

IDENTIFICATION

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PRODUCT CODE: AC-F378B-MA  
 PRODUCT NAME: AJRLLB0 RLB-A/RL02 PCK VFYR  
 PRODUCT DATE: SEPT, 1981  
 MAINTAINER: DIAGNOSTIC ENGINEERING GROUP  
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S.1.1 PROGRAM PURPOSE (ABSTRACT)  
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THIS PROGRAM IS INTENDED TO DETECT NEW BAD SECTORS ON RL02 DISK PACKS AND UPDATE THE FIELD BAD SECTOR FILES (ON CYL377, HEAD1) TO INCLUDE THEM. THE PROGRAM MAY ALSO BE USED TO TYPE THE BAD SECTOR FILES ON THE CONSOLE DEVICE, AND TO REWRITE THE MANUFACTURING BAD SECTOR FILES (WITH NO BAD SECTORS) IF THEY HAVE BEEN DESTROYED.

S.1.2 SYSTEM REQUIREMENTS  
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S.1.2.1 HARDWARE REQUIREMENTS  
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PDP8/E,F,M,OR A WITH 8K MEMORY  
VT278 WITH 16-32K OF MEMORY  
CONSOLE DEVICE (ASR 33 OR EQUIVALENT)  
RL8A CONTROLLER WITH ONE OR MORE RL02 DRIVES CONNECTED  
RL278 CONTROLLER WITH ONE OR MORE RL02 DRIVES CONNECTED

S.1.2.2 SOFTWARE REQUIREMENTS  
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THIS PROGRAM IS FULLY COMPATABLE WITH OS/8.

S.1.3 RELATED DOCUMENTS AND STANDARDS  
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DEC STANDARD 144 (COVERING BAD SECTOR FILES FOR DEC DISKPACKS.)

S.1.4 DIAGNOSTIC HIERARCHY PREREQUISITES  
-----

THIS PROGRAM IS NOT INTENDED FOR RL8A/RL02 DIAGNOSIS, AND ALL RL8A/RL02 DIAGNOSTICS SHOULD RUN SUCCESSFULLY PRIOR TO RUNNING THIS PROGRAM.

S.1.5 ASSUMPTIONS  
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THE CPU, CONSOLE DEVICE, THE FIRST 8K OF MEMORY, AND THE RL8A/RL01 SUBSYSTEM ARE ASSUMED TO BE FAULT FREE. IF A FAULT IS SUSPECTED IN THESE UNITS, THE APPROPRIATE DIAGNOSTICS SHOULD BE RUN FIRST.

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**S.2.1 LOADING AND STARTING PROCEEDURES**  
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THE PROGRAM MAY BE LOADED BY PAPER TAPE, APT, OR STANDARD OS/8 LOADING PROCEEDURES. THE STARTING ADDRESS IS 200. THE PROGRAM MAY BE RESTARTED AT LOCATION 201, WHICH WILL ALLOW THE USE OF PREVIOUS PARAMETERS AND UNITS.

**S.2.2 SPECIAL ENVIRONMENTS**  
 -----

THIS PROGRAM MAY BE LOADED UNDER APT8A, BUT MAY NOT BE MONITORED BY THE APT8A SYSTEM.

**S.2.3 PROGRAM OPTIONS**  
 -----

**S.2.3.1 OPERATOR PROMPTS**  
 -----

THE CONSOLE PACKAGE (S.2.3.3) IS ALWAYS ACTIVE AND CANNOT BE DISABLED.

THE DEFAULT RESPONSE TO ALL "YES/NO" QUESTIONS IS ALWAYS "NO" AND MAY BE GOTTEN BY TYPING A "<CR>". TYPE "Y" FOR YES, "N" (OR "<CR>") FOR NO.

THE FOLLOWING PROMPTS ARE ISSUED PRIOR TO PACK VERIFICATION:

"SELECT NON-DEFAULT PARAMETERS?"

OR

"CHANGE PREVIOUS PARAMETERS?" (IF UNITS HAVE ALREADY BEEN VERIFIED.)  
 IF NO, THE DEFAULT ("NO" RESPONSES) OR PREVIOUS RESPONSES WILL BE USED (DEPENDING UPON THE QUESTION).  
 IF YES, THE FOLLOWING QUESTIONS WILL BE ASKED:

"USE DEVICE CODES 62,63?"

IF NO, THE STANDARD DEVICE CODES 60,61 ARE USED.

"TYPE BAD SECTOR FILES?"

IF YES, THE BAD SECTOR FILES WILL BE TYPED PRIOR TO ANY PACK VERIFICATION OR MODIFICATION OF THE FILES.

"SUPPRESS HEADER VERIFICATION?"

IF YES, HEADER VERIFICATION WILL NOT BE PERFORMED. (THIS OPTION IS PROVIDED IN CASE ONLY BAD SECTOR FILE TYPEOUT IS DESIRED.)

SINCE DATA AREA VERIFICATION DESTROYS ALL DATA PREVIOUSLY ON THE DISK, IT IS MADE OPTIONAL.

"USE CYLINDER LIMITS?"

THIS QUESTION IS ASKED ONLY IF HEADER AND/OR DATA AREA VERIFICATION IS REQUESTED.

IF NO, THE DEFAULT LIMITS (0-377) ARE USED.

IF YES, THE OPERATOR IS PROMPTED TO ENTER FIRST THE UPPER LIMIT AND THEN THE LOWER LIMIT IN OCTAL. THE UPPER LIMIT MUST BE GREATER THAN OR EQUAL TO THE LOWER LIMIT.

"ENTER FIELD BAD SECTOR LIMIT IN DECIMAL (DEF=126):"

THIS QUESTION IS ASKED ONLY IF HEADER AND/OR DATA AREA VERIFICATION IS REQUESTED.

THE OPERATOR MAY TYPE A <CR> TO ACHIEVE THE DEFAULT OF 126, OR HE MAY ENTER A VALUE FROM 0 TO 126. IF THE NUMBER OF FIELD BAD SECTORS EXCEEDS THIS NUMBER, THE PACK WILL BE REJECTED. (THE FIELD FILES WILL NOT HAVE BEEN MODIFIED.)

"DELETE OLD FIELD BAD SECTOR FILES?"

THIS QUESTION WILL ONLY BE ASKED IF BOTH HEADER AND DATA AREA VERIFICATION ARE REQUESTED, AND DEFAULT CYLINDER LIMITS ARE USED.

IF YES, THE OPERATOR IS ASKED "ARE YOU SURE?"

ANY CHARACTER OTHER THAN "Y" WILL CAUSE THE QUESTION TO BE REASKED. IF DELETION IS REQUESTED, PREVIOUS RESPONSES WILL NOT BE ALLOWED AFTER VERIFICATION OF THE SELECTED PACKS.

"FORCE BAD SECTORS?"

IF YES, SECTORS MAY BE FORCED INTO THE BAD SECTOR FILE. THIS FEATURE IMPLIES THAT ONLY ONE UNIT MAY BE VERIFIED. THE OPERATOR WILL BE ASKED TO ENTER THE UNIT NUMBER AND THE BAD SECTOR ADDRESSES (IN OCTAL) THAT HE WISHES TO FORCE INTO THE FILE. THESE ARE THE ONLY PROMPTS FOR WHICH THERE ARE NO DEFAULTS. WHEN NO MORE BAD SECTORS ARE TO BE ENTERED, A <CR> MUST BE TYPED IN RESPONSE TO THE PROMPT FOR THE CYLINDER ENTRY. PREVIOUS RESPONSES WILL NOT BE ALLOWED AFTER VERIFICATION OF THE SELECTED UNIT. THE FOLLOWING QUESTION(S) CONCERNING UNITS WILL NOT BE ASKED.

"TEST UNIT N ?" (ONCE FOR EACH UNIT)

OR

"TEST SAME UNIT(S) AGAIN?"

THE FIRST TIME, THE OPERATOR IS ASKED WHICH UNITS ARE TO BE VERIFIED INDIVIDUALLY. THEREAFTER, HE MAY USE THE SAME UNITS, OR CHANGE THEM.

"ARE YOU SURE?"

ANY CHARACTER OTHER THAN "Y" WILL RESTART THE ENTIRE QUESTION SEQUENCE WITH NO OPTION TO USE PREVIOUS RESPONSES OR UNITS. TYPING "Y" WILL BEGIN VERIFICATION OF THE FIRST UNIT.

IN ADDITION TO THE PRECEEDING PROMPTS, THE OPERATOR MAY BE ASKED TO ENTER THE PACK SERIAL NUMBER (NO DEFAULT) IF ALL BAD SECTOR FILES HAVE BEEN DESTROYED, OR ASKED IF HE WISHES THE MANUFACTURING FILES REWRITTEN IF THEY HAVE BEEN DESTROYED.

ANY TIME THE PROGRAM IS WAITING FOR OPERATOR INPUT, THE CONSOLE BELL IS RUNG APPROXIMATELY EVERY 20 SECONDS.

THE SWITCH REGISTER IS NOT USED FOR PROGRAM CONTROL.

### S.2.3.3 CONSOLE PACKAGE COMMAND SUMMARY

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A MORE COMPLETE DESCRIPTION OF THE CONSOLE PACKAGE MAY BE FOUND IN DOCUMENT NO. 175-003-009-02. BELOW IS A SUMMARY OF AVAILABLE CONTROL FUNCTIONS. A "CONTROL" CHARACTER IS TYPED BY HOLDING DOWN THE "CONTROL" KEY AND HITTING THE CHARACTER.

NOTE: WHILE BAD SECTOR FILE WRITING IS IN PROGRESS, ALL CONSOLE INPUT IS IGNORED.

CNTRL-G . NOTE: THE SWITCH REGISTER IS NOT USED, BUT CONTROL-G MAY STILL BE USED TO INTERRUPT THE PROGRAM AND EITHER CONTINUE (WITH A <CR>) OR RESTART THE PROGRAM (WITH A <LF>).

OPEN THE PSEUDO SWITCH REGISTER FOR MODIFICATION.

THE PROGRAM WILL TYPE "G" FOLLOWED BY:

"SR=XXXX ", WHERE XXXX IS THE SWITCH REGISTER SETTING.

THE VALUE MAY BE LEFT UNCHANGED OR A NEW VALUE MAY BE ENTERED. TYPING A <CR> WILL SAVE THE NEW VALUE (IF ONE WAS ENTERED) AND CONTINUE THE PROGRAM. TYPING A LINE FEED WILL SAVE THE NEW VALUE (IF ENTERED) AND RESTART THE PROGRAM AT LOCATION 200. TYPING ANY OTHER CHARACTER WILL CAUSE THE PROMPT TO BE RE-ISSUED.

NOTE: IF THE HARDWARE SWITCHES ARE BEING USED, THEIR VALUE WILL BE TYPED OUT, BUT ANY NEW VALUE TYPED IN WILL BE SAVED IN LOCATION 20.

CNTRL-C RETURN TO OS/8 MONITOR (AT LOCATION 7600). IF THE MONITOR BOOT IS NOT PRESENT, THE RESULTS ARE INDETERMINATE.

CNTRL-S DISABLE ALL OUTPUT. THE PROGRAM WILL HANG WHEN IT ATTEMPTS TO OUTPUT TO THE CONSOLE DEVICE. AT THIS POINT, THE ONLY CHARACTERS THAT WILL BE RECOGNIZED ARE THE CONTROL-C AND CONTROL-Q.

CNTRL-Q REENABLE ALL OUTPUT (AFTER A "S").

CNTRL-F THIS IS A NON-STANDARD CONTROL CHARACTER. THE CONSOLE FILL COUNT (LOCATION 23) IS OPENED FOR MODIFICATION. BEHAVIOR IS SIMILAR TO THAT FOR CONTROL-G, EXCEPT THAT A LINE FEED WILL NOT BE RECOGNIZED. THE DEFAULT FILL COUNT IS 1. A FILL COUNT OF 14 IS USUALLY REQUIRED FOR LA30'S.

ALL OTHER CHARACTERS WILL BE ECHOED, FOLLOWED BY A "?" AND <CR>.

-----  
HEADER VERIFICATION REQUIRES APPROXIMATELY 20 SECONDS PER PACK.  
DATA AREA VERIFICATION REQUIRES APPROXIMATELY 7 1/2 MINUTES PER  
PACK. (VALUES ARE ASSUMING DEFAULT CYLINDER LIMITS.) EACH BAD  
SECTOR WILL SLOW DATA AREA VERIFICATION BY ABOUT 2 SECONDS.

S.3.0 ERROR INFORMATION  
-----

S.3.1 ERROR REPORTING PROCEDURES  
-----

SINCE THIS PROGRAM IS NOT INTENDED FOR DIAGNOSTIC USE, THERE IS VERY  
LIMITED ERROR REPORTING.

"(REASON FOR REJECTION) - PACK REJECTED"

THE PACK IS REJECTED FOR THE REASON STATED, AND VERIFICATION  
CONTINUES WITH THE NEXT UNIT.

"? UNIT FAILURE PC=XXXX"

THERE IS A PROBLEM WITH THE UNIT. AT THE INDICATED PC IN THE  
LISTING IS A COMMENT STATING THE PROBLEM MORE SPECIFICALLY. THE  
APPROPRIATE DIAGNOSTICS SHOULD BE RUN. THE UNIT IS REJECTED  
AND VERIFICATION CONTINUES WITH THE NEXT UNIT.

"? FAILURE OCCURED WHILE WRITING BAD SECTOR FILES!"

THE ABOVE UNIT FAILURE OCCURED AFTER BAD SECTOR FILE WRITING  
WAS STARTED. THE BAD SECTOR FILES ARE SUSPECT, THEY MAY NOT  
ALL AGREE WITH ONE ANOTHER.

"? SOFTWARE ERROR PC=XXXX"

THIS MESSAGE SHOULD NEVER BE TYPED. IF IT IS, A PROGRAM RELOAD  
IS RECOMMENDED. IF THE PROBLEM PERSISTS, IT MIGHT BE CAUSED BY  
A HARDWARE PROBLEM, PARTICULARLY IF PC=0000.

-----  
THE ONLY ACTUAL HALT INSTRUCTION IS WITHIN THE POWER FAIL ROUTINE.

IF A SOFTWARE ERROR IS REPORTED (AS SPECIFIED ABOVE), A CALL TO THE CONSOLE PACKAGE CONTROL-G ROUTINE IS MADE AND THE PROGRAM HANGS PENDING OPERATOR ACTION.

#### S.4.0 PROGRESS REPORTS

-----

WHEN THE PROGRAM BEGINS VERIFICATION OF A NEW PACK, IT TYPES:

"WORKING ON UNIT N"

ALL TYPEOUTS FOLLOWING THIS AND PRECEEDING THE NEXT "WORKING ON UNIT" MESSAGE APPLY TO THIS UNIT.

THE BAD SECTOR FILES ARE THEN RETRIEVED, AND THE PACK SERIAL NUMBER IS TYPED. IF BAD SECTOR FILE TYPEOUT IS REQUESTED, THE BAD SECTOR FILES ARE TYPED AT THIS TIME.

HEADER VERIFICATION IS PERFORMED UPON THE ENTIRE PACK (WITHIN CYLINDER LIMITS) BEFORE PROCEEDING TO DATA AREA VERIFICATION. PROGRESS MAY BE MONITORED WITH THE "MQ" DISPLAY, WHICH ALWAYS CONTAINS THE HEAD AND CYLINDER (IN COMMAND A FORMAT) TO WHICH THE LAST SEEK WAS MADE.

FIELD BAD SECTOR FILES ARE REWRITTEN AFTER VERIFICATION IS COMPLETED. THE NUMBER OF NEW SECTORS ENTERED INTO THE FIELD FILE, AS WELL AS THE NEW TOTAL, IS TYPED IN DECIMAL AS FOLLOWS:

"X NEW BAD SECTORS ADDED TO FILE (Y TOTAL)"

IF NO NEW BAD SECTORS WERE FOUND, THE FIELD FILES WILL NOT BE MODIFIED AND THE FOLLOWING MESSAGE IS TYPED:

"NO NEW BAD SECTORS FOUND (FIELD FILES NOT REWRITTEN)"

VERIFICATION THEN PROCEEDS TO THE NEXT UNIT SELECTED. IF NONE REMAIN TO BE VERIFIED,

"DONE"

IS TYPED AND PROGRAM CONTROL RETURNS TO THE BEGINNING (TO THE "CHANGE PREVIOUS PARAMETERS" OR "SELECT NON-DEFAULT PARAMETERS" PROMPT).



-----  
**S.5.1 INSTRUCTION SET**  
 -----

TRANSFERS FROM THE AC TO REGISTER IN THE CONTROLLER  
 CLEAR THE AC AFTER THE TRANSFER IS COMPLETE. TRANSFERS  
 TO THE AC FROM REGISTERS IN THE CONTROLLER CLEAR THE AC  
 FIRST THEN THE TRANSFER TAKES PLACE.

THE SKIP INSTRUCTIONS IN THIS INSTRUCTION SET ARE  
 SKIP AND THEN CLEAR IOT'S. THIS MEANS THAT IF A  
 GIVEN CONDITION IS TRUE, IE; "FUNCTION DONE" IS TRUE  
 (SET TO A LOGIC ONE) THE FUNCTION DONE FLAG WILL  
 BE CLEARED AT THE COMPLETION OF THE SKIP IOT.

THE DEVICE CODE IS JUMPER SELECTABLE FOR EITHER 60,61 OR 30,31.  
 60,61 IS STANDARD. IOT CODES 30,31 MAY BE USED BY SETTING SWITCH  
 REGISTER BIT 11 TO A 1.

OCTAL CODE -----	MNEMONIC -----	FUNCTION -----
6600	RLDC	CLEAR DEVICE, ALL REGISTERS, AC AND FLAGS.
6601	RLSD	SKIP ON FUNCTION DONE, THEN CLEAR IF SET TO A ONE.
6602	RLMA	LOAD BREAK MA REGISTER FROM AC 0:11
6603	RLCA	LOAD COMMAND REGISTER "A" FROM AC 0:11
6604	RLCB	LOAD COMMAND REGISTER "B" FROM AC 0:11, EXECUTE COMMAND
6605	RLSA	LOAD SECTOR ADDRESS FROM AC 0:5
6606	----	SPARE (WILL CLEAR THE AC)
6607	RLWC	LOAD WORD COUNT FROM AC 0:11
6610	RRER	READ ERROR REGISTER INTO AC 0:2,11.
6611	RRWC	READ WORD COUNT INTO AC 0:11
6612	RRCA	READ COMMAND REGISTER "A" INTO AC 0:11
6613	RRCB	READ COMMAND REGISTER "B" INTO AC 0:11
6614	RRSA	READ SECTOR ADDRESS INTO AC 0:5
6615	RRSI	READ SILO WORD (8 BIT) INTO AC 4:11
6616	----	SPARE (AC NOT AFFECTED)
6617	RLSE	SKIP ON COMPOSITE ERROR, THEN CLEAR IF SET TO A ONE

-----  
BREAK MA REGISTER

AC0- MSB

"

AC11-LSB

## COMMAND REGISTER "A"

AC0- DIRECTION; ZERO= MOVE HEADS AWAY

FROM SPINDLE (LOWER CYL. ADD.)

ONE= MOVE TOWARDS SPINDLE (HI ADD.)

AC1- HEAD SELECT- ZERO= UPPER HEAD

ONE= LOWER HEAD

AC2- SPARE

AC3- RESERVED FOR DISK EXPANSION

AC4- CYLINDER ADDRESS/DIFFERENCE WORD; MSB

"

"

AC11- CYLINDER ADDRESS/DIFFERENCE WORD; LSB

## COMMAND REGISTER "B"

AC0- MAINT. INHIBIT. PREVENT THE FOLLOWING SIGNALS

FROM GOING TO/FROM THE DRIVE;

WRT GATE, WRT DATA, DRV CMND, DRV STAT., DRV RDY

SEC PLS, READ DATA, STAT. CLK, DRV ERR.

AC1- MAINTENANCE- LOOP DAR TO SILO SERIAL IN

AC2- MODE; ZERO= TRUNCATED (128 12 BIT WORDS/SECTOR)

ONE= BYTE (256 8 BIT WORDS/SECTOR)

MUST BE SET TO A 1 WHEN DOING

A "GET STATUS" OR "READ HEADER" COMMAND.

AC3- INTERRUPT ENABLE

AC4- DRIVE SELECT; MSB

AC5- DRIVE SELECT; LSB

AC6- EMA; MSB

AC7- "

AC8- EMA; LSB

AC9- FUNCTION BIT C

AC10- " " B

AC11-FUNCTION BIT A

## FUNCTION BIT DEFINITION

BIT C	BIT B	BIT A	COMMAND
----	----	----	-----
0	0	0	MAINTENANCE
0	0	1	RESET
0	1	0	GET STATUS
0	1	1	SEEK
1	0	0	READ HEADER
1	0	1	WRITE DATA
1	1	0	READ DATA
1	1	1	READ DATA
			WITHOUT HEADER CHECK

AC0- SECTOR ADDRESS; MSB

.

.

AC5- SECTOR ADDRESS; LSB

## DISK STATUS REGISTER

WORD #1

AC4- SPARE (0)

AC5- HEAD SELECT

AC6- COVER OPEN \*

AC7- HEADS OUT

AC8- BRUSH HOME

AC9- STATE C

AC10-STATE B

AC11-STATE A

WORD #2

AC4- WRITE DATA ERROR \*

AC5- HEAD CURRENT ERROR \*

AC6- WRITE LOCK STATUS

AC7- SEEK TIME OUT ERROR \*

AC8- SPIN UP TIME OUT ERROR \*

AC9- WRITE GATE ERROR \*

AC10-VOLUME CHECK \*

AC11-DRIVE SELECT ERROR \*

\*CAUSES DRIVE ERROR TO SET TO A ONE (1)

## STATE BIT DEFINITION

BIT C	BIT B	BIT A	DEFINITION
----	----	----	-----
0	0	0	LOAD STATE
0	0	1	SPIN-UP
0	1	0	LOAD HEADS
0	1	1	BRUSH CYCLE
1	0	0	SEEK-TRACK COUNTING
1	0	1	SEEK LINEAR MODE
1	1	0	UNLOAD HEADS
1	1	1	SPIN-DOWN

## HEADER WORDS

WORD #1

AC4- CYLINDER ADDRESS 0 (LSB)

AC5- HEAD SELECT

AC6- SECTOR ADDRESS 5 (MSB)

.

AC11-SECTOR ADDRESS 0 (LSB)

WORD #2

AC4- 0

AC5- CYLINDER ADDRESS 7 (MSB)

.

AC11-CYLINDER ADDRESS 1

WORDS #3 &amp; #4

ALL 0'S

AC0- CRC ERROR  
AC1- OPERATION INCOMPLETE (OPI)  
AC2- DATA LATE/HEADER NOT FOUND  
AC10-DRIVE ERROR  
AC11-DRIVE READY; A ONE= DRV RDY  
A ZERO= DRV RDY(NOT)

NOTE:DRIVE ERROR AND DRIVE READY ARE ASSERTED WHEN  
DRIVE INTERFACE IS DISABLED (CB0 = 1).

WORD COUNT REGISTER; A 12 BIT WORD COUNT  
REGISTER HAS BEEN PROVIDED TO ALLOW UP TO  
4,096 DATA BREAKS (DMA'S) TO TAKE PLACE AT  
ONE TIME. THIS REGISTER IS LOADED WITH  
THE RLWC IOT FROM AC 0:11, WHICH MUST BE  
THE 2'S COMPLIMENT OF THE NUMBER OF TRANSFERS  
THAT ARE TO TAKE PLACE.

#### S.6.0 PSEUDO-CODE FLOWCHART

-----  
THE FOLLOWING PL/I-LIKE PSEUDO-CODE FLOWCHART REPRESENTS THE FLOW  
OF PROGRAM CONTROL, AS WELL AS GIVING SOME INDICATION OF SPECIFIC  
IMPLEMENTATION PROCEEDURE. ANYONE MAKING MODIFICATIONS TO THE PROGRAM  
SHOULD UNDERSTAND THESE FLOWS FIRST AND BE SURE TO INCLUDE ANY CHANGES  
TO THE PROGRAM IN THEM.

"[LABEL]"'S ARE ACTUAL PAL-10 STATEMENT LABELS USED IN THE PROGRAM,  
INCLUDED FOR EASE OF FINDING THE ASSEMBLY-LANGUAGE CORRESPONDING TO  
PSEUDO-CODE STATEMENTS.

```

-----
SET ^C ALLOWED
TYPE "AJRLL PACK VERIFIER"

RESTART FROM QUESTION SEQUENCE:
-----
CLEAR DEFAULT FLAG
CLEAR UNIT FLAG

RESTART FROM PROGRAM:
-----
SET ^C ALLOWED
IF DEFAULT FLAG IS CLEAR
    THEN "DO YOU WISH TO SELECT NON-DEFAULT PARAMETERS?"
    ELSE "DO YOU WISH TO CHANGE PREVIOUS PARAMETERS?"
SET ^G<LF> TO RESTART FROM QUESTION SEQUENCE
IF LAST RESPONSE WAS "NO"
    THEN IF DEFAULT FLAG IS CLEAR THEN SET UP DEFAULTS
    ELSE ("YES")
        SET DEFAULT FLAG
        "USE DEVICE CODE 62,63?"
        "TYPE BAD SECTOR FILES?"
        "SUPPRESS HEADER VERIFICATION?"
        "DO DATA AREA VERIFICATION?"
        IF HEADER OR DATA VERIFICATION SELECTED
            THEN "SET CYLINDER LIMITS?"
            IF "YES" THEN ALLOW LIMITS ENTRY
            "MAXIMUM NUMBER OF BAD SECTORS?"
        IF (BOTH HDR AND DATA VERIFICATION) AND (NO CYLINDER LIMITS)
            THEN ASKAGN: "DELETE OLD BAD SECTOR FILE?"
            IF "YES"
                THEN "ARE YOU SURE?"
                IF NOT "YES"
                    THEN ASKAGN
                    ELSE CLEAR DEFAULT FLAG
        "FORCE BAD SECTORS?"
        IF "YES"
            THEN
                CLEAR DEFAULT FLAG
                "UNIT # (0-3)?"
                SET UNIT ACTIVE; OTHER UNITS INACTIVE
                CALL SETUP-BAD-SECTOR-BUFFERS
                TYPE ENTRY INSTRUCTIONS
                DO UNTIL NO MORE ENTRIES
                    REQUEST AND SAVE CYLINDER, TRACK, AND SECTOR
                    CALL ENTER-BAD-SECTOR
            END

```

--[RSTRQS]--

--[RESTAR]--

```

THEN      IF UNIT FLAG IS SET THEN "TEST SAME UNITS AGAIN?"      --[UNITST]--
          IF (UNIT FLAG CLEAR) OR "NO"
            THEN          "VERIFY UNIT 0?"
                        "VERIFY UNIT 1?"
                        "VERIFY UNIT 2?"
                        "VERIFY UNIT 3?"

"ARE YOU SURE?"
IF NOT "YES" THEN RESTART FROM QUESTION SEQUENCE      --[LASTCH]--
SET UNIT FLAG
SET ^G<LF> TO RESTART FROM PROGRAM
CHANGE DEVICE CODES
SET UP TO SELECT FIRST UNIT

SELECT NEXT DRIVE:
-----
IF NO MORE UNITS
  THEN      TYPE "DONE"
            RESTART (FROM PROGRAM)
SELECT THE UNIT
IF NOT FORCING BAD SECTORS
  THEN      "WORKING ON UNIT" N
            CALL SETUP-BAD-SECTOR-BUFFERS
IF HEADER VERIFICATION REQUESTED
  THEN      SET CYLINDER = LOW LIMIT      --[DOHDRV]--
            SET TRACK = 0
            DO UNTIL CYLINDER > HIGH LIMIT
              CALL VERIFY-HEADERS
              COMPUTE NEXT TRACK
            END
IF DATA AREA VERIFICATION REQUESTED      --[DATVCH]--
  THEN      SET CYLINDER = LOW LIMIT
            IF CYLINDER = 0
              THEN      TRACK=1
              ELSE      TRACK=0
            CLEAR ZERO-BUFFER
            SETUP PATTERN--BUFFER
            DO UNTIL (CYLINDER > HIGH LIMIT) OR (CYLINDER = 377 AND TRACK = 1)      --[DATVLP]--
              SETUP PATTERNS IN OVERLAPPING BUFFER-PORTION
              CALL CHECK-TRACK(BUF1,PAT1)
              CALL CHECK-TRACK(BUF2,PAT2)
              CALL CHECK-TRACK(BUF3,PAT3)
              CLEAR OVERLAPPING BUFFER-PORTION
              CALL CHECK-TRACK-WITH-ZEROS (NOT INCLUDED WITH FLOWS, SINCE ESSENTIALLY SIMILAR TO CHECK-TRACK)
              COMPUTE NEXT TRACK
            END
IF WRITE FILES FLAG IS SET      --[FILEWR]--
  THEN      CALL WRITE-FILES(FIELD BUFFER,SECTOR 24,FIELD0)
            TYPE "NEWBAD" NEW BAD SECTORS ADDED TO FILE ("OLDBAD" TOTAL)
  ELSE      TYPE NO NEW BAD SECTORS FOUND (FIELD FILES NOT REWRITTEN)
SELECT NEXT DRIVE

```

```

-----
DO UNTIL GOOD FILE READ OR NO MORE MANUFACTURING BAD SECTOR FILES
  READ A MANUFACTURING BAD SECTOR FILE
  VERIFY FORMAT AND CONTENTS
END
IF NONE COULD BE READ THEN REJECT PACK /*THERE IS A DIFFERENCE BETWEEN A FILE THAT
/*CANNOT BE READ AND A FILE THAT IS NOT GOOD (IS GARBAGE)

IF GOOD FILE READ
  THEN    SAVE SERIAL NUMBER                      --[GDREDM]--
          SET POINTER TO MANUFACTURING FILES
  ELSE    CLEAR POINTER TO MANUFACTURING FILES      --[SAVMPT]--
DO UNTIL GOOD FILE READ OR NO MORE FIELD BAD SECTOR FILES
  READ A FIELD BAD SECTOR FILE
  VERIFY FORMAT AND CONTENTS
END
IF NONE COULD BE READ THEN REJECT PACK
IF GOOD FILE READ
  THEN    SET FIELD FILES POINTER                  --[GDREDF]--
          CLEAR WRITE FILES FLAG
          IF MANUFACTURING FILES POINTER IS NON-ZERO
            THEN    COMPARE SERIAL # FROM MANUFACTURING AND FIELD FILES
                    IF DIFFERENT THEN "SERIAL #'S DO NOT COMPARE"
                        "SERIAL NUMBER IN MANUFACTURING FILES USED"
                        WRITE SERIAL NUMBER INTO FIELD FILE BUFFER
                        SET WRITE FILES FLAG
          ELSE      SAVE SERIAL NUMBER              --[SAVFSN]--
  ELSE      CLEAR FIELD FILES POINTER              --[SAVFPT]--
IF BOTH MANUFACTURING AND FIELD POINTER ARE ZERO (FILES INVALID) --[BOTHCH]--
  THEN    "ALL BAD SECTOR FILES ARE DESTROYED! ENTER PACK SERIAL # : "
          SAVE SERIAL NUMBER
          CALL MANUF-DESTROYED
  ELSE    TYPE SERIAL NUMBER                      --[TYPNUM]--
          IF BAD SECTOR FILE TIMEOUT IS REQUESTED
            THEN    IF MANUFACTURING FILES ARE VALID
                    THEN    CALL TYPE-FILES(MANUF)
                            CALL TYPE-FILES(FIELD)
            IF MANUFACTURING FILES ARE NOT VALID      --[MANVCH]--
            THEN    TYPE "MANUFACTURING FILES ARE DESTROYED!"
                    CALL MANUF-DESTROYED
IF FIELD FILES POINTER IS ZERO OR DELETION REQUESTED --[FLDCHK]--
  THEN    SET WRITE FILES FLAG
          CALL SETUP-BLANK-FILE(FIELD)
          SET FIELD FILE POINTER
          CLEAR COUNT OF NUMBER OF OLD BAD SECTORS
  ELSE    COUNT NUMBER OF BAD SECTORS IN FIELD FILE AND SAVE --[FLDCNT]--
          CLEAR NUMBER OF NEW BAD SECTORS FOUND
RETURN
-----

```

```

-----
CLEAR FILE WRITTEN FLAG
DISABLE ^C'S AND RESTARTS
DO 5 TIMES
    RETRY = -2
    DO UNTIL NO ERROR
        WRITE 1 FILE (2 SECTORS AT SECTOR)
        IF ERROR
            THEN WRITE GARBAGE INTO FILE
                DOEXIT
            ELSE READ FILE BACK AND COMPARE
                IF ERROR (READ OR COMPARE)
                    THEN INCREMENT RETRY
                        IF RETRY >= 0 THEN WRITE GARBAGE AND EXIT
                    ELSE SET FILE WRITTEN FLAG
        END
    ADD 4 TO SECTOR
END
ENABLE ^C'S AND RESTARTS
IF FILE WRITTEN FLAG IS CLEAR THEN REJECT PACK
RETURN
-----

```

```

SUBROUTINE: MANUF-DESTROYED  --[MANDES]-- /*HANDLES POSSIBLE REWRITE OF MANUFACTURING
                                     /*FILES IF THEY ARE DESTROYED
ASKAGN: TYPE "DO YOU WISH MANUFACTURING FILES REWRITTEN (WITH NO BAD SECTORS)?"
IF YES THEN "ARE YOU SURE?"
    IF NOT YES
        THEN ASKAGN
        ELSE CALL SETUP-BLANK-FILE(ZERBUF, FIELD)
            CALL WRITE-FILES(ZERBUF, SECO, FIELD)
            TYPE "MANUFACTURING FILES REWRITTEN!"
RETURN
-----

```

```

SUBROUTINE: TYPE-FILES(POINTER-TO-FILE) --[TYPFIL]-- /*POINTER STARTS AT LISTINGS, NOT AT SERIAL NUMBER
-----
IF POINTER = 0
    THEN TYPE "DESTROYED"
    ELSE
        FETCH CYLINDER AND SAVE IT
        FETCH ZERO WORD OF CYLINDER ENTRY
        IF ZERO WORD = 377
            THEN TYPE "NONE"
            ELSE TYPE HEADER FOR BAD SECTORS
                DO UNTIL ZERO WORD NOT= 0
                    TYPE CYLINDER
                    FETCH AND TYPE TRACK AND SECTOR
                    TYPE <CR><LF>
                    FETCH AND SAVE CYLINDER
                    FETCH ZERO WORD
                END
RETURN
-----

```



```

-----
COPY SERIAL NUMBER TO BUFFER
CLEAR FOUR WORDS
COPY 377 TO REMAINING 504 WORDS
RETURN
-----

```

```

SUBROUTINE: ENTER-BAD-SECTOR                                --["ENTERBAD" (XENTBD)]--
-----
CALL CHECK-FOR-LISTING(MANUF)
IF NOT LISTED
  THEN CALL CHECK-FOR-LISTING(FIELD)
        IF NOT LISTED
          THEN INCREMENT NEW BAD SECTOR COUNT
                IF NEW COUNT + OLD COUNT > MAXIMUM ALLOWED
                  THEN REJECT PACK
                  ELSE SET WRITE FILES FLAG
                       INSERT ENTRY (AT INSERT POSITION)

```

```

RETURN
-----

```

```

SUBROUTINE: CHECK-FOR-LISTING(POINTER-TO-FILE)              --[CH4LST]--
-----
IF POINTER IS NON-ZERO
  THEN INSERT POSITION = POINTER-TO-FILE
        DO 126 TIMES OR UNTIL EXIT                          --[LOOK4L]--
          IF BAD CYLINDER < CYLINDER AT INSERT POSITION
            THEN EXIT
            ELSE IF BAD CYLINDER = LISTED CYLINDER
              THEN IF BAD TRACK < LISTED TRACK
                THEN EXIT
                ELSE IF BAD TRACK = LISTED TRACK
                  THEN IF BAD SECTOR < LISTED SECTOR
                    THEN EXIT
                    ELSE IF BAD SECTOR = LISTED SECTOR
                      THEN RETURN(LISTED)
                      --[ADD4PS]--
          INSERT POSITION = INSERT POSITION + 4
        END
  RETURN(NOT LISTED W/ INSERT POSITION)
ELSE RETURN(FILE NOT VALID)
-----

```

```

-----
SEEK TO POSITION
RETRY = -3
RETRY 40 READ 1:
GET 40 CONSECUTIVE HEADERS
COMPUTE EXPECTED FIRST SECTOR READ
DO 40 TIMES
    CHECK HEADER
    IF HEADER IS BAD
        THEN LIST (EXPECTED) SECTOR IN TABLE
        ELSE IF OUT OF SEQUENCE
            THEN RETRY = RETRY + 1
            IF RETRY < 0, THEN RETRY 40 READ 1
            ELSE REJECT PACK
END
IF ANY SECTORS BAD (LISTED IN TABLE)
    THEN RETRY = -3
    RETRY 40 READ 2:
    GET 40 CONSECUTIVE HEADERS
    COMPUTE EXPECTED FIRST SECTOR READ
    DO 40 TIMES
        CHECK HEADER
        IF HEADER IS BAD
            THEN IF SECTOR IS LISTED IN TABLE (WAS BAD PREVIOUSLY) THEN CALL ENTER-BAD-SECTOR
            ELSE IF SECTOR IS OUT OF SEQUENCE THEN RETRY 40 HEADER READ (UP TO 3 TIMES, THEN REJECT PACK)
END
RETURN
-----

```

SUBROUTINE: CHECK-TRACK (BUFFER,PATTERN)

[CHKTRK]

```

-----
SEEK
SELECT SECTOR BASED ON HEAD POSITION (OPTIMIZE)
DO 5 TIMES
    SECTOR = (SECTOR + 20) MOD 50
    WRITE 8 SECTORS (1/5 OF TRACK) AT SECTOR
    IF ERROR

```

[WRITRK]

```

        THEN SAVSEC=SECTOR
        SAVBUF=BUFFER
        DO 8 TIMES
            WRITE 1 SECTOR
            IF ERROR THEN CALL ENTER-BAD-SECTOR
            SECTOR=(SECTOR+2)MOD 10
            IF SECTOR = 0
                THEN SECTOR=SECSAV+1
                BUFFER=BUFFER+1
            ELSE SECTOR=SECTOR+SECSAV
                BUFFER=BUFFER+2

```

[SLOWRT]

```

        END
        SECTOR=SECSAV
        BUFFER=BUFSAV

```

END

```

DO 5 TIMES
    SELECT SECTOR BASED ON HEAD POSITION
    DO WHILE SECTOR-GROUP-READ FLAG (IN TABLE) IS SET
        SECTOR=(SECTOR+10)MOD 50
    END
    SET FLAG IN SECTOR-GROUP-READ TABLE FOR THIS SECTOR GROUP
    READ 8 SECTORS (TO BUFFER)
    IF ERROR
        THEN SETUP PATTERN-BUFFER
        CALL SLOW-READ(BUFFER,PATTERN)
        ELSE CURBUF=BUFFER
        DO 8 TIMES
            CHECK 256 WORDS (1 SECTOR) IN CURBUF
            IF ERROR
                THEN REWRITE BUFFER PORTION AT CURBUF
                CALL CHECK-SECTOR(SECTOR,BUFFER,PATTERNS)
            CURBUF=CURBUF+256
            SECTOR=SECTOR+1
            SETUP PATTERNS FOR THIS SECTOR
        END
    END
END
RETURN
-----

SUBROUTINE: SLOW-READ(BUFFER,PATTERN)
-----
DO 8 TIMES
    CALL CHECK-FOR-LISTING(BOTH MANUF AND FIELD)
    IF NOT LISTED
        THEN READ 1 SECTOR
        IF ERROR
            THEN CALL CHECK-SECTOR(SECTOR,BUFFER,PATTERNS)
            ELSE COMPARE READ BUFFER TO PATTERNS
            IF ERROR THEN CALL CHECK-SECTOR(SECTOR,BUFFER,PATTERNS)
        SECTOR=SECTOR+1
        SETUP PATTERNS FOR NEXT SECTOR
    END
END
RETURN
-----

SUBROUTINE: CHECK-SECTOR(SECTOR,CURBUF,PATTERNS)
-----
CALL CHECK-FOR-LISTING(BOTH MANUF AND FIELD)
IF NOT LISTED
    THEN WRITE SECTOR FROM BUFFER
    IF ERROR
        THEN CALL ENTER-BAD-SECTOR
        ELSE READ SECTOR BACK
        COMPARE TO PATTERNS
        IF ERROR THEN CALL ENTER-BAD-SECTOR
END
RETURN
-----

```

[RED5LP]

[READF]

[FIFCHK]

[FIFCHK]

--[SLORED]--

--[CHKSEC]--

/AJRLL-B RL8A/RL02 PACK VERIFIER

/ REVISION HISTORY

/

/

/

/

/

/

/

/

/

/

/

ORIGINAL BY  
MODIFICATION BY

JACK RICH

DATE

----

H. POULTER

FEBRUARY 1979

HP 001

MODIFICATIONS TO RUN THE RL02.

