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 SWR0=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

PSEUDO SWITCH REGISTER

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 C8STRT
                        /WHERE YOU WANT TO RESTART THE PROGRAM.


                        /SETUP1 IN XC8ERR    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            PST8=   6664
6665            PSIE=   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

                C8PASS= JMS I   .
0024 0200                XCAPAS         /C8 PASS COMPLETION ROUTINE
                C8CKSW= JMS I   .
0025 0262                XC8SW          /CHECK SW REG SETTING
                C8TTYI= JMS I   .
0026 0272                XC8TTY         /FETCH CONSOL CHAR
                C8CNTR= JMS I   .
0027 0400                XC8CNT         /CHECK FOR CONTROL CHAR
                C8PRNT= JMS I   .
0030 0303                XCAPNT         /CA PRINT A BUFFER
                C8SWIT= JMS I   .
0031 0656                XCAPSW         /SET UP PSEUDO SW. REG
                C8OCTA= JMS I   .
0032 1000                XC8OCT         /CONVERT TO ASCII AND PRINT
                CACRLF= JMS I   .
0033 1023                XCACRL         /DO A CARRIGE RETUR+LINE FEED
                C8ECHO= JMS I   .
0034 1063                XC8ECH         /CHECK INPUT CHAR
                CATYPE= JMS I   .
0035 1077                XCATYP         /CA PRINT ONE CHAR
                C8ERR=  JMS I   .
0036 1237                XC8ERR         /CA ERROR  HANDLER
                C8INQU= JMS I   .
0037 0635                XC8INQ         /LOOK FOR OPERATOR INTERVENTION
                CACKPA= JMS I   .
0040 1041                XCACKP         /CHECK IF CONTROL CHAR
                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     C8RY1           /CONTINUE ON RUNNING PROGRAM
0212  4232  OOPACK, JMS     CKCOUT          /CLASS CHECK C8PASS COUNT
0213  5230          JMP     C8RY1           /C8PASS COUNT NOT DONE REDO PROGRAM
0214  2250          ISZ     PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
0215  4774*         JMS     XC8CRLF
0216  4303          JMS     XCAPNT          /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  C8RY1,  ISZ     XCAPAS          /BUMP RETURN
0231  5600          JMP I   XC8PAS
0232  0000  CKCOUT, 0
0233  1251          TAD     OOSET           /CHECK IF SET UP NEEDED
0234  7640          SZA CLA                 /0=SET UP CAPASS 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     OOCNT           /STORE IN HERE
```



```
0241  2251          ISZ     OOSET           /INDICATE VALUE SET UP
0242  2247  NOSET,  ISZ     OOCNT           /COUNT THE NUMBER OF PASSES
0243  5230          JMP     C8RY1           /EXIT FOR ANOTHER PASS
0244  3251          DCA     OOSET           /SET TO C8PRNT C8PASS
0245  2232          ISZ     CKCOUT          /BUMP RETURN FOR
0246  5632          JMP I   CKCOUT          /C8PASS C8TYPE OUT
0247  0000  OOCNT,  0
0250  0000  PASCNT, 0                       /
0251  0000  OOSET,  0
0252  0000  CNTVAL, 0
0253  0410  MESPAS, TEXT    "OHRKRF  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     XCASW           /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 A 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            /AND 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              C8001,  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     C8001           /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     C8003           /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              C8003,  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  1200
0374  1223
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

                /EX.    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    XCACNT, 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 O 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            CNTRLO
                /
                /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     RYRET0          /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  1220  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  4220  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'  C8RDPS, 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 @ 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     CBCHAR          /NOT CR, GET CHAR
0723  1355            TAD     (-260           /CHECK IF IT IS IN RANGE
0724  7710            SPA CLA                 /IF NOT POSITIVE CBERR CHAR SMALLER THEN 260
0725  5336            JMP     ERR1            /CBERR =CHAR TOO SMALL
0726  1774'           TAD     CBCHAR          /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            /CBERR ON CHAR NOT IN RANGE
0732  1774'           TAD     CBCHAR          /GET CHAR
0733  0353            AND     (7              /MASK FOR RIGHT BYTE
0734  3774'           DCA     CBCHAR          /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     XCBCRLF         /
0741  5266            JMP     CBRDPS          /EXIT+ASK AGAIN
0742  4773'  ENDIT,   JMS     XCBCRLF         /DO A CR LF
0743  3345            DCA     CBSWST          /CLEAR THE PSW ENTRY FLAG
0744  5656            JMP I   XCBPSW          /EXIT ROUTINE
0745  0000  CBSWST, 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  1000
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

              /CBOCTA

              /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
              /       CBOCTA= JMS XCBOCT
              /
              /EX,    JMS     XCBOCTA         /AC CONTAINS NUMBER TO BE CHANGE
              /       RETURN IS TO CALL PLUS ONE AC=0
              /
              /CALLS USED ARE =XCATYPE=

1000  0000  XCBOCT, 0
1001  7176            CLL RTL
1002  7006            RTL                     /POSITION THE FIRST CHAR FOR PRINTING
1003  3221            DCA     CBTMP1          /SAVE CORRECT POSITIONED WORD HERE
1004  1377            TAD     (-4
1005  3222            DCA     CBCKP           /STORE COUNTER IN HERE
1006  1221  CBDO4,    TAD     CBTMP1          /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     CBTMP1          /
1013  7006            RTL
1014  7004            RAL                     /PUT NEXT NUMBER IN POSITION
1015  3221            DCA     CBTMP1          /STORE IT
1016  2222            ISZ     CBCKP           /DONE YET WITH FOUR NUMBERS
1017  5206            JMP     CBDO4           /NOT YET DO MORE
1020  5600            JMP I   XCBOCT          /DONE WITH FOUR
1021  0000  CBTMP1, 0
1022  0000  CBCKP,  0


