS THEN A READ DATA.
3370                      /
3371  3452  1341  TST43,  TAD     TIMSTP
3372  3453  3140          DCA     TCNTR5                  /SETUP PASS COUNTER
3373  3454  4432  T43R1,  KILBUF                         /CLEAR BUFFER
3374  3455  4423          RANADD                          /GET RANDOM NUMBER
3375  3456  0120          AND     K0037
3376  3457  1122          TAD     K7740
3377  3460  3137          DCA     TCNTR4                  /SETUP COUNTER FOR SEEKS
3378  3461  4423  T43R2,  RANADD                         /GET RANDOM SEEK ADDRESS
3379  3462  3136          DCA     TCNTR3                  /SAVE IT
3380  3463  7004          RAL                             /LINK IS EXTENDED BIT
3381  3464  3135          DCA     TCNTR2                  /SAVE IT
3382  3465  1135          TAD     TCNTR2
3383  3466  3150          DCA     CMREG                   /SETUP COMMAND
3384  3467  1136          TAD     TCNTR3
3385  3470  4424          SEEK                            /SEEK ONLY A RANDOM TRACK
3386  3471  3514          T43T                            /TEXT POINTER
3387  3472  5312          JMP     T43E                    /ERROR, SKIP OR STATUS
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3388  3473  2137          ISZ     TCNTR4                  /COUNT NUMBER TO DO
3389  3474  5261          JMP     T43R2
3390  3475  1135          TAD     TCNTR2
3391  3476  3150          DCA     CMREG                   /SETUP FOR READ DATA
3392  3477  1136          TAD     TCNTR3
3393  3500  4426          DISKGO                          /LOAD AND GO READ DATA
3394  3501  3514          T43T                            /TEXT POINTER
3395  3502  5312          JMP     T43E                    /ERROR SKIP OR STATUS
3396  3503  1113          TAD     K2525
3397  3504  4430          FIGURE                          /CHECK DATA READ
3398  3505  7610          SKP CLA                         /ALL O.K.
3399  3506  5312          JMP     T43E                    /ERROR, DATA
3400  3507  2140          ISZ     TCNTR5
3401  3510  5254          JMP     T43R1                   /MORE TO TEST
3402  3511  4437          NERROR                          /P.K. TO NEXT TEST
3403  3512  4440  T43E,   ERROR                           /ERROR, SKIP, STATUS, OR DATA
3404  3513  3452          TST43                           /SCOPE LOOP POINTER
3405  3514  0000  T43T,   0000                            /TEXT POINTER
3406                      /
3407                      /CHECK DISK HEADER WORDS WITH READ DATA
3408                      /IF STATUS ERROR OCCURRES THEN CHECK DATA.
3409                      /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3410                      /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
3411                      /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3412                      /
3413  3515  4525          JMS I   XLOAD
3414  3516  7775          7775
3415  3517  7340  TST44,  CLA CLL CMA
3416  3520  3171          DCA     SOFERR                  /SETUP CRC ERROR POINTER
3417  3521  3134          DCA     TCNTR1                  /SETUP LOWER ADDRESS
3418  3522  3135          DCA     TCNTR2                  /SETUP EXTENDED
3419  3523  1072          TAD     DRIVNO                  /CURRENT DRIVE
3420  3524  1156          TAD     HOMEMA                  /CURRENT FIELD
3421  3525  3150          DCA     CMREG                   /SETUP COMMAND
3422  3526  4530  T44R,   TICK
3423  3527  1067          TAD     BGNBUF                  /START OF BUFFER
3424  3530  4451          LOCUR                           /LOAD CURRENT ADDRESS
3425  3531  1150          TAD     CMREG                   /LAST COMMAND ISSUED
3426  3532  4450          LOCMD                           /LOAD COMMAND
3427  3533  1134          TAD     TCNTR1                  /LOWER ADDRESS
3428  3534  4452          LDADD                           /LOAD AND GO
3429  3535  4447          DSKSKP                          /DISK SKIP IOT
3430  3536  5335          JMP     .-1                     /HANG IF NO SKIP
3431  3537  4444          RDSTAT                          /READ STATUS
3432  3540  1105          TAD     K4000                   /SHOULD ONLY BE DONE
3433  3541  7640  TIMSTP,  SZA CLA                       /JUST DONE FLAG ?
3434  3542  5357          JMP     T44E                    /STATUS ERROR
3435  3543  2134          ISZ     TCNTR1                  /UPDATE ADDRESS
3436  3544  5347          JMP     .+3                     /DON'T SET EXTENDED TRACK
3437  3545  2150          ISZ     CMREG                   /YES, SET IT
3438  3546  2135          ISZ     TCNTR2
3439  3547  1135          TAD     TCNTR2
3440  3550  7650          SNA CLA                         /IS EXTENDED SET
3441  3551  5326          JMP     T44R                    /NO, CONTINUE
3442  3552  1134          TAD     TCNTR1
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3443  3553  1170          TAD     ENDTRK                  /ADD IN FUDGE FACTOR
3444  3554  7640          SZA CLA                         /DONE WITH DISK
3445  3555  5326          JMP     T44R                    /NO, MORE TO GO
3446  3556  5367          JMP     T44OK                   /ALL O.K.
3447  3557  1113  T44E,   TAD     K2525
3448  3560  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
3449  3561  5364          JMP     .+3                     /ERROR, JUST STATUS
3450  3562  1165          TAD     K5373                   /TEXT POINTER
3451  3563  7410          SKP                             /ERROR
3452  3564  1166          TAD     K5300                   /STATUS ERROR POINTER
3453  3565  3372          DCA     T44T                    /SETUP
3454  3566  7610          SKP CLA
3455  3567  4437  T44OK,  NERROR                         /O.K. TO NEXT TEST
3456  3570  4440          ERROR                           /ERROR, READ DATA
3457  3571  3517          TST44                           /SCOPE LOOP POINTER
3458  3572  5300  T44T,   5300                            /TEXT POINTER
3459                      /
3460  3573  5774          JMP I   .+1
3461  3574  3616          TST45=4                 /NEXT TEST
3462        3600  PAGE
3463                      /
3464                      /ROUTINE TO COMPARE CRREG1 AND CRREG2 TO
3465                      /GDREG1 AND GDREG2.
3466                      /
3467  3600  0000  COMP2,  0
3468  3601  7300          CLA CLL
3469  3602  1142          TAD     GDREG1
3470  3603  0117          AND     K0017
3471  3604  7041          CIA
3472  3605  1144          TAD     CRREG1
3473  3606  7640          SZA CLA
3474  3607  5214          JMP     CRERR                   /NOT THE SAME
3475  3610  1145          TAD     CRREG2
3476  3611  7041          CIA
3477  3612  1143          TAD     GDREG2
3478  3613  7640          SZA CLA
3479  3614  2200  CRERR,  ISZ     COMP2                   /ERROR, NOT THE SAME
3480  3615  5600          JMP I   COMP2
3481                      /
3482                      /
3483                      /VERIFY THAT WRITING ON A TRACK DOES NOT AFFECT
3484                      /AN ADJACENT TRACK. THE TEST SEQUENCE IS AS FOLLOWS:
3485                      /WRITE TRACKS 00000-00100-00040 THEN READ AND CHECK
3486                      /TRACKS 00040-00000-00100, WRITE TRACKS 00020-00120-00060
3487                      /THEN READ AND CHECK TRACKS 00060-00020-00120, ETC.
3488                      /THE CENTER TRACK IS SET TO A DATA PATTERN OF
3489                      /2525+5252. THE LOWER AND UPPER TRACKS ARE
3490                      /SET TO A DATA PATTERN OF 5252+2525. THE FIRST TWO
3491                      /WORDS OF EVERY SECTOR ARE SET TO THE ABSOLUTE
3492                      /DISK ADDRESS.
3493                      /
3494  3616  7346          CLL CLA CMA RTL
3495  3617  3175          DCA     KCNT                    /ESTABLISH PROPER COUNT
3496  3620  4525          JMS I   XLOAD
3497  3621  7750          7750
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3498  3622  1012  T545,   TAD     K0020                   /GET STARTING POINTER
3499  3623  3134          DCA     TCNTR1                  /SAVE IT
3500  3624  1372          TAD     K7156
3501  3625  3140          DCA     TCNTR5                  /COUNTER FOR TRACKS TO DO
3502  3626  7346  T45SC,  CLA CLL CMA RTL
3503  3627  3137          DCA     TCNTR4                  /THREE TRACK COUNTER POINTER
3504  3630  1134          TAD     TCNTR1
3505  3631  3136          DCA     TCNTR3                  /WRITE CENTER TRACK FIRST
3506  3632  1113          TAD     K2525                   /DATA PATTERN FOR CENTER TRACK
3507  3633  5244          JMP     T45A1                   /GO WRITE CENTER TRACK
3508  3634  1137  T45R1,  TAD     TCNTR4                  /GET POINTER
3509  3635  7110          CLL RAR
3510  3636  7630          SZL CLA                         /WRITE UPPER OR LOWER????
3511  3637  1122          TAD     K7740                   /DO LOWER
3512  3640  1012          TAD     K0020
3513  3641  1134          TAD     TCNTR1                  /REDUCE OR UPDATE
3514  3642  3136          DCA     TCNTR3                  /SAVE TRACK TO DO
3515  3643  1114          TAD     K5252                   /USE COMPLEMENT OF CENTER TRACK
3516  3644  4431  T45A1,  FILBUF                         /FILL BUFFER WITH DATA
3517  3645  1110          TAD     K7760                   /GET SECTOR COUNTER POINTER
3518  3646  3135          DCA     TCNTR2                  /SETUP COUNTER
3519  3647  3141          DCA     TCNTR6                  /START WITH 0
3520  3650  1141  T45R2,  TAD     TCNTR6                  /GET SECTOR POINTER
3521  3651  0117          AND     K0017                   /MASK SECTORS
3522  3652  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
3523  3653  1136          TAD     TCNTR3                  /GET DISK ADDRESS
3524  3654  7104          CLL RAL                         /PUT EXTENDED BIT IN LINK
3525  3655  0110          AND     K7760
3526  3656  1463          TAD I   XLOTRK                  /ADD IN SECTORS
3527  3657  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
3528  3660  7630          SZL CLA                         /SET EXTENDED BIT????
3529  3661  7001          IAC                             /YES!!!
3530  3662  1072          TAD     DRIVNO                  /ADD IN CURRENT DRIVE
3531  3663  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
3532  3664  1464          TAD I   XHITRK                  /GET EXTENDED BIT
3533  3665  1105          TAD     K4000                   /FUNCTION WRITE DATA
3534  3666  3150          DCA     CMREG                   /SETUP COMMAND REGISTER POINTER
3535  3667  1463          TAD I   XLOTRK                  /GET CYL., SURFACE, AND SECTOR
3536  3670  4426          DISKGO                          /WRITE ALL
3537  3671  3767          T45T                            /TEXT POINTER
3538  3672  5365          JMP     T45E                    /ERROR, WRITE SKIP OR STATUS
3539  3673  1141          TAD     TCNTR6
3540  3674  1075          TAD     K0003                   /UPDATE SECTOR POINTER
3541  3675  3141          DCA     TCNTR6
3542  3676  2135          ISZ     TCNTR2                  /UPDATE SECTOR COUNTER
3543  3677  5250          JMP     T45R2                   /DO REST OF TRACK
3544  3700  2137          ISZ     TCNTR4                  /UPDATE TRACK COUNTER
3545  3701  5234          JMP     T45R1                   /DO OTHERS
3546                      /
3547  3702  7340          CLA CLL CMA
3548  3703  3144          DCA     CRREG1                  /SETUP FIRST TIME POINTER
3549  3704  7346          CLA CLL CMA RTL
3550  3705  3137          DCA     TCNTR4                  /TRACK COUNTER POINTER
3551  3706  1134          TAD     TCNTR1
3552  3707  3136          DCA     TCNTR3                  /SETUP FOR READ CENTER FIRST
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3553  3710  5320          JMP     T45A2                   /READ AND CHECK CENTER TRACK
3554  3711  1137  T45R3,  TAD     TCNTR4                  /POINTER
3555  3712  7110          CLL RAR
3556  3713  7630          SZL CLA                         /CHECK UPPER OR LOWER
3557  3714  1122          TAD     K7740                   /CHECK LOWER
3558  3715  1012          TAD     K0020
3559  3716  1134          TAD     TCNTR1                  /REDUCE OR UPDATE
3560  3717  3136          DCA     TCNTR3                  /SAVE THE TRACK TO READ
3561  3720  1110  T45A2,  TAD     K7760                   /AMOUNT OF SURFACE SECTORS
3562  3721  3135          DCA     TCNTR2                  /SETUP SECTOR COUNTER
3563  3722  3141          DCA     TCNTR6                  /START WITH 0
3564  3723  1136  T45R4,  TAD     TCNTR3                  /GET DISK ADDRESS
3565  3724  7104          CLL RAL                         /PUT EXTENDED BIT IN LINK
3566  3725  0110          AND     K7740
3567  3726  3145          DCA     CRREG2                  /SAVE RESULTS
3568  3727  7630          SZL CLA                         /SET EXTENDED BIT
3569  3730  7001          IAC                             /YES
3570  3731  3150          DCA     CMREG                   /SETUP COMMAND FOR READ DATA
3571  3732  1141          TAD     TCNTR6                  /GET SECTOR POINTER
3572  3733  0117          AND     K0017                   /MASK
3573  3734  1145          TAD     CRREG2                  /ADD IN TRACK
3574  3735  4426          DISKGO                          /READ DATA
3575  3736  3767          T45T                            /TEXT POINTER
3576  3737  5365          JMP     T45E                    /ERROR, READ SKIP OR STATUS
3577  3740  1144          TAD     CRREG1                  /GET FIRST TIME POINTER
3578  3741  7650          SNA CLA                         /FIRST TIME????
3579  3742  1113          TAD     K2525                   /NO
3580  3743  1113          TAD     K2525
3581  3744  4430          FIGURE                          /CHECK DATA READ
3582  3745  7610          SKP CLA                         /DATA ALL O.K.
3583  3746  5365          JMP     T45F                    /ERROR, DATA
3584  3747  1141          TAD     TCNTR6
3585  3750  1077          TAD     KP005                   /UPDATE SECTOR POINTER
3586  3751  3141          DCA     TCNTR6
3587  3752  2135          ISZ     TCNTR2                  /UPDATE SECTOR COUNTER
3588  3753  5323          JMP     T45R4                   /DO REST OF SURFACE
3589  3754  3144          DCA     CRREG1                  /CLEAR FIRST TIME FLAG
3590  3755  2137          ISZ     TCNTR4                  /UPDATE TRACK COUNTER
3591  3756  5311          JMP     T45R3                   /DO OTHER TRACKS
3592  3757  1134          TAD     TCNTR1                  /GET CURRENT TRACK POINTER
3593  3760  1011          TAD     K0010                   /UPDATE
3594  3761  3134          DCA     TCNTR1                  /SAVE IT
3595  3762  2140          ISZ     TCNTR5                  /UPDATE TOTAL AMOUNT TO DO
3596  3763  5226          JMP     T45SC                   /MORE TO DO
3597  3764  4437          NERR0P                          /ALL O.K. TO END OF TEST
3598  3765  4440  T45E,   ERROR                           /ERROR, TRACKS AFFECTED
3599  3766  3622          T5T45                           /SCOPE LOOP POINTER
3600  3767  0000  T45T,   0000                            /MODIFIED TEXT POINTER
3601                      /
3602  3770  5771          JMP I   .+1                     /TO END OF TEST
3603  3771  4062          ENDTST
3604                      /
3605  3772  7156  K7156,  7156
3606                      /
3607        4000          PAGE
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3608                      /
3609                      /ROUTINE TO WAIT FOR 500 MS.
3610                      /
3611  4000  0000  WTISZ,  0
3612  4001  7320          CLA CLL
3613  4002  1122          TAD     K7740                   /GET TIME CONSTANT
3614  4003  3330          DCA     RDAD
3615  4004  3331          DCA     LOMN
3616  4005  2331          ISZ     LOMN
3617  4006  5205          JMP     .+1
3618  4007  2330          ISZ     RDAD
3619  4010  5205          JMP     .+3
3620  4011  5600          JMP I   WTISZ                   /EXIT
3621                      /
3622                      /
3623                      /
3624                      /PROGRAM TO AID IN HEAD ALIGNMENT.
3625                      /GET TWO SEPARATE SEEK ADDRESS FROM
3626                      /THE SWITCH REGISTER AND SEEK ONLY BETWEEN
3627                      /THEM. SECOND ADDRESS MAY BE CHANGED AT ANY TIME.
3628                      /
3629  4012  4405  SWSEK,  CLASIC                          /CHECK FOR CLASSIC.
3630  4013  4431          C8SWIT                          /ROUTINE TO EXECUTE.
3631  4014  7000          NOP
3632  4015  4404          LAS                             /GET FIRST ADDRESS
3633  4016  3134          DCA     TCNTR1                  /SAVE IT
3634  4017  4405          CLASIC                          /CHECK FOR CLASSIC ACTIVE
3635  4020  4436          C8ERR                           /ROUTINE TO EXECUTE.
3636  4021  7402  HEDHLT, HLT                            /WAIT FOR SECOND ADDRESS, IF ON
3637                                                      /CLASSIC CONSOLE PACKAGE HIT
3638                                                      /CONTROL E, IF NOT THEN PRESS
3639                                                      /KEY CONTINUE.
3640  4022  4405  RESEK,  CLASIC                          /CHECK FOR CLASSIC
3641  4023  4431          C8SWIT                          /ROUTINE TO EXECUTE.
3642  4024  7000          NOP
3643  4025  4404          LAS                             /GET SECOND ADDRESS
3644  4026  3135          DCA     TCNTR2                  /SAVE IT
3645  4027  1135          TAD     TCNTR2
3646  4030  0101          AND     K0007                   /MASK DRIVE+EXT. BIT
3647  4031  1104          TAD     K3000                   /GET SEEK FUNCTION
3648  4032  4450          LDCMD                           /LOAD COMMAND REGISTER
3649  4033  1135          TAD     TCNTR2
3650  4034  0110          AND     K7760                   /MASK OFF CYLINDER+SURFACE
3651  4035  4452          LDADD                           /GO SEEK ONLY
3652  4036  4447          DSKSKP                          /SKIP ON DONE
3653  4037  5236          JMP     .-1
3654  4040  4453          CLRALL                          /CLEAR STATUS
3655  4041  4444          RDSTAT                          /READ STATUS
3656  4042  7640          SZA CLA                         /DRIVE DONE?
3657  4043  5240          JMP     .-3                     /NO, WAIT
3658  4044  1134          TAD     TCNTR1                  /GET FIRST ADDRESS
3659  4045  0101          AND     K0007                   /MASK DRIVE+EXT. BIT
3660  4046  1104          TAD     K3000                   /GET SEEK FUNCTION
3661  4047  4450          LDCMD                           /LOAD COMMAND REGISTER
3662  4050  1134          TAD     TCNTR1
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3663  4051  0110          AND     K7760                   /MASK OFF CYLINDER AND SURFACE
3664  4052  4452          LOADD                           /LOAD AND GO SEEK
3665  4053  4447          DSKSKP                          /WAIT FOR DONE
3666  4054  5253          JMP     .-1
3667  4055  4453          CLRALL                          /CLEAR STATUS
3668  4056  4448          RDSTAT                          /READ STATUS
3669  4057  7640          SZA CLA                         /DRIVE DONE?
3670  4060  5255          JMP     .-3                     /NO, WAIT
3671  4061  5225          JMP     RESEK+3         /CHECK FOR NEW ADDRESS
3672                      /
3673                      /IF ALL DRIVES HAVE BEEN TESTED INDIVIDUALLY
3674                      /THEN RUN OVERLAP SEEKS AND OVERLAP SEEKS, WRITES,
3675                      /AND READS ON ALL DRIVES SELECTED. ALSO CHECK FOR HALT AT PASS
3676                      /COMPLETION. AFTER OVERLAP TESTS START AT FIRST
3677                      /DISK DRIVE ON SYSTEM.
3678                      /
3679  4062  4777  ENDTST, JMS I   (GETDRV                  /GET NEXT DRIVE.
3680  4063  2071          ISZ     DRVCNT                  /UPDATE NO. OF DRIVES COUNTER.
3681  4064  5323          JMP     NEXDSK                  /TEST NEXT DRIVE.
3682  4065  1070          TAD     DRVHAV
3683  4066  3071          DCA     DRVCNT                  /SETUP NO. OF DRIVES COUNTER.
3684  4067  4763  TSTSEK, JMS I   XLAP                    /PERFORM OVERLAP SEEKS
3685  4070  4764          JMS I   XOVRRD                  /OVERLAP SEEKS+WRITES+READS
3686  4071  3776'         DCA     DCNT2                   /START OVER AT 0.
3687  4072  4777          JMS I   (GETDRV                 /SELECT FIRST DRIVE.
3688  4073  4405  SAMDSK, CLASIC                         /CHECK FOR CLASSIC ACTIVE
3689  4074  4424          CAPASS                          /PASS COMPLETE
3690  4075  7610          SKP CLA
3691  4076  5302          JMP     .+4
3692  4077  1022          TAD     22
3693  4100  0105          AND     K0002                   /SEE IF ON APT
3694  4101  7650          SNA CLA                         /APT??
3695  4102  5307          JMP     .+5                     /NO
3696  4103  3775          DCA I   (CLKCNT                 /CLEAR APT TIMING COUNTER
3697  4104  7340          CLL CLA CMA
3698  4105  3175          DCA     KCNT
3699  4106  5323          JMP     NEXDSK                  /LOOP PROGRAM
3700  4107  4462          CRLF
3701  4110  4457          PRNTER                          /PRINT PASS COMPLETE
3702  4111  0760          NMES1
3703  4112  4457          PRNTER
3704  4113  7015          TEXEND
3705  4114  4404          LAS
3706  4115  0076          AND     K0004
3707  4116  7650          SNA CLA                         /SWITCH 9 SET?
3708  4117  5323          JMP     .+4
3709  4120  4405          CLASIC
3710  4121  4437          CBINQU
3711  4122  7402  ENDHLT, HLT                           /YES, STOP PROGRAM
3712  4123  7301  NEXDSK, CLA CLL IAC
3713  4124  4453          CLRALL                          /DCLR
3714  4125  3131          DCA     REG0
3715  4126  3132          DCA     REG1
3716  4127  5730          JMP I   .+1                     /LOOP ON PROGRAM
3717  4130  0240          TST0
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3718                      /
3719                      /SUBROUTINE TO ISSUE "DMAN" MAINTENANCE IOT
3720                      /
3721  4131  0000  LDMN,   0
3722  4132  6747  IOT7,   DMAN                          /"DMAN" MAINTENANCE IOT
3723  4133  5731          JMP I   LDMN                    /EXIT
3724  4134  4405          CLASIC
3725  4135  4436          CBERR
3726  4136  7402  ERHLT7, HLT                           /SKIP TRAP ERROR
3727  4137  5334          JMP     .-3
3728                      /
3729                      /SUBROUTINE TO SHIFT, THEN READ DISK ADDRESS
3730                      /INTO DATA BUFFER, 12 SHIFTS
3731                      /
3732  4140  0000  RDAD,   0
3733  4141  7300          CLA CLL
3734  4142  1126          TAD     M12
3735  4143  3133          DCA     SBCNT1
3736  4144  7330          CLA CLL CML RAR                 /SET MAIN(1) ENABLE BIT
3737  4145  4455          LDMAN                           /LOAD MAINTENANCE
3738  4146  7010          RAR
3739  4147  4455          LDMAN                           /LOAD MAINTENANCE
3740  4150  7300          CLA CLL
3741  4151  1015          TAD     K0200                   /SHIFT TRACK ADDRESS BIT
3742  4152  4455          LDMAN                           /LOAD MAINTENANCE IOT
3743  4153  2133          ISZ     SBCNT1
3744  4154  5352          JMP     .-2                     /SHIFT 12 BITS
3745  4155  7300          CLA CLL
3746  4156  1012          TAD     K0020
3747  4157  4455          LDMAN                           /READ DATA BUFFER
3748  4160  3151          DCA     DAREG                   /SAVE RESULTS
3749  4161  1151          TAD     DAREG
3750  4162  5740          JMP I   RDAD                    /EXIT
3751                      /
3752  4163  4200  XLAP,   OVRLAP
3753  4164  4400  XOVRRD, OVRRED
3754                      /
3755  4165  0411  NMES3,  TEXT "DISK"
      4166  2313
      4167  0000
3756                      /
3757  4175  7162
3758  4176  4371
3759  4177  4345
      4200          PAGE
3760                      /
3761                      /
3762                      /ROUTINE TO DO OVERLAP SEEKS ON EXISTING DRIVES
3763                      /AFTER ALL HAVE RUN THE COMPLETE DIAGNOSTIC
3764                      /
3765  4200  0000  OVRLAP, 0
3766  4201  1105          TAD     K4000
3767  4202  3140          DCA     TCNTR5                  /PASS COUNTER
3768  4203  1070  OVRR1,  TAD     DRVHAV
3769  4204  3137          DCA     TCNTR4                  /SET COUNTER FOR NO. OF DRIVES.
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3770  4205  3371          DCA     DCNT2                   /START WITH DRIVE 0
3771  4206  4777  OVRR2,  JMS I   (GETDRV                 /GET NEXT DRIVE.
3772  4207  1072          TAD     DRIVNO                  /GET DRIVE NO.
3773  4210  7110          CLL RAR
3774  4211  4423          RANAND                          /SELECT A RANDOM ADDRESS
3775  4212  4406          DSKOUT                          /SEND DISK OUT
3776  4213  4453          CLRALL                          /CLEAR STATUS
3777  4214  2137          ISZ     TCNTR4                  /UPDATE DISK COUNTER
3778  4215  5206          JMP     OVRR2                   /DO ALL EXISTING DISKS
3779  4216  3371          DCA     DCNT2                   /CLEAR FOR 0
3780  4217  1070          TAD     DRVHAV                  /NO. OF DRIVES.
3781  4220  3137          DCA     TCNTR4                  /SETUP COUNTER
3782  4221  4777  OVRR3,  JMS I   (GETDRV                 /GET NEXT DRIVES.
3783  4222  1072          TAD     DRIVNO                  /GET SELECTED DRIVE.
3784  4223  7110          CLL RAR
3785  4224  4407          DSKIN                           /CHECK FOR DRIVE DONE
3786  4225  5230          JMP     NOTDON                  /DRIVE NOT DONE
3787  4226  5233          JMP     OVROK                   /DRIVE DONE AND NO ERRORS
3788  4227  5254          JMP     OVRERR                  /DRIVE ERRORS
3789  4230  2137  NOTDON, ISZ     TCNTR4                  /UPDATE NO. OF DRIVE COUNTER.
3790  4231  5221          JMP     OVRR3                   /NO, DO REST
3791  4232  5217          JMP     OVRR3-2                 /YES, RESET
3792  4233  7340  OVROK,  CLA CLL CMA
3793  4234  3137          DCA     TCNTR4
3794  4235  2140          ISZ     TCNTR5                  /UPDATE PASS COUNTER, DONE ?
3795  4236  5227          JMP     OVRR2+1                 /NO, SEND OUT
3796  4237  3371          DCA     DCNT2                   /SET FOR 0
3797  4240  1070          TAD     DRVHAV                  /NO. OF DRIVES ON SYSTEM.
3798  4241  3137          DCA     TCNTR4
3799  4242  4777  ALLBAK, JMS I   (GETDRV                 /GET NEXT DRIVE.
3800  4243  1072          TAD     DRIVNO                  /GET SELECTED DRIVE.
3801  4244  7110          CLL RAR
3802  4245  4407          DSKIN                           /CHECK FOR DRIVE DONE
3803  4246  5242          JMP     ALLBAK                  /WAIT FOR THIS DRIVE
3804  4247  7610          SKP CLA                         /WAIT FOR NEXT
3805  4250  5254          JMP     OVRERR                  /DRIVE ERRORS
3806  4251  2137          ISZ     TCNTR4                  /LAST DRIVE HOME YET
3807  4252  5242          JMP     ALLBAK                  /WAIT FOR ALL
3808  4253  4437          NERROR                          /O.K. TO NEXT
3809  4254  4440  OVRERR, ERROR                          /ERROR, OVERLAP SEEKS
3810  4255  4201          OVRLAP+1                        /SCOPE LOOP POINTER
3811  4256  5300          5300                            /TEXT POINTER
3812  4257  5600          JMP I   OVRLAP                  /TO NEXT TEST
3813                      /
3814                      /ROUTINE TO GET DRIVES FROM OPERATOR.
3815                      /
3816  4260  0000  SELDSK, 0
3817  4261  4462          CRLF
3818  4262  4457          PRNTER                  /PRINT MESSAGE "RK8-E DRIVE"
3819  4263  3760          NMES1                   /MESSAGE POINTER
3820  4264  4462          CRLF
3821  4265  4457          PRNTER                  /PRINT MESSAGE "TEST"
3822  4266  6560          NMES2                   /MESSAGE POINTER
3823  4267  3370          DCA     DCNT1
3824  4270  3070          DCA     DRVHAV          /COUNTER FOR NO. OF DRIVES.
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3825  4271  1776' NXTDSK, TAD     M4
3826  4272  3371          DCA     DCNT2           /NO. OF POSSIBLE DRIVES.
3827  4273  4462          CRLF
3828  4274  4457          PRNTER
3829  4275  4165          NMES3
3830  4276  1370          TAD     DCNT1
3831  4277  1374          TAD     DSKON           /COMPUTE WAY TO DISK BUFFER.
3832  4300  3372          DCA     DCNT3           /SAVE POINTER.
3833  4301  1370          TAD     DCNT1           /GET DRIVE NO.
3834  4302  1364          TAD     K0260
3835  4303  4436          TYPE                    /TYPE DRIVE NO.
3836  4304  1366          TAD     K0277
3837  4305  4436          TYPE                    /TYPE ?.
3838  4306  6031          KSF                     /SKIP ON KEY.
3839  4307  5306          JMP     .-1
3840  4310  6036          KRB                     /GET INPUT.
3841  4311  0367          AND     K0177
3842  4312  1215          TAD     K0200
3843  4313  3373          DCA     DCNT4           /SAVE INPUT.
3844  4314  1373          TAD     DCNT4
3845  4315  4436          TYPE                    /ECHO INPUT.
3846  4316  1373          TAD     DCNT4
3847  4317  7041          CIA
3848  4320  1365          TAD     K0331
3849  4321  7100          CLL
3850  4322  7650          SNA CLA                 /Y OR N.
3851  4323  7360          CLA CLL CMA CML         /Y.
3852  4324  3772          DCA I   DCNT3           /SAVE ON FLAG.
3853  4325  7630          SZL CLA                 /WAS DRIVE SELECTED.
3854  4326  2070          ISZ     DRVHAV          /YES.
3855  4327  1775' SELDSK, TAD     K0240           /SPACE
3856  4330  4436          TYPE
3857  4331  2370          ISZ     DCNT1
3858  4332  2371          ISZ     DCNT2
3859  4333  5274          JMP     NXTDSK
3860  4334  1070          TAD     DRVHAV
3861  4335  7650          SNA CLA                 /ANY SELECTED.
3862  4336  5261          JMP     SELDSK+1        /TRIED TO FOOL ME.
3863  4337  1070          TAD     DRVHAV
3864  4340  7041          CIA
3865  4341  3070          DCA     DRVHAV          /SET COUNTER FOR NO. OF DRIVES.
3866  4342  3371          DCA     DCNT2           /START WITH DRIVE 0.
3867  4343  4345          JMS     GETDRV          /GET FIRST DRIVE.
3868  4344  5660          JMP I   SELDSK          /EXIT.
3869                      /
3870                      /ROUTINE TO SELECT DRIVES ON SYSTEM.
3871                      /
3872  4345  0000  GETDRV, 0
3873  4346  1371          TAD     DCNT2
3874  4347  0075          AND     K0003
3875  4350  1374          TAD     DSKON           /WAY TO BUFFER.
3876  4351  3370          DCA     DCNT1           /SAVE POINTER FOR WAY TO BUFFER.
3877  4352  1371          TAD     DCNT2
3878  4353  0075          AND     K0003
3879  4354  7104          CLL RAL
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3880  4355  3072          DCA     DRIVNO          /SETUP DRIVE NO.
3881  4356  2371          ISZ     DCNT2           /UPDATE TO NEXT DRIVE.
3882  4357  7000          NOP
3883  4360  1770          TAD I   DCNT1           /GET BUFFER FLAG.
3884  4361  7640          SZA CLA                 /DISK ON SYSTEM?
3885  4362  5745          JMP I   GETDRV          /YES, USE DRIVNO.
3886  4363  5346          JMP     GETDRV+1        /SELECT NEXT.
3887                      /
3888  4364  0260    K0260,  0260
3889  4365  0331    K0331,  0331
3890  4366  0277    K0277,  0277
3891  4367  0177    K0177,  0177
3892  4370  0000    DCNT1,  0
3893  4371  0000    DCNT2,  0
3894  4372  0000    DCNT3,  0
3895  4373  0000    DCNT4,  0
3896  4374  1561    DSKON,  DISK0
3897                      /
3898  4375  6064
3899  4376  6110
3900  4377  4345
            4400    PAGE
3901                      /
3902                      /ROUTINE TO PERFORM RANDOM OVERLAP SEEKS, WRITES AND,
3903                      /READS ON ALL EXISTING DRIVES AFTER THEY HAVE RUN THE
3904                      /COMPLETE DIAGNOSTIC.
3905                      /
3906  4400  0000    OVRRED, 0
3907  4401  7330          CLA CLL CML RAR
3908  4402  3140          DCA     TCNTR5                  /PASS COUNTER
3909  4403  1070    OVRRD1, TAD     DRVHAV
3910  4404  3137          DCA     TCNTR4                  /SET COUNTER FOR NO. OF DRIVES.
3911  4405  3777'         DCA     DCNT2                   /START WITH DRIVE 0
3912  4406  4776    OVRRD2, JMS I   (GETDRV                 /SELECT DRIVE NO.
3913  4407  1072          TAD     DRIVNO                  /DRIVE NO. SELECTED.
3914  4410  7110          CLL RAR
3915  4411  4423          RANADD                          /SELECT A RANDOM ADDRESS
3916  4412  4406          DSKOUT                          /SEND DISK OUT
3917  4413  4453          CLRALL                          /CLEAR STATUS
3918  4414  2137          ISZ     TCNTR4                  /UPDATE DISK COUNTER
3919  4415  5206          JMP     OVRRD2                  /DO ALL EXISTING DISKS
3920  4416  3777'         DCA     DCNT2                   /CLEAR FOR 0
3921  4417  1070          TAD     DRVHAV
3922  4420  3137          DCA     TCNTR4                  /SET COUNTER FOR NO. OF DRIVES.
3923  4421  4776    OVRRD3, JMS I   (GETDRV                 /SELECT DRIVE.
3924  4422  1072          TAD     DRIVNO                  /GET DRIVE SELECTED
3925  4423  7110          CLL RAR
3926  4424  4407          DSKIN                           /CHECK THIS DRIVE
3927  4425  5232          JMP     CHKNEX                  /CHECK FOR NEXT DRIVE
3928  4426  5235          JMP     OVRDOK                  /DONE AND NO ERRORS
3929  4427  1166    POLERR, TAD     K5300
3930  4430  3324          DCA     TOVRDT                  /SETUP TEXT POINTER
3931  4431  5322          JMP     OVRDER                  /ERRORS
3932  4432  2137    CHKNEX, ISZ     TCNTR4                  /UPDATE NO. COUNTER.
3933  4433  5221          JMP     OVRRD3                  /NO, DO REST
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3934  4434  5217          JMP     OVRRD3-2                /YES, RESET
3935  4435  1072    OVRDOK, TAD     DRIVNO
3936  4436  7110          CLL RAR
3937  4437  1327          TAD DSKPOT
3938  4440  3326          DCA     DSKADD                  /COMPUTER WAY TO BUFFER.
3939  4441  1726          TAD I   DSKADD                  /GET DISK ADDRESS
3940  4442  3135          DCA     TCNTR2                  /SAVE IT
3941  4443  1326          TAD     DSKADD                  /GET POINTER
3942  4444  1076          TAD     K0004                   /ADD IN FUDGE FACTOR
3943  4445  3326          DCA     DSKADD                  /MAKE ADDRESS
3944  4446  1114          TAD     K5252                   /GET DATA PATTERN TO USE
3945  4447  4431          FILBUF                          /FILL DATA BUFFER
3946  4450  1726          TAD I   DSKADD                  /GET EXTENDED BIT
3947  4451  1072          TAD     DRIVNO                  /ADD IN DRIVE NUMBER
3948  4452  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
3949  4453  1135          TAD     TCNTR2                  /GET CYL., SURFACE, AND SECTOR
3950  4454  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
3951  4455  1464          TAD I   XHITRK                  /GET EXTENDED BIT
3952  4456  1105          TAD     K4000                   /ADD IN WRITE FUNCTION
3953  4457  3150          DCA     CMREG                   /SETUP COMMAND POINTER
3954  4460  1463          TAD I   XLOTRK                  /GET ADDRESS
3955  4461  4426          DISKGO                          /DISK WRITE DATA
3956  4462  4524          TOVRDT                          /TEXT POINTER
3957  4463  5322          JMP     OVRDER                  /ERROR, WRITE SKIP OR STATUS
3958  4464  4432          KILBUF                          /CLEAR DATA BUFFER
3959  4465  1726          TAD I   DSKADD                  /GET EXTENDED BIT
3960  4466  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
3961  4467  1135          TAD     TCNTR2                  /GET DISK ADDRESS
3962  4470  4426          DISKGO                          /GO, READ DATA
3963  4471  4524          TOVRDT                          /TEXT POINTER
3964  4472  5322          JMP     OVRDER                  /ERROR
3965  4473  1114          TAD     K5252
3966  4474  4430          FIGURE                          /WORD BY WORD COMPARE DATA
3967  4475  7610          SKP CLA                         /DATA O.K, CONTINUE
3968  4476  5322          JMP     OVRDER                  /DATA ERROR
3969  4477  1072          TAD     DRIVNO                  /GET DRIVE NO. SELECTED
3970  4500  7110          CLL RAR
3971  4501  4423          RANADD                          /GENERATE RANDOM ADDRESS
3972  4502  4406          DSKOUT                          /SEND DRIVE BACK OUT
3973  4503  2140          ISZ     TCNTR5                  /UPDATE PASS COUNTER, DONE ?
3974  4504  5232          JMP     CHKNEX                  /CHECK FOR NEXT DRIVE
3975  4505  3777'         DCA     DCNT2                   /SET FOR 0
3976  4506  1070          TAD     DRVHAV                  /GET NO. OF DRIVES ON SYSTEM.
3977  4507  3137          DCA     TCNTR4
3978  4510  4776    REDBAK, JMS I   (GETDRV                 /SELECT DRIVE
3979  4511  1072          TAD     DRIVNO                  /GET DRIVE SELECTED.
3980  4512  7110          CLL RAR
3981  4513  4407          DSKIN                           /CHECK THIS DRIVE
3982  4514  5310          JMP     REDBAK                  /WAIT FOR DRIVE
3983  4515  7610          SKP CLA                         /CHECK FOR NEXT
3984  4516  5227          JMP     POLERR                  /ERROR
3985  4517  2137          ISZ     TCNTR4                  /LAST DRIVE HOME YET
3986  4520  5310          JMP     REDBAK                  /WAIT FOR ALL
3987  4521  4437          NERROR                          /O.K. TO NEXT
3988  4522  4440    OVRDER, ERROR                           /OVERLAP SEEKS+READ DATA
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3989    4523  4401            OVRRED+1                        /SCOPE LOOP POINTER
3990    4524  5300    TOVRDT, 5300                            /TEXT POINTER
3991    4525  5600            JMP I   OVRRED                  /TO NEXT TEST
3992                    /
3993    4526  0000    DSKADD, 0
3994    4527  6366    DSKPOT, DSK0A
3995                    /
3996                    /ROUTINE TO CHECK DRIVE IN AC
3997                    /
3998    4530  0000    DIN,    0
3999    4531  7104            CLL RAL                         /MAKE DRIVE NO.
4000    4532  4450            LDCMD                           /FIRST SELECT DRIVE
4001    4533  1150            TAD     CMREG
4002    4534  1015            TAD     K0200                   /ENABLE SET DONE BIT
4003    4535  4450            LDCMD                           /LOAD COMMAND
4004    4536  7332            CLA CLL CML RTR                 /MAYBE EXPECTED STATUS
4005    4537  3143            DCA     GDREG2                  /SETUP COMPARE REGISTER
4006    4540  4444            RDSTAT                          /READ STATUS
4007    4541  4447            DSKSKP                          /CHECK FOR SKIP
4008    4542  5353            JMP     NDIN                    /CHECK FOR NOT DONE
4009    4543  7332            CLA CLL CML RAR                 /EXPECTED STATUS
4010    4544  3143            DCA     GDREG2                  /SETUP COMPARE REGISTER
4011    4545  4444            RDSTAT                          /READ STATUS
4012    4546  1105            TAD     K4000                   /ADD IN FUDGE FACTOR
4013    4547  7640            SZA CLA                         /O.K.????
4014    4550  2330            ISZ     DIN                     /ERROR!!!!
4015    4551  2330            ISZ     DIN
4016    4552  5730            JMP I   DIN                     /EXIT
4017    4553  1106    NDIN,   TAD     K6000
4018    4554  7640            SZA CLA                         /SKIP IF NO ERROR
4019    4555  5350            JMP     .-5                     /ERROR EXIT
4020    4556  5730            JMP I   DIN                     /EXIT
4021                    /
4022                    /ROUTINE TO COMPARE AC TO GDREG2
4023                    /
4024    4557  0000    COMP1,  0
4025    4560  3155            DCA     ACREG
4026    4561  1155            TAD     ACREG                   /SAVE AC
4027    4562  7041            CIA
4028    4563  1143            TAD     GDREG2
4029    4564  7640            SZA CLA                         /SKIP IF O.K.
4030    4565  2357            ISZ     COMP1                   /ERROR, DON'T COMPARE
4031    4566  5757            JMP I   COMP1
4032                    /
4033                    /
4034    4576  4345
4035    4577  4371
              4600    PAGE
4036                    /
4037                    /MANUAL FUNCTION TEST
4038                    /LOAD ADDRESS 0201 OR "MANUAL".
4039                    /SET SWITCHES TO FUNCTION
4040                    /PRESS START
4041                    /MACHINE SHOULD HALT
4042                    /SET SWITCHES TO DISK ADDRESS
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4043                    /PRESS START
4044                    /MACHINE SHOULD HALT
4045                    /SET SWITCHES TO COMPLEMENT DATA PATTERN
4046                    /PRESS START
4047                    /MACHINE SHOULD HALT
4048                    /SET SWITCHES TO 0000
4049                    /PRESS START
4050                    /INCASE OF FAILURES USE NORMAL SCOPE SWITCHES
4051                    /IF LOOP IS DESIRED USE NORMAL SCOPE SWITCHES
4052                    /
4053    4600  4405    MANUAL, CLASIC                                  /CHECK FOR CLASIC.
4054    4601  4431            C8SWIT                          /ROUTINE TO EXECUTE.
4055    4602  7000            NOP
4056    4603  4404            LAS
4057    4604  0326            AND     K7707                   /MASK
4058    4605  3134            DCA     TCNTR1                  /SAVE FUNCTION
4059    4606  7340            CLA CLL CMA
4060    4607  3131            DCA     REG0                    /SETUP FOR ONE PASS
4061    4610  6224            RIF                             /USE CURRENT FIELD
4062    4611  1134            TAD     TCNTR1
4063    4612  3134            DCA     TCNTR1                  /ACTUAL FUNCTION
4064    4613  1134            TAD     TCNTR1
4065    4614  0100            AND     K0006                   /MASK DISK DRIVE
4066    4615  3072            DCA     DRIVNO                  /ACTUAL DRIVE
4067    4616  4405            CLASIC                          /CHECK FOR CLASSIC.
4068    4617  4436            C8ERR                           /ROUTINE TO EXECUTE.
4069    4620  7402            HLT                             /WAIT FOR DISK ADDR. IN SWITCHES.
4070                                                            /IF ON CLASSIC CONSOLE PACKAGE
4071                                                            /HIT CONTROL E, IF NOT THEN
4072                                                            /PRESS KEY CONTINUE.
4073    4621  4405            CLASIC                          /CHECK FOR CLASSIC
4074    4622  4431            C8SWIT                          /ROUTINE TO EXECUTE.
4075    4623  7000            NOP
4076    4624  4404            LAS
4077    4625  3135            DCA     TCNTR2                  /SAVE DISK ADDRESS
4078    4626  4405            CLASIC                          /CHECK FOR CLASSIC.
4079    4627  4436            C8ERR                           /ROUTINE TO EXECUTE.
4080    4630  7402            HLT                             /WAIT FOR COMPLEMENT DATA.
4081                                                            /IF ON CLASSIC CONSOLE PACKAGE
4082                                                            /HIT CONTROL E, IF NOT THEN
4083                                                            /PRESS KEY CONTINUE.
4084    4631  4405            CLASIC                          /CHECK FOR CLASSIC
4085    4632  4431            C8SWIT                          /ROUTINE TO EXECUTE.
4086    4633  7000            NOP
4087    4634  4404            LAS
4088    4635  3136            DCA     TCNTR3                  /SAVE IT
4089    4636  4405            CLASIC                          /CHECK FOR CLASSIC.
4090    4637  4436            C8ERR                           /ROUTINE TO EXECUTE.
4091    4640  7402            HLT                             /WAIT FOR OPERATOR TO CONTINUE
4092                                                            /IF ON CLASSIC CONSOLE PACKAGE
4093                                                            /HIT CONTROL E, IF NOT THEN
4094                                                            /PRESS KEY CONTINUE.
4095    4641  1136            TAD     TCNTR3
4096    4642  4431            FILBUF                          /FILL BUFFER WITH DATA
4097    4643  7300    TMANS,  CLA CLL
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4098    4644  1134          TAD     TCNTR1                  /GET FUNCTION
4099    4645  0107          AND     K7000                   /MASK
4100    4646  1106          TAD     K6000
4101    4647  7630          SZL CLA                         /WAS IT A READ
4102    4650  7340          CLA CLL CMA                     /NO, SET A FLAG
4103    4651  3137          DCA     TCNTR4                  /READ FLAG
4104    4652  1134          TAD     TCNTR1                  /GET FUNCTION
4105    4653  0107          AND     K7000                   /MASK
4106    4654  1115          TAD     K5000
4107    4655  7640          SZA CLA                         /WAS IT A SEEK
4108    4656  5266          JMP     NTSEK                   /NOT A SEEK
4109    4657  1134          TAD     TCNTR1                  /YES
4110    4660  3150          DCA     CMREG                   /SETUP COMMAND
4111    4661  1135          TAD     TCNTR2                  /DISK ADDRESS
4112    4662  4424          SEEK                            /SEEK ONLY
4113    4663  4724          TMANT                           /TEXT POINTER
4114    4664  5322          JMP     TMANE                   /ERROR, SKIP OR STATUS
4115    4665  5321          JMP     TMANOK                  /TO HANDLER
4116    4666  1134  NTSEK,  TAD     TCNTR1                  /GET FUNCTION
4117    4667  0101          AND     K0007                   /MASK
4118    4670  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
4119    4671  1134          TAD     TCNTR1                  /FUNCTION
4120    4672  3150          DCA     CMREG                   /SETUP COMMAND
4121    4673  1135          TAD     TCNTR2                  /DISK ADDRESS
4122    4674  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
4123    4675  1137          TAD     TCNTR4                  /GET READ FLAG
4124    4676  7650          SNA CLA                         /WAS IT A READ
4125    4677  4432          KILBUF                          /YES, CLEAR BUFFER
4126    4700  1135          TAD     TCNTR2                  /GET DISK ADDRESS
4127    4701  4426          DISKGO                          /DISK GO
4128    4702  4724          TMANT                           /TEXT POINTER
4129    4703  5322          JMP     TMANE                   /ERROR
4130    4704  1137          TAD     TCNTR4                  /GET READ FLAG
4131    4705  7640          SZA CLA                         /WAS IT A READ
4132    4706  5321          JMP     TMANOK                  /WAS A WRITE, TO HANDLER
4133    4707  1150          TAD     CMREG                   /GET LAST COMMAND
4134    4710  0014          AND     K0100                   /MASK OUT HALF BIT
4135    4711  7650          SNA CLA                         /WAS IT HALF BLOCK TRANSFERS
4136    4712  5317          JMP     .+5                     /NO, COMPARE WHOLE BLOCK
4137    4713  1136          TAD     TCNTR3                  /GET GOOD WORD POINTER
4138    4714  4427          HAFCHK                          /CHECK FOR HALF BLOCK
4139    4715  5321          JMP     TMANOK                  /O.K. NO ERRORS
4140    4716  5322          JMP     TMANE                   /DATA ERROR
4141    4717  1136          TAD     TCNTR3                  /WAS A READ
4142    4720  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
4143    4721  4437  TMANOK, NERROR                          /NO ERRORS
4144    4722  4440  TMANE,  ERROR                           /ERROR IN FUNCTION SELECTED
4145    4723  4643          TMANS                           /SCOPE LOOP POINTER
4146    4724  5373  TMANT,  5373                            /TEXT POINTER
4147                /
4148    4725  5243          JMP     TMANS                   / LOOP
4149                /
4150    4726  7707  K7707,  7707
4151                /
4152                /SUBROUTINE TO WAIT FOR INTERRUPTS
```



