IDENTIFICATION

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

PRODUCT NAME: RK8E DRIVE CONTROL TEST

DATE RELEASED: APRIL 1976

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 SWR001.

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. UNFORMATED 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=1 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

SWR9=1   THE CRC, STATUS, COMMAND, LOWER DATA, AND
               SURFACE AND SECTOR REGISTERS.

               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 5.9, 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 SWR9=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 "RUN" 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 RX05 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 DOC-
    UMENTATION. (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
   "APHLT1M 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 DOC-
   UMENTATION. (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 0200 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 9,
   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 6.)

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 9-18 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 9-18 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 INTERMIT-
TENTLY. (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 "ST2".
(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 "DLOC"

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".

EPHLT9   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 INFORMA-
TION 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 GO:5252 ST:0010 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 GO:116047 CR:116046 CM:1000 DA:7777

THE FOLLOWING IS AN EXAMPLE OF AN ERROR TYPEOUT THAT COULD
HAVE OCCURED 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 DR: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

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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 SWR0=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 INTILIZE 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 D

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 EXECUTION 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 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.

```
  1                        /
  2                        /RKAE DRIVE CONTROL TEST
  3                        /
  4                        /MAINDEC-08-DHRKB-G-L
  5                        /
  6                        /COPYRIGHT (C) 1972, 1976 DIGITAL EQUIP. CORP.
  7                        /
  8                        /MAYNARD, MASS. 01754
  9                        /
 10            0001                FIELD   1
 11                        /
 12                        /CONSOL SRC -V2-RA-CONSOLE PACKAGE
 13                        /
 14                        /THE PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE TERMINAL
 15                        /EVERY FIVE(5) SECONDS OR SOONER.
 16                        /
 17                        /LOCATIONS THAT NEED TO BE SET UP FOR USING THE CONSOLE PACKAGE.
 18                        /
 19                        /CNTVAL IN XCRPASS     THIS LOCATION DETERMINDS THE NUMBER OF
 20                        /PROGRAM COMPLETIONS THAT ARE NEEDED BEFORE THE PASS MESSAGE IS TYPED
 21                        /THE VALUE SHOULD PUT THE PASS MESSAGE OUT IN THE RANGE OF 1 TO 5 MINUTES.
 22                        /THIS SHOULD BE A POSITIVE NUMBER.
 23                        /
 24                        /CASTRT   THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
 25                        /IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
 26                        /THE RETURN JUMPS TO XDOSW WHICH CONTAINS CASTRT SO PUT THE LABEL CASTRT
 27                        /WHERE YOU WANT TO RESTART THE PROGRAM.
 28                        /
 29                        /
 30                        /SETUP1 IN XCRERR    THIS IS THE MASK BIT FOR HALT ON ERROR
 31                        /PLACE THE CORRECT BIT IN THIS LOCATION FOR HALTING ON ERRORS.
 32                        /
 33                        /SETUP2 IN XCRPASS   THIS IS THE MASK FOR HALT & END OF PASS.
 34                        /
 35                        /THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
 36                        /TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL=0.
 37                        /IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
 38                        /THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.
 39                        /
 40                        /
 41            0000        CONSOL=0
 42            6661                PSKF=   6661
 43            6662                PCLF=   6662
 44            6663                PSKE=   6663
 45            6664                PSTB=   6664
 46            6665                PSIE=   6665
 47            6004                GTF=    6004
 48            7701                ACL=    7701
 49            6007                CAF=    6007
 50            7421                MQL=    7421
 51            7501                MQA=    7501
 52                        /
 53            0020        *20
 54                        /
 55   0020  0000          F1SWR,  0
```

```
 56   0021  4000          F10P1,  4000
 57   0022  0000          F10P2,  0
 58                        /
 59                        IFDEF CONSOL <
 60
 61
 62            0024        *24
 63
 64            4024                CRPASS= JMS I    .
 65   0024  0200                   XCRPAS           /C8 PASS COMPLETION ROUTINE
 66            4025                CBCKSW= JMS I    .
 67   0025  0262                   XCBSW            /CHECK SW REG SETTING
 68            4026                CRTTY1= JMS I    .
 69   0026  0272                   XCBTTY           /FETCH CONSOL CHAR
 70            4027                C8CNTR= JMS I    .
 71   0027  0400                   XCBCNT           /CHECK FOR CONTROL CHAR
 72            4030                C8PRNT= JMS I    .
 73   0030  0303                   XCRPNT           /C8 PRINT A BUFFER
 74            4031                C8SWIT= JMS I    .
 75   0031  0656                   XCRPSW           /SET UP PSEUDO SW. REG
 76            4032                C8OCTA= JMS I    .
 77   0032  1000                   XC8OCT           /CONVERT TO ASCII AND PRINT
 78            4033                CRCRLF= JMS I    .
 79   0033  1023                   XCRCRL           /DO A CARRIGE RETUR+LINE FEED
 80            4034                C8ECHO= JMS I    .
 81   0034  1063                   XCRECH           /CHECK INPUT CHAR
 82            4035                CRTYPE= JMS I    .
 83   0035  1077                   XCRTYP           /C8 PRINT ONE CHAR
 84            4036                CRERR=  JMS I    .
 85   0036  1237                   XC8ERR           /C8 ERROR  HANDLER
 86            4037                C8INOU= JMS I    .
 87   0037  0635                   XCRINQ           /LOOK FOR OPERATOR INTERVENTION
 88            4040                CRCKPA= JMS I    .
 89   0040  1041                   XCRCKP           /CHECK IF CONTROL CHAR
 90            4041                CRPAUS= JMS I    .
 91   0041  0337                   XCRPAU           /IF CONSOL PACKAGE RETURN CALL PLUS ONE
 92                                                 /IF NOT USING CONSOL REPLACE CALL WITH
 93                                                 /A HLT AND THEN GO TO THE HALT
 94
 95                        /***************************************************************
 96                                /*20              /PSEUDO SWITCH REGISTER
 97
 98
 99                                /*21              /HARDWARE INDICATORS
100                                                 /4000=USE FRONT PANEL SWITCH REGISTER
101                                                 /0000=USE THE PSEUDO SWITCH REGISTER LOC.20
102
103                                /*22              /SYSTEM CONFIGURATION
104                                                 /4000=CONSOL PACKAGE SET ACTIVE
105                                                 /0000=CONSOLE PACKAGE SET DEACTIVE
106
107                                /*23              /RESERVED FOR FUTURE USE
108                                >
109                        /
110            0200        *200
```

```
111                         /
112                         /****************************************************************
113                         /CØPASS
114                         /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
115                         /THE VALUE OF ** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
116                         /THE PROGRAM TO COMPLETE THIS MANY CØPASS TO BE IN THE 1 TO 4 MINUTE
117                         /RANGE
118                         /       CØPASS=JMS    XCØPAS
119           /EX. OF CALL              CØPASS
120                         /                     HLT              /HALT IF NON CONSOL PACKAGE
121                         /             JMP     START1           /CONTINUE RUNNING THIS PROGRAM
122
123
124                         /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
125                         /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
126                         /THE LOCATION SETUP2 IS THE MASK BIT FOR THE HALT AT END OF PASS
127                         /CHECK THAT IT IS CORRECT FOR THE CURRENT PROGRAM
128
129                         /CALLS USED BY XCØPAS ARE  CHKCLA=XCØCRLF=XCØOCTA=XCØSW=XCØPNT=XCØINQ=
130
131
132   0200   0000   XCØPAS, 0
133   0201   7200          CLA
134   0202   4777*         JMS    CHKCLA           /IS WORD 22 BIT 3 ACTIVE CONSOLE?
135   0203   5212          JMP    DOPACK           /IS CLASSIC
136   0204   4776*         JMS    CØGET            /GET REGISTERS.
137   0205   4262          JMS    XCØSW            /DEACTIVE CONSOL CHECK SR SETTING
138   0206   0375          AND    (400             /FOR HALT ON END OF CØPASS
139   0207   7640          SZA CLA                 /1= HALT 0 CONTINUE
140   0210   5600          JMP I  XCØPAS           /GO TO HALT
141   0211   5230          JMP    CØBY1            /CONTINUE ON RUNNING PROGRAM
142   0212   4232   DOPACK, JMS    CKCOUT           /CLASS CHECK CØPASS COUNT
143   0213   5230          JMP    CØBY1            /CØPASS COUNT NOT DONE REDO PROGRAM
144   0214   2250          ISZ    PASCNT           /CØPASS COUNT DONE SET CØPASS COUNT
145   0215   4774*         JMS    XCØCRLF
146   0216   4303          JMS    XCØPNT           /CØPRNT BUFFER
147   0217   0253          MESPAS                  /
148   0220   1250          TAD    PASCNT           /GET NUMBER
149   0221   4773*         JMS    XCØOCTA          /CONVERT IT TO ASCII
150   0222   4774*         JMS    XCØCRLF          /DO A CARRIAGE RETURN
151   0223   4776*         JMS    CØGET            /GET REGISTERS.
152   0224   4262          JMS    XCØSW            /CHECK A HALT AT END OF CØPASS
153   0225   0375   SETUP2, AND    (400             /MASK BIT
154   0226   7640          SZA CLA                 /HALT #1 NO SKIP CONTINUE =0
155   0227   4772*         JMS    XCØINQ           /STOP PROGRAM EXECUTION=LOOK FOR INPUT
156   0230   2200   CØBY1,  ISZ    XCØPAS           /BUMP RETURN
157   0231   5600          JMP I  XCØPAS
158   0232   0000   CKCOUT, 0
159   0233   1251          TAD    DOSET            /CHECK IF SET UP NEEDED
160   0234   7640          SZA CLA                 /0=SET UP CAPASS COUNT VALUE
161                         /1=CØPASS COUNT VALUE OK
162   0235   5242          JMP    NOSET            /CØPASS COUNT VALUE ON
163   0236   1253          TAD    CNTVAL           /GET COUNT VALUE FOR THIS PROG
164   0237   7040          CMA                     /SET TO NEGATIVE
165   0240   3247          DCA    DOCNT            /STORE IN HERE
```

```
166   0241   2251          ISZ    DOSET            /INDICATE VALUE SET UP
167   0242   2247   NOSET,  ISZ    DOCNT            /COUNT THE NUMBER OF PASSES
168   0243   5230          JMP    CØBY1            /EXIT FOR ANOTHER PASS
169   0244   3251          DCA    DOSET            /SET TO CØPRNT CØPASS
170   0245   2232          ISZ    CKCOUT           /BUMP RETURN FOR
171   0246   5632          JMP I  CKCOUT           /CØPASS CØTYPE OUT
172   0247   0000   DOCNT,  0
173   0250   0000   PASCNT, 0
174   0251   0000   DOSET,  0
175   0252   0000   CNTVAL, 0
176   0253   0410   MESPAS, TEXT   "DHRKAF  PASS "
      0254   7213
      0255   0206
      0256   4040
      0257   2001
      0260   2323
      0261   4000
177
178
179
180                         /****************************************************************
181
182                         /CØCKSW
183
184                         /THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
185                         /ROUTINE THAT WILL CHECK WHERE TO READ THE
186                         /CØ SWITCHES FROM IE. FROM PANEL OR PSEUDO SWITCH REGISTER
187                         /THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.
188
189                         /CØCKSW=          JMS XCØSW
190                         /EX.     JMS     XCØSW            /READ THE CØSWIT REGISTER
191                         /                                 /RETURN WITH THE CONTENTS OF SWITCH REGISTER
192
193                         /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF CØSWIT SETTING
194
195                         /CALLS USED ARE=XCØCKPA=
196
197
198
199   0262   0000   XCØSW,  0
200   0263   4771*         JMS    XCØCKPA          /GO CHECK THE IF ANY CONTROL
201   0264   7000          NOP
202   0265   1221          TAD    21               /GET NO FOR INDICATOR
203   0266   7710          SPA CLA                 /CHECK IF FROM PANEL 0000
204   0267   7614          7614                    /ON LAS AND SKIP GET FROM PANEL WITH LAS
205   0270   1020          TAD    20               /PSEUDO SWITCH
206   0271   5662          JMP I  XCØSW            /EXIT WITH STATUS BIT IN AC.
207
208
209                         /****************************************************************
210
211                         /CØTTY1
212                         /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
213                         /AND REMOVE ANY PARITY BITS, THEN MAKE IT A BIT ASCI.
214                         /       CØTTY1= JMS XCØTTY
```

```
215                                  /EX,    JMS     XC8TTYI           /READ CHAR FROM THE CONSOL DEVICE
216                                          /                         /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
217
218
219                                  /CALLS USED -NONE-BUT C8CHAR IS OFF PAGE AND IN ROUTINE CALLED XCRECHO
220
221                                  /
222                                  /
223      0272    0000        XC8TTY, 0
224      0273    6031                KSF                               /LOOK FOR KEYBOARD FLAG
225      0274    5273                JMP     .-1
226      0275    6036                KRB                               /GET CHAR
227      0276    0370                AND     (177                      /MASK FOR 7 BITS
228      0277    1367                TAD     (200                      /ADD THE EIGTH BIT
229      0300    3766*               DCA     C8CHAR                    /STORE IT
230      0301    1766*               TAD     C8CHAR
231      0302    5672                JMP I   XC8TTY                    /EXIT
232
233
234
235                                  /**********************************************************************
236
237                                  /C8PRNT
238
239                                  /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
240                                  /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL.    PRINTING OF THE BUFFER
241                                  /WILL STOP WHEN A 00 CHAR IS DETECTED. CHARACTERS ARE PACKED 2 PER WORD.
242
243                                  /        C8PRNT* JMS XC8PNT
244
245
246                                  /EX.    JMS     XC8PNT                         /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
247                                  /       MESS77                                 /LOCATION OF C8PRNT BUFFER
248
249                                  /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
250                                  /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0
251
252                                  /CALLS USED ARE-XC8TYPE-XC8PNT
253
254
255
256      0303    0000        XC8PNT, 0
257      0304    7300                CLA CLL
258      0305    1703                TAD I   XC8PNT                    /GET C8PRNT BUFFERS STARTING LOCATION
259      0306    3336                DCA     PTSTOR                    /STORE IN PTSTOR
260      0307    2303                ISZ     XC8PNT                    /BUMP RETURN
261      0310    1736        C8001,  TAD I   PTSTOR                    /GET DATA WORD
262      0311    0365                AND     (7700                     /MASK FOR LEFT BYTE
263      0312    7450                SNA                               /CHECK IF 00 TERMINATE
264      0313    5703                JMP I   XC8PNT                    /EXIT
265      0314    7500                SMA                               /IS AC MINUS
266      0315    7020                CML                               /MAKE CHAR A 300 AFTER ROTATE
267      0316    7001                IAC                               /MAKE CHAR A 200 AFTER ROTATE
268      0317    7012                RTR
269      0320    7012                RTR
```

```
270      0321    7012                RTR                               /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
271      0322    4764*               JMS     XC8TYPE                   /C8PRNT IT ON CONSOLE
272      0323    1736                TAD I   PTSTOR                    /GET DATA WORD
273      0324    0363                AND     (0077                     /MASK FOR RIGHT BYTE
274      0325    7450                SNA                               /CHECK IF 00 TERMINATOR
275      0326    5703                JMP I   XC8PNT                    //EXIT
276      0327    1362                TAD     (3700                     /ADD FUDGE FACTOR TO DETERMINE IF 200
277      0330    7500                SMA                               /OR 300 IS TO BE ADD TO CHAR
278      0331    1361                TAD     (100                      /ADD 100
279      0332    1360                TAD     (200                      /ADD 200
280      0333    4764*               JMS     XC8TYPE                   /C8TYPE ONLY BITS 4-11
281      0334    2336                ISZ     PTSTOR                    /BUMP POINTER FOR NEXT WORD
282      0335    5310                JMP     C8001                     /DO AGAIN
283      0336    0000        PTSTOR, 0                                 /STOR FOR C8PRNT BUFFER
284                                  /**********************************************************************
285
286
287                                  /C8PAUS
288                                  /THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE,IF ACTIVE
289                                  /IT WILL RETURN TO CALL PLUS ONE AC= 0. AND DO THAT INSTRUCTION.
290                                  /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
291                                  /WITH A 7402 HALT AND THEN RETURN TO THE HALT.
292
293                                  /        C8PAUS* JMS XC8PAU
294                                  /
295                                  /
296                                  /EX.            JMS     XC8PAUS           /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
297                                  /               ANYTHING                  /RETURN HERE IF ON ACTIVE CONSOL
298                                  /
299                                  /
300
301                                  /CALLS USED ARE -CHKCLA-
302
303
304
305      0337    0000        XC8PAU, 0
306      0340    7300                CLA CLL
307      0341    4777*               JMS     CHKCLA                    /CHECK LOC 22 BIT 3 CONSOLE BIT
308      0342    5350                JMP     CAD03                     /GO DO CONSOL PART RETURN CALL+1
309      0343    7040                CMA                               /DEACTIVE CONSOLE PACKAGE PUT HLT IN CALL
310      0344    1337                TAD     XC8PAU                    /GET CORRECT RETURN ADDRS
311      0345    3337                DCA     XC8PAU                    /SET UP RETURN
312      0346    1357                TAD     (7402                     /GET CODE FOR HLT
313      0347    3737                DCA I   XC8PAU                    /PUT HALT IN CALL LOCATION
314      0350    5737        CAD03,  JMP I   XC8PAU                    /GO TO HALT OR RETURN TO NEXT LOCATION
315
316
317      0357    7402
318      0360    0240
319      0361    0100
320      0362    3700
321      0363    0077
322      0364    1077
323      0365    7700
324      0366    1075
```

```
325   0367   0200
326   0370   0177
327   0371   1041
328   0372   0635
329   0373   1200
330   0374   1223
331   0375   0420
332   0376   2420
333   0377   1200
             0400      PAGE
334                    /*********************************************************
335
336
337                    /C8CNTR
338                    /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
339                    /IT WILL CHECK FOR THE FOLLOWING CHAR C=R=Q=L=S
340                    /        C8CNTR= JMS XC8CNT
341                    /
342                    /EX.    JMS    XCRCNTR              /CHECK FOR CONTROL CHARACTER
343                    /       JMP    ANYTHING             /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
344                    /       JMP    ANYTHING             /LOC. IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
345                    /
346
347                    /RETURN IS TO CALL PLUS ONE IF CONTINUE
348                    /RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
349                    /RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
350                    /CONTROL CHAR ..THIS WILL PRINT THE CHARACTER AND A ?
351                    /CLEAR THE AC AND RETURN CALL+2.
352
353                    /CALLS USED ARE=CHKCLA=XC8TYPE=XCACRLF=C8GET=UPAROW=XC8TYI=XC8PSW=
354                    /
355                    /
356                    /
357   0400   0200      XCRCNT, 0
358   0401   3777*               DCA    ACSAVE              /SAVE THE AC
359   0402   0776*               JMS    CHKCLA              /CHECK LOC,22 BIT3 FOR CONSOLE BIT
360   0403   5206                JMP    .+3                 /ON ACTIVE CONSOLE
361   0404   1777*               TAD    ACSAVE              /DEACTIVE CONSOLEGET AC FOR RETURN
362   0405   5600                JMP I  XC8CNT              /EXIT NOT ON ACTIVE CONSOLE
363   0406   6004                GTF
364   0407   3775*               DCA    FLSAVE
365   0410   7501                MQA
366   0411   3770*               DCA    MQSAVE              /SAVE THE MQ
367   0412   3255                DCA    INDEXA              /SET DISPLACEMENT INTO TABLE =
368   0413   1257                TAD    XTABLA              /GET ADDRS OF TABLE A
369   0414   3256                DCA    GETDAT              /CONTAINS POINTER TO CONTROL CHAR
370   0415   1656      REDOA,    TAD I  GETDAT              /GET CONTROL CHAR FROM TABLE
371   0416   7450                SNA                        /CHECK FOR A 0 END OF TABLE
372   0417   5226                JMP    DONEA               /END OF TABLE NO CONTROL CHAR
373   0420   1773*               TAD    CACHAR              /COMPARE CHAR TO CONTROL CHAR
374   0421   7650                SNA CLA                    /0 IF MATCH
375   0422   5243                JMP    GOITA               /MATCH
376   0423   2255                ISZ    INDEXA              /NO MATCH NOT END OF TABLE REDO
377   0424   2256                ISZ    GETDAT              /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
378   0425   5215                JMP    REDOA               /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
```

```
379   0426   1772*     DONEA,    TAD    INMODE              /CHECK IF PROGRAM EXPECTS CHAR
380   0427   7600                SZA CLA                     /1=CHAR EXPECTED  0= NO CHAR EXPECTED
381   0430   5240                JMP    EXITA               /CHAR EXPECTED
382   0431   1773*               TAD    C8CHAR              /GET CHAR =NOT CONTROL=NOT EXPECTED
383   0432   4771*               JMS    XC8TYPE             /C8PRNT CHAR
384   0433   1370                TAD    (277                /GET CODE FOR "?"
385   0434   4771*               JMS    XC8TYPE
386   0435   4767*               JMS    XC8CRLF
387   0436   2200                ISZ    XC8CNT              /BUMP RETURN
388   0437   5600                JMP I  XC8CNT              /EXIT CALL+2
389   0440   2200      EXITA,    ISZ    XC8CNT              /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
390   0441   1773*               TAD    CACHAR              /PUT CHAR IN AC.
391   0442   5600                JMP I  XC8CNT              /EXIT
392   0443   1773*     GOITA,    TAD    C8CHAR              /GET THE CONTENTS OF CHAR
393   0444   1366                TAD    (100                /ADD 100 TO FORM A GOOD ASCII CHARACTER
394   0445   3773*               DCA    C8CHAR              /RESTORE COFFECT CHAR
395   0446   1260                TAD    XTABLB              /GET START OF TABLE B
396   0447   1255                TAD    INDEXA              /GET HOW FAR INTO TABLE
397   0450   3254                DCA    GOTOA               /STORE IT
398   0451   1654                TAD I  GOTOA               /GET THE ROUTINE STARTTING ADDRESS
399   0452   3254                DCA    GOTOA               /STORE IT IN HERE
400   0453   5654                JMP I  GOTOA               /GOTO CONTROL CHAR ROUTINE
401   0454   0000      GOTOA,    0000                        /ADD OF CNTRL ROUTINE TO EXECUTE
402   0455   0000      INDEXA,   0000                        /DISPLACEMENT INTO CNTRL TABLE
403   0456   0000      GETDAT,   0000                        /LOCATION OF ADDRS OF CONTROL CHAR.
404   0457   0461      XTABLA,   TABLA                       /ADDRS OF TABLEA
405   0460   0471      XTABLB,   TABLB                       /ADDRS OF TABLEB
406   0461   7575      TABLA,    7575                        /CNTRL C BACK TO MONITOR 203
407   0462   7560                7560                        /CNTRL L SWITCH ERROR PRINTING DEVICE 214
408   0463   7557                7557                        /CNTRL Q START DISPLAYING CHAR. AGAIN 221
409   0464   7556                7556                        /CNTRL R BACK TO BEGINNING OF PROGRAM 222
410   0465   7555                7555                        /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
411   0466   7573                7573                        /CNTRL E CONTINUE WITH PROGRAM 205
412   0467   7574                7574                        /CONTROL O CHANGE SWITCH REGISTER ON FLY
413   0470   0000                0000
414
415   0471   0531      TABLB,    CNTRLC
416   0472   2537                CNTRLL
417   0473   0500                CNTRLQ
418   0474   0511                CNTRLR
419   0475   0521                CNTRLS
420   0476   0505                CNTRLE
421   0477   2600                CNTRLO
422                    /
423                    /CONTROL Q
424                    /START SENDING CHAR. TO THE DISPLAY
425                    /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
426                    /THE CALL FOR CONTROL S.
427                    /
428   0500   3772*     CNTRLQ,   DCA    INMODE              /SET SOFT FLAG FOR UNEXPECTED CHAR
429   0501   1335                TAD    CASETS              /CHECK IF CONTROL S TYPED IN
430   0502   7640                SZA CLA
431   0503   5306                JMP    BYRETO              /CONTROL S TYPED IN
432   0504   4765*               JMS    C8GET               /NO CONTROL S TYPED PREVIOUSLY
433   0505   5600                JMP I  XC8CNTR             /LEAVE VIA CNTR ENTRY ADDRESS
```

```
434    0506   3335    RYRETR, DCA     CBSETS        /CLEAR THE SOFT FLAG
435    0507   4765*           JMS     CBGET         /RESTORE REGISTERS
436    0510   5736            JMP I   CBRETR        /EXIT TO ADDRESS SET BY CONTROL S
437                   /
438                   /
439                   /CONTROL R
440                   /GO TO THE QUESTION CBSWIT
441    0511   3764*   CNTRLR, DCA     TTYLPT        /CLEAR THE TYPE FLAG SET TO TTY
442    0512   3335            DCA     CBSETS        /CLEAR SOFT FLAG FOR CNTRL S
443    0513   3772*           DCA     INMODE
444    0514   4763*           JMS     UPAROW        /PRINT THE ^ AND CBCHAR
445    0515   3762*   CBRY4,  DCA     CBSWST        /CLEAR FLAG FOR CNTRL D OR R
446    0516   6203            CIF CDF R
447    0517   5720            JMP I   XDOSW         /GO TO ADDRS OF CBSWIT
448    0520   0200    XDOSW,  BGN           /DOSW IS LABEL FOR CBSWIT QUESTION
449                   /
450                   /
451                   /CONTROL S
452                   /STOP SENDING CHAR. TO DISPLAY UNTIL A ^Q IS RECEIVED
453                   /
454                   /
455    0521   1335    CNTRLS, TAD     CBSETS        /IF: DO NOT STORE IN CBRETR
456    0522   7640            SZA CLA
457    0523   5327            JMP     CBDO7         /DONT SET UP CBRETR
458    0524   7001            IAC                   /MAKE RETURN CALL PLUS 2
459    0525   1200            TAD     XCBCNT        /GET RETURN FOR THIS CALL
460    0526   3336            DCA     CBRETR        /STORE IT HERE FOR USE BE CNTRL Q
461    0527   2335    CBDO7,  ISZ     CBSETS        /SET FLAG TO SAVE CALL
462    0530   4761*           JMS     XCBTTYI           /LOOK FOR THE INPUT
463    0531   4765*           JMS     CBGET         /GET REGISTERS
464    0532   4220            JMS     XCBCNTR           /CHECK FOR THE CONTROL CHAR
465    0533   7200            CLA
466    0534   5321            JMP     CNTRLS        /IF NOT A CNTRL Q R C REASK
467    0535   0000    CBSETS, 0
468    0536   0000    CBRETR, 0
469                   /
470                   /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER -THE TWO OUTPUTS ARE THE
471                   /CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
472                   /
473                   /
474    0537   1760*   CNTRLL, TAD     TTYLPT        /GET PRESENT CBSWIT INDICATOR
475    0540   7040            CMA                   /COMPLEMENT IT
476    0541   3764*           DCA     TTYLPT        /STOR NEW CBSWIT
477    0542   4763*           JMS     UPAROW        /CBPRNT ^ AND CHAR ON NEW DEVICE
478    0543   4765*           JMS     CBGET         /RESTORE THE REGISTERS
479    0544   5600            JMP I   XCBCNT        /EXIT
480                   /
481                   /CONTROL E
482                   /CONTINUE RUNNING FROM A INQUIRE OR ERROR
483                   /
484                   /
485    0545   4763*   CNTRLE, JMS     UPAROW        /PRINT THE CONTROL CHAR
486    0546   3762*           DCA     CBSWST        /CLEAR ENTRY FLAG.
487    0547   4765*           JMS     CBGET         /GET THE REGISTERS
488    0550   5600            JMP I   XCBCNT        /RETURN TO CALL PLUS ONE
```

```
489
490
491                   /CONTROL C
492                   /RETURN TO MONITOR CONTROL C
493    0551   3764*   CNTRLC, DCA     TTYLPT        /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
494    0552   3762*           DCA     CBSWST        /CLEAR ENTRY FLAG.
495    0553   4763*           JMS     UPAROW        /CBPRNT A^ AND LETTER IN CHAR
496    0554   6203            CDF CIF               /GO TO 0 FLD
497    0555   6007            CAF                   /CLEAR THE WORLD
498    0556   5760            JMP I   (7600         /GO TO DIAGNOSTIC MONITOR
499                   /***********************************************************************
500                   /
501                   /
502                   /
503    0560   7600
504    0561   0272
505    0562   0745
506    0563   0615
507    0564   1121
508    0565   0624
509    0566   0100
510    0567   1023
511    0570   0277
512    0571   1777
513    0572   1076
514    0573   1075
515    0574   1346
516    0575   1347
517    0576   1200
518    0577   1305
       0600    PAGE
519
520                   /
521                   /CONTROL 0
522                   /CHANGE THE SWITCH REGISTER ANYTIME CNTRL 0 AND RETURN TO
523                   /THE PROGRAM RUNNING.
524
525
526    0600   4215    CNTRLD, JMS     UPAROW
527    0601   1213            TAD     CBSETD        /CHECK IF THE RETURN ADDRS IS SAFE
528    0602   7640            SZA CLA
529    0603   5207            JMP     CBDO11        /DO NOT CHANGE THE RETURN ADDRS
530    0604   1777*           TAD     XCBCNT        /GET THE RETURN ADDRS AND SAVE IT
531    0605   3214            DCA     CBRETD        /SAVE THE RETURN HERE
532    0606   2213            ISZ     CBSETD        /INDICATE RETURN SAVED DONT DISTROY
533    0607   4256    CBDO11, JMS     XCBPSW            /GO CHANGE THE SWITCH REGISTER
534    0610   3213            DCA     CBSETD        /CLEAR THE FLAG
535    0611   4234            JMS     CBGET         /RESTORE THE AC NO LINK ETC
536    0612   5614            JMP I   CBRETD        /RETURN TO THE PROGRAM
537                   /
538    0613   0000    CBSETD, 0
539    0614   0000    CBRETD, 0
540
541
542
```

```
503                          /THIS WILL TYPE A UP ARROW AND THE CHAR IN C8CHAR,
504
545     0615  0000     UPARON,  0                      /C8PRNT THE "^" AND THE CHAR C8TYPED IN
546     0616  1376              TAD      (336           /CODE FOR ^
547     0617  4775*             JMS      XC8TYPE
548     0620  1774*             TAD      C8CHAR         /C8TYPE THE CHAR
549     0621  4775*             JMS      XC8TYPE
550     0622  4773*             JMS      XC8CRLF
551     0623  5615              JMP  I   UPARON         /EXIT
552
553
554
555                          /******************************************************************
556
557     0624  0000     C8GET,   0
558     0625  7200              CLA
559     0626  1772*             TAD      MQSAVE
560     0627  7421              MQL                     /RESTORE MQ
561     0630  1771*             TAD      FLSAVE
562     0631  7004              RAL                     /RESTORE THE LINK
563     0632  7200              CLA
564     0633  1770*             TAD      ACSAVE         /RESTORE THE AC
565     0634  5624              JMP  I   C8GET          /GET THE REGISTERS
566
567
568
569                          /******************************************************************
570
571                          /C8INQU
572                          /C8INQU ROUTINE WILL PRINT A WAITING
573                          /AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
574                          /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
575                          /IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
576                          /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN,
577
578                          /        C8INQU =      JMS XC8INQ
579
580                          /EX,     JMS      XC8INQ               /C8 WILL PRINT A WAITINGAND WAIT FOR INPUT
581                          /        DO ANYTHING                  /RETURN IS CALL PLUS ONE AC =0 CONTINUE
582
583                          /CALLS USED ARE =CHKCLA=XC8PNT=XC8TYI=C8GET=XC8CNTR=
584
585
586     0635  0000     XC8INQ,  0
587     0636  7300              CLA CLL
588     0637  4767*             JMS      CHKCLA         /CHECK LOC 22 BIT 3 CONSOLE BIT
589     0640  7410              SKP                     /ACTIVE CONSOLE PACKAGE
590     0641  5635              JMP  I   XC8INQ         /NOT CONSOLE LEAVE
591     0642  4766*             JMS      XC8PNT
592     0643  0651              WATMES                  /INQUIR WAITTING
593     0644  4765*             JMS      XC8TTYI        /GET CHARACTER
594     0645  4224              JMS      C8GET
595     0646  4777*             JMS      XC8CNTR        /CHECK IF CONTROL CHARACTER
596     0647  5635              JMP  I   XC8INQ         /EXIT AND CONTINUE
597     0650  5236              JMP      XC8INQ+1       /REASK
```

```
598     0651  2701     WATMES,  TEXT     "WAITING "
        0652  1124
        0653  1116
        0654  0740
        0655  0000
599
600
601                          /******************************************************************
602
603                          /C8SWIT
604
605                          /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
606                          /SW QUESTION . IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
607                          /RETURN TO CALL PLUS ONE AC=0,
608                          /C8SWIT WILL SET UP THE PSEUDO SWITCH
609                          /REGISTER WITH THE NEW DATA ENTERED
610                          /
611                          /        C8SWIT =      JMS XC8PSW
612
613                          /EX,     JMS      XC8PSW               /SET UP PSEUDO C8SWIT REGISTER IF
614                          /                                     /ON THE CONSOL PACKAGE. RETURN IS CALL PLUS ONE AC = 0
615
616                          /CALLS USED ARE =CHKCLA=XC8PSW=XC8PNT=XC8OCTA=XC8TYPE=
617
618
619     0656  0000     XC8PSW,  0
620     0657  4767*             JMS      CHKCLA         /CHECK LOC 22 BIT 3 CONSOLE BIT
621     0660  7410              SKP                     /ACTIVE CONSOLE
622     0661  5656              JMP  I   XC8PSW         /DEACTIVE CONSOLE PACKAGE
623                                                     /RETURN WITHOUT ASKING PSEUDO SWITCH
624     0662  1345              TAD      C8SWST         /IS THE SOFT FLAG SET FOR SWITCH?
625     0663  7640              SZA CLA                 /SKIP IF ONE ENTRY A TIME OK
626     0664  5760*             JMP      C88Y4          /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
627     0665  2345              ISZ      C8SWST         /FIRST ENTRY SET FLAG
628     0666  4766*     C8ROPS, JMS      XC8PNT         /C8PRNT SR=
629     0667  0707              MESA
630     0670  1020              TAD      20             /GET CONTENTS OF SW
631     0671  4763*             JMS      XC8OCTA        /CONVERT IT TO ASCII
632     0672  1362              TAD      (40            /GET SPACE
633     0673  4775*             JMS      XC8TYPE
634     0674  2761*             ISZ      INMODE         /SET FLAG FOR CHAR EXECTED
635     0675  4760*             JMS      XC8ECHO        /LOOK FOR INPUT
636     0676  4315              JMS      TSTCHA         /NOT CONTROL TEST IT IS LEGAL
637     0677  1774*             TAD      C8CHAR         /STORE NEW CHAR IN SW REG
638     0700  3020              DCA      20
639
640     0701  1357              TAD      (-3            /GET A MINUS 3
641     0702  3346              DCA      TMPCNT         /STORE IN TEMP COUNT
642     0703  4760*     GETCH1, JMS      XC8ECHO        /GET NEXT CHAR
643     0704  4315              JMS      TSTCHA         /CHECK IF CR=GOOD CHAR
644     0705  1020              TAD      20             /GET C8SWIT REGISTER
645     0706  7106              RTL CLL                 /ROTATE IT LEFT 3 PLACES
646     0707  7004              RAL
647     0710  1774*             TAD      C8CHAR         /GET CHAR+ADD IT TO PREVIOUS CONTENTS
648     0711  3020              DCA      20             /SAVE NEW CONTENTS
```

```
649    0712  2346              ISZ     TMPCNT        /BUMP COUNT
650    0713  5303              JMP     GETCM1        /JMP BACK+GET NEXT CHAR
651    0714  5302              JMP     ENDIT         /END 4 CHAR CATYPED IN
652    0715  0000    TSTCHA,   0
653    0716  7041              CIA                   /CMPL CHAR IN AC
654    0717  1356              TAD     (215          /TEST IF IT IS A CARRIAGE RETURN
655    0720  7650              SNA CLA               /SKIP IN NOT CR.
656    0721  5302              JMP     ENDIT         /WAS CARRIAGE RETURN
657    0722  1774'             TAD     CACHAR        /NOT CR, GET CHAR
658    0723  1355              TAD     (-260         /CHECK IF IT IS IN RANGE
659    0724  7710              SPA CLA               /IF NOT POSITIVE CAERR CHAR SMALLER THEN 260
660    0726  5336              JMP     ERR1          /CAERR -CHAR TOO SMALL
661    0726  1774'             TAD     CACHAR        /GET CHAR
662    0727  1354              TAD     (-270         /GET A -270+CHECK IF IT IS LARGER THEN 7
663    0737  7720              SMA CLA               /SKIP IF LESS THEN 7
664    0731  5336              JMP     ERR1          /CAERR ON CHAR NOT IN RANGE
665    0732  1774'             TAD     CACHAR        /GET CHAR
666    0733  0353              AND     (7            /MASK FOR RIGHT BYTE
667    0734  3774'             DCA     CACHAR        /STORE IN CHAR
668                                                  /GET CHAR IN AC
669    0735  5715              JMP I   TSTCHA        /EXIT
670    0736  1352    ERR1,     TAD     (277          /CARRNT
671    0737  4775'             JMS     XCATYPE       /?
672    0740  4773'             JMS     XCACRLF       /
673    0741  5266              JMP     CBRDRS        /EXIT+ASK AGAIN
674    0742  4773'   ENDIT,    JMS     XCACRLF       /DO A CR LF
675    0743  3345              DCA     CRSWST        /CLEAR THE PSW ENTRY FLAG
676    0744  5656              JMP I   XCAPSW        /EXIT ROUTINE
677    0745  0000    CASWST,   0
678
679    0746  0000    TMPCNT,   0
680    0747  2322    MESA,     TEXT    "SR: "
       0750  7540
       0751  0000
681
682
683    0752  0277
684    0753  0007
685    0754  7512
686    0755  7520
687    0756  0215
688    0757  7775
689    0760  1063
690    0761  1076
691    0762  0040
692    0763  1200
693    0764  0515
694    0765  0272
695    0766  0303
696    0767  1200
697    0770  1345
698    0771  1347
699    0772  1346
700    0773  1023
701    0774  1275
```

```
702    0775  1077
703    0776  0336
704    0777  0400
       1000            PAGE
705
706                    /CROCTA
707
708                    /OCTAL TO ASCII CONVERSION
709                    /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
710                    /THE RESULT WILL BE PRINTED ON THE CONSOL TERMINAL
711                    /        CAOCTA= JMS XCBOCT
712                    /
713                    /EX.     JMS     XCBOCTA       /AC CONTAINS NUMBER TO BE CHANGE
714                    /        RETURN IS TO CALL PLUS ONE AC=0
715
716                    /CALLS USED ARE =XCATYPE=
717
718
719    1000  0000    XCBOCT,   0
720    1001  7136              CLL RTL
721    1002  7006              RTL
722    1003  3221              DCA     CATMP1        /POSITION THE FIRST CHAR FOR PRINTING
723    1004  1377              TAD     (-4           /SAVE CORRECT POSITIONED WORD HERE
724    1005  3222              DCA     CRCKP
725    1006  1221    CADO4,    TAD     CATMP1        /STORE COUNTER IN HERE
726    1007  0376              AND     (0007         /GET FIRST NUMBER
727    1010  1375              TAD     (260          /MASK
728    1011  4277              JMS     XCATYPE       /ADD THE PRINT CONSTANT
729    1012  1221              TAD     CATMP1        /TYPE THE NUMBER
730    1013  7006              RTL                   /
731    1014  7004              RAL
732    1015  3221              DCA     CATMP1        /PUT NEXT NUMBER IN POSITION
733    1016  2222              ISZ     CRCKP         /STORE IT
734    1017  5206              JMP     CADO4         /DONE YET WITH FOUR NUMBERS
735    1020  5620              JMP I   XCBOCT        /NOT YET DO MORE
736    1021  0000    CATMP1,   0                     /DONE WITH FOUR
737    1022  0000    CRCKP,    0
738
739
740                    /***************************************************************
741
742                    /CBCRLF
743                    /CATYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
744                    /
745                    /        CBCRLF= JMS XCBCRL
746                    /
747                    /EX.     JMS     XCBCRLF       /CARRNT A CR AND LF WITH FILL
748                    /                              /RETURN TO CALL PLUS ONE AC =0
749                    /CALLS USED ARE =XCATYPE=
750
751
752    1023  0000    XCACRLF,0
753    1024  7300              CLA CLL
754    1025  1374              TAD     (215          /GET CODE FOR CR
755    1026  4277              JMS     XCATYPE
```

```
756    1227  1237          TAD    FILLER
757    1230  7000          CMA
758    1231  3200          DCA    FILCNT      /STORE FILLER IN HERE
759    1232  1373          TAD    (212        /GET CODE FOR LF
760    1233  4277   CADD2, JMS    XCATYPE
761    1234  2240          ISZ    FILCNT      /CHECK ON FILLER CHAR
762    1235  5233          JMP    CADD2       /TYPE A NON PRINTING CHAR
763    1236  5623          JMP I  XCACRL      /EXIT
764    1237  0004   FILLER, 0004              /FILLER SET FOR 4 CHAR
765    1240  0000   FILCNT, 0                 /COUNTER FOR FILL
766
767
768
769                 //*************************************************
770                 /CACKPA
771                 /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
772                 /TERMINAL. IFTHE FLAG IS SET AND THE CONSOLE PACKAGE IS
773                 /ACTIVE A CHECK IS MADE TO DETERMINO IF IT IS A CONTROL CHAR.
774                 /IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
775                 /IF NOT A CONTROL CHARACTER OR A CONTROL E=0=L=0=IT WILL DO
776                 /THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
777                 /A "ON CONTROL CHARACTER WILL BE PRINTEDAND A "2" IT WILL RETURN TO
778                 /CALL PLUS 2.
779                 /IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
780                 /CALL PLUS 1.
781
782
783                 /      CACKPA= JMS    XCACKP
784
785
786                 /EX,   JMS    XCACKPA              /CALL TO CHECK IF CONTROL CHAR SET
787                 /      ANYTHING(SKIP)              /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
788                 /      ANYTHING(JMP EXIT SKIP CHAIN)   /RETURN IF NOT CONTROL OR CONTINUE CONTROL
789
790
791                 /CALLS USED ARE =XCATTYI=XCACNTR=CAGET=
792
793
794    1241  0000   XCACKP, 0