MODIFICATION BY

DATE

----

MIKE LETENDRE

FEB. 1981

ML 001

VERSION "B" CHANGES FOR THE VT278  
COMPATABILITY UPGRADE.

0000	0000	FIELD	0	
0000	0000	*0		
0000	0302		"B	
0001	5402	JMP I	+.1	/REVISION B
0002	1735	PWRFAL		/GO TO POWER FAIL ROUTINE
0003	1755	PWRUP		/POINTER TO POWER FAIL ROUTINE
				/POINTER TO POWER UP ROUTINE (A JMP I 3
				/ INSTRUCTION IS PLACED AT 0)
	0010	*10		
0010	0000	AUTO10,	0	/TEMP USE ONLY
0011	0000	AUTO11,	0	/TEMP USE BUT NOT TO BE USED BY SUBROUTINES
0012	0000	AUTO12,	0	/USED BY CHKBSF TO SCAN FILE
0013	0000	AUTO13,	0	/TEMP USE ONLY
0014	0000	AUTO14,	0	/USED BY HDRVY TO POINT TO STORED HEADERS
0015	0000	AUTO15,	0	/USED BY HDRVY TO POINT TO SAVED BAD SECTORS
0016	0000	AUTO16,	0	/USED BY SETUP BLANK FILE ROUTINES
				/(INITIALIZED BY SRN2BF)
0017	0000	AUTO17,	0	/USED BY ENTER SERIAL NUMBER ROUTINE
	0020	*20		
0020	0000	PSWR,	0	/THE SWITCH REGISTER IS NOT USED BY THE PROGRAM
0021	0000	HCW1,	0	/4000 FOR HARDWARE SWITCHES (WHICH ARE NOT USED)
0022	0000	HCW2,	0	/LOCATIONS 20-22 ARE FOR COMPATIBILITY AND NOT USED.
0023	0001	FILLER,	1	/NUMBER OF FILLER CHARACTERS REQUIRED
	4424	RLDC=	JMS I .	/DEVICE CLEAR IOT SUBROUTINE CALL
0024	1657	XRLDC		/POINTERS TO IOT ROUTINES
	4425	RLSD=	JMS I .	/SKIP ON DONE IOT SUBROUTINE CALL
0025	1662	XRLSD		
	4426	RLMA=	JMS I .	/LOAD BREAK MA IOT SUBROUTINE CALL
0026	1667	XRLMA		
	4427	RLCA=	JMS I .	/LOAD COMMAND REG A IOT SUBROUTINE CALL
0027	1672	XRLCA		
	4430	RLCB=	JMS I .	/LOAD COMMAND REG B IOT SUBROUTINE CALL
0030	1675	XRLCB		
	4431	RLSA=	JMS I .	/LOAD SECTOR ADDRESS IOT SUBROUTINE CALL
0031	1700	XRLSA		
	4432	RLWC=	JMS I .	/LOAD WORD COUNT REG SUBROUTINE CALL
0032	1703	XRLWC		
	4433	RRER=	JMS I .	/READ ERROR REG IOT SUBROUTINE CALL
0033	1706	XRRER		
	4434	RRWC=	JMS I .	/READ WORD COUNT IOT SUBROUTINE CALL
0034	1711	XRRWC		
	4435	RRCA=	JMS I .	/READ COMMAND REG A IOT SUBROUTINE CALL

0035	1714	XRRCA		
	4436	RRCB= JMS I	.	/READ COMMAND REG B IOT SUBROUTINE CALL
0036	1717	XRRCB		
	4437	RRSA= JMS I	.	/READ SECTOR ADDR IOT SUBROUTINE CALL
0037	1722	XRRSA		
	4440	RRSI= JMS I	.	/READ SILO WORD IOT SUBROUTINE CALL
0040	1725	XRRSI		
	4441	RLSE= JMS I	.	/SKIP ON DRIVE ERROR IOT SUBROUTINE CALL
0041	1730	XRLSE		
	4442	CONSOL= JMS I	.	/TELETYPE INPUT HANDLER
0042	1000	XCONSO		
	4443	GETRES= JMS I	.	/GET OPERATORS RESPONSE TO YES-NO QUES
0043	1354	XGETRE		
	4444	ENTVAL= JMS I	.	/ALLOW OPERATOR TO ENTER VALUE
0044	1543	XENTVA		
	4445	GETNUM= JMS I	.	/GET OCTAL NUMBER
0045	1600	XGETNU		
	4446	RESET= JMS I	.	/RESET DRIVE AND WAIT FOR DONE
0046	1765	XRESET		
	4447	GETSTA= JMS I	.	/GET STATUS AND WAIT FOR DUNE
0047	2000	XGETST		
	4450	ERRHAN= JMS I	.	/HANDLE POSSIBLE DRIVE ERROR
0050	2200	XERRHA		
	4451	SEEK= JMS I	.	/SEEK TO TRACK AND CYL CONTAINED IN CYLNDR, TRACK
0051	2026	XSEEK		
	4452	REDHDR= JMS I	.	/ISSUE A READ HEADER AND WAIT FOR DONE. HEADER LEFT IN SILO
0052	2354	XREDHD		
	4453	JMPPM1= JMS I	.	/JMP .-1 EXCEPT ALLOW CONSOLE INPUT
0053	1642	XJMPPM		
	4454	WRITE0= JMS I	.	/ISSUE WRITE FROM FIELD 0
0054	2400	XWRITO		
	4455	WRITE1= JMS I	.	/ISSUE WRITE FROM FIELD 1
0055	2405	XWRIT1		/THESE ROUTINES SKIP IF NO ERROR
	4456	READ0= JMS I	.	/READ TO FIELD 0
0056	2412	XREAD0		
	4457	READ1= JMS I	.	/READ TO FIELD 1
0057	2417	XREAD1		
	4460	ENTERBAD= JMS I	.	/ENTER CYLNDR, TRACK, AND SECTOR INTO FIELD BAD SECTOR FILE
0060	4200	XENTBD		
	4461	RUSURE= JMS I	.	/ASK OPERATOR "ARE YOU SURE" AND WAIT
0061	1523	XRUSUR		
	4462	CNTRLG= JMS I	.	/OPEN SWITCH REGISTER (SR=XXXX)
0062	1107	XCTRLG		
	4463	WZITFG= JMS I	.	/CHECK IF LAST CHARACTER WAS *F OR *G
0063	1155	XWZITF		
	4464	RJECTU= JMS I	.	/REJECT THE UNIT GO SELECT NEXT UNIT
0064	2336	XRJCTU		/THIS ROUTINE DOES NOT HAVE NORMAL RETURN
	4465	RJECTP= JMS I	.	/PRINT REASON AND REJECT PACK AND GO SELECT NEXT UNIT
0065	5441	XRJCTP		/THIS ROUTINE DOES NOT HAVE NORMAL RETURN
	4466	LISN= JMS I	.	
0066	1404	XLISN		
	4467	MESAGE= JMS I	.	
0067	1306	MESAGX		
	4470	PRNT1= JMS I	.	
0070	1167	XPRNT1		

```

      4471 PRNT2= JMS I .
0071 1200 XPRNT2
      4472 PRNT4= JMS I .
0072 1212 XPRNT4
      4473 SPACE2= JMS I .
0073 1400 SPACX2
      4474 TYPE= JMS I .
0074 1224 XTYPE
      4475 CRLF= JMS I .
0075 1267 XCRLF
      4476 VT278= JMS I .
0076 3551 XVT278
0077 0000 TEMP1, 0
0100 0000 TEMP2, 0
0101 0000 TEMP3, 0
0102 0000 STATS1, 0
0103 0000 STATS2, 0
0104 0200 CGPNTR, 200
0105 0000 CCRET, 0

0106 0000 CYLNR, 0
0107 0000 TRACK, 0
0110 0000 SECTOR, 0
0111 0000 NEWBAD, 0
0112 0000 OLDBAD, 0
0113 0000 DRVNUM, 0
0114 0000 NOPRNT, 0
0115 0000 LASTIN, 0
0116 0000 LDNGO, 0
0117 0000 DEVCOD, 0

0120 0000 UNITSV, 0
0121 0000 DFAULT, 0
0122 0000 BSFTYP, 0
0123 0000 HDRSUP, 0
0124 0000 DATAVF, 0
0125 0000 LOLIM, 0
0126 0777 HILIM, 777
0127 0176 MAXBAD, 176
0130 0000 BSFDEL, 0
0131 0000 BSFORC, 0
0132 0000 RETRY, 0
0133 0000 BUFFER, 0
0134 0000 WRDCNT, 0
0135 0000 MANUPT, 0
0136 0000 FLDPNT, 0
0137 0000 WRTFIL, 0
0140 0000 SERNO1, 0
0141 0000 SERNO2, 0
0142 0000 SERNO3, 0
0143 0000 SERNO4, 0
0144 0000 PATRN1, 0
0145 0000 PATRN2, 0
0146 0000 PATRN3, 0
0147 0000 CURPA1, 0

```

/TEMPORARY STORAGE ONLY!

/TEMP3 NOT TO BE ALTERED BY ANY SUBROUTINES!!

/STATUS WORD 1 FROM GET STATUS SAVED HERE

/STATUS WORD 2 FROM GET STATUS SAVED HERE

/\*G<LF> RETURNS THROUGH THIS POINTER

/\*C RETURNS TO OS/8 IF ZERO; ELSE KEYBOARD INPUT IGNORED

/(BAD SECTOR FILE WRITING IN PROGRESS)

/COUNT OF NEWLY FOUND BAD SECTORS

/COUNT OF FIELD BAD SECTORS ALREADY IN PREVIOUS FILE

/DRIVE NUMBER CURRENTLY BEING WORKED ON

/FLAG TO ALLOW OUTPUT (USED W/ CNTRL-S)

/LAST CHARACTER INPUT IS STORED HERE

/FLAG FOR LEADING ZERO SUPPRESSION (TYPDEC & TYPERN)

/0 IF DEVICE CODE 60,61 IS TO BE USED

/20 IF DEVICE CODE 62,63 IS TO BE USED

/UNITS VALID FLAG

/PREVIOUS NON-DEFAULTS ALLOWED IF NON-0

/FLAG FOR BAD SECTOR FILE TYPING

/FLAG FOR SUPPRESSING HEADER VERIFICATION

/FLAG FOR DATA AREA VERIFICATION

/LOWER CYLINDER LIMIT

/UPPER CYLINDER LIMIT

/MAXIMUM NUMBER OF BAD SECTORS ALLOWED

/FLAG TO DELETE OLD FIELD BAD SECTOR FILE

/FLAG FOR FORCING BAD SECTORS

/RETRY COUNTER FOR SINGLE FUNCTIONS

/POINTER TO BUFFER FOR READS AND WRITES

/WORD COUNT FOR READS AND WRITES

/POINTER TO MANUF BAD SECTOR LISTINGS (0 IF INVALID)

/POINTER TO FIELD BAD SECTOR LISTINGS (0 IF INVALID)

/FLAG TO WRITE FIELD FILES AT END OF VERIFICATION

/SERIAL NUMBER STORED IN THESE 4 LOCATIONS

HP 001

0150	0000	CURPA2, 0		
0151	0000	CURPA3, 0		
0152	0000	CURBUF, 0		
0153	0000	CYLSAV, 0	/PLACE CYLINDER VALUE HERE	HP 001
0154	0000	RESPON, 0		
0155	0001	K1, 1	/	HP 001
0156	0777	K0777, 0777	/	HP 001
0157	0377	K377, 377		
0160	0050	K50, 50		
0161	0176	K176, 176		
0162	7001	M0777, -0777	/	HP 001
0163	7401	M377, -377		
0164	0077	K77, 77		
0165	0200	K200, 200		
0166	0010	K10, 10		
0167	7770	M10, -10		
0170	7774	M4, -4		
0171	7773	M5, -5		
0172	7730	M50, -50		
6007	CAF=6007		/CLEAR ALL FLAGS	
6035	KIE=6035		/AC11 TO CONSOLE INTERRUPT ENABLE FF	
6030	KCF=6030		/CLEAR KEYBOARD FLAG	
6032	KCC=6032			
6045	TIE=6045			
6031	KSF=6031			
7002	BSW=7002			
6102	SPL=6102		/SKIP ON POWER LOW	
7421	MQL= 7421		/LOAD MQ FROM AC THEN CLEAR AC	
7521	SWP= 7521		/SWAP AC AND MQ	
7701	ACL= 7701		/LOAD MQ INTO AC	
	/DISK STATUS REGISTER BIT DEFINITIONS			
	/WORD1			
0100	HDSLCT= 100		/HEAD SELECT	
0040	COVERO= 40		/COVER OPEN	
0020	HEDOUT= 20		/HEADS OUT (OVER DISK)	
0010	BRUSHH= 10		/BRUSH HOME	
	/STATE DEFINITIONS			
0001	SPINUP= 1			
0002	LODHED= 2			
0003	BRUSHC= 3			
0004	SEKCNT= 4			
0005	SEKLIN= 5			
0006	UNLODH= 6			
0007	SPINDN= 7			
	/WORD 2			
0200	WRDERR= 200		/WRITE DATA ERROR	
0100	HEDCUR= 100		/HEAD CURRENT ERROR	
0040	WRLOCK= 40		/WRITE LOCK STATUS	
0020	TIMOUT= 20		/SEEK TIME OUT	
0010	SPUPTO= 10		/SPIN UP TIME OUT	
0004	WRGATE= 4		/WRITE GATE ERROR	
0002	VOLUME= 2		/VOLUME CHECK	

0001 DRSLER= 1

/DRIVE SELECT ERROR



0200	0200	*200			
0200	7410	START,	SKP		/START ADDRESS
0201	5212		JMP	RESTAR	/RESTART ADDRESS
0202	6007		CAF		/CLEAR ALL FLAGS
0203	6035		KIE		/DISABLE CONSOLE INTERRUPTS
0204	6045		TIE		
0205	3105		DCA	CCRET	/ALLOW CONTROL C'S
0206	4467		MESSAGE		/TYPE OUT PROGRAM TITLE
0207	0000		PTITLE		
0210	3121	RSTRQS,	DCA	DEFAULT	/CLEAR DEFAULT FLAG
0211	3120		DCA	UNITSV	/CLEAR UNITS VALID FLAG
0212	3105	RESTAR,	DCA	CCRET	/ALLOW ^C'S
0213	4442		CONSOL		/ALLOW CONSOLE INPUT
0214	1377		TAD	(RSTRQS	/SET ^G<LF> TO RESTART FROM QUESTION SEQUENCE
0215	3104		DCA	CGPNTR	
0216	1121	DEFTST,	TAD	DEFAULT	/GET DEFAULT FLAG FOR TESTING
0217	7650		SNA CLA		/SKIP IF NON-DEFAULTS ARE CURRENTLY SET UP
0220	5224		JMP	+.4	
0221	4467		MESSAGE		/"CHANGE PREVIOUS"
0222	0045		CHNGPR		/THIS WILL ALLOW SAME PARAMETERS TO BE USED
0223	5226		JMP	+.3	/WITHOUT REANSWERING QUESTIONS
0224	4467		MESSAGE		/"SELECT NON-DEFAULT"
0225	0033		USEDEF		
0226	4467		MESSAGE		/" PARAMETERS? "
0227	0056		PARAMS		
0230	4443		GETRES		/GET OPERATOR'S RESPONSE (TO WHICHEVER QUESTION)
0231	5216		JMP	DEFTST	/INVALID RESPONSE--ASK AGAIN
0232	7640		SZA CLA		/SKIP IF ANSWER WAS NO
0233	5253		JMP	PARAMC	/GO ALLOW PARAMETER CHANGES
0234	1121		TAD	DEFAULT	/CHECK DEFAULT FLAG
0235	7640		SZA CLA		/SKIP IF DEFAULTS ARE SELECTED
0236	5776		JMP	UNITST	/USE SAME PARAMETERS--GO TEST FOR UNITS
0237	3117		DCA	DEVCOD	/USE DEFAULT DEVICE CODE
0240	3122		DCA	BSFTYP	/NO TYPING OF BSF'S
0241	3123		DCA	HDRSUP	/NO HEADER VERIFICATION SUPPRESSION
0242	3124		DCA	DATAVF	/NO DATA AREA VERIFICATION
0243	3125		DCA	LOLIM	/NO LOWER LIMIT
0244	1156		TAD	K0777	/NO UPPER LIMIT
0245	3126		DCA	HILIM	
0246	1161		TAD	K176	/126 (DECIMAL) MAXIMUM BAD SECTORS
0247	3127		DCA	MAXBAD	
0250	3130		DCA	BSFDEL	/NO BAD SECTOR FILE DELETION
0251	3131		DCA	BSFORC	/NO FORCED BAD SECTORS
0252	5776		JMP	UNITST	/GO TEST FOR UNITS
0253	7201	PARAMC,	CLA IAC		/FLAG THAT PARAMETERS ARE BEING CHANGED
0254	3121		DCA	DEFAULT	
0255	4467		MESSAGE		/USE DEVICE CODES 62,63?
0256	0065		USE62		
0257	4443		GETRES		/GET OPERATOR'S RESPONSE
0260	5255		JMP	.-3	/WAIT FOR VALID RESPONSE
0261	7106		CLL RTL		/AC=1 IF RESPONSE WAS "Y" AND 0 IF "N" OR
0262	7106		CLL RTL		/"<CR>". MOVE BIT 11 OVER TO BIT 7
0263	3117		DCA	DEVCOD	/AND SAVE DEVICE CODE FLAG
0264	4467		MESSAGE		
0265	0115		TYPBSQ		/TYPE BAD SECTOR FILES?

HP 001

0266	4443	GETRES		/GET RESPONSE	
0267	5264	JMP	.-3	/TRY AGAIN FOR VALID RESPONSE	
0270	3122	DCA	BSFTYP	/SAVE FLAG	
0271	4467	MESSAGE		/"SUPPRESS HEADER"	
0272	0131	SUPHDQ			
0273	4467	MESSAGE		/" VERIFICATION? "	
0274	0150	VERIFI			
0275	4443	GETRES		/GET RESPONSE	
0276	5271	JMP	.-5	/INVALID RESPONSE	
0277	3123	DCA	HDRSUP	/SAVE FLAG	
0300	4467	MESSAGE		/"DO DATA AREA"	
0301	0141	DATAVQ			
0302	4467	MESSAGE		/" VERIFICATION? "	
0303	0150	VERIFI			
0304	4443	GETRES		/GET OPERATOR'S RESPONSE	
0305	5300	JMP	.-5	/INVALID ANSWER	
0306	3124	DCA	DATAVF	/SAVE FLAG	
0307	1123	TAD	HDRSUP	/IF HEADER VERIFICATION IS NOT SUPPRESSED	
0310	7041	CIA		/ OR	
0311	1124	TAD	DATAVF	/ IF DATA AREA VERIFICATION IS SELECTED	
0312	7710	SPA CLA		/THEN ASK THE QUESTIONS ABOUT LIMITS AND MAX BAD SECTORS	
0313	5775	JMP	DELCHK	/DON'T ASK--GO CHECK IF OPR SHOULD BE ASKED ABOUT BSF DELETION	
0314	4467	MESSAGE			
0315	0102	USCYLM		/USE CYLINDER LIMITS?	
0316	4443	GETRES		/GET RESPONSE	
0317	5314	JMP	.-3	/WAIT FOR GOOD ONE	
0320	7650	SNA CLA		/SKIP IF RESPONSE WAS YES	
0321	5337	JMP	DEFLIM	/GO SET UP DEFAULT LIMITS	
0322	1156	ASKHI, TAD	K0777	/GET MAXIMUM ALLOWABLE OPERATOR INPUT	HP 001
0323	4444	ENTVAL		/ALLOW OPERATOR TO ENTER VALUE	
0324	0160	ENTHI		/POINTER TO TEXT FOR OPERATOR PROMPT FOR ENTRY	
0325	5322	JMP	ASKHI	/ASK AGAIN IF ENTRY WAS TOO HIGH	
0326	1156	TAD	K0777	/OK NO INPUT--USE DEFAULT	HP 001
0327	3126	DCA	HILIM	/SAVE INPUT (OR DEFAULT)	
0330	1126	TAD	HILIM	/GET MAXIMUM ALLOWABLE VALUE FOR LOW LIMIT ENTRY	
0331	4444	ENTVAL		/ALLOW OPERATOR TO ENTER VALUE	
0332	0206	ENTLO		/POINTER TO TEXT FOR LOW LIMIT ENTRY PROMPT	
0333	5322	JMP	ASKHI	/IF LOW LIMIT HIGHER THAN HI LIMIT--REPROPT FOR BOTH	
0334	7200	CLA		/OK NO INPUT--USE DEFAULT	
0335	3125	DCA	LOLIM	/SAVE NUMBER INPUT (OR DEFAULT)	
0336	5342	JMP	MBSASK	/ASK ABOUT MAX NUMBER OF BAD SECTORS	
0337	1156	DEFLIM, TAD	K0777	/SET UP DEFAULT LIMITS	HP 001
0340	3126	DCA	HILIM	/SAVE UPPER LIMIT	
0341	3125	DCA	LOLIM	/SAVE LOWER LIMIT	
0342	4467	MBSASK, MESSAGE			
0343	0231	MAXBSQ		/MAXIMUM NUMBER OF BAD SECTORS (DECIMAL)?	
0344	3127	DCA	MAXBAD	/CLEAR MAXIMUM NUMBER OF BAD SECTORS	
0345	3101	DCA	TEMP3	/CLEAR NUMBERS INPUT FLAG	
0346	4466	MAXLIS, LISN		/WAIT FOR INPUT	
0347	0001	1		/IF OCTAL VALUE INPUT	
0350	0402	GOTNUM		/GO TO GOTNUM (GOT NUMBER)	
0351	7510	- "8		/IF AN "8" IS INPUT	
0352	0401	GET8		/GO TO GET8	
0353	7507	- "9		/IF A "9" IS INPUT	
0354	0400	GET9		/GO TO GET9	

0355	7563	-215		/IF A CARRIAGE RETURN
0356	0422	NUMCHK		/CHECK IF END OF NUMBER OR DEFAULT
0357	0000	0		/IF UNMATCHED INPUT
0360	0361	.+1		/CONTINUE
0361	4463	WZITFG		/ALLOW ^F OR ^G HANDLING
0362	4467	MESSAGE		/TYPE "?<CR><LF>"
0363	0410	QESMRK		
0364	5342	JMP	MBSASK	/GO START OVER
0375	0427			
0376	0541			
0377	0210			
	0400			
		PAGE		
0400	7001	GET9,	IAC	/INCREMENT AC (TO GET 9 INTO IT)
0401	1166	GET8,	TAD	/ADD 8 INTO AC
0402	3077	GOTNUM,	DCA	/SAVE NUMBER INPUT
0403	2101	ISZ	TEMP3	/FLAG THAT A NUMBER WAS INPUT. (NOTE THAT
				/THERE IS A BUG IF 4096 0'S ARE TYPED)
0404	1363		TAD	/GET -10. INTO AC
0405	3100		DCA	/SAVE IT IN A COUNTER
0406	1127		TAD	/\
0407	2100		ISZ	/ >MULTIPLY MAXBAD BY 10.
0410	5206		JMP	//
0411	1077		TAD	/ADD IN LSB TO PREVIOUS DIGITS
0412	3127		DCA	/SAVE ENTERED NUMBER SO FAR
0413	1127		TAD	/GET NUMBER ENTERED
0414	1365		TAD	/SUBTRACT 126 FROM NUMBER INPUT
0415	7750		SPA SNA	/SKIP IF NUMBER IS TOO BIG
0416	5777		JMP	/GO LISTEN FOR MORE
0417	4467		MESSAGE	/MAXIMUM SPACE AVAILABLE IN BAD SECTORS FILES IS 1261
0420	0263		MAXBIG	
0421	5776		JMP	/TRY AGAIN
0422	1101	NUMCHK,	TAD	/CHECK IF ANY NUMBERS WERE INPUT
0423	7640		SZA CLA	/SKIP IF NOT--SET UP DEFAULT
0424	5227		JMP	/NUMBER THAT WAS INPUT IS ALREADY SAVED
0425	1161		TAD	
0426	3127		DCA	/SAVE DEFAULT VALUE
0427	1123	DELCHK,	TAD	/IF BOTH HEADER VERIFICATION
0430	7041		CIA	/ AND
0431	1124		TAD	/ DATA AREA VERIFICATION ARE SELECTED
0432	7750		SPA SNA	/THEN SKIP
0433	5255		JMP	/NO BAD SECTOR FILE DELETION ALLOWED IF BOTH NOT SELECTED
0434	1125		TAD	/AND IF THE DEFAULT LIMITS ARE USED
0435	7640		SZA CLA	/ THEN THE QUESTION CAN BE ASKED
0436	5255		JMP	/LIMIT IN USE--DO NOT ALLOW DELETION
0437	1126		TAD	/CHECK OUT UPPER LIMIT
0440	1162		TAD	/
0441	7640		SZA CLA	/SKIP IF 777
0442	5255		JMP	/LIMIT IN USE--NO DELETION ALLOWED
0443	4467	DELASK,	MESSAGE	
0444	0302		DELOLD	/DELETE OLD FIELD BAD SECTOR FILE?
0445	4443		GETRES	/GET RESPONSE
0446	5243		JMP	/INVALID RESPONSE
0447	7650		SNA CLA	/SKIP IF ANSWER WAS YES

HP 001

0450	5255	JMP	NODEL	/ANSWER WAS NO	
0451	4461	RUSURE		/ASK OPERATOR "ARE YOU SURE?"	
0452	5243	JMP	DELASK	/NOT SURE--ASK AGAIN	
0453	3121	DCA	DFAULT	/SURE--CLEAR DEFAULT FLAG (DO NOT ALLOW SAME	
				/PARAMETERS TO BE USED NEXT TIME AROUND)	
0454	7201	CLA IAC		/SET FLAG FOR BAD SECTOR FILE DELETION	
0455	3130	NODEL, DCA	BSFDEL	/SAVE DELETION FLAG	
0456	4467	MESSAGE			
0457	0334	FRCBSQ		/FORCE BAD SECTORS?	
0460	4443	GETRES		/GET RESPONSE	
0461	5256	JMP	.-3	/INVALID RESPONSE	
0462	3131	DCA	BSFORC	/SAVE FLAG	
0463	1131	TAD	BSFORC		
0464	7650	SNA CLA		/SKIP IF FORCING BAD SECTORS	
0465	5341	JMP	UNITST	/GO ASK ABOUT UNITS TO TEST	
0466	3121	DCA	DFAULT	/CLEAR DEFAULT FLAG (DO NOT ALLOW SAME PARAMETERS	
				/TO BE USED NEXT TIME IF FORCING BAD SECTORS	
0467	1375	TAD	(DRVACT-1	/SET UP POINTER TO DRIVE ACTIVE TABLE	
0470	3010	DCA	AUTO10		
0471	3410	DCA I	AUTO10	/SET ALL DRIVES INACTIVE	
0472	3410	DCA I	AUTO10		
0473	3410	DCA I	AUTO10		
0474	3410	DCA I	AUTO10		
0475	7325	CLA IAC	STL RAL	/3 IS MAXIMUM NUMBER ALLOWED TO BE INPUT	
0476	4444	ENTVAL		/PROMPT OPERATOR AND GET INPUT	
0477	0346	UNITNQ		/PROMPT FOR UNIT NUMBER	
0500	5275	JMP	.-3	/INPUT TOO HIGH	
0501	5275	JMP	.-4	/NO INPUT--NO DEFAULT FOR UNIT NUMBER	
0502	3113	DCA	DRVNUM	/SAVE DRIVE NUMBER INPUT	
0503	1113	TAD	DRVNUM		
0504	1375	TAD	(DRVACT-1	/USE INPUT NUMBER AS OFFSET INTO TABLE	
0505	3010	DCA	AUTO10		
0506	7201	CLA IAC		/SET THE FLAG FOR DRIVE ACTIVE	
0507	3410	DCA I	AUTO10		
0510	4774	JMS	SETUPB	/SET UP BAD SECTOR BUFFERS	
0511	4467	MESSAGE		/ENTER BAD SECTOR ADDRESS (IN OCTAL) IN RESPONSE	
0512	0527	ENTRY1		/ TO PROMPTS. WHEN NO MORE TO BE ENTERED,	
0513	4467	MESSAGE		/ TYPE <CR> IN RESPONSE TO "CYLINDER" PROMPT	
0514	0567	ENTRY2			
0515	1156	PRMCYL, TAD	K0777	/777 IS MAXIMUM ALLOWABLE INPUT	HP 001
0516	4444	ENTVAL		/PROMPT FOR ENTRY	
0517	0510	CYLPRM		/OF CYLINDER	
0520	5315	JMP	PRMCYL	/TOO HIGH--TRY AGAIN	
0521	5341	JMP	UNITST	/NO MORE ENTRIES	
0522	3106	DCA	CYLNR	/SAVE ENTRY	
0523	7201	CLA IAC		/1 IS MAXIMUM TRACK ENTRY ALLOWED	
0524	4444	ENTVAL		/PROMPT AND GET TRACK ENTRY	
0525	0516	TRKPRM			
0526	5323	JMP	.-3	/TOO HIGH	
0527	5323	JMP	.-4	/NO DEFAULT--REPROMPT	
0530	3107	DCA	TRACK	/SAVE TRACK INPUT	
0531	1364	TAD	K47	/47 IS MAXIMUM ALLOWABLE SECTOR ENTRY	
0532	4444	ENTVAL		/PROMPT AND ACCEPT INPUT	
0533	0522	SECPRM			
0534	5331	JMP	.-3	/TOO HIG	

Address	Hex	Label	Operation	Comment
0535	5331		JMP	.-4 /NO DEFAULTS
0536	3110		DCA	SECTOR /SAVE VALID INPUT
0537	4460		ENTERBAD	/ENTER THE BAD SECTOR INTO THE FILE
0540	5315		JMP	PRMCTL /PROMPT FOR NEXT BAD SECTOR
0541	1131	UNITST,	TAD	BSFORC /CHECK IF FORCING BAD SECTORS
0542	7640		SZA CLA	/SKIP IF NOT
0543	5773		JMP	LASTCH /UNIT ALREADY DETERMINED IF FORCING BAD SECTORS
0544	1120		TAD	UNITSV /CHECK UNITS VALID FLAG
0545	7650		SNA CLA	/SKIP IF UNITS VALID
0546	5355		JMP	UNIASK /NOT VALID--ASK ABOUT UNITS
0547	4467		MESSAGE	
0550	0355		TSTAGQ	/TEST SAME UNITS AGAIN?
0551	4443		GETRES	/GET RESPONSE
0552	5347		JMP	.-3 /INVALID RESPONSE
0553	7640		SZA CLA	/SKIP IF ANSWER WAS NO
0554	5773		JMP	LASTCH /USE SAME UNITS
0555	1170	UNIASK,	TAD	M4 /SET UP COUNTER FOR NUMBER OF DRIVES
0556	3101		DCA	TEMP3
0557	3113		DCA	DRVNUM /ZERO DRIVE NUMBER
0560	1375		TAD	(DRVACT-1 /SET UP POINTER TO DRIVE ACTIVE TABLE
0561	3011		DCA	AUTO11
0562	5772		JMP	DRVLUP
0563	7766	M12,	-12	
0564	0047	K47,	47	
0565	7602	M176,	-176	
0572	0602			
0573	0616			
0574	2600			
0575	5607			
0576	0342			
0577	0346			
	0600	PAGE		
0600	4467		MESSAGE	/IN CASE OF REPROMPT AFTER INVALID INPUT
0601	0410		QESMRK	/"?<CR>"
0602	4467	DRVLUP,	MESSAGE	/"TEST DRIVE "
0603	0023		TSTDRV	
0604	1113		TAD	DRVNUM /GET DRIVE NUMBER
0605	4470		PRNT1	/TYPE IT
0606	4467		MESSAGE	/" ? "
0607	0031		SPQSP	
0610	4443		GETRES	/GET OPERATORS RESPONSE
0611	5200		JMP	DRVLUP-2 /REPROMPT IF NOT "Y","N", OR "<CR>"
0612	3411		DCA 1	AUTO11 /SET THE DRIVE ACTIVE FLAG BASED ON OPR'S RESPONSE
				/RETURN FROM GETRES WAS "1" IF ANSWER
				/WAS "Y", AND "0" IF ANSWER WAS "N" OR "<CR>"
0613	2113		ISZ	DRVNUM /GO TO NEXT DRIVE (FOR TYPEOUT)
0614	2101		ISZ	TEMP3 /ASKED FOR ALL DRIVES?
0615	5202		JMP	DRVLUP /NO--GO PROMPT FOR NEXT DRIVE
		/LAST CHANCE FOR OPERATOR TO CORRECT INPUT ERRORS (WITHOUT ^C OR ^G<LF>)		
0616	4475	LASTCH,	CRLF	
0617	4461		RUSURE	/ARE YOU SURE?
0620	5777		JMP	RSTRQS /NO--START ALL OVER

0621	7201	CLA	IAC	/YES--SET UNITS VALID FLAG
0622	3120	DCA	UNITSV	
0623	1376	TAD	(RESTAR	/SET "G POINTER FOR RESTART FROM PROGRAM
0624	3104	DCA	CGPNTR	
0625	4775'	JMS	IOTCNG	/CHANGE IOT CODES
0626	7240	STA		/SET UP "PREVIOUS DRIVE" NUMBER
0627	3113	DCA	DRVNUM	
0630	2113	NXTDRV, ISZ	DRVNUM	
0631	7307	CLA	CLL IAC RTL	/4 INTO AC FOR MASK
0632	0113	AND	DRVNUM	/CHECK IF AT DRIVE "4"
0633	7650	SNA	CLA	/SKIP IF SO
0634	5240	JMP	..+4	/VALID DRIVE--GO CHECK IF ACTIVE
0635	4467	MESSAGE		
0636	0372	DONE		/"DONE!"
0637	5776'	JMP	RESTAR	/RESTART
0640	1113	TAD	DRVNUM	/FORM OFFSET INTO DRIVE ACTIVE TABLE
0641	1374	TAD	(DRVACT	
0642	3077	DCA	TEMP1	
0643	1477	TAD	I TEMP1	/PICK UP DRIVE ACTIVE FLAG FOR THIS DRIVE
0644	7650	SNA	CLA	/SKIP IF ACTIVE--BEGIN VERIFICATION
0645	5230	JMP	NXTDRV	/TRY CHECKING NEXT DRIVE
0646	4446	RESET		/RESET THE DRIVE
0647	4450	ERRHAN		/HANDLE ANY PROBLEMS--RETURN IF READY
0650	1131	TAD	BSFORC	/CHECK IF FORCING BAD SECTORS
0651	7640	SZA	CLA	/SKIP IF NOT
0652	5261	JMP	DOHDRV	/GO CHECK IF TO DO HEADER VERIFICATION
0653	4467	MESSAGE		
0654	0376	WORKOU		/"WORKING ON UNIT "
0655	1113	TAD	DRVNUM	/TYPE THE DRIVE NUMBER
0656	4470	PRNT1		
0657	4475	CRLF		/AND <CR><LF>
0660	4773'	JMS	SETUPB	/SET UP BAD SECTOR BUFFERS
0661	4442	DOHDRV, CONSOL		
0662	1123	TAD	HDRSUP	/CHECK IF HEADER VERIFICATION IS SUPPRESSED
0663	7640	SZA	CLA	/SKIP IF NOT
0664	5274	JMP	DATVCH	/GO CHECK IF TO DO DATA VERIFICATION
0665	1125	TAD	LOLIM	/INITIALIZE CYLINDER TO LOW LIMIT
0666	3106	DCA	CYLNR	
0667	3107	DCA	TRACK	/CLEAR STARTING TRACK
0670	4772'	HDRVLP, JMS	HDRVFY	/SEEK AND VERIFY ALL 40 HEADERS
0671	4771'	JMS	NXTTRK	/COMPUTE NEXT TRACK
0672	5270	JMP	HDRVLP	/NORMAL NEXT TRACK--SEEK AND VERIFY
0673	5270	JMP	HDRVLP	/CYL 777, TRK 1 RETURN--OK, USE IT
		/NXTTRK CALL+3	IS RETURN WHEN CYLNR > HILIM	
0674	1124	DATVCH, TAD	DATVVF	/CHECK DATA VERIFICATION FLAG
0675	7650	SNA	CLA	/SKIP IF DATA VERIFICATION IS REQUESTED
0676	5331	JMP	FILEWR	/NOT--GO CHECK IF TO WRITE FILES
0677	1125	TAD	LOLIM	/SET UP STARTING CYLINDER
0700	3106	DCA	CYLNR	
0701	3107	DCA	TRACK	/SET UP STARTING TRACK
0702	4770'	JMS	CLRBUF	/CLEAR 2K ZERO BUFFER
0703	4767'	JMS	PATBUF	/SET UP 2K PATTERN BUFFER
0704	4766'	DATVLP, JMS	PATPOR	/SET UP THE OVERWRITTEN PORTION OF 2K PATTERN BUFFER
0705	4765'	JMS	CHKTRK	/CHECK THE ENTIRE TRACK
0706	1276	BUF1		/USING DATA AT BUFFER 1 (110110110110...)