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

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


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

```
0756  1227  1237            TAD     FILLER
0757  1230  7040            CMA
0758  1231  3240            DCA     FILCNT          /STORE FILLER IN HERE
0759  1232  1373            TAD     (212            /GET CODE FOR LF
0760  1233  4277  CRDO2,    JMS     XCBTYPE
0761  1234  2240            ISZ     FILCNT          /CHECK ON FILLER CHAR
0762  1235  5233            JMP     CRDO2           /TYPE A NON PRINTING CHAR
0763  1236  5623            JMP I   XCRCRL          /EXIT
0764  1237  0004  FILLER, 0004                     /FILLER SET FOR 4 CHAR
0765  1240  0000  FILCNT, 0                        /COUNTER FOR FILL
0766
0767
0768
0769                  //*************************************************************
0770                  /CRCKPA
0771                  /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
0772                  /TERMINAL. IFTHE FLAG IS SET AND THE CONSOLE PACKAGE IS
0773                  /ACTIVE A CHECK IS MADE TO DETERMIND IF IT IS A CONTROL CHAR.
0774                  /IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
0775                  /IF NOT A CONTROL CHARACTER OR A CONTROL E=0=L=0=IT WILL DO
0776                  /THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
0777                  /A NON CONTROL CHARACTER WILL BE PRINTEDAND A "?" IT WILL RETURN TO
0778                  /CALL PLUS 2.
0779                  /IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
0780                  /CALL PLUS 1.
0781
0782
0783                  /       CRCKPA* JMS     XCRCKP
0784
0785
0786                  /EX.    JMS     XCRCKPA                 /CALL TO CHECK IF CONTROL CHAR SET
0787                  /       ANYTHING(SKIP)          /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
0788                  /       ANYTHING(JMP EXIT SKIP CHAIN)   /RETURN IF NOT CONTROL OR CONTINUE CONTROL
0789
0790
0791                  /CALLS USED ARE =XCBTTYI=XCRCNTR=CRGET=
0792
0793
0794  1241  0000  XCBCKP, 0
0795  1242  3772'           DCA     ACSAVE          /SAVE THE AC
0796  1243  6704            GTF                     /SAVE THE FLAGS
0797  1244  3771'           DCA     FLSAVE          /SAVE THE FLAGS
0798  1245  7501            MQA                     /PUT MQ IN AC
0799  1246  3770'           DCA     MQSAVE          /SACE THE MQ
0800  1247  6731            KSF                     /CHECK THE KEYBOARD FLAG
0801  1250  5261            JMP     CBRY3           /EXIT TO CALL PLUS 1
0802  1251  4767'           JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
0803  1252  7410            SKP                     /ACTIVE CONSOLE PACKAGE
0804  1253  5261            JMP     CBRY3           /EXIT TO CALL PLUS 1
0805  1254  4766'           JMS     XCBTTYI         /GET THE CHAR
0806  1255  4765'           JMS     CBGET           /GET THE FLAGS
0807  1256  4764'           JMS     XCBCNTR         /CHECK IF CONTROL  CHAR.
0808  1257  7000            NOP                     /RETURN IF A CONTINUE CHAR.
0809  1260  2241            ISZ     XCBCKP          /BUMP RETURN FOR CALL PLUS 2
0810  1261  4765'  CBBY3,   JMS     CBGET           /GET REGISTERS
```



```
0811  1262  5641            JMP I   XCRCKP          /SAY GOOD BY
0812
0813                  //*************************************************************
0814
0815                  /CRECHO
0816                  /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD.  STORE IT IN LOCATION CHAR
0817                  /CHECK IF IT WAS A CONTROL CHARACTER -SET INMODE -PRINT CHARACTER
0818
0819                  /       CBECHO =        JMS XCBECH
0820                  /EX.    JMS     XCBECHO         /LOOK FOR CONSOL CHAR CBPRNT IT
0821                                                  /RETURN CALL PLUS ONE AC = CHAR CATYPED IN
0822
0823                  /CALLS USED ARE =XCBTTYI=XCRCNTR=CAGET=XCBECH=XCATTYPE
0824
0825                  /
0826  1263  0000  XCRECH, 0
0827  1264  4766'           JMS     XCBTTYI         /WAIT FOR CHAR FROM KEYBOARD
0828  1265  4765'           JMS     CBGET           /RESTORE THE REGISTERS
0829  1266  2276            ISZ     INMODE          /SET INMODE IDENTIFING THIS AS A EXPECTED CHAR
0830  1267  4764'           JMS     XCRCNTR         /GO CHECK IF IT IS A CONTROL CHAR
0831  1270  5663            JMP I   XCRECH          /WAS A CONTROL CHAR =CONTINUE RUNNING
0832  1271  4277            JMS     XCBTYPE         /NOT A CONTROL CHAR CBPRNT IT
0833  1272  3276            DCA     INMODE          /CLEAR FLAG THAT CHAR EXPECTED
0834  1273  1275            TAD     CBCHAR          /GET CHAR IN AC
0835  1274  5663            JMP I   XCRECH          /EXIT
0836  1275  0000  CBCHAR, 0
0837  1276  0000  INMODE, 0
0838
0839                  /*************************************************************
0840
0841                  /CBTYPE
0842                  /THIS ROUTINE WILL CAPRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 6A.
0843                  /
0844                  /       CATYPE* JMS XCATYP
0845
0846                  /EX.    JMS     XCBTYPE         /CAPRNT THE CHAR IN THE AC.
0847                          /                       /RETURN CALL PLUS ONE AC =0000
0848                                                  /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYCBOCT
0849
0850                  /CALLS USED ARE =CBHANG=XCACNTR=XCAPNT=XCBCRLF=XCAINQU=
0851
0852
0853  1277  0000  XCBTYP, 0
0854  1300  3322            DCA     PNTRUF          /STORE CHAR
0855  1301  1321            TAD     TTYLPT          /CHECK 0=TTY 7777=LPT
0856  1302  7640            SZA CLA
0857  1303  5312            JMP     XDOLPT          /DO OUT PUT ON LPT
0858  1304  1322            TAD     PNTRUF
0859  1305  6046            TLS
0860  1306  6041            TSF
0861  1307  5326            JMP     .-1
0862  1310  6042            TCF
0863  1311  5316            JMP     CBRY5
0864  1312  1322  XDOLPT, TAD     PNTRUF          /GET CHAR
0865  1313  6666            PSTB    PCLF            /CAPRNT IT
```

```
1114  4322                  JMS     C8HANG          /CHECK KEYBOARD IF HUNG
1115  6662                  PCLF                    /CLEAR THE FLAG
1116  7600      C8RYS,      7600                    /CLEAR THE AC
1117  5677                  JMP I   XCATYP          /EXIT
1120  0000      PNTBUF, 0
1121  0000      TTYLPT, 0


1122  0000      C8HANG, 0
1123  7200                  CLA             /
1124  1316                  TAD     C8RYS           /GET CONSTANT 7600
1125  3320                  DCA     PNTBUF          /PNTBUF IS NOW A COUNTER
1126  6661                  PSKF                    /SKIP ON PRINTER DONE
1127  7410                  SKP                     /NOT DONE YET
1130  5722                  JMP I   C8HANG          /SAW FLAG DONE
1131  2345                  ISZ     C8CONT          /FIRST COUNTER FAST ONE
1132  5326                  JMP     .-4             /CHECK IF FLAG SET YET
1133  2320                  ISZ     PNTBUF          /MADE 4096 COUNTS ON FAST COUNTER
1134  5331                  JMP     .-3             /KEEP IT UP FOR 5 SEC
1135  1764'                 TAD     XC8CNTR         /GET THE RETURN ADDRESS IN CONTROL
1136  3322                  DCA     C8HANG          /SAVE IT IN HANG
1137  3321                  DCA     TTYLPT          /ALLOW PRINTING ON TTY
1140  4763'                 JMS     XC8PNT
1141  1146                  MESHANG                 /LPT ERROR
1142  4223                  JMS     XC8CRLF
1143  4762'                 JMS     XC8INQU         /PRINT WAITING
1144  5722                  JMP I   C8HANG          /CONTINUE TO SAVE ADDRESS
1145  0000      C8CONT, 0                           /COUNTER FOR TIMER
1146  1420      MESHANG,TEXT    "LPT ERROR"
1147  2440
1150  0522
1151  2217
1152  2200

1162  2635
1163  0323
1164  2400
1165  2624
1166  0272
1167  1200
1170  1346
1171  1347
1172  1345
1173  0212
1174  0215
1175  0260
1176  0207
1177  7774
      1200      PAGE
                /*************************************************************************
                /*************************************************************************

                /THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD.
                /TO SEE IF THE CONSOLE BIT 3 (400) IS SET IF SET THEN RETURN
                /TO CALL PLUS TWO FO A ACTIVE CONSOLR PACKAGE AC=0
```



```
                /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.


1200  0000      CHKCLA, 0
1201  7200                  CLA
1202  1022                  TAD     22              /GET THE COTENTA OF LOCATION 22
1203  0377                  AND     (400            /MASK FOR BIT 3 (400
1204  7650                  SNA CLA                 /
1205  2200                  ISZ     CHKCLA          /ACTIVE CONSOLE PACKAGE RETURN
                                                    /CALL PLUS ONE (1) FOR ACTIVE
1206  5600                  JMP I   CHKCLA          /DEACTIVE CONSOLE PACKAGE RETURN
                                                    /CALL PLUS TWO (2)

                /C8ERR
                /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
                /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
                /           C8ERR=  JMS XC8ERR
                /EX.        JMS     XC8ERR          /GO TO C8ERR CALL IF NOT CONSOL
                /                                   /RETURN IS CALL PLUS ONE AC =0000

                /CALLS USED ARE -CHKCLA-XC8CRLF-XC8SW-XC8INQU-XC8PNT-XC8OCTA-


1207  0000      XC8ERR, 0
1210  6002                  IOF
1211  3345                  DCA     ACSAVE          /SAVE AC
1212  6004                  GTF
1213  3347                  DCA     FLSAVE          /SAVE THE FLAGS
1214  7501                  MQA
1215  3346                  DCA     MQSAVE          /SAVE THE MQ
1216  7340                  CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
1217  1207                  TAD     XC8ERR          /GET RETTURN LOCATION
1220  3344                  DCA     PCSAVE          /SAVE ADD OF C8ERR CALL
1221  6201                  CDF
1222  7340                  CLA CLL CMA
1223  1776                  TAD I   (CLASIK)        /GET REAL PC.
1224  3316                  DCA     REALPC          /SAVE IT.
1225  6211                  CDF     10
1226  4200                  JMS     CHKCLA          /CHECK LOC.22 BIT 3 CONSOL BIT
1227  7410                  SKP                     /ACTIVE CONSOLE PACKAGE
1230  5270                  JMP     NTCLAS          /NOT CLASSIC SYSTEM
1231  4775'                 JMS     C8GET           /GET REGISTERS.
1232  4774'                 JMS     XC8SW           /CHECK SWITCH REG FOR BIT THAT INDICATES
                                                    /NO ERROR MESSAGE
1233  0373      SETUP1, AND     (0000               /MASK FOR BIT FOR NO ERROR PRINTING
                                                    /IF THIS ERROR MESSAGE IS TO ALWAYS
                                                    /BE PRINTED LEAVE AND VALUE AT 0000
1234  7640                  SZA CLA                 /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
1235  5262                  JMP     C8D010          /DO NOT PRINT
1236  4772'                 JMS     XC8CRLF
1237  4771'                 JMS     XC8PNT
1240  1320                  ERRMES                  /PRINT THE ERROR MESSAGE
1241  4771'                 JMS     XC8PNT
1242  1533                  MESPC                   /PRINT THE PC STSTEMENT
1243  1316                  TAD     REALPC          /GET PC
```

```
 971   1244  4770*          JMS     XC8OCTA         /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     XC8OCTA
 976   1251  4771*          JMS     XC8PNT
 977   1252  1336           MESMQ                   /PRINT MQ
 978   1253  1346           TAD     MQSAVE
 979   1254  4770*          JMS     XC8OCTA
 980   1255  4771*          JMS     XCAPNT
 981   1256  1341           MESFL                   /PRINT FL
 982   1257  1347           TAD     FLSAVE
 983   1260  4770*          JMS     XC8OCTA
 984   1261  4772*          JMS     XCACRLF
 985   1262  4775*  C8DO10, JMS     C8GET           /GET REGISTERS.
 986   1263  4774*          JMS     XC8SW           /CHECK SWITCH REGISTER
 987   1264  7610           SKP CLA                 /SKIP IF BIT 0 SET
 988   1265  5300           JMP     C8RY2           /LEAVE
 989   1266  4767*          JMS     XC8INQ          /GO TO THE INQUIRE ROUTINE
 990   1267  5300           JMP     C8RY2           /LEAVE
 991   1270  4775*  NTCLAS, JMS     C8GET           /GET REGISTERS.
 992   1271  4774*          JMS     XC8SW           /CHECK PSFUNC SWITCH REGISTER
 993                                                /CHECK THE C8SWIT REGISTER
 994   1272  7610           SKP CLA                 /SKIP IF HALT
 995   1273  5637           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  5637           JMP I   XC8ERR
1002                        /
1003                        /
1004   1302  7402   8QUINS, HLT                     /PUT INSTRUCTION TO EXECUTE HERE.
1005   1303  7200           NOP
1006   1304  3317           DCA     MYAC            /SAVE AC
1007   1305  6221           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  1000
1035   1371  0303
1036   1372  1223
1037   1373  0200
1038   1374  0262
1039   1375  0624
1040   1376  5132
1041   1377  2402
             2000           FIELD 2
```

```
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  11??????  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
```

```
1042                    /
1043                    /NOTE: LOCATION 0 WILL CONTAIN THE REVISION
1044                    /LEVEL(IN ASCII) ON PROGRAM LOAD.
1045                    /
1046                    /
1047                    /ALL KNOWN HALTS
1048                    /
1049    1400  4761      ERHLT1                          /UNDEFINED INTERRUPT
1050    1401  5576      ERHLT2                          /SKIP TRAP FOR DCLR
1051    1402  6173      ERHLT3                          /SKIP TRAP FOR DLAG
1052    1403  4776      ERHLT4                          /SKIP TRAP FOR DLCA
1053    1404  5161      ERHLT5                          /SKIP TRAP FOR DRST
1054    1405  6556      ERHLT6                          /SKIP TRAP FOR DLDC
1055    1406  4136      ERHLT7                          /SKIP TRAP FOR DMAN
1056    1407  5300      ERHLT8                          /THE RECOVERABLE ERROR HALT
1057    1410  6417      STPHLT                          /PROGRAM STOP OR HALT FROM SWR9=1
1058    1411  6625      CHNHLT                          /IOT CHANGE HALT
1059    1412  2734      HPHLT1                          /HALT FOR "CHECK WRITE PROTECT"
1060    1413  2776      HPHLT2                          /HALT FOR "CHECK WRITE PROTECT"
1061    1414  5273      APHLT1                          /HALT FOR "CHECK WRITE PROTECT"
1062    1415  4122      ENDHLT                          /END OF TEST HALT FROM SWR9=1
1063    1416  4021      MEMHLT                          /FROM ALIGNMENT SUBTEST
1064                    /
1065                    /BUFFER LOCATION INFORMATION
1066                    /
1067    1417  7177      WRKBUF                          /START OF PROGRAM DATA BUFFER
1068    1420  7576      ENDBUF                          /END OF PROGRAM DATA BUFFER
1069    1421  7177      HITPK                           /DISK ADDRESS WORD IF BUFFER
1070    1422  7200      LOTPK                           /DISK ADDRESS WORD IN BUFFER
1071    1423  7577      STPCHK                          /BUFFER+1 "BREAK STOP CHECK" "1234"
1072                    /
1073          6741      DSKP=6741                       /SKIP ON TRANSFER DONE OR ERROR
1074          6742      DCLR=6742                       /CLEAR DISK CONTROL LOGIC
1075          6743      DLAG=6743                       /LOAD ADDRESS AND GO
1076          6744      DLCA=6744                       /LOAD CURRENT ADDRESS
1077          6745      DRST=6745                       /READ STATUS REGISTER
1078          6746      DLDC=6746                       /LOAD COMMAND REGISTER
1079          6747      DMAN=6747                       /LOAD MAINTENANCE
1080          7346      NL7777=7346                     /-3 CONSTANT
1081                    /
1082          4406      DSKOUT=JMS I    XDOUT
1083          4407      DSKIN=JMS I     XDIN
1084          4423      RWNAOD=JMS I    XRWAD
1085          4425      RECAL=JMS I     XRESTR
1086          4424      SEEK=JMS I      XONLY
1087          4426      DISKGO=JMS I    XDISKG
1088          4427      WAFCHK=JMS I    XWFCHK
1089          4432      KILBUF=JMS I    XKLBUF
1090          4431      FILBUF=JMS I    XFLBUF
1091          4434      WATISZ=JMS I    XWTISZ
1092          4433      SKPWAT=JMS I    XSKWAT
1093          4430      FIGURE=JMS I    XFGURE
1094          4437      WERROR=JMS I    XWERRO
1095          4440      ERROR=JMS I     XERRO
1096          4441      IONWAT=JMS I    XIONWT
```



```
1097          4442      ACCMP1=JMS I    XCOMP1
1098          4443      ACCMP2=JMS I    XCOMP2
1099          4444      RDSTAT=JMS I    XRDST
1100          4445      RDCMD=JMS I     XRDCM
1101          4446      RDADD=JMS I     XRDAD
1102          4452      LDADD=JMS I     XLDAD
1103          4447      DSKSKP=JMS I    XSDKP
1104          4450      LDCMD=JMS I     XLDCM
1105          4451      LDCUR=JMS I     XLDCA
1106          4453      CLRALL=JMS I    XCLOR
1107          4454      RDCRC=JMS I     XRDCR
1108          4455      LDMAN=JMS I     XLDMN
1109          4456      RDBUF=JMS I     XRDBF
1110          4457      PRNTER=JMS I    XPRN
1111          4460      OCTEL=JMS I     XFROCT
1112          4461      TWOCT=JMS I     XTOCT
1113          4436      TYPE=JMS I      XPRINT
1114          4462      CRLF=JMS I      XCRLF
1115          4405      CLASIC=JMS I    XCLAS
1116          4404      LAS=JMS I       XLAS
1117          4530      TICK=JMS I      XTICK
1118                    /
1119          0000      *0
1120                    /
1121    0000  0307              0307                    /REVISION "G"
1122    0001  5001              5001
1123    0002  0002              0002
1124    0003  0003              0003
1125                    /
1126    0004  5075      XLAS,   MYLAS
1127    0005  5172      XCLAS,  CLASIC
1128    0006  5553      XDOUT,  DOUT
1129    0007  4530      XDIN,   DIN
1130                    /
1131          0010      *10
1132                    /
1133    0010  0000      AUTO1P, 0
1134                    /
1135    0011  0010      K0010,  0010
1136    0012  0020      K0020,  0020
1137    0013  0040      K0040,  0040
1138    0014  0100      K0100,  0100
1139    0015  0200      K0200,  0200
1140    0016  0400      K0400,  0400
1141    0017  1000      K1000,  1000
1142                    /
1143          0020      *20
1144                    /
1145    0020  0000      SWR,    0                       /SWITCH REGISTER.
1146    0021  4000      CP1,    4000                    /CONTROL WORD 1
1147    0022  0000      CP2,    0                       /CONTROL WORD 2
1148                    /
1149    0023  6321      XRWAD,  RWAD
1150    0024  6215      XONLY,  ONLY
1151    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 0020    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 3620    XCOMP2, COMP2
1166    0044 5150    XROST,  ROST
1167    0045 5413    XRDCM,  RDCM
1168    0046 4143    XRDAD,  RDAD
1169    0047 4120    XSDKB,  SDKB
1170    0050 6504    XLDCM,  LDCM
1171    0051 4765    XLDCA,  LDCA
1172    0052 6164    XLDAD,  LDAD
1173    0053 5571    XCLDR,  CLDR
1174    0054 6200    XRDCB,  RDCB
1175    0055 4131    XLDMN,  LDMN
1176    0056 5420    XRDBF,  RDBF
1177    0057 6111    XPRN,   PRN
1178    0060 6065    XFRDCT, FRDCT
1179    0061 6236    XTDCT,  TDCT
1180    0062 6053    XCRLF,  UPONE
1181    0063 7200    XLDTRK, LDTRK
1182    0064 7177    XHITRK, HITRK
1183    0065 4530    CYL450, 0503
1184    0066 4520    TRK212, 4520
1185    0067 7177    RGNBUF, WRKBUF
1186    0070 0000    DRVHAV, 0
1187    0071 0000    DRVCNT, 0
1188    0072 0000    DWIVNO, 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    XAERRO, AERRO
1224    0130 7132    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    CRREG1, 0
1238    0145 0000    CRREG2, 0
1239    0146 0000    STREG,  0
1240    0147 0000    DHREG,  0
1241    0150 0000    DMREG,  0
1242    0151 0000    DAREG,  0
1243    0152 0000    CAREG,  0
1244    0153 0000    ADREG,  0
1245    0154 0000    DTREG,  0
1246    0155 0000    ACREG,  0
1247    0156 0000    HOMEMA, 0
1248    0157 0000    STCON,  0000
1249    0160 0011    CRWRD1, 0011
1250    0161 6007    CRWRD2, 6007
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    SOFERR, 7777
1259    0172 0000    SAVPCT, 0
1260    0173 0000    RESTRT, 0000
1261    0174 5617    XTIME,  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  CRSWIT                          /GET SWITCH REGISTER
1292  0232  7200  NOP
1293  0233  1022  TAD     22
1294  0234  0016  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     GDREG2                  /SETUP COMPARE REGISTER
1308  0242  1015  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  ACCMPI                          /CHECK RESULTS
1313  0247  7610  SKP CLA                         /O.K. SO FAR
1314  0250  5256  JMP     T0E                     /ERROR STATUS
1315  0251  3143  DCA     GDREG2                  /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  3772  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  0206  0206                            /TEXT POINTER
1344                /
1345                /INTERRUPT TEST
1346                /
1347                /VERIFY THAT INT. DECLARES FROM
1348                /THE TRANSFER DONE FLAG WHEN DISK
1349                /DRIVE UNDER TEST IS READY TO SEEK,
1350                /READ, OR WRITE.
1351                /
1352  0300  3131  DCA     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.
```