```
4153                /IF INTERRUPT OCCURES GO BACK+1
4154                /
4155    4727  0000  IONWT,  0
4156    4730  7450          SNA                             /FAST OR SLOW
4157    4731  1122          TAD     K7740                   /GET SLOW CONSTANT
4158    4732  3364          DCA     ICNTR2                  /SETUP COUNTER
4159    4733  3363          DCA     ICNTR1                  /SETUP COUNTER
4160    4734  6001          ION                             /TURN IT ON
4161    4735  2363          ISZ     ICNTR1
4162    4736  5335          JMP     .-1
4163    4737  2364          ISZ     ICNTR2
4164    4740  5335          JMP     .-3
4165    4741  6002          IOF                             /TURN IT OFF
4166    4742  5727          JMP I   IONWT                       /NO INT OCCURED
4167    4743  1022  INTADD, TAD     22
4168    4744  0016          AND     K0400
4169    4745  7640          SZA CLA                         /ON CLASSIC?
4170    4746  6031          KSF
4171    4747  5353          JMP     .+4                     /NO FLAG OR CLASSIC.
4172    4750  6032          KCC
4173    4751  6001          ION
4174    4752  5400          JMP I   0                       /RETURN TO LOOP.
4175    4753  2327          ISZ     IONWT                   /UPDATE GOT AN INTERRUPT RETURN.
4176    4754  4447          DSKSKP                          /CHECK DISK FLAG.
4177    4755  7610          SKP CLA                         /WASN'T SO ERROR.
4178    4756  5727          JMP I   IONWT                   /EXIT AND INDICATE AN INTERRUPT.
4179    4757  4405          CLASIC
4180    4760  4436          CAERR
4181    4761  7402  ERHLT1, HLT                             /ERROR, ILLEGAL INTERRUPT
4182    4762  5357          JMP     .-3
4183                /
4184    4763  0000  ICNTR1, 0
4185    4764  0000  ICNTR2, 0
4186                /
4187                /SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
4188                /
4189    4765  0000  LDCA,   0
4190    4766  3153          DCA     ADREG                   /SAVE IN ADDRESS
4191    4767  1153          TAD     ADREG
4192    4770  3152          DCA     CAREG                   /SETUP INITIAL CURRENT ADDRESS
4193    4771  1153          TAD     ADREG
4194    4772  6744  IOT4,   DLCA                            /LOAD CURRENT ADDRESS IOT
4195    4773  5765          JMP I   LDCA
4196    4774  4405          CLASIC
4197    4775  4436          CAERR
4198    4776  7402  ERHLT4, HLT                             /SKIP TRAP ERROR.
4199    4777  5374          JMP     .-3
4200                /
4201          5000  PAGE
4202                /
4203                /ROUTINE TO CHECK THE WRITE PROTECT FUNCTION
4204                /WHEN IT IS SET UNDER PROGRAM CONTROL
4205                /NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST
4206                /
4207    5000  4405  AUTPRO, CLASIC                          /CHECK FOR CLASSIC.
```