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0707 0333          333          /AND HERE IS THE DATA IN IT
0710 0155          155
0711 0266          266
0712 4765'        JMS          CHKTRK      /CHECK THE ENTIRE TRACK
0713 1277          BUF2        /USING DATA AT BUFFER 2 (011011011011...)

0714 0155          155          /AND HERE IS THE DATA IN IT
0715 0266          266
0716 0333          333
0717 4765'        JMS          CHKTRK      /CHECK THE ENTIRE TRACK
0720 1300          BUF3        /USING DATA AT BUFFER 3 (10110110110110...)
0721 0266          266          /AND HERE IS THE DATA IN IT
0722 0333          333
0723 0155          155
0724 4764'        JMS          CLRPOR      /CLEAR THE OVERWRITTEN PORTION OF BUFFER
0725 4763'        JMS          CHKTRK      /CHECK THE TRACK WITH 0'S
0726 4771'        JMS          NXTTRK      /COMPUTE NEXT TRACK
0727 5304          JMP          DATVLP      /VERIFY DATA AT THIS TRACK
0730 7000          NOP          /AT CYL 777, TRK 1 (DON'T WRITE)--CHECK IF TO WRITE FILES
                                /THIS RETURN IS USED IF CYLNDR > HILIM
0731 1137          FILEWR, TAD      WRTFIL    /CHECK WRITE FILES FLAG
0732 7650          SNA CLA        /SKIP IF SET (FILES TO BE WRITTEN)
0733 5353          JMP          NOWRIT
0734 1356          TAD          K24A        /SET UP STARTING SECTOR OF WRITE FOR
0735 3110          DCA          SECTOR      /      FIELD FILES
                                /AC HAS 0 FOR FIELD ARGUMENT
0736 4762'        JMS          WRTFI      /WRITE THE BAD SECTOR FILES (FROM FIELD 0)
0737 5651          FLDDBSF        /POINTER TO FILE BUFFER
0740 4475          CRLF          /TYPE A <CR><LF>
0741 1111          TAD          NEWBAD      /GET THE NUMBER OF NEW BAD SECTORS THAT WERE
0742 4761'        JMS          TYPDEC      / ENTERED AND TYPE IT IN DECIMAL
0743 4467          MESSAGE        /("X)" NEW BAD SECTORS ADDED TO FIELD FILE ("
0744 1117          NEWADD
0745 1111          TAD          NEWBAD      /GET TOTAL NUMBER NOW IN FILE
0746 1112          TAD          OLDBAD
0747 4761'        JMS          TYPDEC      /TYPE IT IN DECIMAL
0750 4467          MESSAGE        /" TOTAL)"
0751 1140          TOTAL
0752 5230          JMP          NXTDRV      /SELECT NEXT DRIVE
0753 4467          NOWRIT, MESSAGE
0754 1145          NONWB
0755 5230          JMP          NXTDRV      /"NO NEW BAD SECTORS FOUND (FIELD FILES NOT REWRITTEN)"
                                /SELECT NEXT UNIT

0756 0024          K24A, 24
                                /AJRLL CONSOLE UTILITIES

0761 3227
0762 4400
0763 4637
0764 4345
0765 4600
0766 4545
0767 4520
0770 2735
0771 2516

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0772 3600  
 0773 2600  
 0774 5610  
 0775 5465  
 0776 0212  
 0777 0210  
 1000

PAGE

/CONSOL

/

/THIS ROUTINE IS USED TO PROCESS KEYBOARD INPUT. IF CCRET IS NON-ZERO  
 / (BAD SECTOR FILE WRITING IN PROGRESS), THEN ALL INPUT IS IGNORED. IF  
 / OUTPUT IS DISABLED, THEN ONLY CONTROL-Q AND CONTROL-C ARE RECOGNIZED.  
 / IF OUTPUT IS ENABLED, THEN IN ADDITION, CONTROL-G AND CONTROL-S ARE  
 / RECOGNIZED. THESE CHARACTERS HAVE THE FOLLOWING CONTROL FEATURES:  
 / CNTRL-G -- ENTER SWITCH REGISTER MODIFICATION ROUTINE  
 / CNTRL-C -- RETURN TO OS/8 MONITOR  
 / CNTRL-S -- INHIBIT ALL FURTHER OUTPUT. ONLY CNTRL-Q OR CNTRL-C  
 / WILL BE RECOGNIZED. (IF THE PROGRAM ATTEMPTS TO  
 / OUTPUT, IT WILL HANG WAITING FOR A CNTRL-Q OR C.)

/ CNTRL-Q -- ENABLE OUTPUT  
 / CNTRL-F -- ADJUST FILLER CHARACTER COUNT  
 / ALL OTHER CHARACTERS ARE ECHOED, FOLLOWED BY "?" AND CRLF.

/ IF INPUT AND CCRET=0

/ THEN IF OUTPUT-OFF

/ THEN DO;

/ GET CHARACTER;

/ IF CHARACTER = ^Q

/ THEN TURN OUTPUT ON;

/ ELSE IF CHARACTER = ^C

/ THEN DO;

/ TURN OUTPUT ON;

/ TYPE "^C";

/ GOTO OS/8;

/ END;

/ END;

/ ELSE DO;

/ GET CHARACTER;

/ IF CHARACTER = ^G

/ THEN DO;

/ TYPE "^G";

/ CALL CNTRLG;

/ END;

/ ELSE IF CHARACTER = ^Q

/ THEN;

/ ELSE IF CHARACTER = ^C

/ THEN DO;

/ TYPE "^C";

/ GOTO OS/8;

/ END;

/ ELSE IF CHARACTER = ^S

/ THEN TURN OUTPUT OFF;

/ ELSE IF CHARACTER = ^F

/ THEN CALL CNTRLF;



```

/
/                                     ELSE TYPE "?<CR><LF>";
/RETURN;                               END;
/
1000 0000 XCONSO, 0
1001 6031 KSF
1002 5245 JMP CONRET /SKIP IF KEYBOARD INPUT
1003 4476 VT278 /NO INPUT--RETURN
1004 7200 CLA
1005 1105 TAD CCRET /CHECK IF WRITING OF FILES IS IN PROGRESS
1006 7640 SZA CLA /SKIP IF NOT
1007 5245 JMP CONRET /IGNORE INPUT UNTIL FILES ARE WRITTEN
1010 1114 TAD NOPRNT /PICK UP OUTPUT DISABLE FLAG
1011 7650 SNA CLA /OUTPUT DISABLED?
1012 5220 JMP ONLISN /NO--GO TO ONLISN
1013 4466 LISN /YES--GET CHARACTER FROM KEYBOARD
1014 7557 -221 /CNTRL-Q
1015 1044 CNTRLQ /IF ^Q GO TO CNTRLQ
1016 0000 0 /IF NOT ^Q OR ^C THEN
1017 1045 CONRET / RETURN
1020 4466 ONLISN, LISN /GET CHARACTER
1021 7571 M207, -207 /CNTRL-G
1022 1040 CTLG
1023 7555 -223 /CNTRL-S
1024 1042 CNTRLQ /GO DISABLE OUTPUT
1025 7557 -221 /CNTRL-Q
1026 1045 CONRET /OUTPUT IS ALREADY ON, SO RETURN
1027 7572 -206 /IF CONTROL-F GO TO
1030 1036 CTLF / CTLF
1031 0000 0 /IF INVALID CHARACTER THEN
1032 1033 .+1 / TYPE OUT
1033 4467 MESSAGE / "?" FOLLOWED BY
1034 0410 QESMRK / <CR><LF>
1035 5245 JMP CONRET / AND RETURN
1036 4246 CTLF, JMS CNTRLF /CALL CNTRL-F HANDLER
1037 5245 JMP CONRET /RETURN
1040 4277 CTLG, JMS UPARG
1041 5245 JMP CONRET /RETURN
1042 2114 CNTRLQ, ISZ NOPRNT /SET NOPRINT FLAG
1043 5245 JMP CONRET /RETURN
1044 3114 CNTRLQ, DCA NOPRNT /CLEAR NOPRINT FLAG
1045 5600 CONRET, JMP I XCONSO /RETURN W/AC CLEAR
/
/JMS CNTRLF
/
/CONTROL-F HANDLER. ALLOWS MODIFICATION OF FILL COUNT FROM CONSOLE.
/
1046 0000 CNTRLF, 0
1047 4467 MESSAGE /TYPE "^F<CR>FILL = "
1050 0421 FILLEQ
1051 1023 TAD FILLER /GET FILL COUNT
1052 4472 PRNT4 /PRINT OCTAL FILL COUNT
1053 4445 GETNUM /GET OCTAL INPUT FROM CONSOLE
1054 5260 JMP .+4 /GO SEE WHAT INVLAID INPUT WAS

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1055 5260      JMP      .+3
1056 5276      JMP      CNTFRT      /RETURN WITH FILL UNCHANGED
1057 5275      JMP      CNTFRT-1    /MODIFY FILL AND RETURN
1060 7240      STA
1061 4466      LISN                /USE PREVIOUS INPUT
1062 7572      -206                /CHECK LAST INPUT
1063 1047      CNTRLF+1            /IF CONTRL-F, THEN
1064 7571      -207                /      REISSUE PROMPT
1065 1073      .+6                /IF CONTROL G, THEN GO HANDLE IT
1066 0000      0
1067 1070      .+1                /UNMATCHED INPUT
1070 4467      MESSAGE            /TYPE "?<CR>"
1071 0410      QESMRK
1072 5247      JMP      CNTRLF+1    /GO START OVER
1073 4277      JMS      UPARG        /HANDLE CONTROL G
1074 5247      JMP      CNTRLF+1
1075 3023      DCA      FILLER      /SAVE NEW FILL COUNT
1076 5646      CNTFRT, JMP I  CNTRLF /RETURN W/ AC CLEAR

      /JMS UPARG
      /
      /TYPE "G", THEN CALL CONTROL G HANDLER
      /

1077 0000      UPARG, 0
1100 4467      MESSAGE
1101 0414      UPARRG
1102 4462      CNTRLG
1103 5677      JMP I      UPARG

      /CNTRLG
      /
      /CONTROL-G HANDLER. CALLED WITH "CNTRLG" WHENEVER CONTROL-G IS
      /RECEIVED FROM CONSOLE, OR ON PROGRAM ".
      /

1104 4467      MESSAGE            /THESE THREE INSTRUCTIONS ARE FOR REISSUEING
1105 0414      UPARRG            /THE "G" PROMPT WHEN A CONTROL-G IS TYPED
1106 7410      SKP                /WHEN ALREADY IN CONTROL-G ROUTINE
1107 0000      XCTRLG, 0
1110 4467      MESSAGE            /TYPE "SR="
1111 0416      SWRMSG
1112 4777      JMS      GETSR      /GET SWITCH REG VALUE INTO AC
1113 4472      PRNT4              /TYPE OUT OCTAL VALUE
1114 4445      GETNUM            /GET INPUT FORM OPERATOR
1115 5321      JMP      NOIN      /FIND OUT WHAT INVALID CHARACTER WAS
1116 5325      JMP      YESIN     /SAVE INPUT AND FIND OUT WHAT CHARACTER WAS
1117 5352      JMP      CNTGRT    /RETURN WITHOUT SAVING NEW VALUE
1120 5351      JMP      CNTGRT-1  /SAVE NEW PSEUDO-SR AND RETURN
1121 7240      NOIN, STA
1122 3354      DCA      INFLG      /SET FLAG THAT NO OCTAL INPUT WAS RECEIVED
1123 3353      DCA      DIGIN     /CLEAR OCTAL NUMBER INPUT
1124 5327      JMP      .+3
1125 3353      YESIN, DCA      DIGIN
1126 3354      DCA      INFLG
1127 7240      STA
1130 4466      LISN                /USE OLD KEYBOARD INPUT

```

```

1131 7571      -207      /IF CONTROL-G, THEN
1132 1104      XCTRLG-3  /      REISSUE PROMPT
1133 7566      -212      /ON LINE FEED
1134 1142      LNFEED    /GO TO LNFEED
1135 0000      0         /ON UNMATCHED INPUT
1136 1137      .+1       /CONTINUE
1137 4467      MESSAGE   /TYPE "?" <CR><LF>
1140 0410      QESMRK
1141 5310      JMP      XCTRLG+1  /START OVER WITH PROMPT
1142 1105      LNFEED, TAD      CCRET  /MAKE SURE THAT THIS IS ALLOWED
1143 7640      SZA CLA      /SKIP IF IT IS
1144 4000      JMS      0         /HOW DID I GET HERE??? !!SOFTWARE ERROR!!
1145 1104      TAD      CGPNTR  /PICK UP RETURN POINTER
1146 3307      DCA      XCTRLG  /      PLACE FOR STARTUP
1147 1353      TAD      DIGIN   /GET INPUT DIGITS
1150 2354      ISZ      INFLG   /SKIP IF NOT VALID
1151 3020      DCA      PSWR    /SAVE INPUT DIGITS IN PSEUDO SWITCH REG
1152 5707      CNTGRT, JMP I  XCTRLG /RETURN W/AC CLEAR
/
1153 0000      DIGIN, 0
1154 0000      INFLG, 0

/WZITFG
/
/WAS IT F OR G? SUBROUTINE CHECKS IF LAST CHARACTER INPUT WAS CONTROL-F OR CONTROL-G,
/AND IF SO, CALLS THE APPROPRIATE HANDLER. AC IS CLEAR ON RETURN
/
1155 0000      XWZITF, 0
1156 7300      CLA CLL
1157 1115      TAD      LASTIN   /GET LAST CHARACTER INPUT
1160 1221      TAD      M207     /CHECK IF ^G
1161 7450      SNA      /SKIP IF NOT
1162 4277      JMS      UPARG    /HANDLE ^G
1163 7001      IAC      /CHECK IF ^F
1164 7650      SNA CLA      /SKIP IF NOT
1165 4246      JMS      CNTRLF   /HANDLE CONTROL F
1166 5755      JMP I  XWZITF    /RETURN W/ AC CLEAR

/PRNT1
/
/PRINT OCTAL NUMBER IN AC 9 THRU 11
/
1167 0000      XPRNT1, 0
1170 0375      AND      K7       /IGNORE OTHER BITS
1171 1374      TAD      K260     /MAKE NUMBER ASCII
1172 4474      TYPE
1173 5767      JMP I  XPRNT1
1174 0260      K260, 260
1175 0007      K7, 7

1177 1650      PAGE
1200

/PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11

```

```

1200 0000 XPRNT2, 0 /CALL BY "PRNT2"
1201 3211 DCA P2SAVE
1202 1211 TAD P2SAVE
1203 7012 RTR
1204 7010 RAR
1205 4470 PRNT1
1206 1211 TAD P2SAVE
1207 4470 PRNT1
1210 5600 JMP I XPRNT2
1211 0000 P2SAVE, 0

```

/PRINT FOUR OCTAL NUMBERS IN AC 11 THRU 0 FOLLOWED  
/BY TWO SPACES

```

1212 0000 XPRNT4, 0 /CALL BY "PRNT4"
1213 3223 DCA P4SAVE
1214 1223 TAD P4SAVE
1215 7002 BSW
1216 4471 PRNT2
1217 1223 TAD P4SAVE
1220 4471 PRNT2
1221 4473 SPACE2
1222 5612 JMP I XPRNT4
1223 0000 P4SAVE, 0

```

/TYPE

/

/TYPE THE ASCII CHARACTER IN THE AC

```

1224 0000 XTYPE, 0 /CALL BY "TYPE"
1225 3264 DCA CHARSV /SAVE CHARACTER TO BE TYPED
1226 1105 CHKOK, TAD CCRET /CHECK IF FILE WRITING WAS IN PROGRESS
1227 7640 SZA CLA /SKIP IF NOT
1230 5255 JMP OK2TYP /IGNORE KEYBOARD INPUT AND NOTYPE FLAG AND TYPE THE MESSAGE
                                         /ANYWAY. IT CAN ONLY BE A UNIT FAILURE (WHILE WRITING FILES).

1231 1114 TAD NOPRNT
1232 7650 SNA CLA /OK TO PRINT?
1233 5236 JMP .+3 /YES
1234 4442 CONSOL /WAIT FOR INPUT
1235 5231 JMP .-4 /CHECK IF OUTPUT REENABLED
1236 6031 KSF /SKIP IF READER FLAG SET
1237 5255 JMP OK2TYP /NOT SET, TYPE DATA

1240 4476 VT278
1241 6034 KRS /READ KEYBOARD--LEAVE FLAG SET
1242 1265 TAD M223 /ADD IN MINUS CONTROL-S
1243 7440 SZA /SKIP IF A CONTROL-S
1244 5250 JMP .+4 /GO CHECK FOR CNTRL-C
1245 6032 KCC /CLEAR KEYBOARD FLAG
1246 2114 ISZ NOPRNT /SET NO PRINT FLAG
1247 5226 JMP CHKOK /GO GET IN CONTROL-Q WAIT LOOP
1250 1266 TAD K20 /CHECK FOR CONTROL-C
1251 7640 SZA CLA /SKIP IF CONTROL-C
1252 5255 JMP OK2TYP /NOT ^C--TYPE THE CHARACTER
1253 6032 KCC /CLEAR KEYBOARD FLAG
1254 5777 JMP CNTRLC /HANDLE CONTROL-C

```

```

1255 1264 OK2TYP, TAD CHARSV /GET CHARACTER
1256 6046 TLS
1257 7200 CLA
1260 6041 TSF
1261 5260 JMP .-1
1262 6042 TCF
1263 5624 JMP I XTYPE
/
1264 0000 CHARSV, 0
1265 7555 M223, -223
1266 0020 K20, 20

```

/TYPE A CR AND LF WITH NUMBER OF FILLERS  
/AS DETERMINED BY LOCATION "FILLER"

```

1267 0000 XCRLF, 0 /CALL BY "CRLF"
1270 7200 CLA
1271 1303 TAD K215
1272 4474 TYPE
1273 1023 TAD FILLER
1274 7040 CMA
1275 3305 DCA CRLFSV
1276 1304 TAD K212
1277 4474 TYPE
1300 2305 ISZ CRLFSV
1301 5277 JMP .-2
1302 5667 JMP I XCRLF
1303 0215 K215, 0215
1304 0212 K212, 0212
1305 0000 CRLFSV, 0

```

/PRINT PACKED ASCII TEXT TERMINATED BY  
/SIX-BIT 00

```

1306 0000 MESAGX, 0 /CALL BY "MESSAGE"
1307 7344 CLA CLL CMA RAL /-2 INTO AC
1310 3350 DCA MESCNT /SET UP CHARACTER COUNTER
1311 1706 TAD I MESAGX
1312 3351 DCA MESSAV
1313 2306 ISZ MESAGX /SET UP RETURN
1314 6211 MESLUP, CDF 10 /FIELD OF TEXT
1315 1751 TAD I MESSAV
1316 6201 CDF 0 /BACK TO HERE
1317 2350 ISZ MESCNT /FIRST OR SECOND CHARACTER OF WORD
1320 5327 JMP MESBSW /FIRST-PUT CHARACTER INTO LOW BYTE
1321 2351 ISZ MESSAV /2ND--INCREMENT POINTER FOR NEXT TIME
1322 3100 DCA TEMP2 /SAVE AC
1323 7344 CLA CLL CMA RAL /RESTORE CHARACTER COUNTER
1324 3350 DCA MESCNT
1325 1100 TAD TEMP2
1326 7410 SKP
1327 7002 MESBSW, BSW /GET FIRST CHARACTER INTO POSITION
1330 0164 AND K77

```

```

1331 7450      SNA                /TERMINATOR (00)?
1332 5706      JMP I      MESAGX  /YES
1333 1346      TAD      M43
1334 7450      SNA                /CRLF?
1335 5344      JMP      .+7      /YES
1336 1352      TAD      K3A
1337 7510      SPA                /200 OR 300
1340 1353      TAD      K100A     /300
1341 1347      TAD      K240     /200
1342 4474      TYPE
1343 7410      SKP
1344 4475      CRLF
1345 5314      JMP      MESLUP
1346 7735      M43,      7735
1347 0240      K240,     0240
1350 0000      MESCNT, 0
1351 0000      MESSAV, 0
1352 0003      K3A,      3
1353 0100      K100A,   100

      /GETRES
      /
      / THIS SUBROUTINE WAITS FOR OPERATOR RESPONSE TO YES, NO QUESTIONS. A <CR> IS
      /TREATED AS A NO RESPONSE. IF AN INVALID RESPONSE IS RECEIVED, A "?<CR><LF>"
      /IS TYPED AND A NORMAL RETURN IS MADE, ELSE THE PROGRAM SKIPS.
      /IF THE RESPONSE WAS "Y", THE AC CONTAINS A "1" ON RETURN, ELSE 0.
      /
1354 0000      XGETRE, 0
1355 7200      CLA                /USE NEW INPUT
1356 4466      LISN
1357 7447      -"Y
1360 1371      GOTYES             /IF YES--SAVE FOR 1 IN AC ON RETURN
1361 7462      -"N
1362 1372      GOTNO             /TYPE CRLF AN SKIP
1363 7563      -215             /IF NO--SAVE FOR 0 IN AC ON RETURN
1364 1375      RESRET           /AND TYPE CRLF AND SKIP
1365 0000      0                /IF <CR>--SKIP ON RETURN
1366 1367      .+1
1367 4463      WZITFG
1370 5376      JMP      RESRET+1 /CHECK FOR CONTROL F OR G
1371 7001      GOTYES, IAC        /AND RETURN
1372 3154      GOTNO, DCA        /SET AC TO ONE
1373 4475      CRLF             /SAVE RETURN VALUE
1374 1154      TAD      RESPON  /TYPE CRLF
1375 2354      RESRET, ISZ      /GET RETURN VALUE
1376 5754      JMP I      XGETRE /SKIP ON RETURN IF VALID INPUT
                                   /RETURN WITH 0 OR 1 IN AC

      /

1377 1510      PAGE
1378 1400

      /PRINT 2 SPACES

1400 0000      SPACX2, 0        /CALL BY "SPACE2"
1401 4467      MESSAGE

```

1402 0427  
1403 5600

TWOSPA  
JMP I SPACX2

/COMPARE INPUT TO LIST FOLLOWING CALL  
/INPUT ONE CHARACTER IF AC=0  
/USE LAST INPUT IF AC NON ZERO

1404 0000	XLISN, 0	/CALL BY "LISN"
1405 7640	SZA CLA	
1406 5226	JMP LISN1	/USE LAST INPUT SINCE AC NOT ZERO
1407 4262	JMS GETINP	/WAIT FOR KEYBOARD INPUT
1410 1114	TAD NOPRNT	/CHECK OUTPUT ENABLE FLAG
1411 7640	SZA CLA	/SKIP IF OK TO OUTPUT
1412 5226	JMP LISN1	/DON'T PRINT CHARACTER
1413 1115	TAD LASTIN	
1414 1260	TAD M212	
1415 7450	SNA	/IS IT A LF?
1416 5222	JMP .+4	/YES
1417 1261	TAD M3	
1420 7640	SZA CLA	/IS IT A CR?
1421 5224	JMP .+3	/NO
1422 4475	CRLF	
1423 5226	JMP LISN1	
1424 1115	TAD LASTIN	
1425 4474	TYPE	/PRINT THE CHARACTER
1426 1604	LISN1, TAD I XLISN	/GET COMPARE VALUE
1427 2204	ISZ XLISN	
1430 7450	SNA	/EXIT?
1431 5252	JMP LISN3	/YES
1432 7500	SMA	
1433 5242	JMP LISNUM	/LOOK FOR OCTAL NUMBER
1434 1115	TAD LASTIN	/COMPARE
1435 7650	SNA CLA	/EQUAL?
1436 5252	JMP LISN3	/YES
1437 7200	LISN2, CLA	
1440 2204	ISZ XLISN	
1441 5226	JMP LISN1	
1442 7200	LISNUM, CLA	/LOOK FOR OCTAL NUMBER
1443 1115	TAD LASTIN	
1444 1250	TAD M270	
1445 7500	SMA	/IS IT LESS THAN 8?
1446 5237	JMP LISN2	/NO, SO NOT AN OCTAL NUMBER
1447 1166	TAD K10	
1450 7510	M270, SPA	/IS IT GREATER THAN ZERO?
1451 5237	JMP LISN2	/NO, SO NOT A NUMBER
1452 3100	LISN3, DCA TEMP2	
1453 1604	TAD I XLISN	
1454 3204	DCA XLISN	
1455 1100	TAD TEMP2	
1456 5604	JMP I XLISN	/AC IS ZERO UNLESS OCTAL NUMBER
1457 0177	K177, 0177	
1460 7566	M212, 7566	
1461 7775	M3, 7775	

/JMS GETINP

```

/
/WAIT FOR TTY INPUT. BEEP BELL EVERY 20 SECONDS IF NO INPUT. CHECK
/IF INPUT CHARACTER WAS CONTROL-C AND GO TO OS/8 IF IT WAS.
/IT IT WAS NOT, RETURN WITH CHARACTER IN LASTIN (AC CLEAR).
/
1462 0000 GETINP, 0
1463 7200 CLA
1464 1321 TAD K6500 /SET UP TIMERS FOR BEEPER WAIT
1465 3100 DCA TEMP2 /((INITIAL VALUE OF TEMP1 IS UNIMPORTANT))
1466 6031 KSF
1467 7410 SKP
1470 5300 JMP FLGSET /NO INPUT--TIME FOR BEEPER
1471 2077 ISZ TEMP1 /THE FLAG WAS SET--READ THE CHARACTER
1472 5266 JMP .-4 /CHECK LSB TIMER
1473 2100 ISZ TEMP2 /CHECK FOR INPUT
1474 5266 JMP .-6 /CHECK THE MSB TIMER
1475 1322 TAD K207 /TIME NOT UP--CHECK FOR INPUT
1476 4474 TYPE /GET CONTROL-G CHARACTER
1477 5263 JMP GETINP+1 /TYPE IT
1500 6036 FLGSET, KRB /KEEP WAITING
1501 0257 AND K177
1502 1165 TAD K200
1503 3115 DCA LASTIN
1504 1320 TAD M203
1505 1115 TAD LASTIN /CHECK IF CHARACTER WAS A CONTROL-C
1506 7640 SZA CLA /SKIP IF IT IS
1507 5662 JMP I GETINP /RETURN WITH AC CLEAR

1510 3114 CNTRLC, DCA NOPRNT /TURN OUTPUT ON
1511 1105 TAD CCRET /CHECK IF CONTROL C'S ARE ALLOWED
1512 7640 SZA CLA /SKIP IF YES
1513 4000 JMS 0 /HOW DID I GET HERE?? !!SOFTWARE ERROR!!
1514 4467 MESSAGE /THEN TYPE "C<CR><LF>"
1515 0412 UPARRC
1516 5717 JMP I K7600

/
1517 7600 K7600, 7600
1520 7575 M203, -203
1521 6500 K6500, 6500
1522 0207 K207, 207

/RUSURE
/
/SUBROUTINE ASK OPERATOR "ARE YOU SURE?"
/IF "Y" IS TYPED, THE ROUTINE TYPES "YES" AND SKIPS ON RETURN.
/ANYTHING ELSE, "NO" IS TYPED AND A NORMAL RETURN IS MADE (C STILL
/RETURNS TO OS/8).
/
1523 0000 XRUSUR, 0
1524 4467 MESSAGE
1525 0324 AREYOU /ARE YOU SURE?
1526 4262 JMS GETINP /WAIT FOR INPUT CHARACTER
1527 1342 TAD M331 /COMPARE CHARACTER TO Y
1530 1115 TAD LASTIN
1531 7650 SNA CLA /SKIP IF NOT A Y

```



```

1532 5336      JMP      .+4
1533 4467      MESSAGE
1534 0506      NO
1535 5341      JMP      .+4          /RETURN
1536 4467      MESSAGE
1537 0503      YES
1540 2323      ISZ      XRUSUR      /SKIP ON RETURN TO FLAG A YES
1541 5723      JMP I    XRUSUR
/
1542 7447      M331,   -331

/ENTVAL
/POINTER TO MESSAGE
/
/SUBROUTINE PROMPTS OPERATOR TO ENTER OCTAL VALUE. TO MAKE THE SUBROUTINE
/USEFUL FOR MANY PURPOSES, THE PROMPT MESSAGE IS AN ARGUMENT FOLLOWING
/THE CALL (POINTER TO THE TEXT). THE VALUE MUST BE LESS THAN OR EQUAL TO
/THE VALUE CONTAINED IN THE AC UPON ENTRY. IF THE VALUE ENTERED WAS TOO HIGH,
/A NORMAL RETURN IS MADE (AC CLEAR). IF NOTHING WAS ENTERED (JUST <CR>),
/THE ROUTINE SKIPS. IF A VALID VALUE WAS ENTERED, THE ROUTINE SKIPS TWICE
/WITH THE VALUE IN AC.
/
1543 0000      XENTVA, 0
1544 3375      DCA      MAXVAL      /SAVE MAXIMUM ALLOWABLE ARGUMENT VALUE
1545 1743      TAD I    XENTVA      /GET POINTER TO TEXT ARGUMENT
1546 2343      ISZ      XENTVA      /SKIP OVER ARGUMENT
1547 3351      DCA      .+2         /SAVE POINTER
1550 4467      ENTMES, MESSAGE    /PROMPT OPERATOR
1551 0000      0                  /POINTER TO PROMPT PLACED HERE
1552 4445      GETNUM      /GET OCTAL INPUT
1553 5367      JMP      ENTCHK     /CHECK FOR ^F OR ^G
1554 5367      JMP      ENTCHK
1555 5373      JMP      ENTRET-1   /SKIP ONCE IF NO INPUT
1556 3077      DCA      TEMP1      /SAVE DIGITS ENTERED
1557 1077      TAD      TEMP1
1560 7041      CIA
1561 1375      TAD      MAXVAL      /COMPARE DIGITS TO MAXIMUM ALLOWABLE VALUE
1562 7700      SMA CLA
1563 5371      JMP      ENTRET-3   /SKIP IF OUT OF RANGE
1564 4467      MESSAGE      /GET DIGITS AND RETURN
1565 0410      QESMRK      /TYPE "?<CR>" AND RETURN
1566 5374      JMP      ENTRET
1567 4463      ENTCHK, WZITFG      /HANDLE A ^F OR ^G
1570 5350      JMP      ENTMES     /REPROMPT FOR VALID INPUT
1571 1077      TAD      TEMP1      /GET NUMBER INPUT
1572 2343      ISZ      XENTVA
1573 2343      ISZ      XENTVA
1574 5743      ENTRET, JMP I    XENTVA /RETURN W/NUMBER IN AC
/
1575 0000      MAXVAL, 0

1600      PAGE

/GETNUM
/SUBROUTINE WAITS FOR OCTAL DIGITS TO BE INPUT FOLLOWED BY <CR>.