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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  1272          TAD     DRIVND                  /GET CURRENT DRIVE
1384  0331  6452          LDCMD                           /LOAD COMMAND REGISTER
1385  0332  1120          TAD     K0006
1386  0333  3357          DCA     T3T                     /SETUP TEXT POINTER
1387  0334  6452          LDADD                           /DLAG, LOAD DISK ADDRESS
1388  0335  6433          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  1213          TAD     K0040
1394  0343  3143          DCA     GDREG2                  /SETUP EXPECTED STATUS
1395  0344  6444          RDSTAT                          /READ STATUS REGISTER
1396  0345  6442          ACCMP1                          /CHECK RESULTS
1397  0346  7617          SKP CLA                         /STATUS IS O.K.
1398  0347  5355          JMP     T3E                     /ERROR STATUS INCORRECT
1399  0350  6453          CLRALL                          /CLEAR STATUS
1400  0351  3143          DCA     GDREG2                  /SETUP EXPECTED STATUS
1401  0352  6444          RDSTAT                          /READ STATUS
1402  0353  6442          ACCMP1                          /CHECK RESULTS
1403  0354  6437          NERROR                          /ALL IS O.K.
1404  0355  6440   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   KRMF,  RMF
1411  0363  4743   INTRQ, INTAND
1412  0364  5403   K5403, 5403
1413                      /
1414  0365  7160
1415  0366  7161
1416  0367  4260
1417  0370  7225
1418  0371  5000
1419  0372  2706
1420  0373  6600
1421  0374  4600
            0400    PAGE
1422                      /
1423                      /
1424                      /RESTORE TEST
1425                      /
```



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1426                      /VERIFY THAT "RECALIBRATE" SETS TRANSFER
1427                      /DONE THEN DRIVE READY ON SELECTED DRIVE.
1428                      /
1429  0400  6425   TST4,  RECAL                           /"RECALIBRATE"
1430  0401  0406          T4T                             /TEXT POINTER
1431  0402  5204          JMP     T4E                     /ERROR, SKIP OR STATUS
1432  0403  6437          NERROR                          /O.K. TO NEXT TEST
1433  0404  6440   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  7321   TST5,  CLA CLL IAC                     /EXTENDED
1446  0412  3152          DCA     CMREG                   /SETUP EXTENDED BIT
1447  0413  1266          TAD     TRK212                  /GET LOWER DISK ADDRESS
1448  0414  6424          SEEK                            /SEEK ONLY 312
1449  0415  0422          T5T                             /TEXT POINTER
1450  0416  5220          JMP     T5E                     /ERROR, SKIP OR STATUS
1451  0417  6437          NERROR                          /O.K. TO NEXT TEST
1452  0420  6440   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  7321   TST6,  CLA CLL IAC
1463  0424  3152          DCA     CMREG                   /SETUP EXTENDED BIT
1464  0425  1266          TAD     TRK212
1465  0426  6424          SEEK                            /SEEK ONLY 312
1466  0427  0437          T6T                             /TEXT POINTER
1467  0430  5235          JMP     T6E                     /ERROR, SKIP OR STATUS
1468  0431  6425          RECAL                           /"RECALIBRATE"
1469  0432  0437          T6T                             /TEXT POINTER
1470  0433  5235          JMP     T6E                     /ERROR, SKIP OR STATUS
1471  0434  6437          NERROR                          /O.K. TO NEXT TEST
1472  0435  6440   T6E,   ERROR                           /ERROR, STATUS
1473  0436  0423          TST6                            /SCOPE LOOP POINTER
1474  0437  5322   T6T,   5322                            /TEXT POINTER
1475                      /
1476                      /
1477                      /VERIFY RESTORE CLEARS ADDRESS BITS,
1478                      /
1479                      /VERIFY A "RECALIBRATE" FROM CYLINDER,
1480                      /SURFACE, AND SECTOR 77777.
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1481                    /
1482  0440  3150  TST7,  DCA     CMREG                   /CLEAR EXTENDED BIT
1483  0441  7300        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  T7F,  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  TST8,  DCA     TCNTR1
1502  0455  3135        DCA     TCNTR2
1503  0456  1134  TAR,  TAD     TCNTR1
1504  0457  3152        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  TAF,  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     T9F                     /ERROR, SKIP OR STATUS
1541  0515  7300        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
1567  0540  3134  TST10, DCA     TCNTR1                  /INITIALIZES APT TIMING FOR A LONGER VALUE
1568  0541  3135        DCA     TCNTR2
1569  0542  1134  T10R,  TAD     TCNTR1
1570  0543  3150        DCA     CMREG                   /GET EXTENDED BIT
1571  0544  1135        TAD     TCNTR2                  /SETUP EXTENDED BIT
1572  0545  4424        SEEK                            /GET CYLINDER
1573  0546  0573        T10T                            /SEEK ONLY
1574  0547  5371        JMP     T10F                    /TEXT POINTER
1575  0550  4425        RECAL                           /ERROR IN SEEK ONLY
1576  0551  0573        T10T                            /"RECALIBRATE"
1577  0552  5371        JMP     T10F                    /TEXT POINTER
1578  0553  7300        CLA CLL                         /ERROR, SKIP OR STATUS
1579  0554  1135        TAD     TCNTR2
1580  0555  1013        TAD     K0040                   /GET LAST CYLINDER
1581  0556  3135        DCA     TCNTR2                  /UPDATE
1582  0557  7430        SZL
1583  0560  2134        ISZ     TCNTR1                  /TIME TO SET EXTENDED?
1584  0561  1134        TAD     TCNTR1                  /YES
1585  0562  7650        SNA CLA                         /GET EXTENDED POINTER
1586  0563  5342        JMP     T10R                    /SET?
1587  0564  1135        TAD     TCNTR2                  /NO DO THIS CYLINDER
1588  0565  1170        TAD     ENDTRK                  /GET LAST CYLINDER
1589  0566  7640        SZA CLA                         /GET LAST POINTER!
1590  0567  5342        JMP     T10R                    /NON-EXISTENT CYLINDER?
                                                        /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
            7600          PAGE
1600                      /
1601                      /SINGLE DRIVE VIBRATION TEST!!
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  1215          TAD     K0200                   /ENABLE SET DONE
1701  0723  1104          TAD     K3000                   /FUNCTION SEEK ONLY
1702  0724  4450          LDCMD                           /LOAD COMMAND
1703  0725  4452          LDADD                           /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  1205  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          LDCMD                           /LOAD COMMAND
1765  1024  1134          TAD     TCNTR1
1766  1025  4452          LDADD                           /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          LDCMD                           /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          LDCMD                           /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
```

```
        1065  5300          5300            /MODIFIED TEXT POINTER
        1066  5272          JMP     .+4     /TO NEXT TEST
        1067  4440  T14KE,  ERROR           /ERROR, DISK SKIP
        1070  1010          TST14           /SCOPE LOOP POINTER
        1071  0006          0006            /TEXT POINTER
                    /
                    /STATUS TEST
                    /
                    /VERIFY THAT SKIP AND STATUS DOES OCCUR
                    /AFTER 256 WRITE ALL AND READ ALL BREAKS.
                    /THIS SHOULD WRITE ALL ZEROS ON AND
                    /READ ALL ZEROS OFF THE DISK SECTOR 00000.
                    /
        1072  4432          KILBUF          /ZERO WRITE BUFFER
        1073  1115  TST15,  TAD     K5000   /WRITE ALL FUNCTION
        1074  3150          DCA     CMREG   /SETUP COMMAND
        1075  4426          DISKGO          /DISK WRITE ALL
        1076  1110          T15T            /TEXT POINTER
        1077  5306          JMP     T15E    /ERROR, SKIP OR STATUS
        1100  1017          TAD     K1000   /FUNCTION READ ALL
        1101  3150          DCA     CMREG   /SETUP COMMAND REGISTER
        1102  4426          DISKGO          /DISK READ ALL
        1103  1110          T15T            /TEXT POINTER
        1104  5306          JMP     T15E    /ERROR, SKIP OR STATUS
        1105  4437          NERROR          /O.K. TO NEXT TEST
        1106  4440  T15E,   ERROR           /ERROR, WRITE ALL
        1107  1073          TST15           /SCOPE LOOP POINTER
        1110  5300  T15T,   5300            /MODIFIED TEXT POINTER
                    /
                    /STATUS TEST
                    /
                    /VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
                    /128 WRITE ALL AND READ ALL BREAKS.
                    /THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
                    /ALL ZEROS OFF THE DISK SECTOR 00000.
                    /
        1111  1115  TST16,  TAD     K5000   /FUNCTION WRITE ALL
        1112  1014          TAD     K0100   /HALF BIT
        1113  3150          DCA     CMREG   /SETUP COMMAND
        1114  4426          DISKGO          /DISK WRITE ALL
        1115  1130          T16T            /TEXT POINTER
        1116  5326          JMP     T16E    /ERROR, DISK SKIP OR STATUS
        1117  1017          TAD     K1000   /FUNCTION READ ALL
        1120  1014          TAD     K0100   /HALF BIT
        1121  3150          DCA     CMREG   /SETUP COMMAND
        1122  4426          DISKGO          /DISK READ ALL
        1123  1130          T16T            /TEXT POINTER
        1124  5326          JMP     T16E    /ERROR, SKIP OR STATUS
        1125  4437          NERROR          /O.K. TO NEXT TEST
        1126  4440  T16E,   ERROR           /ERROR, WRITE ALL
        1127  1111          TST16           /SCOPE LOOP POINTER
        1130  5300  T16T,   5300            /MODIFIED TEXT POINTER
                    /
                    /VERIFY ALL SECTORS CAN BE ACCESSED.
                    /
```



```
                    /VERIFY A WRITE ALL TO ALL OF CYLINDER 0
                    /AND USE DATA PATTERN 2525+5252.
                    /MAKE THE FIRST TWO WORDS IN THE BUFFER
                    /EQUAL THE DISK ADDRESS. CHECK THE DATA WITH
                    /READ ALL.
                    /
        1131  4525          JMS I   XLOAD   /WILL SET UP COUNTERS FOR NEXT TESTS
        1132  7771          7771
        1133  1122  TST17,  TAD     K7740
        1134  3134          DCA     TCNTR1  /SETUP SECTOR COUNTER
        1135  1113  T17S,   TAD     K2525
        1136  4431          FILBUF          /FILL OUTBOUND BUFFER
        1137  1115          TAD     K5000   /FUNCTION WRITE ALL
        1140  3150          DCA     CMREG   /SETUP COMMAND
        1141  1134          TAD     TCNTR1
        1142  0120          AND     K0037   /MASK OFF SECTORS
        1143  3463          DCA I   XLOTRK  /SETUP ADDRESS WORD IN BUFFER
        1144  1072          TAD     DRIVNO  /GET DRIVE NUMBER
        1145  3464          DCA I   XHITRK  /SETUP ADDRESS WORD IN BUFFER
        1146  1463          TAD I   XLOTRK
        1147  4426          DISKGO          /DISK WRITE ALL
        1150  1173          T17T            /TEXT POINTER
        1151  5371          JMP     T17E    /ERROR, SKIP OR STATUS
        1152  4432          KILBUF          /KILL DATA BUFFER
        1153  1017          TAD     K1000   /FUNCTION READ ALL
        1154  3150          DCA     CMREG   /SETUP COMMAND
        1155  1134          TAD     TCNTR1
        1156  0120          AND     K0037   /MASK OF SECTORS
        1157  4426          DISKGO          /DISK READ ALL
        1160  1173          T17T            /TEXT POINTER
        1161  5371          JMP     T17E    /ERROR, STATUS OR SKIP
        1162  1113          TAD     K2525
        1163  4430          FIGURE          /WORD BY WORD COMPARE OF DATA
        1164  7610          SKP CLA         /THIS SECTOR O.K.
        1165  5371          JMP     T17E    /ERROR, DATA
        1166  2134          ISZ     TCNTR1  /UPDATE SECTOR COUNTER
        1167  5335          JMP     T17S    /TRY NEXT SECTOR
        1170  4437          NERROR          /O.K. TO NEXT TEST
        1171  4440  T17E,   ERROR           /ERROR, READ ALL
        1172  1133          TST17           /SCOPE LOOP POINTER
        1173  5373  T17T,   5373            /TEXT POINTER
                    /
        1174  5775          JMP I   .+1     /TO NEXT TEST
        1175  1202          TST18
                    /
        1177  7160
              1200          PAGE
                    /
                    /VERIFY ALL SECTORS CAN BE ACCESSED.
                    /
                    /VERIFY A WRITE DATA TO ALL OF CYLINDER 0
                    /AND USE DATA PATTERN 5252+2525.
                    /MAKE THE FIRST TWO WORDS OF THE BUFFER
                    /EQUAL THE DISK ADDRESS. CHECK THE
                    /DATA WITH READ DATA.
```

```
1907                    /
1908    1200  7000      NOP
1909    1201  7000      NOP
1910    1202  1122  TST18,  TAD     K7740
1911    1203  3134      DCA     TCNTR1                  /SECTOR COUNTER
1912    1204  1114  T18S,   TAD     K5252
1913    1205  4431      FILBUF                          /FILL OUTROUND 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
```



```
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  4031              FILBUF                          /FILL BUFFER WITH DATA
2020    1324  1272              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  1214              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     T21F                    /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     K0100                   /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              HAFCHK                          /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  2322      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  4031              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  4026              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  4032      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  4026              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  4427              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  1113              TAD     K5252
```

```
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  T5T24,  TAD     K7740
2173  1512  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2174  1513  1113  T24S,   TAD     K2525
2175  1514  4431          FILBUF                          /FILL OUTBOUND BUFFER
2176  1515  7301          CLA CLL IAC
2177  1516  1272          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  T5T25,  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 OUTROUND 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  5222          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  T25R6,  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  0120          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  T27R7,  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     T27F            /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  T$T28,  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  T$T29,  TAD     K7740
