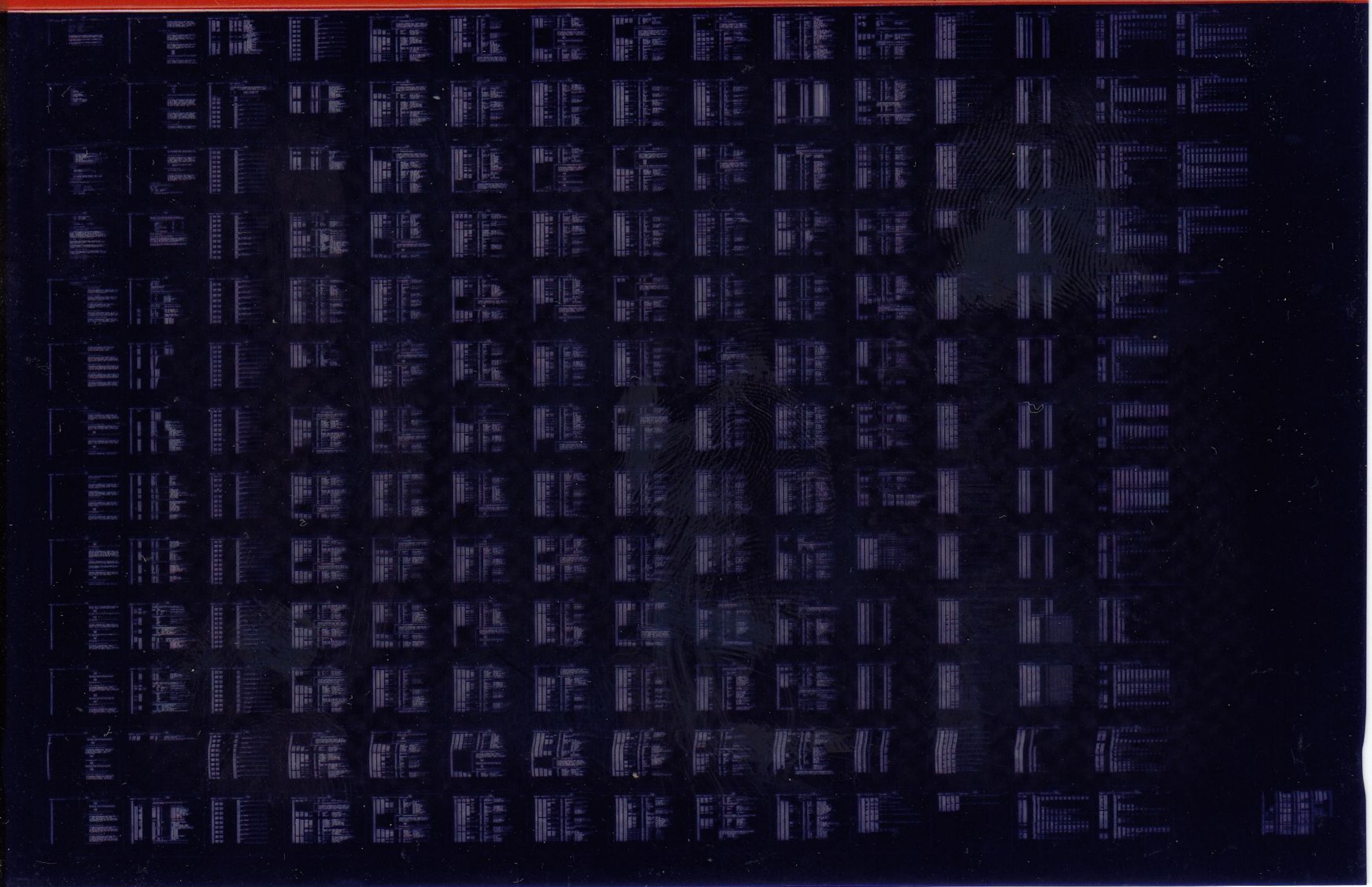
RK611

DISKLESS CONTROL PART 4
CZR6DB0

AH-9110B-MC

FICHE 1 OF 1

MAR 1978
digital
MADE IN USA



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IDENTIFICATION

PRODUCT CODE: AC-S108B-MC

PRODUCT NAME: CZR6DB0 RK611 DSKLS CTRL PRT 4

DATE: FEB 1978

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: ROY SPITZER

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1.0 ABSTRACT

THE RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 4

A. TESTS THE LOADING OF THE DRIVE BUS MESSAGE SHIFT REGISTERS FOR CLASS C COMMANDS.
B. TESTS HEADER GENERATION FOR SEARCH OPERATIONS.
C. TESTS WRITE DATA NPR TRANSFERS TO SILO.
D. TESTS HEADER RECOGNITION.
E. TESTS CYLINDER, TRACK, AND SECTOR INCREMENT AFTER SUCCESSFUL HEADER SEARCH.
F. TESTS DETECTION OF ALL HEADER TYPE ERRORS.
G. TESTS ECC GENERATION AND WRITING.
H. TESTS PARTIAL SECTOR WRITE (ZERO FILL).
I. TESTS 18 BIT FORMAT ECC GENERATION AND DATA WRITE.

NO RK06 DRIVE IS REQUIRED FOR PROGRAM EXECUTION.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11 SYSTEM (16K CORE MEMORY)
CONSOLE TERMINAL
DECTAPE, PAPER TAPE READER, OR DECDISK
RK611 CONTROLLER

2.2 PRELIMINARY PROGRAMS

RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 1 (CZR6A)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 2 (CZR6B)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3 (CZR6C)

3.0 OPERATING PROCEDURES

3.1 LOADING PROCEDURE

THE PROGRAM CAN BE LOADED FROM PAPER TAPE USING ABSOLUTE LOADER OR FROM XXDP MEDIA SUPPORTED BY XXDP.

3.2 STARTING PROCEDURE

LOCATION 200 - START PROGRAM

LOCATION 204 - RESTART PROGRAM

LOCATION 214 - REQUEST BUS ADDRESS, VECTOR ADDRESS, AND PRIORITY MODIFICATION

3.3 OPTIONAL SWITCH SETTINGS

SW15 - HALT PROGRAM
SW14 - LOOP ON TEST
SW13 - INHIBIT ERROR TYPE OUT

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                        SW12 -  ABORT AFTER 20 ERRORS
                        SW11 -  INHIBIT ITERATION COUNT
                        SW10 -  BELL ON ERROR
                        SW9  -  LOOP ON ERROR
                        SW8  -  LOOP ON TEST IN SWITCHES 0-7


                3.4 RUN TIME

                        FIRST PASS              :25 MINUTES
                        SUBSEQUENT PASSES       3:15 MINUTES


                4.0     OPERATING PROCEDURES

                THE PROGRAM IS EXECUTED BY STARTING AT THE APPROPIATE ADDRESS.

                4.1     'SOFTWARE' SWITCH REGISTER

                IF THE PROGRAM IS BEING RUN ON A SWITCHLESS PROCESSOR (I.E., AN 11/04
                OR 11/34) THE PROGRAM WILL DETERMINE THAT THE HARDWARE SWITCH
                REGISTER IS NOT PRESENT AND WILL USE A 'SOFTWARE' SWITCH
                REGISTER.  THE SETTINGS OF THE 'SOFTWARE' SWITCHES ARE CONTROLLED
                THROUGH A KEYBOARD ROUTINE WHICH IS CALLED BY TYPING 'CONTROL G'.  THE
                PROGRAM WILL RECOGNIZE THE 'CONTROL G' AT ANY TIME EXCEPT WHEN THE
                PROGRAM IS AT A HIGHER PRIORITY PROCESSING AN RK06 INTERRUPT.  THE
                'SOFTWARE' SWITCH VALUES ARE ENTERED AS AN OCTAL NUMBER IN RESPONSE
                TO THE PROMPT FROM THE SWITCH ENTRY ROUTINE:

                SWR = NNNNNN     NEW ='

                EACH TIME SWITCH SETTINGS ARE ENTERED, THE ENTIRE SWITCH
                REGISTER IMAGE MUST BE ENTERED.  LEADING ZEROES ARE NOT REQUIRED.
                'RUBOUT' AND 'CONTROL U' FUNCTIONS MAY BE USED TO CORRECT TYPING
                ERRORS DURING SWITCH ENTRY.

                ON PROCESSORS WITH HARDWARE SWITCH REGISTERS, THE 'SOFTWARE' SWITCH
                REGISTER MAY BE USED.  IF THE PROGRAM FINDS ALL 16 SWITCHES
                IN THE 'UP' POSITION, ALL SWITCH REGISTER REFERENCES WILL BE TO THE
                'SOFTWARE' REGISTER AND THE PROCEDURES DESCRIBED ABOVE MUST BE
                FOLLOWED.

                4.2     CONTROL C (↑C) OPERATION

                IF ↑C IS TYPED AT ANY TIME DURING THE PROGRAM EXECUTION THE
                PROGRAM IS HALTED IMMEDIATELY. IF A MONITOR IS PRESENT (XXDP CHAIN,
                ACT, APT) THE PROGRAM RETURNS CONTROL TO THE MONITOR. IF NO MONITOR
                IS PRESENT, THE CPU IS HALTED. DEPRESSING THE CONTINUE KEY WILL DO
                A PROGRAM RESTART.

                4.3     CONTROL S (↑S) OPERATION

                IF ↑S IS TYPED AT ANY TIME THE PROGRAM WILL GO INTO A STALL LOOP
                UNTIL A CONTROL Q (↑Q) IS TYPED.

                4.4     CONTROL Q (↑Q) OPERATION
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IF A ↑S HAS BEEN TYPED, TYPING THE ↑Q CANCELS THE STALL
INITIATED BY THE ↑S.

5.0 PROGRAM DESCRIPTION

**TYPE C INSTRUCTION'S DRIVE MESSAGES

TEST 1 READ DATA SEEK MESSAGE

CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR. PUT TH CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA TO AN RK06, IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7, WORD COUNT 177777. CLOCK IN THE SEEK MESSAGE AND MAKE SURE IT IS GENERATED PROPERLY.

TEST 2 WRITE DATA SEEK MESSAGE

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT CONTROLLER IN MAINTENANCE MODE. ISSUE A WRITE DATA OF ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1777, TRACK 7, DRIVE 7. CLOCK IN SEEK MESSAGE. CHECK IF PROPER MESSAGE IS ASSEMBLED.

TEST 3 SEEK MESSAGE FOR WRITE CHECK

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 1777, HEAD 7, DRIVE 7. CLOCK
IN SEEK COMMAND. MAKE SURE CORRECT MESSAGE
IS ASSEMBLED.

TEST 4 READ DATA CLEAR MESSAGE

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT THE CONTROLLER ON DIAGNOSTIC MODE. ISSUE A READ DATA TO AN RK06, IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7, WORD COUNT 177777. CLOCK IN THE SEEK MESSAGE AND TH CLEAR MESSAGE AND MAKE SURE THE CLEAR MESSAGE IS CORRECT

TEST 5 WRITE DATA AND DRIVE CLEAR MESSAGE

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT CONTROLLER IN MAINTENANCE MODE. ISSUE A WRITE DATA OF ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1777, TRACK 7, DRIVE 7. CLOCK IN SEEK MESSAGE AND DRIVE CLEAR CHECK IF PROPER DRIVE CLEAR MESSAGE IS ASSEMBLED.

TEST 6 DRIVE CLEAR MESSAGE FOR WRITE CHECK

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 1777, HEAD 7, DRIVE 7. CLOCK
THROUGH SEEK MESSAGE AND CLOCK IN DRIVE CLEAR.
MAKE SURE CORRECT MESSAGE IS ASSEMBLED.

**HEADER GENERATION

TEST 7 HEADER GENERATION (PART 1)

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT THE
CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA OF 1
WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0
SECTOR 0. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES.
CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
TO MAKE THAT THE HEADER IS CORRECT. REPEAT FOR CYLINDER
1-1777.

TEST 10 HEADER GENERATION (PART 2)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT
THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA OF
1 WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD
0, SECTOR 0. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGE
CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
TO MAKE THAT THE HEADER IS CORRECT. REPEAT FOR HEADS 1-

TEST 11 HEADER GENERATION (PART 3)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT
THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA OF
ONE WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HE
0, SECTOR 0. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGE
CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
TO MAKE SURE HEADER IS CORRECT. REPEAT FOR SECTORS 1-25

TEST 12 HEADER GENERATION (PART 4)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT
THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA OF
ONE WORD FOR AND RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
HEAD 0, SECTOR 0. CLOCK THROUGH SEEK AND DRIVE CLEAR
MESSAGES, CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE
REGISTER 3 TO MAKE SURE HEADER IS CORRECT. REPEAT FOR 2
SECTOR FORMAT.

```
                                        **NPR TRANSFER FOR WRITE DATA


                                                TEST 13 WRITE DATA NPR TRANSFER

                                                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
                                                        67 WORDS, TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
                                                        TRACK 0, DRIVE 0.  CLOCK IN SEEK AND DRIVE CLEAR MESSAGE
                                                        GIVE ENOUGH CLOCK PULSE FOR 68 SILO WORDS. MAKE SURE DAT
                                                        LATE DOES NOT OCCUR.  READ BACK 66 WORDS AND VERIFY THEY
                                                        ARE CORRECT.


                                        **HEADER RECOGNITION TESTS


                                                TEST 14 WRITE DATA HEADER RECOGNITION

                                                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                                        CONTROLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ON
                                                        WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
                                                        SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                                                        SIMULATE A SECTOR PULSE AND A HEADER WITH THE FOLLOWING
                                                        DATA:

                                                                000000
                                                                140000
                                                                140000

                                                        MAKE SURE WRITE GATE SETS SHOWING CORRECT HEADER RECOGNI



                                                TEST 15 SECTOR PULSE DETECTION FOR WRITE DATA

                                                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                                        CONTROLLER IN MAINTENANCE MODE ISSUE A WRITE DATA OF ONE
                                                        WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
                                                        SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                                                        SIMULATE AN INDEX PULSE AND A HEADER WITH THE FOLLOWING
                                                        DATA:

                                                                000000
                                                                140000
                                                                140000

                                                        MAKE SURE WRITE GATE DOES NOT SET.


                                                TEST 16 SECTOR INCREMENT

                                                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF 0
                                                        TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
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                        SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                        SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
                        THAT WRITE GATE SETS.

                        REPEAT FOR SECTOR 1-24.


                TEST 17 TRACK INCREMENT


                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF 0
                        TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
                        SECTOR 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                        SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
                        THAT WRITE GATE SETS.


                TEST 20 CYLINDER INCREMENT
                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF 0
                        TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 2,
                        SECTOR 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                        SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
                        THAT WRITE GATE SETS.

                        REPEAT FOR CYLINDER = 1-632.


                TEST 21 BAD SECTOR ERROR (PART 1)

                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
                        ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
                        HEAD 0, SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
                        MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER WITH
                        THE FOLLOWING DATA:


                                000000
                                040000
                                040000

                        MAKE SURE BAD SECTOR ERROR SETS.  CHECK THAN DISK ADDRES
                        IS NOT INCREMENTED.


                TEST 22 BAD SECTOR ERROR (PART 2)

                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                        CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
                        ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
                        HEAD 0, SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
                        MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER WITH
```

THE FOLLOWING DATA:

000000
100000
100000

MAKE SURE BAD SECTOR ERROR SETS. CHECK THAT DISK ADDRES IS NOT INCREMENTED.

TEST 23 OPERATION INCOMPLETE

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT CONTROLLER IN MAINTENANCE MODE. ISSUE A WRITE DATA OF ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1253, HEAD 2, SECTOR 23. CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND 32 SECTORS WITH 1 BIT DIFFERENT IN 30 BITS OF OPI DETERMININATION. ALL SIMULATED HEADERS, HAVE GOOD HEADER VRC. MAKE SURE ONLY OPERATION INCOMPLETE AND CONTROLLER ARE THE ONLY ERRORS THAT SET.

TEST 24 HEADER VRC

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT CONTROLLER IN MAINTENANCE MODE. ISSUE A WRITE DATA OF ONE WORD WITH CDT SET IN 24 SECTOR FORMAT, CYLINDER 1253 HEAD 2, SECTOR 23. CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES SIMULATE A SECTOR PULSE AND HEADER WITH BIT 0 OF THE VRC INCORRECT. MAKE SURE ONLY HEADER VRC AND CONTROLLER ERROR ARE THE ONLY ERRORS SET. REPEAT FOR BITS 1-15 OF VRC.

TEST 25 BAD SECTOR ERROR AND HEADER VRC

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT CONTROLLER IN MAINTENANCE MODE. ISSUE A WRITE DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 300. HEAD 1, SECTOR 17, CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE THE FOLLOWING HEADER:

000300
040057
040356

MAKE SURE ONLY HEADER VRC ERROR SETS.

TEST 26 GOOD HEADER AND PREVIOUS BSE

CLEAR RK611 CONTROLLER WITH CONTROLLER CLEAR. PUT CONTRCLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF

ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 100,
HEAD 0, SECTOR 1. CLOCK THROUGH SEEK AND DRIVE CLEAR
MESSAGES. SIMULATE A SECTOR PULSE AND A HEADER OF THE
FOLLOWING 3 WORDS WITH A BAD SECTOR INDICATION:

```
000100
040000
040100
```

MAKE SURE NO ERROR IS REPORTED AND WRITE GATE DOES NOT
SET. SIMULATE A SECTOR PULSE AND A HEADER OF THE FOLLOW
3 WORDS:

```
000100
140001
140101
```

MAKE SURE WRITE GATE SETS INDICATING THAT HEADER HAS
BEEN RECOGNIZED.

TEST 27 GOOD HEADER AND PREVIOUS HVRC

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT
CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF
ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 200,
HEAD 0, SECTOR 1. CLOCK THROUGH SEEK AND DRIVE CLEAR
MESSAGES. SIMULATE A SECTOR PULSE AND A HEADER OF THE
FOLLOWING 3 WORDS WITH A BAD HEADER VRC:

```
000200
140000
140000
```

MAKE SURE NO ERROR IS REPORTED AND WRITE GATE DOES NOT
SET. SIMULATE A SECTOR PULSE AND A HEADER OF THE
FOLLOWING 3 WORDS:

```
000200
140001
140201
```

MAKE SURE WRITE GATE SEES INDICATING THAT HEADER HAS
BEEN RECOGNIZED.

TEST 30 BAD SECTOR ERROR AND PREVIOUS HVRC

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A
WRITE DATA OF ONE WORD TO AN RK06 IN 26 SECTOR
FORMAT, CYLINDER 400, HEAD 0, SECTOR 1. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A HEADER OF THE FOLLOWING 3 WORDS WITH A

BAD HEADER VRC:

000400
140000
140000

MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
DOES NOT SET. SIMULATE A SECTOR PULSE AND A
HEADER CONSISTING OF THE FOLLOWING 3 WORDS:

000400
040001
040401

MAKE SURE BAD SECTOR ERROR SETS AND HEADER VRC
ERROR DOES NOT SET.

TEST 31 HEADER VRC AND PREVIOUS BSE

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A
WRITE DATA OR ONE WORD TO AN RK06 IN 26 SECTOR
FORMAT, CYLINDER 140, HEAD 0, SECTOR 1. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A HEADER OF THE FOLLOWING 3 WORDS WITH A HEADER
VRC ERROR:

000140
040000
040140

MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
DOES NOT SET. STIMULATE A SECTOR PULSE AND A
HEADER CONSISTING OF THE FOLLOWING THREE WORDS:

000140
140001
140101

MAKE SURE HEADER VRC ERROR SETS AND BAD SECTOR
ERROR DOES NOT SET.

TEST 32 OPI AND HVRC ON LAST HEADER

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 240, HEAD 0, SECTOR 1. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND 30 HEADERS CONSISTING OF THE FOLLOWING 3 WORDS:

000240

```
                                        140000
                                        140240

                                MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
                                DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
                                HEADER CONSISTING OF THE FOLLOWING THREE WORDS:

                                        000240
                                        140000
                                        140040

                                MAKE SURE HEADER VRC AND OPI ERROR SET.


                        TEST 33 OPI AND PREVIOUS HEADER VRC (PART 1)

                                CLEAR THE RK611 CONTROLLER WITH A  CONTROLLER CLEAR.
                                PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                                DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
                                CYLINDER 300, HEAD 0, SECTOR 1.  CLOCK THROUGH
                                SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A
                                SECTOR PULSE AND 30 HEADERS CONSISTING OF THE
                                FOLLOWING 3 WORDS:

                                        000300
                                        140000
                                        140300


                                THEN SIMULATE A 3 WORD HEADER CONSISTING ON
                                THE FOLLOWING DATA:

                                        000300
                                        140000
                                        140200

                                MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
                                DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
                                HEADER CONSISTING OF THE FOLLOWING THREE WORDS:

                                        000300
                                        140000
                                        140300

                                MAKE SURE HEADER VRC AND OPI ERRORS SET.


                        TEST 34 OPI AND PREVIOUS HEADER VRC (PART 2)

                                CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                                DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
                                CYLINDER 40, HEAD 0, SECTOR 1.  CLOCK THROUGH
                                SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
                                PULSE AND A HEADER CONSISTING OF THE FOLLOWING
```

THREE WORDS HAVING A BAD HEADER VRC:

000040
140000
140000

MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
DOES NOT SET. SIMULATE A SECTOR PULSE AND 31
HEADERS CONSISTING OF THE FOLLOWING THREE WORDS:

000040
140000
140040

MAKE SURE HEADER VRC AND OPI ERRORS SET.

TEST 35 BSE AND CONTROLLER ERROR

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA
OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A HEADER WITH A BSE ERROR. MAKE SURE CONTROLLER
ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
CONTROLLER ERROR RESETS.

TEST 36 HVRC AND CONTROLLER ERROR

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA
OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 300, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A HEADER WITH A HVRC ERROR. MAKE SURE CONTROLLER
ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
CONTROLLER ERROR RESETS.

TEST 37 READ DATA AND HVRC ERROR

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 300, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A HEADER WITH A HVRC ERROR. MAKE SURE CONTROLLER
ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
CONTROLLER ERROR RESETS.

TEST 40 WRITE CHECK AND HVRC

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 300, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND
A HEADER WITH A HEADER VRC ERROR. MAKE SURE
HVRC AND CONTROLLER ERROR ARE SET. CLEAR CONTROLLER
AND MAKE SURE CONTROLLER ERROR RESETS.

**ECC GENERATION TESTS

TEST 41 ECC INITIALIZATION

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF 10 WORDS TO AN RK06, IN 26 SECTOR
FORMAT, CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
A SECTOR PULSE AND A GOOD HEADER. CLOCK THROUGH ONLY FO
DATA WORDS OF ZEROES. MAKE SURE THE ECC PATTERN
REGISTER REMAINS ZERO.

TEST 42 ECC GENERATION (PART 1)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
FORMAT, CYLINER 0, HEAD 0, SECTOR 0. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR
PULSE AND A GOOD HEADER. CLOCK THROUGH ONLY THE
FOLLOWING SIX WORDS OF DATA:

005001
040040
020004
000064
000000
000000

CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.

TEST 43 ECC GENERATION (PART 2)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
FORMAT, CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH
SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE

AND A GOOD HEADER. CLOCK THROUGH ONLY THE FOLLOWING
SIX WORDS OF DATA:

177777
177777
177777
177777
177777
177777

CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.

TEST 44 ECC WRITING

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF 400 WORDS. TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGE. SIMULATE A SECTOR PULSE
AND A GOOD HEADER. CLOCK THROUGH ALL 400 WORDS
AND THE TWO ECC WORDS. MAKE SURE THE TWO ECC WORDS
ARE CORRECT AND WRITTEN PROPERLY. CHECK BUS ADDRESS,
WORD COUNT, CYLINDER, TRACK, AND SECTOR.

**PARTIAL WRITE DATA

TEST 45 ZERO FILL ON WRITE DATA

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
DATA OF 103 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A GOOD HEADER. CLOCK THROUGH ALL 400 WORDS AND
THE TWO ECC WORDS. CHECK THE SECTOR FOR ZERO FILL
AND MAKE SURE THE TWO ECC WORDS ARE WRITTEN PROPERLY.
CHECK BUS ADDRESS, WORD COUNT, CYLINDER, TRACK, AND SECT

**18 BIT FORMAT WRITES

TEST 46 18 BIT WRITE DATA (PART 1)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA
OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK

AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A GOOD HEADER. CLOCK THROUGH 6 WORDS OF 177777.
VERIFY THAT TWO ZERO BITS ARE PRESENT FOR EACH WORD.