795    1242  3772*          DCA    ACSAVE      /SAVE THE AC
796    1243  6204          GTF                 /SAVE THE FLAGS
797    1244  3771*          DCA    FLSAVE      /SAVE THE FLAGS
798    1245  7501          MQA                 /PUT MQ IN AC
799    1246  3770*          DCA    MQSAVE      /SACE THE MQ
800    1247  6031          KSF                 /CHECK THE KEYBOARD FLAG
801    1250  5261          JMP    CABY3       /EXIT TO CALL PLUS 1
802    1251  4767*          JMS    CHKCLA      /CHECK LOC 22 BIT 3 CONSOLE BIT
803    1252  7410          SKP                 /ACTIVE CONSOLE PACKAGE
804    1253  5261          JMP    CABY3       /EXIT TO CALL PLUS 1
805    1254  4766*          JMS    XCATTYI     /GET THE CHAR
806    1255  4765*          JMS    CAGET       /GET THE FLAGS
807    1256  4764*          JMS    XCACNTR     /CHECK IF CONTROL  CHAR.
808    1257  7000          NOP                 /RETURN IF A CONTINUE CHAR.
809    1260  2241          ISZ    XCACKP      /BUMP RETURN FOR CALL PLUS 2
810    1261  4765*   CABY3, JMS    CAGET       /GET REGISTERS
```

```
811    1262  5641          JMP I  XCACKP      /SAY GOOD BY
812
813                 //*************************************************
814
815                 /CAECHO
816                 /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD.  STORE IT IN LOCATION CHAR
817                 /CHECK IF IT WAS A CONTROL CHARACTER =SET INMODE =PRINT CHARACTER
818
819                 /      CAECHO =      JMS XCAECH
820                 /EX,   JMS    XCAECHO      /LOOK FOR CONSOL CHAR CAPRNT IT
821                 /                           /RETURN CALL PLUS ONE AC = CHAR CATYPED IN
822
823                 /CALLS USED ARE =XCATTYI=XCACNTR=CAGET=XCAECH=XCATYPE
824
825                 /
826    1263  0000   XCAECH, 0000
827    1264  4766*          JMS    XCATTYI     /WAIT FOR CHAR FROM KEYBOARD
828    1265  4765*          JMS    CAGET       /RESTORE THE REGISTERS
829    1266  2276          ISZ    INMODE      /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
830    1267  4764*          JMS    XCACNTR     /GO CHECK IF IT IS A CONTROL CHAR
831    1270  5663          JMP I  XCAECH      /WAS A CONTROL CHAR =CONTINUE RUNNING
832    1271  4277          JMS    XCATYPE     /NOT A CONTROL CHAR CAPRNT IT
833    1272  3276          DCA    INMODE      /CLEAR FLAG THAT CHAR EXPECTED
834    1273  1275          TAD    CACHAR      /GET CHAR IN AC
835    1274  5663          JMP I  XCAECH      /EXIT
836    1275  0000   CACHAR, 0000
837    1276  0000   INMODE, 0
838
839                 /*************************************************
840
841                 /CATYPE
842                 /THIS ROUTINE WILL CAPRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
843                 /
844                 /      CATYPE= JMS XCATYP
845
846                 /EX,   JMS    XCATYPE      /CAPRNT THE CHAR IN THE AC.
847                 /                           /RETURN CALL PLUS ONE AC =0000
848                 /                           /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYCADCT
849
850                 /CALLS USED ARE =CBHANG=XCACNTR=XCAPNT=XCACRLF=XCATNOU=
851
852
853    1277  0000   XCATYP, 0
854    1300  3320          DCA    PNTBUF      /STORE CHAR
855    1301  1321          TAD    TTYLPT      /CHECK 0=TTY 7777=LPT
856    1302  7640          SZA CLA
857    1303  5312          JMP    XDOLPT      /DO OUT PUT ON LPT
858    1304  1320          TAD    PNTBUF
859    1305  6046          TLS
860    1306  6041          TSF
861    1307  5306          JMP    .-1
862    1310  6042          TCF
863    1311  5316          JMP    CABY5
864    1312  1320   XDOLPT, TAD    PNTBUF      /GET CHAR
865    1313  6666          PSTB   PCLF        /CAPRNT IT
```

```
865  1114  4322         JMS    CRHANG        /CHECK KEYBOARD IF HUNG
867  1115  6662         PCLF                 /CLEAR THE FLAG
868  1116  7600  CARYS, 7600                 /CLEAR THE AC
869  1117  5677         JMP I  XCRTYP        /EXIT
870  1120  0000  PNTRUF, 0
871  1121  0000  TTYLPT, 0
872
873
874  1122  0000  CRHANG, 0
875  1123  7200         CLA
876  1124  1316         TAD    CARYS         /
877  1125  3320         DCA    PNTRUF        /GET CONSTANT 7600
878  1126  6661         PSKF                 /PNTRUF IS NOW A COUNTER
879  1127  7410         SKP                  /SKIP ON PRINTER DONE
880  1130  5722         JMP I  CRHANG        /NOT DONE YET
881  1131  2345         ISZ    CACONT        /SAW FLAG DONE
882  1132  5126         JMP    .+6           /FIRST COUNTER FAST ONE
883  1133  2320         ISZ    PNTRUF        /CHECK IF FLAG SET YET
884  1134  5541         JMP    .-3           /4000 4000 COUNTS ON FAST COUNTER
885  1135  1740?        TAD    XC8CNTR       /KEEP IT UP FOR 5 SEC
886  1136  3322         DCA    CBHANG        /GET THE RETURN ADDRESS IN CONTROL
887  1137  3321         DCA    TTYLPT        /SAVE IT IN HANG
888  1140  4765?        JMS    XCRPNT        /ALLOW PRINTING ON TTY
889  1141  1146         MESHANG              /LPT ERROR
890  1142  4223         JMS    XCRCRLF
891  1143  4762?        JMS    XCRINGU       /PRINT WAITING
892  1144  5722         JMP I  CRHANG        /CONTINUE TO SAVE ADDRESS
893  1145  0000  CACONT, 0                   /COUNTER FOR TIMER
894  1146  1422  MESHANG,TEXT   "LPT ERROR"
     1147  2045
     1150  2522
     1151  2217
     1152  2200
895
896  1162  2635
897  1163  0323
898  1164  2022
899  1165  2624
900  1166  0272
901  1167  1200
902  1170  1306
903  1171  1307
904  1172  1305
905  1173  0212
906  1174  0215
907  1175  2260
908  1176  0207
909  1177  7770
     1200         PAGE
910              /*********************************************************************
911              /*********************************************************************
912
913              /THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD,
914              /TO SEE IF THE CONSOLE BIT 3 (400) IS SET IF SET THEN RETURN
915              /TO CALL PLUS TWO FOR A ACTIVE CONSOLE PACKAGE AC=0
```

```
916              /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.
917
918
919  1202  0000  CHKCLA, 0
920  1201  7200         CLA
921  1202  1022         TAD    22            /GET THE COTENTA OF LOCATION 22
922  1203  0377         AND    (400          /MASK FOR BIT 3 (400
923  1204  7650         SNA CLA              /
924  1205  2220         ISZ    CHKCLA        /ACTIVE CONSOLE PACKAGE RETURN
925                                          /CALL PLUS ONE (1) FOR ACTIVE
926  1206  5600         JMP I  CHKCLA        /DEACTIVE CONSOLE PACKAGE RETURN
927                                          /CALL PLUS TWO (2)
928
929              /CBERR
930              /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A CAERR IS ENCOUNTERED
931              /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK CBSWIT REGISTERS.
932              /        CAERR, JMS XCAERR
933              /EX,     JMS    XCBERR        /GO TO CAERR CALL IF NOT CONSOL
934              /                             /RETURN IS CALL PLUS ONE AC =000
935
936              /CALLS USED ARE =CHKCLA=XCRCRLF=XCASW=XCRINGU=XCRPNT=XCBOCTA=
937
938
939  1207  0000  XCAERR, 0
940  1210  6032         IOF
941  1211  3345         DCA    ACSAVE        /SAVE AC
942  1212  6004         GTF
943  1213  3347         DCA    FLSAVE        /SAVE THE FLAGS
944  1214  7501         MQA
945  1215  3346         DCA    MQSAVE        /SAVE THE MQ
946  1216  7440         CLA CLL CMA          /SUBTRACT A 1 FOR TRUE LOCATION
947  1217  1207         TAD    XCAERR        /GET RETURN LOCATION
948  1220  3344         DCA    PCSAVE        /SAVE ADD OF CAERR CALL
949  1221  6211         CDF
950  1222  7347         CLA CLL CMA          /
951  1223  1776         TAD I  (CLASIC)      /GET REAL PC.
952  1224  3316         DCA    REALPC        /SAVE IT.
953  1225  6211         CDF    10
954  1226  4202         JMS    CHKCLA        /CHECK LOC.22 BIT 3 CONSOL BIT
955  1227  7410         SKP                  /ACTIVE CONSOLE PACKAGE
956  1230  5270         JMP    NTCLAS        /NOT CLASSIC SYSTEM
957  1231  4736?        JMS    CRGET         /GET REGISTERS.
958  1232  4770?        JMS    XCASW         /CHECK SWITCH REG FOR BIT THAT INDICATES
959                                          /NO ERROR MESSAGE
960  1233  0373  SETUP3, AND    (3000        /MASK FOR BIT FOR NO ERROR PRINTING
961                                          /IF THIS ERROR MESSAGE IS TO ALWAYS
962                                          /BE PRINTED LEAVE AND VALUE AT 0000
963  1234  7600         SZA CLA              /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
964  1235  5262         JMP    CAOOIO        /DO NOT PRINT
965  1236  4772?        JMS    XCRCRLF
966  1237  4771?        JMS    XCRPNT
967  1240  1327         ERRMES               /PRINT THE ERROR MESSAGE
968  1241  4771?        JMS    XCRPNT
969  1242  1337         MESPC                /PRINT THE PC STATEMENT
970  1243  1316         TAD    REALPC        /GET PC
```

```
971    1244   4770'            JMS     XCBOCTA     /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     XCBOCTA
976    1251   4771'            JMS     XCAPNT
977    1252   1336            MESMQ                /PRINT MQ
978    1253   1346            TAD     MQSAVE
979    1254   4770'            JMS     XCBOCTA
980    1255   4771'            JMS     XCAPNT
981    1256   1341            MESFL                /PRINT FL
982    1257   1347            TAD     FLSAVE
983    1260   4770'            JMS     XCBOCTA
984    1261   4772'            JMS     XCACRLF
985    1262   4775'   CBOOIN, JMS     CBGET        /GET REGISTERS.
986    1263   4774'            JMS     XCBSW        /CHECK SWITCH REGISTER
987    1264   7610            SKP CLA              /SKIP IF BIT 0 SET
988    1265   5320            JMP     CARY2        /LEAVE
989    1266   4767'            JMS     XCBINQ       /GO TO THE INQUIRE ROUTINE
990    1267   5320            JMP     CARY2        /LEAVE
991    1270   4775'   NTCLAS, JMS     CBGET        /GET REGISTERS.
992    1271   4774'            JMS     YCBSW        /CHECK PSEUDO SWITCH REGISTER
993                                                /CHECK THE CBSWIT REGISTER
994    1272   7610            SKP CLA              /SKIP IF HALT
995    1273   5627            JMP I   XCBFPB       /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     CBGET
999    1277   5744            JMP I   PCSAVE       /EXIT  TO CALL AND HALT
1000   1300   4775'   CARY2,  JMS     CBGET        /GET THE REGISTERS
1001   1301   5627            JMP I   XCAEPB
1002                          /
1003                          /
1004   1302   7402    ROUTNS, HLT                  /PUT INSTRUCTION TO EXECUTE HERE.
1005   1303   7200            NOP
1006   1304   3317            DCA     MYAC
1007   1305   6221            CDF     0            /SAVE AC
1008   1306   1022            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   7200    REALPC, 0
1018   1317   0300    MYAC,   0
1019                          /
1020   1320   0410    FRAMES, TEXT    "DMRKRF  FAILED "
       1321   2213
       1322   0206
       1323   4940
       1324   0601
       1325   1114
```

```
       1326   0500
       1327   4002
1321   1330   4740    MESPC,  TEXT    "  PC:"
       1331   2203
       1332   7200
1322   1333   4040    MESAC,  TEXT    "  AC:"
       1334   2123
       1335   7200
1323   1336   4040    MESMQ,  TEXT    "  MQ:"
       1337   1521
       1340   7200
1324   1341   4740    MESFL,  TEXT    "  FL:"
       1342   3614
       1343   7200
1325   1344   7777    PCSAVE, 7777
1326   1345   7777    ACSAVE, 7777
1327   1346   7777    MQSAVE, 7777
1328   1347   7777    FLSAVE, 7777
1329                          /
1330                          /
1331   1365   0320
1332   1366   7402
1333   1367   0635
1334   1370   1000
1335   1371   0303
1336   1372   1223
1337   1373   2720
1338   1374   0262
1339   1375   2524
1340   1376   5122
1341   1377   2402
       2000                    FIELD 2
```

```
0000   00000000   02000000   11101111   11111111   11000000   00000000   00000000   00000000
0102   00000000   00000000   02000000   00000000   00000000   00000000   00000000   00000000

0200   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111
0302   11111111   11111111   11111111   11111111   11111111   10000001   11111111   11111111

0402   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111
0502   11111111   11111111   11111111   11111111   11111111   11111110   11111111   11111111

0602   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111
0722   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111


1002   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111
1102   11111111   11111111   11111111   11111111   11111111   11100002   00111111   11111111

1202   11111111   11111111   11111111   11111111   11111111   11111111   11111111   11111111
1302   11111111   11111111   11111111   11111111   11111111   00000000   00000111   11111111

1402
1502

1602
1702

2002
2102

2202
2302

2402
2502

2602
2702

3002
3102

3202
3302

3402
3502

3602
3702
```

```
4002
4102

4202
4302

4402
4502

4602
4702

5202
5102

5202
5302

5402
5502

5602
5702

6002
6102

6202
6302

6402
6502

6602
6702

7002
7102

7202
7302

7402
7502

7602
7702
```

```
1242                           /
1243                           /NOTE; LOCATION 0 WILL CONTAIN THE REVISION
1244                           /LEVEL(IN ASCII) ON PROGRAM LOAD.
1245                           /
1246                           /
1247                           /ALL KNOWN HALTS
1248                           /
1249    1000   6761    FRHLT1                      /UNDEFINED INTERRUPT
1250    1001   5576    FRHLT2                      /SKIP TRAP FOR DCLR
1251    1002   6173    FRHLT3                      /SKIP TRAP FOR DLAG
1252    1003   4776    FRHLT4                      /SKIP TRAP FOR DRST
1253    1004   5161    FRHLT5                      /SKIP TRAP FOR DRST
1254    1005   6556    FRHLT6                      /SKIP TRAP FOR DLDC
1255    1006   4136    FRHLT7                      /SKIP TRAP FOR DMAN
1256    1007   5304    FRHLT0                      /THE RECOVERABLE ERROR HALT
1257    1010   6417    STPHLT                      /PROGRAM STOP OR HALT FROM SWR001
1258    1011   6625    CHNHLT                      /INT CHANGE HALT
1259    1012   2730    HPHLT1                      /HALT FOR "CHECK WRITE PROTECT"
1260    1013   2776    HPHLT2                      /HALT FOR "CHECK WRITE PROTECT"
1261    1014   5073    APHLT1                      /HALT FOR "CHECK WRITE PROTECT"
1262    1015   4122    ENDHLT                      /END OF TEST HALT FROM SWR001
1263    1016   4021    MEDHLT                      /FROM ALIGNMENT SUBTEST
1264                           /
1265                           /BUFFER LOCATION INFORMATION
1266                           /
1267    1017   7177    WRKBUF                      /START OF PROGRAM DATA BUFFER
1268    1020   7576    ENDBUF                      /END OF PROGRAM DATA BUFFER
1269    1021   7177    HITRK                       /DISK ADDRESS WORD IF BUFFER
1270    1022   7200    LOTRK                       /DISK ADDRESS WORD IN BUFFER
1271    1023   7577    STPCHK                      /BUFFER+1 "BREAK STOP CHECK" "1234"
1272                           /
1273           6741    DSKP=6741                   /SKIP ON TRANSFER DONE OR ERROR
1274           6742    DCLR=6742                   /CLEAR DISK CONTROL LOGIC
1275           6743    DLAG=6743                   /LOAD ADDRESS AND GO
1276           6744    DLCA=6744                   /LOAD CURRENT ADDRESS
1277           6745    DRST=6745                   /READ STATUS REGISTER
1278           6746    DLDC=6746                   /LOAD COMMAND REGISTER
1279           6747    DMAN=6747                   /LOAD MAINTENANCE
1280           7346    NL7775=7346                 /-3 CONSTANT
1281                           /
1282    4006    DSKOUT=JMS I    XDOUT
1283    4007    DSKIN=JMS I     XDIN
1284    4023    RANADD=JMS I    XRNAD
1285    4025    RECAL=JMS I     XRESTR
1286    4024    SEEK=JMS I      XONLY
1287    4026    DISKGO=JMS I    XDISKG
1288    4027    HAFCHK=JMS I    XHFCHK
1289    4032    KILBUF=JMS I    XKLBUF
1290    4031    FILBUF=JMS I    XFLBUF
1291    4030    WAITSZ=JMS I    XWTISZ
1292    4033    SKPWAT=JMS I    XSKWAT
1293    4032    FIGURE=JMS I    XFGURE
1294    4037    NERROR=JMS I    XNERRO
1295    4040    ERROR=JMS I     XERRO
1296    4041    IONWAT=JMS I    XIONWT
```

```
1097    4042    ACCMP1=JMS I    XCOMP1
1098    4043    ACCMP2=JMS I    XCOMP2
1099    4044    RDSTAT=JMS I    XRDST
1100    4045    RDCMD=JMS I     XRDCM
1101    4046    RDADD=JMS I     XRDAD
1102    4052    LDADD=JMS I     XLDAD
1103    4047    DSKSKP=JMS I    XSDKP
1104    4050    LDCMD=JMS I     XLDCM
1105    4051    LDCUR=JMS I     XLDCA
1106    4053    CLRALL=JMS I    XCLOR
1107    4054    RDCRC=JMS I     XRDCR
1108    4055    LDMAN=JMS I     XLDMN
1109    4056    RDBUF=JMS I     XRDBF
1110    4057    PRNTER=JMS I    XPRN
1111    4060    OCTEL=JMS I     XEROCT
1112    4061    TWOCT=JMS I     XTOCT
1113    4036    TYPE=JMS I      XPRINT
1114    4062    CRLF=JMS I      XCRLF
1115    4065    CLASIC=JMS I    XCLAS
1116    4064    LAS=JMS I       XLAS
1117    4530    TICK=JMS I      XTICK
1118                           /
1119    0000    *0
1120                           /
1121    0000    6327            0327            /REVISION "G"
1122    0001    5001            5001
1123    0002    0002            0002
1124    0003    0003            0003
1125                           /
1126    0004    5375    XLAS,   MYLAS
1127    0005    5122    XCLAS,  CLASIK
1128    0006    5553    XDOUT,  DOUT
1129    0007    4530    XDIN,   DIN
1130                           /
1131    0010    *10
1132                           /
1133    0010    0000    AUTOIC, 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    0000    CP1,    0000            /CONTROL WORD 1
1147    0022    0000    CP2,    0               /CONTROL WORD 2
1148                           /
1149    0023    6321    XRNAD,  RNAD
1150    0024    6215    XONLY,  ONLY
1151    0025    6200    XRESTR, RESTOR
```

```
1152   0026   5600   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   4200   XWTIS2, WTIS2
1159   0035   7222   THSFLD, PRSFLD
1160   0036   6151   XPRINT, PRINT
1161   0037   6400   XAERRO, NERRO
1162   0042   5200   XFRRO, FRRO
1163   0041   4727   XIONWT, IONWT
1164   0042   4557   XCOMP1, COMP1
1165   0043   3622   XCOMP2, COMP2
1166   0044   5154   XRDST, RDST
1167   0045   5412   XRDCH, RDCH
1168   0046   4142   XWRAD, RRAD
1169   0047   1122   XSDXP, SDXP
1170   0050   4543   XLDCH, LDCH
1171   0051   4765   XLDCA, LDCA
1172   0052   6164   XLDAD, LDAD
1173   0053   5571   XCLRR, CLRR
1174   0054   6300   XWDCR, RDCR
1175   0055   4131   XLDWN, LDWN
1176   0056   5420   XRDRF, RDRF
1177   0057   6111   XPRN, PRN
1178   0062   6265   XFRDCT, FRDCT
1179   0061   6234   XTOCT, TOCT
1180   0062   6253   XCRLF, UPONF
1181   0063   7222   XLOTRK, LOTRK
1182   0064   7177   XHITRK, HITRK
1183   0065   4520   CYLOSP, 0520
1184   0066   4522   TRK212, 4522
1185   0067   7177   RGNBUF, WRKBUF
1186   0072   2200   DRWHAV, 0
1187   0071   2222   GRVCNT, 0
1188   0072   2200   DRIVNO, 0
1189   0073   0001   K0001, 0001
1190   0074   0002   K0002, 0002
1191   0075   0003   K0003, 0003
1192   0076   0004   K0004, 0004
1193   0077   0005   K0005, 0005
1194   0100   0006   K0006, 0006
1195   0101   0007   K0007, 0007
1196   0102   1234   K1234, 1234
1197   0103   2000   K2000, 2000
1198   0104   3000   K3000, 3000
1199   0105   4000   K4000, 4000
1200   0106   6000   K6000, 6000
1201   0107   7000   K7000, 7000
1202   0110   7760   K7760, 7760
1203   0111   7700   K7700, 7700
1204   0112   0077   K0077, 0077
1205   0113   2525   K2525, 2525
1206   0114   5252   K5252, 5252
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1207   0115   5000   K5000, 5000
1208   0116   7771   K7771, 7771
1209   0117   0017   K0017, 0017
1210   0120   0037   K0037, 0037
1211   0121   6201   KCDF, CDF
1212   0122   7740   K7740, 7740
1213   0123   7400   K7400, 7400
1214   0124   7600   K7600, 7600
1215   0125   1355   YLOAD, LOADCT
1216
1217          /
              DECIMAL
1218          /
1219   0126   7764   M12, -12
1220          /
1221          OCTAL
1222          /
1223   0127   7103   KAERRO, AERRO
1224   0130   7135   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   CDREG1, 0
1238   0145   0000   CDREG2, 0
1239   0146   0000   STREG, 0
1240   0147   0000   DHREG, 0
1241   0150   0000   CMREG, 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   HOMEWA, 0
1248   0157   0000   STCON, 0000
1249   0160   0011   CRWRD1, 0011
1250   0161   6047   CRWRD2, 6047
1251   0162   0000   CATCNT, 0
1252   0163   0000   SAVDAT, 0
1253   0164   0306   K0306, 0306
1254   0165   5373   X5373, 5373
1255   0166   5300   X5300, 5300
1256   0167   6374   K6374, 6374
1257   0170   3242   FNDTRK, 3242
1258   0171   7777   SDFERR, 7777
1259   0172   0000   SAVPCT, 0
1260   0173   0200   RESTRT, 0200
1261   0174   5617   KTIME, 5617
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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   K0201           /JMP I 3 FOR LOC. 2
1280   0216   1364          TAD     K5403
1281   0217   3474          DCA I   K0002
1282   0220   1363          TAD     INTRO           /GET ADDRESS RETURN
1283   0221   3475          DCA I   K0003
1284   0222   7402   PRSFLD, HLT                     /MAKE DF=IF
1285   0223   4773          JMS I   CRPTB           /TEST FOR APT SYSTEM
1286   0224   4462          CRLF
1287   0225   4772          JMS I   CSELDSK         /SETUP DRIVES ON SYSTEM.
1288   0226   1072          TAD     DRVMAV
1289   0227   3071          DCA     DRVCNT          /COUNTER TO AMOUNT OF DRIVES.
1290   0230   4425          CLASIC                  /CHECK FOR CONSOLE PKG
1291   0231   4431          CRSWIT                  /GET SWITCH REGISTER
1292   0232   7200          NOP
1293   0233   1022          TAD     22
1294   0234   0216          AND     K0400
1295   0235   7640          SZA CLA
1296   0236   6307          6307                    /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   1215          TAD     K0200           /ENABLE SET DONE BIT
1309   0243   1072          TAD     DRIVNO          /GET CURRENT DRIVE NUMBER
1310   0244   4450          LDCMD                   /LOAD COMMAND REGISTER
1311   0245   4400          RDSTAT                  /READ STATUS
1312   0246   4402          ACCMP1                  /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
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1317   0253   4404          RDSTAT                  /READ STATUS
1318   0254   7650          SNA CLA                 /SHOULD BE 0000
1319   0255   4437          NERROR                  /O.K. 4096 LOOPS
1320   0256   4400   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   CCOUNT
1330   0262   1075          TAD     K0003           /SET UP APT TIMING
1331   0263   7001          CIA                     /GETS -4
1332   0264   3772          DCA I   CCNT            /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   5270          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   4400   T1E,   ERROR                   /ERROR, DSKP FAILED
1342   0276   0265          TST1                    /SCOPE LOOP POINTER
1343   0277   0306          0306                    /TEXT POINTER
1344                 /
1345                 /INTERRUPT TEST
1346                 /
1347                 /VERIFY THAT INT. OCCURES FROM
1348                 /THE TRANSFER DONE FLAG WHEN DISK
1349                 /DRIVE UNDER TEST IS READY TO SEEK,
1350                 /READ, OR WRITE.
1351                 /
1352   0300   2131          ISZ     REG0            /SET ONE TIME TEST FLAG.
1353   0301   1215   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   7200          CLA CMA                 /SOFTWARE FLAG
1358   0306   4401          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   4401          IONWAT                  /WAIT FOR DISK INTERRUPT
1363   0313   7610          SKP CLA                 /O.K. NO INT.
1364   0314   5323          JMP     T2E             /ERROR, INT.
1365   0315   1215          TAD     K0200           /ENABLE SET DONE BIT
1366   0316   1072          TAD     DRIVNO          /CURRENT DRIVE
1367   0317   4450          LDCMD                   /LOAD COMMAND
1368   0320   7300          CLA CLL CMA             /SOFTWARE FLAG
1369   0321   4401          IONWAT                  /WAIT FOR DISK INTERRUPT
1370   0322   4437          NERROR                  /O.K. 4096 LOOPS
1371   0323   4400   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  1137   TST3,   TAD    K7000
1382  0327  1156          TAD    MOMEMA
1383  0330  1072          TAD    DRIVND       /GET CURRENT DRIVE
1384  0331  4457          LDCMD               /LOAD COMMAND REGISTER
1385  0332  1120          TAD    K0006
1386  0333  3357          DCA    T3T          /SETUP TEXT POINTER
1387  0334  4452          LDADD               /DLAG, LOAD DISK ADDRESS
1388  0335  4433          SKPWAT              /WAIT FOR ERROR SKIP
1389  0336  5355          JMP    T3E          /ERROR, NO SKIP OCCURRED
1390  0337  1166          TAD    K5500
1391  0340  3357          DCA    T3T          /SETUP TEXT POINTER
1392  0341  7327          CLA CLL CML RAR
1393  0342  1013          TAD    K0040
1394  0343  3143          DCA    GDREG2       /SETUP EXPECTED STATUS
1395  0344  4444          RDSTAT              /READ STATUS REGISTER
1396  0345  4442          ACCMP1              /CHECK RESULTS
1397  0346  7617          SKP CLA             /STATUS IS O.K.
1398  0347  5355          JMP    T3E          /ERROR STATUS INCORRECT
1399  0350  4453          CLRALL              /CLEAR STATUS
1400  0351  3143          DCA    GDREG2       /SETUP EXPECTED STATUS
1401  0352  4444          RDSTAT              /READ STATUS
1402  0353  4442          ACCMP1              /CHECK RESULTS
1403  0354  4437          NERROR              /ALL IS O.K.
1404  0355  4440   T3E,   ERROR               /ERROR, TIMING SKIP OR STATUS
1405  0356  2326          TST3                /SCOPE LOOP POINTER
1406  0357  0006   T3T,   0006                /TEXT POINTER
1407  0360  5761          JMP I  .+1
1408  0361  0400          TST4
1409                /
1410  0362  6200   ARMF,   RMF
1411  0363  0703   INTRQ,  INTADD
1412  0364  5403   K5403,  5403
1413                /
1414  0370  7160
1415  0371  7161
1416  0372  4260
1417  0373  7225
1418  0374  5000
1419  0375  2726
1420  0376  6600
1421  0377  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  4425   TST4,   RECAL               /"RECALIBRATE"
1430  0401  0406          T4T                 /TEXT POINTER
1431  0402  5204          JMP    T4E          /ERROR, SKIP OR STATUS
1432  0403  4437          NERROR              /O.K. TO NEXT TEST
1433  0404  4440   T4E,   ERROR               /ERROR, DISK SKIP OR STATUS
1434  0405  2400          TST4                /SCOPE LOOP POINTER
1435  0406  0006   T4T,   0006                /TEXT POINTER
1436  0407  5610          JMP I  .+1
1437  0410  0411          TST5
1438                /
1439                /
1440                /HEAD MOTION AND STATUS TEST
1441                /
1442                /VERIFY THAT "SEEK ONLY" TRACK 312 SETS
1443                /TRANSFER DONE THEN DRIVE IS READY.
1444                /
1445  0411  7301   TST5,   CLA CLL IAC         /EXTENDED
1446  0412  3152          DCA    CMREG        /SETUP EXTENDED BIT
1447  0413  1066          TAD    TRK212       /GET LOWER DISK ADDRESS
1448  0414  4424          SEEK                /SEEK ONLY 312
1449  0415  0422          T5T                 /TEXT POINTER
1450  0416  5220          JMP    T5E          /ERROR, SKIP OR STATUS
1451  0417  4437          NERROR              /O.K. TO NEXT TEST
1452  0420  4440   T5E,   ERROR               /ERROR, DISK SKIP OR STATUS
1453  0421  2411          TST5                /SCOPE LOOP POINTER
1454  0422  0006   T5T,   0006                /TEXT POINTER
1455                /
1456                /
1457                /VERIFY RESTORE CLEARS ADDRESS BITS
1458                /
1459                /SOMETHING IS WORKING, NOW SEEK ONLY TRACK 312
1460                /THEN RECALIBRATE AND CHECK FOR NO ERRORS IN STATUS.
1461                /
1462  0423  7301   TST6,   CLA CLL IAC
1463  0424  3152          DCA    CMREG        /SETUP EXTENDED BIT
1464  0425  1066          TAD    TRK212
1465  0426  4424          SEEK                /SEEK ONLY 312
1466  0427  0437          T6T                 /TEXT POINTER
1467  0430  5235          JMP    T6E          /ERROR, SKIP OR STATUS
1468  0431  4425          RECAL               /"RECALIBRATE"
1469  0432  0437          T6T                 /TEXT POINTER
1470  0433  5235          JMP    T6E          /ERROR, SKIP OR STATUS
1471  0434  4437          NERROR              /O.K. TO NEXT TEST
1472  0435  4440   T6E,   ERROR               /ERROR, STATUS
1473  0436  2423          TST6                /SCOPE LOOP POINTER
1474  0437  5320   T6T,   5320                /TEXT POINTER
1475                /
1476                /
1477                /VERIFY RESTORE CLEARS ADDRESS BITS.
1478                /
1479                /VERIFY A "RECALIBRATE" FROM CYLINDER,
1480                /SURFACE, AND SECTOR 07777.
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1481                          /
1482     0440  3150  TST7,   DCA     CHREG          /CLEAR EXTENDED BIT
1483     0441  7340          CLA CLL CMA
1484     0442  4420          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  4037          NERROR                 /O.K. TO NEXT TEST
1491     0451  4440  T7E,    ERROR                  /ERROR, STATUS
1492     0452  0440          TST7                   /SCOPE LOOP POINTER
1493     0453  5300  T7T,    5300                   /TEXT POINTER
1494                         /
1495                         /FIND AND SELECT ALL ADDRESSES
1496                         /
1497                         /VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
1498                         /INCREMENTAL SEEK TEST, SEEK 0, 1, 2, 3, ETC.
1499                         /CHECK TIMING AND NO ERRORS IN STATUS.
1500                         /
1501     0454  3134  TST8,   DCA     TCNTR1
1502     0455  3135          DCA     TCNTR2
1503     0456  1134  T8R,    TAD     TCNTR1
1504     0457  3150          DCA     CHREG          /SETUP EXTENDED BIT
1505     0460  1135          TAD     TCNTR2         /LOWER DISK ADDRESS BITS
1506     0461  4420          SEEK                   /SEQUENTIAL SEEK ONLY
1507     0462  0501          T8T                    /TEXT POINTER
1508     0463  5277          JMP     T8E            /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
1514     0471  5256          JMP     T8R            /IS EXTENDED BIT SET YET
1515     0472  1135          TAD     TCNTR2         /NO, CONTINUE
1516     0473  1170          TAD     ENDTRK         /YES
1517     0474  7640          SZA CLA
1518     0475  5256          JMP     T8R            /WAS IT LAST TRACK
1519     0476  4037          NERROR                 /NO, CONTINUE
1520     0477  4440  T8E,    ERROR                  /O.K. TO NEXT TEST
1521     0500  0454          TST8                   /ERROR, STATUS
1522     0501  5300  T8T,    5300                   /SCOPE LOOP POINTER
1523                         /                      /TEXT POINTER
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     CHREG          /SETUP EXTENDED BIT
1537     0511  1134          TAD     TCNTR1
1538     0512  4420          SEEK                   /DECREMENTAL SEEK ONLY
1539     0513  0534          T9T                    /TEXT POINTER
1540     0514  5332          JMP     T9E            /ERROR, SKIP OR STATUS
1541     0515  7340          CLA CLL CMA
1542     0516  1134          TAD     TCNTR1
1543     0517  3134          DCA     TCNTR1         /DECREMENT
1544     0520  7301          CLA CLL IAC
1545     0521  1134          TAD     TCNTR1
1546     0522  7640          SZA CLA
1547     0523  5307          JMP     T9R            /FIRST TIME 0 YET
1548     0524  1135          TAD     TCNTR2         /NO, CONTINUE
1549     0525  7650          SNA CLA
1550     0526  5331          JMP     T9OK           /PAST EXTENDED BIT
1551     0527  3135          DCA     TCNTR2         /YES, TEST O.K.
1552     0530  5307          JMP     T9R            /CLEAR EXTENDED BIT
1553     0531  4037  T9OK,   NERROR                 /CONTINUE
1554     0532  4440  T9E,    ERROR                  /O.K. TO NEXT TEST
1555     0533  0502          TST9                   /ERROR, SEEK ONLY
1556     0534  5300  T9T,    5300                   /SCOPE LOOP POINTER
1557                         /                      /TEXT POINTER
1558                         /VERIFY RESTORE CLEARS ADDRESS BITS.
1559                         /
1560                         /VERIFY RECALIBRATE FROM ALL
1561                         /CYLINDERS, CHECK ALL CYLINDERS
1562                         /BETWEEN 00000-14500.
1563                         /
1564     0535  1277          TAD     K0005
1565     0536  7041          CIA
1566     0537  3774          DCA     CNT            /INITIALIZES APT TIMING FOR A LONGER VALUE
1567     0540  3134  TST10,  DCA     TCNTR1
1568     0541  3135          DCA     TCNTR2
1569     0542  1134  T10R,   TAD     TCNTR1         /GET EXTENDED BIT
1570     0543  3150          DCA     CHREG          /SETUP EXTENDED BIT
1571     0544  1135          TAD     TCNTR2         /GET CYLINDER
1572     0545  4420          SEEK                   /SEEK ONLY
1573     0546  2573          T10T                   /TEXT POINTER
1574     0547  5371          JMP     T10E           /ERROR IN SEEK ONLY
1575     0550  4425          RECAL                  /"RECALIBRATE"
1576     0551  2573          T10T                   /TEXT POINTER
1577     0552  5371          JMP     T10E           /ERROR, SKIP OR STATUS
1578     0553  7300          CLA CLL
1579     0554  1135          TAD     TCNTR2         /GET LAST CYLINDER
1580     0555  1273          TAD     K0040          /UPDATE
1581     0556  3135          DCA     TCNTR2
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          TST1R                   /SCOPE LOOP POINTER
1594   0573   5300   T10T,  5300                    /TEXT POINTER
1595                 /
1596   0574   5775          JMP I   .+1             /TO NEXT TEST
1597   0575   0600          TST11
1598                 /
1599   0577   7160
              2600   PAGE
1600                 /
1601                 /SINGLE DRIVE VIBRATION 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   7204          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   3142          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   3152          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   3152          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
```

```
1645                 /DRIVES NOT ON THE CONTROL.
1646                 /
1647   0602   4525          JMS I   XLOAD
1648   0603   7000          7000
1649   0604   3131          DCA    REG0            /SETUP FOR 4096 PASSES
1650   0605   7301   TST12, CLA CLL IAC
1651   0606   4453          CLRALL                 /CLEAR CONTROL
1652   0607   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   6450          LDCMD                  /LOAD COMMAND
1667   0666   4414          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   0605          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
```

```
1700    0722    1015            TAD     K0200           /ENABLE SET DONE
1701    0723    1104            TAD     K3000           /FUNCTION SEEK ONLY
1702    0724    4450            LOCMD                   /LOAD COMMAND
1703    0725    4452            LOADO                   /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     GOREG2          /SETUP COMPARE
1711    0735    4444            RDSTAT                  /READ STATUS
1712    0736    4442            ACCMP1                  /CHECK 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     GOREG2          /SETUP COMPARE
1718    0744    4444            RDSTAT                  /READ STATUS
1719    0745    7600            SZA CLA                 /STATUS SHOULD BE 0000
1720    0746    5353            JMP     T13E            /ERROR, STATUS
1721    0747    2135    T134,   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    4040    T13E,   ERROR                   /ERROR, STATUS
1726    0754    0702            TST13                   /SCOPE LOOP POINTER
1727    0755    5300            5300                    /TEXT POINTER
1728                    /
1729    0756    5757            JMP I   .+1             /TO NEXT TEST
1730    0757    1005    TST14P, TST14-3
1731                    /
1732    0760    2213    NMES1,  TEXT "RK8E DRIVE CONTROL TEST"
        0761    7005
        0762    4004
        0763    2211
        0764    2605
        0765    0003
        0766    1716
        0767    2422
        0770    1714
        0771    4024
        0772    0523
        0773    2400
1733                    /
1734    0776    4370
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 OCCUR
1749                    /
1750    1005    2131            ISZ     REGR            /SETUP FOR ONE PAS
1751    1006    7346            NL7775                  /-3 CONSTANT
1752    1007    3777            DCA     CNT
1753    1010    1266    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         /EXPECTED STATUS
1759    1016    1074            TAD     K0002           /SETUP COMPARE REGISTER
1760    1017    3143            DCA     GOREG2          /SETUP COMPARE REGISTER
1761    1020    7301            CLA CLL IAC             /EXTENDED TRACK BIT
1762    1021    1104            TAD     K3000           /FUNCTION SEEK ONLY
1763    1022    1072            TAD     DRIVNO          /CURRENT DRIVE
1764    1023    4450            LOCMD                   /LOAD COMMAND
1765    1024    1134            TAD     TCNTR1          /LOAD AND GO
1766    1025    4452            LOADO                   /LOAD AND GO
1767    1026    4433            SKPWAT                  /WAIT FOR SKIP
1768    1027    5267            JMP     T14KE           /ERROR, NO SKIP
1769    1030    4444            RDSTAT                  /READ STATUS
1770    1031    4442            ACCMP1                  /CHECK RESULTS
1771    1032    7610            SKP CLA                 /STATUS O.K.
1772    1033    5263            JMP     T14SE           /ERROR, STATUS
1773    1034    7301            CLA CLL IAC             /ENABLE CLEAR CONTROL BIT
1774    1035    4453            CLRALL                  /CLEAR CONTROL
1775    1036    1150            TAD     CMREG           /GET LAST COMMAND
1776    1037    1015            TAD     K0200           /GET ENABLE SEEK DONE BIT
1777    1040    4450            LOCMD                   /LOAD COMMAND
1778    1041    4433            SKPWAT                  /WAIT FOR DISK SKIP
1779    1042    5267            JMP     T14KE           /ERROR, SKIP
1780    1043    7330            CLA CLL CML RAR         /EXPECTED STATUS
1781    1044    3143            DCA     GOREG2
1782    1045    4444            RDSTAT                  /READ STATUS
1783    1046    4442            ACCMP1                  /CHECK RESULTS
1784    1047    7610            SKP CLA                 /STATUS O.K.
1785    1050    5263            JMP     T14SE           /ERROR, STATUS
1786    1051    1072            TAD     DRIVNO          /CURRENT DRIVE
1787    1052    4450            LOCMD                   /LOAD COMMAND
1788    1053    3143            DCA     GOREG2          /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    4040    T14SE,  ERROR                   /ERROR, DISK CAPACITY EXCEEDED
1797    1064    1010            TST14                   /SCOPE LOOP POINTER
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1798   1065   5300            5300                    /MODIFIED TEXT POINTER
1799   1066   5272            JMP      .+4            /TO NEXT TEST
1800   1067   4440   T14KE,   ERROR                   /ERROR, DISK SKIP
1801   1070   1010            TST16                   /SCOPE LOOP POINTER
1802   1071   0006            0006                    /TEXT POINTER
1803
1804                 /STATUS TEST
1805
1806                 /VERIFY THAT SKIP AND STATUS DOES OCCUR
1807                 /AFTER 256 WRITE ALL AND READ ALL BREAKS.
1808                 /THIS SHOULD WRITE ALL ZEROS ON AND
1809                 /READ ALL ZEROS OFF THE DISK SECTOR 00000.
1810                 /
1811   1072   4432            KILBUF                  /ZERO WRITE BUFFER
1812   1073   1115   TST15,   TAD      K5000          /WRITE ALL FUNCTION
1813   1074   3150            DCA      CMREG          /SETUP COMMAND
1814   1075   4026            DISKGO                  /DISK WRITE ALL
1815   1076   1110            T15T                    /TEXT POINTER
1816   1077   5306            JMP      T15E           /ERROR, SKIP OR STATUS
1817   1100   1017            TAD      K1000          /FUNCTION READ ALL
1818   1101   3150            DCA      CMREG          /SETUP COMMAND REGISTER
1819   1102   4026            DISKGO                  /DISK READ ALL
1820   1103   1110            T15T                    /TEXT POINTER
1821   1104   5306            JMP      T15E           /ERROR, SKIP OR STATUS
1822   1105   6437            NERROR                  /O.K. TO NEXT TEST
1823   1106   4440   T15E,    ERROR                   /ERROR, WRITE ALL
1824   1107   1073            TST15                   /SCOPE LOOP POINTER
1825   1110   5300   T15T,    5300                    /MODIFIED TEXT POINTER
1826                 /
1827                 /STATUS TEST
1828                 /
1829                 /VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
1830                 /128 WRITE ALL AND READ ALL BREAKS.
1831                 /THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
1832                 /ALL ZEROS OFF THE DISK SECTOR 00000.
1833                 /
1834   1111   1115   TST16,   TAD      K5000          /FUNCTION WRITE ALL
1835   1112   1014            TAD      K0100          /HALF BIT
1836   1113   3150            DCA      CMREG          /SETUP COMMAND
1837   1114   4026            DISKGO                  /DISK WRITE ALL
1838   1115   1130            T16T                    /TEXT POINTER
1839   1116   5326            JMP      T16E           /ERROR, DISK SKIP OR STATUS
1840   1117   1017            TAD      K1000          /FUNCTION READ ALL
1841   1120   1014            TAD      K0100          /HALF BIT
1842   1121   3150            DCA      CMREG          /SETUP COMMAND
1843   1122   4026            DISKGO                  /DISK READ ALL
1844   1123   1130            T16T                    /TEXT POINTER
1845   1124   5326            JMP      T16E           /ERROR, SKIP OR STATUS
1846   1125   6437            NERROR                  /O.K. TO NEXT TEST
1847   1126   4440   T16E,    ERROR                   /ERROR, WRITE ALL
1848   1127   1111            TST16                   /SCOPE LOOP POINTER
1849   1130   5300   T16T,    5300                    /MODIFIED TEXT POINTER
1850                 /
1851                 /VERIFY ALL SECTORS CAN BE ACCESSED.
1852                 /
```

```
1853                 /VERIFY A WRITE ALL TO ALL OF CYLINDER 0
1854                 /AND USE DATA PATTERN 2525+5252.
1855                 /MAKE THE FIRST TWO WORDS IN THE BUFFER
1856                 /EQUAL THE DISK ADDRESS, CHECK THE DATA WITH
1857                 /READ ALL.
1858                 /
1859   1131   4525            JMS I    XLOAD          /WILL SET UP COUNTERS FOR NEXT TESTS
1860   1132   7771            7771
1861   1133   1122   TST17,   TAD      K7700
1862   1134   3134            DCA      TCNTR1         /SETUP SECTOR COUNTER
1863   1135   1113   T17S,    TAD      K2525
1864   1136   4431            FILBUF                  /FILL OUTBOUND BUFFER
1865   1137   1115            TAD      K5000          /FUNCTION WRITE ALL
1866   1140   3150            DCA      CMREG          /SETUP COMMAND
1867   1141   1134            TAD      TCNTR1
1868   1142   0120            AND      K0037          /MASK OFF SECTORS
1869   1143   3463            DCA I    XLOTRK         /SETUP ADDRESS WORD IN BUFFER
1870   1144   1072            TAD      DRIVNO         /GET DRIVE NUMBER
1871   1145   3464            DCA I    XHITRK         /SETUP ADDRESS WORD IN BUFFER
1872   1146   1463            TAD I    XLOTRK
1873   1147   4026            DISKGO                  /DISK WRITE ALL
1874   1150   1173            T17T                    /TEXT POINTER
1875   1151   5371            JMP      T17E           /ERROR, SKIP OR STATUS
1876   1152   4432            KILBUF                  /KILL DATA BUFFER
1877   1153   1017            TAD      K1000          /FUNCTION READ ALL
1878   1154   3150            DCA      CMREG          /SETUP COMMAND
1879   1155   1134            TAD      TCNTR1
1880   1156   0120            AND      K0037          /MASK OF SECTORS
1881   1157   4026            DISKGO                  /DISK READ ALL
1882   1160   1173            T17T                    /TEXT POINTER
1883   1161   5371            JMP      T17E           /ERROR, STATUS OR SKIP
1884   1162   1113            TAD      K2525
1885   1163   0430            FIGURE                  /WORD BY WORD COMPARE OF DATA
1886   1164   7610            SKP CLA                 /THIS SECTOR O.K.
1887   1165   5371            JMP      T17E           /ERROR, DATA
1888   1166   2134            ISZ      TCNTR1         /UPDATE SECTOR COUNTER
1889   1167   5335            JMP      T17S           /TRY NEXT SECTOR
1890   1170   6437            NERROR                  /O.K. TO NEXT TEST
1891   1171   4440   T17E,    ERROR                   /ERROR, READ ALL
1892   1172   1133            TST17                   /SCOPE LOOP POINTER
1893   1173   5373   T17T,    5373                    /TEXT POINTER
1894                 /
1895   1174   5775            JMP I    .+1            /TO NEXT TEST
1896   1175   1202            TST18
1897                 /
1898   1177   7160            7160
       1200    PAGE
1899                 /
1900                 /VERIFY ALL SECTORS CAN BE ACCESSED.
1901                 /
1902                 /VERIFY A WRITE DATA TO ALL OF CYLINDER 0
1903                 /AND USE DATA PATTERN 5252+2525.
1904                 /MAKE THE FIRST TWO WORDS OF THE BUFFER
1905                 /EQUAL THE DISK ADDRESS, CHECK THE
1906                 /DATA WITH READ DATA.
```