2455  2063  3134          DCA     TCNTR1          /SECTOR COUNTER
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2456  2064  3150          DCA     CMREG                   /SETUP COMMAND
2457  2065  1120          TAD     K0037
2458  2066  6426          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  T29I04, DLOC                           /LOAD COMMAND REGISTER
2469  2101  1067          TAD     BGNBUF
2470  2102  6744  T29I08, DLCA                          /LOAD CURRENT ADDRESS
2471  2103  1134          TAD     TCNTR1
2472  2104  0120          AND     K0037                   /MASK SECTOR BITS
2473  2105  6743  T29I0F, DLAG                           /LOAD AND GO
2474  2106  1174          TAD     KTIMF
2475  2107  3135          DCA     TCNTR2                  /TIME COUNTER
2476  2110  6745  T29I00, 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     BGNBUF                  /GET START OF BUFFER
2485  2121  3152          DCA     CAREG                   /SAVE FOR ERROR PRINTER
2486  2122  1134          TAD     TCNTR1
2487  2123  0120          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  5310          JMP     T29I00                  /WAIT FOR GOOD STATUS
2492  2130  0007          DSKSKP                          /ERROR, HAVE TO WAIT FOR FLAG
2493  2131  5330          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  0037          NERROR                          /O.K. TO NEXT TEST
2497  2135  0040  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 2'S FOR ALL 2'S DATA PATTERN.
2506                      /
2507  2140  1110  TST30,  TAD     K7740
2508  2141  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2509  2142  7301  T30R,   CLA CLL IAC
2510  2143  0053          CLRALL                          /CLEAR CONTROL
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2511  2144  0032          KILBUF                          /CLEAR BUFFER AREA
2512  2145  1115          TAD     K5200                   /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  0026          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  0026          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  0053          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  0054  T30D,   RDCRC                           /READ CRC REGISTER
2537  2201  0043          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  0037          NERROR                          /O.K. TO NEXT TEST
2543  2207  0040  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  0053          CLRALL                          /CLEAR CONTROL
2559  2216  1113          TAD     K2525
2560  2217  0031          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
```

```
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     GDREG1                  /STORE IN COMPARE REGISTER
2583  2246  1161          TAD     CRWRD2                  /GET GOOD CRC
2584  2247  3143          DCA     GDREG2                  /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  TST32,  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  1072          TAD     DRIVND                  /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     DRIVND                  /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
2682    2361  2374          T32T                            /DISK READ ALL
2683    2362  5372          JMP     T32E                    /TEXT POINTER
2684    2363  1113          TAD     K2525                   /ERROR, STATUS OR SKIP
2685    2364  4430          FIGURE
2686    2365  7610          SKP CLA                         /WORD BY WORD COMPARE OF DATA
2687    2366  5372          JMP     T32E                    /DATA O.K.
2688    2367  2134          ISZ     TCNTR1                  /ERROR, DATA
2689    2370  5353          JMP     T32R4                   /UPDATE SECTOR COUNTER
2690    2371  4437          NERROR                          /MORE SECTORS TO CHECK
2691    2372  4440  T32E,   ERROR                           /O.K. TO NEXT TEST
2692    2373  2262          TST32                           /ERROR, WRITE ALL
2693    2374  5373  T32T,   5373                            /SCOPE LOOP POINTER
2694                        /                               /TEXT POINTER
2695    2375  5776          JMP I   .+1
2696    2376  2400          TST33                           /TO NEXT TEST
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
```



```
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     GDREG2                  /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          LDMAN                           /ENTER MAINTENANCE
2824    2535  7010          RAR
2825    2536  4455          LDMAN                           /SET DR4 FOR ENABLE SHIFT
2826    2537  7010          RAR
2827    2540  4455          LDMAN                           /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          LDMAN                           /ENTER MAINTENANCE
2855    2565  7010          RAR
2856    2566  4455          LDMAN                           /SET DR4 TO ENABLE SHIFT
2857    2567  7010          RAR
2858    2570  1074          TAD     K0002                   /SET AC BIT 10 DATA
2859    2571  4455          LDMAN                           /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     GDREG2                  /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  1767          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  1767          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  1105          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  1105  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  4440          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.
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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  7000          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            CERR
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    TST37,  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     AGNBUF                  /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            TST37                           /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    TST38,  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          TST3B                           /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  T3T39,  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          T3T39                           /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  T3T40,  TAD     K7000
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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  T41,    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   XWITRK                  /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   XWITRK                  /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  3153          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  3152          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     K7700
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  TST45,  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     K7760
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     T45E                    /ERROR, DATA
3584   3747  1141          TAD     TCNTR6
3585   3750  1277          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  4037          NERROR                          /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  3334          DCA     ROAD
3615   4004  3331          DCA     LOMN
3616   4005  2331          ISZ     LOMN
3617   4006  5205          JMP     .-1
3618   4007  2340          ISZ     ROAD
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  4005  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  4005          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  4005  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  4452          LDCMD                           /LOAD COMMAND REGISTER
3649   4033  1135          TAD     TCNTR2
3650   4034  0110          AND     K7760                   /MASK OFF CYLINDER+SURFACE
3651   4035  4452          LOADD
3652   4036  4447          DSKSKP                          /GO SEEK ONLY
3653   4037  5236          JMP     .-1                     /SKIP ON DONE
3654   4040  4453          CLRALL
3655   4041  4444          RDSTAT                          /CLEAR STATUS
3656   4042  7640          SZA CLA                         /READ STATUS
3657   4043  5240          JMP     .-3                     /DRIVE DONE?
3658   4044  1134          TAD     TCNTR1                  /NO, WAIT
3659   4045  0101          AND     K0007                   /GET FIRST ADDRESS
3660   4046  1104          TAD     K3000                   /MASK DRIVE+EXT. BIT
3661   4047  4452          LDCMD                           /GET SEEK FUNCTION
3662   4050  1134          TAD     TCNTR1                  /LOAD COMMAND REGISTER
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3663  4051  0110          AND     K7760                   /MASK OFF CYLINDER AND SURFACE
3664  4052  4452          LDADD                           /LOAD AND GO SEEK
3665  4053  4447          DSKSKP                          /WAIT FOR DONE
3666  4054  5253          JMP     .-1
3667  4055  4453          CLRALL                          /CLEAR STATUS
3668  4056  4440          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  1370          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     K4000                   /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  7315          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 1372          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 1370          TAD     DRVHAV                  /NO. OF DRIVES.
3781  4220 3137          DCA     TCNTR4                  /SETUP COUNTER
3782  4221 4777  OVRR3,  JMS I   (GETDRV                 /GET NEXT DRIVES.
3783  4222 1372          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 1370          TAD     DRVHAV                  /NO. OF DRIVES ON SYSTEM.
3798  4241 3137          DCA     TCNTR4
3799  4242 4777  ALLBAK, JMS I   (GETDRV                 /GET NEXT DRIVE.
3800  4243 1372          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                     /
3815                     /ROUTINE TO GET DRIVES FROM OPERATOR.
3816                     /
3817  4260 0000  SELDSK, 0
3818  4261 4462          CRLF
3819  4262 4457          PRNTER                          /PRINT MESSAGE "RK8-E DRIVE"
3820  4263 3760          NMES1                           /MESSAGE POINTER
3821  4264 4462          CRLF
3822  4265 4457          PRNTER                          /PRINT MESSAGE "TEST"
3823  4266 6560          NMES2                           /MESSAGE POINTER
3824  4267 3370          DCA     DCNT1
3825  4270 3070          DCA     DRVHAV                  /COUNTER FOR NO. OF DRIVES.
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3826  4271 1776'         TAD     M6
3827  4272 3371          DCA     DCNT2                   /NO. OF POSSIBLE DRIVES.
3828  4273 4462          CRLF
3829  4274 4457  NXTDSK, PRNTER
3830  4275 4165          NMES3
3831  4276 1370          TAD     DCNT1
3832  4277 1374          TAD     DSKON                   /COMPUTE WAY TO DISK BUFFER.
3833  4300 3372          DCA     DCNT3                   /SAVE POINTER.
3834  4301 1370          TAD     DCNT1                   /GET DRIVE NO.
3835  4302 1364          TAD     K0260
3836  4303 4436          TYPE                            /TYPE DRIVE NO.
3837  4304 1366          TAD     K0277
3838  4305 4436          TYPE                            /TYPE ?.
3839  4306 6031          KSF                             /SKIP ON KEY.
3840  4307 5306          JMP     .-1
3841  4310 6036          KRR                             /GET INPUT.
3842  4311 0367          AND     K0177
3843  4312 1215          TAD     K0200
3844  4313 3373          DCA     DCNT4                   /SAVE INPUT.
3845  4314 1373          TAD     DCNT4
3846  4315 4436          TYPE                            /ECHO INPUT.
3847  4316 1373          TAD     DCNT4
3848  4317 7041          CIA
3849  4320 1365          TAD     K0331
3850  4321 7100          CLL
3851  4322 7650          SNA CLA                         /Y OR N.
3852  4323 7360          CLA CLL CMA CML                 /Y.
3853  4324 3772          DCA I   DCNT3                   /SAVE ON FLAG.
3854  4325 7630          SZL CLA                         /WAS DRIVE SELECTED.
3855  4326 2070          ISZ     DRVHAV                  /YES.
3856  4327 1775'         TAD     K0240                   /SPACE
3857  4330 4436          TYPE
3858  4331 2370          ISZ     DCNT1
3859  4332 2371          ISZ     DCNT2
3860  4333 5274          JMP     NXTDSK
3861  4334 1070          TAD     DRVHAV
3862  4335 7650          SNA CLA                         /ANY SELECTED.
3863  4336 5261          JMP     SELDSK+1                /TRIED TO FOOL ME.
3864  4337 1070          TAD     DRVHAV
3865  4340 7041          CIA
3866  4341 3070          DCA     DRVHAV                  /SET COUNTER FOR NO. OF DRIVES.
3867  4342 3371          DCA     DCNT2                   /START WITH DRIVE 0.
3868  4343 4345          JMS     GETDRV                  /GET FIRST DRIVE.
3869  4344 5660          JMP I   SELDSK                  /EXIT.
3870                     /
3871                     /ROUTINE TO SELECT DRIVES ON SYSTEM.
3872                     /
3873  4345 0000  GETDRV, 0
3874  4346 1371          TAD     DCNT2
3875  4347 0075          AND     K0003
3876  4350 1374          TAD     DSKON                   /WAY TO BUFFER.
3877  4351 3370          DCA     DCNT1                   /SAVE POINTER FOR WAY TO BUFFER.
3878  4352 1371          TAD     DCNT2
3879  4353 0075          AND     K0003
3880  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  3460          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  1460          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  0010          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  4443  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  1222  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          CKERR
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     ADRFG                   /SAVE IN ADDRESS
4191  4767  1153          TAD     ADREG
4192  4770  3152          DCA     CARFG                   /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          CKERR
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  5201  4431          CASWIT                          /ROUTINE TO EXECUTE.
4209  5202  7200          NOP
4210  5203  4424          LAS                             /GET THE SWITCHES
4211  5204  7120          CLL RAL
4212  5205  0100          AND     K0006                   /MASK DRIVE NUMBER
4213  5206  3272          DCA     DRIVNO                  /SAVE DRIVE NUMBER
4214  5207  7340          CLA CLL CMA RAL
4215  5210  3132          DCA     REG1                    /SETUP REPEAT POINTER
4216  5211  3131          DCA     REG0
4217  5212  1113          TAD     K2525                   /DATA PATTERN TO WRITE
4218  5213  4431          FILBUF                          /FILL OUTBOUND BUFFER
4219  5214  1272          TAD     DRIVNO
4220  5215  3464          DCA I   XWITRK                  /SETUP ADDRESS WORD IN BUFFER
4221  5216  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
4222  5217  1115          TAD     K5000                   /WRITE ALL FUNCTION
4223  5220  3150          DCA     CMREG                   /SETUP COMMAND
4224  5221  4426          DISKGO                          /WRITE ALL TO SECTOR 0
4225  5222  5270          TAPROT                          /TEXT POINTER
4226  5223  5266          JMP     APERR                   /ERROR, STATUS
4227  5224  1103  APR1,   TAD     K2000                   /FUNCTION WRITE PROTECT