TEST 47 18 BIT WRITE DATA (PART 2)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA
OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A GOOD HEADER. CLOCK THROUGH 6 WORDS OF 177777
WITH BAD PARITY SET. VERIFY WRITING OF TWO PARITY
BITS ON SIMULATED DISK.

NOTE: THIS TEST IS ONLY EXECUTED IF MEMORY
PARITY ENABLE IS PRESENT FOR BUFFER
LOCATION.

TEST 50 CLEAR BAD PARITY BUFFER

THE SOLE PURPOSE OF THIS TEST IS TO CLEAR BADPAR
BUFFER AND REMOVE THE BAD PARITY.

TEST 51 18 BIT WRITE DATA (PART 3)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA
OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
AND A GOOD HEADER. CLOCK THROUGH 400 18 BIT WORDS
AND THE 32 BIT ECC. VERIFY THAT THE ECC IS
WRITTEN CORRECTLY.

6.0 ERROR REPORTING

THE GENERAL FORMAT OF ERROR REPORTS IS:

```
OPERATION DESCRIPTION AND ERROR DESCRIPTION
TEST     ERROR
NUM      PC
XXXXXX   YYYYYY
  EXPECT   ACTUAL   OTHER PERTENANT
  REG      REG      INFORMATION
  ZZZZZZ   WWWWWW   AAAAAA
```

NOTE: MORE THAN ONE SET OF EXPECT/ACTUAL REGISTERS MAY BE
PRINTED OUT. OTHER PERTENANT INFORMATION MAY CONSIST
OF MORE THAN ONE WORD.

OTHER PERTINENT INFORMATION MAY CONTAIN A WORD LABELED
"BIT COUNT". THIS COUNT IS REPORTED WHEN THE OPERATION BEING
PERFORMED INVOLVES CLOCKING THE CONTROLLER THROUGH ONE OR MORE
OF THE VARIOUS FIELDS THAT MAKE UP THE PHYSICAL SECTOR FORMAT.

THESE FIELDS (ALL VALUES GIVEN IN OCTAL) ARE:

FIELD	BITS	WORDS
HEADER PREAMBLE	400	20
HEADER	60	3
GAP	100	4
DATA PREAMBLE	400	20
DATA		
(22(10) SECTOR/TRACK)	10000	400
(20(10) SECTOR/TRACK)	11000	400
ECC	40	2
POSTAMBLE	20	1
GAP		
(22(10) SECTOR/TRACK)	160	7
(20(10) SECTOR/TRACK)	140	6

REFER TO THE RK06 UNIBUS DISK SUBSYSTEM SPECIFICATION FOR MORE
DETAILED DESCRIPTION.

THE "BIT COUNT" REPORTED IS INITIALIZED AT THE START OF EACH FIELD
AND IS INCREMENTED FOR EACH BIT PROCESSED.

WHEN THE OPERATION BEING PERFORMED INVOLVES WRITING, OTHER PERTINENT
INFORMATION MAY CONTAIN WORDS LABELED PRESENT BIT, PRESENT BIT -1,
PRESENT BIT -2, AND PRESENT BIT +1. THESE BITS ARE PRESENTED IN THIS
WAY TO SHOW THE WRITE DATA STREAM IN THE SAME MANNER THAT THE
RK611 LOOKS AT THE DATA STREAM TO COMPUTE PRECOMPENSATION ADVANCE
AND PRECOMPENSATION DELAY IN THE WRITE OPERATION.

WHEN THE OPERATION BEING PERFORMED INVOLVES READING, OTHER PERTINENT
INFORMATION MAY CONTAIN PREVIOUS BIT AND PRESENT BIT WORDS. THESE
BITS RELATE TO RK611 LOGIC THAT DETERMINES WHEN THE BIT IS VALID
FROM THE DECODER.

%

```
                                ; *** REV 003 ***
                                .NLIST  CND,MD,MC
                                .LIST   ME
                                .ENABL  ABS,AMA
167400                          $SWR=   167400
000001                          $TN=    1
                                .TITLE  CZR6DB0 RK611 DSKLS CTRL PRT4
                                ;*COPYRIGHT (C) 1976,1977
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY ROY SPITZER
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                                ;*
                                .SBTTL  OPERATIONAL SWITCH SETTINGS
                                ;*
                                ;*      SWITCH                  USE
                                ;*      ------          --------------------
                                ;*        15            HALT ON ERROR
                                ;*        14            LOOP ON TEST
                                ;*        13            INHIBIT ERROR TYPEOUTS
                                ;*        12            ABORT PROGRAM AFTER 20 ERRORS
                                ;*        11            INHIBIT ITERATIONS
                                ;*        10            BELL ON ERROR
                                ;*         9            LOOP ON ERROR
                                ;*         8            LOOP ON TEST IN SWR<7:0>
                                .SBTTL  BASIC DEFINITIONS
                                ;
                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                          STACK=  1100
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
                                ;
                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER
                                ;
                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
000007                          R7=     %7              ;;GENERAL REGISTER
```

```
                        SP=     %6              ;;STACK POINTER
                        PC=     %7              ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
                        PR0=    0               ;;PRIORITY LEVEL 0
                        PR1=    40              ;;PRIORITY LEVEL 1
                        PR2=    100             ;;PRIORITY LEVEL 2
                        PR3=    140             ;;PRIORITY LEVEL 3
                        PR4=    200             ;;PRIORITY LEVEL 4
                        PR5=    240             ;;PRIORITY LEVEL 5
                        PR6=    300             ;;PRIORITY LEVEL 6
                        PR7=    340             ;;PRIORITY LEVEL 7

                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
020000                  SW13=   20000
010000                  SW12=   10000
004000                  SW11=   4000
002000                  SW10=   2000
001000                  SW09=   1000
000400                  SW08=   400
000200                  SW07=   200
000100                  SW06=   100
000040                  SW05=   40
000020                  SW04=   20
000010                  SW03=   10
000004                  SW02=   4
000002                  SW01=   2
000001                  SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                         EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                  BIT15=  100000
040000                  BIT14=  40000
020000                  BIT13=  20000
010000                  BIT12=  10000
004000                  BIT11=  4000
002000                  BIT10=  2000
001000                  BIT09=  1000
000400                  BIT08=  400
000200                  BIT07=  200
000100                  BIT06=  100
000040                  BIT05=  40
000020                  BIT04=  20
000010                  BIT03=  10
000004                  BIT02=  4
```

```
                        BIT01=  2
                        BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;"T" BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
000034                  TRAPVEC=34              ;;"TRAP" TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
000114                  MEMVEC= 114                     ;MEMORY PARITY VECTOR
172100                  MEMBAS= 172100                  ;MEMORY PARITY BUS ADDRESS
000001                  PAR.EN= 1                       ;ENABLE MEMORY PARITY
000005                  WR.PAR= 5                       ;WRITE BAD PARITY
000210                  AVECT1= 210                     ;DEFINE RK611 VECTOR ADDRESS
000240                  APRIOR= PR5                     ;DEFINE RK611 PRIORITY
177440                  ABASE=  177440                  ;DEFINE BASE OF RK611 REGISTERS

                        .SBTTL  RK611 CONTROLLER REGISTER DEFINITION

000000                  RKCS1=  0                       ;CONTROL AND STATUS REGISTER 1
000002                  RKWC=   2                       ;WORD COUNT REGISTER
000004                  RKBA=   4                       ;BUS ADDRESS REGISTER
000006                  RKDA=   6                       ;DESIRED TRACK SECTOR REGISTER
000010                  RKCS2=  10                      ;CONTROL AND STATUS REGISTER 2
000012                  RKDS=   12                      ;DRIVE STATUS REGISTER
000014                  RKER=   14                      ;ERROR REGISTER
000016                  RKASOF= 16                      ;ATTENTION SUMMARY AND OFFSET REGISTER
000020                  RKDCYL= 20                      ;DESIRED CYLINDER REGISTER
000024                  RKDB=   24                      ;DATA BUFFER
000026                  RKMR1=  26                      ;MAINTENANCE REGISTER 1
000034                  RKMR2=  34                      ;MAINTENANCE REGISTER 2
000036                  RKMR3=  36                      ;MAINTENANCE REGISTER 3
000030                  RKECPS= 30                      ;ECC POSITION INFORMATION
000032                  RKECPT= 32                      ;ECC PATTERN INFORMATION
000022                  RKSPAR= 22                      ;SPARE REGISTER

                        .SBTTL  DRIVE COMMANDS

000001                  SELDRV= 01                      ;SELECT DRIVE
```

```
1048            000003                  PACK=   03                      ;PACK ACKNOWLEDGE
1049            000005                  CLEAR=  05                      ;DRIVE CLEAR
1050            000007                  UNLOAD= 07                      ;UNLOAD
1051            000011                  SRTSPL= 11                      ;START SPINDLE
1052            000013                  RECAL=  13                      ;RECALIBRATE
1053            000015                  OFFSET= 15                      ;OFFSET
1054            000017                  SEEK=   17                      ;SEEK
1055            000021                  RDDATA= 21                      ;READ DATA
1056            000023                  WRDATA= 23                      ;WRITE DATA
1057            000025                  RDHEAD= 25                      ;READ HEADER
1058            000027                  WRHEAD= 27                      ;WRITE HEADER AND DATA
1059            000031                  WRTCHK= 31                      ;WRITE CHECK
1060            000300                  INTR=   300                     ;GENERATE INTERRUPT TO CPU
1061
1062                                    .SBTTL  CONTROL AND STATUS REGISTER 1 BITS
1063
1064            000001                  GO=     BIT0                    ;GO BIT
1065            000100                  IE=     BIT6                    ;INTERRUPT ENABLE
1066            000200                  RDY=    BIT7                    ;CONTROLLER READY
1067            000400                  BA16=   BIT8                    ;BUS ADDRESS BIT 16
1068            001000                  BA17=   BIT9                    ;BUS ADDRESS BIT 17
1069            002000                  CDT=    BIT10                   ;CONTROLLER DRIVE TYPE (0=RK06)
1070            004000                  CTO=    BIT11                   ;CONTROLLER TIMED OUT WAITING FOR
1071                                                                    ;  DRIVE RESPONSE
1072            010000                  CFMT=   BIT12                   ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
1073            020000                  SPAR=   BIT13                   ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
1074            040000                  DI=     BIT14                   ;DRIVE INTERRUPT
1075            100000                  CERR=   BIT15                   ;CONTROLLER ERROR
1076            100000                  CCLR=   BIT15                   ;CONTROLLER CLEAR
1077
1078                                    .SBTTL  CONTROL AND STATUS REGISTER 2 BITS
1079
1080            000007                  DRVMSK= 7                       ;MASK FOR DRIVE SELECTION CODE
1081            000010                  RLS=    BIT3                    ;DESELECT OR RELEASE DRIVE IN BITS 0-2
1082            000020                  BAI=    BIT4                    ;BUS ADDRESS INCREMENT INHIBIT
1083            000040                  SCLR=   BIT5                    ;CLEAR CONTROLLER AND ALL DRIVES
1084            000100                  IR=     BIT6                    ;INPUT READY
1085            000200                  OR=     BIT7                    ;OUTPUT READY
1086            000400                  UFE=    BIT8                    ;UNIT FIELD ERROR
1087            001000                  MDS=    BIT9                    ;MULTIPLE DRIVE SELECT
1088            002000                  PGE=    BIT10                   ;PROGRAMMING ERROR
1089            004000                  NEM=    BIT11                   ;NON-EXISTENT MEMORY
1090            010000                  NED=    BIT12                   ;NON-EXISTENT DRIVE
1091            020000                  UPE=    BIT13                   ;UNIBUS PARITY ERROR
1092            040000                  WCE=    BIT14                   ;WRITE CHECK ERROR
1093            100000                  DLT=    BIT15                   ;DATA LATE ERROR
1094
1095                                    .SBTTL  ERROR REGISTER BIT DEFINITION
1096
1097            000001                  ILF=    BIT0                    ;ILLEGAL FUNCTION CODE
1098            000002                  SKI=    BIT1                    ;SEEK INCOMPLETE
1099            000004                  NXF=    BIT2                    ;NON-EXECUTABLE DRIVE FUNCTION
1100            000010                  DRPAR=  BIT3                    ;DRIVE DETECTED DRIVE BUS PARITY ERROR
1101            000020                  FMTE=   BIT4                    ;FORMAT ERROR
1102            000040                  DTYE=   BIT5                    ;DRIVE TYPE ERROR
1103            000100                  ECH=    BIT6                    ;ECC HARD
```

```
                        BSE=    BIT7                    ;BAD SECTOR ERROR
                        HVRC=   BIT8                    ;HEADER VRC ERRROR
                        COE=    BIT9                    ;CYLINDER ADDRESS OVERFLOW ERROR
                        IDAE=   BIT10                   ;INVALID DISK ADDRESS ERROR
                        WLE=    BIT11                   ;WRITE LOCK ERROR
                        DTE=    BIT12                   ;DRIVE TIMING ERROR
                        OPI=    BIT13                   ;OPERATION (SEARCH) INCOMPLETE
                        UNS=    BIT14                   ;DRIVE UNSAFE
                        DCK=    BIT15                   ;DATA CHECK

                        .SBTTL  STATUS REGISTER BIT DEFINITION

                        DRA=    BIT0                    ;DRIVE AVAILABLE (CONTROLLER IS SET IF
                                                        ;  THIS BIT IS RESET)
                        OFST=   BIT2                    ;DRIVE OFFSET
                        ACLO=   BIT3                    ;AC LOW
                        SPDLSS= BIT4                    ;SPEED LOSS
                        DROT=   BIT5                    ;DRIVE OFF TRACK
                        VV=     BIT6                    ;VOLUME VALID
                        DRDY=   BIT7                    ;DRIVE READY
                        DDT=    BIT8                    ;DRIVE TYPE (0=RK06)
                        WRL=    BIT11                   ;WRITE LOCK
                        PIP=    BIT13                   ;POSITIONING IN PROGRESS
                        DSC=    BIT14                   ;DRIVE STATUS CHANGE
                        SVAL=   BIT15                   ;STATUS VALID

                        .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION

                        MESMSK= 17                      ;MESSAGE MASK

                        PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
                        DMD=    BIT5                    ;DIAGNOSTIC MODE
                        MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
                        MIND=   BIT7                    ;MAINTENANCE INDEX
                        MCLK=   BIT8                    ;MAINTENANCE CLOCK
                        MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
                        MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
                        PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
                        PCD=    BIT12                   ;PRECOMPENSATION DELAY
                        ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
                        WRTGAT= BIT14                   ;WRITE GATE
                        RDGATE= BIT15                   ;READ GATE

                        .SBTTL  TRANSMITTED MESSAGE A

                        S.SEEK= BIT4                    ;SEEK COMMAND
                        S.RECL= BIT5                    ;RECALIBRATE COMMAND
                        S.STSP= BIT6                    ;START SPINDLE COMMAND
                        S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
                        S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
                        S.FMT=  BIT9                    ;FORMAT
                        S.UNLD= BIT10                   ;UNLOAD
                        S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
                        .SBTTL  TRAP CATCHER

                                .=0
```

```
                                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                 000174                         .=174
000174  000000                         DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
000176  000000                         SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
                                        .SBTTL  STARTING ADDRESS(ES)
000200  000137  003334                         JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
000204  000137  003324                         JMP     RESTRT          ;JUMP TO RESTART ROUTINE
                 000214                         .=214
000214  000137  003314                         JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
                                        .SBTTL  ACT11 HOOKS

                                        ;;**************************************************************
                                        ;HOOKS REQUIRED BY ACT11
                 000220                         $SVPC=.                 ;SAVE PC
                 000046                         .=46
000046  034062                         $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                 000052                         .=52
000052  000000                         .WORD   0                       ;;2)SET LOC.52 TO ZERO
                 000220                         .=$SVPC                 ;; RESTORE PC
                 000114                         .=MEMVEC
000114  034526                         MEMERR                          ;MEMPARITY ERROR HANDLER
000116  000340                         PR7
                 001000                         .=1000
                                        .SBTTL  APT PARAMETER BLOCK

                                        ;;**************************************************************
                                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                        ;;**************************************************************
                 001000                         .$X=.   ;;SAVE CURRENT LOCATION
                 000024                         .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                         200     ;;FOR APT START UP
                 000044                         .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  001000                         $APTHDR ;;POINT TO APT HEADER BLOCK
                 001000                         .=.$X   ;;RESET LOCATION COUNTER
                                        ;;**************************************************************
                                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                        ;INTERFACE SPEC.

001000                                  $APTHD:
001000  000000                         $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
001002  001214                         $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
001004  000000                         $TSTM:  .WORD           ;;RUN TIM OF LONGEST TEST
001006  000000                         $PASTM: .WORD           ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
001010  000000                         $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
001012  000032                                 .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
                 000100                 MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
                 000200                 MIND=   BIT7                    ;MAINTENANCE INDEX
                 000400                 MCLK=   BIT8                    ;MAINTENANCE CLOCK
                 001000                 MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
                 002000                 MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
                 004000                 PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
                 010000                 PCD=    BIT12                   ;PRECOMPENSATION DELAY
                 020000                 ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
                 040000                 WRTGAT= BIT14                   ;WRITE GATE
```

```
                                        APT PARAMETER BLOCK

  1216          100000                  RDGATE= BIT15                   ;READ GATE
  1217
  1218                                  .SBTTL  TRANSMITTED MESSAGE A
  1219
  1220          000020                  S.SEEK= BIT4                    ;SEEK COMMAND
  1221          000040                  S.RECL= BIT5                    ;RECALIBRATE COMMAND
  1222          000100                  S.STSP= BIT6                    ;START SPINDLE COMMAND
  1223          000200                  S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
  1224          000400                  S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
  1225          001000                  S.FMT=  BIT9                    ;FORMAT
  1226          002000                  S.UNLD= BIT10                   ;UNLOAD
  1227          004000                  S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
  1228                                  .SBTTL  TRAP CATCHER
  1229
  1230          000000                          .=0
  1231                                  ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
  1232                                  ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
  1233                                  ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
  1234          000174                          .=174
  1235  000174  000000                 DISPREG: .WORD  0                ;;SOFTWARE DISPLAY REGISTER
  1236  000176  000000                 SWREG:   .WORD  0                ;;SOFTWARE SWITCH REGISTER
  1237                                  .SBTTL  STARTING ADDRESS(ES)
  1238  000200  000137  003334                JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
  1239  000204  000137  003324                JMP     RESTRT          ;JUMP TO RESTART ROUTINE
  1240          000214                        .=214
  1241  000214  000137  003314                JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
  1242                                  .SBTTL  ACT11 HOOKS
  1243
  1244                                  ;;*****************************************************************
  1245                                  ;HOOKS REQUIRED BY ACT11
  1246          000220                        $SVPC=.                   ;SAVE PC
  1247          000046                        .=46
  1248  000046  034062                       $ENDAD                    ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
  1249          000052                        .=52
  1250  000052  000000                       .WORD   0                 ;;2)SET LOC.52 TO ZERO
  1251          000220                        .=$SVPC                   ;; RESTORE PC
  1252          000114                        .=MEMVEC
  1253  000114  034526                       MEMERR                    ;MEMPARITY ERROR HANDLER
  1254  000116  000340                       PR7
  1255          001000                        .=1000
  1256                                  .SBTTL  APT PARAMETER BLOCK
  1257
  1258                                  ;;*****************************************************************
  1259                                  ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
  1260                                  ;;*****************************************************************
  1261          001000                        .$X=.     ;;SAVE CURRENT LOCATION
  1262          000024                        .=24      ;;SET POWER FAIL TO POINT TO START OF PROGRAM
  1263  000024  000200                       200       ;;FOR APT START UP
  1264          000044                        .=44      ;;POINT TO APT INDIRECT ADDRESS PNTR.
  1265  000044  001000                       $APTHDR   ;;POINT TO APT HEADER BLOCK
  1266          001000                        .=.$X     ;;RESET LOCATION COUNTER
  1267                                  ;;*****************************************************************
  1268                                  ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
  1269                                  ;INTERFACE SPEC.
  1270
  1271  001000                        $APTHD:
```

```
  1272  001000  000000                $HIBTS: .WORD   0         ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
  1273  001002  001214                $MBADR: .WORD   $MAIL     ;;ADDRESS OF APT MAILBOX (BITS 0-15)
  1274  001004  000000                $TSTM:  .WORD             ;;RUN TIM OF LONGEST TEST
  1275  001006  000000                $PASTM: .WORD             ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
  1276  001010  000000                $UNITM: .WORD             ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
  1277  001012  000032                        .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                                .SBTTL  COMMON TAGS

                                ;;*****************************************************************
                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

                        001100                  .=1100
001100                  $CMTAG:                                 ;;START OF COMMON TAGS
001100  000000                  .WORD   0
001102     000          $TSTNM: .BYTE   0                       ;;CONTAINS THE TEST NUMBER
001103     000          $ERFLG: .BYTE   0                       ;;CONTAINS ERROR FLAG
001104  000000          $ICNT:  .WORD   0                       ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000          $LPADR: .WORD   0                       ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000          $LPERR: .WORD   0                       ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000          $ERTTL: .WORD   0                       ;;CONTAINS TOTAL ERRORS DETECTED
001114     000          $ITEMB: .BYTE   0                       ;;CONTAINS ITEM CONTROL BYTE
001115     001          $ERMAX: .BYTE   1                       ;;CONTAINS MAX. ERRORS PER TEST
001116  000000          $ERRPC: .WORD   0                       ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000          $GDADR: .WORD   0                       ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000          $BDADR: .WORD   0                       ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000          $GDDAT: .WORD   0                       ;;CONTAINS 'GOOD' DATA
001126  000000          $BDDAT: .WORD   0                       ;;CONTAINS 'BAD' DATA
001130  000000                  .WORD   0                       ;;RESERVED--NOT TO BE USED
001132  000000                  .WORD   0
001134     000          $AUTOB: .BYTE   0                       ;;AUTOMATIC MODE INDICATOR
001135     000          $INTAG: .BYTE   0                       ;;INTERRUPT MODE INDICATOR
001136  000000                  .WORD   0
001140  177570          SWR:    .WORD   DSWR                    ;;ADDRESS OF SWITCH REGISTER
001142  177570          DISPLAY: .WORD  DDISP                   ;;ADDRESS OF DISPLAY REGISTER
001144  177560          $TKS:   177560                          ;;TTY KBD STATUS
001146  177562          $TKB:   177562                          ;;TTY KBD BUFFER
001150  177564          $TPS:   177564                          ;;TTY PRINTER STATUS REG. ADDRESS
001152  177566          $TPB:   177566                          ;;TTY PRINTER BUFFER REG. ADDRESS
001154     000          $NULL:  .BYTE   0                       ;;CONTAINS NULL CHARACTER FOR FILLS
001155     002          $FILLS: .BYTE   2                       ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001156     012          $FILLC: .BYTE   12                      ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001157     000          $TPFLG: .BYTE   0                       ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
001160  000000          $TMP0:  .WORD   0                       ;;USER DEFINED
001162  000000          $TMP1:  .WORD   0                       ;;USER DEFINED
001164  000000          $TMP2:  .WORD   0                       ;;USER DEFINED
001166  000000          $TMP3:  .WORD   0                       ;;USER DEFINED
001170  000000          $TMP4:  .WORD   0                       ;;USER DEFINED
001172  000000          $TMP5:  .WORD   0                       ;;USER DEFINED
001174  000000          $TMP6:  .WORD   0                       ;;USER DEFINED
001176  000000          $TMP7:  .WORD   0                       ;;USER DEFINED
001200  000000          $TIMES: 0                               ;;MAX. NUMBER OF ITERATIONS
001202  000000          $ESCAPE:0                               ;;ESCAPE ON ERROR ADDRESS
001204  177607  000377    $BELL:  .ASCIZ  <207><377><377>       ;;CODE FOR BELL
001210     077          $QUES:  .ASCII  /?/                     ;;QUESTION MARK
001211     015          $CRLF:  .ASCII  <15>                    ;;CARRIAGE RETURN
001212  000012          $LF:    .ASCIZ  <12>                    ;;LINE FEED
                                ;;*****************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;*****************************************************************
                                .EVEN
```

```
1334  001214                    $MAIL:
1335  001214  000000            $MSGTY: .WORD   AMSGTY   ;;APT MAILBOX
1336  001216  000000            $FATAL: .WORD   AFATAL   ;;MESSAGE TYPE CODE
1337  001220  000000            $TESTN: .WORD   ATESTN   ;;FATAL ERROR NUMBER
1338  001222  000000            $PASS:  .WORD   APASS    ;;TEST NUMBER
1339  001224  000000            $DEVCT: .WORD   ADEVCT   ;;PASS COUNT
1340  001226  000000            $UNIT:  .WORD   AUNIT    ;;DEVICE COUNT
1341  001230  000000            $MSGAD: .WORD   AMSGAD   ;;I/O UNIT NUMBER
1342  001232  000000            $MSGLG: .WORD   AMSGLG   ;;MESSAGE ADDRESS
1343  001234                    $ETABLE:                 ;;MESSAGE LENGTH
1344  001234     000            $ENV:   .BYTE   AENV     ;;APT ENVIRONMENT TABLE
1345  001235     000            $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT BYTE
1346  001236  000000            $SWREG: .WORD   ASWREG   ;;ENVIRONMENT MODE BITS
1347  001240  000000            $USWR:  .WORD   AUSWR    ;;APT SWITCH REGISTER
1348  001242  000000            $CPUOP: .WORD   ACPUOP   ;;USER SWITCHES
1349                            ;*                       ;;CPU TYPE,OPTIONS
1350                            ;*                       BITS 15-11=CPU TYPE
1351                            ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1352                            ;*                              11/70=06,PDQ=07,Q=10
1353                            ;*                       BIT 10=REAL TIME CLOCK
1354                            ;*                       BIT  9=FLOATING POINT PROCESSOR
1355  001244     000            $MAMS1: .BYTE   AMAMS1   ;;BIT  8=MEMORY MANAGEMENT
1356  001245     000            $MTYP1: .BYTE   AMTYP1   ;;HIGH ADDRESS,M.S. BYTE
1357                            ;*                       ;;MEM. TYPE BLK#1
1358                            ;*                       MEM.TYPE BYTE   --  (HIGH BYTE)
1359                            ;*                              900 NSEC CORE=001
1360                            ;*                              300 NSEC BIPOLAR=002
1361  001246  000000            $MADR1: .WORD   AMADR1   ;;     500 NSEC MOS=003
1362                            ;*                       ;;HIGH ADDRESS,BLK#1
1363  001250     000            $MAMS2: .BYTE   AMAMS2   ;;  MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1364  001251     000            $MTYP2: .BYTE   AMTYP2   ;;HIGH ADDRESS,M.S. BYTE
1365  001252  000000            $MADR2: .WORD   AMADR2   ;;MEM.TYPE,BLK#2
1366  001254     000            $MAMS3: .BYTE   AMAMS3   ;;MEM.LAST ADDRESS,BLK#2
1367  001255     000            $MTYP3: .BYTE   AMTYP3   ;;HIGH ADDRESS,M.S.BYTE
1368  001256  000000            $MADR3: .WORD   AMADR3   ;;MEM.TYPE,BLK#3
1369  001260     000            $MAMS4: .BYTE   AMAMS4   ;;MEM.LAST ADDRESS,BLK#3
1370  001261     000            $MTYP4: .BYTE   AMTYP4   ;;HIGH ADDRESS,M.S.BYTE
1371  001262  000000            $MADR4: .WORD   AMADR4   ;;MEM.TYPE,BLK#4
1372  001264  000210            $VECT1: .WORD   AVECT1   ;;MEM.LAST ADDRESS,BLK#4
1373  001266  000000            $VECT2: .WORD   AVECT2   ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1374  001270  177440            $BASE:  .WORD   ABASE    ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1375  001272  000000            $DEVM:  .WORD   ADEVM    ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1376  001274  000000            $CDW1:  .WORD   ACDW1    ;;DEVICE MAP
1377  001276  000000            $CDW2:  .WORD   ACDW2    ;;CONTROLLER DESCRIPTION WORD#1
1378  001300                    $EIEND:                  ;;CONTROLLER DESCRIPTION WORD#2
1379                            .MEXIT
```

```
                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT


001300                          $ERRTB:
                                ;       ERROR 1:  UNEXPECTED MEMORY PARTIY ENAB.E TRAP
001300  046111                          EM000
001302  044116                          DH000C
001304  042456                          DT000
001306  043012                          DF000
                                ;       ERROR 2:  WRITE BIT ERROR
001310  000000                  EMW:    0
001312  000000                          0
001314  042462                          DT002
001316  043016                          DF002
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       CS1 INCORRECT
001320  046156                          EM300
001322  052052                          EM4000
001324  042504                          DT003
001326  043042                          DF003
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       MESS A INCORRECT
001330  046156                          EM300
001332  052070                          EM4001
001334  042504                          DT003
001336  043042                          DF003
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       MESS B INCORRECT
001340  046156                          EM300
001342  052111                          EM4002
001344  042504                          DT003
001346  043042                          DF003
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
                                ;       CS1 INCORRECT
001350  046233                          EM301
001352  052052                          EM4000
001354  042504                          DT003
001356  043042                          DF003
                                ;       ERROR 7:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
                                ;       MESS A INCORRECT
001360  046233                          EM301
001362  052070                          EM4001
001364  042504                          DT003
001366  043042                          DF003
                                ;       ERROR 10:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
```

```
1436                                    ;       MESS B INCORRECT
1437  001370  046233                            EM301
1438  001372  052111                            EM4002
1439  001374  042504                            DT003
1440  001376  043042                            DF003
1441                                    ;       ERROR 11:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1442                                    ;       CS1 INCORRECT
1443  001400  046311                            EM302
1444  001402  052052                            EM4000
1445  001404  042504                            DT003
1446  001406  043042                            DF003
1447                                    ;       ERROR 12:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1448                                    ;       MESS A INCORRECT
1449  001410  046311                            EM302
1450  001412  052070                            EM4001
1451  001414  042504                            DT003
1452  001416  043042                            DF003
1453                                    ;       ERROR 13:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1454                                    ;       MESS B INCORRECT
1455  001420  046311                            EM302
1456  001422  052111                            EM4002
1457  001424  042504                            DT003
1458  001426  043042                            DF003
1459                                    ;       ERROR 14:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1460                                    ;       CS1 INCORRECT
1461  001430  046370                            EM303
1462  001432  052052                            EM4000
1463  001434  042504                            DT003
1464  001436  043042                            DF003
1465                                    ;       ERROR 15:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1466                                    ;       MESS A INCORRECT
1467  001440  046370                            EM303
1468  001442  052070                            EM4001
1469  001444  042504                            DT003
1470  001446  043042                            DF003
1471                                    ;       ERROR 16:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1472                                    ;       MESS B INCORRECT
1473  001450  046370                            EM303
1474  001452  052111                            EM4002
1475  001454  042504                            DT003
1476  001456  043042                            DF003
1477                                    ;       ERROR 17:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1478                                    ;       CS1 INCORRECT
1479  001460  046446                            EM304
1480  001462  052052                            EM4000
1481  001464  042504                            DT003
1482  001466  043042                            DF003
1483                                    ;       ERROR 20:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1484                                    ;       MESS A INCORRECT
1485  001470  046446                            EM304
1486  001472  052070                            EM4001
1487  001474  042504                            DT003
1488  001476  043042                            DF003
1489                                    ;       ERROR 21:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1490                                    ;       MESS B INCORRECT
1491  001500  046446                            EM304
```

```
1492  001502  052111                    EM4002
1493  001504  042504                    DT003
1494  001506  043042                    DF003
1495                          ;         ERROR 22:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1496                          ;         CS1 INCORRECT
1497  001510  046525                    EM305
1498  001512  052052                    EM4000
1499  001514  042504                    DT003
1500  001516  043042                    DF003
1501                          ;         ERROR 23:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1502                          ;         MESS A INCORRECT
1503  001520  046525                    EM305
1504  001522  052070                    EM4001
1505  001524  042504                    DT003
1506  001526  043042                    DF003
1507                          ;         ERROR 24:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1508                          ;         MESS B INCORRECT
1509  001530  046525                    EM305
1510  001532  052111                    EM4002
1511  00153'  042504                    DT003
1512  00153o  043042                    DF003
1513                          ;         ERROR 25:  ATTEMPTING TO CHECK HEADER GENERATION
1514                          ;         WITH VARIOUS CYLINDER VALUES
1515                          ;         CS1 INCORRECT
1516  001540  046605                    EM306
1517  001542  052052                    EM4000
1518  001544  042504                    DT003
1519  001546  043066                    DF025
1520                          ;         ERROR 26:  ATTEMPTING TO CHECK HEADER GENERATION
1521                          ;         WITH VARIOUS CYLINDER VALUES
1522                          ;         FIRST WORD OF HEADER INCORRECT
1523  001550  046605                    EM306
1524  001552  052132                    EM4003
1525  001554  042504                    DT003
1526  001556  043066                    DF025
1527                          ;         ERROR 27:  ATTEMPTING TO CHECK HEADER GENERATION
1528                          ;         WITH VARIOUS CYLINDER VALUES
1529                          ;         SECOND WORD OF HEADER INCORRECT
1530  001560  046605                    EM306
1531  001562  052162                    EM4004
1532  001564  042504                    DT003
1533  001566  043066                    DF025
1534                          ;         ERROR 30:  ATTEMPTING TO CHECK HEADER GENERATION
1535                          ;         WITH VARIOUS TRACK VALUES
1536                          ;         CS1 INCORRECT
1537  001570  046707                    EM307
1538  001572  052052                    EM4000
1539  001574  042504                    DT003
1540  001576  043066                    DF025
1541                          ;         ERROR 31:  ATTEMPTING TO CHECK HEADER GENERATION
1542                          ;         WITH VARIOUS TRACK VALUES
1543                          ;         FIRST WORD OF HEADER INCORRECT
1544  001600  046707                    EM307
1545  001602  052132                    EM4003
1546  001604  042504                    DT003
1547  001606  043066                    DF025
```