```

```

/ THE FOLLOWING RETURNS ARE USED:
/   CALL +1      /NON-OCTAL, NON-CR CHARACTER INPUT (AC CLEAR)
/   CALL +2      /5 DIGITS OR DIGITS FOLLOWED BY NON-CR (AC CONTAINS FIRST VALID DIGITS)
/   CALL +3      /NO DIGITS ENTERED (AC CLEAR)
/   CALL +4      /1 TO 4 DIGITS ENTERED (AC CONTAINS OCTAL INPUT)
/
1600 0000 XGETNU, 0
1601 7200 CLA
1602 1171 TAD M5
1603 3240 DCA DIGCNT /SET UP COUNTER FOR MAXIMUM OF FOUR
1604 3237 DCA DIGITS /DIGITS (1'S COMPLEMENT IS NEEDED)
1605 4466 GTNMLP, L1SN /ZERO OUT OCTAL NUMBER STORAGE
1606 7563 -215
1607 1627 CARRET /IF <CR>, RETURN
1610 0001 1 /IF OCTAL INPUT PROCESS BELOW
1611 1614 .+3
1612 0000 0 /IF NON-OCTAL INPUT, SKIP OVER CARRIAGE
1613 1631 CARRET+2 /RETURN HANDLER
1614 2240 ISZ DIGCNT /SKIP IF TOO MANY DIGITS
1615 5220 JMP .+3 /OK--CONTINUE
1616 7200 CLA /GET RID OF LAST DIGIT ENTERED
1617 5234 JMP TOOMNY /RETURN
1620 3077 DCA TEMP1 /SAVE DIGIT JUST ENTERED
1621 1237 TAD DIGITS /GET PREVIOUS DIGITS
1622 7104 CLL RAL /ROTATE BITS OVER ONE OCTAL DIGIT
1623 7006 RTL / POSITION
1624 1077 TAD TEMP1 /ADD IN NEW DIGIT
1625 3237 DCA DIGITS /SAVE DIGIT STRING
1626 5205 JMP GTNMLP /GO WAIT FOR MORE INPUT
1627 2200 CARRET, ISZ XGETNU /ADD TWO TO RETURN ADDRESS SINCE
1630 2200 ISZ XGETNU /CARRIAGE RETURN WAS TYPED
1631 1241 TAD K5 /ADD FIVE TO DIGITS COUNTER TO SEE IF
1632 1240 TAD DIGCNT /ANY DIGITS WERE ENTERED
1633 7640 SZA CLA /SKIP IF NO DIGITS WERE ENTERED
1634 2200 TOOMNY, ISZ XGETNU /EXTRA SKIP ON RETURN
1635 1237 TAD DIGITS /GET DIGITS PRIOR TO RETURN
1636 5600 JMP I XGETNU /RETURN--AC HAS DIGITS OR 0
/
1637 0000 DIGITS, 0
1640 0000 DIGCNT, 0
1641 0005 K5, 5
/
/JMPPM1
/
/THIS SUBROUTINE ACTS AS A "JMP .-1" INSTRUCTION EXCEPT THAT THE AC IS
/CLEARED AND CONSOL INPUT CAN BE PROCESSED.
/
1642 0000 XJMPPM, 0
1643 4442 CONSOL /CHECK FOR CONSOLE INPUT
1644 7344 CLA CLL CMA RAL /-2 INTO AC
1645 1242 TAD XJMPPM /SUBTRACT 2 FROM RETURN PC
1646 3242 DCA XJMPPM /SO RETURN IS TO CALL-1
1647 5642 JMP I XJMPPM /RETURN TO CALL-1 W/AC CLEAR

```

/READ EITHER HARDWARE OR SOFTWARE SWITCHES INTO AC

```

      /((THE SWITCHES ARE NOT ACTUALLY USED BY THE PROGRAM)
      /
1650 0000 GETSR, 0
1651 7200 CLA
1652 1021 TAD HCW1 /CHECK IF USING HARDWARE SWITCHES
1653 7710 SPA CLA /SKIP IF USING SOFTWARE
1654 7614 LAS SKP /READ SWITCHES AND RETURN
1655 1020 TAD PSWR /PICK UP SOFTWARE SWITCHES AND RETURN
1656 5650 JMP I GETSR

      /IOT SUBROUTINES

      /CLEAR DEVICE, ALL REGISTERS, AC, AND FLAGS
      /
1657 0000 XRLDC, 0
1660 6600 IOT0, 6600 /ISSUE DEVICE CLEAR
1661 5657 JMP I XRLDC /RETURN (AC CLEAR)

      /SKIP ON FUNCTION DONE, THEN CLEAR IF SET TO A ONE
      /
1662 0000 XRLSD, 0
1663 6601 IOT1, 6601 /SKIP IF DEVICE DONE
1664 7410 SKP /NORMAL RETURN IF NO SKIP
1665 2262 ISZ XRLSD /INCREMENT RETURN ADDR FOR SKIP
1666 5662 JMP I XRLSD /RETURN (AC UNCHANGED)

      /LOAD BREAK MA REG FROM AC
      /
1667 0000 XRLMA, 0
1670 6602 IOT2, 6602 /LOAD MA REGISTER
1671 5667 JMP I XRLMA /RETURN (AC CLEAR)

      /LOAD COMMAND REGISTER A FROM AC
      /
1672 0000 XRLCA, 0
1673 6603 IOT3, 6603 /LOAD COMMAND REG A
1674 5672 JMP I XRLCA /RETURN (AC CLEAR)

      /LOAD COMMAND REGISTER B FROM AC
      /
1675 0000 XRLCB, 0
1676 6604 IOT4, 6604 /LOAD COMMAND REG B
1677 5675 JMP I XRLCB /RETURN (AC CLEAR)

      /LOAD SECTOR ADDRESS REGISTER FROM AC 0:5
      /
1700 0000 XRLSA, 0
1701 6605 IOT5, 6605 /LOAD SECTOR ADDRESS REG
1702 5700 JMP I XRLSA /RETURN (AC CLEAR)

      /LOAD WORD COUNT FROM AC
      /
1703 0000 XRLWC, 0
1704 6607 IOT7, 6607 /LOAD WORD COUNT
1705 5703 JMP I XRLWC /RETURN (AC CLEAR)

```

```

/READ ERROR REGISTER INTO AC
/
1706 0000 XRRER, 0
1707 6610 IOT10, 6610 /READ ERROR REGISTER
1710 5706 JMP I XRRER /RETURN

/READ WORD COUNT REG INTO AC
/
1711 0000 XRRWC, 0
1712 6611 IOT11, 6611 /READ WORD COUNT
1713 5711 JMP I XRRWC /RETURN W/WC IN AC

/READ COMMAND REG A INTO AC
/
1714 0000 XRRCA, 0
1715 6612 IOT12, 6612 /READ COMMAND REG A INTO AC
1716 5714 JMP I XRRCA /RETURN W/CA IN AC

/READ COMMAND REG B INTO AC
/
1717 0000 XRRCB, 0
1720 6613 IOT13, 6613 /READ COMMAND REG B
1721 5717 JMP I XRRCB /RETURN W/ INFO IN AC

/READ SECTOR ADDRESS REGISTER INTO AC 0:5
/
1722 0000 XRRSA, 0
1723 6614 IOT14, 6614 /READ SECTOR ADDR
1724 5722 JMP I XRRSA /RETURN (AC=SA00)

/READ SILO WORD INTO AC 4:11
/
1725 0000 XRRSI, 0
1726 6615 IOT15, 6615 /READ SILO
1727 5725 JMP I XRRSI /RETURN (AC 4:11=SILO)

/SKIP ON DRIVE ERROR, THEN CLEAR IF SET TO A ONE
/
1730 0000 XRLSE, 0
1731 6617 IOT17, 6617 /SKIP ON DRIVE ERROR
1732 7410 SKP /NORMAL RETURN (NO SKIP)
1733 2330 ISZ XRLSE /INC RETURN ADDR FOR SKIP
1734 5730 JMP I XRLSE /RETURN (AC UNCHANGED)

/POWER FAIL ROUTINES
/
1735 7200 PWRFAL, CLA
1736 1000 TAD 0 /GET PC
1737 3354 DCA PCSAVE /SAVE FOR REFERENCE OR ERROR TYPE OUT
1740 6102 SPL /SKIP ON POWER LOW
1741 5345 JMP IMPINT /IMPOSSIBLE INTERRUPT--GO REPORT IT
1742 1353 TAD JMPUP /GET RESTART INSTRUCTION
1743 3000 DCA 0 /SAVE FOR POWER UP
1744 7402 HLT /WAIT FOR POWER UP RESTART

```

```

1745 4467  IMPINT, MESSAGE      /? SOFTWARE ERROR PC =
1746 0630      SFTWER
1747 1354      TAD      PCSAVE  /PICK UP CALL PC
1750 4472      PRNT4      /AND TYPE IT
1751 4462      CNTRLG      /LET OPERATOR DO SOMETHING IF HE WISHES
                        /A PROGRAM RELOAD IS RECOMMENDED !!
1752 5565      JMP I      K200  /RESTART PROGRAM

1753 5403  JMPUP, JMP I      3  /JUMPS TO POWER UP ROUTINE
1754 0000  PCSAVE, 0

1755 6035  PWRUP, KIE      /DISABLE KEYBOARD INTERRUPTS
1756 6045      TIE
1757 4467      MESSAGE      /POWER FAIL PC=
1760 0473      POWER
1761 1354      TAD      PCSAVE  /GET PC OF POWER FAIL
1762 4472      PRNT4      /PRINT IT
1763 4475      CRLF
1764 5565      JMP I      K200  /RESTART PROGRAM

      /RESET
      /
      /CLEAR CONTROLLER AND EXECUTE RESET COMMAND TO CURRENT DRIVE.  WAIT FOR DONE.
      /
1765 0000  XRESET, 0
1766 4424      RLDC      /CLEAR DEVICE
1767 1113      TAD      DRVNUM  /ADD IN DRIVE NUMBER
1770 7002      BSW      /PLACE INTO DRIVE SELECT BITS
1771 7001      IAC      /INCREMENT AC (FOR RESET COMMAND)
1772 4430      RLCB      /ISSUE COMMAND
1773 4425      RLSD      /WAIT FOR DONE
1774 4453      JMPPM1
1775 5765      JMP I      XRESET  /RETURN W/AC CLEAR

2000      PAGE
      /AJRLL SUBROUTINES

      /GETSTA
      /
      /ISSUE GET STATUS TO DRIVE UNDER TEST.  WAIT FOR DONE.  SAVE STATUS.
      /
2000 0000  XGETST, 0
2001 7200      CLA
2002 4431      RL5A      /CLEAR SECTOR ADDRESS (LOADS DAR WITH GARBAGE)
2003 4427      RLCA      /CLEAR COMMAND A
2004 1113      TAD      DRVNUM  /GET DRIVE NUMBER INTO
2005 7002      BSW      /DRIVE SELECT BITS FOR USE IN CB
2006 1225      TAD      K1002  /SET 8 BIT MODE AND FUNCTION 2 (GET STATUS)
2007 4430      RLCB      /ISSUE COMMAND
2010 4425      RLSD      /WAIT FOR DONE
2011 4453      JMPPM1
2012 4433      RRER      /READ ERROR REG
2013 7004      RAL      /GET OPI INTO SIGN BIT
2014 7710      SPA CLA      /SKIP IF OPI NOT SET FROM GET STATUS

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2015 4464      RJECTU      /OPI SET ON GET STATUS--REJECT UNIT
2016 4440      RRSI        /GET THE STATUS WORDS AND SAVE THEM
2017 0157      AND          K377
2020 3102      DCA          STATS1
2021 4440      RRSI
2022 0157      AND          K377
2023 3103      DCA          STATS2
2024 5600      JMP I        XGETST      /RETURN W/AC CLEAR

2025 1002      K1002, 1002

/SEEK
/
/THIS SUBROUTINE IS CALLED WITH THE DESIRED TRACK AND CYLINDER
/IN LOCATIONS "TRACK" AND "CYLNR".
/THE HEAD POSITION IS CHECKED AND IF DIFFERENT THAN THAT DESIRED, A
/SEEK IS PERFORMED TO POSITION THE HEADS IN THE DESIRED POSITION.
/UP TO THREE TRIES ARE ALLOWED FOR THE SEEK TO SUCCESSFULLY COMPLETE.
/
2026 0000      XSEEK, 0
2027 7346      STA CLL RTL      /SET UP FOR THREE RETRIES
2030 3132      DCA          RETRY
2031 1107      TAD          TRACK      /GET TRACK BIT INTO POSITION
2032 7112      CLL RTR
2033 7010      RAR
2034 1106      TAD          CYLNR      /ADD IN DESIRED CYLINDER ADDRESS
2035 7421      MQL          /PUT INTO MQ FOR LOOKS
2036 4276      JMS          COMPOS      /COMPARE HEAD POSITION
2037 5273      JMP          SEEKOK      /NO SEEK NEEDED--RETURN
2040 7041      SEKAGN, CIA      /FORM A DIFFERENCE WORD BASED ON CURRENT
2041 1106      TAD          CYLNR      / CYLINDER ADDRESS
2042 7510      SPA          /SKIP IF DIRECTION 1 IS REQUIRED
2043 5246      JMP          .+3      /DON'T SET DIRECTION BIT
2044 1275      TAD          K4000      /ADD IN DIRECTION TO DIFFERENCE
2045 7410      SKP
2046 7041      CIA          /FORM A POSITIVE DIFFERENCE WORD
2047 3077      DCA          TEMP1      /SAVE DIRECTION AND DIFFERENCE
2050 1107      TAD          TRACK      /PUT HEAD SELECT BIT INTO POSITION
2051 7112      CLL RTR
2052 7010      RAR
2053 1077      TAD          TEMP1      /ADD IN DIRECTION AND DIFFERENCE
2054 4427      RLCA          /LOAD COMMAND A
2055 4431      RLCA          /CLEAR SECTOR ADDRESS REG
2056 1113      TAD          DRVNUM      /GET DRIVE SELECT BITS INTO POSITION
2057 7002      BSW
2060 1274      TAD          K3          /SET FUNCTION BITS FOR SEEK COMMAND
2061 4430      RLCB          /ISSUE COMMAND
2062 4425      RLSD          /WAIT FOR DONE
2063 4453      JMPPM1
2064 4337      JMS          RDYWAT      /WAIT UP TO 3 SECONDS FOR READY
2065 4450      ERRHAN      /HANDLE DRIVE NOT READY
2066 4276      JMS          COMPOS      /COMPARE HEAD POSITION WITH DESIRED POSITION
2067 5273      JMP          SEEKOK      /OK--MAKE GOOD RETURN
2070 2132      ISZ          RETRY      /CHECK IF RETRIED ENOUGH
2071 5240      JMP          SEKAGN      /TRY AGAIN

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2072 4464      RJECTU      /COULD NOT SEEK IN THREE TRIES--REJECT UNIT
2073 5626      SEEKOK, JMP I  XSEEK
/
2074 0003      K3,        3
2075 4000      K4000,    4000

      /JMS COMPOS
      /
      /COMPARE HEAD POSITION TO DESIRED VALUE (IN CYLSAV). IF THE SAME, MAKE NORMAL
      /RETURN WITH AC CLEAR. IF DIFFERENT, SKIP ON RETURN AND RETURN WITH CYLINDER
      /ADDRESS IN AC.
      /
2076 0000      COMPOS, 0
2077 7203      CLA IAC BSW      /SET UP COUNTER FOR 80 READ HEADER ATTEMPTS
2100 7041      CIA
2101 3360      DCA      TIMER1
2102 4452      REDHDR      /READ A HEADER
2103 4441      RLSE      /SKIP IF ERROR
2104 5312      JMP      COMCON  /OK--CONTINUE
2105 4446      RESET      /RESET THE DRIVE
2106 2360      ISZ      TIMER1  /TIME TO GIVE UP?
2107 5302      JMP      .-5      /NO
2110 4465      RJECTP      /YES--REJECT PACK
2111 0705      NOGDHD      /NO GOOD HEADERS
2112 4440      COMCON, RRSI  /GET HEADER WORD 1
2113 7002      BSW
2114 7012      RTR      /PUT HEAD SEL INTO BIT 0, CYL LSB INTO LINK
2115 3077      DCA      TEMP1  /SAVE HEAD SELECT BIT
2116 4440      RRSI      /GET HEADER WORD 2
2117 7004      RAL      /MOVE LSB INTO POSITION
2120 0156      AND      K0777  /MASK GARBAGE AND 0 BIT
2121 3100      DCA      TEMP2  /SAVE CYLINDER
2122 1107      TAD      TRACK  /GET HEAD BIT INTO SIGN BIT
2123 7112      CLL RTR
2124 1077      TAD      TEMP1  /XOR WITH THE CURRENT HEAD POSITION
2125 7710      SPA CLA      /SKIP IF THEY ARE EQUAL
2126 5334      JMP      COMPRT-2 /A SEEK IS NEEDED
2127 1100      TAD      TEMP2  /ADD IN CYLINDER ADDRESS
2130 7041      CIA      /COMPARE TO DESIRED HEAD AND CYLINDER
2131 1106      TAD      CYLNDR  / (AS SPECIFIED IN CYLNDR)
2132 7650      SNA CLA      /SKIP IF NOT EQUAL
2133 5336      JMP      COMPRT  /OK--RETURN WITH AC CLEAR
2134 1100      TAD      TEMP2  /PUT CYL ADDRESS INTO AC
2135 2276      ISZ      COMPOS  /SKIP ON RETURN
2136 5676      COMPRT, JMP I  COMPOS /RETURN

      /JMS RDYWAT
      /
      /THIS SUBROUTINE WAITS FOR DRIVE READY IN A 4 SECOND TIMEOUT LOOP.
      /IF THE DRIVE DID NOT BECOME READY, A NORMAL RETURN IS MADE. IF THE DRIVE
      /BECAME READY, THE ROUTINE SKIPS ON RETURN.
      /
2137 0000      RDYWAT, 0
2140 7200      CLA
2141 1357      TAD      M56      /SET UP MSB TIMER

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2142 3361      DCA      TIMER2      /((INITIAL VALUE OF LSB TIMER IS UNIMPORTANT)
2143 4433      RDWTLP, RRER      /GET ERROR REGISTER
2144 7010      RAR      /ROTATE DRIVE READY BIT INTO LINK
2145 7630      SZL CLA      /SKIP IF DRIVE NOT READY
2146 5355      JMP      RDYRET      /DRIVE READY--GET OUT OF LOOP (RETURN)
2147 4442      CONSOL      /ALLOW CONSOLE INPUT
2150 2360      ISZ      TIMER1      /TICK LSB TIMER
2151 5343      JMP      RDWTLP
2152 2361      ISZ      TIMER2      /TICK MSB TIMER
2153 5343      JMP      RDWTLP
2154 7410      SKP
2155 2337      RDYRET, ISZ      RDYWAT      /DRIVE NOT READY
2156 5737      JMP I      RDYWAT      /NOT READY--SKIP ON RETURN
                                   /RETURN

2157 7722      M56,      -56
2160 0000      TIMER1, 0
2161 0000      TIMER2, 0

                                   /JMS WAIT40
                                   /
                                   /SUBROUTINE WAITS 40 SECONDS (!) FOR DRIVE READY. (USED BY DRIVE ERROR HANDLER.)
                                   /ROUTINE SKIPS ON RETURN IF DRIVE BECOMES READY.
                                   /
2162 0000      WAIT40, 0
2163 7200      CLA
2164 1777      TAD      M12      /CALL RDYWAT 10 TIMES
2165 3375      DCA      TIMER3
2166 4337      JMS      RDYWAT      /WAIT FOR READY (4 SECONDS)
2167 5373      JMP      .+4      /DRIVE IS READY--SKIP ON RETURN
2170 2375      ISZ      TIMER3
2171 5366      JMP      .-3      /WAIT AGAIN
2172 7410      SKP      /DRIVE STILL NOT READY AFTER 40 SECONDS
2173 2362      ISZ      WAIT40      /SKIP ON RETURN IF DRIVE READY
2174 5762      JMP I      WAIT40
                                   /
2175 0000      TIMER3, 0

2177 0563      PAGE
2200          2200

                                   /ERRHAN
                                   /
                                   /THIS SUBROUTINE HANDLES POSSIBLE DRIVE ERRORS. (E.G. AFTER ERROR FLAG
                                   /SET ON READ OR WRITE, OR DRIVE NOT READY AFTER SEEK.)
                                   /IT IS POSSIBLE THAT THE DRIVE WILL BE DROPPED IF THE ERROR IS
                                   /FATAL OR WILL NOT RESET.
                                   /
2200 0000      XERRHA, 0
2201 4447      GETSTA      /GET THE DRIVE STATUS
2202 4446      RESET
2203 1103      TAD      STATS2      /CHECK THE STATUS FROM THE DRIVE
2204 0377      AND      (TIMOUT      /
2205 7650      SNA CLA      /FOR SEEK TIME-OUT ERROR
2206 5217      JMP      YNCONB      /SKIP IF SEEK TIME-OUT ERROR
2207 4446      RESET      /RESET THE DRIVE

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2210	4321	JMS	WAT300	/WAIT 300 MILLISECONDS
2211	4447	GETSTA		/GET DRIVE'S STATUS
2212	1103	TAD	STATS2	/CHECK SEEK TIMEOUT
2213	0377	AND	(TIMEOUT)	
2214	7640	SZA CLA		/SKIP IF CLEARED
2215	4464	RJECTU		/CAN'T RESET SEEK TIMEOUT ERROR--REJECT UNIT
2216	5302	JMP	YNEXIT	/EXIT
2217	1103	YNCONB, TAD	STATS2	/CHECK FOR SPEED ERROR
2220	0376	AND	(SPUPTO)	
2221	7650	SNA CLA		/SKIP IF SPEED ERROR
2222	5250	JMP	YNCONC	
2223	4446	RESET		/RESET THE DRIVE
2224	1102	TAD	STATS1	/CHECK THE STATE BITS
2225	0775	AND	K7	
2226	7650	SNA CLA		/SKIP IF NOT LOAD STATE
2227	5236	JMP	.+7	
2230	4311	JMS	WAIT1	/WAIT 1 MS
2231	4433	RRER		/CHECK IF DRIVE ERROR STILL SET
2232	7012	RTR		
2233	7630	SZL CLA		/SKIP IF STILL SET
2234	5302	JMP	YNEXIT	/EXIT
2235	4464	RJECTU		/CAN'T RESET DRIVE ERROR--REJECT UNIT
2236	4321	JMS	WAT300	/WAIT 300 MS
2237	4447	GETSTA		/GET STATUS
2240	1102	TAD	STATS1	/CHECK STATE BITS
2241	0775	AND	K7	
2242	7650	SNA CLA		/SKIP IF NO LONGER IN LOAD STATE
2243	4464	RJECTU		/DRIVE IN LOAD STATE--REJECT UNIT
2244	4774	JMS	WAIT40	/WAIT 40 SECONDS FOR DRIVE READY
2245	4464	RJECTU		/DRIVE DID NOT BECOME READY--REJECT UNIT
2246	4446	RESET		/RESET THE DRIVE
2247	5302	JMP	YNEXIT	/LET'S EXIT
2250	7203	YNCONC, CLA IAC	BSW	/100 FOR MASK FOR HEAD CURRENT ERROR
2251	0103	AND	STATS2	/CHECK FOR HEAD CURRENT ERROR
2252	7640	SZA CLA		/SKIP IF NOT HEAD CURRENT ERROR
2253	4464	RJECTU		/HEAD CURRENT ERROR -- FATAL!
2254	1103	TAD	STATS2	/CHECK FOR WRITE DATA ERROR
2255	0373	AND	(WRDERR)	
2256	7650	SNA CLA		/SKIP IF SET
2257	5266	JMP	YNCOND	
2260	4321	JMS	WAT300	/WAIT 300 MS
2261	4446	RESET		/RESET THE DRIVE
2262	4774	JMS	WAIT40	/WAIT 40 SECONDS FOR DRIVE READY
2263	4464	RJECTU		/DROP DRIVE--DID NOT BECOME READY
2264	4446	RESET		/RESET THE DRIVE
2265	5302	JMP	YNEXIT	/EXIT
2266	7307	YNCOND, CLA IAC	CLL RTL	/4 FOR MASK FOR WRITE GATE ERROR
2267	0103	AND	STATS2	/CHECK FOR WRITE GATE ERROR
2270	7650	SNA CLA		/SKIP IF SET
2271	5300	JMP	YNCONC	
2272	4446	RESET		/RESET THE DRIVE
2273	4447	GETSTA		/GET STATUS
2274	7307	CLA IAC	CLL RTL	/4 FOR MASK FOR WRITE GATE ERROR
2275	0103	AND	STATS2	/CHECK FOR WRITE GATE ERROR
2276	7640	SZA CLA		/SKIP IF IT CLEARED

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2277 4464      RJECTU      /CAN'T RESET WRITE GATE ERROR--REJECT UNIT
2300 4446      YNCONC, RESET /RESET DRIVE
2301 4311      JMS      WAIT1 /WAIT 1 MS AFTER RESET
2302 4433      YNEXIT, RRER /BEFORE LEAVING, CHECK DRIVE IS
2303 7012      RTR      /READY AND NO ERROR
2304 7500      SMA      /SKIP IF DRIVE IS READY
2305 4464      RJECTU      /CAN'T MAKE DRIVE READY--REJECT UNIT
2306 7630      SZL CLA     /SKIP IF NO DRIVE ERROR
2307 4464      RJECTU      /CAN'T RESET DRIVE ERROR--REJECT UNIT
2310 5600      JMP I      XERRHA /RETURN

      /JMS WAIT1
      /
      /SUBROUTINE REQUIRES APPROXIMATELY 1 MS TO EXECUTE ON PDP8/E
      /
2311 0000      WAIT1, 0
2312 7200      CLA
2313 1320      TAD      M404
2314 3077      DCA      TEMP1
2315 2077      ISZ      TEMP1
2316 5315      JMP      .-1
2317 5711      JMP I      WAIT1
      /
2320 7374      M404, -404

      /SUBROUTINE WAITS 300 MS
      WAT300, 0
2322 7200      CLA
2323 1171      TAD      M5      /SET UP MSB TIMER
2324 3335      DCA      YDLAY2
2325 3334      DCA      YDLAY1 /SET UP LSB TIMER
2326 4442      CONSOL   /ALLOW KEYBOARD INPUT
2327 2334      ISZ      YDLAY1 /TICK LSB TIMER
2330 5326      JMP      .-2
2331 2335      ISZ      YDLAY2 /TICK MSB TIMER
2332 5326      JMP      .-4
2333 5721      JMP I      WAT300 /RETURN
      /
2334 0000      YDLAY1, 0
2335 0000      YDLAY2, 0

      /RJECTU
      /
      /TYPE "UNIT FAILURE PC=XXXX" WHERE XXXX IS CALLPC.
      /IF UNIT FAILURE OCCURED WHILE WRITING BAD SECTOR FILES (CCRET NOT 0),
      /THEN NOTIFY OPERATOR. IN ANY CASE, GO SELECT NEXT DRIVE. (THIS
      /SUBROUTINE DOES NOT HAVE A NORMAL RETURN.)
      /
2336 0000      XRJCTU, 0
2337 4467      MESSAGE      /? UNIT FAILURE PC=
2340 0431      UNITFA
2341 7240      STA      /GET CALL PC
2342 1336      TAD      XRJCTU
2343 4472      PRNT4
2344 4475      CRLF      /PRINT THE CALL PC

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2345 1105      TAD      CCRET      /CHECK IF WRITING BSF'S
2346 7650      SNA CLA      /SKIP IF SO
2347 5772'     JMP      NXTDRV     /NOT--GO SELECT NEXT UNIT
2350 4467      MESSAGE      /? FAILURE OCCURED WHILE WRITING BAD SECTOR FILES!
2351 0443      FALWWB
2352 3105      DCA      CCRET      /CLEAR THE FLAG
2353 5772'     JMP      NXTDRV     /SELECT NEXT UNIT

/REDHDR
/
/THIS SUBROUTINE ISSUES A READ HEADER TO THE DRIVE UNDER TEST AND WAITS
/FOR DONE. THE HEADER WORDS ARE LEFT IN THE SILO.
/
2354 0000      XREDHD, 0
2355 7200      CLA
2356 1113      TAD      DRVNUM      /GET DRIVE SELECT BITS INTO POSITION
2357 7002      BSW
2360 1365      TAD      K1004      /SET FOR 8 BIT MODE AND READ HEADER COMMAND
2361 4430      RLCB      /ISSUE COMMAND
2362 4425      RLSD      /WAIT FOR DONE
2363 5362      JMP      .-1        /JMPPM1 NOT USED TO AVOID CONSOLE INTERRUPTIONS WHEN
                                   /READING 40 CONSECUTIVE HEADERS DURING HEADER VERIFICATION.
2364 5754      JMP I      XREDHD
2365 1004      K1004, 1004

2372 0630
2373 0200
2374 2162
2375 1175
2376 0010
2377 0020
2400 2400      PAGE

/WRITE0
/
/ISSUE WRITE FROM FIELD 0. SKIP IF NO ERROR (2 TRIES ARE ALLOWED).
/
2400 0000      XWRITO, 0
2401 4224      JMS      XECUTE      /EXECUTE THE COMMAND
2402 1005      1005      /COMMAND ARGUMENT (FIELD 0 WRITE)
2403 2200      ISZ      XWRITO      /SKIP SINCE NO ERROR
2404 5600      JMP I      XWRITO      /RETURN (NO SKIP IF ERROR)

/WRITE1
/
/ISSUE WRITE FROM FIELD 1. SKIP IF NO ERROR (2 TRIES ARE ALLOWED).
/
2405 0000      XWRIT1, 0
2406 4224      JMS      XECUTE      /EXECUTE THE COMMAND
2407 1015      1015      /COMMAND ARGUMENT (FIELD 1 WRITE)
2410 2205      ISZ      XWRIT1      /SKIP SINCE NO ERROR
2411 5605      JMP I      XWRIT1      /RETURN (NO SKIP IF ERROR)

/READ0

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/
/ISSUE READ TO FIELD 0.  SKIP IF NO ERROR (2 TRIES ARE ALLOWED).
/
2412 0000 XREAD0, 0
2413 4224 JMS XECUTE /EXECUTE THE COMMAND
2414 1006 1006 /COMMAND ARGUMENT (FIELD 0 READ)
2415 2212 ISZ XREAD0 /SKIP SINCE NO ERROR
2416 5612 JMP I XREAD0 /RETURN (NO SKIP IF ERROR)

/READ1
/
/ISSUE READ TO FIELD 1.  SKIP IF NO ERROR (2 TRIES ARE ALLOWED).
/
2417 0000 XREAD1, 0
2420 4224 JMS XECUTE /EXECUTE THE COMMAND
2421 1016 1016 /COMMAND ARGUMENT (FIELD 1 READ)
2422 2217 ISZ XREAD1 /SKIP SINCE NO ERROR
2423 5617 JMP I XREAD1 /RETURN (NO SKIP IF ERROR)

/JMS XECUTE
/COMMAND ARGUMENT
/
/EXECUTE THE READ OR WRITE COMMAND THAT IS THE ARGUMENT.  ALLOW A RETRY
/ON ERROR.  SKIP IF ERROR AFTER TWO TRIES.
/
2424 0000 XECUTE, 0
2425 7344 STA CLL RAL /-2 FOR RETRY COUNTER
2426 3132 DCA RETRY
2427 1110 RETRYX, TAD SECTOR /SET UP SA
2430 7002 BSW /PUT INTO PROPER BITS
2431 4431 RLSA
2432 1133 TAD BUFFER /SET UP MA
2433 4426 RLMA
2434 1134 TAD WRDCNT /SET UP WORD COUNT
2435 4432 RLWC
2436 1107 TAD TRACK. /COMPUTE CA
2437 7112 CLL RTR
2440 7010 RAR /PUT HEAD SELECT BIT INTO POSITION
2441 1106 TAD CYLNDR /ADD IN CYLINDER ADDRESS
2442 4427 RLCA
2443 1113 TAD DRVNUM /GET DRIVE SELECT BITS INTO POSITION
2444 7002 BSW
2445 1624 TAD I XECUTE /ADD IN REST OF COMMAND
2446 4430 RLCB /GO
2447 4425 RLSD /WAIT FOR DONE
2450 4453 JMPPM1
2451 4441 RLSE /SKIP IF ERROR
2452 5257 JMP NOFLAG /SUCCESS--GO MAKE NORMAL RETURN
2453 4450 ERRHAN /HANDLE POSSIBLE DRIVE ERROR
2454 2132 ISZ RETRY /HAVE I RETRIED ALREADY??
2455 5227 JMP RETRYX /NO--GO BACK
2456 2224 ISZ XECUTE /SKIP ON RETURN TO FLAG ERROR
2457 2224 NOFLAG, ISZ XECUTE /SKIP OVER COMMAND ARGUMENT
2460 5624 JMP I XECUTE

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/JMS GETFIL
/TEXT POINTER
/
/READ AND VERIFY BAD SECTOR FILES UNTIL A GOOD ONE IS READ (OR NONE LEFT).
/SKIP ON RETURN IF A GOOD ONE WAS READ.  NORMAL RETURN IF BAD FORMAT.
/REJECT PACK IF NONE COULD BE READ.  (TYPE MESSAGE BASED ON TEXT POINTER
/ARGUMENT FOR WHICH FILE COULD NOT BE READ.)
/
2461 0000 GETFIL, 0
2462 7200 CLA
2463 1661 TAD I GETFIL /GET TEXT POINTER
2464 3307 DCA GETTXT /PLACE IT FOR POSSIBLE USE
2465 2261 ISZ GETFIL /SKIP OVER PARAMETER ON RETURN
2466 3314 DCA REDFLG /CLEAR FLAG THAT A FILE WAS READ SUCCESSFULLY
2467 1171 TAD M5 /SET UP COUNTER FOR NUMBER OF FILES
2470 3315 DCA REDCNT
2471 4456 REDFLP, READ0 /READ TO FIELD 0
2472 5276 JMP BADFR /READ ERROR--GO SET UP FOR NEXT READ
2473 2314 ISZ REDFLG /FLAG THAT A FILE COULD BE READ
2474 4777 JMS CHKBSF /CHECK THE FORMAT OF THE BAD SECTOR FILE
2475 5312 JMP GDFRED /A GOOD FILE HAS BEEN READ
2476 7307 BADFR, CLA IAC CLL RTL /ADD 4 TO PREVIOUS SECTOR IF FILE WAS BAD
2477 1110 TAD SECTOR
2500 3110 DCA SECTOR
2501 2315 ISZ REDCNT /READ ALL 5 FILES YET?
2502 5271 JMP REDFLP /NO--GO READ ANOTHER
2503 1314 TAD REDFLG /CHECK IF ANY OF THE FILES COULD BE READ AT ALL
2504 7640 SZA CLA /SKIP IF NOT
2505 5313 JMP GETFRT /MAKE NORMAL RETURN
2506 4467 MESSAGE /("THE MANUFACTURING) OR ("THE FIELD)
2507 0000 GETTXT, 0
2510 4465 RJECTP /REJECT THE PACK
2511 0663 BSFNOR /BAD SECTOR FILES COULD NOT BE READ"
2512 2261 GDFRED, ISZ GETFIL /SKIP ON RETURN IF GOOD FILE READ
2513 5661 GETFRT, JMP I GETFIL
/
2514 0000 REDFLG, 0
2515 0000 REDCNT, 0

/JMS NXTTRK
/
/COMPUTE THE NEXT TRACK.  RETURN TO CALL+1 IF NORMAL TRACK.  RETURN TO
/CALL+2 IF CYL 777, TRACK 1 (BSF'S).  RETURN TO CALL+3 IF CYLNDR > HILIM
/(ONLY CHECKED FOR IF TRACK JUST WENT FROM 1 TO 0 (CYLNDR WAS INCREMENTED).)
/A SEEK IS NOT PERFORMED.
/
2516 0000 NXTTRK, 0
2517 2107 ISZ TRACK /GO TO NEXT HEAD
2520 7201 CLA IAC /1 FOR MASK FOR MODULO 2 INCREMENT
2521 0107 AND TRACK /SAVE ONLY BOTTOM BIT
2522 3107 DCA TRACK /SAVE VALID HEAD BIT
2523 1107 TAD TRACK /PICK UP FOR TESTING
2524 7650 SNA CLA /SKIP IF HEAD 1
2525 5333 JMP NXYCYL /WENT TO HEAD 0--GO INCREMENT CYLNDR
2526 1106 TAD CYLNDR /CHECK IF AT CYLNDR 777

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2527 1162      TAD      M0777      /
2530 7650      SNA CLA      /SKIP IF NOT
2531 2316      ISZ      NXTTRK      /SKIP ON RETURN FOR CAUTIONARY RETURN
2532 5343      JMP      NXTRET      /RETURN
2533 2106      NXYCYL, ISZ      CYLNDR      /INCREMENT CYLNDR
2534 1106      TAD      CYLNDR      /CHECK IF ABOVE THE HIGH CYL LIMIT
2535 7041      CIA
2536 1126      TAD      HILIM
2537 7700      SNA CLA      /SKIP IF WE ARE (ABOVE LIMIT)
2540 5343      JMP      NXTRET      /AT OR BELOW LIMIT--RETURN
2541 2316      ISZ      NXTTRK      /SKIP TWICE ON RETURN
2542 2316      ISZ      NXTTRK
2543 5716      NXTRET, JMP I      NXTTRK

/JMS MANDES
/
/SUBROUTINE HANDLES THE ALLOWED REWRITE OF MANUFACTURING FILES IF IT IS
/ DISCOVERED THAT THEY ARE DESTROYED.
/
/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART. [MANUF-DESTROYED]
/
2544 0000      MANDES, 0
2545 4467      MESSAGE      /DO YOU WISH THE MANUFACTURING FILES REWRITTEN (WITH NO BAD SECTORS)?
2546 1216      REWRT1
2547 4467      MESSAGE
2550 1227      MRWRTN
2551 4467      MESSAGE
2552 1246      REWRT2
2553 4443      GETRES      /GET THE Y OR N RESPONSE
2554 5345      JMP      MANDES+1      /REPROMPT ON INVALID RESPONSE
2555 7650      SNA CLA      /SKIP IF ANSWER WAS YES
2556 5374      JMP      MANRET      /REWRITE NOT REQUESTED--RETURN
2557 4461      RUSURE      /ASK IF SURE
2560 5345      JMP      MANDES+1      /NOT SURE--ASK ALL OVER
2561 1367      TAD      PZERBF      /SURE!--GET BUFFER
2562 4776      JMS      BLANKF      /SET UP BLANK FILE
2563 6211      CDF      10      /FIELD ARGUMENT (SKIPPED OVER ON RETURN)
2564 3110      DCA      SECTOR      /SET UP STARTING SECTOR TO WRITE
2565 1166      TAD      K10      /PICK UP FIELD ARGUMENT
2566 4775      JMS      WRITFI      /WRITE THE BAD SECTOR FILES
2567 3600      PZERBF, ZERBUF      /POINTER TO FILE TO WRITE FROM
2570 4475      CRLF
2571 4467      MESSAGE
2572 1227      MRWRTN      /MANUFACTURING FILES REWRITTEN
2573 4475      CRLF
2574 5744      MANRET, JMP I      MANDES

2575 4400
2576 5414
2577 3400
2600      PAGE

/JMS SETUPB
/
/THIS ROUTINE SETS UP THE BAD SECTOR BUFFERS. THE BAD SECTOR FILES ARE READ

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/AND VALIDATED. IF TYPEOUT IS REQUESTED, THEY ARE TYPED OUT AT THIS POINT.  
 /MANUFACTURING FILES MAY BE REWRITTEN AT THIS TIME IF THEY HAVE BEEN DESTROYED.  
 /WHEN THE SUBROUTINE EXITS, THE FIELD BAD SECTOR FILE IS SET UP IN ITS  
 /BUFFER (WITH OLD ENTRIES REMOVED IF DELETION IS REQUESTED), AND BADCNT  
 /CONTAINS THE NUMBER OF BAD SECTORS IN THE FIELD FILE.  
 /

/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART (SETUP-BAD-SECTOR-BUFFERS).  
 /

2600	0000	SETUPB, 0		
2601	7201	CLA IAC		/SET THE TRACK TO 1
2602	3107	DCA TRACK		
2603	1156	TAD K0777		/SET CYLINDER TO 777 (BSF)
2604	3106	DCA CYLNDR		HP 001
2605	4451	SEEK		/POSITION HEADS
2606	1333	TAD M1000		/SET WORD COUNT FOR BAD SECTOR FILE READS
2607	3134	DCA WRDCNT		
2610	1377	TAD (MANBSF		/SET UP BUFFER AT MANUF BSF AREA
2611	3133	DCA BUFFER		
2612	3110	DCA SECTOR		/SET UP SECTOR TO READ (FIRST MANUF FILE)
2613	4776'	JMS GETFIL		/GET A BAD SECTOR FILE (FIRST ONE THAT CAN BE READ)
2614	0643	DMANUF		/TEXT POINTER (USED IN CASE OF PACK REJECTION)
2615	5220	JMP SAVMPT		/NONE WERE GOOD RETURN--GO CLEAR POINTER
2616	4775'	JMS SERSAV		/GOOD ONE READ--SAVE THE SERIAL NUMBER
2617	1374	TAD (MANUBS		/GET POINTER TO BAD SECTOR AREA OF FILE
2620	3135	SAVMPT, DCA MANUPT		/SAVE POINTER (TO FILE OR CLEAR)
2621	1373	TAD (FLDBSF		/SET UP BUFFER POINTER TO FIELD BSF AREAD
2622	3133	DCA BUFFER		
2623	1334	TAD K24		/SET UP STARTING SECTOR FOR FIELD FILE READS
2624	3110	DCA SECTOR		
2625	4776'	JMS GETFIL		/GET FIRST GOOD FIELD FILE
2626	0655	DFIELD		/TEXT POINTER IN CASE OF PACK REJECTION
2627	5247	JMP SAVFPT		/NO GOOD FILES READ--GO ZERO OUT POINTER
2630	1372	TAD (FELDBS		/SET FIELD FILES POINTER
2631	3136	DCA FLDPNT		
2632	3137	DCA WRTFIL		/CLEAR WRITE FILES FLAG
2633	1135	TAD MANUPT		/IF MANUFACTURING FILES ARE VALID(POINTER NON-0)
2634	7650	SNA CLA		/THEN SKIP
2635	5245	JMP SAVFSN		/ELSE GO SAVE PACK SERIAL NUMBER FROM FIELD FILE
2636	4771'	JMS SERCMP		/COMPARE THE SERIAL NUMBER IN THE 2 FILES
2637	7410	SKP		/NUMBERS DID NOT COMPARE
2640	5250	JMP BOTHCH		/NUMBERS OK--GO CHECK UP ABOUT TYPEOUTS
2641	1323	TAD KCDFO		/PICK UP THE FIELD ARGUMENT
2642	4770'	JMS SRN2BF		/WRITE SERIAL NUMBER TO THE BUFFER
2643	2137	ISZ WRTFIL		/SET WRITE FILES FLAG
2644	5250	JMP BOTHCH		/GO CHECK UP ABOUT TYPEOUTS
2645	4775'	SAVFSN, JMS SERSAV		/SAVE SERIAL NUMBER FROM FIELD FILE
2646	5250	JMP BOTHCH		
2647	3136	SAVFPT, DCA FLDPNT		/ZERO OUT FIELD POINTER
2650	1135	BOTHCH, TAD MANUPT		/IF BOTH MANUF AND FIELD FILE POINTERS ARE
2651	1136	TAD FLDPNT		/ ZERO (A BUG IF THEIR SUM IS ZERO WHICH IT ISN'T)
2652	7640	SZA CLA		/THEN SKIP
2653	5263	JMP TYPNUM		/ELSE GO TYPE THE SERIAL NUMBER
2654	4467	MESSAGE		
2655	1040	ALL		/"ALL
2656	4467	MESSAGE		/ BAD SECTOR FILES ARE DESTROYED!"

2657	1043	BSFDES		
2660	4767	JMS	ENTSRN	/PROMPT FOR SERIAL NUMBER ENTRY AND SAVE IT
2661	4766	JMS	MANDES	/ALLOW REWRITE OF MANUF BSF'S
2662	5312	JMP	FLDCHK	/GO SET UP FIELD FILES
2663	4765	TYPNUM, JMS	TYPSTRN	/TYPE THE SERIAL NUMBER
2664	1122	TAD	BSFTYP	/CHECK IF BSF TYPEOUT IS REQUESTED
2665	7650	SNA CLA		/SKIP IF IT IS
2666	5302	JMP	MANVCH	
2667	1135	TAD	MANUPT	/CHECK IF MANUFACTURING FILES ARE VALID PRIOR TO TYPING THEM
2670	7650	SNA CLA		/SKIP IF THEY ARE
2671	5276	JMP	.+5	/TYPE FIELD BAD FIRST IF THEY ARE NOT
2672	4467	MESSAGE		/MANUFACTURING BAD:
2673	1064	MANBAD		
2674	1135	TAD	MANUPT	/PICK UP POINTER TO MANUF FILES FOR ARGUMENT
2675	4764	JMS	TYPFIL	/TYPE THE BAD SECTORS POINTED TO BY AC
2676	4467	MESSAGE		/FIELD BAD:
2677	1076	FLDBAD		
2700	1136	TAD	FLDPNT	/PICK UP THE POINTER TO FIELD FILES
2701	4764	JMS	TYPFIL	/TYPE THE BAD SECTORS
2702	1135	MANVCH, TAD	MANUPT	/CHECK IF MANUF FILES ARE VALID
2703	7640	SZA CLA		/SKIP IF NOT
2704	5312	JMP	FLDCHK	
2705	4467	MESSAGE		
2706	0643	DMANUF		/"THE MANUFACTURING
2707	4467	MESSAGE		/ BAD SECTOR FILES ARE DESTROYED!"
2710	1043	BSFDES		
2711	4766	JMS	MANDES	/ALLOW REWRITE OF MANUF BSF'S
2712	1136	FLDCHK, TAD	FLDPNT	/IF FIELD FILE IS NOT VALID
2713	7650	SNA CLA		
2714	5320	JMP	.+4	/ THEN SET UP BLANK FILE
2715	1130	TAD	BSFDEL	/OR IF DELETION IS REQUESTED
2716	7650	SNA CLA		
2717	5330	JMP	FLDCNT	/ ELSE GO COUNT NUMBER OF BAD SECTORS IN FILE
2720	2137	ISZ	WRTFIL	/ THEN SET WRITE FILES FLAG
2721	1373	TAD	(FLDBSF	/PICK UP POINTER TO FILE
2722	4763	JMS	BLANKF	/SETUP A BLANK FILE (AT BUFFER IN AC)
2723	6201	KCDF0, COF	0	/FIELD ARGUMENT FOR BLANKF
2724	1372	TAD	(FELDBS	/SET UP FIELD FILE POINTER
2725	3136	DCA	FLDPNT	
2726	3112	DCA	OLDBAD	/CLEAR COUNT OF OLD BAD SECTORS
2727	7410	SKP		
2730	4762	FLDCNT, JMS	CNTBAD	/COUNT NUMBER OF SECTORS IN FIELD FILE AND SAVE AT OLDBAD
2731	3111	DCA	NEUBAD	/CLEAR NUMBER OF NEW BAD SECTORS FOUND
2732	5600	JMP I	SETUPB	/RETURN FINALLY WITH BUFFERS SET UP
2733	7000	/		
2734	0024	M1000, -1000		
		K24, 24		
		/JMS CLRBUF		
		/		
		/CLEAR THE 2K BUFFER AT ZERBUF		
		/		
2735	0000	CLRBUF, 0		
2736	7200	CLA		
2737	1361	TAD	(ZERBUF-1	/SET POINTER