```
4208  5001  4431          CASWIT                          /ROUTINE TO EXECUTE.
4209  5002  7200          NOP
4210  5003  4404          LAS                             /GET THE SWITCHES
4211  5004  7104          CLL RAL
4212  5005  0100          AND     K0006                   /MASK DRIVE NUMBER
4213  5006  3272          DCA     DRIVNO                  /SAVE DRIVE NUMBER
4214  5007  7344          CLA CLL CMA RAL
4215  5010  3132          DCA     REG1                    /SETUP REPEAT POINTER
4216  5011  3131          DCA     REG0
4217  5012  1113          TAD     K2525                   /DATA PATTERN TO WRITE
4218  5013  4431          FILBUF                          /FILL OUTBOUND BUFFER
4219  5014  1272          TAD     DRIVNO
4220  5015  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
4221  5016  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
4222  5017  1115          TAD     K5000                   /WRITE ALL FUNCTION
4223  5020  3150          DCA     CMREG                   /SETUP COMMAND
4224  5021  4426          DISKGO                          /WRITE ALL TO SECTOR 0
4225  5022  5070          TAPROT                          /TEXT POINTER
4226  5023  5266          JMP     APERR                   /ERROR, STATUS
4227  5024  1103  APR1,   TAD     K2000                   /FUNCTION WRITE PROTECT
4228  5025  1272          TAD     DRIVNO                  /CURRENT DRIVE
4229  5026  4450          LOCMD                           /LOAD COMMAND REGISTER
4230  5027  4452          LOADD                           /LOAD AND GO
4231  5030  4444          RDSTAT                          /READ STATUS REGISTER
4232  5031  7640          SZA CLA                         /SHOULD BE 0000 ????
4233  5032  5245          JMP     APA1                    /ERROR, STATUS
4234  5033  4432          KILBUF                          /CLEAR OUTBOUND BUFFER
4235  5034  1272          TAD     DRIVNO
4236  5035  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
4237  5036  1115          TAD     K5000                   /WRITE ALL FUNCTION
4238  5037  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
4239  5040  4426          DISKGO                          /WRITE ALL TO SECTOR 0
4240  5041  5070          TAPROT                          /TEXT POINTER
4241  5042  7200          NOP
4242  5043  7326          CLA CLL CML RTL
4243  5044  1012          TAD     K0020                   /MAKE EXPECTED STATUS
4244  5045  3143  APA1,   DCA     GDREG2                  /SETUP COMPARE REGISTER
4245  5046  1166          TAD     K5300
4246  5047  3270          DCA     TAPROT                  /SETUP TEXT POINTER
4247  5050  1146          TAD     STREG                   /GET STATUS READ
4248  5051  4442          ACCMP1                          /CHECK RESULTS
4249  5052  7610          SKP CLA                         /STATUS O.K.
4250  5053  5266          JMP     APERR                   /ERROR, WRITE PROTECT
4251  5054  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
4252  5055  4453          CLRALL                          /CLEAR CONTROL
4253  5056  1017          TAD     K1000                   /FUNCTION READ ALL
4254  5057  3150          DCA     CMREG                   /SETUP COMMAND
4255  5060  4426          DISKGO                          /READ ALL SECTOR 0
4256  5061  5070          TAPROT                          /TEXT POINTER
4257  5062  5266          JMP     APERR                   /ERROR
4258  5063  1113          TAD     K2525                   /EXPECTED PATTERN
4259  5064  4430          FIGURE                          /CHECK DATA READ
4260  5065  4437          NERROR                          /ALL O.K. DO ONE MORE TIME
4261  5066  4440  APERR,  ERROR                           /ERROR, WRITE PROTECT
4262  5067  5224          APR1
```