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1548                                    ;       ERROR 32:  ATTEMPTING TO CHECK HEADER GENERATION
1549                                    ;       WITH VARIOUS TRACK VALUES
1550                                    ;       SECOND WORD OF HEADER INCORRECT
1551  001610  046707                            EM307
1552  001612  052162                            EM4004
1553  001614  042504                            DT003
1554  001616  043066                            DF025
1555                                    ;       ERROR 33:  ATTEMPTING TO CHECK HEADER GENERATION
1556                                    ;       WITH VARIOUS SECTOR VALUES
1557                                    ;       CS1 INCORRECT
1558  001620  047006                            EM308
1559  001622  052052                            EM4000
1560  001624  042504                            DT003
1561  001626  043066                            DF025
1562                                    ;       ERROR 34:  ATTEMPTING TO CHECK HEADER GENERATION
1563                                    ;       WITH VARIOUS SECTOR VALUES
1564                                    ;       FIRST WORD OF HEADER INCORRECT
1565  001630  047006                            EM308
1566  001632  052132                            EM4003
1567  001634  042504                            DT003
1568  001636  043066                            DF025
1569                                    ;       ERROR 35:  ATTEMPTING TO CHECK HEADER GENERATION
1570                                    ;       WITH VARIOUS SECTOR VALUES
1571                                    ;       SECOND WORD OF HEADER INCORRECT
1572  001640  047006                            EM308
1573  001642  052162                            EM4004
1574  001644  042504                            DT003
1575  001646  043066                            DF025
1576                                    ;       ERROR 36:  ATTEMPTING TO CHECK HEADER GENERATION
1577                                    ;       WITH VARIOUS FORMAT VALUES
1578                                    ;       CS1 INCORRECT
1579  001650  047106                            EM309
1580  001652  052052                            EM4000
1581  001654  042504                            DT003
1582  001656  043066                            DF025
1583                                    ;       ERROR 37:  ATTEMPTING TO CHECK HEADER GENERATION
1584                                    ;       WITH VARIOUS FORMAT VALUES
1585                                    ;       FIRST WORD OF HEADER INCORRECT
1586  001660  047106                            EM309
1587  001662  052132                            EM4003
1588  001664  042504                            DT003
1589  001666  043066                            DF025
1590                                    ;       ERROR 40:  ATTEMPTING TO CHECK HEADER GENERATION
1591                                    ;       WITH VARIOUS FORMAT VALUES
1592                                    ;       SECOND WORD OF HEADER INCORRECT
1593  001670  047106                            EM309
1594  001672  052162                            EM4004
1595  001674  042504                            DT003
1596  001676  043066                            DF025
1597                                    ;       ERROR 41:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1598                                    ;       CS1 INCORRECT
1599  001700  047206                            EM310
1600  001702  052052                            EM4000
1601  001704  042524                            DT041
1602  001706  043112                            DF041
1603                                    ;       ERROR 42:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
```

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1604                                    ;       CS2 INCORRECT
1605  001710  047206                            EM310
1606  001712  052212                            EM4005
1607  001714  042524                            DT041
1608  001716  043112                            DF041
1609                                    ;       ERROR 43:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1610                                    ;       ERROR REGISTER INCORRECT
1611  001720  047206                            EM310
1612  001722  052230                            EM4006
1613  001724  042524                            DT041
1614  001726  043112                            DF041
1615                                    ;       ERROR 44:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1616                                    ;       BUS ADD INCORRECT
1617  001730  047206                            EM310
1618  001732  052254                            EM4007
1619  001734  042524                            DT041
1620  001736  043112                            DF041
1621                                    ;       ERROR 45:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1622                                    ;       WORD COUNT INCORRECT
1623  001740  047206                            EM310
1624  001742  052302                            EM4008
1625  001744  042524                            DT041
1626  001746  043112                            DF041
1627                                    ;       ERROR 46:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1628                                    ;       CS1 INCORRECT AFTER READING DATA BUFFER
1629  001750  047206                            EM310
1630  001752  052327                            EM4009
1631  001754  042554                            DT046
1632  001756  043146                            DF046
1633                                    ;       ERROR 47:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1634                                    ;       CS2 INCORRECT AFTER READING DATA BUFFER
1635  001760  047206                            EM310
1636  001762  052377                            EM4010
1637  001764  042554                            DT046
1638  001766  043146                            DF046
1639                                    ;       ERROR 50:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1640                                    ;       ERROR REG INCORRECT AFTER READING DATA BUFFER
1641  001770  047206                            EM310
1642  001772  052447                            EM4011
1643  001774  042554                            DT046
1644  001776  043146                            DF046
1645                                    ;       ERROR 51:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1646                                    ;       DATA READ FROM MEMORY INCORRECT
1647  002000  047206                            EM310
1648  002002  052525                            EM4012
1649  002004  042574                            DT051
1650  002006  043172                            DF051
1651                                    ;       ERROR 52: ATTEMPTING TO CHECK HEADER RECOGNITION
1652                                    ;       CS1 INCORRECT
1653  002010  047273                            EM311
1654  002012  052052                            EM4000
1655  002014  042606                            DT052
1656  002016  043216                            DF052
1657                                    ;       ERROR 53: ATTEMPTING TO CHECK HEADER RECOGNITION
1658                                    ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1659  002020  047273                            EM311
```