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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 OUTBOUND BUFFER
1914    1206  1105            TAD     K4000                   /FUNCTION WRITE DATA
1915    1207  3150            DCA     CMREG                   /SETUP COMMAND
1916    1210  1134            TAD     TCNTR1
1917    1211  0120            AND     K0037                   /MASK OF SECTORS
1918    1212  3463            DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
1919    1213  1072            TAD     DRIVNO                  /GET DRIVE NUMBER
1920    1214  3464            DCA I   XMITRK                  /SETUP ADDRESS WORD IN BUFFER
1921    1215  1463            TAD I   XLOTRK                  /GET ADDRESS
1922    1216  4426            DISKGO                          /DISK WRITE DATA
1923    1217  1201            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  1201            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   XMITRK                  /MAKE DISK ADDRESS WORD
1956    1246  3463            DCA I   XLOTRK                  /MAKE DISK ADDRESS WORD
1957    1247  1115            TAD     K5000                   /FUNCTION WRITE ALL
1958    1250  1014            TAD     K0100                   /HALF BIT
1959    1251  3150            DCA     CMREG                   /SETUP COMMAND
1960    1252  4426            DISKGO                          /DISK WRITE ALL
1961    1253  1271            T19T                            /TEXT POINTER
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1962    1254  5267            JMP     T19E                    /ERROR, SKIP OR STATUS
1963    1255  4453            CLRALL                          /CLEAR STATUS
1964    1256  4432            KILBUF                          /ZERO BUFFER
1965    1257  1017            TAD     K1000                   /FUNCTION READ ALL
1966    1260  3150            DCA     CMREG                   /SETUP COMMAND
1967    1261  4426            DISKGO                          /DISK READ ALL
1968    1262  1271            T19T                            /TEXT POINTER
1969    1263  5267            JMP     T19E                    /ERROR, SKIP OR STATUS
1970    1264  1113            TAD     K2525
1971    1265  4427            HAFCHK                          /WORD BY WORD COMPARE DATA
1972    1266  4437    T190K,  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   XMITRK                  /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    T200K,  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.
```

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2017                   /
2018   1322  1113  TST21,  TAD    K2525
2019   1323  4431          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  1014          TAD    KHIDR                  /HALF BIT
2025   1331  3150          DCA    CMREG                  /SETUP COMMAND
2026   1332  4426          DISKGO                        /DISK WRITE ALL
2027   1333  1352          T21T                          /TEXT POINTER
2028   1334  5350          JMP    T21E                   /ERROR, SKIP OR STATUS
2029   1335  4453          CLRALL                        /CLEAR STATUS
2030   1336  4432          KILBUF                        /ZERO BUFFER
2031   1337  1017          TAD    K1000                  /FUNCTION READ ALL
2032   1340  1014          TAD    K3130                  /HALF BIT
2033   1341  3150          DCA    CMREG                  /SETUP COMMAND
2034   1342  4426          DISKGO                        /DISK READ ALL
2035   1343  1552          T21T                          /TEXT POINTER
2036   1344  5350          JMP    T21E                   /ERROR, SKIP OR STATUS
2037   1345  1113          TAD    K2525
2038   1346  4427          HAFCMK                        /WORD BY WORD COMPARE DATA
2039   1347  4437  T21DR,  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  1435          TST22
2046                   /
2047                   /
2048                   /WILL LOAD THE PROPER COUNTS FOR TEST 17 & 18
2049                   /
2050   1355  2222  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  2200  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 ^
2068                   /USE DATA PATTERN 2525+5252
2069                   /CHECK FOR NO ERRORS IN STATUS.
2070                   /MAKE FIRST TWO WORDS OF EVERY SECTOR
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2071                   /EQUAL TO ADDRESS OF SECTOR.
2072                   /
2073   1400  1122  TST22,  TAD    K7740
2074   1401  3134          DCA    TCNTR1                 /SETUP SECTOR COUNTER
2075   1402  1113          TAD    K2525
2076   1403  4431          FILBUF                        /FILL BUFFER WITH DATA
2077   1404  1134  T22R1,  TAD    TCNTR1
2078   1405  0120          AND    K0037                  /MASK SECTOR BITS
2079   1406  3463          DCA I  XLOTRK                 /SETUP ADDRESS WORD IN BUFFER
2080   1407  1072          TAD    DRIVNO                 /GET DRIVE NUMBER
2081   1410  3464          DCA I  XHITRK                 /SETUP ADDRESS WORD IN BUFFER
2082   1411  1115          TAD    K5000                  /FUNCTION WRITE ALL
2083   1412  3150          DCA    CMREG                  /SETUP COMMAND
2084   1413  1463          TAD I  XLOTRK                 /GET TRACK AND SECTOR
2085   1414  4426          DISKGO                        /DISK WRITE ALL
2086   1415  1444          T22T                          /TEXT POINTER
2087   1416  5242          JMP    T22E                   /ERROR, STATUS OR SKIP
2088   1417  2134          ISZ    TCNTR1                 /UPDATE SECTOR COUNTER
2089   1420  5204          JMP    T22R1                  /MORE SECTORS TO GO
2090                   /
2091                   /VERIFY THAT THE DATA WRITTEN ABOVE
2092                   /ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL.
2093                   /
2094   1421  1122          TAD    K7740
2095   1422  3134          DCA    TCNTR1                 /COUNTER FOR 37 SECTORS
2096   1423  4432  T22R2,  KILBUF                        /CLEAR DATA BUFFER
2097   1424  1017          TAD    K1000                  /READ ALL FUNCTION
2098   1425  3150          DCA    CMREG                  /SETUP COMMAND
2099   1426  1134          TAD    TCNTR1
2100   1427  0120          AND    K0037
2101   1430  4426          DISKGO                        /DISK READ ALL
2102   1431  1444          T22T                          /TEXT POINTER
2103   1432  5202          JMP    T22E                   /ERROR, STATUS OR SKIP
2104   1433  1113          TAD    K2525                  /WORD BY WORD COMPARE OF DATA
2105   1434  4437          FIGURE
2106   1435  7612          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  1322          TST22                         /SCOPE LOOP POINTER
2113   1444  5573  T22T,   5573                          /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
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2126   1450   4431            FILBUF                     /FILL BUFFER WITH DATA
2127   1451   1134   T23R1,   TAD    TCNTR1
2128   1452   0120            AND    KØØ37               /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    KØ8ØØ               /FUNCTION WRITE DATA
2133   1457   3150            DCA    CMREG               /SETUP COMMAND
2134   1460   1463            TAD I  XLOTRK              /SECTOR TO LOAD
2135   1461   4026            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                   /VERIFY THAT THE DATA WRITTEN ABOVE
2141                   /ON CYLINDER Ø WAS O.K. CHECK WITH READ DATA.
2142                   /
2143
2144   1466   1122            TAD    K774Ø
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    KØØ37
2150   1474   4026            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   TST24,   TAD    K774Ø
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   1072            TAD    DRIVNO              /GET DRIVE NUMBER
2178   1517   3464            DCA I  XHITRK              /SETUP ADDRESS WORD IN BUFFER
2179   1520   7301            CLA CLL IAC                /EXTENDED BIT
2180   1521   1115            TAD    K5ØØØ               /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    KØØ37               /MASK OFF SECTOR BITS
2184   1525   1065            TAD    CYL45Ø              /ADD IN CYLINDER
2185   1526   3463            DCA I  XLOTRK              /SETUP ADDRESS WORD IN BUFFER
2186   1527   1463            TAD I  XLOTRK
2187   1530   4026            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    K1ØØØ               /FUNCTION READ ALL
2193   1536   3150            DCA    CMREG               /SETUP COMMAND
2194   1537   1134            TAD    TCNTR1              /SECTOR COUNTER
2195   1540   0120            AND    KØØ37               /MASK OFF SECTORS
2196   1541   1065            TAD    CYL45Ø
2197   1542   4026            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   DISKØ,   Ø
2215   1562   0000   DISK1,   Ø
2216   1563   0000   DISK2,   Ø
2217   1564   0000   DISK3,   Ø
2218   1565   0000   DISK4,   Ø
2219   1566   0000   DISK5,   Ø
2220   1567   0000   DISK6,   Ø
2221   1570   0000   DISK7,   Ø
2222                   /
2223          1600   PAGE
2224                   /
2225                   /VERIFY ALL SECTORS CAN BE ACCESSED
2226                   /
2227                   /VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
2228                   /AND USE DATA PATTERN 5252+2525.
2229                   /THE FIRST TWO WORDS OF THE SECTOR SHOULD
2230                   /EQUAL THE DISK ADDRESS. CHECK THE DATA
2231                   /WITH READ DATA.
2232                   /
2233   1600   1122   TST25,   TAD    K774Ø
2234   1601   3134            DCA    TCNTR1              /SETUP SECTOR COUNTER
2235   1602   1114   T25S,    TAD    K5252
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2236   1603  4431          FILBUF                    /FILL OUTBOUND BUFFER
2237   1604  7301          CLA CLL IAC
2238   1605  1072          TAD     DRIVNO            /GET DRIVE NUMBER
2239   1606  3464          DCA I   XMITRK            /SETUP ADDRESS WORD IN BUFFER
2240   1607  7301          CLA CLL IAC               /EXTENDED BIT
2241   1610  1105          TAD     K4800             /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  1265          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  1604          T25T                      /TEXT POINTER
2259   1632  5242          JMP     T25E              /ERROR, STATUS OR SKIP
2260   1633  1114          TAD     K5252
2261   1634  4430          FIGURE                    /WORD BY WORD COMPARE OF DATA
2262   1635  7610          SKP CLA                   /THIS SECTOR O.K.
2263   1636  5242          JMP     T25E              /ERROR, DATA
2264   1637  2134          ISZ     TCNTR1            /UPDATE SECTOR COUNTER
2265   1640  5202          JMP     T25S              /TRY NEXT SECTOR
2266   1641  4037          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   TST26, TAD     K7740
2280   1646  3134          DCA     TCNTR1            /SETUP SECTOR COUNTER
2281   1647  1114          TAD     K5252
2282   1650  4431          FILBUF                    /FILL BUFFER WITH DATA
2283   1651  1134   T26R1, TAD     TCNTR1
2284   1652  0127          AND     K0037             /MASK SECTOR BITS
2285   1653  1065          TAD     CYL450
2286   1654  3463          DCA I   XLOTRK            /SETUP ADDRESS WORD IN BUFFER
2287   1655  7301          CLA CLL IAC
2288   1656  1072          TAD     DRIVNO            /GET DRIVE NUMBER
2289   1657  3464          DCA I   XMITRK            /SETUP ADDRESS WORD IN BUFFER
2290   1660  7301          CLA CLL IAC               /EXTENDED BIT
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2291   1661  1115          TAD     K5800             /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  0127          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  4037          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   TST27, 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  0127          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   XMITRK            /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   XLDTRK          /SECTOR TO LOAD
2349   1736 4026              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           /COUNTER FOR 37 SECTORS
2359   1744 3134              DCA     TCNTR1
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 4026              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 4030              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 4037              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     HOMENA
2388   1771 1072              TAD     DRIVNO
2389   1772 3136              DCA     TCNTR3          /SAVE FIELD+DRIVE
2390   1773 4525      TST28,  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 4026              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 6706      T28IDA, DLDC                    /LOAD COMMAND REGISTER
2409   2016 1067              TAD     BGNBUF          /GET BEGINNING OF BUFFER POINTER
2410   2017 6744      T28IDB, DLCA                    /LOAD CURRENT ADDRESS
2411   2020 1134              TAD     TCNTR1
2412   2021 0120              AND     K0037           /MASK SECTOR BITS
2413   2022 6743      T28IDC, DLAG                    /LOAD AND GO
2414   2023 1170              TAD     KTIME
2415   2024 3135              DCA     TCNTR2          /TIME COUNTER
2416   2025 6745      T28IDD, 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     T28IDD          /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 4037              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, APPROX. 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      TST29,  TAD     K7740
2455   2063 3134              DCA     TCNTR1          /SECTOR COUNTER
```