```
4263  5070  0000  TAPROT, 0000                           /TEXT POINTER
4264  5071  4435          CLASIC
4265  5072  4436          CAERR
4266  5073  7402  APHLT1, HLT                           /SUCCESSFUL WRITE PROTECT, TO
4267                                                    /REPEAT: IF ON CLASSIC CONSOLE
4268                                                    /PACKAGE HIT CONTROL E. IF NOT
4269                                                    /PRESS KEY CONTINUE.
4270  5074  5200          JMP     AUTPRO
4271                /
4272                /ROUTINE TO GET SWITCHES
4273                /
4274  5075  0000  MYLAS,  0
4275  5076  4405          CLASIC                          /CHECK IF CLASSIC
4276  5077  4425          CHCKSW                          /GET SWITCHES
4277  5100  7604          7604                            /NOT CLASSIC, GET SWITCHES
4278  5101  5675          JMP     I MYLAS
4279                /
4280                /THIS ROUTINE WILL BE A SKIP INSTRUCTION WITHOUT
4281                /CLASSIC, OTHERWISE IT WILL EXECUTE NEXT INSTRUCTION
4282                /IN FIELD 0 AND THEN SKIP THE INSTRUCTION AFTER THAT ONE.
4283                /
4284  5102  0000  CLASIK, 0
4285  5103  3332          DCA     SAVAC                   /SAVE CURRENT AC
4286  5104  1732          TAD I    CLASIK
4287  5105  3333          DCA     ROUTMP                  /SAVE THE CLASSIC ROUTINE
4288  5106  2302          ISZ     CLASIK
4289  5107  1722          TAD     OP2
4290  5110  0377          AND     (400
4291  5111  7640          SZA CLA
4292  5112  5315          JMP     .+3
4293  5113  1332          TAD     SAVAC                   /NO RETURN TO PROGRAM
4294  5114  5702          JMP I   CLASIK
4295  5115  2302          ISZ     CLASIK
4296  5116  6211          CDF     10                      /CHANGE TO FIELD 1
4297  5117  1020          TAD     SWR
4298  5120  3776          DCA I   (SWR)                   /MOVE POINTERS TO FIELD 1
4299  5121  1721          TAD     OP1
4300  5122  3775          DCA I   (OP1)
4301  5123  1722          TAD     OP2
4302  5124  3774          DCA I   (OP2)
4303  5125  1333          TAD     ROUTMP
4304  5126  3773          DCA I   (ROUINS)                /SAVE ROUTINE IN FIELD 1
4305  5127  1332          TAD     SAVAC
4306  5130  6212          CIF     10
4307  5131  5773          JMP I   (ROUINS)                /GO TO FIELD 1
4308                /
4309  5132  0000  SAVAC,  0
4310  5133  0000  ROUTMP, 0
4311                /
4312                /ROUTINE TO WAIT FOR DISK SKIPS
4313                /
4314  5134  0000  SKWAT,  0
4315  5135  7300          CLA CLL
4316  5136  4530          TICK                            /TIMING FOR APT
4317  5137  1122          TAD     K7740                   /GET TIME CONSTANT
```

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4318  5140  3275          DCA     MYLAS
4319  5141  3302          DCA     CLASIK
4320  5142  4447          DSKSKP                          /DSKP "DISK SKIP IOT"
4321  5143  7610          SKP CLA                         /NO SKIP OCCURRED YET
4322  5144  5352          JMP     .+6                     /GOT THE SKIP
4323  5145  2302          ISZ     CLASIK
4324  5146  5342          JMP     .-4
4325  5147  2275          ISZ     MYLAS
4326  5150  5342          JMP     .-6
4327  5151  7610          SKP CLA                         /NO SKIP OCCURRED
4328  5152  2334          ISZ     SKWAT
4329  5153  5734          JMP I   SKWAT                   /EXIT
4330                      /
4331                      /SUBROUTINE TO READ STATUS REGISTER
4332                      /
4333  5154  0000  RDST,    0
4334  5155  6745  IOT5,    DRST                            /READ STATUS IOT
4335  5156  5363          JMP     .+5
4336  5157  4405          CLASIC
4337  5160  4436          CAERR
4338  5161  7402  ERHLT5,  HLT                             /SKIP TRAP ERROR
4339  5162  5357          JMP     .-3
4340  5163  3146          DCA     STREG                   /SAVE RESULTS
4341  5164  1146          TAD     STREG
4342  5165  5754          JMP I   RDST                    /EXIT
4343  5173  1302
4344  5174  0022
4345  5175  0021
4346  5176  0020
4347  5177  0400
                5200      PAGE
4348                      /
4349                      /SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
4350                      /ERROR TYPEOUTS.
4351                      /
4352  5200  0000  ERRO,    0
4353  5201  4527          JMS I   KAERRO                  /REPORT ERROR TO APT
4354  5202  1600          TAD I   ERRO                    /GET RESTART ADDRESS
4355  5203  3173          DCA     RESTRT                  /STORE
4356  5204  4404          LAS                             /GET SWITCH 0
4357  5205  7700          SMA CLA                         /IS IT SCOPE LOOP
4358  5206  5217          JMP     ERRA1                   /NO, CONTINUE
4359  5207  4404          LAS                             /GET SWR2
4360  5210  7006          RTL
4361  5211  7710          SPA CLA                         /INHIBIT BELL????
4362  5212  5215          JMP     .+3                     /YES
4363  5213  1356          TAD     K0207
4364  5214  4436          TYPE
4365  5215  1600          TAD I   ERRO
4366  5216  5757          JMP I   ESCOPE                  /CHECK FOR BELL
4367  5217  1600  ERRA1,  TAD I   ERRO
4368  5220  3360          DCA     RETRN2                  /STORE FOR RETURN
4369  5221  2200          ISZ     ERRO
4370  5222  7301          CLA CLL IAC
4371  5223  1200          TAD     ERRO                    /NEXT TEST POINTER
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4372  5224  3361          DCA     INHIRT                  /STORE FOR SPECIAL RETURN
4373  5225  4462          CRLF
4374  5226  4462          CRLF
4375  5227  1600          TAD I   ERRO                    /GET TEXT POINTER
4376  5230  0101          AND     K0007                   /MASK 9-11
4377  5231  1367          TAD     HEDTAD                  /MAKE ERROR HEADER TAD
4378  5232  3233          DCA     .+1
4379  5233  7402          HLT                             /MODIFIED HEADER TAD
4380  5234  3236          DCA     .+2
4381  5235  4457          PRNTER                          /MODIFIED HEADER POINTER
4382  5236  7402          HLT
4383  5237  4462          CRLF
4384  5240  4457          PRNTER                          /PRINT PC:
4385  5241  5750          TEXPC
4386  5242  7340          CLA CLL CMA
4387  5243  1200          TAD     ERRO                    /GET PC POINTER
4388  5244  4460          OCTEL                           /PRINT PC STORED
4389  5245  1600          TAD I   ERRO                    /GET TEXT POINTER
4390  5246  7104          CLL RAL
4391  5247  7420          SNL
4392  5250  5264          JMP     NTGO                    /NOT GO: REGISTER
4393
4394
4395  5251  3200          DCA     ERRO
4396  5252  4457          PRNTER                          /PRINT GO:
4397  5253  5752          TEXGO
4398  5254  1200          TAD     ERRO
4399  5255  7700          SMA CLA                         /WAS IT A 6 BIT OCTAL BYTE
4400  5256  5261          JMP     .+3                     /NO
4401  5257  1142          TAD     GOREG1                  /GET DATA
4402  5260  4461          TWOCT                           /PRINT TWO OCTAL
4403  5261  1143          TAD     GOREG2
4404  5262  4460          OCTEL                           /PRINT FOUR OCTAL
4405  5263  7610          SKP CLA
4406  5264  3200  NTGO,          DCA     ERRO
4407  5265  1200          TAD     ERRO                    /GET TEXT POINTER
4408  5266  7104          CLL RAL
4409  5267  7420          SNL
4410  5270  5301          JMP     NTCRC
4411  5271  3200          DCA     ERRO
4412  5272  4457          PRNTER                          /PRINT CR:
4413  5273  5754          TEXCR
4414  5274  1144          TAD     CRREG1
4415  5275  4461          TWOCT                           /PRINT
4416  5276  1145          TAD     CRREG2
4417  5277  4460          OCTEL                           /PRINT FOUR OCTAL
4418  5300  7610          SKP CLA
4419  5301  3200  NTCRC,  DCA     ERRO
4420  5302  1363          TAD     XTEXT
4421  5303  3366          DCA     PCNTR2
4422  5304  1364          TAD     XREG
4423  5305  3010          DCA     AUTO10
4424  5306  1116          TAD     K7771
4425  5307  3365          DCA     PCNTR1                  /COUNTER FOR    # OF HEADS
4426  5310  1200  STRAUT, TAD     ERRO                    /GET TEXT POINTER
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4427  5311  7500          SMA
4428  5312  5350          JMP     NOTEX                   /NOT THIS ONE
4429  5313  7104          CLL RAL
4430  5314  3200          DCA     ERRO
4431  5315  1366          TAD     PCNTR2                  /GET TEXT MESSAGE POINTER
4432  5316  2366          ISZ     PCNTR2
4433  5317  2366          ISZ     PCNTR2
4434  5320  3322          DCA     .+2                     /STORE FOR PRNTER
4435  5321  4457          PRNTER                          /PRINT XX:
4436  5322  7402          HLT                             /MODIFIED TEXT POINTER
4437  5323  1410          TAD I   AUTO10
4438  5324  4460          OCTFL                           /PRINT FOUR OCTAL
4439  5325  2365  AGAIN,  ISZ     PCNTR1
4440  5326  5312          JMP     STRAUT                  /CHECK FOR NEXT XX:
4441  5327  4434          LAS                             /GET SWITCH 5
4442  5330  7006          RTL                             /SHIFT FOR TESTING
4443  5331  0216          AND     K0400                   /MASK
4444  5332  7650          SNA CLA                         /WAS IT INHIBIT HALT
4445  5333  5342          JMP     CHKERR                  /NO HALT
4446  5334  7640          SZL CLA                         /SAME OR NEXT TEST
4447  5335  5340          JMP     .+3                     /SAME TEST
4448  5336  1361          TAD     INHIBT                  /GET RETURN
4449  5337  5757          JMP I   ESCOPE                  /CHECK FOR BELL
4450  5340  1360          TAD     RETRN2                  /GET RETURN
4451  5341  5757          JMP I   ESCOPE                  /CHECK FOR BELL
4452  5342  4405  CHKERR, CLASTC
4453  5343  4436          CAFRR
4454  5344  7402  FRHLTS, HLT                             /ALL RECOVERABLE ERROR HALTS
4455  5345  4762          JMS I   XGTREG                  /CHECK FOR GET ALL REGISTERS
4456  5346  5760          JMP I   RETRN2                  /NO, TRY SAME TEST AGAIN
4457  5347  5264          JMP     NTGO                    /DUMP
4458  5350  7104  NOTEX,  CLL RAL
4459  5351  3200          DCA     ERRO
4460  5352  2366          ISZ     PCNTR2
4461  5353  2366          ISZ     PCNTR2
4462  5354  2010          ISZ     AUTO10
4463  5355  5325          JMP     AGAIN
4464                /
4465  5356  0207  K0207,  0207
4466  5357  5470  ESCOPE, SCOPE
4467  5360  0000  RETRN2, 0
4468  5361  0000  INHIBT, 0
4469  5362  5527  XGTREG, GTREG
4470  5363  5756  XTEXT,  TEXST
4471  5364  0145  XREG,   CRREG2
4472  5365  0000  PCNTR1, 0
4473  5366  0000  PCNTR2, 0
4474  5367  1370  HEDTAD, TAD     HEDLST
4475  5370  6671  HEDLST, ERTX1
4476  5371  6704          ERTX2
4477  5372  6720          ERTX3
4478  5373  6736          ERTX4
4479  5374  6746          ERTX5
4480  5375  6760          ERTX6
4481  5376  6772          ERTX7
```



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4482  5377  7002          ERTXR
4483                /
4484                /
4485        5400    PAGE
4486                /
4487                /SUBROUTINE TO READ DATA BUFFER TO AC
4488                /
4489  5400  0000  RDBF,   0
4490  5401  7330          CLA CLL CML RAR
4491  5402  4455          LOMAN
4492  5403  1012          TAD     K0020
4493  5404  4455          LOMAN                           /LOAD MAINTENANCE
4494  5405  3147          DCA     DBREG
4495  5406  1147          TAD     DBREG
4496  5407  3154          DCA     DTREG
4497  5410  1154          TAD     DTREG
4498  5411  5600          JMP I   RDBF                    /EXIT
4499                /
4500                /SUBROUTINE TO SHIFT COMMAND    REGISTER TO
4501                /DATA BUFFER THEN READ DATA BUFFER
4502                /
4503  5412  0000  RDCM,   0
4504  5413  7300          CLA CLL
4505  5414  1126          TAD     M12
4506  5415  3133          DCA     SRCNT1                  /12 BIT SHIFT
4507  5416  7330          CLA CLL CML RAR
4508  5417  4455          LOMAN                           /LOAD MAINTENANCE
4509  5420  7010          RAR
4510  5421  4455          LOMAN                           /LOAD MAINTENANCE
4511  5422  7300          CLA CLL
4512  5423  1216          TAD     K0400                   /ENABLE BIT FOR SHIFT COMMAND
4513  5424  4455          LOMAN                           /LOAD AND GO
4514  5425  2133          ISZ     SRCNT1
4515  5426  5224          JMP     .-2                     /SHIFT 12
4516  5427  7300          CLA CLL
4517  5430  1012          TAD     K0020                   /ENABLE READ BUFFER
4518  5431  4455          LOMAN                           /LOAD AND GO
4519  5432  3150          DCA     CMREG                   /SAVE IT
4520  5433  1150          TAD     CMREG
4521  5434  5612          JMP I   RDCM                    /EXIT
4522                /
4523                /ROUTINE TO ZERO WORK BUFFER
4524                /
4525  5435  0000  KLBUF,  0
4526  5436  7340          CLA CLL CMA
4527  5437  1067          TAD     BGNBUF                  /START OF BUFFER-1
4528  5440  3010          DCA     AUTO10                  /SETUP AUTO INDEX
4529  5441  1123          TAD     K7400
4530  5442  3162          DCA     DATCNT                  /SETUP COUNTER
4531  5443  3410          DCA I   AUTO10                  /CLEAR BUFFER
4532  5444  2162          ISZ     DATCNT                  /UPDATE COUNTER
4533  5445  5243          JMP     .-2                     /NOT ALL CLEARED YET
4534  5446  5635          JMP I   KLBUF                   /BUFFER CLEARED
4535                /
4536                /ROUTINE TO FILL THE WORK BUFFER WITH
```

```
                        /THE COMPLEMENT DATA THATS IN THE AC.
                        /
5447  0000  FLBUF,  0
5450  3163          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  3162          DCA     DATCNT          /SETUP COUNTER
5456  1163  LPDAT,  TAD     SAVDAT          /GET FIRST WORD
5457  3410          DCA I   AUTO10          /STORE IN BUFFER
5460  1163          TAD     SAVDAT          /GET SECOND WORD
5461  7040          CMA                     /COMPLEMENT IT
5462  3410          DCA I   AUTO10          /STORE IN BUFFER
5463  2162          ISZ     DATCNT          /UPDATE COUNTER
5464  5256          JMP     LPDAT           /MORE WORDS TO GO
5465  1102          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  4404          LAS                     /GET SWITCH 7
5472  0012          AND     K0020           /MASK
5473  7640          SZA CLA                 /WAIT LOOP?
5474  4434          WATISZ                  /YES
5475  4404          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  1150          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  4433          SKPWAT                  /WAIT FOR FIRST DONE
5511  7000          NOP
5512  1150          TAD     CMREG           /LAST COMMAND
5513  1015          TAD     K0200
5514  4450          LDCMD                   /LOAD COMMAND
5515  4433          SKPWAT                  /WAIT FOR SECOND DONE
5516  7000          NOP
5517  1150          TAD     CMREG
5520  0325          AND     K7577           /MASK SET DONE
5521  3150          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  4404          LAS                     /GET SWITCH A
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  1072          TAD     DRIVNO          /GET CURRENT DRIVE
5557  4450          LDCMD                   /LOAD COMMAND REGISTER
5560  1150          TAD     CMREG           /GET LAST COMMAND ISSUED
5561  1124          TAD     K3000           /ADD IN SEEK ONLY FUNCTION
5562  1156          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
                        /
                        /SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
                        /
5571  0000  CLDR,   0
5572  6742  IOT2,   DCLR                    /DCLR "CLEAR IOT"
5573  5771          JMP I   CLDR            /EXIT
5574  4405          CLASIC
5575  4436          CBERR
5576  7402  FRHLT2, HLT                     /SKIP TRAP ERROR
5577  5374          JMP     .-3
                        /
5600                  PAGE
                        /
```

```
4647                    /ROUTINE TO READ OR WRITE ON DISK
4648                    /RETURN+1 SKIP OR STATUS ERROR
4649                    /RETURN+2 O.K.
4650                    /
4651    5600  0000  DISKG,  0
4652    5601  3254          DCA     SAVTRK                  /SAVE TRACK ADDRESS
4653    5602  7340          CLA CLL CMA
4654    5603  3171          DCA     SOFERR                  /SET CRC ERROR FLAG
4655    5604  1600          TAD I   DISKG                   /GET TEXT POINTER
4656    5605  3172          DCA     SAVPCT                  /SAVE IT
4657    5606  2200          ISZ     DISKG                   /UPDATE POINTER
4658    5607  1150          TAD     CMREG                   /GET COMMAND
4659    5610  0255          AND     K7501                   /MASK OFF
4660    5611  1156          TAD     HOMEMA                  /CURRENT FIELD
4661    5612  1272          TAD     DRIVNO                  /CURRENT DRIVE
4662    5613  4450          LDCMD                           /LOAD COMMAND
4663    5614  1267          TAD     BGNBUF                  /GET BEGINNING OF BUFFER
4664    5615  4451          LDCUR                           /LOAD CURRENT ADDRESS
4665    5616  1254          TAD     SAVTRK                  /GET TRACK+SECTOR
4666    5617  4452          LDADD                           /LOAD AND GO
4667    5620  4433          SKPWAT                          /WAIT FOR DISK SKIP
4668    5621  5234          JMP     SKPERR                  /ERROR, NO SKIP
4669    5622  7330          CLA CLL CML RAR                 /EXPECTED STATUS
4670    5623  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
4671    5624  4444          RDSTAT                          /READ STATUS
4672    5625  1105          TAD     K4000
4673    5626  7640          SZA CLA                         /WAS STATUS 4000
4674    5627  5236          JMP     STAERR                  /ERROR, STATUS
4675    5630  1165          TAD     K5373                   /TEXT POINTER
4676    5631  2200          ISZ     DISKG                   /UPDATE FOR GOOD RETURN
4677    5632  3572  RETRN,  DCA I   SAVPCT                  /STORE IN TEXT POINTER
4678    5633  5600          JMP I   DISKG                   /EXIT
4679    5634  1164  SKPERR, TAD     K0306                   /SKIP TEXT POINTER
4680    5635  5232          JMP     RETRN                   /EXIT
4681    5636  1146  STAERR, TAD     STREG                   /GET STATUS JUST READ
4682    5637  0011          AND     K0010                   /MASK OUT CRC ERRORS
4683    5640  7650          SNA CLA                         /WERE THERE ANY
4684    5641  5252          JMP     HRDERR                  /NO, OTHERS
4685    5642  7300          CLA CLL
4686    5643  1150          TAD     CMREG                   /GET LAST COMMAND
4687    5644  0107          AND     K7000                   /MASK FUNCTION
4688    5645  1106          TAD     K6000                   /ADD IN FUNCE FACTOR
4689    5646  7630          SZL CLA                         /WAS IT A READ ALL OR READ
4690    5647  5252          JMP     HRDERR                  /NO, MUST BE A WRITE
4691    5650  3171          DCA     SOFERR                  /SET CRC ERROR FLAG
4692    5651  5230          JMP     RETRN+2         /GO CHECK DATA OR RETURN
4693    5652  1166  HRDERR, TAD     K5300
4694    5653  5232          JMP     RETRN                   /EXIT
4695                    /
4696    5654  0000  SAVTRK, 0
4697    5655  7501  K7501,  7501
4698                    /
4699                    /ROUTINE TO COMPARE WORDS IN BUFFER TO
4700                    /KNOWN DATA PATTERN IN THE AC.
4701                    /
```



```
4702    5656  0000  FGURE,  0
4703    5657  3143          DCA     GDREG2                  /SAVE FOR ERROR PRINTER
4704    5660  1067          TAD     BGNBUF                  /GET START OF BUFFER
4705    5661  3153          DCA     ADREG                   /SAVE FOR ERROR PRINTER
4706    5662  1150          TAD     CMREG                   /GET DISK NO. AND EXT. BIT
4707    5663  0101          AND     K0007                   /MASK THEM
4708    5664  7041          CIA
4709    5665  1553          TAD I   ADREG                   /GET FIRST TRACK WORD
4710    5666  7650          SNA CLA                         /WAS IT O.K. ?
4711    5667  5273          JMP     .+4                     /YES, CHECK NEXT TRACK WORD
4712    5670  1150          TAD     CMREG                   /GET DISK NO. AND EXT. BIT
4713    5671  0101          AND     K0007                   /MASK THEM
4714    5672  5343          JMP     DTERR                   /DATA ERROR
4715    5673  2153          ISZ     ADREG                   /UPDATE ADDRESS
4716    5674  1553          TAD I   ADREG                   /GET SECOND WORD
4717    5675  7041          CIA
4718    5676  1151          TAD     DAREG                   /COMPARE TO ADDRESS
4719    5677  7650          SNA CLA                         /WAS SECOND TRACK WORD O.K.
4720    5700  5303          JMP     .+3                     /YES, NOW CHECK DATA
4721    5701  1151          TAD     DAREG                   /GET GOOD INFO
4722    5702  5343          JMP     DTERR                   /DATA ERROR
4723    5703  7326          CLA CLL CML RTL
4724    5704  1123          TAD     K7400
4725    5705  3162          DCA     DATCNT                  /SETUP COUNTER
4726    5706  2153  LPFIG,  ISZ     ADREG                   /UPDATE ADDRESS
4727    5707  1553          TAD I   ADREG                   /GET DATA WORD
4728    5710  7041          CIA
4729    5711  1143          TAD     GDREG2                  /COMPARE TO GOOD ONE
4730    5712  7640          SZA CLA                         /WAS WORD O.K.?
4731    5713  5344          JMP     DTERR+1         /NO, DATA ERROR
4732    5714  1143          TAD     GDREG2                  /GET GOOD DATA
4733    5715  7040          CMA
4734    5716  3143          DCA     GDREG2                  /IT IS A COMPLEMENT DATA PATTERN
4735    5717  2162          ISZ     DATCNT                  /UPDATE BUFFER COUNTER
4736    5720  5306          JMP     LPFIG                   /MORE TO CHECK
4737    5721  2153          ISZ     ADREG                   /UPDATE ADDRESS
4738    5722  1102          TAD     K1234
4739    5723  7041          CIA
4740    5724  1553          TAD I   ADREG                   /GET WORD IN BUFFER+1
4741    5725  7650          SNA CLA                         /WAS IT O.K.
4742    5726  5331          JMP     .+3                     /YES ALL DATA O.K.
4743    5727  1102          TAD     K1234
4744    5730  5343          JMP     DTERR                   /WORD LOST IN BUFFER+1
4745    5731  7330          CLA CLL CML RAR                 /EXPECTED STATUS
4746    5732  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
4747    5733  1171          TAD     SOFERR                  /GET CRC ERROR FLAG
4748    5734  7640          SZA CLA                         /WAS IT SET
4749    5735  5656          JMP I   FGURE                   /NO THE BUFFER IS O.K.
4750    5736  7340          CLA CLL CMA                     /SETUP CRC FLAG
4751    5737  3171          DCA     SOFERR                  /RESET FLAG
4752    5740  1166          TAD     K5300                   /TEXT MESS
4753    5741  3572          DCA I   SAVPCT                  /SETUP TEXT POINTER
4754    5742  7330          CLA CLL CML RAR                 /EXPECTED STATUS
4755    5743  3143  DTERR,  DCA     GDREG2                  /SETUP COMPARE
4756    5744  1553          TAD I   ADREG                   /GET BAD WORD
```