4228  5225  1272          TAD     DRIVNO                  /CURRENT DRIVE
4229  5226  4450          LOCMD                           /LOAD COMMAND REGISTER
4230  5227  4452          LOADD                           /LOAD AND GO
4231  5230  4444          RDSTAT                          /READ STATUS REGISTER
4232  5231  7640          SZA CLA                         /SHOULD BE 0000 ????
4233  5232  5245          JMP     APA1                    /ERROR, STATUS
4234  5233  4432          KILBUF                          /CLEAR OUTBOUND BUFFER
4235  5234  1272          TAD     DRIVNO
4236  5235  3464          DCA I   XWITRK                  /SETUP ADDRESS WORD IN BUFFER
4237  5236  1115          TAD     K5000                   /WRITE ALL FUNCTION
4238  5237  3150          DCA     CMREG                   /SETUP COMMAND REGISTER
4239  5240  4426          DISKGO                          /WRITE ALL TO SECTOR 0
4240  5241  5270          TAPROT                          /TEXT POINTER
4241  5242  7200          NOP
4242  5243  7326          CLA CLL CML RTL
4243  5244  1212          TAD     K0020                   /MAKE EXPECTED STATUS
4244  5245  3143  APA1,   DCA     GDREG2                  /SETUP COMPARE REGISTER
4245  5246  1166          TAD     K5300
4246  5247  3270          DCA     TAPROT                  /SETUP TEXT POINTER
4247  5250  1146          TAD     STREG                   /GET STATUS READ
4248  5251  4442          ACCMP1                          /CHECK RESULTS
4249  5252  7610          SKP CLA                         /STATUS O.K.
4250  5253  5266          JMP     APERR                   /ERROR, WRITE PROTECT
4251  5254  7301          CLA CLL IAC                     /ENABLE CLEAR CONTROL
4252  5255  4453          CLRALL                          /CLEAR CONTROL
4253  5256  1217          TAD     K1000                   /FUNCTION READ ALL
4254  5257  3150          DCA     CMREG                   /SETUP COMMAND
4255  5260  4426          DISKGO                          /READ ALL SECTOR 0
4256  5261  5270          TAPROT                          /TEXT POINTER
4257  5262  5266          JMP     APERR                   /ERROR
4258  5263  1113          TAD     K2525                   /EXPECTED PATTERN
4259  5264  4430          FIGURE                          /CHECK DATA READ
4260  5265  4437          NERROR                          /ALL O.K. DO ONE MORE TIME
4261  5266  4440  APERR,  ERROR                           /ERROR, WRITE PROTECT
4262  5267  5224          APR1
```



```
4263  5270  0000  TAPROT, 0000                           /TEXT POINTER
4264  5271  4435          CLASIC
4265  5272  4436          CRERR
4266  5273  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  5274  5200          JMP     AUTPRO
4271                /
4272                /ROUTINE TO GET SWITCHES
4273                /
4274  5275  0000  MYLAS,  0
4275  5276  4405          CLASIC                          /CHECK IF CLASSIC
4276  5277  4425          CRCKSW                          /GET SWITCHES
4277  5120  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  5122  0000  CLASIK, 0
4285  5123  3332          DCA     SAVAC                   /SAVE CURRENT AC
4286  5124  1722          TAD I    CLASIK
4287  5125  3333          DCA     ROUTMP                  /SAVE THE CLASSIC ROUTINE
4288  5126  2322          ISZ     CLASIK
4289  5127  1222          TAD     OP2
4290  5130  0377          AND     (400
4291  5131  7640          SZA CLA
4292  5132  5315          JMP     .+3
4293  5133  1332          TAD     SAVAC                   /NO RETURN TO PROGRAM
4294  5134  5722          JMP I   CLASIK
4295  5135  2322          ISZ     CLASIK
4296  5136  6211          CDF     10                      /CHANGE TO FIELD 1
4297  5137  1220          TAD     SWR
4298  5140  3776          DCA I   (SWR)                   /MOVE POINTERS TO FIELD 1
4299  5141  1221          TAD     OP1
4300  5142  3775          DCA I   (OP1)
4301  5143  1222          TAD     OP2
4302  5144  3774          DCA I   (OP2)
4303  5145  1333          TAD     ROUTMP
4304  5146  3773          DCA I   (ROUINS)                 /SAVE ROUTINE IN FIELD 1
4305  5147  1332          TAD     SAVAC
4306  5150  6212          CIF     10
4307  5151  5773          JMP I   (ROUINS)                /GO TO FIELD 1
4308                /
4309  5152  0000  SAVAC,  0
4310  5153  0000  ROUTMP, 0
4311                /
4312                /ROUTINE TO WAIT FOR DISK SKIPS
4313                /
4314  5154  0000  SKWAT,  0
4315  5155  7300          CLA CLL
4316  5156  4530          TICK                            /TIMING FOR APT
4317  5157  1122          TAD     K7740                   /GET TIME CONSTANT
```

```
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  FRHLTS, HLT                             /SKIP TRAP ERROR
4339  5162 5357          JMP     .-3
4340  5163 3346          DCA     STREG                   /SAVE RESULTS
4341  5164 1346          TAD     STREG
4342  5165 5754          JMP I   RDST                    /EXIT
4343  5166 1302
4344  5167 0022
4345  5170 0021
4346  5171 0020
4347  5172 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 3367          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     NTGD                    /NOT GD: REGISTER
4393
4394
4395  5251 3200          DCA     ERRO
4396  5252 4457          PRNTER                          /PRINT GD:
4397  5253 5752          TEXGD
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     GDREG1                  /GET DATA
4402  5260 4461          TWOCT                           /PRINT TWO OCTAL
4403  5261 1143          TAD     GDREG2
4404  5262 4460          OCTEL                           /PRINT FOUR OCTAL
4405  5263 7610          SKP CLA
4406  5264 3200  NTGD,           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
```

```
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
4435  5321  4457          PRNTER                          /STORE FOR PRNTER
4436  5322  7402          HLT                             /PRINT XX:
4437  5323  1410          TAD I   AUTO1C                  /MODIFIED TEXT POINTER
4438  5324  4460          OCTFL
4439  5325  2365  AGAIN,  ISZ     PCNTR1                  /PRINT FOUR OCTAL
4440  5326  5312          JMP     STRAUT
4441  5327  4474          LAS                             /CHECK FOR NEXT XX:
4442  5330  7006          RTL                             /GET SWITCH 5
4443  5331  7216          AND     K0400                   /SHIFT FOR TESTING
4444  5332  7650          SNA CLA                         /MASK
4445  5333  5342          JMP     CHKERR                  /WAS IT INHIBIT HALT
4446  5334  7630          SZL CLA                         /NO HALT
4447  5335  5340          JMP     .+3                     /SAME OR NEXT TEST
4448  5336  1361          TAD     INHIBT                  /SAME TEST
4449  5337  5757          JMP I   ESCOPE                  /GET RETURN
4450  5340  1360          TAD     RETRN2                  /CHECK FOR BELL
4451  5341  5757          JMP I   ESCOPE                  /GET RETURN
4452  5342  4005  CHKERR, CLASTC                         /CHECK FOR BELL
4453  5343  4436          CAFFR
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  XRFG,   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
```



```
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  6455          LOMAN
4492  5403  1012          TAD     K0020
4493  5404  6455          LOMAN
4494  5405  3147          DCA     DBREG                   /LOAD MAINTENANCE
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
4507  5416  7330          CLA CLL CML RAR                 /12 BIT SHIFT
4508  5417  6455          LOMAN
4509  5420  7010          RAR                             /LOAD MAINTENANCE
4510  5421  6455          LOMAN
4511  5422  7300          CLA CLL                         /LOAD MAINTENANCE
4512  5423  1216          TAD     K0400
4513  5424  6455          LOMAN                           /ENABLE BIT FOR SHIFT COMMAND
4514  5425  2133          ISZ     SRCNT1                  /LOAD AND GO
4515  5426  5224          JMP     .-2
4516  5427  7300          CLA CLL                         /SHIFT 12
4517  5430  1012          TAD     K0020
4518  5431  6455          LOMAN                           /ENABLE READ BUFFER
4519  5432  3150          DCA     CMREG                   /LOAD AND GO
4520  5433  1150          TAD     CMREG                   /SAVE IT
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  3210          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  1152          TAD     CMREG           /GET LAST COMMAND
5504  0325          AND     K7577           /MASK OUT SET DONE
5505  4450          LOCMD                   /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          LOCMD                   /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          LOCMD                   /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          LOCMD                   /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
                        /
```

```
                        /ROUTINE TO READ OR WRITE ON DISK
                        /RETURN+1 SKIP OR STATUS ERROR
                        /RETURN+2 O.K.
                        /
5600  0000  DISKG,  0
5601  3254          DCA     SAVTRK          /SAVE TRACK ADDRESS
5602  7340          CLA CLL CMA
5603  3171          DCA     SOFERR          /SET CRC ERROR FLAG
5604  1600          TAD I   DISKG           /GET TEXT POINTER
5605  3172          DCA     SAVPCT          /SAVE IT
5606  2200          ISZ     DISKG           /UPDATE POINTER
5607  1150          TAD     CMREG           /GET COMMAND
5610  0255          AND     K7501           /MASK OFF
5611  1156          TAD     MOMEMA          /CURRENT FIELD
5612  1172          TAD     DRIVNO          /CURRENT DRIVE
5613  6450          LDCMD                   /LOAD COMMAND
5614  1067          TAD     BGNBUF          /GET BEGINNING OF BUFFER
5615  6451          LDCUR                   /LOAD CURRENT ADDRESS
5616  1254          TAD     SAVTRK          /GET TRACK+SECTOR
5617  6452          LDADD                   /LOAD AND GO
5620  6433          SKPWAT                  /WAIT FOR DISK SKIP
5621  5234          JMP     SKPERR          /ERROR, NO SKIP
5622  7330          CLA CLL CML RAR         /EXPECTED STATUS
5623  3143          DCA     GDREG2          /SETUP COMPARE REGISTER
5624  6444          RDSTAT                  /READ STATUS
5625  1125          TAD     K4000
5626  7640          SZA CLA                 /WAS STATUS 4000
5627  5236          JMP     STAERR          /ERROR, STATUS
5630  1165          TAD     K5373           /TEXT POINTER
5631  2200          ISZ     DISKG           /UPDATE FOR GOOD RETURN
5632  3572  RETRN,  DCA I   SAVPCT          /STORE IN TEXT POINTER
5633  5600          JMP I   DISKG           /EXIT
5634  1164  SKPERR, TAD     K0306           /SKIP TEXT POINTER
5635  5232          JMP     RETRN           /EXIT
5636  1146  STAERR, TAD     STREG           /GET STATUS JUST READ
5637  0211          AND     K0010           /MASK OUT CRC ERRORS
5640  7650          SNA CLA                 /WERE THERE ANY
5641  5252          JMP     HRDERR          /NO, OTHERS
5642  7300          CLA CLL
5643  1150          TAD     CMREG           /GET LAST COMMAND
5644  0107          AND     K7000           /MASK FUNCTION
5645  1106          TAD     K6000           /ADD IN FUDGE FACTOR
5646  7630          SZL CLA                 /WAS IT A READ ALL OR READ
5647  5252          JMP     HRDERR          /NO, MUST BE A WRITE
5650  3171          DCA     SOFERR          /SET CRC ERROR FLAG
5651  5230          JMP     RETRN-2         /GO CHECK DATA OR RETURN
5652  1166  HRDERR, TAD     K5300
5653  5232          JMP     RETRN           /EXIT
                        /
5654  0000  SAVTRK, 0
5655  7521  K7501,  7501
                        /
                        /ROUTINE TO COMPARE WORDS IN BUFFER TO
                        /KNOWN DATA PATTERN IN THE AC.
                        /
```



```
5656  0000  FGURE,  0
5657  3143          DCA     GDREG2          /SAVE FOR ERROR PRINTER
5660  1067          TAD     BGNBUF          /GET START OF BUFFER
5661  3153          DCA     ADREG           /SAVE FOR ERROR PRINTER
5662  1150          TAD     CMREG           /GET DISK NO. AND EXT. BIT
5663  0101          AND     K0007           /MASK THEM
5664  7041          CIA
5665  1553          TAD I   ADREG           /GET FIRST TRACK WORD
5666  7650          SNA CLA                 /WAS IT O.K. ?
5667  5273          JMP     .+6             /YES, CHECK NEXT TRACK WORD
5670  1150          TAD     CMREG           /GET DISK NO. AND EXT. BIT
5671  0101          AND     K0007           /MASK THEM
5672  5343          JMP     DTERR           /DATA ERROR
5673  2153          ISZ     ADREG           /UPDATE ADDRESS
5674  1553          TAD I   ADREG           /GET SECOND WORD
5675  7041          CIA
5676  1151          TAD     DAREG           /COMPARE TO ADDRESS
5677  7650          SNA CLA                 /WAS SECOND TRACK WORD O.K.
5700  5303          JMP     .+3             /YES, NOW CHECK DATA
5701  1151          TAD     DAREG           /GET GOOD INFO
5702  5343          JMP     DTERR           /DATA ERROR
5703  7326          CLA CLL CML RTL
5704  1123          TAD     K7400
5705  3162          DCA     DATCNT          /SETUP COUNTER
5706  2153  LPFIG,  ISZ     ADREG           /UPDATE ADDRESS
5707  1553          TAD I   ADREG           /GET DATA WORD
5710  7041          CIA
5711  1143          TAD     GDREG2          /COMPARE TO GOOD ONE
5712  7640          SZA CLA                 /WAS WORD O.K.?
5713  5344          JMP     DTERR+1         /NO, DATA ERROR
5714  1143          TAD     GDREG2          /GET GOOD DATA
5715  7040          CMA
5716  3143          DCA     GDREG2          /IT IS A COMPLEMENT DATA PATTERN
5717  2162          ISZ     DATCNT          /UPDATE BUFFER COUNTER
5720  5306          JMP     LPFIG           /MORE TO CHECK
5721  2153          ISZ     ADREG           /UPDATE ADDRESS
5722  1102          TAD     K1234
5723  7041          CIA
5724  1553          TAD I   ADREG           /GET WORD IN BUFFER+1
5725  7650          SNA CLA                 /WAS IT O.K.
5726  5331          JMP     .+3             /YES ALL DATA O.K.
5727  1102          TAD     K1234
5730  5303          JMP     DTERR           /WORD LOST IN BUFFER+1
5731  7330          CLA CLL CML RAR         /EXPECTED STATUS
5732  3143          DCA     GDREG2          /SETUP COMPARE REGISTER
5733  1171          TAD     SOFERR          /GET CRC ERROR FLAG
5734  7640          SZA CLA                 /WAS IT SET
5735  5656          JMP I   FGURE           /NO THE BUFFER IS O.K.
5736  7300          CLA CLL CMA             /SETUP CRC FLAG
5737  3171          DCA     SOFERR          /RESET FLAG
5740  1166          TAD     K5300           /TEXT MESS
5741  3572          DCA I   SAVPCT          /SETUP TEXT POINTER
5742  7330          CLA CLL CML RAR         /EXPECTED STATUS
5743  3143  DTERR,  DCA     GDREG2          /SETUP COMPARE
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  7330            CLA CLL
4779    6002  1126            TAD     M12
4780    6003  3133            DCA     SRCNT1                  /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     SRCNT1
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     SRCNT1                  /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     SRCNT1
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     CRRFG1                  /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     SRCNT1                  /SAVE AC
4814    6040  1133            TAD     SRCNT1
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     SRCNT1
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
```