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2056   2064   3150            DCA    CHREG        /SETUP COMMAND
2057   2065   1123            TAD    K0037
2058   2066   4426            DISKGO              /DISK READ DATA
2059   2067   2137            T29T                /TEXT POINTER
2060   2070   5335            JMP    T29E         /ERROR, SKIP OR STATUS
2061   2071   1166            TAD    K5300
2062   2072   3337            DCA    T29T         /MODIFY TEXT POINTER
2063   2073   3143            DCA    GDREG2       /EXPECTED STATUS
2064   2074   1134    T29R,   TAD    TCNTR1
2065   2075   0073            AND    K2001
2066   2076   7112            CLL    RTR          /MAKE READ OR WRITE
2067   2077   1136            TAD    TCNTR3       /GET FIELD+DRIVE
2068   2102   6746    T29IOA, DLDC                /LOAD COMMAND REGISTER
2069   2101   1067            TAD    AGNBUF
2070   2102   6744    T29IOB, DLCA                /LOAD CURRENT ADDRESS
2071   2103   1134            TAD    TCNTR1
2072   2104   0123            AND    K0037        /MASK SECTOR BITS
2073   2105   6743    T29IOC, DLAG                /LOAD AND GO
2074   2106   1170            TAD    KTIME
2075   2107   3135            DCA    TCNTR2       /TIME COUNTER
2076   2110   6745    T29IOD, DRST                /READ STATUS REGISTER
2077   2111   7450            SNA                 /STATUS O.K.?
2478   2112   5326            JMP    T29W         /WAIT FOR CORRECT RESPONSE (0000)
2079   2113   3146            DCA    STREG        /NO, SAVE STATUS FOR PRINTER
2080   2114   1134            TAD    TCNTR1
2081   2115   0073            AND    K2001
2082   2116   7112            CLL    RTR          /MAKE READ OR WRITE
2083   2117   3150            DCA    CHREG        /SAVE FOR ERROR PRINTER
2084   2120   1067            TAD    AGNBUF       /GET START OF BUFFER
2085   2121   3152            DCA    CAREG        /SAVE FOR ERROR PRINTER
2086   2122   1134            TAD    TCNTR1
2087   2123   0123            AND    K0037        /MAKE SECTOR ADDRESS
2088   2124   3151            DCA    DAREG        /SAVE FOR ERROR PRINTER
2089   2125   5335            JMP    T29E         /ERROR, SECTOR RESPONSE NOT FOUND
2090   2126   2135    T29W,   ISZ    TCNTR2       /UPDATE TIME COUNTER
2091   2127   5310            JMP    T29IOD       /WAIT FOR GOOD STATUS
2092   2130   4407            DSKSKP              /ERROR, HAVE TO WAIT FOR FLAG
2093   2131   5331            JMP    .-1          /HANG IF NO SKIP
2094   2132   2134    T29OK,  ISZ    TCNTR1       /UPDATE SECTOR COUNTER
2095   2133   5274            JMP    T29R         /MORE TO TEST
2096   2134   4437            NERROR              /O.K. TO NEXT TEST
2097   2135   4400    T29E,   ERROR               /ERROR, STATUS
2098   2136   2062            TST29               /SCOPE LOOP POINTER
2099   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   1112    TST30,  TAD    K7740
2508   2141   3134            DCA    TCNTR1       /SETUP SECTOR COUNTER
2509   2142   7321    T30R,   CLA CLL IAC
2510   2143   4453            CLRALL              /CLEAR CONTROL
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2511   2144   4452            KILBUF              /CLEAR BUFFER AREA
2512   2145   1115            TAD    K5000        /FUNCTION WRITE ALL
2513   2146   3150            DCA    CHREG        /SETUP COMMAND
2514   2147   1134            TAD    TCNTR1
2515   2150   0117            AND    K0017        /MASK SECTOR BITS
2516   2151   4426            DISKGO              /DISK WRITE ALL
2517   2152   2211            T30T                /TEXT POINTER
2518   2153   5777?           JMP    T30E         /ERROR, STATUS OR SKIP
2519   2154   1217            TAD    K1000        /FUNCTION READ ALL
2520   2155   3150            DCA    CHREG        /SETUP COMMAND
2521   2156   1134            TAD    TCNTR1
2522   2157   0117            AND    K0017        /MASK SECTOR BITS
2523   2160   4426            DISKGO              /DISK READ ALL
2524   2161   2211            T30T                /TEXT POINTER
2525   2162   5777?           JMP    T30E         /ERROR, STATUS OR SKIP
2526   2163   1167            TAD    K6304
2527   2164   3776?           DCA    T30T         /MODIFY TEXT POINTER
2528   2165   7301            CLA CLL IAC          /ENABLE CLEAR CONTROL
2529   2166   4453            CLRALL              /AND CLEAR BRK ENABLE FLOP
2530   2167   3142            DCA    GDREG1       /STORE IN COMPARE RREGISTER
2531   2170   3143            DCA    GDREG2       /STORE IN COMPARE REGISTER
2532   2171   5772            JMP I  .+1
2533   2172   2200            T30D
2534   2176   2211
2535   2177   2207
       2200           PAGE
2536   2200   4454    T30D,   RDCRC               /READ CRC REGISTER
2537   2201   4445            ACCMP2              /CHECK RESULTS
2538   2202   7612            SKP CLA             /O.K.
2539   2203   5207            JMP    T30F         /ERROR, CRC
2540   2204   2134            ISZ    TCNTR1       /UPDATE SECTOR COUNTER
2541   2205   5777?           JMP    T30R         /MORE SECTORS TO TEST
2542   2206   4437            NERROR              /O.K. TO NEXT TEST
2543   2207   4400    T30F,   ERROR               /ERROR, CRC
2544   2210   2107            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 116407 FOR DATA 2525-5252.
2554                  /
2555   2212   1112    TST31,  TAD    K7760
2556   2213   3134            DCA    TCNTR1       /SETUP SECTOR COUNTER
2557   2214   7321    T31R,   CLA CLL IAC
2558   2215   4453            CLRALL              /CLEAR CONTROL
2559   2216   1113            TAD    K2525
2560   2217   4451            FILBUF              /FILL DATA BUFFER
2561   2220   1115            TAD    K5000        /FUNCTION WRITE ALL
2562   2221   3150            DCA    CHREG        /SETUP COMMAND
2563   2222   1134            TAD    TCNTR1
2564   2223   0117            AND    K0017        /MASK SECTOR BITS
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2565   2224  1110            TAD     K7760                           /DISK WRITE ALL
2566   2225  4426            DISKGO                                  /TEXT POINTER
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     K63P4                           /MODIFY TEXT POINTER
2578   2241  3261            DCA     T31T                            /ENABLE CLEAR CONTROL AND
2579   2242  7301            CLA CLL IAC                             /CLEAR BRK ENABLE FLOP.
2580   2243  4453            CLRALL                                  /GET GOOD CRC
2581   2244  1160            TAD     CRWRD1                          /GET GOOD CRC
2582   2245  3142            DCA     GDREG1                          /STORE IN COMPARE AREGISTER
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     T31P                            /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 T&0 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 T&0 WORDS OF EVERY SECTOR
2604                 /EQUAL TO ADDRESS OF SECTOR.
2605                 /
2606                 /FIRST WRITE CYLINDER 1450
2607                 /
2608   2262  1122   TST32,   TAD     K7740                           /SETUP SECTOR COUNTER
2609   2263  3134            DCA     TCNTR1
2610   2264  1114            TAD     K5252                           /FILL BUFFER WITH DATA
2611   2265  4431            FILBUF
2612   2266  7301            CLA CLL IAC                             /GET DRIVE NUMBER
2613   2267  1272            TAD     DRIVNO                          /SETUP ADDRESS WORD IN BUFFER
2614   2270  3464            DCA I   XHITRK
2615   2271  1134   T32R1,   TAD     TCNTR1                          /MASK SECTOR BITS
2616   2272  0120            AND     K0037                           /LOWER CYLINDER
2617   2273  1065            TAD     CYL450                          /SETUP WORD IN BUFFER
2618   2274  3463            DCA I   XLOTRK
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                           /SETUP SECTOR COUNTER
2632   2307  3134            DCA     TCNTR1
2633   2310  1113            TAD     K2525                           /FILL BUFFER WITH DATA
2634   2311  4431            FILBUF
2635   2312  1134   T32R2,   TAD     TCNTR1                          /MASK SECTOR BITS
2636   2313  0120            AND     K0037                           /SETUP ADDRESS WORD IN BUFFER
2637   2314  3463            DCA I   XLOTRK                          /GET DRIVE NUMBER
2638   2315  1272            TAD     DRIVNO                          /SETUP ADDRESS WORD IN BUFFER
2639   2316  3464            DCA I   XHITRK                          /FUNCTION WRITE ALL
2640   2317  1115            TAD     K5000                           /SETUP COMMAND
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                           /COUNTER FOR 37 SECTORS
2653   2330  3134            DCA     TCNTR1                          /CLEAR DATA BUFFER
2654   2331  4432   T32R3,   KILBUF
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  4032   T32R4, KILBUF                          /CLEAR DATA BUFFER
2677   2354  1017          TAD     K1000                   /READ ALL FUNCTION
2678   2355  3150          DCA     CMREG                   /SETUP COMMAND
2679   2356  1134          TAD     TCNTR1
2680   2357  0120          AND     K0037
2681   2360  4426          DISKGO                          /DISK READ ALL
2682   2361  2374          T32T                            /TEXT POINTER
2683   2362  5372          JMP     T32E                    /ERROR, STATUS OR SKIP
2684   2363  1113          TAD     K2525
2685   2364  4430          FIGURE                          /WORD BY WORD COMPARE OF DATA
2686   2365  7610          SKP CLA                         /DATA O.K.
2687   2366  5372          JMP     T32E                    /ERROR, DATA
2688   2367  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
2689   2370  5353          JMP     T32R4                   /MORE SECTORS TO CHECK
2690   2371  4437          NERROR                          /O.K. TO NEXT TEST
2691   2372  4040   T32E,  ERROR                           /ERROR, WRITE ALL
2692   2373  2262          TST37                           /SCOPE LOOP POINTER
2693   2374  5373   T32T,  5373                            /TEXT POINTER
2694                /
2695   2375  5776          JMP I   .+1                     /TO NEXT TEST
2696   2376  2400          TST33
2697                /
2698   2377  2142          PAGE
       2400
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  1110          TAD     K5252
2715   2403  4431          FILBUF                          /FILL BUFFER WITH DATA
2716   2404  7300   T33R1, CLA CLL
2717   2405  1134          TAD     TCNTR1
2718   2406  0120          AND     K0037                   /MASK OFF SECTOR BITS
2719   2407  3463          DCA I   XLOTRK                  /SETUP ADDRESS WORD IN BUFFER
2720   2410  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2721   2411  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2722   2412  1105          TAD     K4000                   /FUNCTION WRITE DATA
2723   2413  3150          DCA     CMREG                   /SETUP COMMAND
2724   2414  1463          TAD I   XLOTRK                  /SECTOR TO LOAD
2725   2415  4426          DISKGO                          /DISK WRITE DATA
2726   2416  2511          T33T                            /TEXT POINTER
2727   2417  5307          JMP     T33E                    /ERROR, STATUS OR SKIP
2728   2420  2134          ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
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2729   2421  5204          JMP     T33R1                   /MORE SECTORS TO GO
2730                /
2731                /WRITE DATA TO ALL OF CYLINDER 1450
2732                /
2733   2422  1122          TAD     K7740
2734   2423  3134          DCA     TCNTR1                  /SETUP SECTOR COUNTER
2735   2424  1113          TAD     K2525
2736   2425  4431          FILBUF                          /FILL BUFFER WITH DATA
2737   2426  7301          CLA CLL IAC
2738   2427  1072          TAD     DRIVNO                  /GET DRIVE NUMBER
2739   2430  3464          DCA I   XHITRK                  /SETUP ADDRESS WORD IN BUFFER
2740   2431  1134   T33R2, TAD     TCNTR1
2741   2432  0120          AND     K0037                   /MASK OFF SECTOR BITS
2742   2433  1045          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  2130          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  4032   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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2780    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
2 93    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    2555            TXT                     /TEXT POINTER
2811    2520    5346            JMP     T54E            /ERROR,SKIP OR STATUS
2812    2521    7301            CLA CLL IAC
2813    2522    1156            TAD     HOMEMA
2814    2523    1072            TAD     DRIVNO
2815    2524    1125            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
```