```
4757    5745  3154          DCA     DTREG                   /SAVE FOR PRINTER
4758    5746  2256          ISZ     FGURE                   /UPDATE FOR ERROR RETURN
4759    5747  5656          JMP I   FGURE
4760                  /
4761    5750  2003  TEXPC,   TEXT    "PC:"
        5751  7200
4762    5752  0704  TEXGD,   TEXT    "GD:"
        5753  7200
4763    5754  2322  TEXCR,   TEXT    "CR:"
        5755  7200
4764    5756  2324  TEXST,   TEXT    "ST:"
        5757  7200
4765    5760  0402  TEXDB,   TEXT    "DB:"
        5761  7200
4766    5762  0315  TEXCM,   TEXT    "CM:"
        5763  7200
4767    5764  0401  TEXDA,   TEXT    "DA:"
        5765  7200
4768    5766  0301  TEXCA,   TEXT    "CA:"
        5767  7200
4769    5770  0104  TEXAD,   TEXT    "AD:"
        5771  7200
4770    5772  0424  TEXDT,   TEXT    "DT:"
        5773  7200
4771                  /
4772          6000    PAGE
4773                  /
4774                  /SUBROUTINE TO SHIFT CRC REGISTER TO DATA
4775                  /BUFFER THEN READ IT.
4776                  /
4777    6000  0000  RDCR,   0
4778    6001  7300          CLA CLL
4779    6002  1126          TAD     M12
4780    6003  3133          DCA     SBCNT1                  /12 SHIFTER
4781    6004  7330          CLA CLL CML RAR
4782    6005  4455          LDMAN                           /LOAD MAINTENANCE
4783    6006  7010          RAR
4784    6007  4455          LDMAN                           /LOAD MAINTENANCE
4785    6010  7010          RAR
4786    6011  4455          LDMAN                           /LOAD AND GO
4787    6012  2133          ISZ     SBCNT1
4788    6013  5211          JMP     .-2                     /12 BIT SHIFT
4789    6014  7300          CLA CLL
4790    6015  1212          TAD     K0020                   /ENABLE READ BUFFER
4791    6016  4455          LDMAN
4792    6017  3145          DCA     CRREG2                  /SAVE IT
4793    6020  1126          TAD     M12
4794    6021  3133          DCA     SBCNT1                  /12 BIT SHIFTER
4795    6022  7332          CLA CLL CML RTR
4796    6023  4455          LDMAN                           /LOAD MAINTENANCE
4797    6024  7010          RAR
4798    6025  4455          LDMAN                           /LOAD AND GO
4799    6026  2133          ISZ     SBCNT1
4800    6027  5225          JMP     .-2                     /12 BIT SHIFT
4801
```



```
4802
4803    6030  7300          CLA CLL
4804    6031  1212          TAD     K0020                   /ENABLE READ BUFFER
4805    6032  4455          LDMAN
4806    6033  0117          AND     K0017
4807    6034  3144          DCA     CRREG1                  /SAVE OTHER HALF
4808    6035  5600          JMP I   RDCR                    /EXIT
4809                  /
4810                  /SUBROUTINE TO PRINT TWO OCTAL
4811                  /
4812    6036  0000  TOCT,   0
4813    6037  3133          DCA     SBCNT1                  /SAVE AC
4814    6040  1133          TAD     SBCNT1
4815    6041  7010          RAR
4816    6042  7012          RTR
4817    6043  0101          AND     K0007
4818    6044  1777'         TAD     K0260
4819    6045  4436          TYPE                            /PRINT FIRST BYTE
4820    6046  1133          TAD     SBCNT1
4821    6047  0101          AND     K0007
4822    6050  1777'         TAD     K0260
4823    6051  4436          TYPE                            /PRINT SECOND BIT
4824    6052  5636          JMP I   TOCT                    /EXIT
4825                  /
4826                  /
4827                  /
4828                  /ROUTINE TO DO CRLF
4829                  /
4830    6053  0000  UPONE,   0
4831    6054  7300          CLA CLL
4832    6055  1262          TAD     K0215
4833    6056  4436          TYPE
4834    6057  1263          TAD     K0212
4835    6060  4436          TYPE
4836    6061  5653          JMP I   UPONE
4837                  /
4838    6062  0215  K0215,  0215
4839    6063  0212  K0212,  0212
4840    6064  0240  K0240,  0240
4841                  /
4842                  /ROUTINE TO PRINT FOUR OCTAL
4843                  /
4844    6065  0000  FROCT,  0
4845    6066  7006          RTL
4846    6067  7006          RTL
4847    6070  3253          DCA     UPONE
4848    6071  1310          TAD     M4
4849    6072  3236          DCA     TOCT
4850    6073  1253          TAD     UPONE
4851    6074  0101          AND     K0007
4852    6075  1777'         TAD     K0260
4853    6076  4436          TYPE
4854    6077  1253          TAD     UPONE
4855    6100  7006          RTL
4856    6101  7004          RAL
```

```
4857  6102  3253          DCA     UPONE
4858  6103  2236          ISZ     TOCT
4859  6104  5273          JMP     .-11
4860  6105  1264          TAD     K0240
4861  6106  4436          TYPE
4862  6107  5665          JMP I   FROCT
4863  6110  7774    M4,   7774
4864                      /
4865                      /SUBROUTINE TO PRINT TEXT
4866                      /
4867  6111  0000    PRN,  0
4868  6112  7300          CLA CLL
4869  6113  1711          TAD I   PRN                     /GET POINTER
4870
4871
4872  6114  2311          ISZ     PRN
4873  6115  3265          DCA     FROCT
4874  6116  1665          TAD I   FROCT
4875  6117  0111          AND     K7700
4876  6120  7450          SNA
4877  6121  5345          JMP     EXIT
4878  6122  7500          SMA
4879  6123  7020          CML
4880  6124  7001          IAC
4881  6125  7012          RTR
4882  6126  7012          RTR
4883  6127  7012          RTR
4884  6130  4436          TYPE
4885  6131  1665          TAD I   FROCT
4886  6132  0112          AND     K0077
4887  6133  7450          SNA
4888  6134  5345          JMP     EXIT
4889  6135  1350          TAD     K3740
4890  6136  7500          SMA
4891  6137  1347          TAD     K4100
4892  6140  1264          TAD     K0240
4893  6141  4436          TYPE
4894  6142  2265          ISZ     FROCT
4895  6143  7300          CLA CLL
4896  6144  5316          JMP     PRN+5
4897  6145  7300    EXIT, CLA CLL
4898  6146  5711          JMP I   PRN
4899
4900                      /
4901  6147  4100    K4100,  4100
4902  6150  3740    K3740,  3740
4903                      /
4904                      /ROUTINE TO TYPE
4905                      /
4906  6151  0000    PRINT,  0
4907  6152  4405          CLASIC          /CHK FOR CLASSIC
4908  6153  4435          CBTYPE
4909  6154  7410          SKP
4910  6155  5751          JMP I   PRINT
4911  6156  6046          TLS
```



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4912  6157  6041          TSF
4913  6160  5357          JMP     .-1
4914  6161  6042          TCF
4915  6162  7200          CLA
4916  6163  5751          JMP I   PRINT
4917                      /
4918                      /SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
4919                      /
4920  6164  0000    LOAD, 0
4921  6165  3151          DCA     DAREG                   /SAVE OUTBOUND DATA
4922  6166  1151          TAD     DAREG
4923  6167  6743    IOT3, DLAG                            /LOAD DISK ADDRESS REGISTER
4924  6170  5764          JMP I   LOAD                    /EXIT
4925  6171  4405          CLASIC
4926  6172  4436          CBERR
4927  6173  7402    ERHLT3, HLT                           /SKIP TRAP ERROR.
4928  6174  5371          JMP     .-3
4929                      /
4930  6177  4364
            6200          PAGE
4931                      /
4932                      /ROUTINE TO RECALIBRATE SELECTED DRIVE OR
4933                      /SEEK ONLY POSITION IN AC ON SELECTED DRIVE.
4934                      /
4935  6200  0000    RESTOR, 0
4936  6201  7300          CLA CLL
4937  6202  1600          TAD I   RESTOR                  /GET TEXT POINTER
4938  6203  3316          DCA     SAVPC                   /SAVE FOR ERROR
4939  6204  2200          ISZ     RESTOR                  /UPDATE PC
4940  6205  1200          TAD     RESTOR                  /GET PC
4941  6206  3215          DCA     ONLY                    /SAVE FOR END OF SEEK ROUTINE
4942  6207  1072          TAD     DRIVNO                  /CURRENT DRIVE
4943  6210  1156          TAD     HOMEMA                  /CURRENT FIELD
4944  6211  4450          LDCMD                           /LOAD COMMAND
4945  6212  7326          CLA CLL CML RTL                 /ENABLE RECALIBRATE BIT
4946  6213  4453          CLRALL                          /"RECALIBRATE"
4947  6214  5232          JMP     CHECK                   /CHECK FOR ERRORS
4948                      /
4949  6215  0000    ONLY, 0
4950  6216  3317          DCA     SAVTO                   /SAVE LOWER TRACK BITS
4951  6217  1615          TAD I   ONLY                    /GET TEXT POINTER
4952  6220  3316          DCA     SAVPC                   /SAVE FOR ERROR
4953  6221  2215          ISZ     ONLY
4954  6222  1150          TAD     CMREG                   /GET COMMAND
4955  6223  0073          AND     K0001                   /MASK OFF EXTENDED BIT
4956  6224  1156          TAD     HOMEMA                  /CURRENT FIELD
4957  6225  1072          TAD     DRIVNO                  /CURRENT DRIVE
4958  6226  1104          TAD     K3000                   /SEEK ONLY FUNCTION
4959  6227  4450          LDCMD                           /LOAD COMMAND
4960  6230  1317          TAD     SAVTO                   /GET POSITION
4961  6231  4452          LDADD                           /LOAD AND GO
4962  6232  4433    CHECK, SKPWAT                         /WAIT FOR FIRST DONE FLAG
4963  6233  5314          JMP     SEKER1                  /ERROR, NO SKIP
4964  6234  7330          CLA CLL CML RAR                 /EXPECTED STATUS
4965  6235  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
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4966  6236  1122          TAD     K7740
4967  6237  3321          DCA     RNAD                    /SETUP SKIP TIMER
4968  6240  4444          RDSTAT                          /READ STATUS
4969  6241  1125          TAD     K4000
4970  6242  7650          SNA CLA                         /WAS DRIVE DONE?
4971  6243  5252          JMP     .+7                     /YES
4972  6244  1106          TAD     K6000                   /NO, DRIVE MUST BE BUSY!
4973  6245  3143          DCA     GDREG2                  /EXPECTED STATUS
4974  6246  1146          TAD     STREG                   /GET STATUS READ
4975  6247  1103          TAD     K2000                   /ADD IN FUDGE FACTOR
4976  6250  7640          SZA CLA                         /WAS DRIVE BUSY
4977  6251  5311          JMP     SEKER2                  /NO, ERROR
4978  6252  1015          TAD     K0200                   /ENABLE SET SECOND DONE FLAG
4979  6253  1150          TAD     CMREG                   /ORIGINAL COMMAND
4980  6254  4450          LDCMD                           /LOAD COMMAND
4981  6255  7332          CLA CLL CML RTR
4982  6256  3143          DCA     GDREG2                  /EXPECTED STATUS
4983  6257  4530  CHKSKP, TICK                           /APT TIMING
4984  6260  4444          RDSTAT                          /READ STATUS
4985  6261  4447          DSKSKP                          /FLAG SET?
4986  6262  7410          SKP                             /NO
4987  6263  5274          JMP     GOTSKP                  /YES GOT IT!
4988  6264  1106          TAD     K6000
4989  6265  7640          SZA CLA                         /DRIVE BUSY?
4990  6266  5311          JMP     SEKER2                  /NO, ERROR
4991  6267  2365          ISZ     RNWRD4
4992  6270  5257          JMP     CHKSKP
4993  6271  2321          ISZ     RNAD
4994  6272  5257          JMP     CHKSKP
4995  6273  5314          JMP     SEKER1                  /ERROR, NO SKIP!
4996  6274  7330  GOTSKP, CLA CLL CML RAR
4997  6275  3143          DCA     GDREG2                  /SETUP EXPECTED STATUS
4998  6276  4444          RDSTAT                          /READ STATUS
4999  6277  1105          TAD     K4000
5000  6300  7640          SZA CLA                         /WAS IT ONLY DONE FLAG
5001  6301  5311          JMP     SEKER2                  /NO, ERROR STATUS
5002  6302  1150          TAD     CMREG                   /GET LAST COMMAND
5003  6303  0320          AND     A7577                   /MASK OUT
5004  6304  4450          LDCMD                           /CLEAR STATUS
5005  6305  3143          DCA     GDREG2                  /SETUP COMPARE REGISTER
5006  6306  4444          RDSTAT                          /READ STATUS
5007  6307  7650          SNA CLA                         /WAS STATUS 0000?
5008  6310  2215          ISZ     ONLY                    /UPDATE PC
5009  6311  1166  SEKER2, TAD     K5300
5010  6312  3716  GOBAK,  DCA I   SAVPC                   /SETUP TEXT POINTER
5011  6313  5615          JMP I   ONLY                    /BACK TO TEST
5012  6314  1164  SEKER1, TAD     K0306                   /SKIP TEXT POINTER
5013  6315  5312          JMP     GOBAK                   /EXIT
5014                      /
5015  6316  0000  SAVPC,  0
5016  6317  0000  SAVTO,  0
5017  6320  7577  A7577,  7577
5018                      /
5019                      /ROUTINE TO GET A RANDOM DISK ADDRESS
5020                      /
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5021  6321  0000  RNAD,   0
5022  6322  3361          DCA     SAVPOT                  /SAVE DISK NO. POINTER
5023  6323  7101          CLL IAC
5024  6324  1363          TAD     RNWRD1
5025  6325  1364          TAD     RNWRD2
5026  6326  7106          CLL RTL
5027  6327  3363          DCA     RNWRD1
5028  6330  1364          TAD     RNWRD2
5029  6331  7012          RTR
5030  6332  1363          TAD     RNWRD1
5031  6333  3364          DCA     RNWRD2
5032  6334  1364          TAD     RNWRD2
5033  6335  7420          SNL
5034  6336  5342          JMP     GOTADD                  /USE THIS AS DISK ADDRESS
5035  6337  1170          TAD     ENDTRK                  /HAVE TO CHECK BOUNDARIES
5036  6340  7200          CLA
5037  6341  1364          TAD     RNWRD2                  /GET SAME
5038  6342  3365  GOTADD, DCA     RNWRD4                  /SAVE WORD
5039  6343  1362          TAD     DSKSAV                  /GET POINTER
5040  6344  1361          TAD     SAVPOT                  /ADD IN DRIVE NUMBER
5041  6345  3361          DCA     SAVPOT                  /MAKE ADDRESS
5042  6346  1365          TAD     RNWRD4                  /GET WORD
5043  6347  3761          DCA I   SAVPOT                  /STORE IT
5044  6350  1361          TAD     SAVPOT
5045  6351  1076          TAD     K0004                   /ADD IN FUDGE FACTOR
5046  6352  3361          DCA     SAVPOT                  /MAKE ADDRESS
5047  6353  7004          RAL                             /GET THE LINK
5048  6354  3761          DCA I   SAVPOT                  /SAVE EXTENDED BIT
5049  6355  1761          TAD I   SAVPOT                  /GET IT
5050  6356  7110          CLL RAR                         /SHIFT
5051  6357  1365          TAD     RNWRD4                  /GET WORD
5052  6360  5721          JMP I   RNAD                    /EXIT
5053                      /
5054  6361  0000  SAVPOT, 0
5055  6362  6366  DSKSAV, DSK0A
5056  6363  1234  RNWRD1, 1234
5057  6364  2345  RNWRD2, 2345
5058  6365  0000  RNWRD4, 0
5059  6366  0000  DSK0A,  0
5060  6367  0000  DSK1A,  0
5061  6370  0000  DSK2A,  0
5062  6371  0000  DSK3A,  0
5063  6372  0000  DSK0B,  0
5064  6373  0000  DSK1B,  0
5065  6374  0000  DSK2B,  0
5066  6375  0000  DSK3B,  0
5067                      /
5068        6400  PAGE
5069                      /
5070                      /SUBROUTINE FOR "NO ERRORS" AND SCOPE
5071                      /LOOPS. UPDATE UP COUNTER "REG1" ON EVERY ENTRY.
5072                      /
5073  6400  0000  NERRO,  0
5074  6401  2200          ISZ     NERRO
5075  6402  7300          CLA CLL
```

```
5076  6403  4530          TICK
5077  6404  1600          TAD I   NERRO                    /GET RESTART ADDRESS
5078  6405  3173          DCA     RESTRT                   /STORE
5079  6406  4405          CLASIC
5080  6407  4442          C8CKPA
5081  6410  7000          NOP
5082  6411  4424          LAS                              /GET SWITCH 4
5083  6412  0215          AND     K0200                    /MASK
5084  6413  7650          SNA CLA                          /PROGRAM HALT
5085  6414  5223          JMP     .+4
5086  6415  4405          CLASIC
5087  6416  4437          C8INOU
5088  6417  7402  STPHLT, HLT                              /STOP HALT FROM SWR4=1
5089  6420  4424          LAS                              /GET SWITCH 1
5090  6421  7004          RAL
5091  6422  7700          SMA CLA                          /IS IT SCOPE LOOP
5092  6423  5226          JMP     .+3                      /NO
5093  6424  1600          TAD I   NERRO                    /GET RETURN POINTER
5094  6425  5642          JMP I   NSCOPE                   /CHECK FOR WAIT AND RETURN
5095  6426  1131          TAD     REG0
5096  6427  7640          SZA CLA                          /1 OR 4096 PASSES
5097  6430  5233          JMP     NEXTST                   /1 PASS PER TEST
5098  6431  2132          ISZ     REG1                     /UPDATE UPCOUNTER
5099  6432  5573          JMP I   RESTRT                   /BACK TO SAME TEST
5100  6433  7301  NEXTST, CLA CLL IAC                      /ENABLE CLEAR CONTROL
5101  6434  4453          CLRALL                           /CLEAR CONTROL
5102  6435  2200          ISZ     NERRO                    /UPDATE PC STORE
5103  6436  2200          ISZ     NERRO                    /UPDATE PC STORE
5104  6437  5600          JMP I   NERRO                    /TO NEXT SEQUENTIAL TEST
5105                      /
5106  6440  5470  NSCOPE, SCOPE
5107                      /
5108                      /ROUTINE TO DO HALF BLOCK DATA CHECKS
5109                      /
5110  6441  0000  HFCHK,  0
5111  6442  3143          DCA     GDREG2                   /SETUP FOR ERROR PRINTER
5112  6443  1767          TAD     BGNBUF                   /GET START OF BUFFER
5113  6444  3153          DCA     ADREG                    /FOR ERROR PRINTER
5114  6445  1150          TAD     CMREG
5115  6446  0101          AND     K0007
5116  6447  7041          CIA
5117  6450  1553          TAD I   ADREG                    /COMPARE TO BUFFER WORD
5118  6451  7650          SNA CLA                          /SAME ?
5119  6452  5256          JMP     .+4                      /YES
5120  6453  1150          TAD     CMREG
5121  6454  0101          AND     K0007
5122  6455  5337          JMP     HFERR                    /NO
5123  6456  2153          ISZ     ADREG                    /UPDATE ADDRESS
5124  6457  1553          TAD I   ADREG
5125  6460  7041          CIA
5126  6461  1151          TAD     DAREG                    /COMPARE TO DISK ADDRESS
5127  6462  7650          SNA CLA                          /SAME????
5128  6463  5266          JMP     .+3                      /YES
5129  6464  1151          TAD     DAREG
5130  6465  5337          JMP     HFERR                    /NO
```