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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     K0200
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
```



```
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            PAGE
              6200
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  1272            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  1184            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  7338            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     GOREG2                  /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     GOREG2                  /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     GOREG2                  /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     GOREG2                  /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               /
```



```
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  1620          TAD I   NERRO                    /GET RESTART ADDRESS
5078  6405  3173          DCA     RESTRT                   /STORE
5079  6406  4405          CLASIC
5080  6407  4442          C8CKPA
5081  6410  7200          NOP
5082  6411  4404          LAS                              /GET SWITCH 0
5083  6412  0215          AND     K0200                    /MASK
5084  6413  7650          SNA CLA                          /PROGRAM HALT
5085  6414  5220          JMP     .+4
5086  6415  4405          CLASIC
5087  6416  4437          CRINOH
5088  6417  7402    STPHLT, HLT                            /STOP HALT FROM SWR0=1
5089  6420  4404          LAS                              /GET SWITCH 1
5090  6421  7200          RAL
5091  6422  7720          SMA CLA                          /IS IT SCOPE LOOP
5092  6423  5226          JMP     .+3                      /NO
5093  6424  1620          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  7321    NEXTST, CLA CLL IAC                    /ENABLE CLEAR CONTROL
5101  6434  6453          CLRALL                           /CLEAR CONTROL
5102  6435  2220          ISZ     NERRO                    /UPDATE PC STORE
5103  6436  2220          ISZ     NERRO                    /UPDATE PC STORE
5104  6437  5620          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  1267          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
```