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1660  002022  052565          EM4013
1661  002024  042622          DT053
1662  002026  043242          DF053
1663                    ;     ERROR 54: ATTEMPTING TO CHECK SECTOR INCREMENT
1664                    ;     DISK ADDRESS REG INCORRECT
1665  002030  047342          EM312
1666  002032  052633          EM4014
1667  002034  042632          DT054
1668  002036  043266          DF054
1669                    ;     ERROR 55: ATTEMPTING TO CHECK SECTOR INCREMENT
1670                    ;     CYLINDER ADDRESS INCORRECT
1671  002040  047342          EM312
1672  002042  052667          EM4015
1673  002044  042632          DT054
1674  002046  043266          DF054
1675                    ;     ERROR 56: ATTEMPTING TO CHECK TRACK INCREMENT
1676                    ;     DISK ADDRESS REG INCORRECT
1677  002050  047407          EM313
1678  002052  052633          EM4014
1679  002054  042632          DT054
1680  002056  043266          DF054
1681                    ;     ERROR 57: ATTEMPTING TO CHECK TRACK INCREMENT
1682                    ;     CYLINDER ADDRESS INCORRECT
1683  002060  047407          EM313
1684  002062  052667          EM4015
1685  002064  042632          DT054
1686  002066  043266          DF054
1687                    ;     ERROR 60: ATTEMPTING TO CHECK CYLINDER INCREMENT
1688                    ;     DISK ADDRESS INCORRECT
1689  002070  047453          EM314
1690  002072  052633          EM4014
1691  002074  042632          DT054
1692  002076  043266          DF054
1693                    ;     ERROR 61: ATTEMPTING TO CHECK CYLINDER INCREMENT
1694                    ;     CYLINDER ADDRESS INCORRECT
1695  002100  047453          EM314
1696  002102  052667          EM4015
1697  002104  042632          DT054
1698  002106  043266          DF054
1699                    ;     ERROR 62: ATTEMPTING TO CHECK SECTOR PULSE DETECTION WITH
1700                    ;           WRITE DATA
1701                    ;     MAINT. REG. 1 INCORRECT
1702  002110  047522          EM315
1703  002112  052727          EM4016
1704  002114  042622          DT053
1705  002116  043242          DF053
1706                    ;     ERROR 63: ATTEMPTING TO FORCE BAD SECTOR ERROR
1707                    ;     CS1 INCORRECT
1708  002120  047616          EM316
1709  002122  052052          EM4000
1710  002124  042554          DT046
1711  002126  043146          DF046
1712                    ;     ERROR 64: ATTEMPTING TO FORCE BAD SECTOR ERROR
1713                    ;     CS2 INCORRECT
1714  002130  047616          EM316
1715  002132  052212          EM4005
```

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1716  002134  042554                    DT046
1717  002136  043146                    DF046
1718                              ;       ERROR 65: ATTEMPTING TO FORCE BAD SECTOR ERROR
1719                              ;       ERROR REG INCORRECT
1720  002140  047616                    EM316
1721  002142  052230                    EM4006
1722  002144  042554                    DT046
1723  002146  043146                    DF046
1724                              ;       ERROR 66: ATTEMPTING TO FORCE HEADER VRC ERROR
1725                              ;       WHEN BAD SECTOR PRESENT
1726                              ;       CS1 INCORRECT
1727  002150  047663                    EM317
1728  002152  052052                    EM4000
1729  002154  042554                    DT046
1730  002156  043146                    DF046
1731                              ;       ERROR 67: ATTEMPTING TO FORCE HEADER VRC ERROR
1732                              ;       WHEN BAD SECTOR PRESENT
1733                              ;       CS2 INCORRECT
1734  002160  047663                    EM317
1735  002162  052212                    EM4005
1736  002164  042554                    DT046
1737  002166  043146                    DF046
1738                              ;       ERROR 70: ATTEMPTING TO FORCE HEADER VRC ERROR
1739                              ;       WHEN BAD SECTOR PRESENT
1740                              ;       ERROR REG INCORRECT
1741  002170  047663                    EM317
1742  002172  052230                    EM4006
1743  002174  042554                    DT046
1744  002176  043146                    DF046
1745                              ;       ERROR 71: ATTEMPTING TO FORCE HVRC ERROR
1746                              ;       CS1 INCORRECT
1747  002200  047761                    EM318
1748  002202  052052                    EM4000
1749  002204  042646                    DT071
1750  002206  043312                    DF071
1751                              ;       ERROR 72: ATTEMPTING TO FORCE HVRC ERROR
1752                              ;       CS2 INCORRECT
1753  002210  047761                    EM318
1754  002212  052212                    EM4005
1755  002214  042646                    DT071
1756  002216  043312                    DF071
1757                              ;       ERROR 73: ATTEMPTING TO FORCE HVRC ERROR
1758                              ;       ERROR REG INCORRECT
1759  002220  047761                    EM318
1760  002222  052230                    EM4006
1761  002224  042646                    DT071
1762  002226  043312                    DF071
1763                              ;       ERROR 74: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1764                              ;       CS1 INCORRECT
1765  002230  050020                    EM319
1766  002232  052052                    EM4000
1767  002234  042674                    DT074
1768  002236  043346                    DF074
1769                              ;       ERROR 75: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1770                              ;       CS2 INCORRECT
1771  002240  050020                    EM319
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1772  002242  052212                    EM4005
1773  002244  042674                    DT074
1774  002246  043346                    DF074
1775                          ;         ERROR 76: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1776                          ;         ERROR REG INCORRECT
1777  002250  050020                    EM319
1778  002252  052230                    EM4006
1779  002254  042674                    DT074
1780  002256  043346                    DF074
1781                          ;         ERROR 77: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1782                          ;         MR1 INCORRECT AFTER GAP IN WRITE DATA
1783  002260  050020                    EM319
1784  002262  052565                    EM4013
1785  002264  042716                    DT077
1786  002266  043372                    DF077
1787                          ;         ERROR 100: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1788                          ;         CS1 INCORRECT
1789  002270  050071                    EM320
1790  002272  052052                    EM4000
1791  002274  042674                    DT074
1792  002276  043346                    DF074
1793                          ;         ERROR 101: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1794                          ;         CS2 INCORRECT
1795  002300  050071                    EM320
1796  002302  052212                    EM4005
1797  002304  042674                    DT074
1798  002306  043346                    DF074
1799                          ;         ERROR 102: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1800                          ;         ERROR REG INCORRECT
1801  002310  050071                    EM320
1802  002312  052230                    EM4006
1803  002314  042674                    DT074
1804  002316  043346                    DF074
1805                          ;         ERROR 103: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1806                          ;         MR1 INCORRECT AFTER GAP IN WRITE DATA
1807  002320  050071                    EM320
1808  002322  052565                    EM4013
1809  002324  042716                    DT077
1810  002326  043372                    DF077
1811                          ;         ERROR 104: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1812                          ;         CS1 INCORRECT
1813  002330  050155                    EM321
1814  002332  052052                    EM4000
1815  002334  042674                    DT074
1816  002336  043346                    DF074
1817                          ;         ERROR 105: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1818                          ;         CS2 INCORRECT
1819  002340  050155                    EM321
1820  002342  052212                    EM4005
1821  002344  042674                    DT074
1822  002346  043346                    DF074
1823                          ;         ERROR 106: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1824                          ;         ERROR REG INCORRECT
1825  002350  050155                    EM321
1826  002352  052230                    EM4006
1827  002354  042674                    DT074
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1828  002356  043346                    DF074
1829                          ;         ERROR 107: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1830                          ;         MR1 INCORRECT AFTER GAP IN WRITE DATA
1831  002360  050155                    EM321
1832  002362  052565                    EM4013
1833  002364  042716                    DT077
1834  002366  043372                    DF077
1835                          ;         ERROR 110: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1836                          ;         CS1 INCORRECT
1837  002370  050241                    EM322
1838  002372  052052                    EM4000
1839  002374  042674                    DT074
1840  002376  043346                    DF074
1841                          ;         ERROR 111: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1842                          ;         CS2 INCORRECT
1843  002400  050241                    EM322
1844  002402  052212                    EM4005
1845  002404  042674                    DT074
1846  002406  043346                    DF074
1847                          ;         ERROR 112: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1848                          ;         ERPOR REG INCORRECT
1849  002410  050241                    EM322
1850  002412  052230                    EM4006
1851  002414  042674                    DT074
1852  002416  043346                    DF074
1853                          ;         ERROR 113: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1854                          ;         MR1 INCORRECT AFTER GAP IN WRITE DATA
1855  002420  050241                    EM322
1856  002422  052565                    EM4013
1857  002424  042716                    DT077
1858  002426  043372                    DF077
1859                          ;         ERROR 114:  CHECKING HEADER RECOGINTION WITH PREVIOUS BAD
1860                          ;                     SECTOR ERROR CS1 INCORRECT
1861  002430  050324                    EM323
1862  002432  052052                    EM4000
1863  002434  042674                    DT074
1864  002436  043346                    DF074
1865                          ;         ERROR 115:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1866                          ;                     SECTOR ERROR CS2 INCORRECT
1867  002440  050324                    EM323
1868  002442  052212                    EM4005
1869  002444  042674                    DT074
1870  002446  043346                    DF074
1871                          ;         ERROR 116:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1872                          ;                     SECTOR ERROR  ERROR INCORRECT
1873  002450  050324                    EM323
1874  002452  052230                    EM4006
1875  002454  042674                    DT074
1876  002456  043346                    DF074
1877                          ;         ERROR 117:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1878                          ;                     SECTOR ERROR MR1 INCORRECT
1879  002460  050324                    EM323
1880  002462  052565                    EM4013
1881  002464  042716                    DT077
1882  002466  043372                    DF077
1883                          ;         ERROR 120: CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
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1884                                    ;                       VRC ERROR CS1 INCORRECT
1885  002470  050417                           EM324
1886  002472  052052                           EM4000
1887  002474  042674                           DT074
1888  002476  043346                           DF074
1889                                    ;       ERROR 121:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1890                                    ;                   VRC ERROR CS2 INCORRECT
1891  002500  050417                           EM324
1892  002502  052212                           EM4005
1893  002504  042674                           DT074
1894  002506  043346                           DF074
1895                                    ;       ERROR 122:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1896                                    ;                   VRC ERROR  ERROR REG INCORRECT
1897  002510  050417                           EM324
1898  002512  052230                           EM4006
1899  002514  042674                           DT074
1900  002516  043346                           DF074
1901                                    ;       ERROR 123:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1902                                    ;                   VRC ERROR MR1 INCORRECT
1903  002520  050417                           EM324
1904  002522  052565                           EM4013
1905  002524  042716                           DT077
1906  002526  043372                           DF077
1907                                    ;       ERROR 124:  FORCING BAD SECTOR ERROR WITH PREV HEADER
1908                                    ;                   VRC ERROR CS1 INCORRECT
1909  002530  050512                           EM325
1910  002532  052052                           EM4000
1911  002534  042674                           DT074
1912  002536  043346                           DF074
1913                                    ;       ERROR 125:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1914                                    ;                   CS2 INCORRECT
1915  002540  050512                           EM325
1916  002542  052212                           EM4005
1917  002544  042674                           DT074
1918  002546  043346                           DF074
1919                                    ;       ERROR 126:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1920                                    ;                   ERROR REG INCORRECT
1921  002550  050512                           EM325
1922  002552  052230                           EM4006
1923  002554  042674                           DT074
1924  002556  043346                           DF074
1925                                    ;       ERROR 127:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1926                                    ;                   MR1 INCORRECT
1927  002560  050512                           EM325
1928  002562  052565                           EM4013
1929  002564  042716                           DT077
1930  002566  043372                           DF077
1931                                    ;       ERRROR 130:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1932                                    ;                    CS1 INCORRECT
1933  002570  050602                           EM326
1934  002572  052052                           EM4000
1935  002574  042674                           DT074
1936  002576  043346                           DF074
1937                                    ;       ERROR 131:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1938                                    ;                   CS2 INCORRECT
1939  002600  050602                           EM326
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1940  002602  052212                    EM4005
1941  002604  042674                    DT074
1942  002606  043346                    DF074
1943                          ;         ERROR 132:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1944                          ;                     ERROR REG INCORRECT
1945  002610  050602                    EM326
1946  002612  052230                    EM4006
1947  002614  042674                    DT074
1948  002616  043346                    DF074
1949                          ;         ERROR 133:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1950                          ;                     MR1 INCORRECT
1951  002620  050602                    EM326
1952  002622  052565                    EM4013
1953  002624  042716                    DT077
1954  002626  043372                    DF077
1955                          ;         ERROR 134:  ATTEMPTING TO CHECK ECC PATTERN CLEARING
1956                          ;                     ECC PATTERN INCORRECT
1957  002630  051021                    EM329
1958  002632  052745                    EM4017
1959  002634  042730                    DT134
1960  002636  043416                    DF134
1961                          ;         ERROR 135:  ATTEMPTING TO CHECK ECC GENERATION
1962                          ;                     ECC PATTERN INCORRECT
1963  002640  051072                    EM330
1964  002642  052745                    EM4017
1965  002644  042730                    DT134
1966  002646  043416                    DF134
1967                          ;         ERROR 136: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1968                          ;         CS1 INCORRECT
1969  002650  051135                    EM331
1970  002652  052052                    EM4000
1971  002654  042554                    DT046
1972  002656  043146                    DF046
1973                          ;         ERROR 137: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1974                          ;         CS2 INCORRECT
1975  002660  051135                    EM331
1976  002662  052212                    EM4005
1977  002664  042554                    DT046
1978  002666  043146                    DF046
1979                          ;         ERROR 140: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1980                          ;         ERROR REG. INCORRECT
1981  002670  051135                    EM331
1982  002672  052230                    EM4006
1983  002674  042554                    DT046
1984  002676  043146                    DF046
1985                          ;         ERROR 141: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1986                          ;         CS1 INCORRECT
1987  002700  051222                    EM332
1988  002702  052052                    EM4000
1989  002704  042554                    DT046
1990  002706  043146                    DF046
1991                          ;         ERROR 142: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1992                          ;         CS2 INCORRECT
1993  002710  051222                    EM332
1994  002712  052212                    EM4005
1995  002714  042554                    DT046
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1996  002716  043146                    DF046
1997                          ;         ERROR 143: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1998                          ;         ERROR REG. INCOPRECT
1999  002720  051222                    EM332
2000  002722  052230                    EM4006
2001  002724  042554                    DT046
2002  002726  043146                    DF046
2003                          ;         ERROR 144: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2004                          ;         CS1 INCORRECT
2005  002730  051403                    EM335
2006  002732  052052                    EM4000
2007  002734  042742                    DT144
2008  002736  043442                    DF144
2009                          ;         ERROR 145: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2010                          ;         CS2 INCORRECT
2011  002740  051403                    EM335
2012  002742  052212                    EM4005
2013  002744  042742                    DT144
2014  002746  043442                    DF144
2015                          ;         ERROR 146: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2016                          ;         ERROR REG. INCORRECT
2017  002750  051403                    EM335
2018  002752  052230                    EM4006
2019  002754  042742                    DT144
2020  002756  043442                    DF144
2021                          ;         ERROR 147: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2022                          ;         BUS ADDRESS INCORRECT
2023  002760  051403                    EM335
2024  002762  052254                    EM4007
2025  002764  042742                    DT144
2026  002766  043442                    DF144
2027                          ;         ERROR 150: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2028                          ;         WORD COUNT INCORRECT
2029  002770  051403                    EM335
2030  002772  052302                    EM4008
2031  002774  042742                    DT144
2032  002776  043442                    DF144
2033                          ;         ERROR 151: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2034                          ;         CYLINDER ADD INCORRECT
2035  003000  051403                    EM335
2036  003002  052667                    EM4015
2037  003004  042742                    DT144
2038  003006  043442                    DF144
2039                          ;         ERROR 152: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2040                          ;         DISK ADDRESS INCORRECT
2041  003010  051403                    EM335
2042  003012  052633                    EM4014
2043  003014  042742                    DT144
2044  003016  043442                    DF144
2045                          ;         ERROR 153: ATTEMPTING ERROR CLEAR WITH CONTROLLER CLEAR
2046                          ;         CS1 INCORRECT
2047  003020  051457                    EM336
2048  003022  052052                    EM4000
2049  003024  042606                    DT052
2050  003026  043216                    DF052
2051                          ;         ERROR 154: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
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2052                                    ;       CS1 INCORRECT
2053  003030  051534                           EM337
2054  003032  052052                           EM4000
2055  003034  042742                           DT144
2056  003036  043442                           DF144
2057                                    ;       ERROR 155: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2058                                    ;       CS2 INCORRECT
2059  003040  051534                           EM337
2060  003042  052212                           EM4005
2061  003044  042742                           DT144
2062  003046  043442                           DF144
2063                                    ;       ERROR 156: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2064                                    ;       ERROR REGISTER INCORRECT
2065  003050  051534                           EM337
2066  003052  052230                           EM4006
2067  003054  042742                           DT144
2068  003056  043442                           DF144
2069                                    ;       ERROR 157: ATTEMPTIN PARTIAL SECTOR WRITE WITH ZERO FILL
2070                                    ;       BUS ADDRESS INCORRECT
2071  003060  051534                           EM337
2072  003062  052254                           EM4007
2073  003064  042742                           DT144
2074  003066  043442                           DF144
2075                                    ;       ERROR 160: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2076                                    ;       WORD COUNT INCORRECT
2077  003070  051534                           EM337
2078  003072  052302                           EM4008
2079  003074  042742                           DT144
2080  003076  043442                           DF144
2081                                    ;       ERROR 161: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2082                                    ;       CYLINDER ADDRESS INCORRECT
2083  003100  051534                           EM337
2084  003102  052667                           EM4015
2085  003104  042742                           DT144
2086  003106  043442                           DF144
2087                                    ;       ERROR 162: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2088                                    ;       DISK ADDRESS INCORRECT
2089  003110  051534                           EM337
2090  003112  052633                           EM4014
2091  003114  042742                           DT144
2092  003116  043442                           DF144
2093                                    ;       ERROR 163: ATTEMPTING WRITE DATA IN 18 BIT MODE
2094                                    ;       RKECPT INCORRECT
2095  003120  052005                           EM340
2096  003122  052745                           EM4017
2097  003124  043002                           DT151
2098  003126  043476                           DF151
2099                                    ;       ERROR 164: ATTEMPTING WRITE DATA IN 18 BIT MODE
2100                                    ;       RKECPT INCORRECT
2101  003130  052005                           EM340
2102  003132  052745                           EM4017
2103  003134  042730                           DT134
2104  003136  043416                           DF134
2105
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2106                                    .SBTTL  TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER
2107
2108  003140  000000                    T.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
2109  003142  000000                    T.WC:   .WORD   0               ;WORD COUNT REGISTER
2110  003144  000000                    T.BA:   .WORD   0               ;BUS ADDRESS REGISTER
2111  003146  000000                    T.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2112  003150  000000                    T.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
2113  003152  000000                    T.DS:   .WORD   0               ;DRIVE STATUS REGISTER
2114  003154  000000                    T.ER:   .WORD   0               ;ERROR REGISTER
2115  003156  000000                    T.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2116  003160  000000                    T.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
2117  003162  000000                    T.DB:   .WORD   0               ;DATA BUFFER
2118  003164  000000                    T.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
2119  003166  000000                    T.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
2120  003170  000000                    T.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
2121  003172  000000                    T.ECPS: .WORD   0               ;ECC POSITION INFORMATION
2122  003174  000000                    T.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
2123  003176  000000                    T.SPAR: .WORD   0               ;SPARE REGISTER
2124
2125                                    .SBTTL  EXPECTED RK611 CONTROLLER REGISTERS
2126
2127  003200  000000                    E.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
2128  003202  000000                    E.WC:   .WORD   0               ;WORD COUNT REGISTER
2129  003204  000000                    E.BA:   .WORD   0               ;BUS ADDRESS REGISTER
2130  003206  000000                    E.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2131  003210  000000                    E.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
2132  003212  000000                    E.DS:   .WORD   0               ;DRIVE STATUS REGISTER
2133  003214  000000                    E.ER:   .WORD   0               ;ERROR REGISTER
2134  003216  000000                    E.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2135  003220  000000                    E.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
2136  003222  000000                    E.DB:   .WORD   0               ;DATA BUFFER
2137  003224  000000                    E.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
2138  003226  000000                    E.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
2139  003230  000000                    E.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
2140  003232  000000                    E.ECPS: .WORD   0               ;ECC POSITION INFORMATION
2141  003234  000000                    E.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
2142  003236  000000                    E.SPAR: .WORD   0               ;SPARE REGISTER
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                                .SBTTL  PROGRAM DEFINED VARIABLES

003240  000214                RKVEC:  .WORD   214              ;RK611 VECTOR ADDESS
003242  000240                RKPRI:  .WORD   PR5              ;RK611 PRIORITY
003244  000000                TRAPPC: .WORD   0                ;TRAP PC FOR MEMORTY PARITY OPTION
003246  000000                SRTFLG: .WORD   0                ;START FLAG
                                                             ;   0 = 200
                                                             ;   1 = 214
                                                             ;  -1 = 204
003250  000000                ERRCNT: .WORD   0                ;ERROR COUNT FOR ABORT ERROR THRESHOLD
003252  000000                P1.BIT: .WORD   0                ;NEXT BIT
003254  000000                PR.BIT: .WORD   0                ;PRESENT BIT
003256  000000                M1.BIT: .WORD   0                ;BIT-1
003260  000000                M2.BIT: .WORD   0                ;BIT-2
003262  000000                BITCNT: .WORD   0                ;BIT COUNT
003264  000000                WRDCNT: .WORD   0                ;WORD COUNT FOR NPR TRANSFERS
003266  000000                ECCHI:  .WORD   0                ;16 MOST SIGNIFICANT BIT OF ECC
003270  000000                ECCLO:  .WORD   0                ;16 LEAST SIGNIFICANT BIT OF ECC
003272  000000                ECCXOR: .WORD   0                ;FLAG FOR ECC GENERATION
003274  000000                MEMPAR: .WORD   0                ;FLAG FOR MEMORY PARITY OPTION
003276     000                SECTOR: .BYTE   0                ;SECTOR FOR INCREMENT TEST
003277     000                TRACK:  .BYTE   0                ;TRACK FOR INCREMENT TEST
003300  000000                CYLN:   .WORD   0                ;CYLINDER FOR INCREMENT TEST
003302  000000  000000  000000 HEADER: .WORD   0,0,0           ;EXPECTED FOR INCREMENT TEST
003310  000000                HDRCNT: .WORD   0                ;NUMBER OF HEADERS FOR OPI'S
003312  000000                SAVSWR: .WORD   0                ;STORAGE FOR SWITCH REGISTER
```

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                                        .SBTTL  PROGRAM SETUP

003314  012737  000001  003246  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
003322  000406                          BR      START1

003324  012737  177777  003246  RESTRT: MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
003332  000402                          BR      START1

003334  005037  003246          START:  CLR     SRTFLG          ;CLEAR START FLAG
003340  000005                  START1: RESET                   ;RESET THE WHOLE SYSTEM
003342  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
003346  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
003352  004737  040550                  JSR     PC,$TKINT       ;INIT KEYBOARD
003356  012746  000340                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
003362  012746  003370                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
003366  000002                          RTI                     ;LOAD PSW