```
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     MOMEMA              /CURRENT FIELD
2900    2633    1115            TAD     K5000               /FUNCTION WRITE ALL
2901    2634    3152            DCA     CMREG               /SETUP COMMAND
2902    2635    1767            TAD     BGNBUF              /GET START OF BUFFER
2903    2636    3152            DCA     CAREG               /FOR ERROR PRINTER
2904    2637    0530    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    IOT441, 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    0437    T36N,   NERROR                      /O.K. TO NEXT TEST
2938    2701    0440            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    0004            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               /SETUP PASS COUNTER
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            CRERR
2970    2734    7402    MPMLT1, MLT                         /HALT AND WAIT FOR OPERATOR
2971                                                        /IF ON CLASSIC CONSOLE PACKAGE
2972                                                        /HIT CONTROL E. IF NOT THEN
2973                                                        /PRESS KEY CONTINUE.
2974                    /
2975    2735    4432    MPR1,   KILBUF                      /CLEAR OUTBOUND BUFFER
2976    2736    1072            TAD     DRIVNO
2977    2737    3464            DCA I   XHITRK              /SETUP ADDRESS WORD IN BUFFER
2978    2740    1115            TAD     K5000               /WRITE ALL FUNCTION
2979    2741    3150            DCA     CMREG               /SETUP COMMAND REGISTER
2980    2742    4426            DISKGO                      /WRITE ALL TO SECTOR 0
2981    2743    2773            TMPROT                      /TEXT POINTER
2982    2744    7200            NOP
2983    2745    7326            CLA CLL CML RTL
2984    2746    1012            TAD     K0020               /MAKE EXPECTED STATUS
2985    2747    3143            DCA     GOREG2              /SETUP COMPARE REGISTER
2986    2750    1166            TAD     K5300
2987    2751    3373            DCA     TMPROT              /SETUP TEXT POINTER
2988    2752    1106            TAD     STREG               /GET STATUS READ
2989    2753    4442            ACCMP1                      /CHECK RESULTS
2990    2754    7612            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    4037            NERROR                      /ALL O.K., GO LOOP 64 TIMES
3003    2771    4440    MPERR,  ERROR                       /ERROR, WRITE PROTECT
```

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3004   2772  2735           MPR1
3005   2773  0000    TMPROT, 0000                              /TEXT POINTER
3006   2774  4085            CLASIC
3007   2775  4036            CAERR
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  5386            JMP      MANPRO                   /REPEAT
3014         3800    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  3158            DCA      CMREG                    /SETUP COMMAND
3036   3007  1211            TAD      .+2                      /GET TEXT POINTER
3037   3010  7010            SKP
3038   3011  3102    T377    DCA      SAVPCT                   /TEXT POINTER
3039   3012  3172            DCA      SAVPCT                   /SAVE FOR CRC ERROR
3040   3013  1067            TAD      BGNBUF                   /GET START OF BUFFER
3041   3014  3152            DCA      CAREG                    /SAVE FOR ERROR PRINTER
3042   3015  4530    T37R,   TICK                              /APT TIMING
3043   3016  7340            CLA CLL CMA
3044   3017  3171            DCA      SOFERR                   /SETUP CRC ERROR POINTER
3045   3020  4032            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  1153            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      K0800                    /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      GDREG2                   /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      T377                     /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                    /SETUP TEXT POINTER
3076   3057  3302            DCA      T377
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  2158            ISZ      CMREG                    /SET EXTENDED BIT
3084   3067  1158            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  7600            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            LOCUR                   /LOAD CURRENT
3123     3120    1150            TAD     CMREG           /LAST COMMAND ISSUED
3124     3121    4450            LOCMD                   /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     ENOTRK          /ADD IN FUDGE FACTOR
3142     3143    7600            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    1145            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    T38OE,  ERROR                   /ERROR, READ DATA
3155     3160    3105            TST38                   /SCOPE LOOP POINTER
3156     3161    5300    T38T,   5300                    /TEXT POINTER
3157                            /
3158                            /
3159                            /BIG ADDRESSING CHECK!
3160                            /IF A DATA ERROR SHOULD HAPPEN TO OCCUR
3161                            /WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
3162                            /SHOULD REALIZE THAT THE PROBLEM COULD BE
3163                            /ADDRESSING.
3164                            /
3165                            /CHECK DISK HEADER WORD WITH READ DATA
3166                            /IF STATUS ERROR OCCURRES THEN CHECK DATA.
3167                            /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3168                            /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
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3169                            /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3170                            /
3171     3162    4525            JMS I   XLOAD
3172     3163    7776            7776
3173     3164    7340    TST39,  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            LOCUR                   /LOAD CURRENT
3183     3176    1150            TAD     CMREG           /LAST COMMAND
3184     3177    4450            LOCMD                   /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    5220            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     ENOTRK          /ADD IN FUDGE FACTOR
3202     3221    7600            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    1145            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    T39OE,  ERROR                   /ERROR, READ DATA
3215     3236    3164            TST39                   /SCOPE LOOP POINTER
3216     3237    5300    T39T,   5300                    /TEXT POINTER
3217                            /
3218                            /DO A RANDOM READ DATA
3219                            /THE DATA ON THE COMPLETE DISK SHOULD BE 2525+5252.
3220                            /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
3221                            /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
3222                            /
3223     3240    1107    TST40,  TAD     K7000
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3224   3241   3140           DCA     TCNTR5           /LENGTH OF TIME FOR THIS TEST
3225   3242   4023   TA8R,   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   TA8S,   TAD     TCNTR4
3230   3247   3150           DCA     CMREG            /SETUP COMMAND
3231   3250   1136           TAD     TCNTR3
3232   3251   4426           DISKGO                   /DISK READ DATA
3233   3252   3265           TA8T                     /TEXT POINTER
3234   3253   5263           JMP     TA8E             /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     TA8E             /DATA ERROR
3239   3260   2140           ISZ     TCNTR5
3240   3261   5242           JMP     TA8R             /LOOP
3241   3262   4437           NERROR                   /O.K. TO NEXT TEST
3242   3263   4400   TA8E,   ERROR                    /ERROR, READ
3243   3264   3200           TST40                    /SCOPE LOOP POINTER
3244   3265   0000   TA8T,   0000                     /TEXT POINTER
3245                 /
3246                 /RANDOM SEEK THEN WRITE THEN SEEK THEN READ TEST
3247                 /THE DATA WRITTEN IS 2525+5252  AND THE TWO
3248                 /FIRST WORDS OF THE SECTOR ARE SET TO THE DISK ADDRESS.
3249                 /
3250   3266   4525           JMS I   XLOAD
3251   3267   3777           3777
3252   3270   1111   TST41,  TAD     K7700
3253   3271   3140           DCA     TCNTR5           /PASS COUNTER
3254   3272   4023   T41R,   RANADD                   /GENERATE RANDOM NUMBER
3255   3273   0117           AND     K0017
3256   3274   1113           TAD     K7760
3257   3275   3141           DCA     TCNTR6           /SAVE COUNTER
3258   3276   4023           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   4023           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   3460           DCA I   XHITRK           /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   0424           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   0424           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   4400   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   4023   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    7464            DCA I   XHITRK          /DISK ADDRESS WORD IN BUFFER
3334    3413    1134            TAD     TCNTR1          /LOWER DISK ADDRESS
3335    3414    7465            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    3152            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    1301    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    T43P2,  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          /SETUP COMMAND
3383    3466    3150            DCA     CMREG
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     T43P2
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          /MORE TO TEST
3401    3510    5254            JMP     T43R1
3402    3511    4437            NERROR                  /O.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   KLOAD
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     MOMEMA          /CURRENT FIELD
3421    3525    3152            DCA     CMREG           /SETUP COMMAND
3422    3526    4530    T44R,   TICK
3423    3527    1067            TAD     RGNBUF          /START OF BUFFER
3424    3530    4451            LDCUR                   /LOAD CURRENT ADDRESS
3425    3531    1150            TAD     CMREG           /LAST COMMAND ISSUED
3426    3532    4450            LDCMD                   /LOAD COMMAND
3427    3533    1134            TAD     TCNTR1          /LOWER ADDRESS
3428    3534    4452            LDAOD                   /LOAD AND GO
3429    3535    4407            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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3403    3553   1170            TAD     ENDTRK          /ADD IN FUDGE FACTOR
3404    3554   7640            SZA CLA                 /DONE WITH DISK
3405    3555   5326            JMP     T44R            /NO, MORE TO GO
3406    3556   5367            JMP     T440K           /ALL O.K.
3407    3557   1113    T44E,   TAD     K2525
3408    3560   4430            FIGURE                  /WORD BY WORD COMPARE OF DATA
3449    3561   5366            JMP     .+3             /ERROR, JUST STATUS
3450    3562   1165            TAD     K5373           /TEXT POINTER
3451    3563   7410            SKP                     /ERROR
3452    3564   1166            TAD     K53PP           /STATUS ERROR POINTER
3453    3565   3372            DCA     T44T            /SETUP
3454    3566   7610            SKP CLA
3455    3567   4037    T440K,  NERROR                  /O.K. TO NEXT TEST
3456    3570   4440            ERROR                   /ERROR, READ DATA
3457    3571   3517            TST40                   /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   1102            TAD     GDREG1
3470    3603   0117            AND     K0017
3471    3604   7001            CIA
3472    3605   1104            TAD     CRREG1
3473    3606   7640            SZA CLA
3474    3607   5214            JMP     CRERR           /NOT THE SAME
3475    3610   1105            TAD     CRREG2
3476    3611   7001            CIA
3477    3612   1103            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 00000-00100-00400 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   0525            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     TCNTR0          /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     TCNTR0          /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     K0000           /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   3747            T45T                    /TEXT POINTER
3538    3672   5305            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     TCNTR0          /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     TCNTR0          /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   T45A3,  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   T45A4,  TAD     TCNTR3          /GET DISK ADDRESS
3565   3724  7104           CLL RAL                 /PUT EXTENDED BIT IN LINK
3566   3725  0110           AND     K7740
3567   3726  3145           DCA     CRREG2          /SAVE RESULTS
3568   3727  7630           SZL CLA                 /SET EXTENDED BIT
3569   3730  7001           IAC                     /YES
3570   3731  3150           DCA     CMREG           /SETUP COMMAND FOR READ DATA
3571   3732  1141           TAD     TCNTR6          /GET SECTOR POINTER
3572   3733  0117           AND     K0017           /MASK
3573   3734  1145           TAD     CRREG2          /ADD IN TRACK
3574   3735  0426           DISKGO                  /READ DATA
3575   3736  3767           T45T                    /TEXT POINTER
3576   3737  5365           JMP     T45E            /ERROR, READ SKIP OR STATUS
3577   3740  1144           TAD     CRREG1          /GET FIRST TIME POINTER
3578   3741  7650           SNA CLA                 /FIRST TIME????
3579   3742  1113           TAD     K2525           /NO
3580   3743  1113           TAD     K2525
3581   3744  4430           FIGURE                  /CHECK DATA READ
3582   3745  7610           SKP CLA                 /DATA ALL O.K.
3583   3746  5365           JMP     T45F            /ERROR, DATA
3584   3747  1141           TAD     TCNTR6
3585   3750  1277           TAD     K0005           /UPDATE SECTOR POINTER
3586   3751  3141           DCA     TCNTR6
3587   3752  2135           ISZ     TCNTR2          /UPDATE SECTOR COUNTER
3588   3753  5323           JMP     T45A4           /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     T45A3           /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  4400   T45F,   ERROR           /ERROR, TRACKS AFFECTED
3599   3766  7622   T45T,   TST45           /SCOPE LOOP POINTER
3600   3767  0000   T45T,   0000            /MODIFIED TEXT POINTER
3601
3602   3770  5771           JMP I   .+1             /TO END OF TEST
3603   3771  4042           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  3340           DCA     9040
3615   4004  3531           DCA     LOMN
3616   4005  2531           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  0431           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  0431           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  1100           TAD     K3000           /GET SEEK FUNCTION
3648   4032  0450           LOCMD           /LOAD COMMAND REGISTER
3649   4033  1135           TAD     TCNTR2
3650   4034  0110           AND     K7760           /MASK OFF CYLINDER+SURFACE
3651   4035  0452           LOADD           /GO SEEK ONLY
3652   4036  0447           DSKSKP          /SKIP ON DONE
3653   4037  5236           JMP     .-1
3654   4040  0453           CLRALL          /CLEAR STATUS
3655   4041  0404           RDSTAT          /READ STATUS
3656   4042  7640           SZA CLA         /DRIVE DONE?
3657   4043  5240           JMP     .-3             /NO, WAIT
3658   4044  1134           TAD     TCNTR1          /GET FIRST ADDRESS
3659   4045  0101           AND     K0007           /MASK DRIVE+EXT. BIT
3660   4046  1100           TAD     K3000           /GET SEEK FUNCTION
3661   4047  0450           LOCMD           /LOAD COMMAND REGISTER
3662   4050  1134           TAD     TCNTR1
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3663    ØØ51  Ø11Ø              AND      K7768          /MASK OFF CYLINDER AND SURFACE
3664    ØØ52  Ø452              LDADD                   /LOAD AND GO SEEK
3665    ØØ53  44Ø7              DSKSKP                  /WAIT FOR DONE
3666    ØØ54  5253              JMP      .-1
3667    ØØ55  4453              CLRALL                  /CLEAR STATUS
3668    ØØ56  444Ø              RDSTAT                  /READ STATUS
3669    ØØ57  764Ø              SZA CLA                 /DRIVE DONE?
3670    ØØ6Ø  5255              JMP      .-3            /NO, WAIT
3671    ØØ61  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    ØØ62  4777     ENDTST, JMS I    (GETDRV        /GET NEXT DRIVE.
3680    ØØ63  2Ø71              ISZ      DRVCNT         /UPDATE NO. OF DRIVES COUNTER.
3681    ØØ64  5323              JMP      NEXDSK         /TEST NEXT DRIVE.
3682    ØØ65  137Ø              TAD      DRVMAV
3683    ØØ66  3Ø71              DCA      DRVCNT         /SETUP NO. OF DRIVES COUNTER.
3684    ØØ67  4763     TSTSEK, JMS I    XLAP           /PERFORM OVERLAP SEEKS
3685    ØØ7Ø  476Ø              JMS I    XOVRRD         /OVERLAP SEEKS+WRITES+READS
3686    ØØ71  3776'             DCA      DCNT?          /START OVER AT Ø.
3687    ØØ72  4777              JMS I    (GETDRV        /SELECT FIRST DRIVE.
3688    ØØ73  44Ø5     SAMDSK, CLASIC                  /CHECK FOR CLASSIC ACTIVE
3689    ØØ74  442Ø              CRPASS                  /PASS COMPLETE
3690    ØØ75  761Ø              SKP CLA
3691    ØØ76  53Ø2              JMP      .+4
3692    ØØ77  1Ø22              TAD      22
3693    Ø1ØØ  Ø1Ø5              AND      KØØØR          /SEE IF ON APT
3694    Ø1Ø1  765Ø              SNA CLA                 /APT??
3695    Ø1Ø2  53Ø7              JMP      .+5            /NO
3696    Ø1Ø3  3775              DCA I    (CLKCNT        /CLEAR APT TIMING COUNTER
3697    Ø1Ø4  734Ø              CLL CLA CMA
3698    Ø1Ø5  3175              DCA      KCNT
3699    Ø1Ø6  5323              JMP      NEXDSK         /LOOP PROGRAM
37ØØ    Ø1Ø7  4462              CRLF
37Ø1    Ø11Ø  4457              PRNTER                  /PRINT PASS COMPLETE
37Ø2    Ø111  Ø76Ø              NMES1
37Ø3    Ø112  4457              PRNTER
37Ø4    Ø113  7315              TEXEND
37Ø5    Ø114  4474              LAS
37Ø6    Ø115  ØØ76              AND      KØØØØ
37Ø7    Ø116  765Ø              SNA CLA                 /SWITCH 9 SET?
37Ø8    Ø117  5323              JMP      .+4
37Ø9    Ø12Ø  44Ø5              CLASIC
371Ø    Ø121  Ø437              CØINØU
3711    Ø122  74Ø2     ENDHLT, HLT                      /YES, STOP PROGRAM
3712    Ø123  73Ø1     NEXDSK, CLA CLL IAC
3713    Ø124  4453              CLRALL                  /ØCLR
3714    Ø125  3131              DCA      REGØ
3715    Ø126  3132              DCA      REG1
3716    Ø127  573Ø              JMP I    .+1            /LOOP ON PROGRAM
3717    Ø13Ø  Ø24Ø              TSTØ
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3718                   /
3719                   /SUBROUTINE TO ISSUE "DMAN" MAINTENANCE IOT
3720                   /
3721    Ø131  ØØØØ     LDMN,   Ø
3722    Ø132  67Ø7     IOTT,   DMAN                    /"DMAN" MAINTENANCE IOT
3723    Ø133  5731              JMP I    LDMN           /EXIT
3724    Ø134  44Ø5              CLASIC
3725    Ø135  Ø436              C8ERR
3726    Ø136  74Ø2     ERHLT?, HLT                      /SKIP TRAP ERROR
3727    Ø137  5334              JMP      .-3
3728                   /
3729                   /SUBROUTINE TO SHIFT, THEN READ DISK ADDRESS
3730                   /INTO DATA BUFFER. 12 SHIFTS
3731                   /
3732    Ø14Ø  ØØØØ     RDAD,   Ø
3733    Ø141  73ØØ              CLA CLL
3734    Ø142  1126              TAD      M12
3735    Ø143  3133              DCA      SBCNT1
3736    Ø144  733Ø              CLA CLL CML RAR         /SET MAIN(1) ENABLE BIT
3737    Ø145  4455              LDMAN                   /LOAD MAINTENANCE
3738    Ø146  7Ø1Ø              RAR
3739    Ø147  4455              LDMAN                   /LOAD MAINTENANCE
3740    Ø15Ø  73ØØ              CLA CLL
3741    Ø151  1Ø15              TAD      KØ2ØØ          /SHIFT TRACK ADDRESS BIT
3742    Ø152  4455              LDMAN                   /LOAD MAINTENANCE IOT
3743    Ø153  2133              ISZ      SBCNT1
3744    Ø154  5352              JMP      .-2            /SHIFT 12 BITS
3745    Ø155  73ØØ              CLA CLL
3746    Ø156  1Ø12              TAD      KØØ2Ø
3747    Ø157  4455              LDMAN                   /READ DATA BUFFER
3748    Ø16Ø  3151              DCA      DAREG          /SAVE RESULTS
3749    Ø161  1151              TAD      DAREG
3750    Ø162  574Ø              JMP I    RDAD           /EXIT
3751                   /
3752    Ø163  42ØØ     XLAP,   OVRLAP
3753    Ø164  44ØØ     XOVRRD, OVRRED
3754                   /
3755    Ø165  Ø411     NMES3,  TEXT "DISK"
        Ø166  2313
        Ø167  ØØØØ
3756                   /
3757    Ø175  7162
3758    Ø176  Ø371
3759    Ø177  Ø345
        Ø2ØØ     PAGE
3760                   /
3761                   /
3762                   /ROUTINE TO DO OVERLAP SEEKS ON EXISTING DRIVES
3763                   /AFTER ALL HAVE RUN THE COMPLETE DIAGNOSTIC
3764                   /
3765    Ø2ØØ  ØØØØ     OVRLAP, Ø
3766    Ø2Ø1  11Ø5              TAD      K4ØØØ
3767    Ø2Ø2  314Ø              DCA      TCNTRS         /PASS COUNTER
3768    Ø2Ø3  1Ø7Ø     OVRR1,  TAD      DRVMAV
3769    Ø2Ø4  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   1272           TAD     DRIVNO         /GET DRIVE NO.
3773   4210   7110           CLL RAR
3774   4211   4423           RANADD                 /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   1270           TAD     DRVHAV         /NO. OF DRIVES.
3781   4220   3137           DCA     TCNTR4         /SETUP COUNTER
3782   4221   4777   OVRR3,   JMS I   (GETDRV        /GET NEXT DRIVES.
3783   4222   1272           TAD     DRIVNO         /GET SELECTED DRIVE.
3784   4223   7110           CLL RAR
3785   4224   4407           DSKIN                  /CHECK FOR DRIVE DONE
3786   4225   5232           JMP     NOTDON         /DRIVE NOT DONE
3787   4226   5253           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   2142           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   1270           TAD     DRVHAV         /NO. OF DRIVES ON SYSTEM.
3798   4241   3137           DCA     TCNTR4
3799   4242   4777   ALLBAK,  JMS I   (GETDRV        /GET NEXT DRIVE.
3800   4243   1072           TAD     DRIVNO         /GET SELECTED DRIVE.
3801   4244   7110           CLL RAR
3802   4245   4407           DSKIN                  /CHECK FOR DRIVE DONE
3803   4246   5242           JMP     ALLBAK         /WAIT FOR THIS DRIVE
3804   4247   7610           SKP CLA                /WAIT FOR NEXT
3805   4250   5254           JMP     OVRERR         /DRIVE ERRORS
3806   4251   2137           ISZ     TCNTR4         /LAST DRIVE HOME YET
3807   4252   5242           JMP     ALLBAK         /WAIT FOR ALL
3808   4253   4437           NERROR                 /O.K. TO NEXT
3809   4254   4440   OVRERP,  ERROR                  /ERROR, OVERLAP SEEKS
3810   4255   4201           OVRLAP+1               /SCOPE LOOP POINTER
3811   4256   5300           5300                   /TEXT POINTER
3812   4257   5600           JMP I   OVRLAP         /TO NEXT TEST
3813                  /
3814                  /ROUTINE TO GET DRIVES FROM OPERATOR.
3815                  /
3816   4260   0000   SELDSK,  0
3817   4261   4462           CRLF
3818   4262   4457           PRNTER                 /PRINT MESSAGE "RK8-E DRIVE"
3819   4263   2760           NMES1                  /MESSAGE POINTER
3820   4264   4462           CRLF
3821   4265   4457           PRNTER                 /PRINT MESSAGE "TEST"
3822   4266   6560           NMES2                  /MESSAGE POINTER
3823   4267   3370           DCA     DCNT1
3824   4270   3070           DCA     DRVHAV         /COUNTER FOR NO. OF DRIVES.
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3825   4271   1776*          TAD     M4
3826   4272   3371           DCA     DCNT2          /NO. OF POSSIBLE DRIVES.
3827   4273   4462           CRLF
3828   4274   4457   NXTDSK,  PRNTER
3829   4275   4165           NMES3
3830   4276   1370           TAD     DCNT1
3831   4277   1370           TAD     DSKON          /COMPUTE WAY TO DISK BUFFER.
3832   4300   3372           DCA     DCNT3          /SAVE POINTER.
3833   4301   1370           TAD     DCNT1          /GET DRIVE NO.
3834   4302   1364           TAD     K0260
3835   4303   4436           TYPE                   /TYPE DRIVE NO.
3836   4304   1366           TAD     K0277
3837   4305   4436           TYPE                   /TYPE ?.
3838   4306   6031           KSF                    /SKIP ON KEY.
3839   4307   5306           JMP     .-1
3840   4310   6036           KRB                    /GET INPUT.
3841   4311   0367           AND     K0177
3842   4312   1215           TAD     K0200
3843   4313   3373           DCA     DCNT4          /SAVE INPUT.
3844   4314   1373           TAD     DCNT4
3845   4315   4436           TYPE                   /ECHO INPUT.
3846   4316   1373           TAD     DCNT4
3847   4317   7041           CIA
3848   4320   1365           TAD     K0331
3849   4321   7100           CLL
3850   4322   7650           SNA CLA                /Y OR N.
3851   4323   7360           CLA CLL CMA CML        /Y.
3852   4324   3772           DCA I   DCNT3          /SAVE ON FLAG.
3853   4325   7630           SZL CLA                /WAS DRIVE SELECTED.
3854   4326   2070           ISZ     DRVHAV         /YES.
3855   4327   1775*          TAD     K0240          /SPACE
3856   4330   4436           TYPE
3857   4331   2370           ISZ     DCNT1
3858   4332   2371           ISZ     DCNT2
3859   4333   5274           JMP     NXTDSK
3860   4334   1070           TAD     DRVHAV
3861   4335   7650           SNA CLA                /ANY SELECTED.
3862   4336   5261           JMP     SELDSK+1       /TRIED TO FOOL ME.
3863   4337   1070           TAD     DRVHAV
3864   4340   7041           CIA
3865   4341   3070           DCA     DRVHAV         /SET COUNTER FOR NO. OF DRIVES.
3866   4342   3371           DCA     DCNT2          /START WITH DRIVE 0.
3867   4343   4305           JMS     GETDRV         /GET FIRST DRIVE.
3868   4344   5660           JMP I   SELDSK         /EXIT.
3869                  /
3870                  /ROUTINE TO SELECT DRIVES ON SYSTEM.
3871                  /
3872   4345   0000   GETDRV,  0
3873   4346   1371           TAD     DCNT2
3874   4347   0075           AND     K0003
3875   4350   1374           TAD     DSKON          /WAY TO BUFFER.
3876   4351   3370           DCA     DCNT1          /SAVE POINTER FOR WAY TO BUFFER.
3877   4352   1371           TAD     DCNT2
3878   4353   0075           AND     K0003
3879   4354   7104           CLL RAL
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3880    4355  3072            DCA     DRIVNO          /SETUP DRIVE NO.
3881    4356  2371            ISZ     DCNT2           /UPDATE TO NEXT DRIVE,
3882    4357  7000            NOP
3883    4360  1770            TAD I   DCNT1           /GET BUFFER FLAG.
3884    4361  7640            SZA CLA                 /DISK ON SYSTEM?
3885    4362  5745            JMP I   GETDRV          /YES, USE DRIVNO,
3886    4363  5346            JMP     GETDRV+1        /SELECT NEXT.
3887                  /
3888    4364  0260    K0260,  0260
3889    4365  0331    K0331,  0331
3890    4366  0277    K0277,  0277
3891    4367  0177    K0177,  0177
3892    4370  0000    DCNT1,  0
3893    4371  0000    DCNT2,  0
3894    4372  0000    DCNT3,  0
3895    4373  0000    DCNT4,  0
3896    4374  1561    DSKON,  DISK0
3897                  /
3898    4375  6064
3899    4376  6110
3900    4377  4345
        4400            PAGE
3901                  /
3902            /ROUTINE TO PERFORM RANDOM OVERLAP SEEKS, WRITES AND,
3903            /READS ON ALL EXISTING DRIVES AFTER THEY HAVE RUN THE
3904            /COMPLETE DIAGNOSTIC.
3905                  /
3906    4400  0200    OVRRED, 0
3907    4401  7330            CLA CLL CML RAR
3908    4402  3140            DCA     TCNTR5          /PASS COUNTER
3909    4403  1070    OVRRO1, 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    OVRRO2, 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     OVRRO2          /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    OVRRO3, 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     OVRRO3          /NO, DO REST
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3934    4434  5217            JMP     OVRRO3-2        /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  1526            TAD     DSKADD          /GET POINTER
3942    4444  1076            TAD     K0000           /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   XWITRK          /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   XWITRK          /GET EXTENDED BIT
3952    4456  1105            TAD     K4000           /ADD IN WRITE FUNCTION
3953    4457  3150            DCA     CHREG           /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     CHREG           /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            DVRRED+1                     /SCOPE LOOP POINTER
3990   4524  5300   TOVROT, 5300                          /TEXT POINTER
3991   4525  5600           JMP I   DVRRED                /TO NEXT TEST
3992                 /
3995   4526  0000   DSKADD, 0
3994   4527  6366   DSKPOT, DSK06
3995                 /
3996                 /ROUTINE TO CHECK DRIVE IN AC
3997                 /
3998   4530  0000   DTN,    0
3999   4531  7104           CLL RAL                       /MAKE DRIVE NO.
4000   4532  4450           LDCNO                         /FIRST SELECT DRIVE
4001   4533  1150           TAD     CNREG
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  4047           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   DTN                   /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
```

```
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           CBSWIT                        /ROUTINE TO EXECUTE.
4055   4602  7000           NOP
4056   4603  6404           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  0170           AND     K0006                 /MASK DISK DRIVE
4066   4615  3072           DCA     DRIVNO                /ACTUAL DRIVE
4067   4616  4405           CLASIC                        /CHECK FOR CLASSIC.
4068   4617  4436           CRERR                         /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 CLASIC
4074   4622  4431           CBSWIT                        /ROUTINE TO EXECUTE.
4075   4623  7000           NOP
4076   4624  6404           LAS
4077   4625  3135           DCA     TCNTR2                /SAVE DISK ADDRESS
4078   4626  4405           CLASIC                        /CHECK FOR CLASIC.
4079   4627  4436           CAERR                         /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 CLASIC
4085   4632  4431           CBSWIT                        /ROUTINE TO EXECUTE.
4086   4633  7000           NOP
4087   4634  6404           LAS
4088   4635  3136           DCA     TCNTR3                /SAVE IT
4089   4636  4405           CLASIC                        /CHECK FOR CLASIC.
4090   4637  4436           CBERR                         /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   THANS,  CLA CLL
```

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4098   0644  1134              TAD    TCNTR1           /GET FUNCTION
4099   0645  0107              AND    K7000            /MASK
4100   0646  1106              TAD    K6000
4101   0647  7630              SZL CLA                 /WAS IT A READ
4102   0650  7340              CLA CLL CMA             /NO, SET A FLAG
4103   0651  3137              DCA    TCNTR6           /READ FLAG
4104   0652  1134              TAD    TCNTR1           /GET FUNCTION
4105   0653  0107              AND    K7000            /MASK
4106   0654  1115              TAD    K5000            /WAS IT A SEEK
4107   0655  7640              SZA CLA                 /NOT A SEEK
4108   0656  5266              JMP    NTSEK            /YES
4109   0657  1134              TAD    TCNTR1           /SETUP COMMAND
4110   0660  3150              DCA    CMREG            /DISK ADDRESS
4111   0661  1135              TAD    TCNTR2           /SEEK ONLY
4112   0662  4024              SEEK
4113   0663  4724              TMANT                   /TEXT POINTER
4114   0664  5322              JMP    TMANE            /ERROR, SKIP OR STATUS
4115   0665  5321              JMP    TMANOK           /TO HANDLER
4116   0666  1134  NTSEK, TAD    TCNTR1           /GET FUNCTION
4117   0667  0101              AND    K0007            /MASK
4118   0670  3464              DCA I  XHITRK           /SETUP ADDRESS WORD IN BUFFER
4119   0671  1134              TAD    TCNTR1           /FUNCTION
4120   0672  3150              DCA    CMREG            /SETUP COMMAND
4121   0673  1135              TAD    TCNTR2           /DISK ADDRESS
4122   0674  3463              DCA I  XLOTRK           /SETUP ADDRESS WORD IN BUFFER
4123   0675  1137              TAD    TCNTR6           /GET READ FLAG
4124   0676  7650              SNA CLA                 /WAS IT A READ
4125   0677  4432              KILBUF                  /YES, CLEAR BUFFER
4126   0700  1135              TAD    TCNTR2           /GET DISK ADDRESS
4127   0701  4026              DISKGO                  /DISK GO
4128   0702  4724              TMANT                   /TEXT POINTER
4129   0703  5322              JMP    TMANE            /ERROR
4130   0704  1137              TAD    TCNTR6           /GET READ FLAG
4131   0705  7640              SZA CLA                 /WAS IT A READ
4132   0706  5321              JMP    TMANOK           /WAS A WRITE, TO HANDLER
4133   0707  1150              TAD    CMREG            /GET LAST COMMAND
4134   0710  0010              AND    K0100            /MASK OUT HALF BIT
4135   0711  7650              SNA CLA                 /WAS IT HALF BLOCK TRANSFERS
4136   0712  5317              JMP    .+5              /NO, COMPARE WHOLE BLOCK
4137   0713  1136              TAD    TCNTR5           /GET GOOD WORD POINTER
4138   0714  4427              HAFCHK                  /CHECK FOR HALF BLOCK
4139   0715  5321              JMP    TMANOK           /O.K. NO ERRORS
4140   0716  5322              JMP    TMANE            /DATA ERROR
4141   0717  1136              TAD    TCNTR5           /WAS A READ
4142   0720  4430              FIGURE                  /WORD BY WORD COMPARE OF DATA
4143   0721  4437  TMANOK, NERROR          /NO ERRORS
4144   0722  4443  TMANE, ERROR           /ERROR IN FUNCTION SELECTED
4145   0723  4643  TMANS           /SCOPE LOOP POINTER
4146   0724  5373  TMANT, 5373            /TEXT POINTER
4147         /
4148   0725  5243              JMP    TMANS            / LOOP
4149         /
4150   4726  7707  K7707, 7707
4151         /
4152               /SUBROUTINE TO WAIT FOR INTERRUPTS
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4153               /IF INTERRUPT OCCURES GO BACK+1
4154         /
4155   0727  0000  IONWT, 0
4156   0730  7450              SNA                      /FAST OR SLOW
4157   0731  1122              TAD    K7740            /GET SLOW CONSTANT
4158   0732  3360              DCA    ICNTR2           /SETUP COUNTER
4159   0733  3363              DCA    ICNTR1           /SETUP COUNTER
4160   0734  6001              ION                      /TURN IT ON
4161   0735  2363              ISZ    ICNTR1
4162   0736  5335              JMP    .-1
4163   0737  2360              ISZ    ICNTR2
4164   0740  5335              JMP    .-3
4165   0741  6002              IOF                      /TURN IT OFF
4166   0742  5727              JMP I  IONWT            /NO INT OCCURED
4167   0743  1222  INTADD, TAD    22
4168   0744  0016              AND    K0000
4169   0745  7640              SZA CLA                  /ON CLASSICT
4170   0746  6031              KSF
4171   0747  5353              JMP    .+4              /NO FLAG OR CLASSIC,
4172   0750  6032              KCC
4173   0751  6001              ION
4174   0752  5400              JMP I  0                /RETURN TO LOOP,
4175   0753  2327              ISZ    IONWT            /UPDATE GOT AN INTERRUPT RETURN,
4176   0754  4447              DSKSKP                   /CHECK DISK FLAG.
4177   0755  7610              SKP CLA                  /WASN'T SO ERROR.
4178   0756  5727              JMP I  IONWT            /EXIT AND INDICATE AN INTERRUPT,
4179   0757  4405              CLASIC
4180   0760  4436              CAERR
4181   0761  7402  ERHLT1, HLT                      /ERROR, ILLEGAL INTERRUPT
4182   0762  5357              JMP    .-3
4183         /
4184   0763  0000  ICNTR1, 0
4185   0764  0000  ICNTR2, 0
4186         /
4187               /SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
4188         /
4189   0765  0000  LDCA, 0
4190   0766  3153              DCA    ADREG            /SAVE IN ADDRESS
4191   0767  1153              TAD    ADREG
4192   0770  3152              DCA    CAREG            /SETUP INITIAL CURRENT ADDRESS
4193   0771  1153              TAD    ADREG
4194   0772  6744  IOT4, DLCA                     /LOAD CURRENT ADDRESS IOT
4195   0773  5765              JMP I  LDCA
4196   0774  4405              CLASIC
4197   0775  4436              CAERR
4198   0776  7402  ERHLT4, HLT                      /SKIP TRAP ERROR,
4199   0777  5376              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,
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4208    5001    4431            CASWIT                      /ROUTINE TO EXECUTE.
4209    5002    7200            NOP
4210    5003    4420            LAS                         /GET THE SWITCHES
4211    5004    7120            CLL RAL
4212    5005    0100            AND     K0006               /MASK DRIVE NUMBER
4213    5006    3272            DCA     DRIVNO              /SAVE DRIVE NUMBER
4214    5007    7344            CLA CLL CMA RAL
4215    5010    3132            DCA     REG1                /SETUP REPEAT POINTER
4216    5011    3131            DCA     REG0
4217    5012    1113            TAD     K2525               /DATA PATTERN TO WRITE
4218    5013    4431            FILBUF                      /FILL OUTBOUND BUFFER
4219    5014    1272            TAD     DRIVNO
4220    5015    3464            DCA I   XMITRK              /SETUP ADDRESS WORD IN BUFFER
4221    5016    3463            DCA I   KLOTRK              /SETUP ADDRESS WORD IN BUFFER
4222    5017    1115            TAD     K5000               /WRITE ALL FUNCTION
4223    5020    3152            DCA     CMREG               /SETUP COMMAND
4224    5021    4426            DISKGO                      /WRITE ALL TO SECTOR 0
4225    5022    5272            TAPROT                      /TEXT POINTER
4226    5023    5266            JMP     APERR               /ERROR, STATUS
4227    5024    1103    APR1,   TAD     K2000               /FUNCTION WRITE PROTECT
4228    5025    1272            TAD     DRIVNO              /CURRENT DRIVE
4229    5026    4450            LOCMD                       /LOAD COMMADN REGISTER
4230    5027    4452            LGADO                       /LOAD AND GO
4231    5030    4444            RDSTAT                      /READ STATUS REGISTER
4232    5031    7640            SZA CLA                     /SHOULD BE 0000 ????
4233    5032    5245            JMP     APA1                /ERROR, STATUS
4234    5033    4432            KILBUF                      /CLEAR OUTBOUND BUFFER
4235    5034    1272            TAD     DRIVNO
4236    5035    3464            DCA I   XMITRK              /SETUP ADDRESS WORD IN BUFFER
4237    5036    1115            TAD     K5000               /WRITE ALL FUNCTION
4238    5037    3152            DCA     CMREG               /SETUP COMMAND REGISTER
4239    5040    4426            DISKGO                      /WRITE ALL TO SECTOR 0
4240    5041    5272            TAPROT                      /TEXT POINTER
4241    5042    7200            NOP
4242    5043    7326            CLA CLL CML RTL
4243    5044    1312            TAD     K0020               /MAKE EXPECTED STATUS
4244    5045    3143    APA1,   DCA     GDREG2              /SETUP COMPARE REGISTER
4245    5046    1166            TAD     K5300
4246    5047    3270            DCA     TAPROT              /SETUP TEXT POINTER
4247    5050    1146            TAD     STREG               /GET STATUS READ
4248    5051    4442            ACCMP1                      /CHECK RESULTS
4249    5052    7610            SKP CLA                     /STATUS O.K.
4250    5053    5266            JMP     APERR               /ERROR, WRITE PROTECT
4251    5054    7301            CLA CLL IAC                 /ENABLE CLEAR CONTROL
4252    5055    4453            CLRALL                      /CLEAR CONTROL
4253    5056    1217            TAD     K1000               /FUNCTION READ ALL
4254    5057    3150            DCA     CMREG               /SETUP COMMAND
4255    5060    4426            DISKGO                      /READ ALL SECTOR 0
4256    5061    5070            TAPROT                      /TEXT POINTER
4257    5062    5266            JMP     APERR               /EPROR
4258    5063    1113            TAD     K2525               /EXPECTED PATTERN
4259    5064    4430            FIGURE                      /CHECK DATA READ
4260    5065    4437            NERROR                      /ALL O.K, DO ONE MORE TIME
4261    5066    4442    APERR,  ERROR                       /ERROR, WRITE PROTECT
4262    5067    5024            APR1
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4263    5070    0000    TAPROT, 0000                        /TEXT POINTER
4264    5071    4435            CLASIC
4265    5072    4436            CRERR
4266    5073    7402    APHLTI, HLT                         /SUCCESSFUL WRITE PROTECT, TO
4267                                                        /REPEAT; IF ON CLASSIC CONSOLE
4268                                                        /PACKAGE HIT CONTROL E, IF NOT
4269                                                        /PRESS KEY CONTINUE.
4270    5074    5200            JMP     AUTPRO
4271            /
4272            /ROUTINE TO GET SWITCHES
4273            /
4274    5075    0000    MYLAS,  0
4275    5076    4405            CLASIC                       /CHECK IF CLASSIC
4276    5077    4425            CRCKSW                       /GET SWITCHES
4277    5100    7604            7604                         /NOT CLASSIC, GET SWITCHES
4278    5101    5675            JMP   I MYLAS
4279            /
4280            /THIS ROUTINE WILL BE A SKIP INSTRUCTION WITHOUT
4281            /CLASSIC, OTHERWISE IT WILL EXECUTE NEXT INSTRUCTION
4282            /IN FIELD 0 AND THEN SKIP THE INSTRUCTION AFTER THAT ONE.
4283            /
4284    5102    0000    CLASIK, 0
4285    5103    3332            DCA     SAVAC               /SAVE CURRENT AC
4286    5104    1702            TAD I   CLASIK
4287    5105    3333            DCA     ROUTMP              /SAVE THE CLASSIC ROUTINE
4288    5106    2302            ISZ     CLASIK
4289    5107    1722            TAD     OP2
4290    5110    0377            AND     (400
4291    5111    7640            SZA CLA
4292    5112    5315            JMP     .+3
4293    5113    1332            TAD     SAVAC               /NO RETURN TO PROGRAM
4294    5114    5702            JMP I   CLASIK
4295    5115    2302            ISZ     CLASIK
4296    5116    6211            CDF     10                  /CHANGE TO FIELD 1
4297    5117    1023            TAD     SWR
4298    5120    3776            DCA I   (SWR)               /MOVE POINTERS TO FIELD 1
4299    5121    1021            TAD     OP1
4300    5122    3775            DCA I   (OP1)
4301    5123    1022            TAD     OP2
4302    5124    3774            DCA I   (OP2)
4303    5125    1333            TAD     ROUTMP
4304    5126    3773            DCA I   (ROUINS)            /SAVE ROUTINE IN FIELD 1
4305    5127    1332            TAD     SAVAC
4306    5130    6212            CIF     10
4307    5131    5773            JMP I   (ROUINS)            /GO TO FIELD 1
4308            /
4309    5132    0702    SAVAC,  0
4310    5133    0000    ROUTMP, 0000
4311            /
4312            /ROUTINE TO WAIT FOR DISK SKIPS
4313            /
4314    5134    0000    SKWAT,  0
4315    5135    7300            CLA CLL
4316    5136    4530            TICK                        /TIMING FOR APT
4317    5137    1122            TAD     K7700               /GET TIME CONSTANT
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4318    5100    3275            DCA     NYLAS
4319    5101    3302            DCA     CLASIK
4320    5102    6447            DSKSKP                          /DSKP "DISK SKIP IOT"
4321    5103    7410            SKP CLA                         /NO SKIP OCCURRED YET
4322    5104    5357            JMP     .+6                     /GOT THE SKIP
4323    5105    2302            ISZ     CLASIK
4324    5106    5342            JMP     .-4
4325    5107    2275            ISZ     NYLAS
4326    5110    5342            JMP     .-6
4327    5111    7610            SKP CLA                         /NO SKIP OCCURRED
4328    5112    2330            ISZ     SKWAT
4329    5113    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    4025            CLASIC
4337    5160    0436            CAERR
4338    5161    7402    ERHLTS, HLT                             /SKIP TRAP ERROR
4339    5162    5357            JMP     .-3
4340    5163    3106            DCA     STREG                   /SAVE RESULTS
4341    5164    1106            TAD     STREG
4342    5165    5754            JMP I   RDST                    /EXIT
4342    5173    1302            
4344    5174    0022            
4345    5175    0021            
4346    5176    0020            
4347    5177    2400            
        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 ART
4354    5202    1600            TAD I   ERRO                    /GET RESTART ADDRESS
4355    5203    3173            DCA     RESTRT                  /STORE
4356    5204    6404            LAS                             /GET SWITCH 0
4357    5205    7700            SMA CLA                         /IS IT SCOPE LOOP
4358    5206    5217            JMP     ERRA1                   /NO, CONTINUE
4359    5207    6404            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    0436            TYPE
4365    5215    1600            TAD I   ERRO
4366    5216    5757            JMP I   ESCOPE                  /CHECK FOR BELL
4367    5217    1600    ERRA1,  TAD I   ERRO
4368    5220    3360            DCA     RETRN2                  /STORE FOR RETURN
4369    5221    2200            ISZ     ERRO
4370    5222    7301            CLA CLL IAC
4371    5223    1200            TAD     ERRO                    /NEXT TEST POINTER
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4372    5224    3361            DCA     INHIRT                  /STORE FOR SPECIAL RETURN
4373    5225    0462            CRLF
4374    5226    0462            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    0457            PRNTER                          /MODIFIED HEADER POINTER
4382    5236    7402            HLT
4383    5237    0462            CRLF
4384    5240    0457            PRNTER                          /PRINT PC:
4385    5241    5750            TEXPC
4386    5242    7300            CLA CLL CMA
4387    5243    1200            TAD     ERRO                    /GET PC POINTER
4388    5244    0460            OCTEL                           /PRINT PC STORED
4389    5245    1600            TAD I   ERRO                    /GET TEXT POINTER
4390    5246    7104            CLL RAL
4391    5247    7420            SNL
4392    5250    5264            JMP     NTGO                    /NOT GO: REGISTER
4393
4394
4395    5251    3200            DCA     ERRO
4396    5252    0457            PRNTER                          /PRINT GO:
4397    5253    5752            TEXGO
4398    5254    1200            TAD     ERRO
4399    5255    7700            SMA CLA                         /WAS IT A 6 BIT OCTAL BYTE
4400    5256    5261            JMP     .+3                     /NO
4401    5257    1142            TAD     GOREG1                  /GET DATA
4402    5260    0461            TWOCT                           /PRINT TWO OCTAL
4403    5261    1143            TAD     GOREG2
4404    5262    0460            OCTEL                           /PRINT FOUR OCTAL
4405    5263    7610            SKP CLA
4406    5264    3200    NTGO,   DCA     ERRO
4407    5265    1200            TAD     ERRO                    /GET TEXT POINTER
4408    5266    7104            CLL RAL
4409    5267    7420            SNL
4410    5270    5301            JMP     NTCRC
4411    5271    3200            DCA     ERRO
4412    5272    0457            PRNTER                          /PRINT CR:
4413    5273    5750            TEXCR
4414    5274    1144            TAD     CRREG1
4415    5275    0461            TWOCT                           /PRINT
4416    5276    1145            TAD     CRREG2
4417    5277    0460            OCTEL                           /PRINT FOUR OCTAL
4418    5300    7610            SKP CLA
4419    5301    3200    NTCRC,  DCA     ERRO
4420    5302    1363            TAD     XTEXT
4421    5303    3366            DCA     PCNTR2
4422    5304    1364            TAD     XREG
4423    5305    3010            DCA     AUTO10
4424    5306    1116            TAD     K7771
4425    5307    3365            DCA     PCNTR1                  /COUNTER FOR   # OF HEADS
4426    5310    1200    STRAUT, TAD     ERRO                    /GET TEXT POINTER
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4427   5311   7500            SMA
4428   5312   5350            JMP     NOTEX                       /NOT THIS ONE
4429   5313   7184            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            PENTER                              /STORE FOR PRNTER
4436   5322   7402            HLT                                 /PRINT XX:
4437   5323   1410            TAD I   AUTO1C                      /MODIFIED TEXT POINTER
4438   5324   4460            OCTFL                               /PRINT FOUR OCTAL
4439   5325   2365   AGAIN,   ISZ     PCNTR1
4440   5326   5317            JMP     STRAUT                      /CHECK FOR NEXT XX:
4441   5327   4474            LAS                                 /GET SWITCH S
4442   5330   7224            RTL                                 /SHIFT FOR TESTING
4443   5331   2216            AND     KP000                       /MASK
4444   5332   7652            SNA CLA                             /WAS IT INHIBIT HALT
4445   5333   5342            JMP     CHKFRR                      /NO HALT
4446   5334   7632            SZL CLA                             /SAME OR NEXT TEST
4447   5335   5300            JMP     .+3                         /SAME TEST
4448   5336   1361            TAD     INHIRT                      /GET RETURN
4449   5337   5757            JMP I   ESCOPE                      /CHECK FOR BELL
4450   5340   1360            TAD     RETRN2                      /GET RETURN
4451   5341   5757            JMP I   ESCOPE                      /CHECK FOR BELL
4452   5342   4405   CHKFRR,  CLASTC
4453   5343   4436            CAFRR
4454   5344   7402   FRHLTS,  HLT                                 /ALL RECOVERABLE ERROR HALTS
4455   5345   4762            JMS I   XGTREG                      /CHECK FOR GET ALL REGISTERS
4456   5346   5760            JMP I   RETRN2                      /NO, TRY SAME TEST AGAIN
4457   5347   5264            JMP     NTGO                        /DUMP
4458   5350   7134   NOTEX,   CLL RAL
4459   5351   3200            DCA     ERRO
4460   5352   2366            ISZ     PCNTR2
4461   5353   2366            ISZ     PCNTR2
4462   5354   2810            ISZ     AUTO10
4463   5355   5325            JMP     AGAIN
4464                  /
4465   5356   0207   KP207,   0207
4466   5357   5470   ESCOPE,  SCOPE
4467   5360   0000   RETRN2,  0
4468   5361   0000   INHIRT,  0
4469   5362   5527   XGTREG,  GTREG
4470   5363   5756   YTEXT,   TEXST
4471   5364   0145   XREG,    CRREG2
4472   5365   0000   PCNTR1,  0
4473   5366   0000   PCNTR2,  0
4474   5367   1370   HEDTAD,  TAD     HEDLST
4475   5370   6671   HEDLST,  ERTX1
4476   5371   6700            ERTX2
4477   5372   6720            ERTX3
4478   5373   6736            ERTX4
4479   5374   6746            ERTX5
4480   5375   6760            ERTX6
4481   5376   6772            ERTX7
```