```

2740 3013      DCA      AUTO13
2741 1333      TAD      M1000      /SET UP COUNTER
2742 3077      DCA      TEMP1
2743 6211      CDF      10
2744 3413      DCA I    AUTO13
2745 3413      DCA I    AUTO13
2746 3413      DCA I    AUTO13
2747 3413      DCA I    AUTO13
2750 2077      ISZ      TEMP1      /DONE?
2751 5344      JMP      .-5        /NO
2752 6201      CDF      0
2753 5735      JMP I    CLRBUF

2761 3577
2762 4145
2763 5414
2764 4066
2765 3126
2766 2544
2767 3000
2770 3346
2771 3324
2772 5661
2773 5651
2774 5631
2775 3303
2776 2461
2777 5621
      3000

PAGE

/JMS ENTSRN
/
/THIS SUBROUTINE PROMPTS OPERATOR TO ENTER THE PACK SERIAL NUMBER.
/UP TO 10 DIGITS ARE ACCEPTED (SERIAL NUMBERS ARE IN OCTAL, FORTUNATELY)
/AND FORMED INTO THE SCREWEY 8 BIT WORDS AS THEY APPEAR WHEN READ FROM
/THE DISK IN 8 BIT MODE. THE SERIAL NUMBER IS SAVED AT THE LOCATIONS
/RESERVED FOR IT.
/
3000 0000      ENTSRN, 0
3001 4467      MESSAGE      /"ENTER "
3002 1201      ENTER
3003 4467      MESSAGE      /"PACK SERIAL NUMBER:"
3004 1205      PCKSRN
3005 1377      TAD      (FOBUF-1      /SETUP POINTER TO WHERE THE 10 DIGITS WILL BE STORED
3006 3017      DCA      AUTO17
3007 1251      TAD      M13      /SET UP COUNTER FOR 11 (I.E. 1 TOO MANY) DIGITS
3010 3252      DCA      SRNCNT
3011 4466      SRNLUP, LISN      /WAIT FOR INPUT
3012 0001      1
3013 3024      SAVDIG      /IF OCTAL INPUT, GO SAVE IT
3014 7563      -215
3015 3030      FIXDIG      /IF <CR>, ASSEMBLE DIGITS INTO A SERIAL NUMBER
3016 0000      0
3017 3020      .+1
3020 4463      WZITFG      /ANYTHING ELSE, CHECK FOR ^F OR ^G

```

```

3021 4467 ESRNQM, MESSAGE /TYPE ?<CR>
3022 0410 QESMRK
3023 5201 JMP ENTSRN+1 /REPROMPT
3024 3417 SAVDIG, DCA I AUTO17 /SAVE THE INPUT DIGIT
3025 2252 ISZ SRNCNT /CHECK IF TOO MANY DIGITS
3026 5211 JMP SRNLUP /NO--GO WAIT FOR ANOTHER CHARACTER
3027 5221 JMP ESRNQM /TOO MANY--?<CR> AND REPROMPT
3030 1252 FIXDIG, TAD SRNCNT /CHECK IF ANY DIGITS WERE ENTERED AT ALL
3031 1250 TAD K13
3032 7650 SNA CLA /SKIP IF THERE WERE
3033 5201 JMP ENTSRN+1 /NO DEFAULT SER # -- REPROMPT
3034 1017 TAD AUTO17 /SAVE POINTER TO THE LAST DIGIT ENTERED
3035 7001 IAC / PLUS 1
3036 3253 DCA SNPNTR
3037 4254 JMS FORMOD /FORM THE ODD WORD
3040 3140 DCA SERNO1 /SAVE IT
3041 4277 JMS FORMEV /FORM AN EVEN WORD
3042 3141 DCA SERNO2 /SAVE IT
3043 4254 JMS FORMOD /FORM AN ODD WORD
3044 3142 DCA SERNO3 /SAVE IT
3045 4277 JMS FORMEV /FORM THE LAST EVEN WORD
3046 3143 DCA SERNO4 /AND SAVE IT
3047 5600 JMP I ENTSRN /RETURN

/
3050 0013 K13, 13
3051 7765 M13, -13
3052 0000 SRNCNT, 0
3053 0000 SNPNTR, 0
/
/JMS FORMOD
/
/FORM AN ODD WORD ( --- -XX YYY ZZZ , WHERE XX IS BOTTOM 2 BITS OF A DIGIT,
/YYY AND ZZZ ARE OCTAL DIGITS) FROM THE DIGITS ENTERED.
/
3054 0000 FORMOD, 0
3055 4315 JMS GETLSD /GET THE NEXT LEAST SIGNIFICANT DIGIT
3056 3274 DCA ENTSV1 /SAVE IT
3057 4315 JMS GETLSD /GET NEXT DIGIT
3060 3275 DCA ENTSV2 /SAVE IT
3061 4315 JMS GETLSD /GET THE NEXT LSDIGIT
3062 3276 DCA ENTSV3 /AND SAVE IT BECAUSE WE NEED THE HIGH ORDER BIT LATER
3063 1276 TAD ENTSV3
3064 7106 CLL RTL /MOVE OVER THE 3RD DIGIT
3065 7004 RAL
3066 1275 TAD ENTSV2 /PLACE 2ND DIGIT
3067 7106 CLL RTL /AND MOVE IT OVER
3070 7004 RAL
3071 1274 TAD ENTSV1 /GET THE LEAST SIGNIFICANT DIGIT
3072 0157 AND K377 /WIPE OUT THE HIGH BIT OF THE MSD
3073 5654 JMP I FORMOD /RETURN WITH NUMBER PORTION

/
3074 0000 ENTSV1, 0
3075 0000 ENTSV2, 0
3076 0000 ENTSV3, 0
/

```

```

/JMS FORMEV
/
/FORM THE EVEN 8 BIT WORD OF DIGITS ( --- -0A AAB BBX , WHERE AAA AND
/BBB ARE DIGITS, AND X IS THE HIGH BIT OF THE DIGIT THAT WAS IN THE ODD WORD.)
/
3077 0000 FORMEV, 0
3100 4315 JMS GETLSD /GET THE NEXT LEAST SIGNIFICANT DIGIT
3101 3274 DCA ENTSV1 /SAVE IT
3102 4315 JMS GETLSD /GET THE NEXT LEAST SIG DIG
3103 7106 CLL RTL /MOVE THE DIGIT OVER
3104 7004 RAL
3105 1274 TAD ENTSV1 /PLACE THE LESS SIGNIFICANT DIGIT
3106 7104 CLL RAL /MOVE OVER 1 BIT POSITION
3107 3274 DCA ENTSV1 /SAVE TEMPORARILY
3110 7307 CLA CLL IAC RTL /4 INTO AC FOR MASK FOR DESIRED BIT
3111 0276 AND ENTSV3 / FROM THE LEAST OF ALL SIG DIGITS (FROM FORMOD
3112 7112 CLL RTR /MOVE BIT OVER INTO POSITION
3113 1274 TAD ENTSV1 /GET OTHER 2 DIGITS
3114 5677 JMP I FORMEV /RETURN WITH DIGITS FORMED
/
/JMS GETLSD
/
/GET THE NEXT LEAST SIGNIFICANT DIGIT FROM THE ONES ENTERED (BY UPDATEING
/THE POINTER TO THE DIGIT TABLE AND IF VALID, GETTING DIGIT), OR 0, IF
/NO MORE DIGITS.
/
3115 0000 GETLSD, 0
3116 7240 STA /SUBTRACT 1 FROM THE POINTER TO BACK UP
3117 1253 TAD SNPNTN / IN THE TABLE TO THE NEXT MORE SIGNIFICANT
3120 3253 DCA SNPNTN / DIGIT (THE NEW LEAST SIGNIFICANT DIGIT)
3121 1253 TAD SNPNTN /CHECK IF THE POINTER HAS MOVED BEFORE
3122 1376 TAD (-FOBUF / THE BEGINNING ENTRY
3123 7700 SMA CLA /SKIP IF IT HAS
3124 1653 TAD I SNPNTN /PICK UP THE ENTRY
3125 5715 JMP I GETLSD /RETURN WITH ENTRY OR ASSUMED LEADING 0'S
/
/JMS TYPNRM
/
/SUBROUTINE TYPES OUT THE SERIAL NUMBER, SUPPRESSING LEADING ZEROS.
/
3126 0000 TYPNRM, 0
3127 4475 CRLF
3130 4467 MESSAGE /"PACK SERIAL NUMBER:"
3131 1205 PCKSRN
3132 3116 DCA LDNGO /CLEAR LEADING 0 FLAG
3133 1143 TAD SERNO4 /PICK UP THE MOST SIGNIFICANT BITS
3134 4360 JMS TYPEVN /TYPE OUT THE EVEN WORD
3135 7201 CLA IAC /GET A MASK
3136 0143 AND SERNO4 /GET THE BIT FROM THE MSB WORD THAT
3137 7002 BSW / IS PART OF THE MOST SIGNIFICANT
3140 7106 CLL RTL / DIGIT IN WORD 3
3141 1142 TAD SERNO3 /GET WORD 3 WITH THE COMPLETE DIGIT AT TOP
3142 4775 JMS TYPODD /TYPE THAT ODD WORD
3143 1141 TAD SERNO2 /GET THE LOW ORDER EVEN WORD

```

```

3144 4360      JMS      TYPEVN      /TYPE OUT THE TWO FULL DIGITS IN IT
3145 7201      CLA IAC      /GET A MASK
3146 0141      AND       SERNO2     /GET THE BIT FROM THE WORD THAT
3147 7002      BSW        /      IS PART OF THE MOST SIGNIFICANT
3150 7106      CLL RTL      /      DIGIT IN WORD 1
3151 1140      TAD       SERNO1     /FORM FULL 3 DIGIT LOW ORDER DIGITS
3152 4775      JMS       TYPODD     /TYPE THEM OUT
3153 1116      TAD       LDNGO      /CHECK THE LEADING 0 FLAG
3154 7650      SNA CLA      /SKIP IF NON-0 (DIGITS WERE TYPED)
3155 4470      PRNT1      /PRINT A ZERO. WOW! PACK NUMBER 0!
3156 4475      CRLF       /<CR><LF>
3157 5726      JMP I      TYPSRN    /RETURN

```

```

/
/JMS TYPEVN
/
/TYPE THE 2 FULL DIGITS IN THE FORMAT OF THE EVEN WORD.
/SUPPRESS LEADING ZEROS.
/

```

```

3160 0000      TYPEVN, 0
3161 3372      DCA       SRNSAV      /SAVE THE VALUE
3162 1372      TAD       SRNSAV
3163 7012      RTR
3164 7012      RTR
3165 4774      JMS       SUPTYP      /GET THE HIGHEST DIGIT
3166 1372      TAD       SRNSAV,     /TYPE IT UNLESS IT'S A LEADING ZERO
3167 7010      RAR
3170 4774      JMS       SUPTYP      /GET LESS SIGNIF DIGIT
3171 5760      JMP I      TYPEVN     /TYPE IT

```

```

/
3172 0000      SRNSAV, 0
3174 3215
3175 3200
3176 1127
3177 6650
3200

```

```

PAGE
/JMS TYPODD
/
/TYPE THE 3 DIGITS THAT HAVE BEEN FORMED IN AC. (THIS ROUTINE IS LIKE A
/"PRNT3" ROUTINE EXCEPT IT WORKS IN CONJUNCTION WITH OTHER ROUTINES HERE
/TO SUPPRESS LEADING ZEROS IN SERIAL NUMBER.)
/

```

```

3200 0000      TYPODD, 0
3201 3214      DCA       SRNSV1
3202 1214      TAD       SRNSV1      /TAKE VALUE
3203 7002      BSW        /GET HIGHEST DIGIT
3204 4215      JMS       SUPTYP      /TYPE IT IF NOT LEADING ZERO
3205 1214      TAD       SRNSV1
3206 7012      RTR
3207 7010      RAR
3210 4215      JMS       SUPTYP      /GET 2ND DIGIT
3211 1214      TAD       SRNSV1      /TYPE IT
3212 4215      JMS       SUPTYP      /TYPE LOWEST DIGIT
3213 5600      JMP I      TYPODD

```

```

/
3214 0000      SRNSV1, 0

```

```

3215 0000 / SUPTYP, 0 /TYPE OCTAL DIGIT IN AC 9-11 UNLESS IT'S A LEADING ZERO
3216 0777' AND K7 /IGNORE OTHER BITS
3217 7440 SZA /SKIP IF IT IS A ZERO
3220 5224 JMP .+4 /GO TYPE THE DIGIT
3221 1116 TAD LDNGO /CHECK IF DIGITS HAVE BEEN TYPED (IF ZERO IS NOT LEADING)
3222 7650 SNA CLA /SKIP IF SO
3223 5226 JMP .+3 /DON'T TYPE THE LEADING ZERO
3224 4470 PRNT1 /TYPE THE DIGIT
3225 2116 ISZ LDNGO /FLAG THAT DIGITS HAVE BEEN TYPED (SUBSEQUENT 0'S NOT LEADING)
3226 5615 JMP I SUPTYP /RETURN

```

/JMS TYPDEC

/

/TYPE THE NUMBER IN THE AC AS UNSIGNED 4 DIGIT OCTAL NUMBER, SUPPRESSING  
/LEADING ZEROS.

/

```

3227 0000 TYPDEC, 0
3230 7450 SNA /SKIP IF THERE ARE DIGITS TO TYPE
3231 5271 JMP TYPD0 /TYPE OUT 1 ZERO AND RETURN
3232 3277 DCA VALUE /SAVE VALUE TO TYPE
3233 3300 DCA DIGIT /CLEAR DIGIT TO TYPE
3234 3116 DCA LDNGO /CLEAR LEADING ZERO FLAG
3235 1376 TAD (TENPWR /SET POINTER TO TABLE OF POWERS OF 10
3236 3302 DCA TENPTR
3237 1170 TAD M4 /SET COUNTER
3240 3301 DCA CNTRZB
3241 7410 SKP
3242 3277 DCA VALUE /SAVE NEW VALUE - 10**X
3243 7100 CLL
3244 1277 TAD VALUE
3245 1702 TYP10L, TAD I TENPTR /SUBTRACT POWER OF 10
3246 7430 SZL
3247 2300 ISZ DIGIT /DEVELOP BCD DIGIT
3250 7430 SZL
3251 5242 JMP TYP10L-3 /LOOP
3252 7200 CLA /WE HAVE THE DIGIT
3253 1300 TAD DIGIT
3254 7440 SZA /CHECK IF ZERO
3255 5261 JMP .+4 /TYPE THE DIGIT
3256 1116 TAD LDNGO /CHECK IF A LEADING 0
3257 7650 SNA CLA /SKIP IF NOT (TYPE THE ZERO)
3260 5264 JMP .+4 /JUMP OVER TYPE
3261 1775' TAD K260 /MAKE DIGIT ASCII
3262 4474 TYPE
3263 2116 ISZ LDNGO /FLAG THAT DIGITS HAVE BEEN TYPED
3264 3300 DCA DIGIT /CLEAR DIGIT
3265 2302 ISZ TENPTR /POINT TO NEXT LOWER POWER OF 10
3266 2301 ISZ CNTRZB /DONE ALL 4 POWERS?
3267 5244 JMP TYP10L-1 /NO
3270 7410 SKP
3271 4470 TYPD0, PRNT1 /TYPE A ZERO
3272 5627 JMP I TYPDEC /RETURN
/
3273 6030 TENPWR, -1750

```

```

3274 7634      -144
3275 7766      -12
3276 7777      -1
3277 0000      VALUE, 0
3300 0000      DIGIT, 0
3301 0000      CNTRZB, 0
3302 0000      TENPTR, 0

```

```

/JMS SERSAV
/

```

```

/SAVE THE SERIAL NUMBER (4 WORDS) AT C(BUFFER) IN SERIAL NUMBER WORDS
/

```

```

3303 0000      SERSAV, 0
3304 7240      STA
3305 1133      TAD      BUFFER      /SET UP POINTER
3306 3010      DCA      AUTO10
3307 1410      TAD I      AUTO10      /GET A WORD
3310 0157      AND      K377      /MASK IT
3311 3140      DCA      SERNO1      /SAVE IT
3312 1410      TAD I      AUTO10      /GET A WORD
3313 0157      AND      K377      /MASK IT
3314 3141      DCA      SERNO2      /SAVE IT
3315 1410      TAD I      AUTO10      /GET A WORD
3316 0157      AND      K377      /MASK IT
3317 3142      DCA      SERNO3      /SAVE IT
3320 1410      TAD I      AUTO10      /GET A WORD
3321 0157      AND      K377      /MASK IT
3322 3143      DCA      SERNO4      /SAVE IT
3323 5703      JMP I      SERSAV

```

```

/JMS SERCMP
/

```

```

/COMPARE THE SERIAL NUMBER IN THE STORAGE WORDS WITH THE ONE AT C(BUFFER).
/SKIP ON RETURN IF THEY ARE EQUAL.
/

```

```

3324 0000      SERCMP, 0
3325 7240      STA
3326 1133      TAD      BUFFER      /SET UP POINTER TO THE BUFFER
3327 3010      DCA      AUTO10
3330 1374      TAD      (SERNO1-1    /SET UP POINTER TO THE PAGE 0 WORDS
3331 3013      DCA      AUTO13
3332 1170      TAD      M4          /SET UP COUNTER
3333 3077      DCA      TEMP1
3334 1410      CMPSRN, TAD I      AUTO10      /GET WORD FROM BUFFER
3335 0157      AND      K377      /MASK IT
3336 7041      CIA
3337 1413      TAD I      AUTO13      /COMPARE TO WORD STORED AWAY
3340 7640      SZA CLA      /SKIP IF EQUAL
3341 5345      JMP      .+4          /RETURN--NOT EQUAL
3342 2077      ISZ      TEMP1      /CHECKED THEM ALL?
3343 5334      JMP      CMPSRN      /NO
3344 2324      ISZ      SERCMP      /YES--SKIP ON RETURN
3345 5724      JMP I      SERCMP

```

```

/JMS SRN2BF

```

/
   
/MOVE THE SERIAL NUMBER IN THE 4 SERNO WORDS TO THE BUFFER IN THE FIELD
   
/SPECIFIED BY THE CDF INSTRUCTION IN THE AC.
   
/AUTO16 POINTS TO NEXT WORD OF BUFFER ON RETURN.
   
/

3346	0000	SRN2BF, 0		
3347	3354	DCA	FLDCNG	/SAVE THE CDF INSTRUCTION
3350	7240	STA		
3351	1133	TAD	BUFFER	/SET UP POINTER TO THE BUFFER IN AUTO16
3352	3016	DCA	AUTO16	
3353	1140	TAD	SERNO1	/MOVE A WORD
3354	7402	FLDCNG, HLT		/CDF INSTRUCTION PLACED HERE
3355	3416	DCA I	AUTO16	
3356	1141	TAD	SERNO2	/MOVE A WORD
3357	3416	DCA I	AUTO16	
3360	1142	TAD	SERNO3	/MOVE A WORD
3361	3416	DCA I	AUTO16	
3362	1143	TAD	SERNO4	/MOVE A WORD
3363	3416	DCA I	AUTO16	
3364	6201	CDF	0	/CHANGE BACK TO THIS FIELD
3365	5746	JMP I	SRN2BF	

3374 0137  
 3375 1174  
 3376 3273  
 3377 1175  
 3400

PAGE

/JMS CHKBSF

/

/CHECK THE FORMAT OF THE BAD SECTOR FILE. THE HEADER FORMAT (SERIAL NO.  
 /AND ZERO WORDS) IS VERIFIED. THE FORMAT OF ALL BAD SECTOR LISTINGS IS  
 /VERIFIED (INCLUDING CHECK FOR ASCENDING ORDER) AND THE 1'S FILL IS CHECKED.  
 /THE ROUTINE SKIPS ON RETURN IF ANY FORMAT ERRORS ARE FOUND.  
 /

3400	0000	CHKBSF, 0		
3401	7200	CLA		
3402	1133	TAD	BUFFER	/SET UP BUFFER POINTER TO PICK UP SECOND
3403	3012	DCA	AUTO12	/SERIAL NUMBER WORD
3404	1412	TAD I	AUTO12	
3405	0165	AND	K200	/CHECK IF THE UNUSED BIT IS SET
3406	7640	SZA CLA		/SKIP IF NOT
3407	5342	JMP	BADBSF	/BAD FORMAT ALREADY--MAKE RETURN
3410	2012	ISZ	AUTO12	/SKIP NEXT SERIAL NUMBER WORD (ALWAYS LOOKS OK)
3411	1412	TAD I	AUTO12	/PICK UP SERIAL NO. WORD 4
3412	0165	AND	K200	/AND CHECK THE UNUSED BIT
3413	7640	SZA CLA		/SKIP IF OK
3414	5342	JMP	BADBSF	
3415	1170	TAD	M4	/SET UP COUNTER FOR THE 4 ZERO WORDS
3416	3077	DCA	TEMP1	
3417	1412	TAD I	AUTO12	/PICK UP A ZERO WORD
3420	0157	AND	K377	
3421	7640	SZA CLA		/SKIP IF OK
3422	5342	JMP	BADBSF	/FORMAT ERROR--RETURN
3423	2077	ISZ	TEMP1	

3424	5217	JMP	.-5	/CHECK NEXT ZERO WORD	
3425	3345	DCA	PRECYL	/SET UP SMALLEST ALLOWABLE CYLINDER	
3426	3346	DCA	PRESEC	/SET UP SMALLEST ALLOWABLE TRACK AND SECTOR	
3427	1777	TAD	M176	/SET UP COUNTER IN CASE OF FULL	
3430	3347	DCA	CHKCNT	/ BAD SECTOR FILE	
3431	1412	CHKLUP, TAD	I AUTO12	/PICK UP THE CYLINDER ADDRESS WORD	
3432	0157	AND	K377	/MASK IT	
3433	3350	DCA	SAVCYL	/SAVE IT	
3434	1412	TAD	I AUTO12	/PICK UP SECOND WORD OF CYLINDER ADDRESS	
3435	0157	AND	K377	/MASK IT	
3436	3100	DCA	TEMP2	/SAVE SECOND WORD OF CYLINDER ADDRESS	HP 001
3437	1100	TAD	TEMP2	/CHECK FOR ALL ONES, INDICATES NO BAD SECTORS	HP 001
3440	1163	TAD	M377	/ADD 2'S COMPLEMENT OF 377	HP 001
3441	7640	SZA	CLA	/SKIP IF ALL ONES (1) END OF BAD SECTOR BLOCK	HP 001
3442	5245	JMP	MAKCYL	/NOT ALL ONES SO MAKE CYLINDER ADDRESS	HP 001
3443	1100	TAD	TEMP2	/GET SECOND WORD OF CYLINDER ADDRESS	HP 001
3444	5317	JMP	ALL1CH	/CHECK FOR ALL ONES	HP 001
3445	1100	MAKCYL, TAD	TEMP2	/GET SECOND WORD OF CYL ADDRESS,MSB IN BIT 11	HP 001
3446	7002	BSW		/PUT THE MSB OF CYL ADD. IN BIT 5 (000 00X 000 000)	HP 001
3447	7106	CLL	RTL	/POSITION MSB INTO BIT 3 (000 X00 000 000)	HP 001
3450	1350	TAD	SAVCYL	/ADD THE CYLINDER ADDRESS FIRST WORD	HP 001
3451	3350	DCA	SAVCYL	/SAVE NEW CYLINDER ADDRESS	HP 001
/					
3452	1412	TAD	I AUTO12	/GET THE SECTOR	
3453	0157	AND	K377		
3454	3100	DCA	TEMP2	/SAVE IT	
3455	1100	TAD	TEMP2		
3456	1172	TAD	M50	/CHECK IF OUT OF RANGE	
3457	7700	SMA	CLA	/SKIP IF NOT	
3460	5342	JMP	BADBSF		
3461	1412	TAD	I AUTO12	/PICK UP TRACK LISTING	
3462	0157	AND	K377		
3463	3077	DCA	TEMP1	/SAVE IT	
3464	7344	STA	CLL RAL	/GET A MASK TO LOOK AT INVALID BITS	
3465	0077	AND	TEMP1		
3466	7640	SZA	CLA	/SKIP IF ALL UNUSED BITS WERE 0	
3467	5342	JMP	BADBSF		
/NOW CHECK THAT SECTOR IS LISTED IN ASCENDING ORDER. IF CYLO, TRKO, SECO					
/IS LISTED (AS MIGHT BE THE CASE IF THE ENTIRE FILE IS 0'S) IT WILL BE CAUGHT					
/AS AN OUT OF SEQUENCE.					
3470	1350	TAD	SAVCYL	/COMPARE CYLINDER TO PREVIOUS	
3471	7041	CIA		/ CYLINDER LISTED IN THE BAD	
3472	1345	TAD	PRECYL	/ SECTOR FILE	
3473	7540	SMA	SZA	/SKIP IF NEW CYLINDER IS >= OLD ONE	
3474	5342	JMP	BADBSF	/OUT OF SEQUENCE	
3475	7640	SZA	CLA	/SKIP IF EQUAL TO OLD ONE	
3476	5306	JMP	SAVNEW	/FILE IS ASCENDING--SAVE NEW PREVIOUS VALUES	
3477	1077	TAD	TEMP1	/GET TRACK BIT INTO AC5 TO SERVE AS	
3500	7002	BSW		/ AN MSB TO SECTOR	
3501	1100	TAD	TEMP2	/ADD IN SECTOR	
3502	7041	CIA		/COMPARE TO PREVIOUS BAD SECTOR	
3503	1346	TAD	PRESEC		
3504	7700	SMA	CLA	/SKIP IF NEW > PREVIOUS	
3505	5342	JMP	BADBSF	/OUT OF SEQUENCE	
3506	1350	SAVNEW, TAD	SAVCYL	/SAVE PREVIOUS CYLINDER	



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3507 3345      DCA      PRECYL
3510 1077      TAD      TEMP1
3511 7002      BSW
3512 1100      TAD      TEMP2
3513 3346      DCA      PRESEC
3514 2347      ISZ      CHKCNT
3515 5231      JMP      CHKLUP
3516 5343      JMP      GUDBSF
3517 1163      ALLICH, TAD      M377
3520 7640      SZ A CLA
3521 5342      JMP      BADBSF
3522 1350      TAD      SAVCYL
3523 1163      TAD      M377
3524 7640      SZ A CLA
3525 5342      JMP      BADBSF
3526 1347      TAD      CHKCNT
3527 7104      CLL RAL
3530 7105      CLL IAC RAL
3531 3347      DCA      CHKCNT
3532 1412      CH1LUP, TAD I AUTO12
3533 0157      AND      K377
3534 1163      TAD      M377
3535 7640      SZ A CLA
3536 5342      JMP      BADBSF
3537 2347      ISZ      CHKCNT
3540 5332      JMP      CH1LUP
3541 5343      JMP      GUDBSF
3542 2200      BADBSF, ISZ      CHKBSF
3543 7200      GUDBSF, CLA
3544 5600      JMP I CHKBSF

3545 0000      /
3546 0000      PRECYL, 0
3547 0000      PRESEC, 0
3550 0000      CHKCNT, 0
3551 0000      SAVCYL, 0
3552 6031      XVT278, 0
3553 6030      KSF
3554 5751      KCF
3554 5751      JMP I XVT278

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3577 0565
3600

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PAGE

/JMS HDRVFFY

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/
/SUBROUTINE POSITIONS HEADS AT CYLND, TRACK AND READS AND VERIFIES 40
/CONSECUTIVE HEADERS. A RETRY IS ALLOWED ON A HEADER READ. ANY HEADERS
/BAD IN TWO TRIES WILL BE ENTERED INTO THE BAD SECTOR FILE. A HEADER IS
/CONSIDERED BAD IF THERE IS AN ERROR ON THE READ OR IF THE SECTOR LISTING
/OR ZERO HEADER WORDS ARE INVALID. IF AN INCORRECT CYLINDER OR HEAD
/SELECT BIT IS LISTED (IN A HEADER THAT WAS READ WITHOUT ERROR), THEN THE
/PACK IS REJECTED. IF THE SECTOR ADDRESSES ARE NOT IN ORDER IN THREE
/ATTEMPTS TO READ THE 40 HEADERS, THEN THE PACK IS ALSO REJECTED.
/