```
5131  6466  2153          ISZ     ADREG                    /UPDATE ADDRESS
5132  6467  7526          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
5138  6475  7640          SZA CLA                          /WERE THEY THE SAME
5139  6476  5300          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  7340          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  3150          DCA     DTREG                    /SAVE FOR PRINTER
5175  6542  2241          TSZ     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  7200          NOP
5185  6551  1150          TAD     CMREG
```

```
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          CAERR                           /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  4059
      6563  3175
      6564  3105
      6565  2340
      6566  1722
      6567  4016
      6570  7516
      6571  1751
      6572  7220
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  3200          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          CAERR
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  6041  KHFCHK, HFCHK
5229  6632  6000  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  2322          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  2400
          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  TFXEND, 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  K0800
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  APTRR,  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  1271          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  5120  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          TOF                             /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          TOF
5375  7147  7402          HLT                             /CHANGED TO CURRENT DATA FIELD
5376  7150  6272          CIF 70                  /LOCATION OF UVPROM
5377  7151  4763          JMS I K4500             /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  4500  K4500,  4500                  /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	C8TYPI	4426	DIN	4530	ERHLT6	4556
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	0267	CKCOUT	0232	DMAN	6747	ERTX7	6772
BYRETR	0506	CLASIC	4405	DOCNT	0247	ERTX8	7002
C8BY1	0230	CLASTK	5102	DONEA	0426	ESCOPE	5357
C8BY2	1300	CLDR	5571	DOPACK	0212	EXIT	6145
C8BY3	1061	CLKCNT	7162	DOSET	0251	EXTTA	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	5656
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
C8DD1	0310	CNTRLQ	0500	DSK2A	6370	FLSAVE	1347
C8DD10	1262	CNTRLR	0511	DSK2B	6374	FROCT	6065
C8DD11	0607	CNTRLS	0521	DSK3A	6371	GDREG1	0142
C8DD2	1233	CNTVAL	0252	DSK3B	6375	GDREG2	0143
C8DD3	0350	COMP1	4557	DSKADD	4526	GETCH1	0703
C8DD4	1006	COMP2	3600	DSKIN	4007	GETDAT	0456
C8DD7	0527	CONSOL	0000	DSKON	4374	GETDRV	4345
C8FCHO	4434	CONST1	1366	DSKOUT	4406	GOBAK	6312
C8ERR	4436	COUNT	7161	DSKP	6741	GOITA	0443
C8GET	0624	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

HFEPR	6537	K0240	6064	LDCMD	4450	OVRDOK	4435
HFR1	6472	K0260	4364	LDCUR	4451	OVRERR	4254
HFR2	6510	K0277	4366	LDMAN	4455	OVRLAP	4200
HITRK	7177	K0306	0164	LDMN	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	K7720	0111	NEXTST	6433	RDBF	5400
K0001	0073	K7727	4726	NL7775	7346	RDBUF	4456
K0002	0074	K7740	0122	NMES1	0760	RDCM	5412
K0003	0075	K7760	0110	NMES2	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	LDAD	6164	ONLY	6215	RESTRT	0173
K0207	5356	LDADD	4452	OP1	0021	RETRN	5632
K0212	6063	LDCA	4765	OP2	0022	RETRN2	5360
K0215	6062	LDCM	6544	OVRDER	4522	RNAD	6321

RNWRD1 6363
RNWRD2 6364
RNWRD4 6365
ROUINS 1302
ROUTMP 5133
RSTRT 6630
SAMDSK 4073
SAVAC 5132
SAVDAT 0163
SAVPC 6316
SAVPCT 0172
SAVPDT 6361
SAVTO 6317
SAVTRK 5654
SBCNT1 0133
SCOPE 5470
SDKP 1000
SEEK 4424
SEKER1 6314
SEKER2 6311
SELDSK 4260
SETUP1 1233
SETUP2 0225
SKPERR 5634
SKPWAT 4433
SKWAT 5134
SOFERR 0171
STAERR 5636
STCON 0157
STPCHK 7577
STPHLT 6417
STRAUT 5310
STREG 0146
SWR 0020
SWSEK 4012
T0E 0256
T10E 0571
T10R 0542
T10T 0573
T11E 0637
T11P1 0602
T11R2 0612
T11R3 0616
T11T 0641
T12A 0673
T12E 0677
T12R 0654
T13A 0747
T13E 0753
T13R 0707
T14KE 1067
T14R 1013
T143E 1063
T15E 1106
T15T 1110
T16E 1126
T16T 1130
T17E 1171
T178 1135
T17T 1173
T18E 1237
T188 1200
T18T 1241
T19E 1267
T190K 1266
T19T 1271
T1E 0275
T20E 1317
T200K 1316
T20T 1321
T21E 1350
T210K 1347
T21T 1352
T22E 1442
T22R1 1400
T22R2 1423
T22T 1444
T23E 1506
T23R1 1451
T23R2 1470
T23T 1510
T24E 1554
T248 1513
T24T 1556
T25E 1642
T258 1602
T25T 1644
T26E 1714
T26R1 1651
T26R2 1673
T26T 1716
T27E 1765
T27R1 1723
T27R2 1745
T27T 1767
T28E 2055
T28IOA 2015
T28IOB 2017
T28IOC 2022
T28IOD 2025
T28OK 2052
T28R 2010
T28T 2057
T29E 2135
T29IOA 2100
T29IOB 2102
T29IOC 2105
T29IOD 2110
T29OK 2132
T29R 2074
T29T 2137
T29W 2126
T2E 0323
T30D 2200
T30E 2207
T30R 2142
T30T 2211
T31E 2257
T31R 2214
T31T 2261
T32E 2372
T32R1 2271
T32R2 2312
T32R3 2331
T32R4 2353
T32T 2374
T33E 2507
T33R1 2404
T33R2 2431
T33R3 2450
T33R4 2467
T33T 2511
T34E 2546
T34T 2550
T35E 2615
T36E 2673
T36N 2700
T36R 2637
T36T 2703
T37A 3054
T37E 3100
T37R 3015
T37T 3102
T38DE 3157
T3AE 3146
T3AOK 3156
T38R 3115
T3AT 3161
T39DE 3235
T39E 3224
T39OK 3234
T39R 3173
T39T 3237
T3E 0355
T3T 0357
T40E 3263
T40R 3242
T40S 3246
T40T 3265
T41E 3357
T41R 3272
T41S 3306
T41T 3361
T42E 3447
T42R 3402
T42S 3406
T42T 3451
T43E 3512
T43R1 3454
T43R2 3461
T43T 3514
T44E 3557
T440K 3567
T44R 3526
T44T 3572
T45A1 3644
T45A2 3720
T45E 3765
T45R1 3634
T45R2 3650
T45R3 3711
T45R4 3723
T45SC 3626
T45T 3767
T4E 0404
T4T 0406
T5E 0420
T5T 0422
T6E 0435
T6T 0437
T7E 0451
T7T 0453
T8E 0477
T8R 0456
T8T 0501
T9E 0532
T90K 0531
T9R 0507
T9T 0534
TABLA 0461
TABLB 0471
TAPROT 5070
TCNTR1 0134
TCNTR2 0135
TCNTR3 0136
TCNTR4 0137
TCNTR5 0140
TCNTR6 0141

TEXAD 5770
TEXCA 5766
TEXCM 5762
TEXCR 5754
TEXDA 5764
TEXDB 5760
TEXDT 5772
TEXEND 7015
TEXGO 5752
TEXPC 5750
TEXST 5756
THSFLD 0035
TICK 4530
TIMSTP 3541
TMANE 4722
TMANOK 4721
TMANS 4643
TMANT 4724
TMPCNT 0746
TMPROT 2773
TOCT 6036
TOTST 5526
TOVRDT 4524
TRK212 0066
TST0 0240
TST0P 7102
TST1 0265
TST10 0540
TST11 0600
TST12 0645
TST13 0702
TST14 1010
TST14P 0757
TST15 1073
TST16 1111
TST17 1133
TST18 1202
TST19 1242
TST2 0301
TST20 1272
TST21 1322
TST22 1400
TST23 1445
TST24 1511
TST25 1600
TST26 1645
TST27 1717
TST28 1773
TST29 2062
TST3 0326
TST30 2140
TST31 2212
TST32 2262
TST33 2400
TST34 2514
TST35 2551
TST36 2622
TST37 3002
TST38 3105
TST39 3164
TST4 0400
TST40 3240
TST41 3270
TST42 3400
TST43 3452
TST44 3517
TST45 3622
TST5 0411
TST6 0423
TST7 0440
TST8 0454
TST9 0502
TSTCHA 0715
TSTSEK 4067
TTYLPT 1121
TWOCT 4461
TYPE 4436
UPAROW 0615
UPONE 6053
WATISZ 4430
WATMES 0651
WRKBUF 7177
WTISZ 4000
XCBCKP 1041
XCBCNT 0400
XCBCRL 1023
XCBECH 1063
XCBERR 1207
XCBIND 0635
XCBOCT 1000
XCBPAS 0200
XCBPAU 0337
XCBPNT 0303
XCBPSW 0656
XCBSW 0262
XCBTTY 0272
XCBTYP 1077
XCLAS 0005
XCLDR 0053
XCOMP1 0042
XCOMP2 0043
XCRLF 0062
XDIN 0007
XDISKG 0026
XDOLPT 1112
XDNSW 0520
XDOUT 0006
XDSKON 7077
XERRO 0040
XFGURE 0030
XFLBUF 0031
XFROCT 0060
XGTREG 5362
XHFCHK 0027
XHITRK 0064
XIONWT 0041
XKLBUF 0032
XLAP 4163
XLAS 0004
XLDAD 0052
XLOCA 0051
XLOCM 0050
XLOMN 0055
XLOAD 0125
XLOTRK 0063
XMYLAS 7101
XNERRO 0037
XONLY 0024
XOVRRD 4164
XPRINT 0036
XPRN 0057
XRNAD 0046
XRNBF 0056
XRNCM 0045
XRNCR 0054
XRNST 0044
XREG 5364
XRESTR 0025
XRNAD 0023
XSDKP 0047
XSKWAT 0033
XTABLA 0457
XTABLB 0460
XTEXT 5363
XTICK 0130
XTOCT 0061
XWTISZ 0034