```
4482   5377   7002            ERTXA
4483                  /
4484                  /
4485          5400   PAGE
4486                  /
4487                  /SUBROUTINE TO READ DATA BUFFER TO AC
4488                  /
4489   5400   0000   RDBF,    0
4490   5401   7330            CLA CLL CML RAR
4491   5402   4455            LDMAN
4492   5403   1012            TAD     KB020
4493   5404   4455            LDMAN
4494   5405   3147            DCA     DAREG                       /LOAD MAINTENANCE
4495   5406   1147            TAD     DAREG
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   0200   RDCM,    0
4504   5413   7300            CLA CLL
4505   5414   1126            TAD     M12
4506   5415   3133            DCA     SRCNT1                      /12 BIT SHIFT
4507   5416   7330            CLA CLL CML RAR
4508   5417   4455            LDMAN                               /LOAD MAINTENANCE
4509   5420   7010            RAR
4510   5421   4455            LDMAN                               /LOAD MAINTENANCE
4511   5422   7300            CLA CLL
4512   5423   1216            TAD     K2400                       /ENABLE BIT FOR SHIFT COMMAND
4513   5424   4455            LDMAN                               /LOAD AND GO
4514   5425   2133            ISZ     SRCNT1
4515   5426   5220            JMP     .-2                         /SHIFT 12
4516   5427   7300            CLA CLL
4517   5430   1012            TAD     KB020                       /ENABLE READ BUFFER
4518   5431   4455            LDMAN                               /LOAD AND GO
4519   5432   3150            DCA     CMREG                       /SAVE IT
4520   5433   1150            TAD     CMREG
4521   5434   5612            JMP I   RDCM                        /EXIT
4522                  /
4523                  /ROUTINE TO ZERO WORK BUFFER
4524                  /
4525   5435   0000   KLBUF,   0
4526   5436   7340            CLA CLL CMA
4527   5437   1047            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
```

```
4537                             /THE COMPLEMENT DATA THATS IN THE AC.
4538                             /
4539    5447  0000    FLBUF,  0
4540    5450  3163            DCA     SAVDAT              /SAVE DATA WORD
4541    5451  7300            CLA CLL CMA
4542    5452  1067            TAD     BGNBUF              /START OF BUFFER-1
4543    5453  3010            DCA     AUTO10              /SETUP AUTO INDEX
4544    5454  1124            TAD     K7600
4545    5455  3162            DCA     DATCNT              /SETUP COUNTER
4546    5456  1163    LPDAT,  TAD     SAVDAT              /GET FIRST WORD
4547    5457  3410            DCA I   AUTO10              /STORE IN BUFFER
4548    5460  1163            TAD     SAVDAT              /GET SECOND WORD
4549    5461  7040            CMA                         /COMPLEMENT IT
4550    5462  3410            DCA I   AUTO10              /STORE IN BUFFER
4551    5463  2162            ISZ     DATCNT              /UPDATE COUNTER
4552    5464  5256            JMP     LPDAT               /MORE WORDS TO GO
4553    5465  1102            TAD     K1234
4554    5466  3010            DCA I   AUTO10              /MAKE WORD IN BUFFER+1
4555    5467  5647            JMP I   FLBUF               /BUFFER FULL
4556                             /
4557                             /ROUTINE TO CHECK FOR WAIT AND RECALIBRATE
4558                             /
4559    5470  3326    SCOPE,  DCA     TOTST               /SAVE SCOPE LOOP POINTER
4560    5471  4404            LAS                         /GET SWITCH 7
4561    5472  0012            AND     K0020               /MASK
4562    5473  7640            SZA CLA                     /WAIT LOOP?
4563    5474  4434            WAIT32                      /YES
4564    5475  4404            LAS                         /GET SWITCH 6
4565    5476  0013            AND     K0040               /MASK
4566    5477  7650            SNA CLA                     /IS IT CLEAR DISK
4567    5500  5322            JMP     NOCLR               /NO, DON'T
4568    5501  7301            CLA CLL IAC                  /ENABLE CLEAR CONTROL
4569    5502  4453            CLRALL                      /CLEAR CONTROL
4570    5503  1150            TAD     CHREG               /GET LAST COMMAND
4571    5504  0325            AND     K7577               /MASK OUT SET DONE
4572    5505  4450            LDCMD                       /LOAD COMMAND
4573    5506  7326            CLA CLL CML RTL              /ENABLE RECALIBRATE
4574    5507  4453            CLRALL                      /RECALIBRATE
4575    5510  4433            SKPWAT                      /WAIT FOR FIRST DONE
4576    5511  7000            NOP
4577    5512  1150            TAD     CHREG               /LAST COMMAND
4578    5513  1015            TAD     K0200
4579    5514  4450            LDCMD                       /LOAD COMMAND
4580    5515  4433            SKPWAT                      /WAIT FOR SECOND DONE
4581    5516  7000            NOP
4582    5517  1150            TAD     CHREG
4583    5520  0325            AND     K7577               /MASK SET DONE
4584    5521  3150            DCA     CHREG
4585    5522  7301    NOCLR,  CLA CLL IAC                  /ENABLE CLEAR CONTROL
4586    5523  4453            CLRALL                      /CLEAR CONTROL
4587    5524  5726            JMP I   TOTST               /GO TO TEST
4588                             /
4589    5525  7577    K7577,  7577
4590    5526  0000    TOTST,  0
4591                             /
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4592                             /ROUTINE TO GET ALL REGISTERS
4593                             /(NOTE: THIS ROUTINE WILL CAUSE ONE MAINTENANCE
4594                             /DATA BREAK TO LOCATION 0  IF THE LAST PREVIOUS
4595                             /FUNCTION EXECUTED WAS A READ DATA BREAK.)
4596                             /
4597    5527  0000    GTREG,  0
4598    5530  4404            LAS                         /GET SWITCH 8
4599    5531  0011            AND     K0010               /MASK
4600    5532  7650            SNA CLA                     /WAS IT GET ALL REGISTERS
4601    5533  5727            JMP I   GTREG               /NO, GO BACK
4602    5534  2327            ISZ     GTREG               /YES, UPDATE POINTER
4603    5535  4440            RDSTAT                      /READ STATUS
4604    5536  4456            RDBUF                       /READ LOWER BUFFER
4605    5537  7300            CLA CLL
4606    5540  4451            LDCUR                       /SET CA TO 0 FOR BREAK
4607    5541  7332            CLA CLL CML RTR             /ENABLE SHIFT TO LOWER BUFFER
4608    5542  4455            LDMAN                       /BREAK IF LAST BREAK WAS A READ
4609    5543  4454            RDCRC                       /READ CRC
4610    5544  4446            RDADD                       /READ TRACK
4611    5545  4445            RDCMD                       /READ COMMAND
4612    5546  4462            CRLF
4613    5547  7301            CLA CLL IAC                  /ENABLE CLEAR CONTROL
4614    5550  4453            CLRALL                      /CLEAR CONTROL
4615    5551  1124            TAD     K7600
4616    5552  5727            JMP I   GTREG               /EXIT
4617                             /
4618                             /ROUTINE TO SEND DRIVES ON AN OVERLAP SEEK
4619                             /
4620    5553  0000    DOUT,   0
4621    5554  3327            DCA     GTREG               /SAVE ADDRESS
4622    5555  7004            RAL
4623    5556  1072            TAD     DRIVNO              /GET CURRENT DRIVE
4624    5557  4450            LDCMD                       /LOAD COMMAND REGISTER
4625    5560  1150            TAD     CHREG               /GET LAST COMMAND ISSUED
4626    5561  1134            TAD     K3000               /ADD IN SEEK ONLY FUNCTION
4627    5562  1156            TAD     MEMENA              /ADD IN CURRENT FIELD
4628    5563  4450            LDCMD                       /LOAD COMMAND REGISTER
4629    5564  1327            TAD     GTREG               /GET SAVED ADDRESS
4630    5565  4452            LDADD                       /LOAD AND GO
4631    5566  4447            DSKSKP                      /WAIT FOR FIRST DONE FLAG
4632    5567  5366            JMP     .-1                 /HANG IF NO SKIP
4633    5570  5753            JMP I   DOUT                /DISK IS OUT
4634                             /
4635                             /SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
4636                             /
4637    5571  0000    CLDR,   0
4638    5572  6742    IOT2,   DCLR                        /DCLR "CLEAR IOT"
4639    5573  5771            JMP I   CLDR                /EXIT
4640    5574  4405            CLASIC
4641    5575  0036            CBERR
4642    5576  7402    FRHLT2, HLT                         /SKIP TRAP ERROR
4643    5577  5374            JMP     .-3
4644                             /
4645          5600    PAGE
4646                             /
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4647                         /ROUTINE TO READ OR WRITE ON DISK
4648                         /RETURN+1 SKIP OR STATUS ERROR
4649                         /RETURN+2 O.K.
4650                         /
4651    5600    0000    DISKG,  0
4652    5601    3254            DCA     SAVTRK              /SAVE TRACK ADDRESS
4653    5602    7340            CLA CLL CMA
4654    5603    3171            DCA     SOFERR              /SET CRC ERROR FLAG
4655    5604    1600            TAD I   DISKG               /GET TEXT POINTER
4656    5605    3172            DCA     SAVPCT              /SAVE IT
4657    5606    2200            ISZ     DISKG               /UPDATE POINTER
4658    5607    1150            TAD     CMREG               /GET COMMAND
4659    5610    0255            AND     K7501               /MASK OFF
4660    5611    1156            TAD     HOMEMA              /CURRENT FIELD
4661    5612    1172            TAD     DRIVNO              /CURRENT DRIVE
4662    5613    6450            LOCMD                       /LOAD COMMAND
4663    5614    1267            TAD     RGNBUF              /GET BEGINNING OF BUFFER
4664    5615    6451            LOCUR                       /LOAD CURRENT ADDRESS
4665    5616    1254            TAD     SAVTRK              /GET TRACK+SECTOR
4666    5617    6452            LOADP                       /LOAD AND GO
4667    5620    6453            SKPWAT                      /WAIT FOR DISK SKIP
4668    5621    5234            JMP     SKPERR              /ERROR, NO SKIP
4669    5622    7330            CLA CLL CML RAR             /EXPECTED STATUS
4670    5623    3143            DCA     GOREG2              /SETUP COMPARE REGISTER
4671    5624    6464            RDSTAT                      /READ STATUS
4672    5625    1125            TAD     K0000               /
4673    5626    7640            SZA CLA                     /WAS STATUS 0000
4674    5627    5236            JMP     STAERR              /ERROR, STATUS
4675    5630    1165            TAD     K5373               /TEXT POINTER
4676    5631    2200            ISZ     DISKG               /UPDATE FOR GOOD RETURN
4677    5632    3572    RETRN,  DCA I   SAVPCT              /STORE IN TEXT POINTER
4678    5633    5600            JMP I   DISKG               /EXIT
4679    5634    1164    SKPERR, TAD     K0306               /SKIP TEXT POINTER
4680    5635    5232            JMP     RETRN               /EXIT
4681    5636    1146    STAERR, TAD     STREG               /GET STATUS JUST READ
4682    5637    0011            AND     K0010               /MASK OUT CRC ERRORS
4683    5640    7650            SNA CLA                     /WERE THERE ANY
4684    5641    5252            JMP     HRDERR              /NO, OTHERS
4685    5642    7320            CLA CLL
4686    5643    1150            TAD     CMREG               /GET LAST COMMAND
4687    5644    0107            AND     K7000               /MASK FUNCTION
4688    5645    1106            TAD     K6000               /ADD IN FUDGE FACTOR
4689    5646    7630            SZL CLA                     /WAS IT A READ ALL OR READ
4690    5647    5252            JMP     HRDERR              /NO, MUST BE A WRITE
4691    5650    3171            DCA     SOFERR              /SET CRC ERROR FLAG
4692    5651    5230            JMP     RETRN-2             /GO CHECK DATA OR RETURN
4693    5652    1164    HRDERR, TAD     K5300
4694    5653    5232            JMP     RETRN               /EXIT
4695                         /
4696    5654    0000    SAVTRK, 0
4697    5655    7501    K7501,  7501
4698                         /
4699                         /ROUTINE TO COMPARE WORDS IN BUFFER TO
4700                         /KNOWN DATA PATTERN IN THE AC.
4701                         /
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4702    5656    0000    FGURE,  0
4703    5657    3143            DCA     GOREG2              /SAVE FOR ERROR PRINTER
4704    5660    1267            TAD     RGNBUF              /GET START OF BUFFER
4705    5661    3153            DCA     ADREG               /SAVE FOR ERROR PRINTER
4706    5662    1150            TAD     CMREG               /GET DISK NO. AND EXT. BIT
4707    5663    0101            AND     K0007               /MASK THEM
4708    5664    7001            CIA
4709    5665    1553            TAD I   ADREG               /GET FIRST TRACK WORD
4710    5666    7650            SNA CLA                     /WAS IT O.K. ?
4711    5667    5273            JMP     .+4                 /YES, CHECK NEXT TRACK WORD
4712    5670    1150            TAD     CMREG               /GET DISK NO. AND EXT. BIT
4713    5671    0101            AND     K0007               /MASK THEM
4714    5672    5343            JMP     DTERR               /DATA ERROR
4715    5673    2153            ISZ     ADREG               /UPDATE ADDRESS
4716    5674    1553            TAD I   ADREG               /GET SECOND WORD
4717    5675    7001            CIA
4718    5676    1151            TAD     DAREG               /COMPARE TO ADDRESS
4719    5677    7650            SNA CLA                     /WAS SECOND TRACK WORD O.K.
4720    5700    5303            JMP     .+3                 /YES, NOW CHECK DATA
4721    5701    1151            TAD     DAREG               /GET GOOD INFO
4722    5702    5343            JMP     DTERR               /DATA ERROR
4723    5703    7326            CLA CLL CML RTL
4724    5704    1123            TAD     K7000
4725    5705    3162            DCA     DATCNT              /SETUP COUNTER
4726    5706    2153    LPFIG,  ISZ     ADREG               /UPDATE ADDRESS
4727    5707    1553            TAD I   ADREG               /GET DATA WORD
4728    5710    7001            CIA
4729    5711    1143            TAD     GOREG2              /COMPARE TO GOOD ONE
4730    5712    7640            SZA CLA                     /WAS WORD O.K.?
4731    5713    5344            JMP     DTERR+1             /NO, DATA ERROR
4732    5714    1143            TAD     GOREG2              /GET GOOD DATA
4733    5715    7040            CMA
4734    5716    3143            DCA     GOREG2              /IT IS A COMPLEMENT DATA PATTERN
4735    5717    2162            ISZ     DATCNT              /UPDATE BUFFER COUNTER
4736    5720    5306            JMP     LPFIG               /MORE TO CHECK
4737    5721    2153            ISZ     ADREG               /UPDATE ADDRESS
4738    5722    1102            TAD     K1234
4739    5723    7041            CIA
4740    5724    1553            TAD I   ADREG               /GET WORD IN BUFFER+1
4741    5725    7650            SNA CLA                     /WAS IT O.K.
4742    5726    5331            JMP     .+3                 /YES ALL DATA O.K.
4743    5727    1102            TAD     K1234
4744    5730    5343            JMP     DTERR               /WORD LOST IN BUFFER+1
4745    5731    7330            CLA CLL CML RAR             /EXPECTED STATUS
4746    5732    3143            DCA     GOREG2              /SETUP COMPARE REGISTER
4747    5733    1171            TAD     SOFERR              /GET CRC ERROR FLAG
4748    5734    7640            SZA CLA                     /WAS IT SET
4749    5735    5656            JMP I   FGURE               /NO THE BUFFER IS O.K.
4750    5736    7340            CLA CLL CMA                 /SETUP CRC FLAG
4751    5737    3171            DCA     SOFERR              /RESET FLAG
4752    5740    1116            TAD     K5300               /TEXT MESS
4753    5741    3572            DCA I   SAVPCT              /SETUP TEXT POINTER
4754    5742    7330            CLA CLL CML RAR             /EXPECTED STATUS
4755    5743    3143    DTERR,  DCA     GOREG2              /SETUP COMPARE
4756    5744    1553            TAD I   ADREG               /GET BAD WORD
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4757   5745  3154          DCA     DTREG                    /SAVE FOR PRINTER
4758   5746  2296          ISZ     FGURE                    /UPDATE FOR ERROR RETURN
4759   5747  5656          JMP I   FGURE
4760                  /
4761   5750  2003  TEXPC,  TEXT    "PC:"
       5751  7200
4762   5752  0704  TEXGO,  TEXT    "GO:"
       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         6300     PAGE
4773                  /
4774                  /SUBROUTINE TO SHIFT CRC REGISTER TO DATA
4775                  /BUFFER THEN READ IT.
4776                  /
4777   6000  0000  ROCR,   0
4778   6001  7330          CLA CLL
4779   6002  1126          TAD     M12
4780   6003  3133          DCA     SBCNT1                   /12 SHIFTER
4781   6004  7330          CLA CLL CML RAR
4782   6005  4455          LDMAN                            /LOAD MAINTENANCE
4783   6006  7010          RAR
4784   6007  4455          LDMAN                            /LOAD MAINTENANCE
4785   6010  7010          RAR
4786   6011  4455          LDMAN                            /LOAD AND GO
4787   6012  2133          ISZ     SBCNT1
4788   6013  5211          JMP     .-2                      /12 BIT SHIFT
4789   6014  7300          CLA CLL
4790   6015  1712          TAD     K0020                    /ENABLE READ BUFFER
4791   6016  4455          LDMAN
4792   6017  3145          DCA     CRREG2                   /SAVE IT
4793   6020  1126          TAD     M12
4794   6021  3133          DCA     SBCNT1                   /12 BIT SHIFTER
4795   6022  7332          CLA CLL CML RTR
4796   6023  4455          LDMAN                            /LOAD MAINTENANCE
4797   6024  7010          RAR
4798   6025  4455          LDMAN                            /LOAD AND GO
4799   6026  2133          ISZ     SBCNT1
4800   6027  5225          JMP     .-2                      /12 BIT SHIFT
4801
```

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4802
4803   6030  7320          CLA CLL
4804   6031  1712          TAD     K0020                    /ENABLE READ BUFFER
4805   6032  4455          LDMAN
4806   6033  0117          AND     K0017
4807   6034  3144          DCA     CRREG1                   /SAVE OTHER HALF
4808   6035  5600          JMP I   ROCR                     /EXIT
4809                  /
4810                  /SUBROUTINE TO PRINT TWO OCTAL
4811                  /
4812   6036  0000  TOCT,   0
4813   6037  3133          DCA     SBCNT1                   /SAVE AC
4814   6040  1133          TAD     SBCNT1
4815   6041  7010          RAR
4816   6042  7012          RTR
4817   6043  0101          AND     K0007
4818   6044  1777*         TAD     K0260
4819   6045  4436          TYPE                             /PRINT FIRST BYTE
4820   6046  1133          TAD     SBCNT1
4821   6047  0101          AND     K0007
4822   6050  1777*         TAD     K0260
4823   6051  4436          TYPE                             /PRINT SECOND BIT
4824   6052  5636          JMP I   TOCT                     /EXIT
4825                  /
4826                  /
4827                  /
4828                  /ROUTINE TO DO CRLF
4829                  /
4830   6053  0000  UPONE,  0
4831   6054  7300          CLA CLL
4832   6055  1262          TAD     K0215
4833   6056  4436          TYPE
4834   6057  1263          TAD     K0212
4835   6060  4436          TYPE
4836   6061  5653          JMP I   UPONE
4837                  /
4838   6062  0215  K0215,  0215
4839   6063  0212  K0212,  0212
4840   6064  0240  K0240,  0240
4841                  /
4842                  /ROUTINE TO PRINT FOUR OCTAL
4843                  /
4844   6065  0000  FROCT,  0
4845   6066  7006          RTL
4846   6067  7006          RTL
4847   6070  3253          DCA     UPONE
4848   6071  1510          TAD     H6
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     K0200
4861    6106    4436            TYPE
4862    6107    5665            JMP I   PROCT
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     PROCT
4874    6116    1665            TAD I   PROCT
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   PROCT
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     PROCT
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    K0100,  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    6703    IOT3,   DLAG                    /LOAD DISK ADDRESS REGISTER
4924    6170    5760            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    4360            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            LOCMD                   /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     SAVTD           /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    1100            TAD     K3000           /SEEK ONLY FUNCTION
4959    6227    4450            LOCMD                   /LOAD COMMAND
4960    6230    1317            TAD     SAVTD           /GET POSITION
4961    6231    4052            LDADD                   /LOAD AND GO
4962    6232    4433    CHECK,  SKPWAT                  /WAIT FOR FIRST DONE FLAG
4963    6233    5314            JMP     SEKER1          /ERROR, NO SKIP
4964    6234    7330            CLA CLL CML RAR         /EXPECTED STATUS
4965    6235    3103            DCA     GDREG2          /SETUP COMPARE REGISTER
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4966    6236    1122            TAD     K7748
4967    6237    3321            DCA     RNAD            /SETUP SKIP TIMER
4968    6240    4444            RDSTAT                  /READ STATUS
4969    6241    1105            TAD     K4000
4970    6242    7650            SNA CLA                 /WAS DRIVE DONE?
4971    6243    5252            JMP     .+7             /YES
4972    6244    1106            TAD     K6000           /NO, DRIVE MUST BE BUSY!
4973    6245    3143            DCA     GDREG2          /EXPECTED STATUS
4974    6246    1146            TAD     STREG           /GET STATUS READ
4975    6247    1123            TAD     K2000           /ADD IN FUDGE FACTOR
4976    6250    7640            SZA CLA                 /WAS DRIVE BUSY
4977    6251    5311            JMP     SEKER2          /NO, ERROR
4978    6252    1015            TAD     K0200           /ENABLE SET SECOND DONE FLAG
4979    6253    1150            TAD     CMREG           /ORIGINAL COMMAND
4980    6254    4450            LDCMD                   /LOAD COMMAND
4981    6255    7332            CLA CLL CML RTR
4982    6256    3143            DCA     GDREG2          /EXPECTED STATUS
4983    6257    4530    CHKSKP, TICK                    /APT TIMING
4984    6260    4440            RDSTAT                  /READ STATUS
4985    6261    4447            DSKSKP                  /FLAG SET?
4986    6262    7410            SKP                     /NO
4987    6263    5274            JMP     GOTSKP          /YES GOT IT!
4988    6264    1106            TAD     K6000
4989    6265    7640            SZA CLA                 /DRIVE BUSY?
4990    6266    5311            JMP     SEKER2          /NO, ERROR
4991    6267    2365            ISZ     RNWRD4
4992    6270    5257            JMP     CHKSKP
4993    6271    2321            ISZ     RNAD
4994    6272    5257            JMP     CHKSKP
4995    6273    5314            JMP     SEKER1          /ERROR, NO SKIP!
4996    6274    7330    GOTSKP, CLA CLL CML RAR
4997    6275    3143            DCA     GDREG2          /SETUP EXPECTED STATUS
4998    6276    4444            RDSTAT                  /READ STATUS
4999    6277    1105            TAD     K4000
5000    6300    7640            SZA CLA                 /WAS IT ONLY DONE FLAG
5001    6301    5311            JMP     SEKER2          /NO, ERROR STATUS
5002    6302    1150            TAD     CMREG           /GET LAST COMMAND
5003    6303    0320            AND     A7577           /MASK OUT
5004    6304    4450            LDCMD                   /CLEAR STATUS
5005    6305    3143            DCA     GDREG2          /SETUP COMPARE REGISTER
5006    6306    4444            RDSTAT                  /READ STATUS
5007    6307    7650            SNA CLA                 /WAS STATUS 0000?
5008    6310    2215            ISZ     ONLY            /UPDATE PC
5009    6311    1166    SEKER2, TAD     K5300
5010    6312    3716    GOBAK,  DCA I   SAVPC           /SETUP TEXT POINTER
5011    6313    5615            JMP I   ONLY            /BACK TO TEST
5012    6314    1164    SEKER1, TAD     K0306           /SKIP TEXT POINTER
5013    6315    5312            JMP     GOBAK           /EXIT
5014                            /
5015    6316    0000    SAVPC,  0
5016    6317    0000    SAVTO,  0
5017    6320    7577    A7577,  7577
5018                            /
5019                            /ROUTINE TO GET A RANDOM DISK ADDRESS
5020                            /
```

```
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    7020            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   0530           TICK
5077   6404   1620           TAD I   NERRO            /GET RESTART ADDRESS
5078   6405   3173           DCA     RESTRT           /STORE
5079   6406   4405           CLASIC
5080   6407   4442           CBCKPA
5081   6410   7300           NOP
5082   6411   4404           LAS                      /GET SWITCH 0
5083   6412   0215           AND     KA200            /MASK
5084   6413   7650           SNA CLA                  /PROGRAM HALT
5085   6414   5223           JMP     .+4
5086   6415   4405           CLASIC
5087   6416   4437           CBTNOU
5088   6417   7402  STPHLT,  HLT                      /STOP HALT FROM SWR401
5089   6420   4404           LAS                      /GET SWITCH 1
5090   6421   7300           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   5602           JMP I   NSCOPE           /CHECK FOR WAIT AND RETURN
5095   6426   1131           TAD     PFG0
5096   6427   7640           SZA CLA                  /1 OR 4096 PASSES
5097   6430   5233           JMP     NEXTST           /1 PASS PER TEST
5098   6431   2132           ISZ     REG1             /UPDATE UPCOUNTER
5099   6432   5573           JMP I   RESTRT           /BACK TO SAME TEST
5100   6433   7301  NEXTST,  CLA CLL IAC              /ENABLE CLEAR CONTROL
5101   6434   4453           CLRALL                   /CLEAR CONTROL
5102   6435   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   0200  HFCHK,   0
5111   6442   3143           DCA     GOREG2           /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     CHREG
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     CHREG
5121   6454   0101           AND     K0007
5122   6455   5337           JMP     HFERR            /NO
5123   6456   2153           ISZ     ADREG            /UPDATE ADDRESS
5124   6457   1553           TAD I   ADREG
5125   6460   7041           CIA
5126   6461   1151           TAD     DAREG            /COMPARE TO DISK ADDRESS
5127   6462   7650           SNA CLA                  /SAME????
5128   6463   5266           JMP     .+3              /YES
5129   6464   1151           TAD     DAREG
5130   6465   5337           JMP     HFERR            /NO
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5131   6466   2153           ISZ     ADREG            /UPDATE ADDRESS
5132   6467   7326           CLA CLL CML RTL
5133   6470   1124           TAD     K7600
5134   6471   3162           DCA     DATCNT           /SETUP COUNTER FOR FIRST HALF
5135   6472   1553  HFR1,    TAD I   ADREG
5136   6473   7041           CIA
5137   6474   1143           TAD     GDREG2           /COMPARE TO GOOD VALUE
5138   6475   7640           SZA CLA                  /WERE THEY THE SAME
5139   6476   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   1122           TAD     K1234
5158   6521   7650           SNA CLA                  /WAS IT O.K.?
5159   6522   5325           JMP     .+3              /YES
5160   6523   1122           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   2201           ISZ     HFCHK
5176   6543   5641           JMP I   HFCHK
5177                 /
5178                 /SUBROUTINE TO LOAD COMMAND REGISTER
5179                 /
5180   6544   0000  LDCM,    0
5181   6545   3150           DCA     CHREG            /SAVE OUTBOUND DATA
5182   6546   4405           CLASIC
5183   6547   4440           CBCKPA
5184   6550   7000           NOP
5185   6551   1150           TAD     CHREG
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5186    6552    6746    IOT6,    DLOC                    /LOAD COMMAND REGISTER
5187    6553    5744             JMP I   LOCM            /EXIT
5188    6554    4405             CLASIC                  /CHECK FOR CLASSIC.
5189    6555    4036             CAERR                   /ROUTINE TO EXECUTE.
5190    6556    7402    FRHLT6,  HLT                     /SKIP TRAP ERROR.
5191    6557    5354             JMP     .-3
5192                    /
5193    6560    2405    HNFS2,   TEXT  "TEST (Y=YES OR N=NO)!"
        6561    2324
        6562    4050
        6563    3175
        6564    3105
        6565    2340
        6566    1722
        6567    4916
        6570    7516
        6571    1751
        6572    7220
5194                    /
5195            6622    PAGE
5196                    /
5197                    /ROUTINE TO CHANGE PROGRAM DEVICE CODES
5198                    /
5199    6622    4405    CHANG,   CLASIC
5200    6621    4431             CASNIT
5201    6622    7300             NOP
5202    6623    7204             LAS
5203    6624    0227             AND     K0770
5204    6625    3631             DCA I   KHFCHK          /SAVE DESIRED CODE
5205    6626    1235             TAD     CCNTR1
5206    6627    3632             DCA I   KNERRO
5207    6630    1236             TAD     CHNPOT
5208    6631    3233             DCA     CNGSAV
5209    6632    1633    CHANGR,  TAD I   CNGSAV          /GET ADDRESS POINTER
5210    6633    3200             DCA     Ø               /SAVE IT
5211    6634    1420             TAD I   Ø               /GET OLD IOT CODE
5212    6635    0234             AND     K7027           /MASK
5213    6636    1631             TAD I   KHFCHK          /ADD IN DESIRED
5214    6637    3400             DCA I   Ø               /CHANGE CORE
5215    6640    2233             ISZ     CNGSAV          /UPDATE ADDRESS POINTER
5216    6641    2632             ISZ I   KNERRO          /UPDATE CHANGE COUNTER
5217    6642    5212             JMP     CHANGR
5218    6643    4405             CLASTC
5219    6644    4036             CAERR
5220    6645    7402    CHNHLT,  HLT                     /DEVICE CODES CHANGED
5221    6646    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    6647    0770    K0770,   0770
5226                    /
5227    6650    0200    RSTRT,   BGN
5228    6651    6041    KHFCHK,  HFCHK
5229    6652    6400    KNERRO,  NERRO
5230                    /
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5231    6653    0200    CNGSAV,  Ø
5232    6654    7027    K7027,   7027
5233    6655    7746    CCNTR1,  7746
5234    6656    6637    CHNPOT,  CHNPOT+1
5235    6657    1701             IOT1
5236    6660    5572             IOT2
5237    6661    6167             IOT3
5238    6662    4772             IOT4
5239    6663    5155             IOT5
5240    6664    6552             IOT6
5241    6665    4132             IOT7
5242    6666    2650             IOT1A1
5243    6667    2647             IOT3A1
5244    6670    2643             IOT4A1
5245    6671    2652             IOT5A1
5246    6672    2645             IOT6A1
5247    6673    3731             IOT1A2
5248    6674    3255             IOT2A2
5249    6675    3030             IOT3A2
5250    6676    3270             IOT4A2
5251    6677    3033             IOT5A2
5252    6700    3726             IOT6A2
5253    6701    2215             T28IDA
5254    6702    2017             T28IDB
5255    6703    2722             T28IDC
5256    6704    2725             T28IDD
5257    6705    2100             T29IDA
5258    6706    2102             T29IDB
5259    6707    2105             T29IDC
5260    6710    2110             T29IDD
5261                    /
5262    6711    2324    FRTX1,   TEXT     "STATUS REGISTER ERROR"
        6712    2124
        6713    2523
        6714    4722
        6715    0507
        6716    1123
        6717    2405
        6700    2240
        6701    0522
        6702    2217
        6703    2200
5263    6704    0317    FRTX2,   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    FRTX3,   TEXT     "DISK ADDRESS REGISTER ERROR"
```

```
        6721  2313
        6722  4001
        6723  0400
        6724  2205
        6725  2323
        6726  4022
        6727  0507
        6730  1123
        6731  2405
        6732  2240
        6733  2522
        6734  2217
        6735  2200
5265    6736  0411    FRTX4,  TEXT    "DISK DATA ERROR"
        6737  2313
        6740  0204
        6741  3124
        6742  3140
        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  4205
        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  2522
        6770  2217
        6771  2200
5268    6772  0411    FRTX7,  TEXT    "DISK SKTP ERROR"
        6773  2313
        6774  4023
        6775  1311
        6776  2200
        6777  0522
        7000  2217
        7001  2200
5269    7002  0411    FRTX8,  TEXT    "DISK INTERRUPT ERROR"
        7003  2313
        7004  4011
        7005  1624
        7006  0522
        7007  2225
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        7010  2024
        7011  4005
        7012  2222
        7013  1722
        7014  0000
5270                          /
5271    7015  4020    TEXEND,  TEXT    " PASS COMPLETE"
        7016  2123
        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    APTR,    0
5282    7026  1022             TAD  22                        /TEST FOR APT SYSTEM
5283    7027  0105             AND  K0000
5284    7030  7650             SNA CLA                        /ON APT ?
5285    7031  5625             JMP I APTR                     /NO
5286    7032  1022             TAD    22                      /NOP CONSOLE PACKAGE
5287    7033  0300             AND    K7377
5288    7034  3022             DCA    22
5289    7035  1127             TAD    K7000                   /NOP SWITCH REGISTER ROUTINE
5290    7036  3701             DCA I  XMYLAS                  /NOP SWITCHES
5291    7037  3363             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    APTAR,   TAD    22
5302    7052  0014             AND    K0100
5303    7053  7650             SNA CLA                        /SINGLE DRIVE TEST?
5304    7054  5264             JMP    .+10                    /NO!!!!
5305    7055  7200             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
```