003370                          1$:
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
003370  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
003374  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
003376  022706  001140                  CMP     #SWR,R6 ;;DONE?
003402  001374                          BNE     .-6             ;;LOOP BACK IF NO
003404  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
003410  012737  034646  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
003416  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
003424  012737  037404  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
003432  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
003440  012737  042366  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
003446  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
003454  012737  042232  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
003462  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
003470  013737  033726  033720          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
003476  005037  001200                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
003502  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
003506  112737  000001  001115          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
003514  012737  003514  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
003522  012737  003522  001110          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                                ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                                ;;EQUAL TO A "-1"  SETUP FOR A SOFTWARE SWITCH REGISTER.
003530  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
003534  012737  003570  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
003542  012737  177570  001140          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
003550  012737  177570  001142          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
003556  022777  177777  175354          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
003564  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
003566  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
003570  012716  003576          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
003574  000002                          RTI
003576  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
003604  012737  000174  001142          MOV     #DISPREG,DISPLAY
003612  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
```

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2225  003616  005037  001222                  CLR     $PASS           ;;CLEAR PASS COUNT
2226  003622  132737  000200  001235          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
2227  003630  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
2228  003632  012737  001236  001140          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
2229  003640                          67$:
2230  003640  005037  003250                  CLR     EPRCNT
2231                                  .SBTTL  TYPE PROGRAM NAME
2232                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
2233  003644  005227  177777                  INC     #-1             ;;FIRST TIME?
2234  003650  001055                          BNE     68$             ;;BRANCH IF NO
2235  003652  022737  034062  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
2236  003660  001451                          BEQ     68$             ;;BRANCH IF YES
2237  003662  104401  003730                  TYPE    ,69$            ;;TYPE ASCIZ STRING
2238                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
2239  003666  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
2240  003672  001012                          BNE     70$             ;;BRANCH IF YES
2241  003674  123727  001234  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
2242  003702  001406                          BEQ     70$             ;;BRANCH IF YES
2243  003704  023727  001140  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
2244  003712  001005                          BNE     71$             ;;BRANCH IF NO
2245  003714  104406                          GTSWR                   ;;GET SOFT-SWR SETTINGS
2246  003716  000403                          BR      71$
2247  003720  112737  000001  001134  70$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2248  003726                          71$:
2249  003726  000426                          BR      68$             ;;GET OVER THE ASCIZ
2250                                  ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 4 CZR6DB0/<CRLF>
2251  004004                          68$:
2252  004004  005227  177777                  INC     #-1             ;TYPE RUN TIME MESSAGE FIRST PASS ONLY
2253  004010  001002                          BNE     2$
2254  004012  104401  043671                  TYPE    ,OPR006
2255  004016  022737  000001  003246  2$:     CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2256  004024  001117                          BNE     15$             ;NO, CONTINUE SETUP
2257  004026  104401  043522          5$:     TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (   ) ="
2258  004032  013746  001270                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2259  004036  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2260  004040  104401  043551                  TYPE    ,OPR002
2261  004044  104412                          RDOCT                   ;GET VALUE
2262  004046  012637  001160                  MOV     (SP)+,$TMP0
2263  004052  001407                          BEQ     7$              ;CHECK IF <CR>
2264  004054  022737  160000  001160          CMP     #160000,$TMP0   ;CHECK IF IN I/O PAGE
2265  004062  101361                          BHI     5$
2266  004064  013737  001160  001270          MOV     $TMP0,$BASE     ;LOAD NEW BUS ADDRESS
2267  004072  104401  043557          7$:     TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (   ) ="
2268  004076  013746  001264                  MOV     $VECT1,-(SP)    ;GET VECTOR ADDRESS FOR TYPE OUT
2269  004102  042716  160000                  BIC     #160000,(SP)    ;CLEAR PRIORITY BITS
2270  004106  104402                          TYPOC
2271  004110  104401  043551                  TYPE    ,OPR002
2272  004114  104412                          RDOCT                   ;GET VALUE
2273  004116  012637  001160                  MOV     (SP)+,$TMP0
2274  004122  001407                          BEQ     10$             ;CHECK IF <CR>
2275  004124  022737  001000  001160          CMP     #1000,$TMP0     ;CHECK IF LEGAL
2276  004132  101757                          BLOS    7$
2277  004134  013737  001160  001264          MOV     $TMP0,$VECT1    ;LOAD NEW VECTOR ADDRESS
2278  004142  104401  043607          10$:    TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (   ) ="
2279  004146  005046                          CLR     -(SP)           ;MAKE ROOM ON THE STACK
2280  004150  113716  001265                  MOVB    $VECT1+1,(SP)   ;GET PRIORITY
```

```
2281  004154  006216                        ASR     (SP)              ;SHIF RIGH 5 BITS
2282  004156  006216                        ASR     (SP)
2283  004160  006216                        ASR     (SP)
2284  004162  006216                        ASR     (SP)
2285  004164  006216                        ASR     (SP)
2286  004166  104402                        TYPOC
2287  004170  104401  043551                TYPE    ,OPR002
2288  004174  104412                        RDOCT                     ;GET VALUE
2289  004176  012637  001160                MOV     (SP)+,$TMPO
2290  004202  001430                        BEQ     15$               ;CHECK FOR DEFAULT
2291  004204  022737  000007  001160        CMP     #7,$TMPO          ;CHECK IF LEGAL
2292  004212  103753                        BLO     10$
2293  004214  022737  000004  001160        CMP     #4,$TMPO
2294  004222  101347                        BHI     10$
2295  004224  006337  001160                ASL     $TMPO             ;SHIFT 5 BITS LEFT
2296  004230  006337  001160                ASL     $TMPO
2297  004234  006337  001160                ASL     $TMPO
2298  004240  006337  001160                ASL     $TMPO
2299  004244  006337  001160                ASL     $TMPO
2300  004250  042737  160000  001264        BIC     #160000,$VECT1    ;GET PRIORITY BITS
2301  004256  153737  001160  001265        BISB    $TMPO,$VECT1+1
2302  004264  013737  001264  003240  15$:  MOV     $VECT1,RKVEC
2303  004272  042737  160000  003240        BIC     #160000,RKVEC     ;GET VECTOR
2304  004300  113737  001265  003242        MOVB    $VECT1+1,RKPRI    ;GET PRIORITY
2305  004306  013702  001270                MOV     $BASE,R2          ;SET '611 BASE
2306  004312  005037  001202                CLR     $ESCAPE           ;CLEAR ESCAPE
2307  004316  004737  034366        NEWPAS: JSR     PC,PARCHK         ;ENABLE MEMORY PARITY
2308  004322  012746  000000                MOV     #PRO,-(SP)        ;LOCK OUT INTERRUPTS
2309  004326  012746  004334                MOV     #TST1,-(SP)
2310  004332  000002                        RTI
```

```
                                        .SBTTL  **TYPE C INSTRUCTION'S DRIVE MESSAGES

                                        ;;*****************************************************************
                                        ;*TEST 1         READ DATA SEEK MESSAGE
                                        ;*
                                        ;*       CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
                                        ;*       CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA TO AN
                                        ;*       RK06, IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE
                                        ;*       7, WORD COUNT 177777.  CLOCK IN THE SEEK MESSAGE AND
                                        ;*       MAKE SURE IT IS GENERATED PROPERLY.
                                        ;*
                                        ;*****************************************************************
004334  000004                  TST1:   SCOPE
004336  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
004344  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
004350  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004356  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004364  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
004372  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
004400  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004406  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
004414  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004422  012762  012021  000000          MOV     #CDT!CFMT!RDDATA,RKCS1(R2)  ;ISSUE RDDATA WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004430  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004434  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004442  012762  000040  000026          MOV     #DMD,RKMR1(R2)
004450  005300                          DEC     R0
004452  001370                          BNE     1$
004454  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
004462  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
004470  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
004476  012737  012021  003200          MOV     #CDT!CFMT!RDDATA,E.CS1  ;LOAD EXPECTED CS1
004504  012737  071027  003226          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
004512  012737  037760  003230          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
004520  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
004526  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
004530  104003                          ERROR   3               ;CS1 INCORRECT
004532  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004540  000412                          BR      TST2            ;;GO TO NEXT TEST

004542  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
004550  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
004552  104004                          ERROR   4               ;MESS A INCORRECT
004554  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
004562  001401                          BEQ     TST2            ;;YES, GO ON TO NEXT TEST
004564  104005                          ERROR   5               ;MESS B INCORRECT

                                        ;;*****************************************************************
                                        ;*TEST 2         WRITE DATA SEEK MESSAGE
                                        ;*
                                        ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                        ;*       CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
                                        ;*       ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1777,
                                        ;*       TRACK 7, DRIVE 7.  CLOCK IN SEEK MESSAGE.  CHECK IF
                                        ;*       PROPER MESSAGE IS ASSEMBLED.
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                                        ;*
                                        ;**********************************************************************
000000                          TST2:   SCOPE
004570  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
004576  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
004602  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004610  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004616  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
004624  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
004632  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004640  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
004646  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004654  012762  012023  000000          MOV     #CDT!CFMT!WRDATA,RKCS1(R2)  ;ISSUE WRDATA WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004662  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004666  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004674  012762  000040  000026          MOV     #DMD,RKMR1(R2)
004702  005300                          DEC     R0
004704  001370                          BNE     1$
004706  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
004714  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
004722  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
004730  012737  012023  003200          MOV     #CDT!CFMT!WRDATA,E.CS1  ;LOAD EXPECTED CS1
004736  012737  071227  003226          MOV     #S.SEEK!S.RTC!S.FMT!7000?,E.MR2  ;LOAD EXPECTED MR2
004744  012737  037760  003230          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
004752  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
004760  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
004762  104006                          ERROR   6               ;CS1 INCORRECT
004764  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004772  000412                          BR      TST3            ;;GO TO NEXT TEST

004774  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005002  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
005004  104007                          ERROR   7               ;MESS A INCORRECT
005006  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005014  001401                          BEQ     TST3            ;;YES, GO ON TO NEXT TEST
005016  104010                          ERROR   10              ;MESS B INCORRECT

                                        ;**********************************************************************
                                        ;*TEST 3        SEEK MESSAGE FOR WRITE CHECK
                                        ;*
                                        ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE CHECK
                                        ;*      OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
                                        ;*      CYLINDER 1777, HEAD 7, DRIVE 7.  CLOCK
                                        ;*      IN SEEK COMMAND.  MAKE SURE CORRECT MESSAGE
                                        ;*      IS ASSEMBLED.
                                        ;*
                                        ;**********************************************************************
005020  000004                  TST3:   SCOPE
005022  012737  000050  001200          MOV     #50,$TIMES      ;;DO 50 ITERATIONS
005030  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
005034  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005042  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
005050  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
005056  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
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2423  005064  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2424  005072  012762  003400  000006          MOV     #3400,RKDA(R2)    ;LOAD TRACK
2425  005100  012762  000007  000010          MOV     #7,RKCS2(R2)      ;LOAD DRIVE NUM.
2426  005106  012762  012031  000000          MOV     #CDT!CFMT!WRTCHK,RKCS1(R2)  ;ISSUE WRTCHK WITH CDT SET IN
2427                                                                    ;  24 SECTOR FORMAT
2428  005114  012700  000016                  MOV     #3*4+2,R0         ;CLOCK IN DRIVE MESSAGE
2429  005120  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2430  005126  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2431  005134  005300                          DEC     R0
2432  005136  001370                          BNE     1$
2433  005140  016237  000000  003140          MOV     RKCS1(R2),T.CS1   ;STORE COMMAND STATUS REG. 1
2434  005146  016237  000034  003166          MOV     RKMR2(R2),T.MR2   ;STORE MAINT REG. 2 (MESS A)
2435  005154  016237  000036  003170          MOV     RKMR3(R2),T.MR3   ;STORE MAINT REG. 3 (MESS B)
2436  005162  012737  012031  003200          MOV     #CDT!CFMT!WRTCHK,E.CS1  ;LOAD EXPECTED CS1
2437  005170  012737  071027  003226          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2438  005176  012737  037760  003230          MOV     #37760,E.MR3      ;LOAD EXPECTED MR3
2439  005204  023737  003200  003140          CMP     E.CS1,T.CS1       ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2440  005212  001405                          BEQ     2$                ;YES, CHECK MESSAGE A
2441  005214  104011                          ERROR   11                ;CS1 INCORRECT
2442  005216  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
2443  005224  000412                          BR      TST4              ;;GO TO NEXT TEST
2444
2445  005226  023737  003226  003166  2$:     CMP     E.MR2,T.MR2       ;CHECK MESS A CORRECT
2446  005234  001401                          BEQ     3$                ;YES, CHECK MESSAGE B
2447  005236  104012                          ERROR   12                ;MESS A INCORRECT
2448  005240  023737  003230  003170  3$:     CMP     E.MR3,T.MR3       ;CHECK MESS B CORRECT
2449  005246  001401                          BEQ     TST4              ;;YES, GO ON TO NEXT TEST
2450  005250  104013                          ERROR   13                ;MESS B INCORRECT
2451
2452                                  ;;*****************************************************************
2453                                  ;*TEST 4        READ DATA CLEAR MESSAGE
2454                                  ;*
2455                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT THE
2456                                  ;*      CONTROLLER ON DIAGNOSTIC MODE.  ISSUE A READ DATA TO AN
2457                                  ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE
2458                                  ;*      7,  WORD COUNT 177777.  CLOCK IN THE SEEK MESSAGE AND THE
2459                                  ;*      CLEAR MESSAGE AND MAKE SURE THE CLEAR MESSAGE IS CORRECT.
2460                                  ;*
2461                                  ;*****************************************************************
2462  005252  000004                  TST4:   SCOPE
2463  005254  012737  000062  001200          MOV     #50.,$TIMES       ;;DO 50. ITERATIONS
2464  005262  013702  001270                  MOV     $BASE,R2          ;LOAD RK611 BASE
2465  005266  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
2466  005274  012762  000040  000026          MOV     #DMD,RKMR1(R2)    ;PUT RK611 IN DIAGNOSTIC MODE
2467  005302  012762  177777  000002          MOV     #-1,RKWC(R2)      ;LOAD WORD COUNT
2468  005310  012762  055216  000004          MOV     #BUFF,RKBA(R2)    ;LOAD DUMMY BUS ADDRESS
2469  005316  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2470  005324  012762  003400  000006          MOV     #3400,RKDA(R2)    ;LOAD TRACK
2471  005332  012762  000007  000010          MOV     #7,RKCS2(R2)      ;LOAD DRIVE NUMBER
2472  005340  012762  012021  000000          MOV     #CDT!CFMT!RDDATA,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2473                                                                    ;  24 SECTOR FORMAT
2474  005346  012700  000156                  MOV     #27.*4+2,R0       ;LOAD COUNT TO LOAD DRIVE CLEAR
2475  005352  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2476  005360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2477  005366  005300                          DEC     R0
2478  005370  001370                          BNE     1$
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2479  005372  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2480  005400  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2481  005406  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2482  005414  012737  012021  003200          MOV     #CDT!CFMT!RDDATA,E.CS1  ;LOAD EXPECTED CS1
2483  005422  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2484  005430  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2485  005434  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2486  005442  001405                          BEQ     2$              ;YES, CHECK MESSB
2487  005444  104014                          ERROR   14              ;CS1 INCORRECT
2488  005446  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2489  005454  000412                          BR      TST5            ;;GO TO NEXT TEST
2490
2491  005456  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2492  005464  001401                          BEQ     3$              ;YES, CHECK MESS B
2493  005466  104015                          ERROR   15              ;MESS A INCORRECT
2494  005470  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2495  005476  001401                          BEQ     TST5            ;;YES, GO ON TO NEXT TEST
2496  005500  104016                          ERROR   16              ;MESS B INCORRECT
2497
2498                                  ;;*****************************************************************
2499                                  ;*TEST 5        WRITE DATA AND DRIVE CLEAR MESSAGE
2500                                  ;*
2501                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2502                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
2503                                  ;*      ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1777,
2504                                  ;*      TRACK 7, DRIVE 7.  CLOCK IN SEEK MESSAGE AND DRIVE CLEAR.
2505                                  ;*      CHECK IF PROPER DRIVE CLEAR MESSAGE IS ASSEMBLED.
2506                                  ;*
2507                                  ;;*****************************************************************
2508  005502  000004                  TST5:   SCOPE
2509  005504  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
2510  005512  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2511  005516  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2512  005524  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2513  005532  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2514  005540  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2515  005546  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2516  005554  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2517  005562  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2518  005570  012762  012023  000000          MOV     #CDT!CFMT!WRDATA,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2519                                                                  ;  24 SECTOR FORMAT
2520  005576  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2521  005602  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2522  005610  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2523  005616  005300                          DEC     R0
2524  005620  001370                          BNE     1$
2525  005622  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2526  005630  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2527  005636  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2528  005644  012737  012023  003200          MOV     #CDT!CFMT!WRDATA,E.CS1  ;LOAD EXPECTED CS1
2529  005652  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2530  005660  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2531  005664  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2532  005672  001405                          BEQ     2$              ;YES, CHECK MESSB
2533  005674  104017                          ERROR   17              ;CS1 INCORRECT
2534  005676  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
```

```
2535  005704  000412                          BR      TST6            ;;GO TO NEXT TEST
2536
2537  005706  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2538  005714  001401                          BEQ     3$              ;YES, CHECK MESS B
2539  005716  104020                          ERROR   20              ;MESS A INCORRECT
2540  005720  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2541  005726  001401                          BEQ     TST6            ;;YES, GO ON TO NEXT TEST
2542  005730  104021                          ERROR   21              ;MESS B INCORRECT
2543
2544                                  ;;*****************************************************************
2545                                  ;*TEST 6        DRIVE CLEAR MESSAGE FOR WRITE CHECK
2546                                  ;*
2547                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2548                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2549                                  ;*      CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
2550                                  ;*      CYLINDER 1777, HEAD 7, DRIVE 7.  CLOCK
2551                                  ;*      THROUGH SEEK MESSAGE AND CLOCK IN DRIVE CLEAR.
2552                                  ;*      MAKE SURE CORRECT MESSAGE IS ASSEMBLED.
2553                                  ;*
2554                                  ;;*****************************************************************
2555  005732  000004                  TST6:   SCOPE
2556  005734  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
2557  005742  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2558  005746  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2559  005754  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2560  005762  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2561  005770  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2562  005776  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2563  006004  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2564  006012  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2565  006020  012762  012031  000000          MOV     #CDT!CFMT!WRTCHK,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2566                                                                  ;  24 SECTOR FORMAT
2567  006026  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2568  006032  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2569  006040  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2570  006046  005300                          DEC     R0
2571  006050  001370                          BNE     1$
2572  006052  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2573  006060  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2574  006066  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2575  006074  012737  012031  003200          MOV     #CDT!CFMT!WRTCHK,E.CS1  ;LOAD EXPECTED CS1
2576  006102  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2577  006110  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2578  006114  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2579  006122  001405                          BEQ     2$              ;YES, CHECK MESSB
2580  006124  104022                          ERROR   22              ;CS1 INCORRECT
2581  006126  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2582  006134  000412                          BR      TST7            ;;GO TO NEXT TEST
2583
2584  006136  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2585  006144  001401                          BEQ     3$              ;YES, CHECK MESS B
2586  006146  104023                          ERROR   23              ;MESS A INCORRECT
2587  006150  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2588  006156  001401                          BEQ     TST7            ;;YES, GO ON TO NEXT TEST
2589  006160  104024                          ERROR   24              ;MESS B INCORRECT
2590
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                                .SBTTL  **HEADER GENERATION

                                ;;*****************************************************************
                                ;*TEST 7         HEADER GENERATION (PART 1)
                                ;*
                                ;*       CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT THE
                                ;*       CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA OF 1
                                ;*       WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
                                ;*       SECTOR 0.  CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES.
                                ;*       CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
                                ;*       TO MAKE THAT THE HEADER IS CORRECT.  REPEAT FOR CYLINDERS
                                ;*       1-1777.
                                ;*
                                ;*****************************************************************
006162  000004                TST7:   SCOPE
006164  012737  000012  001200        MOV     #10.,$TIMES             ;;DO 10. ITERATIONS
006172  013702  001270                MOV     $BASE,R2                ;LOAD RK611 BASE
006176  005037  003220                CLR     E.DCYL                  ;INITIALIZE CYLINDER ADD
006202  005037  003206                CLR     E.DA                    ;INITIALIZE TRACK AND SECTOR
006206  012737  000021  003200        MOV     #RDDATA,E.CS1           ;INITIALIZE FORMAT
006214  012737  006222  001110        MOV     #1$,$LPERR              ;LOAD LOOP ON ERROR LOCATION FOR
                                                                      ;  SUBTEST LOOP
006222                          1$:
006222  004737  036006                JSR     PC,CALHDR               ;CALULATE EXPECTED HEADER
006226  012762  100000  000000        MOV     #CCLR,RKCS1(R2)         ;CLEAR RK611
006234  012762  000040  000026        MOV     #DMD,RKMR1(R2)          ;PUT RK611 IM MAINTENANCE MODE
006242  012762  177777  000002        MOV     #-1,RKWC(R2)            ;LOAD WORD COUNT
006250  012762  055216  000004        MOV     #BUFF,RKBA(R2)          ;LOAD DUMMY BUS ADDRESS
006256  013762  003220  000020        MOV     E.DCYL,RKDCYL(R2)       ;LOAD CYLINDER NUMBER
006264  013762  003206  000006        MOV     E.DA,RKDA(R2)           ;LOAD TRACK AND SECTOR
006272  013762  003200  000000        MOV     E.CS1,RKCS1(R2)         ;LOAD COMMAND AND FORMAT
006300  012700  000426                MOV     #69.*4+2,R0             ;LOAD COUNT UNTIL HEADER GENERATION
006304  012762  000440  000026  5$:   MOV     #DMD!MCLK,RKMR1(R2)
006312  012762  000040  000026        MOV     #DMD,RKMR1(R2)
006320  005300                        DEC     R0
006322  001370                        BNE     5$
006324  016237  000000  003140        MOV     RKCS1(R2),T.CS1         ;STORE COMMAND AND STATUS REG 1
006332  016237  000034  003166        MOV     RKMR2(R2),T.MR2         ;STORE FIRST HEADER WORD
006340  016237  000036  003170        MOV     RKMR3(R2),T.MR3         ;STORE SECOND WORD
006346  023737  003200  003140        CMP     E.CS1,T.CS1             ;CHECK COMMAND AND STATRUS REG 1 CORRECT
006354  001405                        BEQ     6$                      ;YES, CHECK FIRST LINE OF HEADER
006356  104025                        ERROR   25                      ;CS1 INCORRECT
006360  012762  100000  000000        MOV     #CCLR,RKCS1(R2)         ;CLEAR CONTROLLER
006366  000412                        BR      15$                     ;YES, CHECK SECOND WORD OF HEADER
006370  023737  003226  003166  6$:   CMP     E.MR2,T.MR2             ;CHECK IF FIRST WORD OF HEADER CORRECT
006376  001401                        BEQ     7$                      ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
006400  104026                        ERROR   26                      ;FIRST WORD OF HEADER INCORRECT
006402  023737  003230  003170  7$:   CMP     E.MR3,T.MR3             ;CHECK IF SECOND WORD OF HEADER CORRECT
006410  001401                        BEQ     15$                     ;YES,CHECK IF LOOP ON ERROR
006412  104027                        ERROR   27                      ;SECOND WORD INCORRECT
006414  104415                15$:    SCOPE                           ;LOOP ON ERROR
006416  005237  003220                INC     E.DCYL                  ;INCREMENT EXPECTED CYLINDER
006422  022737  000633  003220        CMP     #633,E.DCYL             ;CHECK IF VALUE OF CYLINDER OVERFLOW DETECTION
006430  001002                        BNE     16$                     ;NO, CONTINUE
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2647  006432  005237  003220                    INC     E.DCYL          ;USE 634
2648  006436  022737  001777  003220  16$:      CMP     #1777,E.DCYL    ;CHECK IF FINISHED
2649  006444  103266                            BHIS    1$              ;NO, GO TO NEXT CONFIGURATION
2650
2651                                  ;;*****************************************************************
2652                                  ;*TEST 10       HEADER GENERATION (PART 2)
2653                                  ;*
2654                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2655                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA OF
2656                                  ;*      1 WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD
2657                                  ;*      0, SECTOR 0.  CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGE.
2658                                  ;*      CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
2659                                  ;*      TO MAKE THAT THE HEADER IS CORRECT.  REPEAT FOR HEADS 1-7.
2660                                  ;*
2661                                  ;;*****************************************************************
2662  006446  000004                  TST10:  SCOPE
2663  006450  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2664  006456  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2665  006462  005037  003220                  CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
2666  006466  005037  003206                  CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
2667  006472  012737  000021  003200          MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
2668  006500  012737  006506  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
2669                                                                  ;  SUBTEST LOOP
2670
2671  006506                          1$:
2672  006506  004737  036006                  JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
2673  006512  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2674  006520  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
2675  006526  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2676  006534  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2677  006542  013762  003220  000020          MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
2678  006550  013762  003206  000006          MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
2679  006556  013762  003200  000000          MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
2680  006564  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
2681  006570  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2682  006576  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2683  006604  005300                          DEC     R0
2684  006606  001370                          BNE     5$
2685  006610  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2686  006616  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
2687  006624  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
2688  006632  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
2689  006640  001405                          BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
2690  006642  104030                          ERROR   30              ;CS1 INCORRECT
2691  006644  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2692  006652  000412                          BR      15$             ;YES, CHECK SECOND WORD OF HEADER
2693
2694  006654  023737  003226  003166  6$:     CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
2695  006662  001401                          BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
2696  006664  104031                          ERROR   31              ;FIRST WORD OF HEADER INCORRECT
2697  006666  023737  003230  003170  7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
2698  006674  001401                          BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
2699  006676  104032                          ERROR   32              ;SECOND WORD INCORRECT
2700  006700  104415                  15$:    SCOP1                   ;LOOP ON ERROR
2701  006702  105237  003207                  INCB    E.DA+1          ;INCREMENT TRACK
2702  006706  122737  000007  003207          CMPB    #7,E.DA+1       ;CHECK IF FINISHED
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2703  006714  103274                          BHIS    1$              ;NO, GO TO NEXT CONFIGURATION
2704
2705                                  ;;*****************************************************************
2706                                  ;*TEST 11       HEADER GENERATION (PART 3)
2707                                  ;*
2708                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2709                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA OF
2710                                  ;*      ONE WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD
2711                                  ;*      0, SECTOR 0.  CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES.
2712                                  ;*      CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
2713                                  ;*      TO MAKE SURE HEADER IS CORRECT.  REPEAT FOR SECTORS 1-25.
2714                                  ;*
2715                                  ;;*****************************************************************
2716  006716  000004                  TST11:  SCOPE
2717  006720  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2718  006726  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2719  006732  005037  003220                  CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
2720  006736  005037  003206                  CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
2721  006742  012737  000021  003200          MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
2722  006750  012737  006756  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
2723                                                                  ;  SUBTEST LOOP
2724
2725  006756                          1$:
2726  006756  004737  036006                  JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
2727  006762  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2728  006770  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
2729  006776  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2730  007004  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2731  007012  013762  003220  000020          MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
2732  007020  013762  003206  000006          MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
2733  007026  013762  003200  000000          MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
2734  007034  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEPDER GENERATION
2735  007040  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2736  007046  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2737  007054  005300                          DEC     R0
2738  007056  001370                          BNE     5$
2739  007060  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2740  007066  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
2741  007074  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
2742  007102  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
2743  007110  001405                          BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
2744  007112  104033                          ERROR   33              ;CS1 INCORRECT
2745  007114  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2746  007122  000412                          BR      15$             ;YES, CHECK SECOND WORD OF HEADER
2747
2748  007124  023737  003226  003166  6$:     CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
2749  007132  001401                          BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
2750  007134  104034                          ERROR   34              ;FIRST WORD OF HEADER INCORRECT
2751  007136  023737  003230  003170  7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
2752  007144  001401                          BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
2753  007146  104035                          ERROR   35              ;SECOND WORD INCORRECT
2754  007150  104415                  15$:    SCOP1                   ;LOOP ON ERROR
2755  007152  105237  003206                  INCB    E.DA            ;INCREMENT SECTOR
2756  007156  122737  000025  003206          CMPB    #25,E.DA        ;CHECK IF FINISHED
2757  007164  103274                          BHIS    1$              ;NO, GO TO NEXT CONFIGURATION
2758
```

```
                                ;;*****************************************************************
                                ;*TEST 12       HEADER GENERATION (PART 4)
                                ;*
                                ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA OF
                                ;*      ONE WORD FOR AND RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
                                ;*      HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK AND DRIVE CLEAR
                                ;*      MESSAGES, CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE
                                ;*      REGISTER 3 TO MAKE SURE HEADER IS CORRECT.  REPEAT FOR 24
                                ;*      SECTOR FORMAT.
                                ;*
                                ;*****************************************************************
007166  000004                  TST12:  SCOPE
007170  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
007176  013702  001270          1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
007202  005037  003220                  CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
007206  005037  003206                  CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
007212  012737  000021  003200          MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
007220  012737  007226  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                ;  SUBTEST LOOP
007226                          1$:
007226  004737  036006                  JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
007232  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007240  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
007246  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
007254  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
007262  013762  003220  000020          MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
007270  013762  003206  000006          MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
007276  013762  003200  000000          MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
007304  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
007310  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
007316  012762  000040  000026          MOV     #DMD,RKMR1(R2)
007324  005300                          DEC     R0
007326  001370                          BNE     5$
007330  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
007336  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
007344  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
007352  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
007360  001405                          BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
007362  104036                          ERROR   36              ;CS1 INCORRECT
007364  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
007372  000412                          BR      15$             ;YES, CHECK SECOND WORD OF HEADER

007374  023737  003226  003166  6$:     CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
007402  001401                          BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
007404  104037                          ERROR   37              ;FIRST WORD OF HEADER INCORRECT
007406  023737  003230  003170  7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
007414  001401                          BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
007416  104040                          ERROR   40              ;SECOND WORD INCORRECT
007420  104415                  15$:    SCOP1                   ;LOOP ON ERROR
007422  032737  010000  003200          BIT     #CFMT,E.CS1     ;CHECK IF FINISHED
007430  001004                          BNE     TST13           ;;YES, GO TO NEXT TEST
007432  052737  010000  003200          BIS     #CFMT,E.CS1     ;USE 24 SECTOR FORMAT
007440  000672                          BR      1$
```

```
                                .SBTTL  **NPR TRANSFER FOR WRITE DATA

                                ;;*****************************************************************
                                ;*TEST 13       WRITE DATA NPR TRANSFER
                                ;*
                                ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                                ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
                                ;*      67 WORDS, TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
                                ;*      TRACK 0, DRIVE 0.  CLOCK IN SEEK AND DRIVE CLEAR MESSAGES.
                                ;*      GIVE ENOUGH CLOCK PULSE FOR 68 SILO WORDS. MAKE SURE DATA
                                ;*      LATE DOES NOT OCCUR.  READ BACK 66 WORDS AND VERIFY THEY
                                ;*      ARE CORRECT.
                                ;*
                                ;;*****************************************************************
007442  000004                  TST13:  SCOPE
007444  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
007452  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
007456  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007464  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
007472  012762  177675  000002          MOV     #-67.,RKWC(R2)  ;WORD COUNT=67
007500  012762  053154  000004          MOV     #NPRBUF,RKBA(R2)  ;LOAD BUFFER ADDRESS
007506  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRDATA
007514  012700  004724                  MOV     #68.*37.,R0     ;ISSUE ENOUGH CLOCKS FOR 68
007520  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  NPR TRANSFERS
007526  012762  000040  000026          MOV     #DMD,RKMR1(R2)
007534  005300                          DEC     R0
007536  001370                          BNE     1$
007540  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
007546  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
007554  016237  000002  003142          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
007562  016237  000004  003144          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
007570  016237  000014  003154          MOV     RKER(R2),T.ER   ;STORE ERROR REG.
007576  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
007604  012737  000200  003210          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
007612  012737  177777  003202          MOV     #-1,E.WC        ;LOAD EXPECTED WORD COUNT
007620  012737  053360  003204          MOV     #NPRBUF+<66.*2>,E.BA  ;LOAD EXPECTED BUS ADDRESS
007626  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
007632  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
007640  001405                          BEQ     5$              ;YES, CHECK CS2
007642  104041                          ERROR   41              ;CS1 INCORRECT
007644  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007652  000517                          BR      TST14           ;;GO TO NEXT TEST
                                
007654  023737  003210  003150  5$:     CMP     E.CS2,T.CS2     ;CHECK CS2
007662  001401                          BEQ     6$              ;NO, CHECK BUS ADDRESS
007664  104042                          ERROR   42              ;CS2 INCORRECT
007666  023737  003204  003144  6$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
007674  001401                          BEQ     7$              ;YES, CHECK WORD COUNT
007676  104044                          ERROR   44              ;BUS ADDRESS INCORRECT
007700  023737  003202  003142  7$:     CMP     E.WC,T.WC       ;CHECK WORD COUNT
007706  001401                          BEQ     8$              ;YES, CONTINUE
007710  104045                          ERROR   45              ;WORD COUNT INCORRECT
007712  023737  003214  003154  8$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
007720  001401                          BEQ     10$             ;YES, CONTINUE
007722  104043                          ERROR   43              ;ERROR REG INCORRECT
007724  012703  053154          10$:    MOV     #NPRBUF,R3      ;LOAD ADDRESS OR START OF BUFFER
```

```
2871  007730  012701  000101                 MOV     #65.,R1          ;LOAD COUNT FOR SICO
2872  007734  005037  003264                 CLR     WRDCNT           ;INITIALIZE WORD COUNT
2873  007740  012737  000300  003210         MOV     #IR!OR,E.CS2     ;LOAD EXPECTED CS2
2874  007746  012337  003222          15$:   MOV     (R3)+,E.DB       ;LOAD EXPECTED DATA
2875  007752  016237  000024  003162         MOV     RKDB(R2),T.DB    ;GET DATA READ
2876  007760  012700  000020                 MOV     #20,R0           ;SET COUNT TO WAIT FOR SILO
2877  007764  005300                 16$:   DEC     R0               ;DEC COUNT
2878  007766  001376                 BNE     16$                      ;WAIT FOR 0
2879  007770  016237  000000  003140         MOV     RKCS1(R2),T.CS1  ;STORE CS1
2880  007776  016237  000010  003150         MOV     RKCS2(R2),T.CS2  ;STORE CS2
2881  010004  016237  000014  003154         MOV     RKER(R2),T.ER    ;STORE ERROR REG.
2882  010012  023737  003200  003140         CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
2883  010020  001405                 BEQ     20$                      ;YES, CONTINUE
2884  010022  104046                 ERROR   46                       ;CS1 INCORRECT
2885  010024  012762  100000  000000         MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2886  010032  000427                 BR      TST14                    ;;GO ON TO NEXT TEST
2887
2888  010034  023737  003210  003150  20$:   CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
2889  010042  001401                 BEQ     21$                      ;YES, CONTINUE
2890  010044  104047                 ERROR   47                       ;CS2 INCORRECT
2891  010046  023737  003214  003154  21$:   CMP     E.ER,T.ER        ;CHECK ERROR REG CORRECT
2892  010054  001401                 BEQ     22$                      ;YES, CONTINUE
2893  010056  104050                 ERROR   50                       ;ERROR REG INCORRECT
2894  010060  023737  003222  003162  22$:   CMP     E.DB,T.DB        ;CHECK DATA CORRECT
2895  010066  001401                 BEQ     25$                      ;YES, CONTINUE
2896  010070  104051                 ERROR   51                       ;DATA INCORRECT
2897  010072  005237  003264          25$:   INC     WRDCNT           ;INCREMENT WORD COUNT
2898  010076  005301                 DEC     R1
2899  010100  001003                 BNE     26$                      ;CHECK IF LAST WORD
2900  010102  012737  000100  003210         MOV     #IR,E.CS2        ;UPDATE EXPECTED CS2
2901  010110  100316          26$:   BPL     15$                      ;CHECK IF FINISHED
2902
2903                           .SBTTL  **HEADER RECOGNITION TESTS
2904
2905                           ;;*****************************************************************
2906                           ;*TEST 14       WRITE DATA HEADER RECOGNITION
2907                           ;*
2908                           ;*       CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2909                           ;*       CONTROLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE
2910                           ;*       WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
2911                           ;*       SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
2912                           ;*       SIMULATE A SECTOR PULSE AND A HEADER WITH THE FOLLOWING
2913                           ;*       DATA:
2914                           ;*
2915                           ;*               000000
2916                           ;*               140000
2917                           ;*               140000
2918                           ;*
2919                           ;*       MAKE SURE WRITE GATE SETS SHOWING CORRECT HEADER RECOGNITION.
2920                           ;*
2921                           ;*****************************************************************
2922  010112  000004          TST14:  SCOPE
2923  010114  012737  000012  001200         MOV     #10.,$TIMES      ;;DO 10. ITERATIONS
2924  010122  013702  001270                 MOV     $BASE,R2         ;LOAD RK611 BASE
2925  010126  012762  100000  000000         MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2926  010134  012762  000040  000026         MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN DIAGNOSTIC MODE
```

```
2927  010142  012762  177777  000002          MOV     #-1,RKWC(R2)      ;WORD COUNT=1
2928  010150  012762  055216  000004          MOV     #BUFF,RKBA(R2)    ;LOAD DUMMY BUS ADDRESS
2929  010156  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
2930  010164  012700  000426                  MOV     #69.*4+2,R0       ;ISSUE ENOUGH CLOCKS UNIT  READY
2931                                                                    ;  FOR SECTOR PULSE
2932  010170  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2933  010176  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2934  010204  005300                          DEC     R0
2935  010206  001370                          BNE     1$
2936  010210  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
2937  010216  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2938  010224  012737  000023  003200          MOV     #WRDATA,E.CS1     ;STORE EXPECTED CS1
2939  010232  005037  003254                  CLR     PR.BIT            ;GENERATE SYNCH
2940  010236  005037  003256                  CLR     M1.BIT
2941  010242  005037  003262                  CLR     BITCNT
2942  010246  012700  000377                  MOV     #255.,R0
2943  010252  004737  037026          5$:     JSR     PC,RDBIT
2944  010256  016237  000000  003140          MOV     RKCS1(R2),T.CS1
2945  010264  023737  003200  003140          CMP     E.CS1,T.CS1       ;CHECK CS1 CORRECT
2946  010272  001112                          BNE     63$               ;NO, REPORT ERROR
2947  010274  005237  003262                  INC     BITCNT            ;INCREMENT BIT COUNT
2948  010300  005300                          DEC     R0                ;CHECK IF SYNCH FINISHED
2949  010302  001363                          BNE     5$
2950  010304  012737  000001  003254          MOV     #1,PR.BIT         ;SIMULATE SYNCH BIT
2951  010312  004737  037026                  JSR     PC,RDBIT
2952  010316  016237  000000  003140          MOV     RKCS1(R2),T.CS1
2953  010324  023737  003200  003140          CMP     E.CS1,T.CS1       ;CHECK CS1 CORRECT
2954  010332  001072                          BNE     63$               ;NO, REPORT CS1
2955  010334  005237  003262                  INC     BITCNT            ;INCREMENT BIT COUNT
2956  010340  012703  053364                  MOV     #HEAD1,R3         ;SIMULATE GOOD HEADER
2957  010344  012701  000003                  MOV     #3,R1
2958  010350  012304                  12$:    MOV     (R3)+,R4          ;GET NEXT HEADER WORD
2959  010352  012700  000020                  MOV     #16.,R0           ;LOAD BITS PER WORD
2960  010356  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT     ;STORE PREVIOUS BIT
2961  010364  006004                          ROR     R4                ;GET NEXT BIT
2962  010366  103403                          BCS     17$
2963  010370  005037  003254                  CLR     PR.BIT
2964  010374  000403                          BR      18$
2965
2966  010376  012737  000001  003254  17$:    MOV     #1,PR.BIT
2967  010404  004737  037026          18$:    JSR     PC,RDBIT          ;SIMULATE NEXT BIT
2968  010410  016237  000000  003140          MOV     RKCS1(R2),T.CS1   ;GET CS1
2969  010416  023737  003200  003140          CMP     E.CS1,T.CS1       ;CHECK CS1 CORRECT
2970  010424  001035                          BNE     63$               ;NO, REPORT ERROR
2971  010426  005237  003262                  INC     BITCNT            ;INCREMENT BIT COUNT
2972  010432  005300                          DEC     R0                ;CHECK IF READY FOR NEXT HEADER WORD
2973  010434  001350                          BNE     15$               ;NO, CONTINUE
2974  010436  005301                          DEC     R1                ;CHECK IF FINISHED WITH HEAD
2975  010440  001343                          BNE     12$               ;NO, CONTINUE
2976  010442  012700  000105                  MOV     #69.,R0           ;LOAD COUNT FOR GAP
2977  010446  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT     ;SIMULATE GAP
2978  010454  005037  003254                  CLR     PR.BIT
2979  010460  004737  037026                  JSR     PC,RDBIT
2980  010464  005300                          DEC     R0
2981  010466  001367                          BNE     25$
2982  010470  016237  000026  003164          MOV     RKMR1(R2),T.MR1   ;GET MR1
```

```
2983  010476  012737  062040  003224          MOV     #DMD!ECCW!WCWD!WRTGAT,E.MR1  ;LOAD EXPECTED MR1
2984  010504  023737  003224  003164          CMP     E.MR1,T.MR1         ;CHECK IF WRITE GATE SET
2985  010512  001411                          BEQ     TST15               ;;YES, GO ON TO NEXT TEST
2986  010514  104053                          ERROR   53
2987  010516  000407                          BR      TST15               ;;GO ON TO NEXT TEST
2988
2989  010520  016237  000010  003150  63$:    MOV     RKCS2(R2),T.CS2     ;STORE CS2 FOR PRINT OUT
2990  010526  016237  000014  003154          MOV     RKER(R2),T.ER       ;STORE ERROR REG FOR PRINT OUT
2991  010534  104052                          ERROR   52                  ;REPORT ERROR
2992
2993                                  ;;*****************************************************************
2994                                  ;*TEST 15       SECTOR PULSE DETECTION FOR WRITE DATA
2995                                  ;*
2996                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2997                                  ;*      CONTROLLER IN MAINTENANCE MODE ISSUE A WRITE DATA OF ONE
2998                                  ;*      WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
2999                                  ;*      SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3000                                  ;*      SIMULATE AN INDEX PULSE AND A HEADER WITH THE FOLLOWING
3001                                  ;*      DATA:
3002                                  ;*
3003                                  ;*              000000
3004                                  ;*              140000
3005                                  ;*              140000
3006                                  ;*
3007                                  ;*      MAKE SURE WRITE GATE DOES NOT SET.
3008                                  ;*
3009                                  ;*****************************************************************
3010  010536  000004                  TST15:  SCOPE
3011  010540  012737  000012  001200          MOV     #10.,$TIMES         ;;DO 10. ITERATIONS
3012  010546  013702  001270                  MOV     $BASE,R2            ;LOAD RK611 BASE
3013  010552  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
3014  010560  012700  000700                  MOV     #700,R0             ;SET STALL COUNT
3015  010564  005300                  4$:     DEC     R0                  ;DEC COUNT
3016  010566  001376                          BNE     4$                  ;LOOP UNTIL ZERO
3017  010570  012762  000040  000026          MOV     #DMD,RKMR1(R2)      ;PUT RK611 IN DIAGNOSTIC MODE
3018  010576  012762  177777  000002          MOV     #-1,RKWC(R2)        ;WORD COUNT = 1
3019  010604  012762  055216  000004          MOV     #BUFF,RKBA(R2)      ;LOAD DUMMY BUS ADDRESS
3020  010612  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)   ;ISSUE WRITE DATA
3021  010620  012700  000426                  MOV     #69.*4+2,R0         ;ISSUE ENOUGH CLOCKS UNTILL READY
3022                                                                      ;  FOR SECTOR PULSE
3023  010624  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3024  010632  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3025  010640  005300                          DEC     R0
3026  010642  001370                          BNE     1$
3027  010644  012700  000004                  MOV     #4,R0               ;SIMULATE INDEX PULSE
3028  010650  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3029  010656  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3030  010664  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3031  010672  005300                          DEC     R0
3032  010674  001370                          BNE     2$
3033  010676  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3034  010704  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
3035  010710  005037  003256                  CLR     M1.BIT
3036  010714  012700  000377                  MOV     #255.,R0
3037  010720  004737  037026          5$:     JSR     PC,RDBIT
3038  010724  005300                          DEC     R0
```

```
3039  010726  001374                        BNE     5$
3040  010730  012737  000001  003254        MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3041  010736  004737  037026                JSR     PC,RDBIT
3042  010742  012703  053364                MOV     #HEAD1,R3       ;SIMULATE GOOD HEADER
3043  010746  012701  000003                MOV     #3,R1
3044  010752  012304                  12$:  MOV     (P3)+,R4        ;GET NEXT HEADER WORD
3045  010754  012700  000020                MOV     #16.,R0         ;LOAD BITS PER WORDS
3046  010760  013737  003254  003256  15$:  MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
3047  010766  006004                        ROR     R4              ;GET NEXT BIT
3048  010770  103403                        BCS     17$
3049  010772  005037  003254                CLR     PR.BIT
3050  010776  000403                        BR      18$
3051
3052  011000  012737  000001  003254  17$:  MOV     #1,PR.BIT
3053  011006  004737  037026          18$:  JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3054  011012  005300                        DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3055  011014  001361                        BNE     15$             ;NO,CONTINUE
3056  011016  005301                        DEC     R1              ;CHECK IF FINISHED WITH HEADER
3057  011020  001354                        BNE     12$             ;NO,CONTINUE
3058  011022  012700  000100                MOV     #64.,R0         ;LOAD COUNT FOR GAP
3059  011026  013737  003254  003256  25$:  MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3060  011034  005037  003254                CLR     PR.BIT
3061  011040  004737  037026                JSR     PC,RDBIT
3062  011044  005300                        DEC     R0
3063  011046  001367                        BNE     25$
3064  011050  016237  000026  003164        MOV     RKMR1(R2),T.MR1 ;GET MR1
3065  011056  012737  022040  003224        MOV     #DMD!ECCW!MEWD,E.MR1 ;LOAD EXPECTDED MR1
3066  011064  023737  003164  003224        CMP     T.MR1,E.MR1     ;CHECK IF WRITE GATE DID NOT SET
3067  011072  001401                        BEQ     TST16           ;;YES, GO ON TO NEXT TEST
3068  011074  104053                        ERROR   53
3069
3070                                  ;;*****************************************************************
3071                                  ;*TEST 16       SECTOR INCREMENT
3072                                  ;*
3073                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3074                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE WORD
3075                                  ;*      TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
3076                                  ;*      SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3077                                  ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
3078                                  ;*      THAT WRITE GATE SETS,
3079                                  ;*
3080                                  ;*      REPEAT FOR SECTOR 1-24.
3081                                  ;*
3082                                  ;*****************************************************************
3083  011076  000004                  TST16:  SCOPE
3084  011100  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3085  011106  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3086  011112  005037  003300                  CLR     CYLN            ;INITIALIZE CYLINDER
3087  011116  005037  003276                  CLR     SECTOR          ;INITIALIZE TRACK AND SECTOR
3088  011122  012737  011130  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3089                                                                  ;  SUBTEST LOOP
3090
3091  011130                           1$:
3092  011130  004737  035624                  JSR     PC,INCHDR       ;GENERATE HEADER WORDS
3093  011134  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
3094  011142  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
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3095  011150  013762  003300  000020          MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
3096  011156  013762  003276  000006          MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
3097  011164  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3098  011172  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3099  011200  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3100  011206  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3101                                                                  ;  FOR SECTOR PULSE
3102  011212  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3103  011220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3104  011226  005300                          DEC     R0
3105  011230  001370                          BNE     5$
3106  011232  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3107  011240  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3108  011246  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
3109  011252  005037  003256                  CLR     M1.BIT
3110  011256  012700  000377                  MOV     #255.,R0
3111  011262  004737  037026          10$:    JSR     PC,RDBIT
3112  011266  005300                          DEC     R0
3113  011270  001374                          BNE     10$
3114  011272  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3115  011300  004737  037026                  JSR     PC,RDBIT
3116  011304  012703  003302                  MOV     #HEADER,R3      ;SIMULATE HEADER
3117  011310  012701  000003                  MOV     #3,R1
3118  011314  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3119  011316  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
3120  011322  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT
3121  011330  006004                          ROR     R4
3122  011332  103403                          BCS     17$
3123  011334  005037  003254                  CLR     PR.BIT
3124  011340  000403                          BR      18$
3125
3126  011342  012737  000001  003254  17$:    MOV     #1,PR.BIT
3127  011350  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3128  011354  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3129  011356  001361                          BNE     15$             ;NO, CONTINUE
3130  011360  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3131  011362  001354                          BNE     12$             ;NO, CONTINUE
3132  011364  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3133  011370  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3134  011376  005037  003254                  CLR     PR.BIT
3135  011402  004737  037026                  JSR     PC,RDBIT
3136  011406  005300                          DEC     R0              ;CHECK IF GAP FINISHED
3137  011410  001367                          BNE     25$             ;NO, CONTINUE
3138  011412  016237  000006  003146          MOV     RKDA(R2),T.DA   ;GET DISK ADDRESS REG
3139  011420  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL  ;GET CYLINDER ADD REG.
3140  011426  023737  003206  003146          CMP     E.DA,T.DA       ;CHECK DISK ADD CORRECT
3141  011434  001401                          BEQ     30$             ;YES, CONTINUE
3142  011436  104054                          ERROR   54              ;DISK ADDRESS INCORRECT
3143  011440  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL   ;CHECK IF CYLINDER ADD CORRECT
3144  011446  001401                          BEQ     32$             ;YES, CHECK IF LOOP ON ERROR
3145  011450  104002                          ERROR   R2              ;CYLINDER INCORRECT
3146  011452  104415                  32$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3147  011454  105237  003276                  INCB    SECTOR          ;INCREMENT SECTOR
3148  011460  122737  000026  003276          CMPB    #26,SECTOR      ;CHECK IF ALL SECTOR TRIED
3149  011466  001220                          BNE     1$              ;NO, TRY NEXT VALUE
3150
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3151                                    ;;*****************************************************************
3152                                    ;*TEST 17       TRACK INCREMENT
3153                                    ;*
3154                                    ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3155                                    ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE WORD
3156                                    ;*      TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
3157                                    ;*      SECTOR 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3158                                    ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
3159                                    ;*      THAT WRITE GATE SETS.
3160                                    ;*
3161                                    ;*      REPEAT FOR TRACK = 1.
3162                                    ;*
3163                                    ;*****************************************************************
3164  011470  000004                    TST17:  SCOPE
3165  011472  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3166  011500  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
3167  011504  005037  003300                    CLR     CYLN            ;INITIALIZE CYLINDER
3168  011510  012737  000025  003276            MOV     #25,SECTOR      ;INITIALIZE TRACK AND SECTOR
3169  011516  012737  011524  001110            MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3170                                                                    ;  SUBTEST LOOP
3171
3172  011524                            1$:
3173  011524  004737  035624                    JSR     PC,INCHDR       ;GENERATE HEADER WORDS
3174  011530  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
3175  011536  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3176  011544  013762  003300  000020            MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
3177  011552  013762  003276  000006            MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
3178  011560  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3179  011566  012762  055216  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3180  011574  012762  000023  000000            MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3181  011602  012700  000426                    MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3182                                                                    ;  FOR SECTOR PULSE
3183  011606  012762  000440  000026    5$:     MOV     #DMD!MCLK,RKMR1(R2)
3184  011614  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3185  011622  005300                            DEC     R0
3186  011624  001370                            BNE     5$
3187  011626  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3188  011634  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3189  011642  005037  003254                    CLR     PR.BIT          ;GENERATE SYNCH
3190  011646  005037  003256                    CLR     M1.BIT
3191  011652  012700  000377                    MOV     #255.,R0
3192  011656  004737  037026            10$:    JSR     PC,RDBIT
3193  011662  005300                            DEC     R0
3194  011664  001374                            BNE     10$
3195  011666  012737  000001  003254            MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3196  011674  004737  037026                    JSR     PC,RDBIT
3197  011700  012703  003302                    MOV     #HEADER,R3      ;SIMULATE HEADER
3198  011704  012701  000003                    MOV     #3,R1
3199  011710  012304                    12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3200  011712  012700  000020                    MOV     #16.,R0         ;LOAD BITS PER WORD
3201  011716  013737  003254  003256    15$:    MOV     PR.BIT,M1.BIT
3202  011724  006004                            ROR     R4
3203  011726  103403                            BCS     17$
3204  011730  005037  003254                    CLR     PR.BIT
3205  011734  000403                            BR      18$
3206
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```
3207  011736  012737  000001  003254  17$:    MOV     #1,PR.BIT
3208  011744  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3209  011750  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3210  011752  001361                          BNE     15$             ;NO, CONTINUE
3211  011754  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3212  011756  001354                          BNE     12$             ;NO, CONTINUE
3213  011760  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3214  011764  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3215  011772  005037  003254                  CLR     PR.BIT
3216  011776  004737  037026                  JSR     PC,RDBIT
3217  012002  005300                          DEC     R0              ;CHECK IF GAP FINISHED
3218  012004  001367                          BNE     25$             ;NO, CONTINUE
3219  012006  016237  000006  003146          MOV     RKDA(R2),T.DA   ;GET DISK ADDRESS REG
3220  012014  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL  ;GET CYLINDER ADD REG.
3221  012022  023737  003206  003146          CMP     E.DA,T.DA       ;CHECK DISK ADD CORRECT
3222  012030  001401                          BEQ     30$             ;YES, CONTINUE
3223  012032  104056                          ERROR   56              ;DISK ADDRESS INCORRECT
3224  012034  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL   ;CHECK IF CYLINDER ADD CORRECT
3225  012042  001401                          BEQ     32$             ;YES, CHECK IF LOOP ON ERROR
3226  012044  104002                          ERROR   R2              ;CYLINDER INCORRECT
3227  012046  104415                  32$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3228  012050  105237  003277                  INCB    TRACK           ;INCREMENT TRACK
3229  012054  122737  000003  003277          CMPB    #3,TRACK        ;CHECK IF ALL TRACKS TRIED
3230  012062  001220                          BNE     1$              ;NO, TRY NEXT VALUE
3231
3232                                  ;;*****************************************************************
3233                                  ;*TEST 20       CYLINDER INCREMENT
3234                                  ;*
3235                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3236                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE WORD
3237                                  ;*      TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 2,
3238                                  ;*      SECTOR 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3239                                  ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
3240                                  ;*      THAT WRITE GATE SETS.
3241                                  ;*
3242                                  ;*      REPEAT FOR CYLINDER = 1-632.
3243                                  ;*
3244                                  ;*****************************************************************
3245  012064  000004                  TST20:  SCOPE
3246  012066  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3247  012074  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3248  012100  005037  003300                  CLR     CYLN            ;INITIALIZE CYLINDER
3249  012104  012737  001025  003276          MOV     #1025,SECTOR    ;INITIALIZE TRACK AND SECTOR
3250  012112  012737  012120  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3251                                                                  ;  SUBTEST LOOP
3252
3253  012120                          1$:
3254  012120  004737  035624                  JSR     PC,INCHDR       ;GENERATE HEADER WORDS
3255  012124  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
3256  012132  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3257  012140  013762  003300  000020          MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
3258  012146  013762  003276  000006          MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
3259  012154  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3260  012162  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3261  012170  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3262  012176  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
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3263                                                            ;  FOR SECTOR PULSE
3264  012202  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3265  012210  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3266  012216  005300                          DEC     R0
3267  012220  001370                          BNE     5$
3268  012222  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3269  012230  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3270  012236  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
3271  012242  005037  003256                  CLR     M1.BIT
3272  012246  012700  000377                  MOV     #255.,R0
3273  012252  004737  037026          10$:    JSR     PC,RDBIT
3274  012256  005300                          DEC     R0
3275  012260  001374                          BNE     10$
3276  012262  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH BIT
3277  012270  004737  037026                  JSR     PC,RDBIT
3278  012274  012703  003302                  MOV     #HEADER,R3          ;SIMULATE HEADER
3279  012300  012701  000003                  MOV     #3,R1
3280  012304  012304                  12$:    MOV     (R3)+,R4            ;GET NEXT HEADER WORD
3281  012306  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
3282  012312  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT
3283  012320  006004                          ROR     R4
3284  012322  103403                          BCS     17$
3285  012324  005037  003254                  CLR     PR.BIT
3286  012330  000403                          BR      18$
3287
3288  012332  012737  000001  003254  17$:    MOV     #1,PR.BIT
3289  012340  004737  037026          18$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
3290  012344  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT HEADER WORD
3291  012346  001361                          BNE     15$                 ;NO, CONTINUE
3292  012350  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
3293  012352  001354                          BNE     12$                 ;NO, CONTINUE
3294  012354  012700  000100                  MOV     #64.,R0             ;LOAD COUNT FOR GAP
3295  012360  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
3296  012366  005037  003254                  CLR     PR.BIT
3297  012372  004737  037026                  JSR     PC,RDBIT
3298  012376  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
3299  012400  001367                          BNE     25$                 ;NO, CONTINUE
3300  012402  016237  000006  003146          MOV     RKDA(R2),T.DA       ;GET DISK ADDRESS REG
3301  012410  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL   ;GET CYLINDER ADD REG.
3302  012416  023737  003206  003146          CMP     E.DA,T.DA           ;CHECK DISK ADD CORRECT
3303  012424  001401                          BEQ     30$                 ;YES, CONTINUE
3304  012426  104060                          ERROR   60                  ;DISK ADDRESS INCORRECT
3305  012430  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL       ;CHECK IF CYLINDER ADD CORRECT
3306  012436  001401                          BEQ     32$                 ;YES, CHECK IF LOOP ON ERROR
3307  012440  104002                          ERROR   R2                  ;CYLINDER INCORRECT
3308  012442  104415                  32$:    SCOP1                       ;CHECK IF LOOP ON ERROR
3309  012444  005237  003300                  INC     CYLN                ;INCREMENT CYLINDER
3310  012450  022737  000633  003300          CMP     #633,CYLN           ;CHECK IF ALL CYLINDER TRIED
3311  012456  001220                          BNE     1$                  ;NO, TRY NEXT VALUE
3312
3313                                  ;;*****************************************************************
3314                                  ;*TEST 21        BAD SECTOR ERROR (PART 1)
3315                                  ;*
3316                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3317                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3318                                  ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
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                                        ;*      HEAD 0, SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
                                        ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER WITH
                                        ;*      THE FOLLOWING DATA:
                                        ;*
                                        ;*              000000
                                        ;*              040000
                                        ;*              040000
                                        ;*
                                        ;*      MAKE SURE BAD SECTOR ERROR SETS.  CHECK THAN DISK ADDRESS
                                        ;*      IS NOT INCREMENTED.
                                        ;*
                                        ;;*****************************************************************
012460  000004                          ;ST21:  SCOPE
012462  012737  000012  001200                  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
012470  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
012474  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
012502  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
012510  012762  000000  000020                  MOV     #0,RKDCYL(R2)   ;LOAD CYLINDER
012516  012762  000000  000006                  MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
012524  012762  177777  000002                  MOV     #-1,RKWC(R2)    ;WORD COUNT=1
012532  012762  055216  000004                  MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
012540  012762  000023  000000                  MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
012546  012700  000426                          MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                        ;  FOR SECTOR PULSE
012552  012762  000440  000026  1$:             MOV     #DMD!MCLK,RKMR1(R2)
012560  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
012566  005300                                  DEC     R0
012570  001370                                  BNE     1$
012572  012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
012600  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
012606  005037  003254                          CLR     PR.BIT          ;GENERATE SYNCH
012612  005037  003256                          CLR     M1.BIT
012616  012700  000377                          MOV     #255.,R0
012622  004737  037026          5$:             JSR     PC,RDBIT
012626  005300                                  DEC     R0              ;CHECK IF SYNCH FINISHED
012630  001374                                  BNE     5$
012632  012737  000001  003254                  MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
012640  004737  037026                          JSR     PC,RDBIT
012644  012703  053372                          MOV     #HEAD2,R3       ;SIMULATE HEADER ERROR
012650  012701  000003                          MOV     #3,R1
012654  012304                  12$:            MOV     (R3)+,R4        ;GET NEXT HEADER WORD
012656  012700  000020                          MOV     #16.,R0         ;LOAD BITS PER WORD
012662  013737  003254  003256  15$:            MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
012670  006004                                  ROR     R4              ;GET NEXT BIT
012672  103403                                  BCS     17$
012674  005037  003254                          CLR     PR.BIT
012700  000403                                  BR      18$
012702  012737  000001  003254  17$:            MOV     #1,PR.BIT
012710  004737  037026          18$:            JSR     PC,RDBIT        ;SIMULATE NEXT BIT
012714  005300                                  DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
012716  001361                                  BNE     15$             ;NO, CONTINUE
012720  005301                                  DEC     R1              ;CHECK IF FINISHED WITH HEAD2
012722  001354                                  BNE     12$             ;NO, CONTINUE
012724  012700  000100                          MOV     #64.,R0         ;LOAD COUNT FOR GAP
012730  013737  003254  003256  25$:            MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
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3375  012736  005037  003254                    CLR     PR.BIT
3376  012742  004737  037026                    JSR     PC,RDBIT
3377  012746  005300                            DEC     R0              ;CHECK IF GAP FINISHED
3378  012750  001367                            BNE     25$             ;NO, CONTINUE
3379  012752  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;GET CS1
3380  012760  016237  000010  003150            MOV     RKCS2(R2),T.CS2 ;GET CS2
3381  012766  016237  000014  003154            MOV     RKER(R2),T.ER   ;GET ERROR REG
3382  012774  012737  000023  003200            MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
3383  013002  012737  000300  003210            MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3384  013010  012737  000200  003214            MOV     #BSE,E.ER       ;LOAD EXPECTED ERROR REG.
3385  013016  023737  003200  003140            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3386  013024  001401                            BEQ     30$             ;YES, CHECK CS2
3387  013026  104063                            ERROR   63              ;CS1 INCORRECT
3388  013030  023737  003210  003150  30$:      CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3389  013036  001401                            BEQ     32$             ;YES, CHECK ERROR REG.
3390  013040  104064                            ERROR   64              ;CS2 INCORRECT
3391  013042  023737  003214  003154  32$:      CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3392  013050  001401                            BEQ     TST22           ;YES, GO ON TO NEXT TEST
3393  013052  104065                            ERROR   65              ;ERROR REG INCORRECT
3394
3395                                    ;;*****************************************************************
3396                                    ;*TEST 22       BAD SECTOR ERROR (PART 2)
3397                                    ;*
3398                                    ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3399                                    ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3400                                    ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
3401                                    ;*      HEAD 0, SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3402                                    ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER WITH
3403                                    ;*      THE FOLLOWING DATA:
3404                                    ;*
3405                                    ;*              000000
3406                                    ;*              100000
3407                                    ;*              100000
3408                                    ;*
3409                                    ;*      MAKE SURE BAD SECTOR ERROR SETS.  CHECK THAT DISK ADDRESS
3410                                    ;*      IS NOT INCREMENTED.
3411                                    ;*
3412                                    ;*****************************************************************
3413  013054  000004                    TST22:  SCOPE
3414  013056  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3415  013064  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
3416  013070  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3417  013076  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3418  013104  012762  000000  000020            MOV     #0,RKDCYL(R2)   ;LOAD CYLINDER
3419  013112  012762  000000  000006            MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
3420  013120  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3421  013126  012762  055216  000004            MOV     #BUFF,RK8A(R2)  ;LOAD DUMMY BUS ADDRESS
3422  013134  012762  000023  000000            MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3423  013142  012700  000426                    MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3424                                                                    ;  FOR SECTOR PULSE
3425  013146  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
3426  013154  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3427  013162  005300                            DEC     R0
3428  013164  001370                            BNE     1$
3429  013166  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3430  013174  012762  000040  000026            MOV     #DMD,RKMR1(R2)
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3431  013202  005037  003254                CLR     PR.BIT          ;GENERATE SYNCH
3432  013206  005037  003256                CLR     M1.BIT
3433  013212  012700  000377                MOV     #255.,R0
3434  013216  004737  037026          5$:   JSR     PC,RDBIT
3435  013222  005300                       DEC     R0              ;CHECK IF SYNCH FINISHED
3436  013224  001374                       BNE     5$
3437  013226  012737  000001  003254        MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3438  013234  004737  037026                JSR     PC,RDBIT
3439  013240  012703  053400                MOV     #HEAD3,R3       ;SIMULATE HEADER ERROR
3440  013244  012701  000003                MOV     #3,R1
3441  013250  012304          12$:  MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3442  013252  012700  000020                MOV     #16.,R0         ;LOAD BITS PER WORD
3443  013256  013737  003254  003256  15$:  MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
3444  013264  006004                       ROR     R4              ;GET NEXT BIT
3445  013266  103403                       BCS     17$
3446  013270  005037  003254                CLR     PR.BIT
3447  013274  000403                       BR      18$
3448
3449  013276  012737  000001  003254  17$:  MOV     #1,PR.BIT
3450  013304  004737  037026          18$:  JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3451  013310  005300                       DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3452  013312  001361                       BNE     15$             ;NO, CONTINUE
3453  013314  005301                       DEC     R1              ;CHECK IF FINISHED WITH HEAD3
3454  013316  001354                       BNE     12$             ;NO, CONTINUE
3455  013320  012700  000100                MOV     #64.,R0         ;LOAD COUNT FOR GAP
3456  013324  013737  003254  003256  25$:  MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3457  013332  005037  003254                CLR     PR.BIT
3458  013336  004737  037026                JSR     PC,RDBIT
3459  013342  005300                       DEC     R0              ;CHECK IF GAP FINISHED
3460  013344  001367                       BNE     25$             ;NO, CONTINUE
3461  013346  016237  000000  003140        MOV     RKCS1(R2),T.CS1 ;GET CS1
3462  013354  016237  000010  003150        MOV     RKCS2(R2),T.CS2 ;GET CS2
3463  013362  016237  000014  003154        MOV     RKER(R2),T.ER   ;GET ERROR REG
3464  013370  012737  000023  003200        MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
3465  013376  012737  000300  003210        MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3466  013404  012737  000200  003214        MOV     #BSE,E.ER       ;LOAD EXPECTED ERROR REG.
3467  013412  023737  003200  003140        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3468  013420  001401                       BEQ     30$             ;YES, CHECK CS2
3469  013422  104063                       ERROR   63              ;CS1 INCORRECT
3470  013424  023737  00321C  003150  30$:  CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3471  013432  001401                       BEQ     32$             ;YES, CHECK ERROR REG.
3472  013434  104064                       ERROR   64              ;CS2 INCORRECT
3473  013436  023737  003214  003154  32$:  CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3474  013444  001401                       BEQ     TST23           ;YES, GO ON TO NEXT TEST
3475  013446  104065                       ERROR   65              ;ERROR REG INCORRECT
3476
3477                          ;;*****************************************************************
3478                          ;*TEST 23       OPERATION INCOMPLETE
3479                          ;*
3480                          ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3481                          ;*       CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3482                          ;*       ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1253,
3483                          ;*       HEAD 2, SECTOR 23.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3484                          ;*       MESSAGES.  SIMULATE A SECTOR PULSE AND 32 SECTORS WITH
3485                          ;*       1 BIT DIFFERENT IN 30 BITS OF OPI DETERMININATION. ALL
3486                          ;*       SIMULATED HEADERS, HAVE GOOD HEADER VRC.  MAKE SURE ONLY
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3487                                        ;*      OPERATION INCOMPLETE AND CONTROLLER ARE THE ONLY ERRORS
3488                                        ;*      THAT SET.
3489                                        ;*
3490                                        ;*************************************************************
3491  013450  000004                       ;ST23:  SCOPE
3492  013452  012737  000012  001200               MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3493  013460  013702  001270               2$:     MOV     $BASE,R2        ;LOAD RK611 BASE
3494  013464  012762  100000  000000               MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3495  013472  012700  002500                       MOV     #2500,R0                ;SET COUNT FOR STALL
3496  013476  005300                       2$:     DEC     R0              ;DEC COUNT
3497  013500  001376                               BNE     2$              ;LOOP UNTIL 0
3498  013502  012762  000040  000026               MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3499  013510  012762  055216  000004               MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
3500  013516  012762  177777  000002               MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
3501  013524  012762  001253  000020               MOV     #1253,RKDCYL(R2) ;LOAD CYLINDER
3502  013532  012762  001023  000006               MOV     #1023,RKDA(R2)  ;LOAD TRACK AND SECTOR
3503  013540  012762  010023  000000               MOV     #WRDATA!CFMT,RKCS1(R2) ;ISSUE WRITE DATA
3504  013546  012700  000426                       MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3505                                                                        ;  FOR SECTOR PULSE
3506  013552  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)
3507  013560  012762  000040  000026               MOV     #DMD,RKMR1(R2)
3508  013566  005300                               DEC     R0
3509  013570  001370                               BNE     1$
3510  013572  012705  000040                       MOV     #32.,R5         ;LOAD HEADER COUNT
3511  013576  012703  053574                       MOV     #OPI1,R3        ;LOAD ADDRESS OF HEADERS
3512  013602  012737  010023  003200               MOV     #WRDATA!CFMT,E.CS1      ;LOAD EXPECTED CS1
3513  013610  012737  000300  003210               MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3514  013616  005037  003214                       CLR     E.ER            ;LOAD EXPECTED ERROR REG
3515  013622  012737  022040  003224               MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
3516  013630  005037  003310                       CLR     HDRCNT          ;INITIALIZE HEADER COUNT
3517  013634  012762  000140  000026  5$:      MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
3518  013642  012762  000040  000026               MOV     #DMD,RKMR1(R2)
3519  013650  022737  000037  003310               CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
3520  013656  001460                               BEQ     26$             ;YES - SKIP TO ERROR TEST
3521  013660  005037  003254                       CLR     PR.BIT          ;GENERATE SYNCH
3522  013664  005037  003256                       CLR     M1.BIT
3523  013670  012700  000377                       MOV     #255.,R0
3524  013674  004737  037026               10$:    JSR     PC,RDBIT
3525  013700  005300                               DEC     R0              ;CHECK IF SYNCH FINISHED
3526  013702  001374                               BNE     10$
3527  013704  012737  000001  003254               MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3528  013712  004737  037026                       JSR     PC,RDBIT
3529  013716  012701  000003                       MOV     #3,R1           ;SIMULATE OPI
3530  013722  012304                       12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3531  013724  012700  000020                       MOV     #16.,R0         ;LOAD BITS PER WORD
3532  013730  013737  003254  003256  15$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
3533  013736  006004                               ROR     R4              ;GET NEXT BIT
3534  013740  103403                               BCS     17$
3535  013742  005037  003254                       CLR     PR.BIT
3536  013746  000403                               BR      18$
3537
3538  013750  012737  000001  003254  17$:     MOV     #1,PR.BIT
3539  013756  004737  037026               18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3540  013762  005300                               DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3541  013764  001361                               BNE     15$             ;NO, CONTINUE
3542  013766  005301                               DEC     R1              ;CHECK IF FINISHED WITH HEADER
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3543  013770  001354                        BNE     12$                 ;NO CONTINUE
3544  013772  012700  000100                MOV     #64.,R0             ;LOAD COUNT FOR GAP
3545  013776  013737  003254  003256  25$:  MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
3546  014004  005037  003254                CLR     PR.BIT
3547  014010  004737  037026                JSR     PC,RDBIT
3548  014014  005300                        DEC     R0                  ;CHECK IF GAP IS FINISHED
3549  014016  001367                        BNE     25$                 ;NO, CONTINUE
3550  014020  016237  000000  003140  26$:  MOV     RKCS1(R2),T.CS1     ;GET CS1
3551  014026  016237  000010  003150        MOV     RKCS2(R2),T.CS2     ;GET CS2
3552  014034  016237  000014  003154        MOV     RKER(R2),T.ER       ;GET ERROR REG.
3553  014042  023737  003200  003140        CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
3554  014050  001401                        BEQ     30$                 ;YES, CONTINUE
3555  014052  104074                        ERROR   74                  ;CS1 INCORRECT
3556  014054  023737  003210  003150  30$:  CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
3557  014062  001401                        BEQ     31$                 ;YES, CONTINUE
3558  014064  104075                        ERROR   75                  ;CS2 INCORRECT
3559  014066  023737  003214  003154  31$:  CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
3560  014074  001401                        BEQ     32$                 ;YES, CONTINUE
3561  014076  104076                        ERROR   76                  ;ERROR REG INCORRECT
3562  014100  016237  000026  003164  32$:  MOV     RKMR1(R2),T.MR1     ;GET MR1
3563  014106  023737  003224  003164        CMP     E.MR1,T.MR1         ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
3564  014114  001401                        BEQ     34$                 ;YES, CONTINUE
3565  014116  104077                        ERROR   77                  ;MR1 INCORRECT
3566  014120  005237  003310          34$:  INC     HDRCNT              ;INCREMENT HEADER COUNT
3567  014124  022737  000037  003310        CMP     #31.,HDRCNT         ;CHECK IF LAST HEADER
3568  014132  001011                        BNE     35$                 ;NO, CHECK IF FINSHED
3569  014134  012737  020000  003214        MOV     #OPI,E.ER           ;LOAD ERROR BIT
3570  014142  042737  000001  003200        BIC     #GO,E.CS1           ;ADJUST E.CS1 FOR END OF OP CONTENTS
3571  014150  052737  100200  003200        BIS     #RDY!CERR,E.CS1
3572  014156  005305                  35$:  DEC     R5                  ;CHECK IF FINISHED
3573  014160  001402                        BEQ     37$                 ;YES - SKIP
3574  014162  000137  013634                JMP     5$                  ;DO NEXT SECTOR
3575  014166  012762  100000  000000  37$:  MOV     #CCLR,RKCS1(R2)     ;CLEAR CONTROLLER
3576  014174  016237  000000  003140        MOV     RKCS1(R2),T.CS1     ;GET CS1
3577  014202  016237  000010  003150        MOV     RKCS2(R2),T.CS2     ;    CS2
3578  014210  016237  000014  003154        MOV     RKER(R2),T.ER       ;    ER
3579  014216  012737  000200  003200        MOV     #RDY,E.CS1          ;SET EXPECTED CS1
3580  014224  023737  003140  003200        CMP     T.CS1,E.CS1         ;CHECK IF CORRECT
3581  014232  001401                        BEQ     TST24               ;;GO TO NEXT TEST
3582  014234  104153                        ERROR   153
3583
3584                                ;;*****************************************************************
3585                                ;*TEST 24       HEADER VRC
3586                                ;*
3587                                ;*      CLEAR RK611 CONTROLLER WITH A CONTRC _ER CLEAR.  PUT
3588                                ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3589                                ;*      ONE WORD WITH CDT SET IN 24 SECTOR FORMAT, CYLINDER 1253,
3590                                ;*      HEAD 2, SECTOR 23.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3591                                ;*      MESSAGES SIMULATE A SECTOR PULSE AND HEADER WITH BIT 0
3592                                ;*      OF THE VRC INCORRECT.  MAKE SURE ONLY HEADER VRC AND
3593                                ;*      CONTROLLER ERROR ARE THE ONLY ERRORS SET.  REPEAT FOR
3594                                ;*      BITS 1-15 OF VRC.
3595                                ;*
3596                                ;*****************************************************************
3597  014236  000004                TST24:  SCOPE
3598  014240  012737  000012  001200        MOV     #10.,$TIMES         ;;DO 10. ITERATIONS
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3599  014246  013702  001270                    MOV     $BASE,R2          ;LOAD RK611 BASE
3600  014252  012737  012023  003200            MOV     #CFMT!CDT!WRDATA,E.CS1 ;LOAD EXPECTED CS1
3601  014260  012737  000300  003210            MOV     #IR!OR,E.CS2      ;LOAD EXPECTED CS2
3602  014266  012737  000400  003214            MOV     #HVRC,E.ER        ;LOAD EXPECTED ERROR REGISTER
3603  014274  012737  000001  001170            MOV     #1,$TMP4          ;INITIALIZE BIT FOR VRC ERROR
3604  014302  012737  014310  001110            MOV     #1$,$LPERR        ;LOAD LOOP ON ERROR LOCATION FOR
3605                                                                      ;  SUBTEST LOOP
3606
3607  014310                            1$:
3608  014310  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3609  014316  012700  002000                    MOV     #2000,R0                ;SET COUNT FOR STALL
3610  014322  005300                    2$:     DEC     R0              ;DEC COUNT
3611  014324  001376                            BNE     2$              ;LOOP UNTIL 0
3612  014326  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
3613  014334  012737  140370  055200            MOV     #140370,VRCHDR+4 ;LOAD VRC
3614  014342  033737  001170  055200            BIT     $TMP4,VRCHDR+4  ;MAKE ONE BIT BAD
3615  014350  001404                            BEQ     3$
3616  014352  043737  001170  055200            BIC     $TMP4,VRCHDR+4
3617  014360  000403                            BR      5$
3618
3619  014362  053737  001170  055200  3$:       BIS     $TMP4,VRCHDR+4
3620  014370  012762  055216  000004  5$:       MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3621  014376  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
3622  014404  012762  001023  000006            MOV     #1023,RKDA(R2)  ;LOAD TRACK 2 SECTOR 23
3623  014412  012762  001253  000020            MOV     #1253,RKDCYL(R2) ;LOAD CYLINDER 1253
3624  014420  012762  012023  000000            MOV     #CFMT!CDT!WRDATA,RKCS1(R2) ;ISSUE COMMAND
3625  014426  012700  000426                    MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL READY FOR SECTOR
3626  014432  012762  000440  000026  10$:       MOV     #DMD!MCLK,RKMR1(R2)
3627  014440  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3628  014446  005300                            DEC     R0
3629  014450  001370                            BNE     10$
3630  014452  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
3631  014460  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3632  014466  005037  003254                    CLR     PR.BIT          ;INITIAL BITS
3633  014472  005037  003256                    CLR     M1.BIT
3634  014476  012700  000377                    MOV     #255.,R0        ;SIMULATE SYNCH
3635  014502  004737  037026            15$:    JSR     PC,RDBIT
3636  014506  005300                            DEC     R0
3637  014510  001374                            BNE     15$
3638  014512  012737  000001  003254            MOV     #1,PR.BIT       ;GENERATE SYNCH BIT
3639  014520  004737  037026                    JSR     PC,RDBIT        ;SIMULSTE SYNC 1 BIT
3640  014524  012703  055174                    MOV     #VRCHDR,R3      ;LOAD ADDRESS OF HEADER
3641  014530  012701  000003                    MOV     #3,R1           ;LOAD HEADER COUNT
3642  014534  012304                    17$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3643  014536  012700  000020                    MOV     #16.,R0         ;LOAD BITS PER WORD
3644  014542  013737  003254  003256  20$:       MOV     PR.BIT,M1.BIT   ;SIMULATE NEXT BIT
3645  014550  006004                            ROR     R4
3646  014552  103403                            BCS     23$
3647  014554  005037  003254                    CLR     PR.BIT
3648  014560  000403                            BR      25$
3649
3650  014562  012737  000001  003254  23$:       MOV     #1,PR.BIT
3651  014570  004737  037026            25$:    JSR     PC,RDBIT
3652  014574  005300                            DEC     R0              ;CHECK IF FINISHED WITH WORD
3653  014576  001361                            BNE     20$             ;NO, CONTINUE
3654  014600  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
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3655  014602  001354                          BNE     17$             ;NO, CONTINUE
3656  014604  012700  000100                  MOV     #64.,R0         ;SIMULATE GAP
3657  014610  013737  003254  003256  30$:    MOV     PR.BIT,M1.BIT
3658  014616  005037  003254                  CLR     PR.BIT
3659  014622  004737  037026                  JSR     PC,RDBIT
3660  014626  005300                          DEC     R0
3661  014630  001367                          BNE     30$
3662  014632  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE CS1
3663  014640  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;STORE CS2
3664  014646  016237  000014  003154          MOV     RKER(R2),T.ER   ;STORE ERROR REG
3665  014654  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3666  014662  001401                          BEQ     35$             ;YES, CHECK CS2
3667  014664  104071                          ERROR   71              ;CS1 INCORRECT
3668  014666  023737  003210  003150  35$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3669  014674  001401                          BEQ     37$             ;YES, CHECK ERROR REG
3670  014676  104072                          ERROR   72              ;CS2 INCORRECT
3671  014700  023737  003214  003154  37$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3672  014706  001401                          BEQ     40$             ;YES, CHECK IF LOOP ON ERROR
3673  014710  104073                          ERROR   73              ;ERROR REG INCORRECT
3674  014712  104415                  40$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3675  014714  006337  001170                  ASL     $TMP4           ;GET NEXT PATTERN
3676  014720  103402                          BCS     TST25           ;;CHECK IF FINISHED
3677  014722  000137  014310                  JMP     1$              ;NO, CONTINUE
3678
3679                                  ;;*****************************************************************
3680                                  ;*TEST 25       BAD SECTOR ERROR AND HEADER VRC
3681                                  ;*
3682                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3683                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3684                                  ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 300.
3685                                  ;*      HEAD 1, SECTOR 17, CLOCK IN BOTH SEEK AND DRIVE CLEAR
3686                                  ;*      MESSAGES.  SIMULATE THE FOLLOWING HEADER:
3687                                  ;*
3688                                  ;*              000300
3689                                  ;*              040057
3690                                  ;*              040356
3691                                  ;*
3692                                  ;*      MAKE SURE ONLY HEADER VRC ERROR SETS.
3693                                  ;*
3694                                  ;;*****************************************************************
3695  014726  000004                  TST25:  SCOPE
3696  014730  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3697  014736  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3698  014742  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3699  014750  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3700  014756  012762  000300  000020          MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER
3701  014764  012762  000417  000006          MOV     #417,RKDA(R2)   ;LOAD TRACK AND SECTOR
3702  014772  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3703  015000  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
3704  015006  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3705  015014  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3706                                                                  ;  FOR SECTOR PULSE
3707  015020  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3708  015026  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3709  015034  005300                          DEC     R0
3710  015036  001370                          BNE     1$
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 3711  015040  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 3712  015046  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3713  015054  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
 3714  015060  005037  003256                  CLR     M1.BIT
 3715  015064  012700  000377                  MOV     #255.,R0
 3716  015070  004737  037026          5$:     JSR     PC,RDBIT
 3717  015074  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
 3718  015076  001374                          BNE     5$
 3719  015100  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH BIT
 3720  015106  004737  037026                  JSR     PC,RDBIT
 3721  015112  012703  053406                  MOV     #HEAD4,R3           ;SIMULATE HEADER ERROR
 3722  015116  012701  000003                  MOV     #3,R1
 3723  015122  012304          12$:    MOV     (R3)+,R4            ;GET NEXT HEADER WORD
 3724  015124  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
 3725  015130  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
 3726  015136  006004                          ROR     R4                  ;GET NEXT BIT
 3727  015140  103403                          BCS     17$
 3728  015142  005037  003254                  CLR     PR.BIT
 3729  015146  000403                          BR      18$
 3730
 3731  015150  012737  000001  003254  17$:    MOV     #1,PR.BIT
 3732  015156  004737  037026          18$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
 3733  015162  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT HEADER WORD
 3734  015164  001361                          BNE     15$                 ;NO, CONTINUE
 3735  015166  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEAD4
 3736  015170  001354                          BNE     12$                 ;NO, CONTINUE
 3737  015172  012700  000100                  MOV     #64.,R0             ;LOAD COUNT FOR GAP
 3738  015176  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
 3739  015204  005037  003254                  CLR     PR.BIT
 3740  015210  004737  037026                  JSR     PC,RDBIT
 3741  015214  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
 3742  015216  001367                          BNE     25$                 ;NO, CONTINUE
 3743  015220  016237  000000  003140          MOV     RKCS1(R2),T.CS1     ;GET CS1
 3744  015226  016237  000010  003150          MOV     RKCS2(R2),T.CS2     ;GET CS2
 3745  015234  016237  000014  003154          MOV     RKER(R2),T.ER       ;GET ERROR REG
 3746  015242  012737  000023  003200          MOV     #WRDATA,E.CS1       ;LOAD EXPECTED CS1
 3747  015250  012737  000300  003210          MOV     #IR!OR,E.CS2        ;LOAD EXPECTED CS2
 3748  015256  012737  000400  003214          MOV     #HVRC,E.ER          ;LOAD EXPECTED ERROR REG.
 3749  015264  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
 3750  015272  001401                          BEQ     30$                 ;YES, CHECK CS2
 3751  015274  104066                          ERROR   66                  ;CS1 INCORRECT
 3752  015276  023737  003210  003150  30$:    CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
 3753  015304  001401                          BEQ     32$                 ;YES, CHECK ERROR REG.
 3754  015306  104067                          ERROR   67                  ;CS2 INCORRECT
 3755  015310  023737  003214  003154  32$:    CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
 3756  015316  001401                          BEQ     TST26               ;YES, GO ON TO NEXT TEST
 3757  015320  104070                          ERROR   70                  ;ERROR REG INCORRECT
 3758
 3759                                  ;;*****************************************************************
 3760                                  ;*TEST 26       GOOD HEADER AND PREVIOUS BSE
 3761                                  ;*
 3762                                  ;*      CLEAR RK611 CONTROLLER WITH CONTROLLER CLEAR.  PUT
 3763                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA OF
 3764                                  ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 100,
 3765                                  ;*      HEAD 0, SECTOR 1.  CLOCK THROUGH SEEK AND DRIVE CLEAR
 3766                                  ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER OF THE
```