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5131  6466  2153          ISZ     ADREG                    /UPDATE ADDRESS
5132  6467  7326          CLA CLL CML RTL
5133  6470  1124          TAD     K7600
5134  6471  3162          DCA     DATCNT                   /SETUP COUNTER FOR FIRST HALF
5135  6472  1553  HFR1,   TAD I   ADREG
5136  6473  7041          CIA
5137  6474  1143          TAD     GDREG2                   /COMPARE TO GOOD VALUE
5138  6475  7640          SZA CLA                          /WERE THEY THE SAME
5139  6476  5340          JMP     HFERR+1          /ERROR, DATA BREAK
5140  6477  2153          ISZ     ADREG                    /UPDATE ADDRESS POINTER
5141  6500  1143          TAD     GDREG2
5142  6501  7040          CMA
5143  6502  3143          DCA     GDREG2                   /NEXT WORD IS COMPLEMENT
5144  6503  2162          ISZ     DATCNT
5145  6504  5272          JMP     HFR1                     /MORE TO TEST IN FIRST HALF
5146  6505  1124          TAD     K7600
5147  6506  3162          DCA     DATCNT                   /SETUP COUNTER
5148  6507  3143          DCA     GDREG2                   /REST OF BUFFER SHOULD BE 0000
5149  6510  1553  HFR2,   TAD I   ADREG
5150  6511  7640          SZA CLA                          /WAS IT 0
5151  6512  5337          JMP     HFERR                    /ERROR
5152  6513  2153          ISZ     ADREG
5153  6514  2162          ISZ     DATCNT
5154  6515  5310          JMP     HFR2                     /MORE TO CHECK
5155  6516  1553          TAD I   ADREG                    /GET WORD IN BUFFER+1
5156  6517  7041          CIA
5157  6520  1102          TAD     K1234
5158  6521  7650          SNA CLA                          /WAS IT O.K.?
5159  6522  5325          JMP     .+3                      /YES
5160  6523  1102          TAD     K1234
5161  6524  5337          JMP     HFERR                    /ERROR, BUFFER+1
5162  6525  7330          CLA CLL CML RAR                  /EXPECTED STATUS
5163  6526  3143          DCA     GDREG2                   /SETUP COMPARE REGISTER
5164  6527  1171          TAD     SOFERR                   /GET CRC ERROR FLAG
5165  6530  7640          SZA CLA                          /WAS IT SET
5166  6531  5641          JMP I   HFCHK                    /NO ERRORS
5167  6532  7300          CLA CLL CMA
5168  6533  3171          DCA     SOFERR                   /RESET CRC ERROR FLAG
5169  6534  1166          TAD     K5300                    /TEXT
5170  6535  3572          DCA I   SAVPCT                   /SET UP POINTER
5171  6536  7330          CLA CLL CML RAR                  /EXPECTED STATUS
5172  6537  3143  HFERR,  DCA     GDREG2                   /SETUP COMPARE
5173  6540  1553          TAD I   ADREG                    /GET BAD WORD
5174  6541  3154          DCA     DTREG                    /SAVE FOR PRINTER
5175  6542  2241          ISZ     HFCHK
5176  6543  5641          JMP I   HFCHK
5177                      /
5178                      /SUBROUTINE TO LOAD COMMAND REGISTER
5179                      /
5180  6544  0000  LDCM,   0
5181  6545  3150          DCA     CMREG                    /SAVE OUTBOUND DATA
5182  6546  4405          CLASIC
5183  6547  4442          C8CKPA
5184  6550  7000          NOP
5185  6551  1150          TAD     CMREG
```

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5186  6552  6746  TOT6,   DLOC                    /LOAD COMMAND REGISTER
5187  6553  5744          JMP I   LOCM            /EXIT
5188  6554  4405          CLASIC                  /CHECK FOR CLASSIC.
5189  6555  4436          CBERR                   /ROUTINE TO EXECUTE.
5190  6556  7402  ERHLT6, HLT                     /SKIP TRAP ERROR.
5191  6557  5354          JMP     .-3
5192                      /
5193  6560  2405  NMES2,  TEXT "TEST (Y=YES OR N=NO)!"
      6561  2324
      6562  4050
      6563  3175
      6564  3105
      6565  2340
      6566  1722
      6567  4016
      6570  7516
      6571  1751
      6572  7200
5194                      /
5195        6600          PAGE
5196                      /
5197                      /ROUTINE TO CHANGE PROGRAM DEVICE CODES
5198                      /
5199  6600  4405  CHANG,  CLASIC
5200  6601  4431          CASWIT
5201  6602  7000          NOP
5202  6603  4404          LAS
5203  6604  0227          AND     K0770
5204  6605  3631          DCA I KHFCHK            /SAVE DESIRED CODE
5205  6606  1235          TAD     CONTR1
5206  6607  3632          DCA I KNERRO
5207  6610  1236          TAD     CHNPOT
5208  6611  3233          DCA     CNGSAV
5209  6612  1633  CHANGR, TAD I   CNGSAV          /GET ADDRESS POINTER
5210  6613  3000          DCA     0               /SAVE IT
5211  6614  1400          TAD I   0               /GET OLD IOT CODE
5212  6615  0234          AND     K7007           /MASK
5213  6616  1631          TAD I KHFCHK            /ADD IN DESIRED
5214  6617  3400          DCA I   0               /CHANGE CORE
5215  6620  2233          ISZ     CNGSAV          /UPDATE ADDRESS POINTER
5216  6621  2632          ISZ I KNERRO            /UPDATE CHANGE COUNTER
5217  6622  5212          JMP     CHANGR
5218  6623  4405          CLASIC
5219  6624  4436          CBERR
5220  6625  7402  CHNHLT, HLT                     /DEVICE CODES CHANGED
5221  6626  5630          JMP I   RSTRT           /TO START PROGRAM AT
5222                                              /LOCATION 0200: IF ON CLASSIC
5223                                              /CONSOLE PACKAGE HIT CONTROL
5224                                              /E. IF NOT PRESS KEY CONTINUE.
5225  6627  0770  K0770,  0770
5226                      /
5227  6630  0200  RSTRT,  BGN
5228  6631  6441  KHFCHK, HFCHK
5229  6632  6400  KNERRO, NERRO
5230                      /
```



```
5231  6633  0200  CNGSAV, 0
5232  6634  7007  K7007,  7007
5233  6635  7746  CONTR1, 7746
5234  6636  6637  CHNPOT, CHNPOT+1
5235  6637  1701          IOT1
5236  6640  5572          IOT2
5237  6641  6167          IOT3
5238  6642  4772          IOT4
5239  6643  5155          IOT5
5240  6644  6552          IOT6
5241  6645  4132          IOT7
5242  6646  2650          IOT1A1
5243  6647  2647          IOT3A1
5244  6650  2643          IOT4A1
5245  6651  2652          IOT5A1
5246  6652  2645          IOT6A1
5247  6653  3331          IOT1A2
5248  6654  3255          IOT2A2
5249  6655  3230          IOT3A2
5250  6656  3224          IOT4A2
5251  6657  3233          IOT5A2
5252  6660  3226          IOT6A2
5253  6661  2215          T28IOA
5254  6662  2017          T28IOB
5255  6663  2222          T28IOC
5256  6664  2225          T28IOD
5257  6665  2100          T29IOA
5258  6666  2102          T29IOB
5259  6667  2105          T29IOC
5260  6670  2110          T29IOD
5261                      /
5262  6671  2324  ERTX1,  TEXT    "STATUS REGISTER ERROR"
      6672  0124
      6673  2523
      6674  4222
      6675  0507
      6676  1123
      6677  2405
      6700  2240
      6701  0522
      6702  2217
      6703  2200
5263  6704  0317  ERTX2,  TEXT    "COMMAND REGISTER ERROR"
      6705  1515
      6706  0116
      6707  2440
      6710  2205
      6711  0711
      6712  2324
      6713  0522
      6714  4005
      6715  2222
      6716  1722
      6717  0000
5264  6720  0411  ERTX3,  TEXT    "DISK ADDRESS REGISTER ERROR"
```

```
          6721  2313
          6722  4001
          6723  0404
          6724  2205
          6725  2323
          6726  4022
          6727  0507
          6730  1123
          6731  2405
          6732  2240
          6733  0522
          6734  2217
          6735  2200
5265      6736  0411    FRTX4,  TEXT    "DISK DATA ERROR"
          6737  2313
          6740  4004
          6741  0124
          6742  0140
          6743  0522
          6744  2217
          6745  2200
5266      6746  0322    FRTX5,  TEXT    "CRC REGISTER ERROR"
          6747  0340
          6750  2205
          6751  0711
          6752  2324
          6753  0522
          6754  4005
          6755  2222
          6756  1722
          6757  0000
5267      6760  0401    FRTX6,  TEXT    "DATA REGISTER ERROR"
          6761  2401
          6762  4022
          6763  0507
          6764  1123
          6765  2405
          6766  2240
          6767  0522
          6770  2217
          6771  2200
5268      6772  0411    FRTX7,  TEXT    "DISK SKIP ERROR"
          6773  2313
          6774  4023
          6775  1311
          6776  2040
          6777  0522
          7000  2217
          7001  2200
5269      7002  0411    FRTX8,  TEXT    "DISK INTERRUPT ERROR"
          7003  2313
          7004  4011
          7005  1624
          7006  0522
          7007  2225
```



```
          7010  2024
          7011  4005
          7012  2222
          7013  1722
          7014  0000
5270                      /
5271      7015  4020    TEXEND, TEXT    " PASS COMPLETE"
          7016  0123
          7017  2340
          7020  0317
          7021  1520
          7022  1405
          7023  2405
          7024  0000
5272                      /
5273                      /
5274
5275                      /
5276                      /THIS ROUTINE WILL TEST FOR THE AVAILABILITY OF THE
5277                      /APT 8A TEST SYSTEM AND NOP ANY CONSOLE PACKAGE WHICH
5278                      /MIGHT HAVE BEEN SET UP.
5279                      /
5280                      /
5281      7025  0000    APTA,   0
5282      7026  1022            TAD 22                          /TEST FOR APT SYSTEM
5283      7027  0105            AND K4000
5284      7030  7650            SNA CLA                         /ON APT ?
5285      7031  5625            JMP I APTA                      /NO
5286      7032  1022            TAD     22
5287      7033  0300            AND     K7377                   /NOP CONSOLE PACKAGE
5288      7034  3022            DCA     22
5289      7035  1107            TAD     K7000                   /NOP SWITCH REGISTER ROUTINE
5290      7036  3701            DCA I   XMYLAS                  /NOP SWITCHES
5291      7037  3362            DCA     CLKCNT
5292      7040  3072            DCA     DRIVNO                  /START WITH DRIVE 0.
5293      7041  1022            TAD     22
5294      7042  0075            AND     K0003                   /# OF DRIVES
5295      7043  3303            DCA     AERRO                   /SET COUNTER FOR NO. OF DRIVES.
5296      7044  1303            TAD     AERRO
5297      7045  7040            CMA
5298      7046  3071            DCA     DRVCNT                  /SETUP COUNTER.
5299      7047  1071            TAD     DRVCNT
5300      7050  3330            DCA     KTICK
5301      7051  1022    APTBR,  TAD     22
5302      7052  0014            AND     K0100
5303      7053  7650            SNA CLA                         /SINGLE DRIVE TEST?
5304      7054  5264            JMP     .+10                    /NO!!!!
5305      7055  7240            CLA CMA
5306      7056  3071            DCA     DRVCNT                  /COUNT OF 1.
5307      7057  1303            TAD     AERRO
5308      7060  7104            CLL RAL
5309      7061  3072            DCA     DRIVNO                  /TEST ONLY THIS DRIVE.
5310      7062  1303            TAD     AERRO                   /TEST THIS DRIVE
5311      7063  7410            SKP
5312      7064  1362            TAD     CLKCNT
```

```
5313  7065 1677          TAD I   XDSKON
5314  7066 3327          DCA     PCSAV
5315  7067 7240          CLA CMA
5316  7070 3727          DCA I   PCSAV                   /SET ACTIVE INDICATOR.
5317  7071 2362          ISZ     CLKCNT
5318  7072 2330          ISZ     KTICK
5319  7073 5251          JMP     APTAR
5320  7074 1071          TAD     DRVCNT
5321  7075 3370          DCA     DRVMAV                  /TALLY FOR AMOUNT OF DRIVES.
5322  7076 5702          JMP I   TSTOP                   /RETURN WITH CONSOLE PACKAGE
5323                                                     /NOP AND SWITCH REGISTER NOP.
5324                     /
5325  7077 4374    XDSKON, DSKON
5326  7100 7377    K7377,  7377
5327  7101 5100    XMYLAS, MYLAS+3
5328  7102 0233    TSTOP,  TST0+5
5329                     /
5330                     /THIS ROUTINE WILL REPORT ERRORS TO THE APT SYSTEM IF REQUIRED.
5331                     /IT FIRST TEST FOR APT  THEN EXECUTES THE ERROR CODING.
5332                     /
5333  7103 0000    AERRO,  0
5334  7104 7200          CLA                             /MAKE SURE AC IS CLEAR
5335  7105 1022          TAD 22                          /GET CONFIGURATION
5336  7106 0105          AND K4000                       /ISOLATE APT BIT
5337  7107 7650          SNA CLA                         /ON APT
5338  7110 5703          JMP I AERRO                     /NO
5339  7111 7340          CLL CLA CMA                     /SET UP FOR GETTING ERROR PC
5340  7112 1725          TAD I PERROR                    /GET ERROR PC
5341  7113 3327          DCA PCSAV                       /STORE FOR FUTURE USE
5342  7114 6002          IOF                             /DISABLE INTERUPT SYSTEM
5343  7115 6224          RIF                             /SET UP FOR DATA FIELD IN ERROR
5344  7116 1121          TAD KCDF                        /ESTABLISHES DATA FIELD
5345  7117 3321          DCA .+2
5346  7120 1327          TAD PCSAV                       /GET ERROR ADDRESS
5347  7121 7402          HLT                             /REPLACED WITH ERROR DATA FIELD
5348  7122 6272          CIF 70                  /FIELD OF UVPROM
5349  7123 5726          JMP I K6520                     /REPORT ERROR
5350  7124 5703          JMP I AERRO                     /RETURN TO THE NORMAL REPORTING
5351                     /
5352  7125 5200    PERROR, ERRO                          /POINTER TO PC IN ERROR
5353  7126 6520    K6520,  6520                          /POINTER TO UV PROM ADDRESS
5354  7127 0000    PCSAV,  0                             /PLACE WHERE ERROR PC IS STORED
5355                     /
5356                     /THIS ROUTINE IS A NOP IF NOT BEING USED ON THE APT LINE.
5357                     /IF APT IS ENABLED A TIMING PULSE IS GENERATED AT
5358                     /APPROXIMATELY 1.5 SECOND INTERVALS
5359                     /
5360  7130 0000    KTICK,  0
5361  7131 1022          TAD 22                  /GET HARDWARE CONFIGURATION
5362  7132 0105          AND K4000               /TEST FOR APT EACH TIME
5363  7133 7650          SNA CLA
5364  7134 5730          JMP I KTICK                     /NO TIMING GENERATED
5365  7135 2362          ISZ CLKCNT              /SEE IF TIMING NEEDS TO BE DONE
5366  7136 5730          JMP I KTICK                     /NO, RETURN TO MAIN FLOW
5367  7137 1361          TAD COUNT                       /INIT FIRST CLOCK
```



```
5368  7140 3362          DCA CLKCNT
5369  7141 2175          ISZ KCNT                /FOR TESTS REQUIRING LONGER TIME OUT ON APT
5370  7142 5730          JMP I KTICK                     /RETURN, NOT READY TO NOTIFY APT
5371  7143 6224          RIF                     /START SETUP FOR UV PROM
5372  7144 1121          TAD KCDF
5373  7145 3347          DCA .+2                 /WILL ESTABLISH CURRENT DATA FIELD
5374  7146 6002          IOF
5375  7147 7402          HLT                     /CHANGED TO CURRENT DATA FIELD
5376  7150 6272          CIF 70                  /LOCATION OF UVPROM
5377  7151 4763          JMS I K6500             /LET APT KNOW YOU ARE RUNNING
5378  7152 7300          CLL CLA                         /MAKE SURE AC AND LINK ARE CLEAR
5379  7153 1361          TAD COUNT
5380  7154 3362          DCA CLKCNT              /INITIALIZE CLOCK COUNTER
5381  7155 1360          TAD CNT
5382  7156 3175          DCA KCNT
5383  7157 5730          JMP I   KTICK
5384                     /
5385  7160 7777    CNT,    -1
5386  7161 7777    COUNT,  7777
5387  7162 0000    CLKCNT, 0
5388  7163 6500    K6500,  6500                  /POINTS TO UV PROM
5389                     /
5390          7177       *7177
5391                     /
5392          7177       WRKBUF=.
5393                     /
5394          7177       HITRK=.
5395          7200       LOTRK=.+1
5396                     /
5397          7576       ENDBUF=.+377
5398                     /
5399          7577       STPCHK=.+400
5400                     /
5401                     $$$
```

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

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111000  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111101

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110011


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111101

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000011

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

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  11100011

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000001

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000
```



```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00000111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000011

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  11111100  00011111

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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  11111111  11111001

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


7000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7100  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

7200
7300

7400
7500

7600
7700
```

```
A7577   6320        C8SETD  0613        DCLR    6742        ERHLT1  4761
ACCMP1  4442        C8SETS  0535        DCNT1   4370        ERHLT2  5576
ACCMP2  4443        C8SWIT  4431        DCNT2   4371        ERHLT3  6173
ACL     7701        C8SWST  0745        DCNT3   4372        ERHLT4  4776
ACREG   0155        C8TMP1  1021        DCNT4   4373        ERHLT5  5161
ACSAVE  1345        C8TTYI  4426        DIN     4530        ERHLT6  6556
ADREG   0153        C8TYPE  4435        DISK0   1561        ERHLT7  4136
AERRO   7103        CAF     6007        DISK1   1562        ERHLT9  5344
AGAIN   5325        CAREG   0152        DISK2   1563        ERR1    0736
ALLBAK  4242        CCNTR1  6635        DISK3   1564        ERRA1   5217
APA1    5045        CHANG   6600        DISK4   1565        ERRMES  1320
APERR   5066        CHANGR  6612        DISK5   1566        ERRO    5200
APHLT1  5073        CHECK   6232        DISK6   1567        ERROR   4440
APR1    5024        CHKCLA  1200        DISK7   1570        ERTX1   6671
APT8    7025        CHKERR  5342        DISKG   5600        ERTX2   6704
APT8R   7051        CHKNEX  4432        DISKGO  4426        ERTX3   6720
AUTO10  0010        CHKSKP  6257        DLAG    6743        ERTX4   6736
AUTPRO  5000        CHNHLT  6625        DLCA    6744        ERTX5   6746
BGN     0200        CHNPOT  6636        DLDC    6746        ERTX6   6760
BGNBUF  0067        CKCOUT  0232        DMAN    6747        ERTX7   6772
BYRETR  0506        CLASIC  4405        DOCNT   0247        ERTX8   7002
C8BY1   0230        CLASIK  5102        DONEA   0426        ESCOPE  5357
C8BY2   1300        CLDR    5571        DOPACK  0212        EXIT    6145
C8BY3   1061        CLKCNT  7162        DOSET   0251        EXITA   0440
C8BY4   0515        CLRALL  4453        DOUT    5553        F10P1   0021
C8BY5   1116        CLRTRN  1315        DRIVNO  0072        F10P2   0022
C8CHAR  1075        CMREG   0150        DRST    6745        F1SWR   0020
C8CKP   1022        CNGSAV  6633        DRVCNT  0071        FGURE   5654
C8CKPA  4440        CNT     7160        DRVHAV  0070        FIGURE  4430
C8CKSW  4425        CNTRLC  0551        DSK0A   6366        FILBUF  4431
C8CNTR  4427        CNTRLD  0600        DSK0B   6372        FILCNT  1040
C8CONT  1145        CNTRLE  0545        DSK1A   6367        FILLER  1037
C8CRLF  4433        CNTRLL  0537        DSK1B   6373        FLBUF   5447
C8D01   0310        CNTRLQ  0500        DSK2A   6370        FLSAVE  1347
C8D010  1262        CNTRLR  0511        DSK2B   6374        FROCT   6065
C8D011  0607        CNTRLS  0521        DSK3A   6371        GDREG1  0142
C8D02   1033        CNTVAL  0252        DSK3B   6375        GDREG2  0143
C8D03   0350        COMP1   4557        DSKADD  4526        GETCH1  0703
C8D04   1006        COMP2   3600        DSKIN   4407        GETDAT  0456
C8D07   0527        CONSOL  0000        DSKON   4374        GETDRV  4345
C8ECHO  4434        CONST1  1366        DSKOUT  4406        GOBAK   6312
C8ERR   4436        COUNT   7161        DSKP    6741        GOITA   0443
C8GET   0620        CRERR   3614        DSKPOT  4527        GOTADD  6342
C8HANG  1122        CRLF    4462        DSKSAV  6362        GOTOA   0454
C8INQU  4437        CRREG1  0144        DSKSKP  4447        GOTSKP  6274
C8OCTA  4432        CRREG2  0145        DTERR   5743        GTF     6004
C8PASS  4424        CRWRD1  0160        DTREG   0154        GTREG   5527
C8PAUS  4441        CRWRD2  0161        ENDBUF  7576        HAFCHK  4427
C8PRNT  4430        CYL450  0065        ENDHLT  4122        HEDHLT  4021
CARDPS  0666        DAREG   0151        ENDIT   0742        HEDLST  5370
C8RETD  0614        DATCNT  0162        ENDTRK  0170        HEDTAD  5367
C8RETR  0536        DBREG   0147        ENDTST  4062        HFCHK   6441
```