```

/THIS ROUTINE HAS A PSEUDO-CODE FLOWCHART [VERIFY-HEADERS]

```

3600 0000      /HDRVFY, 0
3601 4451      SEEK
3602 7346      STA CLL RTL
3603 3132      DCA RETRY
3604 4257      RTRYH1, JMS GET40H
3605 4311      JMS FRSTSC
                        /POSITION HEADS
                        /ALLOW 3 RETRIES FOR OUT OF ORDER SECTORS

3606 1172      TAD M50
3607 3256      DCA HDRCNT
3610 1377      TAD (FOBUF-1
3611 3014      DCA AUTO14
3612 1375      TAD AFTRHD
3613 3015      DCA AUTO15
3614 4776      JMS CHKHDR
3615 5231      JMP BADORD
3616 3415      DCA I AUTO15
3617 2256      ISZ HDRCNT
3620 5214      JMP .-4
3621 1375      TAD AFTRHD
3622 7041      CIA
3623 1015      TAD AUTO15
3624 7650      SNA CLA
3625 5255      JMP HDRRET
3626 7240      STA
3627 3415      DCA I AUTO15
3630 5240      JMP REVFYH
                        /SET UP POINTER TO WHERE HEADERS ARE STORED

                        /SET UP POINTER IN BUFFER (AFTER HEADERS)
                        / TO WHERE BAD SECTORS WILL BE STORED (FOR RETRIES)
                        /VERIFY A HEADER
                        /RETURN FOR BAD SECTOR ORDER
                        /SAVE SECTOR (IN AC) IN THE BAD STORAGE AREA
                        /CHECKED ALL 40 HEADERS?
                        /NO--GO BACK
                        /YES--CHECK IF ANY HEADERS
                        / WERE BAD BY
                        / SEEING IF POINTER MOVED
                        /SKIP IF ANY WERE BAD
                        /OK--RETURN
                        /SET A MINUS WORD AT END OF
                        / BAD SECTOR STORAGE AREA
                        /GO RETRY ENTIRE PROCESS AGAIN--THIS TIME
                        /ENTERING BAD SECTORS (THAT WERE BAD THIS TIME ALSO)
                        /INTO THE BAD SECTOR FILE
                        /RETRIED ENUFF?
                        /NO--TRY IT AGAIN
                        /YES--REJECT PACK FOR OUT OF ORDER SECTORS
                        /RETRIED ENUFF ON THE SECOND TIME AROUND?
                        /NO
                        /REJECT THE PACK
                        /POINTER TO TEXT--BAD SECTOR ORDER
                        /-3 FOR COUNTER FOR RETRIES

3631 2132      BADORD, ISZ RETRY
3632 5204      JMP RTRYH1
3633 5236      JMP .+3
3634 2132      BDORD2, ISZ RETRY
3635 5242      JMP REVFYH+2
3636 4465      RJECTP
3637 0775      BDORDR
3640 7346      REVFYH, STA CLL RTL
3641 3132      DCA RETRY
3642 4257      JMS GET40H
3643 4311      JMS FRSTSC
3644 1172      TAD M50
3645 3256      DCA HDRCNT
3646 1377      TAD (FOBUF-1
3647 3014      DCA AUTO14
3650 4776      JMS CHKHDR
3651 5234      JMP BDORD2
3652 4357      JMS GOTBAD
                        /CHECK A HEADER
                        /BAD SECTOR ORDER--DRIVE IS PROBABLY DRIFTING OFF TRACK
                        /CHECK IF THE SECTOR WAS BAD LAST TIME, AND IF
                        /SO, THEN ENTER INTO FILE
                        /CHECKED ALL 40?
                        /NO

3653 2256      ISZ HDRCNT
3654 5250      JMP .-4
3655 5600      HDRRET, JMP I HDRVFY
                        /
3656 0000      HDRCNT, 0
                        /
                        /JMS GET40H -- READ 40 CONSECUTIVE HEADERS AND STORE AT FOBUF

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3657 0000 GET40H, 0
3660 7200 CLA
3661 1172 TAD M50 /SET UP COUNTER FOR HEADERS
3662 3256 DCA HDRCNT
3663 1377 TAD (FOBUF-1 /SET UP POINTER TO STORAGE AREA
3664 3014 DCA AUTO14
3665 4452 G40LUP, REDHDR /READ A HEADER
3666 4433 RRER /SAVE THE ERROR REG IN STORAGE AREA
3667 3414 DCA I AUTO14
3670 4440 RRSI /SAVE HEADER WORD 1
3671 0157 AND K377
3672 3414 DCA I AUTO14
3673 4440 RRSI /SAVE HEADER WORD 2
3674 0157 AND K377
3675 3414 DCA I AUTO14
3676 4440 RRSI /ADD THE 8 BIT HEADER WORDS 3 AND 4 INTO 1 WORD
3677 0157 AND K377 / AND SAVE TOGETHER. THEIR SUM SHOULD
3700 3077 DCA TEMP1 / BE ZERO. (SINCE THEY ARE 8 BIT
3701 4440 RRSI / WORDS, THEY CANNOT BY CHANCE BE COMPLEMENTS.)
3702 0157 AND K377
3703 1077 TAD TEMP1 /ADD HDR WORD 3 BACK INTO WORD 4
3704 3414 DCA I AUTO14 /SAVE THE COMBINED WORDS
3705 2256 ISZ HDRCNT /READ 40 HEADERS?
3706 5265 JMP G40LUP /NO
3707 4442 CONSOL /YES--ALLOW CONSOLE INPUT
3710 5657 JMP I GET40H

/
/JMS FRSTSC -- SUBROUTINE COMPUTES WHAT THE PREVIOUS SECTOR WAS
/ FOR THE HEADER FIRST READ. IT DOES THIS EVEN THOUGH THE
/ FIRST HEADER(S) READ MAY HAVE BEEN BAD!
/

3711 0000 FRSTSC, 0
3712 7200 CLA
3713 1172 TAD M50 /SET UP COUNTER IN CASE ALL HEADERS ARE BAD
3714 3256 DCA HDRCNT
3715 1377 TAD (FOBUF-1 /SET UP POINTER TO HEADERS
3716 3014 DCA AUTO14
3717 7240 FSTLUP, STA /COMPARE THE ERROR REG FOR THIS READ HEADER
3720 1414 TAD I AUTO14 / TO ITS CORRECT VALUE (0001)
3721 7640 SZA CLA /SKIP IF NO ERROR
3722 5331 JMP NOTGUD
3723 1414 TAD I AUTO14 /PICK UP HEADER WORD 1
3724 0164 AND K77 /SAVE ONLY SECTOR BITS
3725 1172 TAD M50 /COMPARE TO ILLEGALLY HIGH VALUE
3726 7510 SPA /SKIP IF OUT OF RANGE (DO NOT CLEAR AC!)
3727 5340 JMP GOTGUD /GO PROCESS VALUE IN AC
3730 7410 SKP /ONLY BUMP POINTER BY 2
3731 2014 NOTGUD, ISZ AUTO14 /BUMP POINTER TO NEXT HEADER
3732 2014 ISZ AUTO14
3733 2014 ISZ AUTO14
3734 2256 ISZ HDRCNT /TRIED ALL 40 HEADERS? :
3735 5317 JMP FSTLUP /NO
3736 4465 RJECTP /THAT'S FUNNY. I COULD READ ONE FOR SEEK VERIFICATION
3737 0705 NOGDHD /EITHER FLAKY DRIVE OR NEARLY SHOT PACK

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3740 1160 GOTGUD, TAD K50 /REJECT PACK AND SELECT NEXT UNIT
3741 3110 DCA SECTOR /RESTORE THE SECTOR VALUE IN THE AC
3742 1256 TAD HDRCNT /SAVE IT
3743 1160 TAD K50 /MAKE A COUNTER BASED ON THE NUMBER OF HEADERS
3744 7040 CMA / THAT WERE LOOKED AT IN LOOKING FOR A
3745 3256 DCA HDRCNT / VALID SECTOR
3746 1110 TAD SECTOR /SAVE COUNTER
3747 1356 TAD M1 /PICK UP SECTOR ADDRESS OF GOOD HEADER
3750 2256 ISZ HDRCNT /SUBTRACT ONE FOR EVERY HEADER THAT WAS LOOKED AT
3751 5347 JMP .-2
3752 7510 SPA /SKIP IF SECTOR IS POSITIVE
3753 1160 TAD K50 /RESTORE "LESS THAN 0" SECTOR TO ITS ACTUAL ADDRESS
3754 3110 DCA SECTOR /SAVE THE SECTOR THAT WAS PRIOR TO FIRST HEADER READ
3755 5711 JMP I FRSTSC

/
3756 7777 M1. -1
/
/JMS GOTBAD -- IF SECTOR IS LISTED IN BAD SECTOR STORAGE AREA, THEN
/ ENTER INTO BAD SECTOR FILE

3757 0000 GOTBAD, 0
3760 7200 CLA
3761 1375 TAD AFTRHD
3762 3015 DCA AUTO15 /SET UP POINTER TO WHERE BAD SECTORS WERE PLACED
3763 1415 GBLOOP, TAD I AUTO15 /PICK UP A SECTOR
3764 7510 SPA /SKIP IF NOT LIST TERMINATOR
3765 5373 JMP GBTRTN /RETURN--NOT LISTED
3766 7041 CIA /COMPARE THE LISTED SECTOR
3767 1110 TAD SECTOR /TO THE ONE JUST FOUND BAD
3770 7650 SNA CLA /SKIP IF NOT THE SAME
3771 4460 ENTERBAD /ENTER IT INTO FILE
3772 5363 JMP GBLOOP
3773 7200 GBTRTN, CLA
3774 5757 JMP I GOTBAD

/
3775 7110 AFTRHD, FOFUF+237
3776 4000
3777 6650
4000 PAGE
/
/JMS CHKHDR
/
/VERIFY THAT THE CURRENT HEADER POINTED TO BY AUTO14 WAS READ WITHOUT ERROR
/AND HAS CORRECT FORMAT (CORRECT CYLINDER, HEAD, AND SECTOR, AND ZERO WORDS).
/REJECT PACK IF INCORRECT CYLINDER OR HEAD IS LISTED.
/THE FOLLOWING RETURNS ARE USED:
/ CALL+1 OUT OF SEQUENCE SECTORS
/ CALL+2 BAD HEADER (AC AND "SECTOR" CONTAIN EXPECTED SECTOR)
/ CALL+3 HEADER OK
/((AC IS CLEAR EXCEPT FOR RETURN TO CALL+2)
/
4000 0000 CHKHDR, 0
4001 7200 CLA
4002 2110 ISZ SECTOR /BUMP SECTOR THAT THIS HEADER SHOULD BE
4003 1110 TAD SECTOR /CHECK FOR SECTOR 50

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4004	1172	TAD	M50	
4005	7700	SMA	CLA	/SKIP IF NOT SECTOR 50
4006	3110	DCA	SECTOR	/RESTORE TO ITS RIGHTFUL SECTOR NUMBER
4007	7240	STA		/COMPARE ERROR REG TO DESIRED VALUE (0001)
4010	1414	TAD	I AUTO14	/PICK UP ERROR REG FROM THE READ HEADER
4011	7640	SZA	CLA	/SKIP IF AS EXPECTED
4012	5253	JMP	HDRERR	/ERROR ON THE HEADER READ
4013	1414	TAD	I AUTO14	/PICK UP HEADER WORD 1
4014	3077	DCA	TEMP1	/SAVE IT
4015	1077	TAD	TEMP1	
4016	7002	BSW		/PUT HEAD SELECT BIT INTO AC 11
4017	1107	TAD	TRACK	/XOR WITH THE EXPECTED HEAD BIT
4020	7010	RAR		/MOVE XOR'D BIT INTO LINK FOR TESTING
4021	7630	SZL	CLA	/SKIP IF HEAD SELECT BIT IS OK
4022	5264	JMP	BADCYT	/BAD TRACK--GO REJECT PACK
4023	1077	TAD	TEMP1	
4024	7002	BSW		/MOVE THE CYLINDER LSB INTO THE LINK
4025	7012	RTR		
4026	7200	CLA		/NOW PICK UP HEADER WORD 2, WHICH
4027	1414	TAD	I AUTO14	/ CONTAINS REST OF CYL ADDRESS
4030	7004	RAL		/MOVE LSB INTO WORD
4031	7041	CIA		/COMPARE CYLINDER LISTED TO DESIRED ONE
4032	1106	TAD	CYLNRD	
4033	7640	SZA	CLA	/SKIP IF OK
4034	5264	JMP	BADCYT	/BAD CYLINDER--REJECT PACK
4035	1077	TAD	TEMP1	/PICK UP HEADER WORD 1 AGAIN
4036	0164	AND	K77	/SAVE SECTOR ADDRESS
4037	1172	TAD	M50	/CHECK IF OUT OF RANGE
4040	7500	SMA		/SKIP IF NOT
4041	5255	JMP	OUTRNG	
4042	1160	TAD	K50	/RESTORE SECTOR
4043	7041	CIA		/COMPARE TO EXPECTED SECTOR BASED ON PREVIOUS
4044	1110	TAD	SECTOR	
4045	7640	SZA	CLA	/SKIP IF OK
4046	5263	JMP	HDCHRT	/IF IN BAD ORDER--JUST RETURN
4047	1414	TAD	I AUTO14	/PICK UP COMBINED HEADER WORDS 3 & 4
4050	7650	SNA	CLA	/SKIP IF NOT OK
4051	5261	JMP	GUDHDR	
4052	5257	JMP	BADHDR	
4053	2014	HDRERR, ISZ	AUTO14	/FIX POINTER TO POINT TO NEXT HEADER
4054	2014	ISZ	AUTO14	
4055	2014	OUTRNG, ISZ	AUTO14	/ IF PROCESSING WAS INCOMPLETE
4056	7200	CLA		
4057	1110	BADHDR, TAD	SECTOR	/PICK UP SECTOR IF HEADER WAS BAD
4060	7410	SKP		/ONLY SKIP ONCE IF ERROR
4061	2200	GUDHDR, ISZ	CHKHDR	/SKIP TWICE ON RETURN
4062	2200	ISZ	CHKHDR	/SKIP ON RETURN
4063	5600	HDCHRT, JMP I	CHKHDR	
4064	4465	BADCYT, RJECTP		/REJECT PACK
4065	0744	CYTENT		/BAD CYLINDER OR TRACK ENTRY IN THE HEADER

/JMS TYPFIL

/

/THIS SUBROUTINE TYPES THE BAD SECTOR FILE LISTING POINTED TO BY THE AC.

/IF THE POINTER IS INVALID, THE ROUTINE TYPES "DESTROYED".  
 /IF THERE ARE NO BAD SECTORS LISTED, IT TYPES "NONE".  
 /IF THERE ARE BAD SECTORS, A HEADER AND THE SECTORS ARE TYPED AS FOLLOWS:  
 /CYLNR HEAD SECTOR  
 /XXX X XX  
 /  
 /THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART (TYPE-BAD-SECTOR-FILES)  
 /

4066	0000	TYPFIL, 0			
4067	7440	SZA		/SKIP IF POINTER IS NOT VALID	
4070	5274	JMP	+.4	/CONTINUE PROCESSING	
4071	4467	MESSAGE			
4072	1263	DESTROY		/"DESTROYED!"	
4073	5342	JMP	TYFIRT	/RETURN	
4074	1777	TAD	M1	/SET UP POINTER FOR AUTOINC USE	
4075	3013	DCA	AUTO13	/SAVE POINTER	
4076	1413	TAD I	AUTO13	/GET FIRST CYLINDER	
4077	0157	AND	K377	/MASK IT, OF COURSE	HP 001
4100	3153	DCA	CYLSAV	/SAVE IT	
4101	1413	TAD I	AUTO13	/GET THE ZERO WORD	
4102	0157	AND	K377		
4103	4776	JMS	NEWONE	/ADDED ROUTINE TO FIX CYLINDER ADDRESS	HP 001
4104	5666	JMP I	TYPFIL	/WILL NEED DATA FROM AUTO13	
				/AND WILL TYPE MESSAGE NONE	
				/HAS TWO RETURNS CALL+1 FOR NO ENTRIES	
				/AND CALL+2 FOR ENTRIES	
				/	HP 001
4105	4467	MESSAGE		/TYPE HEADER FOR THE LISTINGS	
4106	1104	BSHDR		/"CYLNR HEAD SECTOR"	
4107	7240	STA		/SET A WORD (IN F0BUF) IN CASE	
4110	3775	DCA I	(ENDFBS+1	/THERE ARE 126 BAD SECTORS IN FILE	
4111	1153	TAD	CYLSAV	/GET CYLINDER THAT WAS SAVED	
4112	7002	BSW		/PRINT THE HIGH DIGIT	
4113	4470	PRNT1			
4114	1153	TAD	CYLSAV	/PRINT BOTTOM TWO DIGITS	
4115	4471	PRNT2			
4116	4473	SPACE2		/4 SPACES FOR FORMAT	
4117	4473	SPACE2			
4120	1413	TAD I	AUTO13	/GET SECTOR	
4121	3153	DCA	CYLSAV	/SAVE MOMENTARILY	
4122	1413	TAD I	AUTO13	/GET TRACK	
4123	4470	PRNT1		/TYPE IT	
4124	4473	SPACE2		/4 SPACES FOR FORMAT	
4125	4473	SPACE2			
4126	1153	TAD	CYLSAV	/GET SECTOR BACK	
4127	4471	PRNT2		/TYPE IT	
4130	4475	CRLF		/END OF LINE	
4131	1413	TAD I	AUTO13	/SAVE NEXT CYLINDER	
4132	0157	AND	K377		
4133	3153	DCA	CYLSAV		
4134	1413	TAD I	AUTO13	/GET THE SECOND WORD OF THE CYLINDER ADDRESS	
4135	0157	AND	K377		
4136	3077	DCA	TEMP1	/TEMPORARY STORAGE OF 2'ND CYLINDER WORD	HP 001
4137	1077	TAD	TEMP1	/CHECK IF THE WORD IS ALL ONES	HP 001
4140	1163	TAD	M377	/BY ADDING 2'S COMPLEMENT OF 377	HP 001

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4141 7650      SNA CLA
4142 5666      TYFIRT, JMP I  TYPFIL
4143 4774      JMS      NEW
4144 5311      JMP      TFILUP
/
/SOMETHING IN THE AC THEN SKIP NOT ALL ONE'S
/ALL ONES READ, AC IS ZERO RETURN WITH THE BSF TYPED
/NOT ALL ONES SETUP THE CORRECT CYLINDER ADDRESS
/NOW PRINT THE VALUE IN CYLSAV
HP 001
HP 001
HP 001

/
/JMS CNTBAD
/
/SUBROUTINE COUNTS THE NUMBER OF BAD SECTORS IN THE FIELD FILE AND LEAVES
/THE NUMBER IN OLDBAD. IF THE NUMBER IS LARGER THAN THE MAXIMUM SPECIFIED,
/THE PACK IS REJECTED.
/
4145 0000      CNTBAD, 0
4146 7201      CLA IAC
4147 1136      TAD      FLOPNT
4150 3077      DCA      TEMP1
4151 7240      STA
4152 3775      DCA I (ENDFBS+1
4153 3112      DCA      OLDBAD
4154 1477      CNTLUP, TAD I  TEMP1
4155 0157      AND      K377
4156 7640      SZA CLA
4157 5365      JMP      CNTBCH
4160 2112      ISZ      OLDBAD
4161 7307      CLA IAC CLL RTL
4162 1077      TAD      TEMP1
4163 3077      DCA      TEMP1
4164 5354      JMP      CNTLUP
4165 1112      CNTBCH, TAD      OLDBAD
4166 7041      CIA
4167 1127      TAD      MAXBAD
4170 7700      SNA CLA
4171 5745      JMP I  CNTBAD
4172 4465      RJECTP
4173 0723      TOOMBS
/SET POINTER TO FIRST ZERO WORD IN FILE
/SAVE THE POINTER
/SET A WORD (IN FOBUF) IN CASE
/THERE ARE 126 BAD SECTORS IN FILE
/INIT COUNT OF OLD BAD SECTORS
/PICK UP THE ZERO WORD
/IF IT'S ZERO, THEN THERE IS A SECTOR
/GO CHECK FOR LIMIT EXCEEDED
/COUNT THE SECTOR
/ADD 4 TO POINTER TO
/GET TO NEXT ZERO WORD
/KEEP COUNTING
/COMPARE COUNT TO THE MAXIMUM SPECIFIED
/SKIP IF LIMIT EXCEEDED
/RETURN
/REJECT THE PACK
/FIELD BAD SECTOR LIMIT EXCEEDED

4174 5600
4175 6652
4176 5522
4177 3756
4200
PAGE

/ENTERBAD
/
/ENTER THE SECTOR SPECIFIED BY CYLNRD, TRACK, AND SECTOR INTO THE BAD SECTOR
/FILE (IF NOT ALREADY LISTED). IF ATTEMPT IS MADE TO ENTER BLOCK 0, THE PACK
/IS REJECTED. IF ENTERING THE SECTOR WOULD CAUSE THE BAD SECTOR LIMIT TO
/BE EXCEEDED, THEN THE PACK IS REJECTED.
/
/THIS ROUTINE HAS A PSEUDO-CODE FLOWCHART (ENTER-BAD-SECTOR)
/
4200 0000      XENTBD, 0
4201 7200      CLA
4202 1106      TAD      CYLNRD
4203 1107      TAD      TRACK
/CHECK IF ATTEMPTING TO ENTER BLOCK 0

```

4204	1110	TAD	SECTOR	
4205	7640	SZA CLA		/SKIP IF SO
4206	5211	JMP	.+3	/NORMAL SECTOR--CONTINUE
4207	4465	RJECTP		
4210	0766	BLKOB		/REJECT PACK--BLOCK 0 BAD
4211	1135	TAD	MANUPT	/PICK UP POINTER TO MANUF FILES
4212	4273	JMS	CH4LST	/CHECK IF THE SECTOR IS LISTED IN THEM
4213	7410	SKP		/MANUFACTURING FILES NOT VALID--OK
4214	5270	JMP	ENTBRT	/SECTOR IS LISTED--RETURN
4215	1136	TAD	FLDPNT	/NOT IN MANUF FILES--GET POINTER TO FIELD FILES
4216	4273	JMS	CH4LST	/CHECK IF THE BAD SECTOR IS LISTED
4217	4000	JMS	0	/? FIELD BAD SECTOR FILE SHOULD BE SET UP
4220	5270	JMP	ENTBRT	/LISTED--RETURN
4221	2111	ISZ	NEWBAD	/INCREMENT NEW BAD SECTOR COUNT
4222	1111	TAD	NEWBAD	/CHECK IF TOTAL NUMBER OF BAD SECTORS
4223	1112	TAD	OLDBAD	/ EXCEEDS THE MAXIMUM
4224	7041	CIA		/ SPECIFIED BY THE
4225	1127	TAD	MAXBAD	/ OPERATOR
4226	7700	SMA CLA		/SKIP IF SO (TOO MANY BAD SECTORS)
4227	5232	JMP	.+3	
4230	4465	RJECTP		/REJECT THE PACK
4231	0723	TOUMBS		
4232	2137	ISZ	WRTFIL	/SET THE WRITE FILES FLAG
				/EACH 4 WORD ENTRY (INCLUDING 1'S FILL AFTER LAST ENTRY, WHICH IS INEFFICIENT)
				/IS MOVED DOWN 1 SPOT, STARTING AT THE END OF THE FILE. WHEN ALL ENTRIES
				/BELOW AND INCLUDING THE ONE AT THE INSERT POSITION ARE MOVED DOWN, THE
				/NEW ENTRY MAY BE PLACED AT THE INSERT POSITION.
4233	1377	TAD	(ENDFBS-5	/GET POINTER TO LAST WORD OF 2ND TO LAST ENTRY
4234	3077	DCA	TEMP1	
4235	1376	TAD	(ENDFBS-1	/GET POINTER TO LAST WORD OF FILE
4236	3100	DCA	TEMP2	
4237	1077	INSCHK, TAD	TEMP1	/COMPARE THE ENTRY JUST MOVED (OR LAST ENTRY FIRST TIME IN LOOP)
4240	7041	CIA		/ TO THE INSERT POSITION
4241	1272	TAD	INSPOS	
4242	7700	SMA CLA		/SKIP IF NOT YET MOVED ENUFF ENTRIES DOWN
4243	5261	JMP	INSBS	/OK TO INSERT THE BAD SECTOR
4244	1170	TAD	M4	/SET UP COUNTER FOR NUMBER OF WORDS IN THE ENTRY
4245	3271	DCA	MOVCNT	
4246	1477	MOVLUP, TAD I	TEMP1	/MOVE A WORD OF THE ENTRY DOWN 4 WORDS
4247	3500	DCA I	TEMP2	
4250	7240	STA		/BACK THE POINTER UP A WORD
4251	1077	TAD	TEMP1	
4252	3077	DCA	TEMP1	
4253	7240	STA		/BACK THE OTHER POINTER UP
4254	1100	TAD	TEMP2	
4255	3100	DCA	TEMP2	
4256	2271	ISZ	MOVCNT	/MOVED ALL 4 WORDS OF ENTRY?
4257	5246	JMP	MOVLUP	/NO
4260	5237	JMP	INSCHK	/YES--GO BACK AND CHECK IF NEED TO MOVE MORE ENTRIES
4261	1077	INSBS, TAD	TEMP1	/PLACE POINTER TO ENTRY POSITION (IT IS ALREADY
4262	3010	DCA	AUTO10	/ 1 BEFORE THE INSERT POSITION)
4263	4775	JMS	NEWT00	/WILL PLACE CORRECT CYLINDER ADDRESS INTO TABLE
4264	1110	TAD	SECTOR	/PLACE THE SECTOR
4265	3410	DCA I	AUTO10	
4266	1107	TAD	TRACK	/AND THE TRACK BIT

HP 001



4267 3410 DCA I AUTO10

/

THIS IS A GOOD PLACE TO PUT A BREAK-POINT TO LOOK AT THE  
THE CYLINDERADDRESS WORD ONE AND TWO  
THE SECTOR AND TRACK WHICH ARE BEING PLACED IN THE BSF

4270 5600 ENTBRT, JMP I XENTBD

4271 0000 MOV CNT, 0

4272 0000 INSPOS, 0

/INSERT POSITION LEFT HERE FROM CH4LST

/JMS CH4LST

/

/UPON ENTRY, THE AC CONTAINS A POINTER TO A SET OF BAD SECTOR LISTINGS.

/IF THE POINTER IS 0, RETURN TO CALL+1.

/IF THE SECTOR IS LISTED, RETURN TO CALL+2.

/IF THE SECTOR IS NOT LISTED, RETURN TO CALL+3 WITH INSPOS POINTING TO SPOT  
WHERE SECTOR SHOULD GO TO MAINTAIN ASCENDING ORDER OF LISTINGS.

/THE AC IS ALWAYS CLEAR UPON RETURN.

/

/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART (CHECK-FOR-LISTING)

/

4273 0000

CH4LST, 0

4274 7450

SNA

/SKIP IF POINTER IS VALID

4275 5344

JMP

CH4RET

/RETURN

4276 3272

DCA

INSPOS

/SAVE POINTER

4277 1774

TAD

M176

/SET UP COUNTER IN CASE FILE IS FULL

4300 3271

DCA

MOV CNT

4301 7240

LOOK4L, STA

/LOOK FOR THE LISTING AT THE CURRENT ENTRY

4302 1272

TAD

INSPOS

/SET UP POINTER IN AN AUTOINC REG

4303 3010

DCA

AUTO10

4304 1410

TAD I

AUTO10

/PICK UP THE CYLINDER LISTED

4305 0157

AND

K377

4306 4773

JMS

NEWTWO

/ADDED ROUTINE TO PLACE CYLINDER IN TABLE HP 001

/RETURN CALL +1 IF CYLNDR < LISTED CYL GOT THE POSITION

/RETURN CALL +2 IF CYLNDR >= LISTED CYL

/CYLNDR < LISTED -- GOT THE POSITION

/SKIP IF CYLNDR = LISTED CYL

/GOES AFTER THIS LISTING--GO ADD 4 TO POSITION

/PICK UP THE SECTOR

4307 5341

JMP

GOTPOS

4310 7640

SZA

CLA

4311 5334

JMP

ADD4PS

4312 1410

TAD I

AUTO10

4313 0157

AND

K377

4314 3077

DCA

TEMP1

/SAVE IT FOR LATER

4315 1410

TAD I

AUTO10

/PICK UP THE TRACK

4316 0157

AND

K377

4317 7041

CIA

/COMPARE TRACK TO BE ENTERED TO ONE LISTED

4320 1107

TAD

TRACK

4321 7510

SPA

/SKIP IF TRACK >= LISTED ONE

4322 5341

JMP

GOTPOS

/GOT THE POSITION

4323 7640

SZA

CLA

/SKIP IF TRACK = LISTED ONE

4324 5334

JMP

ADD4PS

/ENTRY GOES BELOW--KEEP LOOKING

4325 1077

TAD

TEMP1

/GET SECTOR BACK

4326 7041

CIA

/COMPARE TO ONE TO BE ENTERED

4327 1110

TAD

SECTOR

```

4330 7510          SPA          /SKIP IF SECTOR >= LISTED ONE
4331 5341          JMP          /GOT THE POSITION
4332 7650          SNA CLA      /SKIP IF NOT EQUAL
4333 5343          JMP          /FOUND THE ENTRY ALREADY LISTED
4334 7307  ADD4PS, CLA CLL IAC RTL /ADD 4 TO THE INSERT POSITION
4335 1272          TAD          INSPOS
4336 3272          DCA          INSPOS
4337 2271          ISZ          MOV CNT
4340 5301          JMP          LOOK4L
4341 7200  GOTPOS, CLA          /DID I ALREADY LOOK THROUGH A FULL FILE?
4342 2273          ISZ          CH4LST /NO--KEEP LOOKING FOR ENTRY
4343 2273  LISTED, ISZ          CH4LST /GOT POSITION--SKIP TWICE ON RETURN
4344 5673  CH4RET, JMP I CH4LST /SKIP ONCE IF LISTED
                                /DON'T SKIP IF FILE INVALID

```

```

/JMS CLRPOR
/

```

```

/CLEAR THE OVERLAPPING BUFFER PORTION.
/

```

```

4345 0000  CLRPOR, 0
4346 7200          CLA
4347 1372          TAD          (ZERBUF-1 /SET POINTER
4350 3013          DCA          AUTO13
4351 1371          TAD          (-PORSZ3 /SET UP COUNTER
4352 3077          DCA          TEMP1
4353 6211          CDF          10
4354 3413          DCA I AUTO13
4355 3413          DCA I AUTO13
4356 3413          DCA I AUTO13
4357 2077          ISZ          TEMP1
4360 5354          JMP          .-4
4361 6201          CDF          0
4362 5745          JMP I CLRPOR

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4371 7352
4372 3577
4373 5555
4374 0565
4375 5543
4376 6650
4377 6644
4400

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PAGE

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```

/JMS WRITFI
/POINTER TO BUFFER
/

```

```

/UPON ENTRY, THE AC CONTAINS A FIELD ARGUMENT (E.G. 10 IF FIELD 1) FOR THE
/BUFFER FIELD. SECTOR CONTAINS EITHER 0 OR 24 FOR MANUFACTURING OR FIELD
/FILES, RESPECTIVELY. THE BAD SECTOR FILES ARE WRITTEN FROM THE BUFFER
/POINTED TO BY THE WORD AT CALL+1 AND ARE VERIFIED. IF A SECTOR PAIR CANNOT
/BE WRITTEN, THEN IT IS ATTEMPTED TO WRITE GARBAGE INTO THAT SECTOR PAIR.
/THIS IS TO AVOID HAVING OUT OF DATE BAD SECTOR FILES THAT LATER MAY BECOME
/READABLE. IF NONE OF THE 5 SECTOR PAIRS CAN BE WRITTEN, THE PACK IS REJECTED.
/
/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART [WRITE-BAD-SECTOR-FILES].
/

```

4400	0000	WRITFI, 0			
4401	3311	DCA	FLDARG	/SAVE THE FIELD ARGUMENT IN THE AC	
4402	1311	TAD	FLDARG	/USE THE FIELD ARGUMENT TO SET UP	
4403	1316	TAD	K1005	/ A PARAMETER FOR THE XECUTE CALL	
4404	3232	DCA	WRTARG	/ TO ISSUE WRITE FROM CORRECT FIELD.	
4405	1311	TAD	FLDARG	/FORM A CDF INSTRUCTION FOR COMPARING	
4406	1317	TAD	KCDF	/ THE FILE AFTER READING IT BACK	
4407	3255	DCA	CMPCDF		
4410	7201	CLA	IAC	/SET THE TRACK	
4411	3107	DCA	TRACK		
4412	1156	TAD	K0777	/ AND THE CYLINDER FOR THE BSF'S	HP 001
4413	3106	DCA	CYLNDR		
4414	4451	SEEK		/POSITION HEADS	
4415	1777'	TAD	M1000	/SET UP WORD COUNT	
4416	3134	DCA	WRDCNT		
4417	3313	DCA	WRTFLG	/FLAG THAT NO SECTORS WERE WRITTEN	
4420	4442	CONSOL		/LAST CHANCE FOR CONSOLE INPUT BEFORE WRITE	
4421	7240	STA		/FLAG THAT CONSOLE INPUT NOT ALLOWED	
4422	3105	DCA	CCRET		
4423	1171	TAD	M5	/COUNTER FOR NUMBER OF FILES (SECTOR PAIRS)	
4424	3312	DCA	FILCNT		
4425	7344	WRAFIL, STA	CLL RAL	/SET UP FOR 2 RETIES AT WRITING AND READING	
4426	3314	DCA	RTRYWF		
4427	1600	RETRYW, TAD	I WRITFI	/PICK UP THE BUFFER POINTER	
4430	3133	DCA	BUFFER	/PLACE IT FOR MA LOADING	
		/			
		/			
		/			
		/			
		/			
		/		THIS IS A GOOD PLACE TO LOOK AT THE BUFFER TO BE WRITTEN.	
		/		PLACE A BREAK-POINT AT JMS XECUTE INSTRUCTION	
4431	4776'	JMS	XECUTE	/ISSUE THE WRITE	
4432	1005	WRTARG, JMP	1005	/OVERWRITTEN TO INCLUDE CORRECT FIELD BITS	
4433	5241	JMP	REDNCM	/NO ERROR--READ AND COMPARE THE FILE	
4434	1165	WRTGAR, TAD	K200	/ATTEMPT TO WRITE GARBAGE INTO FILE ON ERROR	
4435	3133	DCA	BUFFER	/SET UP A BUFFER USING PROGRAM CONTENTS	
4436	4454	WRITE0		/WRITE (FROM FIELD 0)	
4437	7000	NOP		/NO SPECIAL ERROR HANDLING	
4440	5275	JMP	NXTSEC	/TRY NEXT SECTOR PAIR	
4441	1375	REDNCM, TAD	(ZERBUF+2000	/SET UP A BUFFER	
4442	3133	DCA	BUFFER		
4443	4457	READ1		/READ THE FILE BACK	
4444	5272	JMP	REDERR	/GOT A READ ERROR	
4445	7240	STA			
4446	1600	TAD	I WRITFI	/SET UP POINTER TO WRITE BUFFER	
4447	3010	DCA	AUTO10		
4450	7240	STA			
4451	1133	TAD	BUFFER	/SET UP POINTER TO THE READ BUFFER	
4452	3013	DCA	AUTO13		
4453	1777'	TAD	M1000	/SET UP COUNTER FOR NUMBER OF WORDS TO COMPARE	
4454	3315	DCA	CMPCNT		
4455	7402	CMPCDF, HLT		/CDF TO FIELD OF WRITE BUFFER PLACED HERE	
4456	1410	TAD	I AUTO10	/GET WORD FROM WRITE BUFFER	
4457	7041	CIA			
4460	6211	CDF	10	/FIELD OF READ BUFFER	
4461	1413	TAD	I AUTO13	/PICK UP WORD	

```

4462 6201      CDF      0      /BACK TO HERE
4463 0157      AND      K377
4464 7640      SZA CLA      /SKIP IF WORDS WERE EQUAL
4465 5272      JMP      REDERR
4466 2315      ISZ      CMPCNT /DONE ALL WORDS?
4467 5255      JMP      CMPCDF /NO
4470 2313      ISZ      WRTFLG /YES--SET FLAG THAT A WRITE WAS SUCCESSFUL
4471 5275      JMP      NXTSEC /DO NEXT SECTOR PAIR
4472 2314      REDERR, ISZ    RTRYWF /RETRIED TWICE?
4473 5227      JMP      RETRYW /NO
4474 5234      JMP      WRTGAR /YES--ATTEMPT TO WRITE GARBAGE
4475 7307      NXTSEC, CLA CLL IAC RTL
4476 1110      TAD      SECTOR /ADD 4 TO SECTOR
4477 3110      DCA      SECTOR
4500 2312      ISZ      FILCNT /WRITTEN ALL SECTOR PAIRS?
4501 5225      JMP      WRAFIL /NO--WRITE ANOTHER FILE (SECTOR PAIR)
4502 3105      DCA      CCRET /CLEAR FLAG THAT WRITES IN PROGRESS
4503 2200      ISZ      WRTF1 /SKIP OVER BUFFER POINTER ON RETURN
4504 1313      TAD      WRTFLG /CHECK IF ANY OF THE SECTOR PAIRS COULD BE WRITTEN
4505 7640      SZA CLA      /SKIP IF NOT
4506 5600      JMP I      WRTF1 /OK--RETURN

4507 4465      RJECTP
4510 1006      CUDNWR /COULD NOT WRITE BAD SECTOR FILES
                        /REJECT THE PACK

/
4511 0000      FLDARG, 0
4512 0000      FILCNT, 0
4513 0000      WRTFLG, 0
4514 0000      RTRYWF, 0
4515 0000      CMPCNT, 0
4516 1005      K1005, 1005
4517 6201      KCDF, CDF

/
/SET UP THE 3 WORD REPEATING PATTERN IN THE BUFFER FROM BUF1 TO END OF PORBUF.
/
4520 0000      PATBUF, 0
4521 7200      CLA
4522 1374      TAD      (BUF1-1 /SET UP POINTER
4523 3013      DCA      AUTO13
4524 1344      TAD      M1254 /SET UP COUNTER FOR THE 2052 WORD BUFFER / 3
4525 3077      DCA      TEMP1
4526 6211      CDF      10
4527 1341      PATLUP, TAD    K333
4530 3413      DCA I      AUTO13
4531 1342      TAD      K155
4532 3413      DCA I      AUTO13
4533 1343      TAD      K266
4534 3413      DCA I      AUTO13
4535 2077      ISZ      TEMP1
4536 5327      JMP      PATLUP
4537 6201      CDF      0
4540 5720      JMP I      PATBUF

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```

4541 0333 K333, 333
4542 0155 K155, 155
4543 0266 K266, 266
4544 6524 M1254, -1254

```

```

/JMS PATPOR
/

```

```

/SET UP THE 3 WORD REPEATING PATTERN IN THE OVERLAPPING BUFFER PORTION.
/

```

```

4545 0000 PATPOR, 0
4546 7200 CLA
4547 1373 TAD (BUFFPOR-1 /SET POINTER
4550 3013 DCA AUTO13
4551 1372 TAD (-PORSZ3 /SET COUNTER FOR SIZE OF BUFFER PORTION/3
4552 3077 DCA TEMP1
4553 6211 CDF 10
4554 1341 PORLUP, TAD K333 /START WRITING
4555 3413 DCA I AUTO13
4556 1342 TAD K155
4557 3413 DCA I AUTO13
4560 1343 TAD K266
4561 3413 DCA I AUTO13
4562 2077 ISZ TEMP1 /DONE??
4563 5354 JMP PORLUP /NO
4564 6201 CDF 0
4565 5745 JMP I PATPOR

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4572 7352
4573 3577
4574 1275
4575 5600
4576 2424
4577 2733
4600

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PAGE

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/*****/
/DATA AREA VERIFICATION SUBROUTINES

```

```

/JMS CHKTRK

```

```

/BUFFER POINTER

```

```

/3 WORD REPEATING PATTERN
/

```

```

/THIS SUBROUTINE CHECKS THE DATA AREA OF THE CURRENT TRACK WITH THE DATA
/PATTERN SPECIFIED. THE ENTIRE TRACK IS WRITTEN (8 SECTORS AT A TIME)
/AND THEN READ BACK AND VERIFIED (ALSO 8 SECTORS AT A TIME). THIS
/IS THE FASTEST WAY OF DOING THIS AND IT WORKS UNTIL A BAD SECTOR IS
/ENCOUNTERED. THEN SLOWER ROUTINES ARE CALLED WHICH VERIFY THE SECTORS
/INDIVIDUALLY, ENTERING THEM INTO THE BAD SECTOR FILE IF THEY ARE STILL
/BAD AFTER RETRYING THE WRITE AND THE READ TO THAT SECTOR.
/