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                                        ;*      FOLLOWING 3 WORDS WITH A BAD SECTOR INDICATION:
                                        ;*
                                        ;*              000100
                                        ;*              040000
                                        ;*              040100
                                        ;*
                                        ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE DOES NOT
                                        ;*      SET.  SIMULATE A SECTOR PULSE AND A HEADER OF THE FOLLOWING
                                        ;*      3 WORDS:
                                        ;*
                                        ;*              000100
                                        ;*              140001
                                        ;*              140101
                                        ;*
                                        ;*      MAKE SURE WRITE GATE SETS INDICATING THAT HEADER HAS
                                        ;*      BEEN RECOGNIZED.
                                        ;*
                                        ;*************************************************************************
015322  000004                        TST26:  SCOPE
015324  012737  000012  001200                MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
015332  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
015336  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
015344  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
015352  012762  055216  000004                MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
015360  012762  177777  000002                MOV     #-1,RKWC(R2)    ;WORD COUNT -1
015366  012762  000001  000006                MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
015374  012762  000100  000020                MOV     #100,RKDCYL(R2) ;LOAD CYLINDER
015402  012762  000023  000000                MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
015410  012700  000426                        MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                        ;                               FOR SECTOR PULSE
015414  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
015422  012762  000040  000026                MOV     #DMD,RKMR1(R2)
015430  005300                                DEC     R0
015432  001370                                BNE     1$
015434  012705  000002                        MOV     #2,R5           ;LOAD HEADER COUNT
015440  012703  053414                        MOV     #HEADS,R3       ;LOAD ADDRESS OF HEADERS
015444  012737  000023  003200                MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
015452  012737  000300  003210                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
015460  005037  003214                        CLR     E.ER            ;LOAD EXPECTED MR1
015464  012737  022040  003224                MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
015472  005037  003310                        CLR     HDRCNT          ;INITIALIZE HEADER COUNT
015476  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
015504  012762  000040  000026                MOV     #DMD,RKMR1(R2)
015512  005037  003254                        CLR     PR.BIT          ;GENERATE SYNCH
015516  005037  003256                        CLR     M1.BIT
015522  012700  000377                        MOV     #255.,R0
015526  004737  037026          10$:          JSR     PC,RDBIT
015532  005300                                DEC     R0              ;CHECK IF SYNCH FINISHED
015534  001374                                BNE     10$
015536  012737  000001  003254                MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
015544  004737  037026                        JSR     PC,RDBIT
015550  012701  000003                        MOV     #3,R1           ;SIMULATE HEADER
015554  012304                  12$:          MOV     (R3)+,R4        ;GET NEXT HEADER WORD
015556  012700  000020                        MOV     #16.,R0         ;LOAD BITS PER WORD
015562  013737  003254  003256  15$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
015570  006004                                ROR     R4              ;GET NEXT BIT
```