```
HFERR   6537        K0240   6064        LOCMD   4450        OVRDOK  4435
HFR1    6472        K0260   4364        LOCUR   4451        OVRERR  4254
HFR2    6510        K0277   4366        LOMAN   4455        OVRLAP  4200
HITRK   7177        K0306   0164        LOMN    4131        OVROK   4233
HOMEMA  0156        K0331   4365        LOADCT  1355        OVRR1   4203
HRDERR  5652        K0400   0016        LOTRK   7200        OVRR2   4206
ICNTR1  4763        K0770   6627        LPDAT   5456        OVRR3   4221
ICNTR2  4764        K1000   0017        LPFIG   5706        OVRRD1  4403
INDEXA  0455        K1234   0102        M12     0126        OVRRD2  4406
INHIBT  5361        K2000   0103        M4      6110        OVRRD3  4421
INMODE  1076        K2525   0113        MANPRO  2706        OVRRED  4400
INTADD  4743        K3000   0104        MANUAL  4600        PASCNT  0250
INTRQ   0363        K3740   6150        MESA    0747        PCLF    6662
IONWAT  4441        K4000   0105        MESAC   1333        PCNTR1  5365
IONWT   4727        K4100   6147        MESFL   1341        PCNTR2  5366
IOT1    1001        K5000   0115        MESMAN  1146        PCSAV   7127
IOT1A1  2650        K5252   0114        MESMQ   1336        PCSAVE  1344
IOT1A2  3031        K5300   0166        MESPAS  0253        PERROR  7125
IOT2    5572        K5373   0165        MESPC   1330        PNTBUF  1120
IOT2A2  3055        K5403   0364        MPERR   2771        POLERR  4427
IOT3    6167        K6000   0106        MPHLT1  2734        PRINT   6151
IOT3A1  2647        K6304   0167        MPHLT2  2776        PRN     6111
IOT3A2  3030        K6500   7163        MPR1    2735        PRNTER  4457
IOT4    4772        K6520   7126        MQA     7501        PRSFLD  0222
IOT4A1  2643        K7000   0107        MQL     7421        PSIE    6665
IOT4A2  3024        K7007   6634        MQSAVE  1346        PSKE    6663
IOT5    5155        K7156   3772        MYAC    1317        PSKF    6661
IOT5A1  2652        K7377   7100        MYLAS   5075        PSTB    6664
IOT5A2  3033        K7400   0123        NOIN    4553        PTSTOR  0336
IOT6    6552        K7501   5655        NERRO   6400        RANADD  4423
IOT6A1  2645        K7577   5525        NERROR  4437        RDAD    4140
IOT6A2  3026        K7600   0124        NEXDSK  4123        RDADD   4446
IOT7    4132        K7700   0111        NEXTST  6433        RDBF    5400
K0001   0073        K7707   4726        NL7775  7346        RDBUF   4456
K0002   0074        K7740   0122        NMES1   0760        RDCM    5412
K0003   0075        K7760   0110        NMFS2   6560        RDCMD   4445
K0004   0076        K7771   0116        NMES3   4165        RDCR    6000
K0005   0077        KAERRO  0127        NOCLR   5522        RDCRC   4454
K0006   0100        KCDF    0121        NOSET   0242        RDST    5154
K0007   0101        KCNT    0175        NOTDON  4230        RDSTAT  4444
K0010   0011        KHFCHK  6631        NOTEX   5350        REALPC  1316
K0017   0117        KILBUF  4432        NSCOPE  6440        RECAL   4425
K0020   0012        KLBUF   5435        NTCLAS  1270        REDBAK  4510
K0037   0120        KNERRO  6632        NTCRC   5301        REDOA   0415
K0040   0013        KRMF    0362        NTGD    5264        REG0    0131
K0077   0112        KTICK   7130        NTSEK   4666        REG1    0132
K0100   0014        KTIME   0174        NXTDSK  4274        RESEK   4022
K0177   4367        LAS     4404        OCTEL   4460        RESTOR  6200
K0200   0015        LOAD    6164        ONLY    6215        RESTRT  0173
K0207   5356        LOADD   4452        OP1     0021        RETRN   5632
K0212   6063        LOCA    4765        OP2     0022        RETRN2  5360
K0215   6062        LOCM    6544        OVRDER  4522        RNAD    6321
```

```
RNWRD1  6363        T143E  1063        T29IOA  2100        T40R   3242
RNWRD2  6364        T15E   1106        T29IOB  2102        T40S   3246
RNWRD4  6365        T15T   1110        T29IOC  2105        T40T   3265
ROUINS  1302        T16E   1126        T29IOD  2110        T41E   3357
ROUTMP  5133        T16T   1130        T290K   2132        T41R   3272
RSTRT   6630        T17E   1171        T29R    2074        T41S   3306
SAMDSK  4073        T17S   1135        T29T    2137        T41T   3361
SAVAC   5132        T17T   1173        T29W    2126        T42E   3447
SAVDAT  0163        T18E   1237        T2E     0323        T42R   3402
SAVPC   6316        T18S   1204        T30D    2200        T42S   3406
SAVPCT  0172        T18T   1241        T30E    2207        T42T   3451
SAVPOT  6361        T19E   1267        T30R    2142        T43E   3512
SAVTO   6317        T190K  1266        T30T    2211        T43R1  3454
SAVTRK  5654        T19T   1271        T31E    2257        T43R2  3461
SBCNT1  0133        T1E    0275        T31R    2214        T43T   3514
SCOPE   5470        T20E   1317        T31T    2261        T44E   3557
SDKP    1000        T200K  1316        T32E    2372        T440K  3567
SEEK    4424        T20T   1321        T32R1   2271        T44R   3526
SEKER1  6314        T21E   1350        T32R2   2312        T44T   3572
SEKER2  6311        T210K  1347        T32R3   2331        T45A1  3644
SELDSK  4260        T21T   1352        T32R4   2353        T45A2  3720
SETUP1  1233        T22E   1442        T32T    2374        T45E   3765
SETUP2  0225        T22R1  1404        T33E    2507        T45R1  3634
SKPERR  5634        T22R2  1423        T33R1   2404        T45R2  3650
SKPWAT  4433        T22T   1444        T33R2   2431        T45R3  3711
SKWAT   5134        T23E   1506        T33R3   2450        T45R4  3723
SOFERR  0171        T23R1  1451        T33R4   2467        T45SC  3626
STAERR  5636        T23R2  1470        T33T    2511        T45T   3767
STCON   0157        T23T   1510        T34E    2546        T4E    0484
STPCHK  7577        T24E   1554        T34T    2550        T4T    0486
STPHLT  6417        T24S   1513        T35E    2615        T5E    0420
STRAUT  5310        T24T   1556        T36E    2673        T5T    0422
STREG   0146        T25E   1642        T36N    2700        T6E    0435
SWR     0020        T25S   1602        T36R    2637        T6T    0437
SWSEK   4012        T25T   1644        T36T    2703        T7E    0451
T0E     0256        T26E   1714        T37A    3054        T7T    0453
T10E    0571        T26R1  1651        T37E    3100        T8E    0477
T10R    0542        T26R2  1673        T37R    3015        T8R    0456
T10T    0573        T26T   1716        T37T    3102        T8T    0501
T11E    0637        T27E   1765        T38DE   3157        T9E    0532
T11R1   0602        T27R1  1723        T38E    3146        T90K   0531
T11R2   0612        T27R2  1745        T38OK   3156        T9R    0507
T11R3   0616        T27T   1767        T38R    3115        T9T    0534
T11T    0641        T28E   2055        T3AT    3161        TABLA  0461
T12A    0673        T28IOA 2015        T39DE   3235        TABLB  0471
T12E    0677        T28IOB 2017        T39E    3224        TAPROT 5070
T12R    0654        T28IOC 2022        T390K   3234        TCNTR1 0134
T13A    0747        T28IOD 2025        T39R    3173        TCNTR2 0135
T13E    0753        T28OK  2052        T39T    3237        TCNTR3 0136
T13R    0707        T28R   2010        T3E     0355        TCNTR4 0137
T14KE   1067        T28T   2057        T3T     0357        TCNTR5 0140
T14R    1013        T29E   2135        T40E    3263        TCNTR6 0141
```



```
TEXAD   5770        TST32  2262        XDOLPT  1112
TEXCA   5766        TST33  2400        XDOSW   0520
TEXCM   5762        TST34  2514        XDOUT   0006
TEXCR   5754        TST35  2551        XDSKON  7077
TEXDA   5764        TST36  2622        XERRO   0040
TEXDB   5760        TST37  3002        XFGURE  0030
TEXDT   5772        TST38  3105        XFLBUF  0031
TEXEND  7015        TST39  3164        XFRDCT  0060
TEXGO   5752        TST4   0400        XGTREG  5362
TEXPC   5750        TST40  3240        XHFCHK  0027
TEXST   5756        TST41  3270        XHITRK  0064
THSFLD  0035        TST42  3400        XIONWT  0041
TICK    4530        TST43  3452        XKLBUF  0032
TIMSTP  3541        TST44  3517        XLAP    4163
TMANE   4722        TST45  3622        XLAS    0004
TMANOK  4721        TST5   0411        XLOAD   0052
TMANS   4643        TST6   0423        XLOCA   0051
TMANT   4724        TST7   0440        XLOCM   0050
TMPCNT  0746        TST8   0454        XLOMN   0055
TMPROT  2773        TST9   0502        XLOAD   0125
TOCT    6036        TSTCHA 0715        XLOTRK  0063
TOTST   5526        TSTSEK 4067        XMYLAS  7101
TOVRDT  4524        TTYLPT 1121        XNERRO  0037
TRK212  0066        TWOCT  4461        XONLY   0024
TST0    0240        TYPE   4436        XOVRRO  4164
TST0P   7102        UPAROW 0615        XPRINT  0036
TST1    0265        UPONE  6053        XPRN    0057
TST10   0540        WATISZ 4434        XRDAD   0046
TST11   0600        WATMES 0651        XRDBF   0056
TST12   0645        WRKBUF 7177        XRDCM   0045
TST13   0702        WTISZ  4000        XRDCR   0054
TST14   1010        XC8CKP 1041        XRDST   0044
TST14P  0757        XC8CNT 0400        XREG    5364
TST15   1073        XC8CRL 1023        XRESTR  0025
TST16   1111        XC8ECH 1063        XRNAD   0023
TST17   1133        XC8ERR 1207        XSDKP   0047
TST18   1202        XC8INO 0635        XSKWAT  0033
TST19   1242        XC8OCT 1000        XTABLA  0457
TST2    0301        XCAPAS 0200        XTABLB  0460
TST20   1272        XC8PAU 0337        XTEXT   5363
TST21   1322        XC8PNT 0303        XTICK   0130
TST22   1400        XC8PSW 0656        XTOCT   0061
TST23   1445        XC8SW  0262        XWTISZ  0034
TST24   1511        XC8TTY 0272
TST25   1600        XC8TVP 1077
TST26   1645        XCLAS  0005
TST27   1717        XCLDR  0053
TST28   1773        XCOMP1 0042
TST29   2062        XCOMP2 0043
TST3    0326        XCRLF  0062
TST30   2140        XDIN   0007
TST31   2212        XDISKG 0026
```

ERRORS DETECTED: 0

LINKS GENERATED: 136

RUN-TIME: 34 SECONDS

4K CORE USED

```
IOT3A1  2912#  5243
IOT3A2  3053#  5249
IOT4    4194#  5238
IOT4A1  2908#  5244
IOT4A2  3049#  5250
IOT5    4334#  5239
IOT5A1  2915#  5245
IOT5A2  3056#  5251
IOT6    5186#  5240
IOT6A1  2910#  5246
IOT6A2  3051#  5252
IOT7    3722#  5241
K0001   1189#  1279  2404  2425  2465  2481  3085  4955
K0002   1190#  1241  1695  1759  2858
K0003   1191#  1283  1330  3540  3874  3878  5294
K0004   1192#  3706  3942  5045
K0005   1193#  1564  3585
K0006   1194#  1385  2953  4065  4212
K0007   1195#  3646  3659  4117  4376  4707  4713  4817  4821  4851  5115  5121
K0010   1135#  2865  3065  3593  4599  4682
K0017   1209#  1531  2515  2522  2564  2572  3255  3470  3521  3572  4806
K0020   1136#  1754  2984  3498  3512  3558  3746  4243  4492  4517  4561  4798  4804
K0037   1210#  1868  1880  1917  1928  2078  2100  2128  2149  2183  2195  2244  2255  2284
        2310   2339  2364  2397  2412  2432  2457  2472  2487  2616  2636  2659  2680  2718
        2741   2762  2782  3375
K0040   1137#  1393  1580  4565
K0077   1204#  1618  4886
K0100   1138#  1835  1841  1958  1999  2024  2032  4134  5302
K0177   3841   3891#
K0200   1139#  1388  1333  1353  1365  1665  1700  1776  3741  3842  4002  4578  4978  5083
K0227   4363   4465#
K0212   4834   4839#
K0215   4832   4838#
K0240   3855   4840#  4860  4892
K0260   3834   3888#  4818  4822  4852
K0277   3836   3890#
K0306   1253#  4679  5012
K0331   3848   3889#
K0400   1140#  1294  1354  4168  4443  4512
K0770   5203   5225#
K1000   1141#  1817  1840  1877  1965  1998  2031  2097  2192  2307  2486  2427  2519  2569
        2656   2677  2871  2995  3032  3116  4253
K1234   1196#  4553  4738  4743  5157  5160
K2000   1197#  4227  4975
K2525   1205#  1863  1884  1952  1970  2018  2037  2075  2104  2174  2200  2336  2369  2559
        2633   2684  2735  2787  2893  2954  3000  3077  3145  3205  3235  3266  3298  3329
        3355   3396  3447  3506  3579  3580  4217  4258
K3020   1198#  1701  1762  3647  3660  4626  4958
K3740   4889   4902#
K4000   1199#  1914  2132  2241  2346  2417  2422  2722  2745  2815  2818  2916  2932  3059
        3130   3190  3280  3340  3432  3533  3693  3766  3952  4012  4672  4969  4999  5283
        5336   5362
K4100   4891   4901#
```



```
K5000   1207#  1812  1834  1865  1957  1991  2023  2082  2180  2291  2394  2512  2561  2620
        2640   2850  2903  2963  2978  4106  4222  4237
K5252   1206#  1912  1932  1986  2004  2125  2153  2235  2260  2281  2315  2610  2664  2714
        2766   3515  3944  3965
K5300   1255#  1390  2401  2461  2986  3068  3150  3210  3452  3929  4245  4693  4752  5009
        5169
K5373   1254#  3075  3148  3208  3450  4675
K5403   1280   1412#
K6000   1200#  4017  4100  4688  4972  4988
K6304   1256#  2526  2577
K6500   5377   5388#
K6520   5349   5353#
K7000   1201#  1381  3223  4099  4105  4687  5289
K7007   5212   5232#
K7156   3500   3605#
K7377   5287   5326#
K7400   1213#  4529  4724
K7501   4659   4697#
K7577   4571   4583  4589#
K7600   1214#  4544  4615  5133  5146
K7700   1203#  1619  2955  3252  3323  4875
K7707   4057   4150#
K7740   1212#  1607  1861  1910  2073  2094  2123  2144  2172  2233  2279  2303  2334  2358
        2392   2454  2608  2631  2652  2674  2712  2733  2757  2776  3376  3511  3557  3613
        4157   4317  4966
K7760   1202#  2507  2555  2565  2573  3256  3517  3525  3561  3566  3650  3663
K7771   1208#  4424
KAERRO  1223#  4353
KCDF    1211#  1275  5344  5372
KCNT    1262#  3495  3696  5369  5382
KHFCHK  5204   5213  5229#
KILBUF  1289#  1811  1874  1925  1964  1997  2030  2096  2146  2190  2251  2305  2360  2511
        2654   2676  2759  2778  2845  2975  2994  3045  3373  3958  4125  4234
KLBUF   1156   4525#  4534
KNERRO  5206   5216  5229#
KRMF    1277   1410#
KTICK   1224   5300  5318  5360#  5364  5366  5370  5383
KTIME   1261#  2414  2474
LAS     1116#  2951  3632  3643  3705  4056  4076  4087  4210  4356  4359  4441  4560  4564
        4598   5082  5089  5202
LDAD    1172   4920#  4924
LDADD   1102#  1387  1703  1766  2821  2852  2873  3126  3186  3428  3651  3664  4230  4630
        4666   4961
LDCA    1171   4189#  4195
LDCM    1170   5180#  5187
LDCMD   1104#  1310  1335  1356  1367  1384  1666  1702  1764  1777  1787  2816  2851  2872
        3124   3184  3426  3648  3661  4000  4003  4229  4572  4579  4624  4628  4662  4944
        4959   4980  5004
LDCUR   1105#  2847  2868  3122  3182  3424  4606  4664
LDMAN   1108#  2823  2825  2827  2854  2856  2859  3737  3739  3742  3747  4491  4493  4508
        4510   4513  4518  4608  4782  4784  4786  4791  4796  4798  4805
LDMN    1175   3615  3616  3721#  3723
LOADCT  1215   2050#  2051  2057  2058
```