```

```

/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART [CHECK-TRACK].
/

```

```

4600 0000
4601 7200
4602 1600

```

```

CHKTRK, 0

```

```

CLA

```

```

TAD I CHKTRK

```

```

/PICK UP THE BUFFER POINTER ARGUMENT

```

```

4603 3133      DCA    BUFFER      /AND SAVE IT
4604 2200      ISZ    CHKTRK
4605 1600      TAD I    CHKTRK      /PICK UP A WORD OF THE DATA PATTERN
4606 3144      DCA    PATRN1      / AND SAVE IT
4607 2200      ISZ    CHKTRK
4610 1600      TAD I    CHKTRK      /PICK UP A WORD OF THE DATA PATTERN
4611 3145      DCA    PATRN2      / AND SAVE IT
4612 2200      ISZ    CHKTRK
4613 1600      TAD I    CHKTRK      /PICK UP A WORD OF THE DATA PATTERN
4614 3146      DCA    PATRN3      / AND SAVE IT
4615 2200      ISZ    CHKTRK
4616 4451      SEEK
4617 4263      JMS     WRTRK      /POSITION THE HEADS
4620 4312      JMS     INITRF     /WRITE THE ENTIRE TRACK
4621 1171      TAD     M5         /INITIALIZE THE SECTOR GROUPS READ TABLE
4622 3236      DCA     CHKCN1     /SET UP COUNTER FOR NUMBER OF READS
4623 4324      RED5LP, JMS     READF
4624 5230      JMP     .+4
4625 4777'     JMS     PATBUF
                        /READ A FIFTH OF THE TRACK
                        /GOOD RETURN--GO CHECK DATA
                        /ERROR RETURN--SINCE THE READ FAILED, THE
                        /DATA BUFFER IS SUSPECT. SET IT UP
                        /VERIFY THE SECTOR GROUP 1 SECTOR AT A TIME
4626 4776'     JMS     SLORED     /SKIP OVER THE CALL TO 2K DATA CHECKER
4627 7410      SKP
4630 4775'     JMS     FIFCHK     /CHECK THE FIFTH OF A TRACK THAT WAS READ ABOVE
4631 2236      ISZ     CHKCN1     /DONE FIVE READS (ENTIRE TRACK)??
4632 5223      JMP     RED5LP     /NO--GO BACK
4633 5600      JMP I    CHKTRK    /YES--RETURN

/
4634 7750      M30,    -30
4635 0070      K70,    70
4636 0000      CHKCN1, 0

/JMS CHKTR0
/
/THIS SUBROUTINE IS ESSENTIALLY IDENTICLE TO "CHKTRK", EXCEPT IT KNOWS THAT
/THE DATA PATTERN IS ALL 0'S AND USES THIS FACT TO RUN QUICKER. SHOULD
/MEMORY SPACE EVER BECOME A PROBLEM, CHKTRK COULD BE USED BY MAKING THE
/CALLS COMPATIBLE AND THE BUFFER REWRITE (JMS PATBUF) WITHIN CHKTRK NOT
/ASSUME THE PATTERN BUFFER. (IN ANY EVENT, F0BUF SHOULD BE ELEMENATED FIRST.)
/
4637 0000      CHKTR0, 0
4640 7200      CLA
4641 1374      TAD     (ZERBUF
4642 3133      DCA     BUFFER      /PICK UP THE BUFFER POINTER
4643 3144      DCA     PATRN1      /AND SAVE IT
4644 3145      DCA     PATRN2      /SAVE THE PATTERNS (USED BY SLORED)
4645 3146      DCA     PATRN3
4646 4263      JMS     WRTRK      /WRITE THE ENTIRE TRACK
4647 4312      JMS     INITRF     /INITIALIZE THE SECTOR GROUPS READ TABLE
4650 1171      TAD     M5         /SET UP COUNTER FOR NUMBER OF READS
4651 3236      DCA     CHKCN1
4652 4324      RED0LP, JMS     READF
4653 5257      JMP     .+4
4654 4773'     JMS     CLRBUF
                        /READ A FIFTH OF THE TRACK
                        /GOOD RETURN--GO CHECK DATA
                        /ERROR RETURN--SINCE THE READ FAILED, THE
                        /DATA BUFFER IS SUSPECT. SET IT UP
4655 4776'     JMS     SLORED     /VERIFY THE SECTOR GROUP 1 SECTOR AT A TIME

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4656	7410	SKP		/SKIP OVER THE CALL TO 2K DATA CHECKER
4657	4772	JMS	FIFCHO	/CHECK THE FIFTH OF A TRACK THAT WAS READ ABOVE
4660	2236	ISZ	CHKCN1	/DONE FIVE READS (ENTIRE TRACK)?
4661	5252	JMP	REDOLP	/NO--GO BACK
4662	5637	JMP I	CHKTRO	/YES--RETURN

/JMS WRTTRK

/

/WRITE AN ENTIRE TRACK WITH THE 2K OF DATA IN THE BUFFER REPEATED FIVE  
/TIMES (8 BIT MODE). 8 SECTORS ARE WRITTEN (2K), 8 SECTORS ARE SKIPPED, ETC.  
/UNTIL TRACK IS WRITTEN. THIS REQUIRES 1 AND 4/5 SPINS (PLUS ROTATIONAL  
/LATENCY PRIOR TO FIRST TRANSFER) TO WRITE THE TRACK. ROTATIONAL LATENCY  
/PRIOR TO FIRST WRITE IS MINIMIZED (GURANTEED LESS THAN OR EQUAL TO 1/5 SPIN  
/OR 5 MS) BY READING A HEADER AND BEGINNING FIRST WRITE AT SECTOR A  
/MULTIPLE OF 8 HIGHER.

4663	0000	WRTTRK, 0		
4664	4452	REDHDR		/READ A HEADER
4665	4441	RLSE		/SKIP IF ERROR
4666	7410	SKP		
4667	5264	JMP	.-3	/READ ANOTHER HEADER
4670	4440	RRSI		/GET HEADER WORD 1
4671	0235	AND	K70	/SAVE ONLY HIGH ORDER BITS OF SECTOR
4672	1167	TAD	M10	/SUBTRACT 8 TO LOOK LIKE A SECTOR JUST WRITTEN
4673	3110	DCA	SECTOR	/SAVE "SECTOR WRITTEN LAST TIME"
4674	1171	TAD	M5	/SET UP COUNTER FOR NUMBER OF WRITES
4675	3236	DCA	CHKCN1	
4676	1110	WRTLUP, TAD	SECTOR	/GET STARTING SECTOR OF LAST WRITE
4677	1234	TAD	M30	/ADD 20 (OCTAL) TO SECTOR AND COMPARE TO
4700	7510	SPA		/ILLEGAL SECTOR 50 IN ONE EASY STEP
4701	1160	TAD	K50	/ADD 50 BACK IN IF SECTOR IS NEGATIVE
4702	3110	DCA	SECTOR	/SAVE SECTOR THAT WRITE STARTED AT THIS TIME
4703	7330	CLA STL	RAR	/WORD COUNT OF 2K
4704	3134	DCA	WRDCNT	
4705	4455	WRITE1		/ISSUE WRITE
4706	4771	JMS	SLOWRT	/ERROR RETURN--WRITE THE SECTOR GROUP
				/ 1 SECTOR AT A TIME
4707	2236	ISZ	CHKCN1	/DONE 5 WRITES (WHOLE TRACK)?
4710	5276	JMP	WRTLUP	/NO--DO IT AGAIN
4711	5663	JMP I	WRTTRK	/YES--RETURN

/JMS INITRF

/

/SUBROUTINE CLEARS OUT THE SECTOR GROUP TABLE TO INDICATE THAT NO SECTOR  
/GROUPS HAVE BEEN READ. (THIS IS USED IN CONJUNCTION WITH THE READF ROUTINE.)

/

4712	0000	INITRF, 0		
4713	7240	STA		
4714	1360	TAD	PSECTA	/SET UP POINTER TO SECTOR GROUP TABLE
4715	3010	DCA	AUTO10	
4716	3410	DCA I	AUTO10	/CLEAR FIRST ENTRY (FLAG SECTORS 0-7 NOT READ)
4717	3410	DCA I	AUTO10	/FLAG SECTORS 10-17 NOT YET READ
4720	3410	DCA I	AUTO10	/ETC.
4721	3410	DCA I	AUTO10	
4722	3410	DCA I	AUTO10	
4723	5712	JMP I	INITRF	

```

/JMS READF
/
/READ THE NEXT FIFTH OF A TRACK (8 SECTORS) THAT HAS NOT YET BEEN READ (AS
/SPECIFIED BY SECTOR TABLE). IF CALLED WHEN ALL ENTRIES IN SECTAB ARE
/NON-ZERO, THE ROUTINE WILL HANG! THE ROUTINE SKIPS ON RETURN IF THERE
/WAS A READ ERROR.
/
4724 0000 READF, 0
4725 4452 REDHDR /READ A HEADER TO GET POSITION
4726 4441 RLSE /SKIP IF ERROR
4727 7410 SKP
4730 5325 JMP .-3 /WAIT FOR GOOD HEADER
4731 4440 PRSI /READ HEADER WORD 1
4732 0235 AND K70 /SAVE ONLY HIGH ORDER BITS OF SECTOR
4733 3110 DCA SECTOR /SAVE THE SECTOR GROUP THE HEADS ARE IN
4734 1110 NXTGRP, TAD SECTOR /GO TO NEXT HIGHER SECTOR GROUP FOR THE READ
4735 1361 TAD M40 / BY ADDING 10 AND COMPARING TO 50 (ILLEGAL
4736 7510 SPA / GROUP) AT SAME TIME. IF 0, LEAVE AS IS.
4737 1160 TAD K50 / IF NEGATIVE, ADD 50 BACK IN.
4740 3110 DCA SECTOR /SAVE SECTOR GROUP TO READ
4741 1110 TAD SECTOR /CHECK IF THE SECTOR GROUP WAS ALREADY READ
4742 7112 CLL RTR / ON A PREVIOUS CALL. (INDEX INTO TABLE.)
4743 7010 RAR
4744 1360 TAD PSECTA
4745 3077 DCA TEMP1 /SAVE POINTER INTO TABLE
4746 1477 TAD I TEMP1 /PICK UP FLAG FROM TABLE
4747 7640 SZA CLA /SKIP IF NOT YET READ
4750 5334 JMP NXTGRP /TRY TO START READ AT NEXT HIGHER SECTOR GROUP
4751 7240 STA /FLAG THAT THIS GROUP OF 8 SECTORS HAS BEEN READ
4752 3477 DCA I TEMP1
4753 7330 CLA STL RAR /2K WORD COUNT
4754 3134 DCA WRDCNT
4755 4457 READ1 /ISSUE READ
4756 2324 ISZ READF /SKIP ON RETURN IF ERROR
4757 5724 JMP I READF
/
4760 5614 PSECTA, SECTAB
4761 7740 M40, -40

4771 5200
4772 5077
4773 2735
4774 3600
4775 5000
4776 5244
4777 4520
5000
PAGE

```

```

/JMS FIFCHK
/

```

```

/THIS SUBROUTINE CHECKS THE FIFTH OF A TRACK (8 SECTORS OR 2K) THAT WAS
/READ INTO THE BUFFER. IT CHECKS THE DATA 1 SECTOR AT A TIME (256 WORDS)
/TO SIMPLIFY ISOLATING THE FAILING SECTOR. IF A DATA ERROR IS FOUND,
/A CALL TO CHKSEC IS MADE WHICH RETIES THE WRITE AND READ AND ENTERS

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```

/ THE SECTOR INTO THE BAD SECTOR FILE IF STILL BAD.
/
5000 0000 FIFCHK, 0
5001 7240 STA
5002 1133 TAD BUFFER /SAVE A POINTER TO THE CURRENT 256 WORD
5003 3152 DCA CURBUF / BUFFER BEING CHECKED (-1 FOR AUTO INC USE)
5004 4777 JMS SAVPAT

/SAVE THE DATA PATTERNS EXPECTED IN THE BUFFER
/IN CURPA1-3, IN 2'S COMPLEMENT FORM
/SET UP A COUNTER FOR THE 8 SECTORS WORTH OF DATA
5005 1167 TAD M10
5006 3276 DCA FIFCNT
5007 1274 CHKBUF, TAD M126
5010 3077 DCA TEMP1 /SET UP COUNTER (85) FOR NUMBER OF 3 WORD GROUPS TO CHECK
5011 1152 TAD CURBUF
5012 3010 DCA AUTO10 /SET POINTER IN AUTO-INC REG
5013 6211 CDF 10
5014 5227 JMP CHFRSW /CHANGE TO BUFFER FIELD
5015 1410 SECHLP, TAD I AUTO10 /START WITH FIRST WORD OF PATTERN
5016 0157 AND K377 /PICK UP SECOND WORD OF PATTERN
5017 1150 TAD CURPA2
5020 7640 SZA CLA /SKIP IF OK
5021 5240 JMP CHKERR
5022 1410 TAD I AUTO10
5023 0157 AND K377 /CHECK 3RD WORD OF PATTERN
5024 1151 TAD CURPA3
5025 7640 SZA CLA /SKIP IF OK
5026 4240 JMS CHKERR
5027 1410 CHFRSW, TAD I AUTO10 /COMPARE THE FIRST WORD OF PATTERN GROUP
5030 0157 AND K377
5031 1147 TAD CURPA1
5032 7640 SZA CLA /SKIP IF OK
5033 5240 JMP CHKERR
5034 2077 ISZ TEMP1 /CHECKED ALL 256 WORDS??
5035 5215 JMP SECHLP /NO--GO BACK
5036 6201 CDF 0 /YES--BACK TO THIS DATA FIELD
5037 5264 JMP NXTBUF /GO SET UP NEXT BUFFER AND PATTERN SET
5040 6201 CHKERR, CDF 0 /BACK TO THIS FIELD
5041 1274 TAD M126 /SET UP COUNTER FOR REWRITING THIS PORTION
5042 3077 DCA TEMP1 / OF THE BUFFER
5043 1152 TAD CURBUF
5044 3010 DCA AUTO10
5045 6211 CDF 10
5046 5255 JMP WRTFRS
5047 1150 REWRSC, TAD CURPA2
5050 7041 CIA
5051 3410 DCA I AUTO10 /PICK UP THE NEGATED PATTERN
5052 1151 TAD CURPA3 /SINCE PATTERN IS NEGATED--REWRITES ARE SLOWER
5053 7041 CIA /BUT THEY ARE DONE LESS OFTEN THAN DATA COMPARISON
5054 3410 DCA I AUTO10
5055 1147 WRTFRS, TAD CURPA1
5056 7041 CIA
5057 3410 DCA I AUTO10
5060 2077 ISZ TEMP1 /REWRITTEN BUFFER FOR THIS "SECTOR"
5061 5247 JMP REWRSC /NO
5062 6201 CDF 0 /YES
5063 4776 JMS CHKSEC /RETRY THIS SECTOR

```

```

5064 1152  NXTBUF, TAD  CURBUF  /BUMP UP POINTER TO THE NEXT BUFFER
5065 1275      TAD  K400  / 256 WORDS UP
5066 3152      DCA  CURBUF
5067 2110      ISZ  SECTOR  /WE ARE NOW ABOUT TO CHECK NEXT SECTOR
5070 4775'     JMS  NXTPAT  /FIX UP THE NEW CURRENT PATTERNS
5071 2276      ISZ  FIFCNT  /HAVE WE CHECK ALL 8 SECTORS WORTH OF DATA?
5072 5207      JMP  CHKBUF  /NO--GO CHECK ANOTHER 256 WORD BUFFER
5073 5600      JMP I  FIFCHK  /YES--RETURN

/
5074 7652      M126, -126
5075 0400      K400, 400
5076 0000      FIFCNT, 0

/JMS FIFCHO
/
/THIS SUBROUTINE CHECKS THE 8 SECTORS OF EXPECTED 0'S IN THE BUFFER.
/IT IS SIMILAR TO FIFCHK EXCEPT IT UTILIZES THE ZERO DATA PATTERN FOR
/SPEED OPTIMIZATION.
/
5077 0000      FIFCHO, 0
5100 7240      STA
5101 1133      TAD  BUFFER  /SAVE A POINTER TO THE CURRENT 256 WORD
5102 3152      DCA  CURBUF  / BUFFER BEING CHECKED (-1 FOR AUTO INC USE)
5103 4777'     JMS  SAVPAT

/SAVE THE DATA PATTERNS EXPECTED IN THE BUFFER
/IN CURPA1-3, IN 2'S COMPLEMENT FORM
/THIS IS FOR USE BY CHKSEC. IT IS NOT WORTHWHILE TO HAVE
/A "CHKSCO" TO SPEED OPTIMIZE THE OCCASIONAL ERRORS.
/SET UP A COUNTER FOR THE 8 SECTORS WORTH OF DATA

5104 1167      TAD  M10
5105 3276      DCA  FIFCNT
5106 1364      CHKBFO, TAD  M100
5107 3077      DCA  TEMP1
5110 1152      TAD  CURBUF
5111 3010      DCA  AUTO10
5112 6211      CDF  10
5113 1410      SECHOL, TAD I  AUTO10
5114 0157      AND  K377
5115 7640      SZA CLA
5116 5337      JMP  CHKERO
5117 1410      TAD I  AUTO10
5120 0157      AND  K377
5121 7640      SZA CLA
5122 5337      JMP  CHKERO
5123 1410      TAD I  AUTO10
5124 0157      AND  K377
5125 7640      SZA CLA
5126 5337      JMP  CHKERO
5127 1410      TAD I  AUTO10
5130 0157      AND  K377
5131 7640      SZA CLA
5132 5337      JMP  CHKERO
5133 2077      ISZ  TEMP1
5134 5313      JMP  SECHOL
5135 6201      CDF  0
5136 5355      JMP  NXTBFO
5137 6201      CHKERO, CDF  0

/SET UP COUNTER FOR NUMBER OF 4 WORD GROUPS TO CHECK
/ (4 AT A TIME FOR GREATER SPEED)
/SET POINTER IN AUTO-INC REG

/CHANGE TO BUFFER FIELD
/PICK UP WORD OF PATTERN

/SKIP IF OK

/CHECK NEXT WORD OF PATTERN
/SKIP IF OK

/CHECK NEXT WORD OF PATTERN
/SKIP IF OK

/CHECK NEXT WORD OF PATTERN
/SKIP IF OK

/CHECKED ALL 256 WORDS??
/NO--GO BACK
/YES--BACK TO THIS DATA FIELD
/GO SET UP NEXT BUFFER AND PATTERN SET
/BACK TO THIS FIELD

```

```

5140 1364      TAD      M100      /SET UP COUNTER FOR REWRITING THIS PORTION
5141 3077      DCA      TEMP1    /  OF THE BUFFER
5142 1152      TAD      CURBUF
5143 3010      DCA      AUTO10
5144 6211      CDF      10
5145 3410      REWRSO, DCA I  AUTO10
5146 3410      DCA I  AUTO10
5147 3410      DCA I  AUTO10
5150 3410      DCA I  AUTO10
5151 2077      ISZ      TEMP1    /REWRITTEN BUFFER FOR THIS "SECTOR"
5152 5345      JMP      REWRSO   /NO
5153 6201      CDF      0        /YES
5154 4776      JMS      CHKSEC   /RETRY THIS SECTOR
5155 1152      NXTBFO, TAD      CURBUF /BUMP UP POINTER TO THE NEXT BUFFER
5156 1275      TAD      K400     / 256 WORDS UP
5157 3152      DCA      CURBUF
5160 2110      ISZ      SECTOR   /WE ARE NOW ABOUT TO CHECK NEXT SECTOR
5161 2276      ISZ      FIFCNT   /HAVE WE CHECK ALL 8 SECTORS WORTH OF DATA?
5162 5306      JMP      CHKBFO   /NO--GO CHECK ANTOHER 256 WORD BUFFER
5163 5677      JMP I  FIFCHO    /YES--RETURN

5164 7700      M100,  -100

5175 5452
5176 5300
5177 5400
5200 5200      PAGE

                /JMS SLOWRT
                /
                /THIS SUBROUTINE WRITES THE 8 SECTOR GROUP STARTING AT "SECTOR" 1 SECTOR
                /AT A TIME, WITH THE SAME PATTERNS THAT WOULD HAVE BEEN USED HAD THEY
                /BEEN WRITTEN AS A GROUP. ANY SECTOR THAT CANNOT BE WRITTEN IS
                /ENTERED INTO THE BAD SECTOR FILE.
                /EVERY OTHER SECTOR IS WRITTEN SO THAT THE WRITE SHOULD ONLY REQUIRE 2
                /SPINS. (WRITE SECTORS X0, X2, X4, X6, X1, X3, X5, X7.)
                /
5200 0000      SLOWRT, 0
5201 7200      CLA
5202 1133      TAD      BUFFER    /SAVE THE BUFFER
5203 3240      DCA      BUFSAV
5204 1110      TAD      SECTOR    /SAVE THE SECTOR
5205 3242      DCA      SECSAV
5206 1167      TAD      M10
5207 3241      DCA      SLOCNT    /SET UP COUNTER FOR NUMBER OF SECTORS
5210 1243      SLOWLP, TAD      M400 /SET WORD COUNT FOR 1 SECTOR
5211 3134      DCA      WRDCNT
5212 4455      WRITE1
5213 4460      ENTERBAD /WRITE 1 SECTOR FROM "BUFFER"
5214 7305      CLA CLL IAC RAL /ERROR--ENTER SECTOR INTO FILE
5215 1110      TAD      SECTOR    /ADD 2 TO SECTOR
5216 0777      AND      K7
5217 7440      SZA
5220 5225      JMP      SECOKS   /MODULO 10 (OCTAL)
5221 7201      CLA IAC          /SKIP IF 0 (DO NOT CLEAR)
                /SECTOR=SECSAV+1

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5222 1242      TAD      SECSAV
5223 3110      DCA      SECTOR
5224 5230      JMP      .+4
5225 1242      SECOKS, TAD      SECSAV      /ADD 1 TO BUFFER
5226 3110      DCA      SECTOR      /ADD (SECTOR+2)MOD 10 TO SECSAV
5227 2133      ISZ      BUFFER      /ADD 2 TO BUFFER
5230 2133      ISZ      BUFFER
5231 2241      ISZ      SLOCNT      /DONE ALL 8 SECTORS?
5232 5210      JMP      SLOWLP      /NO
5233 1242      TAD      SECSAV      /YES--RESTORE SECTOR
5234 3110      DCA      SECTOR
5235 1240      TAD      BUFSAV      /RESTORE BUFFER
5236 3133      DCA      BUFFER
5237 5600      JMP I    SLOWRT

/
5240 0000      BUFSAV, 0
5241 0000      SLOCNT, 0
5242 0000      SECSAV, 0
5243 7400      M400, -400

/JMS SLORED
/
/THIS SUBROUTINE READS AN 8 SECTOR GROUP AND COMPARES THEM, BUT DOES THIS
/1 SECTOR AT A TIME. COMPARISON TAKES A LONG TIME, SO 8 SPINS ARE REQUIRED.
/ANY SECTOR THAT IS BAD IS GIVEN A RETRY (CHKSEC IS CALLED).
/THE DATA IS SPECIFIED IN PATRN1-3.
/
5244 0000      SLORED, 0
5245 4776      JMS      SAVPAT      /SAVE THE 2'S COMPLEMENT PATTERNS
5246 1167      TAD      M10        /SET UP COUNTER FOR NUMBER OF SECTORS
5247 3241      DCA      SLOCNT
5250 1133      TAD      BUFFER      /SAVE THE BUFFER
5251 3240      DCA      BUFSAV
5252 1133      TAD      BUFFER      /SET UP THE CURRENT BUFFER
5253 3152      DCA      CURBUF      /
5254 1135      SLORLP, TAD      MANUPT /FOR USE BY CHKSEC
5255 4775      JMS      CH4LST      /CHECK IF THE SECTOR IS IN THE MANUFACTURING
5256 7410      SKP              /BAD SECTOR FILE (THIS IS DONE TO SAVE A SPIN.)
5257 5270      JMP      SLODNL      /FILES NOT VALID--IT IS NOT LISTED
5260 1374      TAD      (FOBUF      /SECTOR IS LISTED--DON'T BOTHER WITH READ
5261 3133      DCA      BUFFER      /SET UP THE BUFFER POINTER
5262 1243      TAD      M400
5263 3134      DCA      WRDCNT      /WORD COUNT FOR 1 SECTOR
5264 4456      READO
5265 7410      SKP
5266 4334      JMS      CHKFOB      /READ SECTOR TO FIELD 0
5267 4300      JMS      CHKSEC      /ERROR--GO RETRY THE SECTOR
5270 2152      SLODNL, ISZ      CURBUF /CHECK FOBUF AGAINST CURPA'S
5271 2110      ISZ      SECTOR      /DATA ERROR IN BUFFER--RETRY
5272 4773      JMS      NXTPAT      /SET POINTER TO NEXT BUFFER (FOR REWRITE IN CHKSEC)
5273 2241      ISZ      SLOCNT      /GO TO NEXT SECTOR
5274 5254      JMP      SLORLP      /SAVE NEXT PATTERNS
5275 1240      TAD      BUFSAV      /DONE 8 SECTORS?
5276 3133      DCA      BUFFER      /NO
5277 5644      JMP I    SLORED      /YES--RESTORE BUFFER

```

```

/JMS CHKSEC
/
/THIS SUBROUTINE DOES A WRITE AND READ TO A SECTOR (SPECIFIED IN "SECTOR")
/FROM THE WRITE BUFFER IN CURBUF, AND CHECKS IT AGAINST THE PATTERNS IN
/CURPA1-3. IF FAILURE--SECTOR IS ENTERED INTO THE BAD SECTOR FILE.
/
5300 0000  CHKSEC, 0
5301 7200      CLA
5302 1135      TAD      MANUPT
5303 4775      JMS      CH4LST
5304 7410      SKP
5305 5332      JMP      CKSCRT
5306 1136      TAD      FLDPNT
5307 4775      JMS      CH4LST
5310 4000      JMS      0
5311 5332      JMP      CKSCRT
5312 1133      TAD      BUFFER
5313 3333      DCA      BUFSVC
5314 1152      TAD      CURBUF
5315 3133      DCA      BUFFER
5316 1243      TAD      M400
5317 3134      DCA      WRDCNT
5320 4455      WRITE1
5321 4327      JMS      BADCHS
5322 1374      TAD      (FOBUF
5323 3133      DCA      BUFFER
5324 4456      READ0
5325 5327      JMP      BADCHS
5326 4334      JMS      CHKFOB
5327 4460      BADCHS, ENTERBAD
5330 1333      TAD      BUFSVC
5331 3133      DCA      BUFFER
5332 5700      CKSCRT, JMP I  CHKSEC
/
5333 0000      BUFSVC, 0

/JMS CHKFOB
/
/COMPARE FOBUF TO PATTERNS IN CURPA1-3. SKIP IF NO ERROR
/
5334 0000      CHKFOB, 0
5335 7240      STA
5336 1374      TAD      (FOBUF
5337 3010      DCA      AUTO10
5340 1772      TAD      M126
5341 3077      DCA      TEMP1
5342 5355      JMP      FSTCH0
5343 1410      FOCHLP, TAD I  AUTO10
5344 0157      AND      K377
5345 1150      TAD      CURPA2
5346 7640      SZA  CLA
5347 5365      JMP      FOBERR
5350 1410      TAD I  AUTO10
5351 0157      AND      K377

/CHECK IF SECTOR IS ALREADY LISTED TO
/ SAVE 4 SPINS
/NOT LISTED IN MANUF FILES
/LISTED--RETURN
/TRY THE FIELD FILE
/FIELD FILE NOT VALID--IMPOSSIBLE!
/LISTED--RETURN
/SAVE THE BUFFER POINTER
/SET THE POINTER
/SET WORD COUNT FOR 1 SECTOR
/ISSUE WRITE
/ERROR--ENTER IT INTO FILE
/SET POINTER TO READ BUFFER
/READ TO FIELD 0
/ERROR--ENTER INTO FILE
/COMPARE FOBUF TO CURPA'S
/DATA ERROR RETURN--ENTER INTO FILE
/RESTORE BUFFER
/SET UP POINTER TO BUFFER
/SET UP COUNTER

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5352 1151          TAD      CURPA3
5353 7640          SZA CLA
5354 5365          JMP      FOBERR
5355 1410  FSTCHO, TAD I  AUTO10
5356 0157          AND      K377
5357 1147          TAD      CURPA1
5360 7640          SZA CLA
5361 5365          JMP      FOBERR
5362 2077          ISZ      TEMP1
5363 5343          JMP      FOCHLP
5364 2334          ISZ      CHKFOB
5365 5734  FOBERR, JMP I  CHKFOB

                                     /CHECKED ALL OF THE BUFFER?
                                     /NO
                                     /YES--SKIP ON RETURN

5372 5074
5373 5452
5374 6651
5375 4273
5376 5400
5377 1175
5400          PAGE

5400 0000  SAVPAT, 0          /SAVE THE CURRENT DATA PATTERNS IN 2'S COMPLEMENT
5401 7200          CLA
5402 1144          TAD      PATRN1
5403 7041          CIA
5404 3147          DCA      CURPA1
5405 1145          TAD      PATRN2
5406 7041          CIA
5407 3150          DCA      CURPA2
5410 1146          TAD      PATRN3
5411 7041          CIA
5412 3151          DCA      CURPA3
5413 5600          JMP I  SAVPAT

/JMS BLANKF
/CDF INSTR FIELD ARGUMENT
/
/SET UP A BLANK BAD SECTOR FILE AT BUFFER POSITION IN AC, IN FIELD SPECIFIED
/BY CDF INSTRUCTION PARAMETER FOLLOWING CALL.
/
/THIS SUBROUTINE HAS A PSEUDO-CODE FLOWCHART.
/

5414 0000  BLANKF, 0
5415 3133          DCA      BUFFER          /SAVE BUFFER ADDRESS
5416 1614          TAD I  BLANKF          /GET CDF INSTRUCTION
5417 2214          ISZ      BLANKF          /SKIP OVER IT ON RETURN
5420 3223          DCA      FLDCDF          /PLACE IT FOR EXECUTION
5421 1223          TAD      FLDCDF          /PICK IT UP FOR PARAMETER TO SRN2BF
5422 4777'        JMS      SRN2BF          /MOVE SERIAL NUMBER TO BUFFER (VIA AUTO16)
5423 7402  FLDCDF, HLT          /CDF INSTRUCTION PLACED HERE
5424 3416          DCA I  AUTO16          /CLEAR THE NEXT 4 WORDS
5425 3416          DCA I  AUTO16
5426 3416          DCA I  AUTO16
5427 3416          DCA I  AUTO16
5430 1240          TAD      M770          /COUNTER FOR REST OF FILE
5431 3077          DCA      TEMP1

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5432 1157      TAD      K377      /ALL 1'S INTO REST OF FILE
5433 3416      DCA I    AUTO16
5434 2077      ISZ      TEMP1
5435 5232      JMP      .-3
5436 6201      CDF      0          /CHANGE BACK TO THIS FIELD
5437 5614      JMP I    BLANKF
/
5440 7010      M770,   -770

/RJECTP
/POINTER TO TEXT
/
/PRINT MESSAGE ARGUMENT AND REJECT PACK. THIS SUBROUTINE DOES NOT HAVE A
/NORMAL RETURN!
/
5441 0000      XRJCTP, 0
5442 7200      CLA
5443 1641      TAD I    XRJCTP
5444 3246      DCA      .+2          /PLACE POINTER
5445 4467      MESSAGE  /"REASON FOR REJECTION"
5446 0000      0          /POINTER PLACED HERE
5447 4467      MESSAGE  /" - PACK REJECTED"
5450 1027      PCKREJ
5451 5776      JMP      NXTDRV

5452 0000      NXTPAT, 0          /SAVE THE NEXT EXPECTED CURRENT PATTERNS
5453 7200      CLA              /((THEY WILL START WITH WHAT WAS WORD2))
5454 1147      TAD      CURPA1   /SAVE THE FIRST WORD
5455 3077      DCA      TEMP1
5456 1150      TAD      CURPA2   /MOVE WORD 2 UP TO IT'S SPOT AS THE NEW WORD 1
5457 3147      DCA      CURPA1
5460 1151      TAD      CURPA3
5461 3150      DCA      CURPA2
5462 1077      TAD      TEMP1
5463 3151      DCA      CURPA3
5464 5652      JMP I    NXTPAT

*****/

5465 0000      IOTCNG, 0
5466 1302      TAD      IOTTAB   /GET POINTER TO TABLE OF IOT POINTERS
5467 3010      DCA      AUTO10   /PUT IN AUTO INDEX REGISTER
5470 1410      IOTLUP, TAD I    AUTO10 /PICK UP POINTER TO AN IOT FROM TABLE
5471 7450      SNA
5472 5665      JMP I    IOTCNG   /SKIP IF NOT TABLE TERMINATOR
5473 3077      DCA      TEMP1   /RETURN
5474 1477      TAD I    TEMP1   /SAVE POINTER TO IOT
5475 0301      AND      K7757   /PICK UP IOT THRU POINTER
5476 1117      TAD      DEVCOD  /MASK OUT BIT 7 OF CODE
5477 3477      DCA I    TEMP1   /ADD IN DESIRED CODE
5500 5270      JMP      IOTLUP  /SAVE IOT WITH NEW CODE
/
5501 7757      K7757, 7757     /CONTINUE DOWN IOT POINTER TABLE

```

## /TABLE OF POINTERS TO THE IOT CODES FOR THE RL8A CONTROLLER

```

5502 5502 IOTTAB, IOTTAB
5503 1660 IOT0
5504 1663 IOT1
5505 1670 IOT2
5506 1673 IOT3
5507 1676 IOT4
5510 1701 IOT5
5511 1704 IOT7
5512 1707 IOT10
5513 1712 IOT11
5514 1715 IOT12
5515 1720 IOT13
5516 1723 IOT14
5517 1726 IOT15
5520 1731 IOT17
5521 0000 0

```

/TABLE TERMINATOR

```

/
/NEWONE
/

```

ROUTINE NEWONE IS USED IN TYPFIL ROUTINE

```

5522 0000 NEWONE, 0
5523 3077 DCA TEMP1 /SAVE THE SECOND WORD OF THE CYLINDER ADDRESS HP 001
5524 1077 TAD TEMP1 /GET CYLINDER ADDRESS 2'ND WORD TO TEST IT HP 001
5525 1163 TAD M377 /CHECK IF ALL ONES (1) HP 001
5526 7640 SZA CLA /IF ALL ONE'S THEN TYPE - NONE - HP 001
5527 5333 JMP DOCYL /NOT ALL ONES, SO DO JUMP HP 001
5530 4467 MESSAGE / PRINT
5531 1272 NONE / NONE
5532 5342 JMP NEWEX1 /LEAVE AND RETURN TO CALL+1
5533 1077 DOCYL, TAD TEMP1 /GET THE CYLINDERS SECOND WORD
5534 0155 AND K1 /CHECK FOR MSB IN THIS SECOND WORD OF THE CYL ADD.
5535 7002 BSW /PLACE WHAT EVER WAS THERE IN BIT 5
5536 7106 CLL RTL /ROTEAT IT TO MSB POSITION
5537 1153 TAD CYLSAV /GET FIRST CYLINDER ADDRESS WORD
5540 3153 DCA CYLSAV /SAVE COMPLETE CYLINDER ADDRESS WORD
5541 2322 ISZ NEWONE /BUMP POINTER FOR RETURN
5542 5722 NEWEX1, JMP I NEWONE /RETURN

```

```

/
/ NEWTOO
/

```

ROUTINE NEEDED IN XENTBD  
WILL ADD CORRECT CYLINDER ADDRESS TO TABLE

```

5543 0000 NEWTOO, 0
5544 1106 TAD CYLNDR /GET THE CYLINDER
5545 0157 AND K377
5546 3410 DCA I AUTO10 /PLACE THE FIRST WORD OF CYLINDER ADDRESS IN TABLE
5547 1106 TAD CYLNDR /NOW GET THE MSB OF CYLINDER WORD

```



```

5550 0775'      AND      K400      /MASK OFF JUST MSB BIT
5551 7640      SZA CLA      /SKIP IF MSB WAS 0
5552 7001      IAC      /MSB OF CYLNR WAS A 1
5553 3410      DCA I      AUTO10    /PLACE CORRECT VALUE IN SECOND CYLINDER ADDRESS
5554 5743      JMP I      NEWT00    /WORD BIT 11
                                           /RETURN TABLE UPDATED AC =0

```

```

/
/NEWTWO ROUTINE USED IN CH4LST
/

```

```

5555 0000      NEWTWO, 0
5556 3077      DCA      TEMP1      /SAVE THE FIRST CYLINDER ADDRESS
5557 1410      TAD I      AUTO10    /GET THE SECOND CYLINDER ADDRESS WORD
5560 0155      AND      K1      /MASK OFF
5561 7002      BSW      /PUT CYL. ADD. MSB IN BIT 5      (000 00X 000 000)
5562 7106      CLL RTL      /ROTATE IT TO MSB POSITION BIT 3 (000 X00 000 000)
5563 1077      TAD      TEMP1      /GET REST OF CYLINDER ADDRESS
5564 7041      CIA      /2'S COMPLEMENT IT IT COMPARE IT
5565 1106      TAD      CYLNR      /WITH LISTED CYLINDER
5566 7500      SMA      /RETURN TO GOTPOS IS RESULT IS NEGATIVE
5567 2355      ISZ      NEWTWO     /BUMP RETURN TO CHECK IF IT = TO LISTED
5570 5755      JMP I      NEWTWO
5575 5075
5576 0630
5577 3346
5600

```

```

PAGE
/
/
/ NEW IS A ROUTINE NEEDED IN TYFIL,
/
/

```

```

5600 0000      NEW, 0
5601 1077      TAD      TEMP1      /GET THE GECOND WORD OF THE CYLINDER ADDRESS
5602 0155      AND      K1      /CHECK THE MSB OF CYLINDER ADDRESS IN THIS WORD
5603 7002      BSW      /PLACE THE RESULTS IN BIT 5      (000 00X 000 000)
5604 7106      CLL RTL      /NOW SHIFT IT TO MSB OF CYL ADDRESS BIT 3 (000 X00 000 000)
5605 1153      TAD      CYLSAV     /ADD THE FIRST PART OF THE CYLINDER ADDRESS
5606 3153      DCA      CYLSAV     /SAVE THE COMPLETE CYLINDER ADDRESS
5607 5600      JMP I      NEW

```

```

/DRIVE ACTIVE TABLE
/ACCESS IS BY INDEX--EACH WORD SET TO 1 IF DRIVE IS ACTIVE AND 0 IF DRIVE
/IS NOT AVAILABLE FOR TESTING
/

```

```

5610 0000      DRVACT, 0      /DRIVE 0
5611 0000      0      /1
5612 0000      0      /2
5613 0000      0      /3

```

```

5614 0000      SECTAB, ZBLOCK 5      /FIVE WORD TABLE FOR FLAGGING SECTOR GROUPS READ

```

```
5621 0000 NOPUNCH /DON'T ASSEMBLE BINARY FOR BUFFERS (MAKES TAPE TOO LONG)
5631 0000 MANBSF, ZBLOCK 10 /8 WORDS OF FORMAT INFORMATION
5651 0000 MANUBS, ZBLOCK 20 /BAD SECTOR LISTINGS HERE--GUARANTEED 3 BAD SECTORS MAX.
5661 0000 FLDBSF, ZBLOCK 10
FELDBS, ZBLOCK 770
ENDFBS,

/AT LEAST 2 ADDITIONAL WORDS OF BUFFER ARE
/NEEDED AND ASSUMED TO FOLLOW (SHOULD FOBUF
/EVER BE ELEMENATED FOR SPACE REASONS.)