ERRORS DETECTED: 0

LINKS GENERATED: 136

RUN-TIME: 34 SECONDS

4K CORE USED


```
A7577   5003   5017#
ACCMP1  1097#  1312   1396   1402   1668   1705   1712   1770   1783   1798   2831   2877   2989   4248
ACCMP2  1098#  2537   2586
ACL       48#
ACREG   1246#  4025   4026
ACSAVE   358    361    564    795    941    974   1026#
ADREG   1244#  4190   4191   4193   4705   4709   4715   4716   4726   4727   4737   4748   4756   5113
        5117   5123   5124   5131   5135   5140   5149   5152   5155   5173
AERRO   1223   5295   5296   5307   5310   5333#  533A   5350
AGAIN   4439#  4463
ALLBAK  3799#  3803   3807
APA1    4233   4244#
APERR   4226   4250   4257   4261#
APHLT1  1061   4266#
APR1    4227#  4262
APT8    1285   5281#  5285
APT8R   5301#  5319
AUTO10  1133#  4423   4437   4462   4528   4531   4543   4547   4550   4554
AUTPRO  1270   4207#  4270
BGN      448   1266#  5227
BGNBUF  1185#  2409   2429   2469   2484   2846   2867   2902   2907   3040   3048   3121   3181   3423
        4527   4542   4663   4704   5112
BYRETR   431    434#
C8BY1    141    143    156#   16A
C8BY2    988    990   1000#
C8BY3    801    804    810#
C8BY4    445#   626
C8BY5    863   868#   876
C8CHAR   229    230    373    382    390    392    394    548    637    647    657    661    665    667
         834   836#
C8CKP    724    733   737#
C8CKPA    88#  50A0   51A3
C8CKSW    66#  4276
C8CNTR    70#
C8CONT   881   893#
C8CRLF    78#
C8D01    261#   282
C8D010   964   985#
C8D011   529   533#
C8D02    760#   762
C8D03    308   314#
C8D04    725#   734
C8D07    457   461#
C8ECHO    80#
C8ERR     84#  2969   3087   3635   3725   406A   4079   4090   4180   4197   4265   4337   4453   4641
        4926   51A9   5219
C8GET    136    151    432    435    463    478    487    535    557#   565    594    886    818    828
         957    985    991    998   1000
C8HANG   866   874#   880    886    892
C8INQU    86#  3710   5087
C8OCTA    76#
C8PASS    64#  3689
C8PAUS    90#
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DSK0B    5063#
DSK1A    5060#
DSK1B    5064#
DSK2A    5061#
DSK2B    5065#
DSK3A    5062#
DSK3B    5066#
DSKADD   3938    3939    3941    3943    3946    3959    3993#
DSKIN    1083#   3785    3802    3926    3981
DSKON    1658    1690    3831    3875    3896#   5325
DSKOUT   1082#   3775    3916    3972
DSKP     1073#   1740    2913    3054
DSKPDT   3937    3994#
DSKSAV   5039    5055#
DSKSKP   1103#   1336    1339    2434    2492    2828    2860    2874    3127    3187    3429    3652    3665    4887
         4176    4320    4631    4985
DTERR    4714    4722    4731    4744    4755#
DTREG    1245#   4496    4497    4747    5174
ENDBUF   1068    5397#
ENDHLT   1062    3711#
ENDIT     651     656     674#
ENDTRK   1257#   1516    1588    2928    3089    3141    3201    3443    5235
ENDTST   3603    3679#
ERHLT1   1049    4141#
ERHLT2   1050    4642#
ERHLT3   1051    4927#
ERHLT4   1052    4198#
ERHLT5   1053    4338#
ERHLT6   1054    5190#
ERHLT7   1055    3726#
ERHLT9   1056    4454#
ERR1      660     664     670#
ERR41    4358    4367#
ERRMES    967    1020#
ERRO     1162    4352#   4354    4365    4367    4369    4371    4375    4387    4389    4395    4398    4406    4407
         4411    4419    4426    4430    4459    5352
ERROR    1095#   1320    1341    1371    1404    1433    1452    1472    1491    1520    1554    1592    1638    1676
         1725    1796    1800    1823    1847    1891    1939    1973    2007    2040    2111    2160    2207    2267
         2322    2376    2440    2497    2543    2592    2691    2794    2833    2879    2938    3003    3093    3154
         3214    3242    3307    3362    3403    3456    3598    3809    3988    4144    4261
ERTX1    4475    5262#
ERTX2    4476    5263#
ERTX3    4477    5264#
ERTX4    4478    5265#
ERTX5    4479    5266#
ERTX6    4480    5267#
ERTX7    4481    5268#
ERTX8    4482    5269#
ESCOPE   4366    4449    4451    4466#
EXIT     4877    4888    4897#
EXITA     381     389#
F1OP1      56#
F1OP2      57#
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F1SWR      55#
FGURE    1154    4702#   4749    4758    4759
FIGURE   1093#   1885    1933    2105    2154    2201    2261    2316    2370    2665    2685    2767    2788    3001
         3078    3146    3206    3236    3299    3354    3397    3448    3581    3946    4142    4259
FILBUF   1090#   1864    1913    1953    1987    2319    2876    2126    2175    2236    2282    2337    2560    2611
         2634    2715    2736    2894    2959    3267    3330    3516    3945    4096    4218
FILCNT    758     761     765#
FILLER    756     764#
FLBUF    1155    4539#   4555
FLSAVE    364     561     797     943     982    1028#
FROCT    1178    4844#   4862    4873    4874    4885    4894
GDREG1   1235#   2530    2582    3469    4401
GDREG2   1236#   1307    1315    1394    1400    1653    1697    1710    1717    1760    1781    1788    2463    2531
         2584    2819    2866    2906    2985    3063    3477    4005    4010    4028    4244    4483    4678    4703
         4729    4732    4734    4746    4755    4965    4973    4982    4997    5005    5111    5137    5141    5143
         5148    5163    5172
GETCH1    642#    650
GETDAT    369     370     377     403#
GETDRV   3679    3687    3771    3782    3799    3867    3872#   3885    3886    3912    3923    3978
GOBAK    5010#   5013
GOITA     375     392#
GOTADD   5034    5038#
GOTOA     397     398     399     400     401#
GOTSKP   4987    4996#
GTF       47#     363     796     942
GTREG    4469    4597#   4601    4602    4616    4621    4629
HAFCHK   1088#   1971    2005    2038    4138
HEDHLT   1063    3636#
HEDLST   4474    4475#
HEDTAD   4377    4474#
HFCHK    1153    5112#   5166    5175    5176    5228
HFERR    5122    5139    5139    5151    5161    5172#
HFR1     5135#   5145
HFR2     5149#   5154
HITRK    1069    1182    5394#
HOMEMA   1247#   1273    1274    1382    2387    2813    2848    2869    2899    3033    3118    3178    3420    4627
         4662    4943    4956
HRDERR   4684    4690    4693#
ICNTR1   4159    4161    4184#
ICNTR2   4158    4163    4185#
INDEXA    367     376     396     402#
INHIBT   4372    4448    4468#
INMODE    379     428     443     634     829     833     837#
INTADD   1411    4167#
INTRQ    1282    1411#
IONWAT   1096#   1358    1362    1369
IONWT    1163    4155#   4166    4175    4178
IOT1     1740#   5235
IOT1A1   2913#   5242
IOT1A2   3054#   5247
IOT2     4638#   5236
IOT2A2   3274#   5248
IOT3     4923#   5237
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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   2424   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
K0170   1138#  1835   1841   1958   1999   2024   2032   4134   5302
K0177   3841   3891#
K0200   1139#  1398   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
K2002   1197#  4227   4975
K2525   1205#  1863   1884   1952   1970   2018   2037   2075   2104   2174   2200   2336   2369   2559
        2633   2684   2735   2747   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#
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K5000   1207#  1812   1834   1865   1957   1991   2023   2082   2180   2291   2394   2512   2561   2620
        2642   2850   2929   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   1282   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
K7521   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   5224#
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   1417#
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   4238   4638
        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   4885
LDMN    1175   3615   3616   3721#  3723
LDADCT  1215   2050#  2051   2057   2058
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ROUINS  1004#  4304   4307
ROUTMP  4287   4303   4310#
RSTRT   5221   5227#
SAMDSK  3688#
SAVAC   4285   4293   4305   4309#
SAVDAT  1252#  4540   4546   4548
SAVPC   4938   4952   5010   5015#
SAVPCT  1259#  3039   4456   4477   4753   5170
SAVPDT  5022   5040   5041   5043   5044   5046   5048   5049   5054#
SAVTO   4950   4960   5016#
SAVTRK  4652   4665   4496#
SBCNT1  1227#  3735   3743   4506   4514   4740   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#
SELDSK  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
STPCHK  1071   5399#
STPHLT  1057   5088#
STRAUT  4426#  4440
STREG   1239#  2423   2479   2933   2988   3057   3058   3064   4247   4340   4341   4681   4974
SWR     1208   1209   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    183A   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#
T190K   1972#
T19T    1961   196A   1975#
T1E     1337   1341#
T20E    1995   2003   2007#
T200K   2006#
T20T    1994   2002   2009#
T21E    2028   2036   2040#
T210K   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   237A#
T28E    2400   2436   2440#
T28IOA  2408#  5253
T28IOB  2410#  5254
T28IOC  2413#  5255
T28IOD  2416#  2421   5256
T280K   2419   2437#
T28R    2403#  2438
T28T    2399   2402   2442#
T29E    2460   2489   2497#
T29IOA  2468#  5257
T29IOB  2470#  5258
T29IOC  2473#  5259
T29IOD  2476#  2491   5260
T290K   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      2620    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      2924#   2926    2930
T36T      2940#
T37A      3061    3073#
T37E      3070    3080    3093#
T37P      3042#   3087    3091
T37T      3038    3069    3076    3095#
T380E     3154#
T38E      3132    3145#
T380K     3144    3153#
T38R      3120#   3139    3143
T38T      3151    3156#
T390E     3214#
T39E      3192    3205#
T390K     3204    3213#
T39R      3180#   3199    3203
T39T      3211    3216#
T3E       1389    1398    1404#
T3T       1386    1391    1406#
T40E      3234    3239    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    3350    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#
T440K     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         1098    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    1156#
XFLBUF         1090    1155#
XFROCT         1111    1178#
XGTREG         4455    4469#
XMFCHK         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#
XLOAD          1102    1172#
XLOCA          1105    1171#
XLDCM          1104    1170#
XLDMN          1108    1175#
XLOAD          1215#   1647    1859    2390    2452    2485    2889    3029    3110    3171    3258    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#
XRDCM          1100    1167#
XRDCR          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    4470#
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#
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.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    1038#
.L1375    957    985    991    998    1000   1039#
.L1376    951    1010   1040#  2054   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#
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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    1038#
.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    99A    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    69A#   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    368A   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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