```
3823  015572  103403                          BCS     17$
3824  015574  005037  003254                  CLR     PR.BIT
3825  015600  000403                          BR      18$
3826
3827  015602  012737  000001  003254  17$:    MOV     #1,PR.BIT
3828  015610  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3829  015614  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3830  015616  001361                          BNE     15$             ;NO, CONTINUE
3831  015620  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3832  015622  001354                          BNE     12$             ;NO, CONTINUE
3833  015624  012700  000102                  MOV     #66.,R0         ;LOAD COUNT FOR GAP
3834                                                                  ;  PLUS 2 COUNTS FOR WRTGAT TO SET
3835  015630  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3836  015636  005037  003254                  CLR     PR.BIT
3837  015642  004737  037026                  JSR     PC,RDBIT
3838  015646  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
3839  015650  001367                          BNE     25$             ;NO, CONTINUE
3840  015652  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
3841  015660  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
3842  015666  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
3843  015674  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3844  015702  001401                          BEQ     30$             ;YES, CONTINUE
3845  015704  104114                          ERROR   114             ;CS1 INCORRECT
3846  015706  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3847  015714  001401                          BEQ     31$             ;YES, CONTINUE
3848  015716  104115                          ERROR   115             ;CS2 INCORRECT
3849  015720  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3850  015726  001401                          BEQ     32$             ;YES, CONTINUE
3851  015730  104116                          ERROR   116             ;ERROR REG INCORRECT
3852  015732  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
3853  015740  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
3854  015746  001401                          BEQ     34$             ;YES, CONTINUE
3855  015750  104117                          ERROR   117             ;MR1 INCORRECT
3856  015752  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
3857  015756  012737  062040  003224          MOV     #WRTGAT!DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
3858  015764  005305                          DEC     R5              ;CHECK IF FINISHED
3859  015766  001402                          BEQ     TST27           ;;YES, GO ON TO NEXT TEST
3860  015770  000137  015476                  JMP     5$
3861
3862                          ;;*****************************************************************
3863                          ;*TEST 27       GOOD HEADER AND PREVIOUS HVRC
3864                          ;*
3865                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3866                          ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA OF
3867                          ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 200,
3868                          ;*      HEAD 0, SECTOR 1.  CLOCK THROUGH SEEK AND DRIVE CLEAR
3869                          ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER OF THE
3870                          ;*      FOLLOWING 3 WORDS WITH A BAD HEADER VRC:
3871                          ;*
3872                          ;*              000200
3873                          ;*              140000
3874                          ;*              140000
3875                          ;*
3876                          ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE DOES NOT
3877                          ;*      SET.  SIMULATE A SECTOR PULSE AND A HEADER OF THE
3878                          ;*      FOLLOWING 3 WORDS:
```