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5313    7065    1677            TAD I   XDSKON
5314    7066    3327            DCA     PCSAV
5315    7067    7240            CLA CMA
5316    7070    1727            DCA I   PCSAV                   /SET ACTIVE INDICATOR.
5317    7071    2362            ISZ     CLKCNT
5318    7072    2330            ISZ     KTICK
5319    7073    5251            JMP     APTAR
5320    7074    1071            TAD     DRVCNT
5321    7075    3070            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    0374    XDSKON, DSKON
5326    7100    7377    K7377,  7377
5327    7101    5120    XMYLAS, MYLAS+5
5328    7102    0233    TSTOP,  TSTO+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    5723            JMP I AERRO                     /NO
5339    7111    7340            CLL CLA CMA                     /SET UP FOR GETTING ERROR PC
5340    7112    1725            TAD I PERROR                    /GET ERROR PC
5341    7113    3327            DCA PCSAV                       /STORE FOR FUTURE USE
5342    7114    6002            IOF                             /DISABLE INTERUPT SYSTEM
5343    7115    6224            RIF                             /SET UP FOR DATA FIELD IN ERROR
5344    7116    1121            TAD KCDF                        /ESTABLISHES DATA FIELD
5345    7117    3321            DCA .+2
5346    7120    1327            TAD PCSAV                       /GET ERROR ADDRESS
5347    7121    7402            HLT                             /REPLACED WITH ERROR DATA FIELD
5348    7122    6272            CIF 70            /FIELD OF UVPROM
5349    7123    5726            JMP I K6520                     /REPORT ERROR
5350    7124    5703            JMP I AERRO                     /RETURN TO THE NORMAL REPORTING
5351                    /
5352    7125    5200    PERROR, ERRO                            /POINTER TO PC IN ERROR
5353    7126    6520    K6520,  6520                            /POINTER TO UV PROM ADDRESS
5354    7127    0000    PCSAV,  0                               /PLACE WHERE ERROR PC IS STORED
5355                    /
5356                    /THIS ROUTINE IS A NOP IF NOT BEING USED ON THE APT LINE.
5357                    /IF APT IS ENABLED A TIMING PULSE IS GENERATED AT
5358                    /APPROXIMATELY 1.5 SECOND INTERVALS
5359                    /
5360    7130    0000    KTICK,  0
5361    7131    1022            TAD 22                          /GET HARDWARE CONFIGURATION
5362    7132    0105            AND K4000                       /TEST FOR APT EACH TIME
5363    7133    7650            SNA CLA
5364    7134    5730            JMP I KTICK                     /NO TIMING GENERATED
5365    7135    2362            ISZ CLKCNT                      /SEE IF TIMING NEEDS TO BE DONE
5366    7136    5730            JMP I KTICK                     /NO, RETURN TO MAIN FLOW
5367    7137    1361            TAD COUNT                       /INIT FIRST CLOCK
```

```
5368    7140    3362            DCA CLKCNT
5369    7141    2175            ISZ KCNT                        /FOR TESTS REQUIRING LONGER TIME OUT ON APT
5370    7142    5730            JMP I KTICK                             /RETURN, NOT READY TO NOTIFY APT
5371    7143    6224            RIF                             /START SETUP FOR UV PROM
5372    7144    1121            TAD KCDF
5373    7145    3307            DCA .+2                         /WILL ESTABLISH CURRENT DATA FIELD
5374    7146    6002            IOF
5375    7147    7402            HLT                             /CHANGED TO CURRENT DATA FIELD
5376    7150    6272            CIF 70                          /LOCATION OF UVPROM
5377    7151    4763            JMS I K6500                     /LET APT KNOW YOU ARE RUNNING
5378    7152    7300            CLL CLA                                 /MAKE SURE AC AND LINK ARE CLEAR
5379    7153    1361            TAD COUNT
5380    7154    3362            DCA CLKCNT                      /INITIALIZE CLOCK COUNTER
5381    7155    1360            TAD CNT
5382    7156    3175            DCA KCNT
5383    7157    5730            JMP I  KTICK
5384                    /
5385    7160    7777    CNT,    -1
5386    7161    7777    COUNT,  7777
5387    7162    0000    CLKCNT, 0
5388    7163    6500    K6500,  6500                            /POINTS TO UV PROM
5389                    /
5390            7177    *7177
5391                    /
5392            7177    WRKBUF*,
5393                    /
5394            7177    HITBK*,
5395            7200    LOTBK*,*+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

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  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  11110001

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
```

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
A7577	6320	C8BETD	0613	DCLR	6742	ERMLT1	4761
ACCHP1	0442	C8SETS	0535	DCNT1	4370	ERMLT2	5576
ACCHP2	0443	C88NTT	4431	DCNT2	4371	ERMLT3	6173
ACL	7701	C88N8T	0745	DCNT3	4372	ERMLT4	6776
ACREG	0155	C8THP1	1021	DCNT4	4373	ERMLT5	5141
ACSAVE	1345	C8TTYI	4426	DIN	4530	ERMLT6	4556
ADREG	0153	CATYPE	4435	DISKA	1561	ERMLT7	6136
AERRO	7103	CAF	6007	DISK1	1562	ERMLT9	5344
AGAIN	5325	CAREG	0152	DISK2	1563	ERR1	0736
ALLBAK	4242	CCNTR1	4635	DISK3	1564	ERRA1	5217
APA1	5045	CHANG	6600	DISK4	1565	ERRMES	1320
APERR	5066	CHANGA	6612	DISK5	1566	ERRO	5200
APHLT1	5073	CHECK	6232	DISK6	1567	ERROR	4448
APR1	5024	CHKCLA	1200	DISK7	1570	ERTX1	6671
APT8	7025	CHKERR	5502	DISKG	5600	ERTX2	6704
APT8R	7051	CHKNEX	4432	DISKGO	4426	ERTX3	6720
AUTO10	0010	CHKSKP	6257	DLAG	6703	ERTX4	6736
AUTPRO	5000	CMNHLT	6625	DLCA	6704	ERTX5	6746
AGN	0200	CMNPOT	6636	DLDC	6706	ERTX6	6760
BGNBUF	0267	CKCOUT	0232	DMAN	6707	ERTX7	6772
BYRETR	0506	CLASIC	4405	DOCNT	0247	ERTX8	7002
C8BY1	0230	CLA8TK	5102	DONEA	0426	ESCOPE	5357
C8BY2	1320	CLOR	5571	DOPACK	0212	EXIT	6145
CABY3	1061	CLKCNT	7162	DOSET	0251	EXTTA	6660
C8BY4	0515	CLRALL	4053	DOUT	5553	F1OP1	0021
C8BY5	1116	CLRTRN	1315	DRIVNO	0072	F1OP2	0022
C8CHAR	1075	CNREG	0150	DRST	4705	F1SWR	0020
C8CKP	1022	CNGSAV	6633	DRVCNT	0071	FGURE	5656
C8CKPA	4440	CNT	7160	DRVMAV	0070	FIGURE	6630
C8CKSW	4425	CNTRLC	0551	DSKOA	6366	FILAUP	6631
CACNTR	4407	CNTRLD	0600	DSK0B	6372	FILCNT	1640
C8CONT	1105	CNTRLE	0505	DSK1A	6367	FILLER	1637
C8CRLF	4433	CNTRLL	7537	DSK1B	6373	FLAUF	5447
C8DO1	0310	CNTRLQ	0500	DSK2A	6370	FLSAVE	1347
CADO10	1262	CNTRLR	0511	DSK2B	6374	FROCT	6065
C8DO11	0007	CNTRLS	0521	DSK3A	6371	GDREG1	0142
CADO2	1233	CNTVAL	0252	DSK3B	6375	GDREG2	0143
C8DO3	0350	COMP1	4557	DSKADO	4526	GETCH1	0703
C8DO4	1206	COMP2	3600	DSKIN	4007	GETOAT	0456
C8DO7	0527	CONSOL	0000	DSKON	6374	GETORV	0305
C8FCHO	4034	CONST1	1366	DSKOUT	4406	GONAK	6312
C8ERR	4036	COUNT	7161	DSKP	6761	GOTTA	6443
C8GET	0620	CRERR	3614	DSKPOT	4527	GOTADD	6342
CRHANG	1122	CRLF	4462	DSKSKP	4447	GOTOA	6654
C8INQU	4437	CRREG1	0144	DTERR	5743	GOTSKP	6274
C8OCTA	4432	CRREG2	0145	DTREG	0150	GTF	6004
C0PASS	0024	CRWRO1	0160	ENDBUF	7576	GTREG	5527
C8PAUS	4401	CRWRO2	0161	ENDHLT	4122	MAFCHK	6427
C8PRNT	4430	CYL450	0065	ENDIT	0742	MEOHLT	6021
CARDPS	0666	DAREG	0151	ENDTRK	0170	MEOLST	5376
C8RETO	0614	DATCNT	0162	ENDTST	4062	MEOTAD	5367
C8RETR	0536	DBREG	0147			MFCHK	6041

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
MFEPR	6537	KP240	6064	LDCMO	4050	OVRDOK	4435
MFR1	6472	K0260	0360	LDCUR	4451	OVRERR	4254
MFR2	6510	K0277	0366	LDMAN	4055	OVRLAP	4200
MITRK	7177	K0306	0164	LDMN	4131	OVROK	4233
HOMEMA	0156	K0331	0365	LOADCT	1355	OVRR1	4203
HROEAR	5652	K0400	0016	LOTRK	7200	OVRR2	4206
ICNTR1	4763	K0770	6627	LPDAT	5456	OVRR3	4221
ICNTR2	4764	K1000	0017	LPFIG	5706	OVRRO1	4403
INDEXA	0455	K1234	0102	M12	0126	OVRRD2	0406
INHIST	5361	K2000	0103	M4	6110	OVRRO3	4421
INNODE	1076	K2525	0113	MANPRO	2706	OVRREO	4600
INTADO	4743	K3000	0104	MANUAL	4600	PASCNT	0250
INTRO	0363	K3740	0150	MESA	0707	PCLF	6662
IONWAT	6661	K4000	0105	MESAC	1333	PCNTR1	5565
IOHWT	0727	K4100	6147	MESFL	1341	PCNTR2	5366
IOT1	1001	K5000	0115	MESHAN	1106	PCSAV	7127
IOT1A1	2650	K5252	0114	MESMQ	1336	PCSAVE	1304
IOT1A2	3231	K5300	0166	MESPAS	0253	PERROR	7125
IOT2	5572	K5373	0165	MESPC	1330	PNTBUF	1120
IOT2A2	3055	K5403	0360	MPERR	2771	POLERR	4427
IOT3	6167	K6000	0106	MPHLT1	2734	PRINT	6151
IOT3A1	2647	K6300	0167	MPHLT2	2776	PRN	6111
IOT3A2	3030	K6500	7163	MPR1	2735	PRNTER	6457
IOT4	4772	K6520	7126	MQA	7501	PROFLD	0222
IOT4A1	2643	K7000	0107	MQL	7421	PSIE	6665
IOT4A2	3020	K7007	6634	MQSAVE	1306	PSKE	6663
IOT5	5155	K7156	7772	MYAC	1317	PSKF	6661
IOT5A1	2652	K7377	7100	MYLAS	5075	PSTB	6660
IOT5A2	3033	K7400	0123	NOIN	0553	PTSTOR	0334
IOT6	6552	K7501	5655	NERRO	6400	RANADO	4423
IOT6A1	2645	K7577	5525	NERROR	4437	ROAD	4140
IOT6A2	3026	K7600	0124	NEXOSK	0123	ROADD	4446
IOT7	4132	K7720	0111	NEXTST	6433	ROBF	5400
K0001	0073	K7707	4726	NL7775	7306	RORUF	4456
K0002	0074	K7740	0122	NMES1	0760	ROCH	5412
K0003	0075	K7760	0110	NMFS2	4560	ROCMO	4445
K0004	0076	K7771	0116	NMES3	6165	ROCR	6000
K0005	0077	KAERRO	0127	NOCLR	5522	ROCRC	4450
K0006	0100	KCDF	0121	NOSET	0242	ROST	5150
K0007	0101	KCNT	0175	NOTDON	6230	ROSTAT	4440
K0010	0011	KWFCHK	6631	NOTEX	5350	REALPC	1316
K0017	0117	KILBUF	4432	NSCOPE	6440	RECAL	4425
K0020	0012	KLBUF	5035	NTCLAS	1270	REDBAN	0510
K0037	0120	KNERRO	6632	NTCRC	5301	REDOA	4415
K0040	0013	KRMF	7362	NTGD	5264	REG0	0131
K0077	0112	KTICK	7130	NTSEK	4666	REG1	0132
K0100	0010	KTIME	0174	NXTOSK	4270	RESEK	4022
K0177	0017	LAS	4404	OCTEL	4460	RESTOR	4200
K0200	0015	LDAD	6164	ONLY	6215	RESTRT	0173
K0207	5356	LDADD	4452	OP1	0021	RETRN	5632
K0212	6263	LDCA	4765	OP2	0022	RETRN2	5360
K0215	6062	LDCM	6544	OVRDER	4522	RNAD	6321

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
RNWRD1	6363	T14SE	1063	T29I0A	2100	T4BR	3242
RNWRD2	6364	T15E	1106	T29I0B	2102	T4RS	3246
RNWRD4	6365	T15T	1110	T29I0C	2105	T4BT	3265
ROUINS	1302	T16E	1126	T29I0D	2110	T41E	3397
ROUTMP	5133	T16T	1130	T290K	2132	T41R	3272
RSTRT	6630	T17E	1171	T29R	2070	T41S	3306
SAMDSK	4073	T17S	1135	T29T	2137	T41T	3361
SAVAC	5132	T17T	1173	T29U	2126	T42E	3407
SAVDAT	0163	T18E	1237	T2E	0323	T42R	3402
SAVPC	6316	T18S	1200	T30D	2206	T42S	3406
SAVPCT	0172	T18T	1241	T30E	2207	T42T	3451
SAVPDT	6361	T19E	1267	T30R	2142	T43E	3512
SAVTO	6317	T190K	1266	T30T	2211	T43R1	3454
SAVTRK	5654	T19T	1271	T31E	2257	T43R2	3461
SRCNT1	0133	T1E	0275	T31R	2210	T43T	3514
SCOPE	5470	T20E	1317	T31T	2261	T44E	3557
SDKP	1000	T200K	1316	T32E	2372	T440K	3567
SEEK	0424	T20T	1321	T32R1	2271	T44R	3526
SEKER1	6314	T21E	1350	T32R2	2312	T44T	3572
SEKER2	6311	T210K	1347	T32R3	2331	T45A1	3640
SELDSK	0260	T21T	1352	T32R4	2353	T45A2	3720
SETUP1	1233	T22E	1442	T32T	2370	T45E	3765
SETUP2	0225	T22R1	1400	T33E	2507	T45R1	3634
SKPERR	5634	T22R2	1423	T33R1	2400	T45R2	3650
SKPWAT	0433	T22T	1440	T33R2	2431	T45R3	3711
SKWAT	5134	T23E	1506	T33R3	2450	T45R4	3723
SOFERR	0171	T23R1	1451	T33R4	2467	T45SC	3626
STAERR	5636	T23R2	1470	T33T	2511	T45T	3767
STCON	0157	T23T	1510	T34E	2546	T4E	0404
STPCHK	7577	T24E	1554	T34T	2550	T4T	0406
STPHLT	6417	T24S	1513	T35E	2615	T5E	0420
STRAUT	5310	T24T	1556	T36E	2673	T5T	0422
STREG	0146	T25E	1642	T36N	2700	T6E	0435
SWR	0020	T25S	1602	T36R	2637	T6T	0437
SWREK	4012	T25T	1644	T36T	2703	T7E	0451
TOE	0256	T26E	1714	T37A	3050	T7T	0453
T10E	0571	T26R1	1651	T37E	3100	T8E	0477
T10R	0502	T26R2	1673	T37R	3015	T8R	0456
T10T	0573	T26T	1716	T37T	3102	T8T	0501
T11E	0637	T27E	1745	T38DE	3157	T9E	0532
T11R1	0602	T27R1	1723	T38E	3146	T90K	0531
T11R2	0612	T27R2	1745	T3A0K	3156	T9R	0507
T11R3	0616	T27T	1767	T3AR	3115	T9T	0534
T11T	0601	T28E	2055	T3AT	3161	TABLA	0461
T12A	0673	T28I0A	2015	T39DE	3235	TABLB	0471
T12E	0677	T28I0B	2017	T39E	3224	TAPROT	5070
T12R	0654	T28I0C	2022	T390K	3234	TCNTR1	0134
T13A	0747	T28I0D	2025	T39R	3173	TCNTR2	0135
T13E	0753	T280K	2052	T39T	3237	TCNTR3	0136
T13R	0757	T2AR	2010	T3E	0355	TCNTR4	0137
T1AKE	1067	T28T	2057	T3T	0357	TCNTR5	0140
T14R	1013	T29E	2135	TAME	3263	TCNTR6	0141

Symbol	Value	Symbol	Value	Symbol	Value
TEXAD	5770	TST32	2262	XDDLPT	1112
TEXCA	5766	TST33	2400	XDASW	0520
TEXCH	5762	TST34	2514	XDOUT	0006
TEXCR	5750	TST35	2551	XDSKDN	7077
TEXDA	5764	TST36	2622	XERRO	0000
TEXDB	5760	TST37	3002	XFGURE	0030
TEXDT	5772	TST38	3105	XFLBUF	0031
TEXEND	7015	TST39	3164	XFRCT	0060
TEXGD	5752	TST4	0000	XGTREG	5362
TEXPC	5750	TST40	3240	XHFCHK	0027
TEXST	5756	TST41	3270	XHITRK	0064
THSFLO	0035	TST42	3400	XIONWT	0041
TICK	4530	TST43	3452	XKLBUF	0032
TIMSTP	3541	TST44	3517	XLAP	0163
TMANE	4722	TST45	3622	XLAS	0004
TMANOK	4721	TST5	0411	XLDAD	0052
TMANS	4643	TST6	0423	XLOCA	0051
TMANT	4720	TST7	0440	XLNCM	0050
TMPCNT	0746	TST8	0454	XLDMN	0055
TMPROT	2773	TST9	0502	XLOAD	0125
TOCT	6036	TSTCHA	0715	XLOTRK	0063
TOTST	5526	TSTSEK	4067	XMYLAS	7101
TOVRDT	4524	TTYLPT	1121	XNERRO	0037
TRK212	0066	TWOCT	4461	XONLY	0024
TSTR	0260	TYPE	4436	XOVRRD	0164
TSTOP	7102	UPAROW	0615	XPRINT	0036
TST1	0265	UPONE	6053	XPRN	0057
TST10	0540	WATISZ	4430	XRDAD	0046
TST11	0600	WATMES	0651	XRDBF	0056
TST12	0645	WRKBUF	7177	XRDCM	0045
TST13	0702	WTISZ	4000	XRDCR	0054
TST14	1010	XCACKP	1001	XRDST	0044
TST14P	0757	XCBCNT	0400	XREG	5364
TST15	1073	XCBCRL	1023	XRESTR	0025
TST16	1111	XCBECH	1063	XRNAD	0023
TST17	1133	XCBERR	1207	XSDKP	0047
TST18	1202	XCBIND	0635	XSKWAT	0033
TST19	1242	XCBOCT	1000	XTABLA	0057
TST2	0301	XCBPAS	0200	XTABLB	0060
TST20	1272	XCBPAU	0337	XTEXT	5363
TST21	1322	XCBPNT	0303	XTICK	0130
TST22	1400	XCBPSW	0656	XTOCT	0061
TST23	1445	XCBSW	0262	XWTISZ	0034
TST24	1511	XCBTTY	0272		
TST25	1600	XCBTYP	1077		
TST26	1645	XCLAB	0005		
TST27	1717	XCLDR	0053		
TST28	1773	XCOMP1	0042		
TST29	2062	XCOMP2	0043		
TST3	0326	XCRLF	0062		
TST30	2140	XDIN	0007		
TST31	2212	XDISKG	0026		

ERRORS DETECTED: 0

LINKS GENERAT?: 136

RUN-TIME: 30 SECONDS

4K CORE USED

A7577	5003	5017#												
ACCMP1	1097#	1312	1396	1402	1668	1705	1712	1770	1783	1790	2031	2877	2989	4248
ACCMP2	1098#	2537	2966											
ACL	48#													
ACREG	1246#	4025	4026											
ACSAVE	358	361	564	795	961	970	1026#							
ADREG	1204#	4190	4191	4193	4705	4709	4715	4716	4726	4727	4737	4740	4756	5113
	5117	5123	5124	5131	5135	5140	5149	5157	5155	5173				
AERRO	1223	5295	5296	5307	5310	5333#	5334	5350						
AGAIN	4439#	4463												
ALLBAK	3799#	3803	3807											
APA1	0233	0240#												
APERR	4226	4250	4257	4261#										
APMLT1	1061	4266#												
APR1	4227#	4262												
APT8	1265	5281#	5285											
APT8R	5301#	5319												
AUTO10	1133#	4423	4437	4462	4525	4531	4543	4547	4550	4554				
AUTPRO	1270	4207#	4270											
BGN	448	1266#	5227											
BGNBUF	1185#	2409	2429	2469	2050	2806	2867	2902	2907	3040	3040	3121	3161	3423
	4527	4502	4663	4700	5113									
BYRETR	031	0340												
C8BY1	141	143	156#	168										
C8BY2	988	990	1000#											
C8BY3	801	876	810#											
C8BY4	445#	624												
C8BY5	663	668#	876											
C8CHAR	224	230	373	382	390	392	394	548	637	647	657	661	665	667
	830	856#												
C8CKP	720	733	737#											
C8CKPA	88#	5080	5103											
C8CKSW	66#	4276												
C8CNTR	70#													
C8CONT	881	893#												
C8CRLF	78#													
C8DO1	261#	282												
C8DO10	960	965#												
C8DO11	529	533#												
C8DO2	760#	762												
C8DO3	308	314#												
C8DO4	725#	734												
C8DO7	457	461#												
C8ECHO	80#													
C8ERR	80#	2969	3007	3635	3725	4068	4079	4090	4180	4197	4265	4337	4493	4641
	4926	5109	5219											
C8GET	136	151	432	435	463	470	487	535	557#	565	594	886	810	828
	957	985	991	998	1000									
C8HANG	866	874#	880	886	892									
C8INOU	860	3710	5087											
C8OCTA	76#													
C8PASS	64#	3684												
C8PAUS	90#													

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C8PRNT    72#
C8ROPS   628#    673
C8RETD   531     536    539#
C8RETR   436     460    460#
C8SETC   527     532    534    538#
C8SETS   429     434    442    455    461    467#
C8SWIT    74#   1291   2949   3630   3641   4054   4074   4085   4208   5200
C8SWST   445     486    494    626    627    675    677#
C8THP1   722     725    729    732    736#
C8TTYI    66#
C8TYPE   828#   4900
CAF      498     497
CAREG   1243#   2432   2485   2983   3941   4192
CCNTR1  5205    5233#
CHANG   1268    5199#
CHANGR  5228#   5217
CHECK   4947    4962#
CHKCLA   134     397    359    5A8    622    802    919#   924    926    950
CHKERR  4445    4052#
CHKNEX  3927    3932#   3974
CHKSKP  4943#   4992   4994
CHNHLT  1058    5220#
CHNPOT  5227    5244#   5230
CKCOUT   142    158#    178    171
CLASIC  1115#   1290   2948   2968   3006   3629   3630   3680   3688   3709   3724   4053   4067   4873
        407A    4844   4889   4179   4196   4207   4260   4275   4336   4452   0648   4907   4925   5079
        5086    5182   518A   5199   521A
CLASIK   951    1010   1127   42804   42A6   4288   4294   4295   4319   4323
CLDR    1173    4637#   4459
CLKCNT  2056    3696   5291   5312   5317   5365   5368   5380   5387#
CLRALL  1106#   1316   1338   1360   1399   1651   1671   1685   1708   1716   1757   1770   1963   1996
        2029    2510   2529   2558   2540   2844   2844   2863   2892   2993   3654   3667   3713   3776
        3917    4252   4569   4574   4585   4610   4946   5101
CLRTRN  1911    1914   1016#
CMREG   1241#   1406   1463   1492   1594   1536   1570   1622   1628   1775   1813   1818   1836   1842
        1866    1878   1915   1926   1959   1986   1992   2000   2025   2033   2083   2098   2133   2147
        2161    2193   2242   2253   2292   238A   2347   2362   2395   2428   2456   2483   2513   2528
        2562    2570   2621   2641   2657   2723   2746   2760   2780   2801   2899   2921   2944
        2979    2996   3035   3050   3043   3084   3119   3123   3135   3179   3183   3195   3230   3274
        3281    3297   3293   3341   3350   3383   3391   3421   3425   3437   3534   3570   3993   3460
        4991    4113   4120   4133   4225   4238   4254   4519   4528   4570   4577   4582   4584   4625
        4658    4686   4706   4712   4950   4979   5002   5110   5120   5181   5185
CNGSAV  5228    5209   5215   5231#
CNT     1332    1566   1752   5381   53A5#
CNTRLC   415     493#
CNTRLD   421     526#
CNTRLE   428     485#
CNTRLL   416     474#
CNTRLO   417     428#
CNTRLR   418     441#
CNTRLS   419     455#    466
CNTVAL   163     175#
COMP1   1164    4034#   4030   4031
```

```
COMP2   1165    3467#   3479   3480
CONSOL   41#     59
CONST1  2052    2053   2055   2060#
COUNT   1329    2050   5367   5379   5386#
CRERR   3470    3479#
CRLF    1110#   1286   3700   3617   3820   3427   4373   4374   4383   4612
CRREG1  1237#   3472   3508   3577   3589   4014   4807
CRREG2  1238#   3475   3567   3573   4016   4071   4792
CRWRD1  1249#   25A1
CRWRD2  1250#   25A3
CYL450  1183#   2184   2196   2245   2256   2285   2311   2340   2365   2617   2660   2742   2783
DAREG   1242#   2433   2488   2935   3047   3148   3709   4718   4721   4921   4922   5126   5129
DATCNT  1251#   4530   4532   4545   4551   0725   4735   5134   5144   5147   5153
DBREG   1240#   4094   4095
DCLR    1074#   3074   4630
DCNT1   3823    3830   3833   3857   3876   3883   3892#
DCNT2   3686    3770   3779   3796   3826   3858   3866   3873   3877   3881   3893#   3911   3920   3975
DCNT3   3832    3852   3894#
DCNT4   3843    3844   3886   3895#
DIN     1129    3998#   4014   4015   4016   4020
DISK0   2214#
DISK1   2215#
DISK2   2216#
DISK3   2217#
DISK4   2218#
DISK5   2219#
DISK6   2220#
DISK7   2221#
DISKG   1152    4651#   4655   4657   4676   4678
DISKGO  1087#   1814   1919   1837   1843   1873   1881   1922   1929   1960   1967   1993   2001   2026
        2034    2085   2101   2135   2150   2187   2197   2248   2257   2294   2312   2349   2566   2398
        2458    2516   2523   2566   2573   2623   2603   2661   2681   2725   2748   2763   2784   2965
        2980    2997   3232   3283   3295   3343   3352   3393   3536   3570   3955   3962   4127   4224
        4239    4255
DLAG    1075#   2413   2473   2912   3053   4925
DLCA    1076#   2418   2470   2908   3049   4190
DLOC    1078#   2408   2468   2910   3051   5186
DMAN    1079#   3722
DOCNT    165     167    172#
DONEA    372     379#
DOPACK   135    142#
DOSET    159     166    169    174#
DOUT    1128    4629#   4633
DRIVNO  1188#   1309   1334   1355   1366   1383   1763   1786   1A70   1919   1954   1988   2020   2080
        2130    2177   2238   2288   234X   238A   2613   2638   2720   2738   2814   2849   2878   2896
        2898    2954   2960   2976   3030   3117   3177   3264   3332   3419   3530   3772   3783   3800
        3880    3913   3924   3935   3947   3969   3979   4066   4213   4219   4228   4235   4623   4661
        4992    4957   5292   5300
DRBT    1077#   2016   2476   2915   3056   4334
DRVCNT  1187#   1209   3680   3683   5204   5299   5306   5328
DRVHAV  1186#   1288   3682   3768   3780   3797   3824   3850   3860   3863   3865   3909   3921   3976
        5321
DSKBA   3994    5255   5259#
```

```
DSK00    5063#
DSK1A    5060#
DSK1B    5060#
DSK2A    5061#
DSK2B    5065#
DSK3A    5062#
DSK3B    5066#
DSKADD   3938   3939   3941   3943   3946   3959   3993#
DSKIN    1083#  3785   3802   3926   3981
DSKON    1658   1699   3831   3875   3896#  5325
DSKOUT   1082#  3775   3916   3972
DSKP     1073#  1700   2913   3054
DSKPOT   3937   3944#
DSKSAV   5039   5045#
DSKSKP   1103#  1336   1339   2434   2492   2924   2860   2874   3127   3187   3429   3652   3665   4007
         4176   4320   4631   4985
DTERR    4714   4722   4731   4704   4755#
DTREG    1245#  4496   4497   4797   5174
ENDBUF   1268   5307#
ENDHLT   1262   3711#
ENDIT    651    656    6740#
ENDTRK   1257#  1516   1588   2924   3049   3141   3281   3443   5035
ENDTST   3603   3679#
ERHLT1   1249   4191#
ERHLT2   1050   4642#
ERHLT3   1051   4927#
ERHLT4   1052   4198#
ERHLT5   1053   4338#
ERHLT6   1054   5190#
ERHLT7   1055   3726#
ERHLT9   1056   4050#
ERR1     660    664    670#
ERR4I    4358   4367#
ERRMES   967    1820#
EPRO     1162   4352#  4354   4365   4367   4369   4371   4375   4387   4389   4395   4398   4486   4487
         4011   4419   4426   4430   4459   5352
ERROR    1095#  1320   1301   1371   1000   1033   1452   1472   1491   1520   1550   1592   1638   1676
         1725   1796   1800   1823   1847   1891   1939   1973   2007   2040   2111   2160   2207   2267
         2322   2376   2440   2407   2503   2592   2691   2794   2833   2879   2938   3003   3093   3150
         3214   3242   3307   3362   3483   3456   3590   3809   3980   4140   4261
ERTX1    4475   5262#
ERTX2    4476   5263#
ERTX3    4477   5264#
ERTX4    4478   5265#
ERTX5    4479   5266#
ERTX6    4080   5267#
ERTX7    4081   5268#
ERTX8    4482   5269#
ESCOPE   4366   4449   4451   4466#
EXIT     4877   4888   4897#
EXITA    321    3894
F1OP1    56#
F1OP2    57#
```