6651 0000 FOBUF, ZBLOCK 400
0001 ENPUNCH /ASSEMBLE BINARY AGAIN
FIELD 1
```

[illegible]



0000	*0		
0000	4301	PTITLE, TEXT	"#AJRLL-B RL8A/RL02 PACK VERIFIER#"
0001	1222		
0002	1414		
0003	5502		
0004	4040		
0005	4040		
0006	2214		
0007	7001		
0010	5722		
0011	1460		
0012	6240		
0013	2001		
0014	0313		
0015	4026		
0016	0522		
0017	1106		
0020	1105		
0021	2243		
0022	0000		
0023	2405	TSTDRV, TEXT	"TEST DRIVE "
0024	2324		
0025	4004		
0026	2211		
0027	2605		
0030	4000		
0031	4077	SPQSP, TEXT	" ? "
0032	4000		
0033	4323	USEDEF, TEXT	"#SELECT NON-DEFAULT"
0034	0514		
0035	0503		
0036	2440		
0037	1617		
0040	1655		
0041	0405		
0042	0601		
0043	2514		
0044	2400		
0045	4303	CHNGPR, TEXT	"#CHANGE PREVIOUS"
0046	1001		
0047	1607		
0050	0540		
0051	2022		
0052	0526		
0053	1117		
0054	2523		
0055	0000		
0056	4020	PARAMS, TEXT	" PARAMETERS? "
0057	0122		
0060	0115		
0061	0524		
0062	0522		
0063	2377		

0064	4000		
0065	2523	USE62, TEXT	"USE DEVICE CODES 62,63? "
0066	0540		
0067	0405		
0070	2611		
0071	0305		
0072	4003		
0073	1704		
0074	0523		
0075	4066		
0076	6254		
0077	6663		
0100	7740		
0101	0000		
0102	2523	USCYLM, TEXT	"USE CYLINDER LIMITS? "
0103	0540		
0104	0331		
0105	1411		
0106	1604		
0107	0522		
0110	4014		
0111	1115		
0112	1124		
0113	2377		
0114	4000		
0115	2431	TYPBSQ, TEXT	"TYPE BAD SECTOR FILES? "
0116	2005		
0117	4002		
0120	0104		
0121	4023		
0122	0503		
0123	2417		
0124	2240		
0125	0611		
0126	1405		
0127	2377		
0130	4000		
0131	2325	SUPHDQ, TEXT	"SUPPRESS HEADER"
0132	2020		
0133	2205		
0134	2323		
0135	4010		
0136	0501		
0137	0405		
0140	2200		
0141	0417	DATAVQ, TEXT	"DO DATA AREA"
0142	4004		
0143	0124		
0144	0140		
0145	0122		
0146	0501		
0147	0000		
0150	4026	VERIFI, TEXT	" VERIFICATION? "
0151	0522		
0152	1106		

0153 1103  
0154 0124  
0155 1117  
0156 1677  
0157 4000  
0160 0516  
0161 2405  
0162 2240  
0163 2520  
0164 2005  
0165 2240  
0166 1411  
0167 1511  
0170 2440  
0171 1116  
0172 4017  
0173 0324  
0174 0114  
0175 4050  
0176 0405  
0177 0601  
0200 2514  
0201 2475  
0202 6767  
0203 6751  
0204 7240  
0205 0000  
0206 0516  
0207 2405  
0210 2240  
0211 1417  
0212 2705  
0213 2240  
0214 1411  
0215 1511  
0216 2440  
0217 1116  
0220 4017  
0221 0324  
0222 0114  
0223 4050  
0224 0405  
0225 0675  
0226 6051  
0227 7240  
0230 0000  
0231 0516  
0232 2405  
0233 2240  
0234 0611  
0235 0514  
0236 0440  
0237 0201  
0240 0440  
0241 2305

ENTHI, TEXT "ENTER UPPER LIMIT IN OCTAL (DEFAULT=777): "

HP 001

ENTLO, TEXT "ENTER LOWER LIMIT IN OCTAL (DEF=0): "

MAXBSQ, TEXT "ENTER FIELD BAD SECTOR LIMIT IN DECIMAL (DEF=126): "

0242 0324  
0243 1722  
0244 4014  
0245 1115  
0246 1124  
0247 4011  
0250 1640  
0251 0405  
0252 0311  
0253 1501  
0254 1440  
0255 5004  
0256 0506  
0257 7561  
0260 6266  
0261 5172  
0262 4000  
0263 1501  
0264 3056  
0265 4023  
0266 2001  
0267 0305  
0270 4011  
0271 1640  
0272 0611  
0273 1405  
0274 2340  
0275 1123  
0276 4061  
0277 6266  
0300 4143  
0301 0000  
0302 0405  
0303 1405  
0304 2405  
0305 4017  
0306 1404  
0307 4006  
0310 1105  
0311 1404  
0312 4002  
0313 0104  
0314 4023  
0315 0503  
0316 2417  
0317 2240  
0320 0611  
0321 1405  
0322 2377  
0323 4000  
0324 0122  
0325 0540  
0326 3117  
0327 2540  
0330 2325

MAXBIG, TEXT "MAX. SPACE IN FILES IS 1261#"

DELOLD, TEXT "DELETE OLD FIELD BAD SECTOR FILES? "

AREYOU, TEXT "ARE YOU SURE? "



0331	2205		
0332	7740		
0333	0000		
0334	0617	FRCBSQ, TEXT	"FORCE BAD SECTORS? "
0335	2203		
0336	0540		
0337	0201		
0340	0440		
0341	2305		
0342	0324		
0343	1722		
0344	2377		
0345	4000		
0346	2516	UNITNQ, TEXT	"UNIT NUMBER: "
0347	1124		
0350	4016		
0351	2515		
0352	0205		
0353	2272		
0354	4000		
0355	2405	TSTAGQ, TEXT	"TEST SAME UNIT(S) AGAIN? "
0356	2324		
0357	4023		
0360	0115		
0361	0540		
0362	2516		
0363	1124		
0364	5023		
0365	5140		
0366	0107		
0367	0111		
0370	1677		
0371	4000		
0372	4343	DONE, TEXT	"##DONE#"
0373	0417		
0374	1605		
0375	4300		
0376	4343	WORKOU, TEXT	"##WORKING ON UNIT "
0377	2717		
0400	2213		
0401	1116		
0402	0740		
0403	1716		
0404	4025		
0405	1611		
0406	2440		
0407	0000		
0410	7743	QESMRK, TEXT	"?#"
0411	0000		
0412	3603	UPARRC, TEXT	"^C#"
0413	4300		
0414	3607	UPARRG, TEXT	"^G"
0415	0000		
0416	4323	SWRMSG, TEXT	"#SR="
0417	2275		

0420	0000		
0421	3606	FILLEQ, TEXT	"^F#FILL = "
0422	4306		
0423	1114		
0424	1440		
0425	7540		
0426	0000		
0427	4040	TWOSPA, TEXT	" "
0430	0000		
0431	4377	UNITFA, TEXT	"#? UNIT FAILURE PC="
0432	4025		
0433	1611		
0434	2440		
0435	0601		
0436	1114		
0437	2522		
0440	0540		
0441	2003		
0442	7500		
0443	7740	FALWWB, TEXT	"? FAILURE WAS WHILE WRITING BAD SECTOR FILES!#"
0444	0601		
0445	1114		
0446	2522		
0447	0540		
0450	2701		
0451	2340		
0452	2710		
0453	1114		
0454	0540		
0455	2722		
0456	1124		
0457	1116		
0460	0740		
0461	0201		
0462	0440		
0463	2305		
0464	0324		
0465	1722		
0466	4006		
0467	1114		
0470	0523		
0471	4143		
0472	0000		
0473	4320	POWER, TEXT	"#POWER FAIL PC="
0474	1727		
0475	0522		
0476	4006		
0477	0111		
0500	1440		
0501	2003		
0502	7500		
0503	3105	YES, TEXT	"YES!#"
0504	2341		
0505	4300		
0506	1617	NO, TEXT	"NO#"

0507	4300		
0510	0331	CYLPRM, TEXT	"CYLINDER: "
0511	1411		
0512	1604		
0513	0522		
0514	7240		
0515	0000		
0516	1005	TRKPRM, TEXT	"HEAD: "
0517	0104		
0520	7240		
0521	0000		
0522	2305	SECPRM, TEXT	"SECTOR: "
0523	0324		
0524	1722		
0525	7240		
0526	0000		
0527	4305	ENTRY1, TEXT	"#ENTER BAD SECTOR ADDRESSES (IN OCTAL) IN RESPONSE TO PROMPTS#"
0530	1624		
0531	0522		
0532	4002		
0533	0104		
0534	4023		
0535	0503		
0536	2417		
0537	2240		
0540	0104		
0541	0422		
0542	0523		
0543	2305		
0544	2340		
0545	5011		
0546	1640		
0547	1703		
0550	2401		
0551	1451		
0552	4011		
0553	1640		
0554	2205		
0555	2320		
0556	1716		
0557	2305		
0560	4024		
0561	1740		
0562	2022		
0563	1715		
0564	2024		
0565	2343		
0566	0000		
0567	4327	ENTRY2, TEXT	"#WHEN NO MORE TO ENTER, TYPE <CR> IN RESPONSE TO CYLINDER PROMPT#"
0570	1005		
0571	1640		
0572	1617		
0573	4015		
0574	1722		
0575	0540		

0576	2417		
0577	4005		
0600	1624		
0601	0522		
0602	5440		
0603	2431		
0604	2005		
0605	4074		
0606	0322		
0607	7640		
0610	1116		
0611	4022		
0612	0523		
0613	2017		
0614	1623		
0615	0540		
0616	2417		
0617	4003		
0620	3114		
0621	1116		
0622	0405		
0623	2240		
0624	2022		
0625	1715		
0626	2024		
0627	4300		
0630	7740	SFTWER, TEXT	"? SOFTWARE ERROR! PC="
0631	2317		
0632	0624		
0633	2701		
0634	2205		
0635	4005		
0636	2222		
0637	1722		
0640	4140		
0641	2003		
0642	7500		
0643	4324	DMANUF, TEXT	"#THE MANUFACTURING "
0644	1005		
0645	4015		
0646	0116		
0647	2506		
0650	0103		
0651	2425		
0652	2211		
0653	1607		
0654	4000		
0655	4324	DFIELD, TEXT	"#THE FIELD "
0656	1005		
0657	4006		
0660	1105		
0661	1404		
0662	4000		
0663	0201	BSFNOR, TEXT	"BAD SECTOR FILES COULD NOT BE READ"
0664	0440		

0665 2305  
0666 0324  
0667 1722  
0670 4006  
0671 1114  
0672 0523  
0673 4003  
0674 1725  
0675 1404  
0676 4016  
0677 1724  
0700 4002  
0701 0540  
0702 2205  
0703 0104  
0704 0000  
0705 4316  
0706 1740  
0707 0717  
0710 1704  
0711 4010  
0712 0501  
0713 0405  
0714 2223  
0715 4017  
0716 1640  
0717 0140  
0720 2422  
0721 0103  
0722 1300  
0723 4306  
0724 1105  
0725 1404  
0726 4002  
0727 0104  
0730 4023  
0731 0503  
0732 2417  
0733 2240  
0734 1411  
0735 1511  
0736 2440  
0737 0530  
0740 0305  
0741 0504  
0742 0504  
0743 0000  
0744 4302  
0745 0104  
0746 4003  
0747 3114  
0750 4017  
0751 2240  
0752 1005  
0753 0104

NOGDHD, TEXT    "#NO GOOD HEADERS ON A TRACK"

TOOMBS, TEXT    "#FIELD BAD SECTOR LIMIT EXCEEDED"

CYTENT, TEXT    "#BAD CYL OR HEAD ENTRY IN A HEADER"

0754	4005		
0755	1624		
0756	2231		
0757	4011		
0760	1640		
0761	0140		
0762	1005		
0763	0104		
0764	0522		
0765	0000		
0766	4302	BLK08D, TEXT	"#BLOCK 0 BAD"
0767	1417		
0770	0313		
0771	4060		
0772	4002		
0773	0104		
0774	0000		
0775	4302	BDORDR, TEXT	"#BAD SECTOR ORDER"
0776	0104		
0777	4023		
1000	0503		
1001	2417		
1002	2240		
1003	1722		
1004	0405		
1005	2200		
1006	4303	CUDNWR, TEXT	"#COULD NOT WRITE BAD SECTOR FILES"
1007	1725		
1010	1404		
1011	4016		
1012	1724		
1013	4027		
1014	2211		
1015	2405		
1016	4002		
1017	0104		
1020	4023		
1021	0503		
1022	2417		
1023	2240		
1024	0611		
1025	1405		
1026	2300		
1027	4055	PCKREJ, TEXT	" - PACK REJECTED#"
1030	4020		
1031	0103		
1032	1340		
1033	2205		
1034	1205		
1035	0324		
1036	0504		
1037	4300		
1040	4301	ALL, TEXT	"#ALL "
1041	1414		
1042	4000		

1043	0201	BSFDES, TEXT	"BAD SECTOR FILES ARE DESTROYED!#"
1044	0440		
1045	2305		
1046	0324		
1047	1722		
1050	4006		
1051	1114		
1052	0523		
1053	4001		
1054	2205		
1055	4004		
1056	0523		
1057	2422		
1060	1731		
1061	0504		
1062	4143		
1063	0000		
1064	4315	MANBAD, TEXT	"#MANUFACTURING BAD:"
1065	0116		
1066	2506		
1067	0103		
1070	2425		
1071	2211		
1072	1607		
1073	4002		
1074	0104		
1075	7200		
1076	4306	FLDBAD, TEXT	"#FIELD BAD:"
1077	1105		
1100	1404		
1101	4002		
1102	0104		
1103	7200		
1104	4303	BSHDR, TEXT	"#CYLNR HEAD SECTOR#"
1105	3114		
1106	1604		
1107	2240		
1110	1005		
1111	0104		
1112	4023		
1113	0503		
1114	2417		
1115	2243		
1116	0000		
1117	4016	NEWADD, TEXT	" NEW BAD SECTORS ADDED TO FILE ("
1120	0527		
1121	4002		
1122	0104		
1123	4023		
1124	0503		
1125	2417		
1126	2223		
1127	4001		
1130	0404		
1131	0504		

1132	4024		
1133	1740		
1134	0611		
1135	1405		
1136	4050		
1137	0000		
1140	4024	TOTAL, TEXT	" TOTAL)"
1141	1724		
1142	0114		
1143	5143		
1144	0000		
1145	4316	NONEWB, TEXT	"#NO NEW BAD SECTORS FOUND (FIELD FILES NOT REWRITTEN)"
1146	1740		
1147	1605		
1150	2740		
1151	0201		
1152	0440		
1153	2305		
1154	0324		
1155	1722		
1156	2340		
1157	0617		
1160	2516		
1161	0440		
1162	5006		
1163	1105		
1164	1404		
1165	4006		
1166	1114		
1167	0523		
1170	4016		
1171	1724		
1172	4022		
1173	0527		
1174	2211		
1175	2424		
1176	0516		
1177	5143		
1200	0000		
1201	4305	ENTER, TEXT	"#ENTER "
1202	1624		
1203	0522		
1204	4000		
1205	2001	PCKSRN, TEXT	"PACK SERIAL NO.: "
1206	0313		
1207	4023		
1210	0522		
1211	1101		
1212	1440		
1213	1617		
1214	5672		
1215	4000		
1216	4304	REWRT1, TEXT	"#DO YOU WISH THE "
1217	1740		
1220	3117		



1221	2540		
1222	2711		
1223	2310		
1224	4024		
1225	1005		
1226	4000		
1227	1501	MRWRTN, TEXT	"MANUFACTURING FILES REWRITTEN"
1230	1625		
1231	0601		
1232	0324		
1233	2522		
1234	1116		
1235	0740		
1236	0611		
1237	1405		
1240	2340		
1241	2205		
1242	2722		
1243	1124		
1244	2405		
1245	1600		
1246	4050	REWRT2, TEXT	" (WITH NO BAD SECTORS)? "
1247	2711		
1250	2410		
1251	4016		
1252	1740		
1253	0201		
1254	0440		
1255	2305		
1256	0324		
1257	1722		
1260	2351		
1261	7740		
1262	0000		
1263	4004	DESTRY, TEXT	" DESTROYED!#"
1264	0523		
1265	2422		
1266	1731		
1267	0504		
1270	4143		
1271	0000		
1272	4016	NONE, TEXT	" NONE#"
1273	1716		
1274	0543		
1275	0000		

```

NOPUNCH          /DISABLE BINARY
1276 0333 BUF1, 333 /BUFFER STARTING HERE LOOKS LIKE 110110110110110...
1277 0155 BUF2, 155 /BUFFER STARTING HERE LOOKS LIKE 011011011011011...
1300 0266 BUF3, 266 /BUFFER STARTING HERE LOOKS LIKE 101101101101101...
1301 0000 ZBLOCK 3600-. /BUFFER ACTUALLY EXTENDS 2K BUT FOR NOW, EXTEND UP TO 3600
3600 0000 ZERBUF, 0 /A 2K BUFFER EXTENDS FROM HERE TO 7600
3601 0000 ZBLOCK 3777 /DO NOT ATTEMPT TO COMINE INTO ZBLOCK 4000. IT GIVES A "Q" ERROR
ENPUNCH          /REENABLE BINARY

```

/BUF1, BUF2, AND BUF3 ARE ALL CONSIDERED AS 2K BUFFERS. THEREFORE, THERE IS  
 /A BUFFER PORTION WHICH OVERLAPS ZERBUF. FOR EASE OF BUFFER PORTION REWRITE,  
 /IT IS DESIRED TO HAVE THIS PORTION START AT A MULTIPLE OF 3 WORDS HIGHER  
 /THAN BUF1 (SO 3 WORD PATTERN WILL START WITH "333"). ALSO, THE SIZE OF  
 /THE BUFFER PORTION (WHICH, STRICTLY SPEAKING, IS (BUF3+4000)-ZERBUF,)

/IS TO BE DEFINED AS A MULTIPLE OF 3 SO THAT ALL 3 WORDS OF PATTERN CAN BE  
 /USED IN ONE WRITE LOOP.

/  
 /MATHEMATICAL NOTE: WHERE DIVISION TRUNCATES (AS IN THE "%" OPERATOR  
 /OF THE ASSEMBLER), REMAINDER( X/N ) = X - (( X/N ) \* N).  
 /ALSO, THERE IS NO DOCUMENTATION ON ORDER OF OPERATOR PRECEDENCE, SO  
 /MATHEMATICAL DEFINITIONS OF COMPLEX OPERATORS HAVE BEEN DEFINED IN SMALL STEPS.

/  
 /BUFFOR IS A BUFFER (FOR PURPOSES OF BUFFER PORTION REWRITE ONLY) STARTING  
 /A MULTIPLE OF 3 WORDS AFTER BUF1 AND AT OR UP TO 2 WORDS BEFORE ZERBUF.  
 /BUFFOR= ZERBUF - REMAINDER( (ZERBUF - BUF1) / 3 )  
 / = ZERBUF - ((ZERBUF - BUF1) - ( ((ZERBUF-BUF1)/3) \* 3))  
 / = ZERBUF - ZERBUF + BUF1 + (((ZERBUF-BUF1)/3)\*3)  
 / = BUF1 + ( ((ZERBUF-BUF1)/3)\*3 )

```

2302 TMP= ZERBUF-BUF1 /NUMBER OF WORDS BETWEEN BUF1 AND ZERBUF
0626 TMP= TMP%3 /DIVIDED BY 3 AND TRUNCATED
2302 TMP= TMP*3 /MULTIPLIED BACK BY THREE

```

```

3600 BUFFOR= BUF1+TMP /FINAL FORMULA ABOVE

```

/THE ACTUAL SIZE OF THE BUFFER PORTION IS ( BUF3 + 4000 - BUFFOR )  
 / = (BUF1 + 4002 - BUFFOR) = ( 4002 + (BUF1-BUFFOR) ).  
 /BUF1-BUFFOR HAS BEEN DEFINED AS A MULTIPLE OF 3, SO TO DEFINE THE SIZE  
 /OF THE BUFFER PORTION AS A MULTIPLE OF 3, WE NEED ONLY INCREASE THE SIZE  
 /BY TWO WORDS (4002=2050 DECIMAL; 4004=2052 DECIMAL, WHICH IS DIVISIBLE BY 3).

```

1502 PORSIZ= BUF1+4004-BUFFOR

```

```

0426 PORSZ3= PORSIZ%3 /AND DEFINE IT'S SIZE DIVIDED BY 3

```

/NOTE THAT THIS MAKES THE BUFFER FROM BUF1 TO END OF BUFFOR A MULTIPLE OF  
 /9, SHOULD IT BE DESIRED TO SPEED OPTIMIZE BUFFER WRITE OF BUF1.  
 /THE SAME CANNOT BE SAID OF PORSIZ. NO ASSUMPTIONS CAN BE MADE ABOUT THE  
 /SIZE OF (ZERBUF - BUFFOR), NOR ABOUT ( (BUFFOR+PORSIZ) - ZERBUF).

```

0000 FIELD 0

```

[illegible]



0200 \*200  
8

SEQ 108

ACL	7701	CHKBSF	3400	DATVCH	0674	FILLER	0023
ADD4PS	4334	CHKBUF	5007	DATVLP	0704	FIXDIG	3030
AFTRHD	3775	CHKCN1	4636	DEFLIM	0337	FLDARG	4511
ALL	1040	CHKCNT	3547	DEFTST	0216	FLDBAD	1076
ALLICH	3517	CHKERO	5137	DELASK	0443	FLDBSF	5651
AREYOU	0324	CHKERR	5040	DELCHK	0427	FLDCDF	5423
ASKHI	0322	CHKFOB	5334	DELOLD	0302	FLDCHK	2712
AUTO10	0010	CHKHDR	4000	DESTRY	1263	FLDCNG	3354
AUTO11	0011	CHKLUP	3431	DEVCOD	0117	FLDCNT	2730
AUTO12	0012	CHKOK	1226	DFAULT	0121	FLDPNT	0136
AUTO13	0013	CHKSEC	5300	DFIELD	0655	FLGSET	1500
AUTO14	0014	CHKTRO	4637	DIGCNT	1640	FORMEV	3077
AUTO15	0015	CHKTRK	4600	DIGIN	1153	FORMOD	3054
AUTO16	0016	CHNGPR	0045	DIGIT	3300	FRCBSQ	0334
AUTO17	0017	CKSCRT	5332	DIGITS	1637	FRSTSC	3711
BADBSF	3542	CLRBUF	2735	DMANUF	0643	FSTCHO	5355
BADCHS	5327	CLRPOR	4345	DOCYL	5533	FSTLUP	3717
BADCYT	4064	CMPCDF	4455	DOHDRV	0661	G40LUP	3665
BADFR	2476	CMPCNT	4515	DONE	0372	GBLOOP	3763
BADHDR	4057	CMPSRN	3334	DRSLER	0001	GBTRN	3773
BADORD	3631	CNTBAD	4145	DRVACT	5610	GDFRED	2512
BDORD2	3634	CNTBCH	4165	DRVLUP	0602	GET40H	3657
BDORDR	0775	CNTFRT	1076	DRVNUM	0113	GET8	0401
BLANKF	5414	CNTGRT	1152	ENDFBS	6651	GET9	0400
BLKOB	0766	CNTLUP	4154	ENTBRT	4270	GETFIL	2461
BOTHCH	2650	CNTRL	1510	ENTCHK	1567	GETFRT	2513
BRUSHC	0003	CNTRLF	1046	ENTER	1201	GETINP	1462
BRUSHH	0010	CNTRLG	4462	ENTERB	4460	GETLSD	3115
BSFDEL	0130	CNTRLQ	1044	ENTHI	0160	GETNUM	4445
BSFDES	1043	CNTRL	1042	ENTLO	0206	GETRES	4443
BSFNOR	0663	CNTRZB	3301	ENTMES	1550	GETSR	1650
BSFORC	0131	COMCON	2112	ENTRET	1574	GETSTA	4447
BSFTYP	0122	COMPOS	2076	ENTRY1	0527	GETTXX	2507
BSHDR	1104	CUMPRT	2136	ENTRY2	0567	GOTBAD	3757
BSW	7002	CONRET	1045	ENTSRN	3000	GOTGUD	3740
BUF1	1276	CONSUL	4442	ENTSV1	3074	GOTNO	1372
BUF2	1277	COVERO	0040	ENTSV2	3075	GOTNUM	0402
BUF3	1300	CRLF	4475	ENTSV3	3076	GOTPOS	4341
BUFFER	0133	CRLFSV	1305	ENTVAL	4444	GOTYES	1371
BUFPOR	3600	CTLF	1036	ERRHAN	4450	GTNNMLP	1605
BUFSAV	5240	CTLG	1040	ESRNM	3021	GUDBSF	3543
BUFSVC	5333	CUDNWR	1006	FOBERR	5365	GUDHOR	4061
CAF	6007	CURBUF	0152	FOBUF	6651	HCW1	0021
CARRET	1627	CURPA1	0147	FOCHLP	5343	HCW2	0022
CCRET	0105	CURPA2	0150	FALWNB	0443	HDCHRT	4063
CGPNTR	0104	CURPA3	0151	FELDBS	5661	HDRCNT	3656
CHILUP	3532	CYLND	0106	FIFCHO	5077	HDRERR	4053
CH4LST	4273	CYLPRM	0510	FIFCHK	5000	HDRRET	3655
CH4RET	4344	CYLSAV	0153	FIFCNT	5076	HDRSUP	0123
CHARSV	1264	CYTENT	0744	FILCNT	4512	HDRVFY	3600
CHFRSW	5027	DATAVF	0124	FILEWR	0731	HDRVLP	0670
CHKBFO	5106	DATAVQ	0141	FILLEQ	0421	HDSLCT	0100

HEDCUR 0100  
 HEDOUT 0020  
 HILIM 0126  
 IMPINT 1745  
 INFLG 1154  
 INITRF 4712  
 INSHS 4261  
 INSCHK 4237  
 INSPOS 4272  
 IOT0 1660  
 IOT1 1663  
 IOT10 1707  
 IOT11 1712  
 IOT12 1715  
 IOT13 1720  
 IOT14 1723  
 IOT15 1726  
 IOT17 1731  
 IOT2 1670  
 IOT3 1673  
 IOT4 1676  
 IOT5 1701  
 IOT7 1704  
 IOTCNG 5465  
 IOTLUP 5470  
 IOTTAB 5502  
 JMPPM1 4453  
 JMPUP 1753  
 K0777 0156  
 K1 0155  
 K10 0166  
 K1002 2025  
 K1004 2365  
 K1005 4516  
 K100A 1353  
 K13 3050  
 K155 4542  
 K176 0161  
 K177 1457  
 K20 1266  
 K200 0165  
 K207 1522  
 K212 1304  
 K215 1303  
 K24 2734  
 K240 1347  
 K24A 0756  
 K260 1174  
 K266 4543  
 K3 2074  
 K333 4541  
 K377 0157

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 K400 5075  
 K4000 2075  
 K47 0564  
 K5 1641  
 K50 0160  
 K6500 1521  
 K7 1175  
 K70 4635  
 K7600 1517  
 K77 0164  
 K7757 5501  
 KCC 6032  
 KCDF 4517  
 KCDF0 2723  
 KCF 6030  
 KIE 6035  
 KSF 6031  
 LASTCH 0616  
 LASTIN 0115  
 LDNGO 0116  
 LISN 4466  
 LISN1 1426  
 LISN2 1437  
 LISN3 1452  
 LISNUM 1442  
 LISTED 4343  
 LNFEED 1142  
 LODHED 0002  
 LOLIM 0125  
 LOOK4L 4301  
 M0777 0162  
 M1 3756  
 M10 0167  
 M100 5164  
 M1000 2733  
 M12 0563  
 M1254 4544  
 M126 5074  
 M13 3051  
 M176 0565  
 M203 1520  
 M207 1021  
 M212 1460  
 M223 1265  
 M270 1450  
 M3 1461  
 M30 4634  
 M331 1542  
 M377 0163  
 M4 0170  
 M40 4761

M400 5243  
 M404 2320  
 M43 1346  
 M5 0171  
 M50 0172  
 M56 2157  
 M770 5440  
 MAKCYL 3445  
 MANBAD 1064  
 MANBSF 5621  
 MANDES 2544  
 MANRET 2574  
 MANUBS 5631  
 MANUPT 0135  
 MANVCH 2702  
 MAXBAD 0127  
 MAXBIG 0263  
 MAXBSQ 0231  
 MAXLIS 0346  
 MAXVAL 1575  
 MBSASK 0342  
 MESSAGE 4467  
 MESAGX 1306  
 MESBSW 1327  
 MESCNT 1350  
 MESLUP 1314  
 MESSAV 1351  
 MOVCNT 4271  
 MOVLUP 4246  
 MQL 7421  
 MRWRTN 1227  
 NEW 5600  
 NEWADD 1117  
 NEWBAD 0111  
 NEWEX1 5542  
 NEWONE 5522  
 NEWTOO 5543  
 NEWTWO 5555  
 NO 0506  
 NODEL 0455  
 NOFLAG 2457  
 NOGDHD 0705  
 NOIN 1121  
 NONE 1272  
 NUNEWB 1145  
 NOPRNT 0114  
 NOTGUD 3731  
 NOWRIT 0753  
 NUMCHK 0422  
 NXTBFO 5155  
 NXTBUF 5064  
 NXTCYL 2533

NXTDRV 0630  
 NXTGRP 4734  
 NXTPAT 5452  
 NXTRET 2543  
 NXTSEC 4475  
 NXTTRK 2516  
 OK2TYP 1255  
 OLDBAD 0112  
 ONLISN 1020  
 OUTRNG 4055  
 P2SAVE 1211  
 P4SAVE 1223  
 PARAMC 0253  
 PARAMS 0056  
 PATBUF 4520  
 PATLUP 4527  
 PATPOR 4545  
 PATRN1 0144  
 PATRN2 0145  
 PATRN3 0146  
 PCKREJ 1027  
 PCKSRN 1205  
 PCSAVE 1754  
 PORLUP 4554  
 PORSIZ 1502  
 PORSZ3 0426  
 POWER 0473  
 PRECYL 3545  
 PRESEC 3546  
 PRMCYL 0515  
 PRNT1 4470  
 PRNT2 4471  
 PRNT4 4472  
 PSECTA 4760  
 PSWR 0020  
 PTITLE 0000  
 PWRFAL 1735  
 PWRUP 1755  
 PZERBF 2567  
 QESMRK 0410  
 RDWTLP 2143  
 RDYRET 2155  
 RDYWAT 2137  
 READ0 4456  
 READ1 4457  
 READF 4724  
 RED0LP 4652  
 RED5LP 4623  
 REDCNT 2515  
 REDERR 4472  
 REDFLG 2514  
 REDFLP 2471

REDHDR	4452	SEKLIN	0005	TSTAGO	0355	XCTRLG	1107
REDNCM	4441	SERCMP	3324	TSTDRV	0023	XECUTE	2424
RESET	4446	SERNO1	0140	TWOSPA	0427	XENTBD	4200
RESPON	0154	SERNO2	0141	TYFIRT	4142	XENTVA	1543
RESRET	1375	SERNO3	0142	TYP10L	3245	XERRHA	2200
RESTAR	0212	SERNO4	0143	TYPBSQ	0115	XGETNU	1600
RETRY	0132	SERSAV	3303	TYPDO	3271	XGETRE	1354
RETRYW	4427	SETUPB	2600	TYPDEC	3227	XGETST	2000
RETRYX	2427	SFTWER	0630	TYPE	4474	XJMPPM	1642
REVFYH	3640	SLOCNT	5241	TYPEVN	3160	XLISN	1404
REWRSO	5145	SLODNL	5270	TYPFIL	4066	XPRNT1	1167
REWRSC	5047	SLORED	5244	TYPNUM	2663	XPRNT2	1200
REWRT1	1216	SLURLP	5254	TYPDD	3200	XPRNT4	1212
REWRT2	1246	SLOWLP	5210	TYPSRN	3126	XREAD0	2412
RJECTP	4465	SLOWRT	5200	UNIASK	0555	XREAD1	2417
RJECTU	4464	SNPNTR	3053	UNITFA	0431	XREDHD	2354
RLCA	4427	SPACE2	4473	UNITNQ	0346	XRESET	1765
RLCB	4430	SPACX2	1400	UNITST	0541	XRJCTP	5441
RLDC	4424	SPINDN	0007	UNITSV	0120	XRJCTU	2336
RLMA	4426	SPINUP	0001	UNLODH	0006	XRLCA	1672
RLSA	4431	SPL	6102	UPARG	1077	XRLCB	1675
RLSD	4425	SPOSP	0031	UPARRC	0412	XRLDC	1657
RLSE	4441	SPUPTU	0010	UPARRG	0414	XRLMA	1667
RLWC	4432	SRN2BF	3346	USCYLM	0102	XRLSA	1700
RRCA	4435	SRNCNT	3052	USE62	0065	XRLSD	1662
RRCB	4436	SRNLUP	3011	USEDEF	0033	XRLSE	1730
RRER	4433	SRNSAV	3172	VALUE	3277	XRLWC	1703
RRSA	4437	SRNSV1	3214	VERIFI	0150	XRRCA	1714
RRSI	4440	START	0200	VOLUME	0002	XRRCB	1717
RRWC	4434	STATS1	0102	VT278	4476	XRRER	1706
RSTRQS	0210	STATS2	0103	WAIT1	2311	XRRSA	1722
RTRYH1	3604	SUPHDQ	0131	WAIT40	2162	XRRSI	1725
RTRYWF	4514	SUPTYP	3215	WAT300	2321	XRRWC	1711
RUSURE	4461	SWP	7521	WORKOU	0376	XRUSUR	1523
SAVCYL	3550	SWRMSG	0416	WRAFIL	4425	XSEEK	2026
SAVDIG	3024	TEMP1	0077	WRDCNT	0134	XTYPE	1224
SAVFPT	2647	TEMP2	0100	WRDERR	0200	XVT278	3551
SAVFSN	2645	TEMP3	0101	WKGATE	0004	XWRITO	2400
SAVMPT	2620	TENPTR	3302	WRITEO	4454	XWRIT1	2405
SAVNEW	3506	TENPWR	3273	WRITE1	4455	XWZITF	1155
SAVPAT	5400	TFILUP	4111	WRITFI	4400	YDLAY1	2334
SECHOL	5113	TIE	6045	WRLOCK	0040	YDLAY2	2335
SECHLP	5015	TIMER1	2160	WRTARG	4432	YES	0503
SECOKS	5225	TIMER2	2161	WRTFIL	0137	YESIN	1125
SECPRM	0522	TIMER3	2175	WRTFLG	4513	YNCONB	2217
SECSAV	5242	TIMOUT	0020	WRTFKS	5055	YNCONC	2250
SECTAB	5614	TMP	2302	WRTGAR	4434	YNCOND	2266
SECTOR	0110	TOOMBS	0723	WRTLUP	4676	YNCONC	2300
SEEK	4451	TOOMNY	1634	WRTTRK	4663	YNEXIT	2302
SEEKOK	2073	TOTAL	1140	WZITFG	4463	ZERBUF	3600
SEKAGN	2040	TRACK	0107	XCONSO	1000		
SEKCNT	0004	TRKPRM	0516	XCRLF	1267		