```
LOTRK    1070   1141   5395#
LPDAT    4546#  4552
LPFIG    4726#  4736
M12      1219#  3734   4505   4779   4793
M4       1655   1687   3825   4848   4863#
MANPRO   1269   2948#  3013
MANUAL   1267   4353#
MESA      629    680#
MESAC     973   1022#
MESFL     981   1024#
MESHAN    889    894#
MESMQ     977   1023#
MESPAS    147    176#
MESPC     969   1021#
MPERR    2967   2991   2999   3003#
MPHLT1   1059   2970#
MPHLT2   1062   3008#
MPR1     2975#  3004
MQA        51#   365    798    944
MQL        50#   560
MQSAVE    366    559    799    945    978   1227#
MYAC     1006   1012   1018#
MYLAS    1126   4274#  4278   4318   4325   5327
NDIN     4008   4017#
NERRO    1161   5073#  5074   5077   5093   5102   5103   5104   5229
NERROR   1094#  1319   1342   1370   1403   1432   1451   1471   1490   1519   1553   1591   1637   1675
         1724   1795   1822   1846   1890   1938   1972   2006   2039   2110   2159   2206   2266   2321
         2375   2439   2496   2542   2591   2693   2793   2832   2878   2937   3002   3092   3153   3213
         3241   3336   3361   3402   3456   3597   3808   3947   4143   4260
NEXDSK   3681   3699   3712#
NEXTST   5297   5100#
NL7775   1080#  1751
NMES1    1732#  3702   3819
NMES2    3822   5193#
NMES3    3755#  3829
NOCLR    4567   4585#
NOSET     162    167#
NOTDON   3786   3789#
NOTEX    4428   4458#
NSCOPE   5094   5106#
NTCLAS    956    991#
NTCRC    4410   4419#
NTGO     4392   4406#  4457
NTSEK    4108   4116#
NXTDSK   3828#  3859
OCTEL    1111#  4388   4404   4417   4438
ONLY     1150   4941   4949#  4951   4953   5008   5011
OP1      1146#  4299   4300
OP2      1147#  4289   4301   4302
OVRDER   3931   3957   3964   3968   3988#
OVRDOK   3928   3935#
OVRERR   3788   3805   3809#
OVRLAP   3752   3765#  3810   3812
```



```
OVROK    3787   3792#
OVRR1    3768#
OVRR2    3771#  3778   3795
OVRR3    3782#  3790   3791
OVRRD1   3909#
OVRRD2   3912#  3919
OVRRD3   3923#  3933   3934
OVRRED   3753   3906#  3989   3991
PASCNT    144    148    173#
PCLF       43#   865    867
PCNTR1   4425   4439   4472#
PCNTR2   4421   4431   4432   4433   4460   4461   4473#
PCSAV    5314   5316   5341   5346   5354#
PCSAVE    948    997    999   1025#
PERROR   5340   5352#
PNTBUF    854    858    870#   877    883
POLERR   3929#  3984
PRINT    1160   4906#  4910   4916
PRN      1177   4847#  4869   4872   4896   4898
PRNTER   1110#  3721   3703   3818   3821   3828   4381   4384   4396   4412   4435
PRSFLD   1159   1276   1284#
PSIE       46#
PSKE       44#
PSKF       42#   878
PSTB       45#   865
PTSTOR    259    261    272    281    283#
RANADD   1084#  1609   1613   1617   3225   3254   3258   3262   3325   3374   3378   3774   3915   3971
RDAD     1168   3614   3618   3732#  3750
RDAND    1101#  4610
RDBF     1176   4489#  4498
RDBUF    1109#  4604
RDCM     1167   4503#  4521
RDCMD    1120#  4611
RDCR     1174   4777#  4808
RDCRC    1127#  2536   2585   4609
RDST     1166   4333#  4342
RDSTAT   1099#  1311   1317   1395   1401   1667   1704   1711   1718   1769   1782   1789   2830   2876
         3129   3189   3431   3655   3668   4006   4011   4231   4603   4671   4968   4984   4998   5006
REALPC    952    970   1017#
RECAL    1085#  1429   1468   1487   1575   3336   3346
REDBAK   3978#  3982   3986
REDOA     370#   378
REG0     1225#  1298   1352   1649   1750   2957   3714   4060   4216   5095
REG1     1226#  2956   3715   4215   5098
RESEK    3640#  3671
RESTOR   1151   4935#  4937   4939   4940
RESTRT   1260#  1271   4355   5078   5099
RETRN    4677#  4680   4692   4694
RETRN2   4368   4450   4456   4467#
RNAD     1149   4967   4993   5021#  5052
RNWRD1   5024   5027   5030   5056#
RNWRD2   5025   5028   5031   5032   5037   5057#
RNWRD4   4991   5038   5042   5051   5058#
```

```
ROUINS   1004#  4304    4307
ROUTMP   4287   4303    4310#
RSTRT    5221   5227#
SAMOSK   3688#
SAVAC    4285   4293    4305    4309#
SAVDAT   1252#  4540    4546    4548
SAVPC    4938   4952    5010    5015#
SAVPCT   1259#  3039    4656    4677    4753    5170
SAVPOT   5022   5040    5041    5043    5044    5046    5048    5049    5054#
SAVTD    4950   4960    5016#
SAVTRK   4652   4665    4496#
SBCNT1   1227#  3735    3743    4506    4514    4780    4787    4794    4799    4813    4814    4820
SCOPE    4466   4559#   5106
SDKP     1169   1739#   1742    1743
SEEK     1086#  1448    1465    1484    1506    1538    1572    1624    1630    2809    3276    3289    3385    4112
SEKER1   4963   4995    5012#
SEKER2   4977   4990    5001    5009#
SELOSK   1287   3816#   3862    3868
SETUP1    960#
SETUP2    153#
SKPERR   4668   4679#
SKPWAT   1092#  1348    1767    1778    4575    4580    4667    4962
SKWAT    1157   4314#   4328    4329
SOFERR   1258#  3044    3071    3113    3174    3416    4654    4691    4747    4751    5164    5168
STAERR   4674   4681#
STCON    1248#  1652    1696    1709
STPCMK   1071   5399#
STPHLT   1057   5048#
STRAUT   4426#  4443
STREG    1239#  2423    2479    2933    2988    3057    3058    3064    4247    4340    4341    4681    4974
SWR      1208   1039    1145#   4297    4298
SWSEK    3629#
T0E      1314   1320#
T10E     1574   1577    1592#
T10R     1569#  1586    1590
T10T     1573   1576    1594#
T11E     1626   1632    1638#
T11R1    1609#  1636
T11R2    1617#
T11R3    1621#  1634
T11T     1625   1631    1640#
T12A     1662   1672#
T12E     1670   1676#
T12R     1657#  1674
T13A     1694   1721#
T13E     1707   1714    1720    1725#
T13R     1689#  1723
T14KE    1768   1779    1800#
T14R     1756#  1794
T14SE    1772   1785    1792    1796#
T15E     1816   1821    1823#
T15T     1815   1820    1825#
T16E     1839   1845    1847#
```



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T16T     1838   1844    1849#
T17E     1875   1883    1887    1891#
T17S     1863#  1889
T17T     1874   1882    1893#
T18E     1924   1931    1935    1939#
T18S     1912#  1937
T18T     1923   1930    1941#
T19E     1962   1969    1973#
T19OK    1972#
T19T     1961   196A    1975#
T1E      1337   1341#
T20E     1995   2003    2007#
T20OK    2006#
T20T     1994   2002    2009#
T21E     2028   2036    2040#
T21OK    2039#
T21T     2027   2035    2042#
T22E     2087   2103    2107    2111#
T22R1    2077#  2089
T22R2    2096#  2109
T22T     2086   2102    2113#
T23E     2137   2152    2156    2160#
T23R1    2127#  2139
T23R2    2146#  2158
T23T     2136   2151    2162#
T24E     2189   2199    2203    2207#
T24S     2174#  2205
T24T     2188   2198    2209#
T25E     2250   2259    2263    2267#
T25S     2235#  2265
T25T     2249   2258    2269#
T26E     2296   2314    2318    2322#
T26R1    2283#  229A
T26R2    2305#  2320
T26T     2295   2313    2324#
T27E     2351   2368    2372    2376#
T27R1    2338#  2353
T27R2    2360#  2374
T27T     2350   2367    2378#
T28E     2400   2436    2440#
T28IOA   2408#  5253
T28IOB   2410#  5254
T28IOC   2413#  5255
T28IOD   2416#  2421    5256
T28OK    2419   2437#
T28R     2403#  2438
T28T     2399   2402    2442#
T29E     2460   24A9    2497#
T29IOA   2468#  5257
T29IOB   2470#  5258
T29IOC   2473#  5259
T29IOD   2476#  2491    5260
T29OK    2494#
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T29R      2464#   2495
T29T      2459    2462    2499#
T29W      2478    2490#
T2E       1359    1364    1371#
T30D      2533    2536#
T30E      2518    2525    2539    2543#
T30R      2509#   2541
T30T      2517    2524    2527    2545#
T31E      2568    2576    2588    2592#
T31R      2557#   2590
T31T      2567    2575    2578    2594#
T32E      2625    2645    2663    2667    2683    2687    2691#
T32R1     2615#   2627
T32R2     2635#   2647
T32R3     2654#   2669
T32R4     2676#   2689
T32T      2624    2644    2662    2682    2693#
T33E      2727    2750    2765    2769    2786    2790    2794#
T33P1     2716#   2729
T33R2     2740#   2752
T33R3     2759#   2771
T33R4     2778#   2792
T33T      2726    2749    2764    2785    2796#
T34E      2811    2833#
T34T      2810    2835#
T35E      2879#
T36E      2918    2932#
T36N      2931    2937#
T36R      2904#   2926    2930
T36T      2940#
T37A      3061    3073#
T37E      3070    3080    3093#
T37R      3042#   3087    3091
T37T      3038    3069    3076    3095#
T38DE     3154#
T38E      3132    3145#
T38OK     3144    3153#
T38R      3120#   3139    3143
T38T      3151    3156#
T39DE     3214#
T39E      3192    3205#
T39OK     3204    3213#
T39R      3180#   3199    3203
T39T      3211    3216#
T3E       1389    1398    1404#
T3T       1386    1391    1406#
T40E      3234    3238    3242#
T40R      3225#   3240
T40S      3229#
T40T      3233    3244#
T41E      3278    3285    3291    3297    3301    3307#
T41R      3254#   3305
T41S      3266#   3303
```



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T41T      3277    3284    3290    3296    3309#
T42E      3338    3345    3348    3354    3358    3362#
T42R      3325#   3360
T42S      3329#
T42T      3337    3344    3347    3353    3364#
T43E      3387    3395    3399    3403#
T43R1     3373#   3401
T43R2     3378#   3389
T43T      3386    3394    3405#
T44E      3434    3447#
T44OK     3446    3455#
T44R      3422#   3441    3445
T44T      3453    3458#
T45A1     3507    3516#
T45A2     3553    3561#
T45E      3538    3576    3583    3598#
T45R1     3508#   3545
T45R2     3520#   3543
T45R3     3554#   3591
T45R4     3564#   3588
T45SC     3502#   3596
T45T      3537    3575    3600#
T4E       1431    1433#
T4T       1430    1435#
T5E       1450    1452#
T5T       1449    1454#
T6E       1467    1470    1472#
T6T       1466    1469    1474#
T7E       1486    1489    1491#
T7T       1485    1488    1493#
T8E       1508    1520#
T8R       1503#   1514    1518
T8T       1507    1522#
T9E       1540    1554#
T90K      1550    1553#
T9R       1535#   1547    1552
T9T       1539    1556#
TABLA      404     406#
TABLB      405     415#
TAPROT    4225    4240    4246    4256    4263#
TCNTR1    1228#   1501    1503    1511    1512    1532    1537    1542    1543    1545    1567    1569    1583    1584
          1608    1635    1656    1673    1688    1722    1755    1765    1793    1862    1867    1879    1888    1911
          1916    1927    1936    2074    2077    2088    2095    2099    2108    2124    2127    2138    2145    2148
          2157    2173    2182    2194    2204    2234    2243    2254    2264    2280    2283    2297    2304    2309
          2319    2335    2338    2352    2359    2363    2373    2393    2403    2411    2424    2431    2437    2455
          2464    2471    2480    2486    2494    2508    2514    2521    2540    2556    2563    2571    2589    2609
          2615    2626    2632    2635    2646    2653    2658    2668    2675    2679    2688    2713    2717    2728
          2734    2740    2751    2758    2761    2770    2777    2781    2791    3031    3046    3052    3081    3088
          3114    3125    3133    3140    3175    3185    3193    3200    3259    3275    3288    3326    3334    3342
          3351    3417    3427    3495    3442    3499    3504    3513    3551    3559    3592    3594    3633    3658
          3662    4058    4062    4063    4064    4098    4104    4109    4116    4119
TCNTR2    1229#   1502    1505    1509    1515    1534    1535    1548    1551    1568    1571    1579    1581    1587
          1610    1623    1654    1657    1663    1672    1686    1689    1698    1721    2415    2420    2475    2490
```

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                980
XC8PSW           75     533     619#    622     676
XC8SW            67     137     152     199#    206     958     986     992
XC8TTY           69     223#    231     462     593     805     827
XC8TYP           83     271     280     383     385     547     549     633     671     728     755     760     832     853#
                869
XCLAS          1115    1127#
XCLDR          1106    1173#
XCOMP1         1097    1164#
XCOMP2         109A    1165#
XCRLF          1114    1180#
XDIN           1083    1129#
XDISKG         1087    1152#
XDOLPT          857     864#
XDOSW           447     448#
XDOUT          1082    1128#
XDSKON         5313    5325#
XERRO          1095    1162#
XFGURE         1093    1154#
XFLBUF         1090    1155#
XFROCT         1111    1178#
XGTREG         4455    4469#
XHFCHK         1088    1153#
XHITRK         1182#   1871    1920    1955    1989    2021    2081    2131    2178    2239    2289    2344    2614    2639
               2721    2739    2897    2922    2923    2961    2977    3270    3333    3531    3532    3948    3951    4118
               4220    4236
XIONWT         1096    1163#
XKLBUF         1089    1156#
XLAP           3684    3752#
XLAS           1116    1126#
XLDAD          1102    1172#
XLDCA          1105    1171#
XLDCM          1104    1170#
XLDMN          1108    1175#
XLOAD          1215#   1647    1459    2390    2492    2805    2889    3029    3110    3171    3250    3413    3496
XLOTRK         1181#   1869    1872    1918    1921    1956    1990    2022    2079    2084    2129    2134    2185    2186
               2246    2247    2286    2293    2341    2348    2618    2622    2637    2642    2719    2724    2743    2747
               2895    2911    2919    2927    2934    2962    3272    3335    3522    3526    3527    3535    3950    3954
               4122    4221
XMYLAS         5290    5327#
XNERRO         1094    1161#
XONLY          1086    1150#
XOVRRD         3685    3753#
XPRINT         1113    1160#
XPRN           1110    1177#
XRDAD          1101    1168#
XRDBF          1109    1176#
XROCM          1100    1167#
XROCR          1107    1174#
XRDST          1099    1166#
XREG           4422    4471#
XRESTR         1085    1151#
XRNAD          1084    1149#
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XSDKP          1103    1169#
XSKWAT         1092    1157#
XTABLA          368     404#
XTABLB          395     405#
XTEXT          4420    4477#
XTICK          1117    1224#
XTOCT          1112    1179#
XWTISZ         1091    1158#
.L0357          312     317#
.L0360          279     318#
.L0361          278     319#
.L0362          276     320#
.L0363          273     321#
.L0364          271     280     322#
.L0365          262     323#
.L0366          229     230     324#
.L0367          228     325#
.L0370          227     326#    1332    1414#
.L0371          200     327#    1329    1415#
.L0372          155     328#    1287    1416#
.L0373          149     329#    1285    1417#
.L0374          145     150     330#    1270    1418#
.L0375          138     153     331#    1269    1419#
.L0376          136     151     332#    1268    1420#
.L0377          134     307     333#    1267    1421#
.L0560          498     503#
.L0561          462     504#
.L0562          445     486     494     505#
.L0563          444     477     485     495     506#
.L0564          441     474     476     493     507#
.L0565          432     435     463     478     487     508#
.L0566          393     509#
.L0567          386     510#
.L0570          384     511#
.L0571          383     385     512#
.L0572          379     428     443     513#
.L0573          373     382     390     392     394     514#
.L0574          366     515#
.L0575          364     516#
.L0576          359     517#
.L0577          358     361     518#    1566    1599#
.L0752          670     683#
.L0753          666     684#
.L0754          662     685#
.L0755          658     686#
.L0756          654     687#
.L0757          640     688#
.L0760          635     642     689#
.L0761          634     690#
.L0762          632     691#
.L0763          631     692#
.L0764          626     693#
.L0765          593     694#
```

```
.L0766    591    628    695#
.L0767    588    620    696#
.L0770    564    697#
.L0771    561    698#
.L0772    559    699#
.L0773    550    672    674    700#
.L0774    548    637    647    657    661    665    667    701#
.L0775    547    549    633    671    702#
.L0776    546    703#   1658   1690   1734#
.L0777    530    595    704#   1655   1687   1735#
.L1162    891    896#
.L1163    888    897#
.L1164    807    830    885    898#
.L1165    806    810    828    899#
.L1166    805    827    900#
.L1167    802    901#
.L1170    799    902#
.L1171    797    903#
.L1172    795    904#
.L1173    759    905#
.L1174    754    906#
.L1175    727    907#
.L1176    726    908#
.L1177    723    909#   1752   1898#
.L1365    1009   1031#
.L1366    996    1032#
.L1367    989    1033#
.L1370    971    975    979    983    1034#
.L1371    966    968    972    976    980    1035#
.L1372    965    984    1036#
.L1373    960    1037#
.L1374    958    986    992    103A#
.L1375    957    985    991    998    1000   1039#
.L1376    951    1010   1040#  2056   2062#
.L1377    922    1041#  2054   2063#
.L2176    2527   2534#
.L2177    2518   2525   2535#
.L2377    2541   2698#
.L3377    3199   3203   3321#
.L4175    3696   3757#
.L4176    3686   3758#
.L4177    3679   3687   3759#
.L4375    3855   3898#
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.L4576    3912   3923   3978   4034#
.L4577    3911   3920   3975   4035#
.L5173    4304   4307   4343#
.L5174    4302   4344#
.L5175    4300   4345#
.L5176    4298   4346#
.L5177    4290   4347#
.L6177    4818   4822   4852   4930#
```



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.V0021    4300   4345#
.V0022    4302   4344#
.V0040    632    691#
.V0077    273    321#
.V0100    278    319#   393    509#
.V0177    227    326#
.V0200    228    325#
.V0212    759    905#
.V0215    654    687#   754    906#
.V0240    279    318#
.V0260    727    907#
.V0262    958    986    992    103A#
.V0272    462    504#   593    694#   805    827    900#
.V0277    384    511#   670    6A3#
.V0303    591    628    695#   888    897#   966    968    972    976    980    1035#
.V0336    546    703#
.V0400    138    153    331#   530    595    704#   807    830    885    898#   922    1041#  4290   4347#
.V0515    626    693#
.V0615    444    477    485    495    506#
.V0624    136    151    332#   432    435    463    478    487    508#   806    810    828    899#   957
          985    991    998    1000   1039#
.V0635    155    328#   891    896#   989    1033#
.V0745    445    486    494    505#
.V1000    149    329#   631    692#   971    975    979    983    1034#
.V1023    145    150    330#   386    510#   550    672    674    700#   965    984    1036#
.V1041    200    327#
.V1063    635    642    689#
.V1075    229    230    324#   373    382    390    392    394    514#   548    637    647    657    661
          665    667    701#
.V1076    379    428    443    513#   634    690#
.V1077    271    280    322#   383    385    512#   547    549    633    671    702#
.V1121    441    474    476    493    507#
.V1200    134    307    333#   359    517#   58A    620    696#   802    901#
.V1302    4304   4307   4343#
.V1345    358    361    518#   564    697#   795    904#
.V1346    366    515#   559    699#   799    902#
.V1347    364    516#   561    698#   797    903#
.V2142    2541   2698#
.V2207    2518   2525   2535#
.V2211    2527   2534#
.V2706    1269   1419#
.V3173    3199   3203   3321#
.V3740    276    320#
.V4260    1287   1416#
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.V4371    3686   3758#  3911   3920   3975   4035#
.V4374    1658   1690   1734#
.V4600    1267   1421#
.V5000    1270   1418#
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.V6600    1268    1420#
.V7025    1285    1417#
.V7160    1332    1414#   1566    1599#   1752    1898#
.V7161    1329    1415#   2054    2063#
.V7162    2056    2062#   3696    3757#
.V7402     312     317#    996    1032#
.V7510     662     685#
.V7520     658     686#
.V7600     498     503#
.V7700     262     323#
.V7774     723     909#
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