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FISWR    55#
FGURE    1154   4792#  4749   4758   4759
FIGURE   1093#  1885   1933   2105   2154   2201   2261   2516   2370   2665   2685   2767   2788   3001
         3078   3106   3206   3216   3200   3354   3397   3408   3581   3966   4142   4259
FILBUF   1090#  1868   1913   1953   1987   2019   2076   2126   2175   2236   2282   2337   2560   2611
         2634   2715   2736   2894   2959   3267   3330   3516   3945   4096   4218
FILCNT   758    761    765#
FILLER   756    760#
FLBUF    1155   4539#  4555
FLSAVE   360    561    797    943    982    1028#
FROCT    1178   4844#  4862   4873   4870   4885   4894
GOREG1   1235#  2530   2582   3469   4681
GOREG2   1236#  1307   1315   1394   1480   1693   1697   1710   1717   1760   1781   1788   2463   2531
         2580   2819   2866   2996   2985   3063   3077   4005   4018   4028   4240   4483   4670   4703
         4729   4732   4734   4746   4755   4965   4973   4982   4997   5005   5111   5137   5141   5143
         5148   5163   5172
GETCH1   602#   650
GETDAT   369    370    377    685#
GETDRV   3679   3687   3771   3782   3790   3867   3872#  3885   3886   3912   3923   3978
GOBAK    5010#  5013
GOITA    375    392#
GOTADD   5034   5038#
GOTOA    397    398    399    420    401#
GOTSKP   4987   4996#
GTF      474    363    796    942
GTREG    4469   4597#  4601   4672   4616   4621   4629
HAPCHK   1108#  1971   2005   2030   4130
HEDHLT   1263   3636#
HEDLST   4470   4075#
HEDTAD   4377   4470#
HFCHK    1153   5110#  5166   5175   5176   5220
HFERR    5122   5132   5139   5151   5161   5172#
HFR1     5134#  5145
HFR2     5140#  5154
HITRK    1069   1182   5390#
HOMEMA   1247#  1273   1274   1302   2287   2813   2848   2969   2899   3033   3118   3178   3420   4627
         4660   4943   4956
HRDERR   4680   4690   4693#
ICNTR1   4159   4161   4184#
ICNTR2   4158   4163   4185#
INDEXA   367    376    396    602#
INHIBT   4372   4408   4068#
INMODE   379    428    443    634    829    833    837#
INTADD   1011   4167#
INTRQ    1282   1411#
IONWAT   1096#  1358   1362   1369
IONWT    1163   4155#  4166   4175   4178
IOT1     1700#  5235
IOT1A1   2913#  5242
IOT1A2   3054#  5247
IOT2     4638#  5236
IOT2A2   3070#  5248
IOT3     4923#  5237
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IOTSA1    29120   5243
IOT3A2    30534   5249
IOT4      4194#   5258
IOT4A1    2988#   5204
IOT4A2    30494   5250
IOT5      4334#   5239
IOT5A1    2915#   5245
IOT5A2    3056#   5251
IOT6      5186#   5248
IOT6A1    2910#   5206
IOT6A2    3051#   5252
IOT7      3722#   5201
K0001     11894#  1279  2024  2025  2465  2481  3085  4955
K0002     1190#   1291  1695  1759  2858
K0003     1191#   1283  1730  3540  3878  5294
K0004     1192#   3706  3942  5045
K0005     1193#   1564  3585
K0006     1194#   1305  2953  4065  4212
K0007     1195#   3606  3659  4117  4376  4787  4713  4817  4821  4851  5115  5121
K0010     1135#   2865  3065  3593  4599  4682
K0017     1229#   1531  2515  2522  2564  2572  3255  3470  3521  3572  4806
K0020     1136#   1750  2984  3498  3512  3558  3746  4243  4492  4517  4561  4798  4804
K0037     1210#   1860  1880  1917  1928  2078  2100  2128  2149  2183  2195  2244  2255  2284
          2310    2339  2360  2397  2412  2432  2457  2472  2487  2616  2636  2659  2680  2718
          2741    2762  2782  3375
K0040     1137#   1393  1580  4565
K0077     1204#   1618  4886
K0172     113A4#  1435  1841  1958  1999  2024  2032  4130  5302
K0177     3641    3891#
K0200     1139#   1398  1733  1353  1365  1649  1700  1776  3741  3842  4002  4578  4978  5083
K0207     4363    4465#
K0212     4834    4839#
K0215     4832    4838#
K0240     3855    4840#  4892
K0260     3834    3888#  4818  4822  4852
K0277     3836    3890#
K3306     1253#   4679  5012
K0331     3848    3890#
K0400     1140#   1294  1354  4168  4443  4512
K0770     5203    5225#
K1000     1141#   1617  1840  1877  1965  1990  2031  2097  2192  2387  2486  2427  2519  2569
          2656    2677  2871  2995  3032  3116  4253
K1234     1196#   4553  4738  4743  5157  5160
K2000     1197#   4227  4475
K2525     1205#   1863  1884  1952  1970  2018  2037  2075  2104  2170  2200  2336  2360  2559
          2633    2684  2735  2787  2893  2954  3000  3077  3145  3205  3235  3266  3298  3329
          3355    3396  3447  3506  3579  3580  4217  4258
K3020     1198#   1701  1762  3647  3660  4626  4958
K3740     4889    4902#
K4000     1199#   1914  2132  2241  2346  2417  2422  2722  2745  2815  2918  2916  2932  3059
          3130    3190  3280  3340  3432  3533  3693  3766  3952  4012  4672  4969  4999  5263
          5336    5362
K4100     4691    4901#
```

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K5000     1207#   1812  1830  1845  1957  1991  2023  2082  2180  2291  2394  2512  2561  2620
          2640    2850  2907  2963  2978  4106  4222  4237
K5252     1206#   1912  1932  1986  2004  2125  2153  2235  2260  2281  2315  2610  2660  2710
          2766    3515  3944  3965
K5300     1255#   1390  2081  2461  2986  3068  3150  3210  3452  3924  4245  4693  4752  5004
          5169
K5373     1254#   3075  3148  3208  3450  4675
K5403     1282    4012#
K6000     1200#   4017  4100  4688  4972  4984
K6304     1256#   2576  2577
K6500     5377    5380#
K6520     5349    5353#
K7000     1201#   1301  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#   1610  2995  3252  3323  4475
K7707     4057    4150#
K7740     1212#   1607  1861  1910  2073  2090  2123  2144  2172  2233  2279  2303  2334  2358
          2392    2450  2608  2631  2652  2674  2712  2733  2757  2776  3376  3511  3557  3613
          4157    4317  4966
K7760     1202#   2507  2555  2565  2973  3256  3517  3525  3561  3566  3650  3663
K7771     1208#   4424
KAERRO    1223#   4353
KCDP      1211#   1275  5344  5372
KCNT      1262#   3495  3698  5369  5382
KMFCHK    5204    5213  5224#
KILBUF    1209#   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  5315  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
LOAD      1172    4929#  4924
LOADP     1102#   1347  1703  1766  2821  2852  2873  3126  3186  3428  3651  3664  4238  4630
          4666    4961
LOCA      1171    4189#  4195
LOCH      1170    5180#  5187
LOCMD     1134#   1310  1335  1356  1367  1384  1666  1702  1760  1777  1787  2816  2851  2872
          3124    3184  3426  3608  3661  4099  4083  4229  4572  4574  4624  4628  4662  4944
          4959    4980  5000
LOCUR     1105#   2847  2968  3122  3182  3420  4606  4664
LDMAN     1108#   2823  2825  2827  2854  2856  2859  3737  3739  3742  3747  4491  4493  4506
          4510    4513  4518  4688  4782  4784  4786  4791  4796  4798  4805
LDMN      1175    3615  3616  3721#  3723
LOADCT    1215    2050#  2051  2057  2058
```

```
LOTRK    1870    1141    5395#
LPDAT    4546#   4552
LPFIG    4726#   4796
M12      12190   3734    4505    4779    4793
M4       1655    1687    3825    4848    4863#
MANPRO   1269    2901#   3013
MANUAL   1267    4353#
MESA      629     680#
MESAC     973    1022#
MESFL     981    1024#
MESHAN    889     800#
MESHG     977    1023#
MESPAS    147     176#
MESPC     969    1021#
MPERR    2967    2991    2999    3003#
MPHLT1   1259    2970#
MPHLT2   1260    3200#
MPR1     2975#   3024
MQA        51#    365     798     944
MQL        50#    560
MQSAVE    366     559     799     945     970    1227#
MYAC     1006    1012    1018#
MYLAS    1126    4274#   4278    4318    4325    4327
NDIN     4000#   4017#
NERRO    1161    5073#   5074    5077    5093    5102    5103    5104    5229
NERROR   1090#   1319    1342    1370    1403    1432    1451    1471    1490    1519    1553    1591    1637    1675
         1724    1795    1822    1806    1890    1938    1972    2006    2039    2118    2159    2206    2246    2321
         2375    2439    2496    2542    2591    2690    2793    2832    2878    2937    3002    3092    3153    3213
         3241    3326    3361    3402    3455    3597    3808    3987    4143    4260
NEXOSK   3681    3699    3712#
NEXTST   5297    5100#
NL7775   1080#   1751
NMES1    1732#   3792    3810
NMES2    3822    5193#
NMES3    3755#   3839
NOCLR    4567    4505#
NOSET     162     167#
NOTDON   3786    3789#
NOTEX    4028    4058#
NSCOPE   5094    5126#
NTCLAS    956     991#
NTCRC    4010    4019#
NTGO     4393    4406#   4457
NTSPK    4108    4116#
NXTDSK   3828#   3859
OCTEL    1111#   4388    4004    4017    4038
ONLY     1150    4941    4949#   4951    4953    5008    5011
OP1      1146#   4299    4300
OP2      1147#   4289    4301    4302
OVRDER   3931    3957    3968    3968    3980#
OVRDOK   3926    3935#
OVRERR   3786    3805    3809#
OVRLAP   3752    3765#   3810    3812
```

```
OVROK    3787    3792#
OVRR1    3768#
OVRR2    3771#   3778    3799
OVRR3    3782#   3790    3791
OVRRD1   3909#
OVRRD2   3912#   3919
OVRRD3   3923#   3933    3934
OVRRED   3753    3906#   3989    3991
PASCNT    144     148     173#
PCLF       43#    865     867
PCNTR1   4025    4039    4472#
PCNTR2   4421    4431    4432    4433    4460    4461    4473#
PCSAV    5310    5316    5341    5346    5394#
PCSAVE    996     997     999    1025#
PERROR   5300    5352#
PNTBUF    854     858     864     870#    877     883
POLERR   3929#   3984
PRINT    1160    4906#   4910    4916
PRN      1177    4867#   4869    4872    4896    4898
PRNTER   1110#   3721    3783    3818    3821    3826    4381    4384    4396    4412    4435
PRSFLD   1159    1276    1284#
PSIE       46#
PSKE       40#
PSKF       42#    878
PSTB       45#    865
PTSTOR    259     261     272     281     283#
RANADD   1084#   1629    1613    1617    3225    3254    3258    3262    3325    3374    3378    3774    3915    3971
ROAD     1168    3614    3618    3732#   3750
RDAMD    1101#   4610
RDBF     1176    4869#   4898
RDBUF    1109#   4620
RDCH     1167    4503#   4521
RDCMD    1120#   4611
RDCR     1174    4777#   4805
RDCRC    1127#   2536    2589    4609
RDST     1166    4333#   4302
RDSTAT   1099#   1311    1317    1395    1601    1667    1704    1711    1718    1769    1782    1789    2830    2876
         3129    3189    3431    3655    3668    4006    4011    4231    4603    4671    4968    4984    4998    5006
REALPC    952     970    1017#
RECAL    1085#   1429    1468    1697    1575    3336    3346
REDBAK   3978#   3982    3988
REDDA    3704     378
REG0     1225#   1293    1352    1609    1790    2957    3714    4260    4216    5095
REG1     1226#   2956    3715    4215    5098
RESEK    3640#   3671
RESTOR   1151    4935#   4937    4939    4440
RESTRT   1260#   1271    4355    5074    5099
RETRN    4677#   4680    4692    4694
RETRN2   4368    4450    4456    4667#
RNAD     1149    4967    4993    5021#   5052
RNWRD1   5024    5027    5030    5056#
RNWRD2   5025    5028    5031    5032    5037    5057#
RNWRD4   4991    5038    5042    5051    5058#
```

```
ROUINS    1004#    4324    4307
ROUTNP    4287     4303    4310#
RSTRT     5221     5227#
SAMDSK    3688#
SAVAC     4285     4293    4305    4309#
SAVOAT    1252#    4540    4548
SAVPC     4938     4952    5019    5015#
SAVPCT    1259#    3039    4456    4677    4753    5170
SAVPOT    5022     5040    5041    5043    5044    5046    5048    5049    5054#
SAVTO     4958     4960    5016#
SAVTRK    4652     4665    4696#
SBCNT1    1227#    3735    3743    4506    4514    4740    4787    4794    4799    4813    4814    4828
SCOPE     4466     4559#   5124
SDKP      1169     1739#   1742    1743
SEEK      1006#    1408    1465    1484    1506    1538    1572    1624    1630    2809    3274    3289    3385    4112
SEKER1    4963     4995    5012#
SEKER2    4977     4999    5001    5209#
SELDSK    1287     3816#   3862    3868
SETUP1     960#
SETUP2     153#
SKPERR    4668     4679#
SKPWAT    1092#    1388    1767    1778    4575    4588    4667    4962
SKWAT     1157     4314#   4328    4329
SOFERR    1258#    3040    3071    3113    3174    3016    4654    4691    4707    4751    5164    5168
STAERR    4670     4681#
STCON     1248#    1652    1696    1709
STPCHK    1971     5399#
STPHLT    1057     5088#
STRAUT    4426#    4443
STREG     1239#    2423    2470    2933    2988    3057    3058    3060    4207    4300    4301    4681    4978
SWR       1008#    1009    1145#   4297    4298
SWSEK     3679#
TOE       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#
```

```
T16T      1838     1844    1849#
T17E      1875     1883    1887    1891#
T17S      1863#    1889
T17T      1874     1882    1893#
T18E      1924     1931    1935    1939#
T18S      1912#    1937
T18T      1923     1930    1941#
T19E      1962     1969    1973#
T19OK     1972#
T19T      1961     1968    1975#
TIE       1337     1341#
T20E      1995     2003    2007#
T20OK     2006#
T20T      1994     2002    2009#
T21E      2028     2036    2040#
T21OK     2039#
T21T      2027     2035    2042#
T22E      2087     2103    2107    2111#
T22R1     2077#    2089
T22R2     2096#    2109
T22T      2086     2102    2113#
T23E      2137     2152    2156    2160#
T23R1     2127#    2139
T23R2     2146#    2158
T23T      2136     2151    2162#
T24E      2189     2199    2203    2207#
T24S      2174#    2205
T24T      2188     2198    2209#
T25E      2250     2259    2263    2267#
T25S      2235#    2265
T25T      2249     2258    2269#
T26E      2296     2314    2318    2322#
T26R1     2283#    2298
T26R2     2305#    2320
T26T      2295     2313    2324#
T27E      2351     2368    2372    2376#
T27R1     2338#    2353
T27R2     2360#    2374
T27T      2350     2367    2378#
T28E      2400     2036    2040#
T28IOA    2408#    5253
T28IOB    2410#    5254
T28IOC    2413#    5255
T28IOD    2016#    2421    5256
T28OK     2419     2437#
T28R      2403#    2436
T28T      2399     2402    2042#
T29E      2460     2099    2097#
T29IOA    2468#    5257
T29IOB    2478#    5258
T29IOC    2473#    5259
T29IOD    2076#    2491    5260
T29OK     2490#
```

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T29R    2064#   2495
T29T    2459    2062    2049#
T29W    2478    2090#
T2E     1359    1364    1371#
T30D    2533    2536#
T30E    2518    2525    2530    2503#
T30R    2509#   2541
T30T    2517    2524    2527    2545#
T31E    2568    2576    2580    2592#
T31R    2557#   2590
T31T    2567    2575    2578    2590#
T32E    2625    2645    2663    2667    2683    2687    2691#
T32R1   2615#   2627
T32R2   2635#   2647
T32R3   2654#   2669
T32R4   2676#   2689
T32T    2620    2604    2662    2682    2693#
T33E    2727    2750    2765    2769    2786    2790    2794#
T33R1   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    2906#   2926    2938
T36T    2940#
T37A    3061    3073#
T37E    3070    3066    3093#
T37R    3042#   3087    3091
T37T    3030    3069    3076    3095#
T38DE   3154#
T38E    3132    3145#
T38DK   3140    3153#
T38R    3120#   3139    3143
T38T    3151    3156#
T39DE   3214#
T39E    3192    3205#
T39DK   3204    3213#
T39R    3180#   3199    3203
T39T    3211    3216#
T3E     1389    1398    1404#
T3T     1386    1391    1406#
T40E    3234    3234    3242#
T40R    3225#   3240
T40S    3229#
T40T    3233    3244#
T41E    3278    3285    3291    3297    3301    3307#
T41R    3250#   3305
T41S    3266#   3303
```

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T41T    3277    3284    3290    3296    3308#
T42E    3338    3345    3348    3350    3358    3362#
T42R    3325#   3360
T42S    3329#
T42T    3337    3344    3347    3353    3364#
T43E    3307    3395    3399    3403#
T43R1   3373#   3401
T43R2   3378#   3389
T43T    3386    3394    3405#
T44E    3430    3447#
T440K   3446    3455#
T44R    3422#   3441    3445
T44T    3453    3458#
T45A1   3507    3516#
T45A2   3553    3561#
T45E    3538    3576    3583    3598#
T45R1   3508#   3505
T45R2   3520#   3543
T45R3   3550#   3591
T45R4   3560#   3568
T45SC   3592#   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    1513
T8T     1507    1522#
T9E     1500    1554#
T90K    1550    1553#
T9R     1535#   1547    1552
T9T     1539    1556#
TABLA   400     406#
TABLB   405     410#
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    2070    2077    2088    2095    2099    2108    2124    2127    2138    2105    2146
        2157    2173    2182    2190    2204    2234    2243    2254    2264    2280    2283    2297    2304    2309
        2319    2335    2338    2352    2359    2363    2373    2393    2403    2424    2431    2437    2455
        2464    2071    2480    2486    2494    2506    2514    2521    2540    2556    2563    2571    2589    2609
        2615    2626    2632    2635    2646    2653    2656    2668    2675    2679    2688    2713    2717    2728
        2734    2700    2751    2758    2761    2770    2777    2781    2791    3031    3046    3052    3061    3088
        3114    3125    3133    3140    3175    3185    3193    3200    3259    3275    3288    3326    3334    3342
        3351    3017    3427    3435    3442    3499    3504    3513    3551    3559    3592    3594    3635    3658
        3662    4058    4062    4063    4064    4098    4100    4109    4116    4119
TCNTR2  1229#   1502    1505    1509    1515    1534    1535    1548    1551    1568    1571    1579    1581    1587
        1610    1623    1650    1657    1663    1672    1686    1689    1698    1721    2415    2428    2475    2498
```

```
            988
XC8PSW      75     533    619#   622    676
XC8SW       67     137    152    199#   286    958    986    992
XC8TTY      69     273#   231    662    593    885    827
XC8TYP      83     271    287    3A3    385    547    549    633    671    726    755    766    832    893#
            869
XCLAS      1115   1127#
XCLOR      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   2061   2131   2178   2259   2289   2344   2619   2639
           2721   2739   2897   2922   2975   2961   2977   3270   3333   3531   3532   3946   3951   4118
           4220   4236
XIONWT     1096   1163#
XKLBUF     1089   1156#
XLAP       3684   3752#
XLAS       1116   1264#
XLOAD      1102   1172#
XLOCA      1105   1171#
XLOCH      1104   1179#
XLOHN      1108   1175#
XLOAD      1215#   1647   1659   2399   2452   2985   2889   3024   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
XHYLAS     5290   5327#
XNERRO     1094   1161#
XONLY      1086   1159#
XOVRRO     3685   3753#
XPRINT     1113   1160#
XPRN       1110   1177#
XROAD      1101   1168#
XROBF      1109   1176#
XROCH      1100   1167#
XROCR      1107   1174#
XRDST      1399   1466#
XREG       4422   4471#
XRESTR     1785   1151#
XRNAD      1284   1149#
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X5DKP      1103   1169#
X$SKWAT    1092   1157#
XTABLA      368    898#
XTABLB      395    895#
XTEXT      4420   4477#
XTICK      1117   1224#
XTOCT      1112   1179#
XWTISZ     1091   1158#
.L0357      312    317#
.L0360      279    318#
.L0361      278    319#
.L0362      276    320#
.L0363      273    321#
.L0364      271    280    322#
.L0365      262    323#
.L0366      229    230    324#
.L0367      228    325#
.L0370      227    326#   1332   1414#
.L0371      200    327#   1329   1415#
.L0372      155    328#   1287   1416#
.L0373      149    329#   1285   1417#
.L0374      145    150    330#   1270   1418#
.L0375      138    153    331#   1269   1419#
.L0376      136    151    332#   1268   1420#
.L0377      134    307    333#   1267   1421#
.L0560      498    593#
.L0561      462    504#
.L0562      445    486    494    505#
.L0563      444    477    485    495    506#
.L0564      441    474    476    493    507#
.L0565      432    435    463    478    487    508#
.L0566      393    509#
.L0567      386    510#
.L0570      384    511#
.L0571      383    385    512#
.L0572      379    428    443    513#
.L0573      373    382    390    392    394    514#
.L0574      366    515#
.L0575      364    516#
.L0576      359    517#
.L0577      358    361    518#   1566   1599#
.L0752      670    683#
.L0753      666    684#
.L0754      662    685#
.L0755      658    686#
.L0756      654    687#
.L0757      640    688#
.L0760      635    642    689#
.L0761      634    690#
.L0762      632    691#
.L0763      631    692#
.L0764      626    693#
.L0765      593    694#
```

```
.L0766   591   628   695#
.L0767   588   629   696#
.L0770   564   697#
.L0771   561   698#
.L0772   559   699#
.L0773   550   672   670   700#
.L0774   548   637   647   657   661   665   667   701#
.L0775   547   549   633   671   702#
.L0776   546   7030  1658  1690  1734#
.L0777   530   595   700#  1655  1687  1735#
.L1162   891   896#
.L1163   888   897#
.L1164   807   830   885   898#
.L1165   826   810   824   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  1030#
.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#  2056  2062#
.L1377   922  1041#  2054  2063#
.L2176  2527  2534#
.L2177  2518  2525  2535#
.L2377  2541  2698#
.L3377  3199  3203  3321#
.L4175  3696  3757#
.L4176  3686  3758#
.L4177  3679  3687  3759#
.L4375  3855  3898#
.L4376  3825  3899#
.L4377  3771  3782  3799  3900#
.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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```
.V0000   960  1037#
.V0007   666   644#  726   908#
.V0020  1009  1031#  4290  4346#
.V0021  4300  4345#
.V0022  4302  4344#
.V0040   632   691#
.V0077   273   321#
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