```
                                        ;*
                                        ;*              000200
                                        ;*              140001
                                        ;*              140201
                                        ;*
                                        ;*      MAKE SURE WRITE GATE SEES INDICATING THAT HEADER HAS
                                        ;*      BEEN RECOGNIZED.
                                        ;*
                                        ;;*****************************************************************
015774  000004                  TST27:  SCOPE
015776  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
016004  013702  001270          MOV     $BASE,R2        ;LOAD RK611 BASE
016010  012762  100000  000000  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
016016  012762  000040  000026  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
016024  012762  055216  000004  MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
016032  012762  177777  000002  MOV     #-1,RKWC(R2)    ;WORD COUNT -1
016040  012762  000001  000006  MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
016046  012762  000200  000020  MOV     #200,RKDCYL(R2)  ;LOAD CYLINDER
016054  012762  000023  000000  MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
016062  012700  000426          MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                        ;  FOR SECTOR PULSE
016066  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
016074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
016102  005300                  DEC     R0
016104  001370                  BNE     1$
016106  012705  000002          MOV     #2,R5           ;LOAD HEADER COUNT
016112  012703  053430          MOV     #HEAD6,R3       ;LOAD ADDRESS OF HEADERS
016116  012737  000023  003200  MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
016124  012737  000300  003210  MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
016132  005037  003214          CLR     E.ER            ;LOAD EXPECTED MR1
016136  012737  022040  003224  MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
016144  005037  003310          CLR     HDRCNT          ;INITIALIZE HEADER COUNT
016150  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
016156  012762  000040  000026          MOV     #DMD,RKMR1(R2)
016164  005037  003254          CLR     PR.BIT          ;GENERATE SYNCH
016170  005037  003256          CLR     M1.BIT
016174  012700  000377          MOV     #255.,R0
016200  004737  037026          10$:    JSR     PC,RDBIT
016204  005300                  DEC     R0              ;CHECK IF SYNCH FINISHED
016206  001374                  BNE     10$
016210  012737  000001  003254  MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
016216  004737  037026          JSR     PC,RDBIT
016222  012701  000003          MOV     #3,R1           ;SIMULATE HEADER
016226  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
016230  012700  000020          MOV     #16.,R0         ;LOAD BITS PER WORD
016234  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
016242  006004                  ROR     R4              ;GET NEXT BIT
016244  103403                  BCS     17$
016246  005037  003254          CLR     PR.BIT
016252  000403                  BR      18$

016254  012737  000001  003254  17$:    MOV     #1,PR.BIT
016262  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
016266  005300                  DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
016270  001361                  BNE     15$             ;NO, CONTINUE
016272  005301                  DEC     R1              ;CHECK IF FINISHED WITH HEADER
```

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3935  016274  001354                          BNE     12$                 ;NO, CONTINUE
3936  016276  012700  000102                  MOV     #66.,R0             ;LOAD COUNT FOR GAP
3937                                                                      ;  PLUS 2 COUNTS FOR WRTGAT TO SET
3938  016302  013737  003254  003256  25$:     MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
3939  016310  005037  003254                  CLR     PR.BIT
3940  016314  004737  037026                  JSR     PC,RDBIT
3941  016320  005300                          DEC     R0                  ;CHECK IF GAP IS FINISHED
3942  016322  001367                          BNE     25$                 ;NO, CONTINUE
3943  016324  016237  000000  003140          MOV     RKCS1(R2),T.CS1     ;GET CS1
3944  016332  016237  000010  003150          MOV     RKCS2(R2),T.CS2     ;GET CS2
3945  016340  016237  000014  003154          MOV     RKER(R2),T.ER       ;GET ERROR REG
3946  016346  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
3947  016354  001401                          BEQ     30$                 ;YES, CONTINUE
3948  016356  104120                          ERROR   120                 ;CS1 INCORRECT
3949  016360  023737  003210  003150  30$:     CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
3950  016366  001401                          BEQ     31$                 ;YES, CONTINUE
3951  016370  104121                          ERROR   121                 ;CS2 INCORRECT
3952  016372  023737  003214  003154  31$:     CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
3953  016400  001401                          BEQ     32$                 ;YES, CONTINUE
3954  016402  104122                          ERROR   122                 ;ERROR REG INCORRECT
3955  016404  016237  000026  003164  32$:     MOV     RKMR1(R2),T.MR1     ;GET MR1
3956  016[illegible]  023737  003224  003164          CMP     E.MR1,T.MR1         ;CHECK WRITE GATE CORRECT
3957  01[illegible]  001401                          BEQ     34$                 ;YES, CONTINUE
3958  016[illegible]  104123                          ERROR   123                 ;MR1 INCORRECT
3959  016424  005237  003310          34$:     INC     HDRCNT              ;INCREMENT HEADER COUNT
3960  016430  012737  062040  003224          MOV     #WRTGAT!DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
3961  016436  005305                          DEC     R5                  ;CHECK IF FINISHED
3962  016440  001402                          BEQ     TST30               ;;YES, GO ON TO NEXT TEST
3963  016442  000137  016150                  JMP     5$
3964
3965                                  ;;*****************************************************************
3966                                  ;*TEST 30       BAD SECTOR ERROR AND PREVIOUS HVRC
3967                                  ;*
3968                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3969                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A
3970                                  ;*      WRITE DATA OF ONE WORD TO AN RK06 IN 26 SECTOR
3971                                  ;*      FORMAT, CYLINDER 400, HEAD 0, SECTOR 1.  CLOCK THROUGH
3972                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
3973                                  ;*      AND A HEADER OF THE FOLLOWING 3 WORDS WITH A
3974                                  ;*      BAD HEADER VRC:
3975                                  ;*
3976                                  ;*              000400
3977                                  ;*              140000
3978                                  ;*              140000
3979                                  ;*
3980                                  ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
3981                                  ;*      DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
3982                                  ;*      HEADER CONSISTING OF THE FOLLOWING 3 WORDS:
3983                                  ;*
3984                                  ;*              000400
3985                                  ;*              040001
3986                                  ;*              040401
3987                                  ;*
3988                                  ;*      MAKE SURE BAD SECTOR ERROR SETS AND HEADER VRC
3989                                  ;*      ERROR DOES NOT SET.
3990                                  ;*
```

```
                                ;;*****************************************************************
                        TST30:  SCOPE
016446  000004                
016450  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
016456  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
016462  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
016470  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
016476  012762  055216  000004          MOV     #BUFF,RKBA(R2   ;LOAD DUMMY BUS ADDRESS
016504  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT -1
016512  012762  000001  000006          MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
016520  012762  000400  000020          MOV     #400,RKDCYL(R2)  ;LOAD CYLINDER
016526  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
016534  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                ;  FOR SECTOR PULSE
016540  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
016546  012762  000040  000026          MOV     #DMD,RKMR1(R2)
016554  005300                          DEC     R0
016556  001370                          BNE     1$
016560  012705  000002                  MOV     #2,R5           ;LOAD HEADER COUNT
016564  012703  053444                  MOV     #HEAD7,R3       ;LOAD ADDRESS OF HEADERS
016570  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
016576  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
016604  005037  003214                  CLR     E.ER            ;LOAD EXPECTED MR1
016610  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
016616  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
016622  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
016630  012762  000040  000026          MOV     #DMD,RKMR1(R2)
016636  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
016642  005037  003256                  CLR     M1.BIT
016646  012700  000377                  MOV     #255.,R0
016652  004737  037026          10$:    JSR     PC,RDBIT
016656  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
016660  001374                          BNE     10$
016662  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
016670  004737  037026                  JSR     PC,RDBIT
016674  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
016700  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
016702  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
016706  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
016714  006004                          ROR     R4              ;GET NEXT BIT
016716  103403                          BCS     17$
016720  005037  003254                  CLR     PR.BIT
016724  000403                          BR      18$
016726  012737  000001  003254  17$:    MOV     #1,PR.BIT
016734  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
016740  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
016742  001361                          BNE     15$             ;NO, CONTINUE
016744  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
016746  001354                          BNE     12$             ;NO, CONTINUE
016750  012700  000102                  MOV     #66.,R0         ;LOAD COUNT FOR GAP
                                                                ;  PLUS 2 COUNTS FOR WRTGAT TO SET
016754  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
016762  005037  003254                  CLR     PR.BIT
016766  004737  037026                  JSR     PC,RDBIT
016772  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
016774  001367                          BNE     25$             ;NO, CONTINUE
```

```
4047  016776  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4048  017004  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4049  017012  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
4050  017020  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4051  017026  001401                          BEQ     30$             ;YES, CONTINUE
4052  017030  104124                          ERROR   124             ;CS1 INCORRECT
4053  017032  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4054  017040  001401                          BEQ     31$             ;YES, CONTINUE
4055  017042  104125                          ERROR   125             ;CS2 INCORRECT
4056  017044  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4057  017052  001401                          BEQ     32$             ;YES, CONTINUE
4058  017054  104126                          ERROR   126             ;ERROR REG INCORRECT
4059  017056  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4060  017064  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
4061  017072  001401                          BEQ     34$             ;YES, CONTINUE
4062  017074  104127                          ERROR   127             ;MR1 INCORRECT
4063  017076  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4064  017102  012737  000200  003214          MOV     #BSE,E.ER       ;LOAD EXPECTER ERROR REG
4065  017110  005305                          DEC     R5              ;CHECK IF FINISHED
4066  017112  001402                          BEQ     TST31           ;;YES, GO ON TO NEXT TEST
4067  017114  000137  016622                  JMP     5$
4068
4069                                  ;;*****************************************************************
4070                                  ;*TEST 31       HEADER VRC AND PREVIOUS BSE
4071                                  ;*
4072                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4073                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A
4074                                  ;*      WRITE DATA OR ONE WORD TO AN RK06 IN 26 SECTOR
4075                                  ;*      FORMAT, CYLINDER 140, HEAD 0, SECTOR 1.  CLOCK THROUGH
4076                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4077                                  ;*      AND A HEADER OF THE FOLLOWING 3 WORDS WITH A HEADER
4078                                  ;*      VRC ERROR:
4079                                  ;*
4080                                  ;*              000140
4081                                  ;*              040000
4082                                  ;*              040140
4083                                  ;*
4084                                  ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
4085                                  ;*      DOES NOT SET.  STIMULATE A SECTOR PULSE AND A
4086                                  ;*      HEADER CONSISTING OF THE FOLLOWING THREE WORDS:
4087                                  ;*
4088                                  ;*              000140
4089                                  ;*              140001
4090                                  ;*              140101
4091                                  ;*
4092                                  ;*      MAKE SURE HEADER VRC ERROR SETS AND BAD SECTOR
4093                                  ;*      ERROR DOES NOT SET.
4094                                  ;*
4095                                  ;*****************************************************************
4096  017120  000004                  TST31:  SCOPE
4097  017122  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4098  017130  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4099  017134  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4100  017142  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4101  017150  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
4102  017156  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT -1
```

```
4103  017164  012762  000001  000006          MOV     #1,RKDA(R2)         ;LOAD TRACK AND SECTOR
4104  017172  012762  000140  000020          MOV     #140,RKDCYL(R2)     ;LOAD CYLINDER
4105  017200  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)   ;ISSUE WRITE DATA
4106  017206  012700  000426                  MOV     #69.*4+2,R0         ;ISSUE ENOUGH CLOCKS UNTIL READY
4107                                                                      ;  FOR SECTOR PULSE
4108  017212  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4109  017220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4110  017226  005300                          DEC     R0
4111  017230  001370                          BNE     1$
4112  017232  012705  000002                  MOV     #2,R5               ;LOAD HEADER COUNT
4113  017236  012703  053460                  MOV     #HEAD8,R3           ;LOAD ADDRESS OF HEADERS
4114  017242  012737  000023  003200          MOV     #WRDATA,E.CS1       ;LOAD EXPECTED CS1
4115  017250  012737  000300  003210          MOV     #IR!OR,E.CS2        ;LOAD EXPECTED CS2
4116  017256  005037  003214                  CLR     E.ER                ;LOAD EXPECTED MR1
4117  017262  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
4118  017270  005037  003310                  CLR     HDRCNT              ;INITIALIZE HEADER COUNT
4119  017274  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4120  017302  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4121  017310  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
4122  017314  005037  003256                  CLR     M1.BIT
4123  017320  012700  000377                  MOV     #255.,R0
4124  017324  004737  037026          10$:    JSR     PC,RDBIT
4125  017330  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
4126  017332  001374                          BNE     10$
4127  017334  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH BIT
4128  017342  004737  037026                  JSR     PC,RDBIT
4129  017346  012701  000003                  MOV     #3,R1               ;SIMULATE HEADER
4130  017352  012304          12$:    MOV     (R3)+,R4            ;GET NEXT HEADER WORD
4131  017354  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
4132  017360  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
4133  017366  006004                          ROR     R4                  ;GET NEXT BIT
4134  017370  103403                          BCS     17$
4135  017372  005037  003254                  CLR     PR.BIT
4136  017376  000403                          BR      18$
4137
4138  017400  012737  000001  003254  17$:    MOV     #1,PR.BIT
4139  017406  004737  037026          18$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
4140  017412  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT HEADER WORD
4141  017414  001361                          BNE     15$                 ;NO, CONTINUE
4142  017416  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
4143  017420  001354                          BNE     12$                 ;NO, CONTINUE
4144  017422  012700  000102                  MOV     #66.,R0             ;LOAD COUNT FOR GAP
4145                                                                      ;  PLUS 2 COUNTS FOR WRTGAT TO SET
4146  017426  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
4147  017434  005037  003254                  CLR     PR.BIT
4148  017440  004737  037026                  JSR     PC,RDBIT
4149  017444  005300                          DEC     R0                  ;CHECK IF GAP IS FINISHED
4150  017446  001367                          BNE     25$                 ;NO, CONTINUE
4151  017450  016237  000000  003140          MOV     RKCS1(R2),T.CS1     ;GET CS1
4152  017456  016237  000010  003150          MOV     RKCS2(R2),T.CS2     ;GET CS2
4153  017464  016237  000014  003154          MOV     RKER(R2),T.ER       ;GET ERROR REG
4154  017472  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
4155  017500  001401                          BEQ     30$                 ;YES, CONTINUE
4156  017502  104130                          ERROR   130                 ;CS1 INCORRECT
4157  017504  023737  003210  003150  30$:    CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
4158  017512  001401                          BEQ     31$                 ;YES, CONTINUE
```

```
                                        ERROR   131                 ;CS2 INCORRECT
017514  104131                          CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
017516  023737  003214  003154  31$:    BEQ     32$                 ;YES, CONTINUE
017524  001401                          ERROR   132                 ;ERROR REG INCORRECT
017526  104132                          MOV     RKMR1(R2),T.MR1     ;GET MR1
017530  016237  000026  003164  32$:    CMP     E.MR1,T.MR1         ;CHECK WRITE GATE CORRECT
017536  023737  003224  003164          BEQ     34$                 ;YES, CONTINUE
017544  001401                          ERROR   133                 ;MR1 INCORRECT
017546  104133                  34$:    INC     HDRCNT              ;INCREMENT HEADER COUNT
017550  005237  003310                  MOV     #HVRC,E.ER          ;LOAD EXPECTER ERROR REG
017554  012737  000400  003214          DEC     R5                  ;CHECK IF FINISHED
017562  005305                          BEQ     TST32               ;;YES, GO ON TO NEXT TEST
017564  001402                          JMP     5$
017566  000137  017274

                        ;;**************************************************************
                        ;*TEST 32       OPI AND HVRC ON LAST HEADER
                        ;*
                        ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        ;*      DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
                        ;*      CYLINDER 240, HEAD 0, SECTOR 1.  CLOCK THROUGH
                        ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                        ;*      AND 30 HEADERS CONSISTING OF THE FOLLOWING 3 WORDS:
                        ;*
                        ;*              000240
                        ;*              140000
                        ;*              140240
                        ;*
                        ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
                        ;*      DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
                        ;*      HEADER CONSISTING OF THE FOLLOWING THREE WORDS:
                        ;*
                        ;*              000240
                        ;*              140000
                        ;*              140040
                        ;*
                        ;*      MAKE SURE HEADER VRC AND OPI ERROR SET.
                        ;**************************************************************
017572  000004          TST32:  SCOPE
017574  012737  000012  001200          MOV     #10.,$TIMES         ;;DO 10. ITERATIONS
017602  013702  001270                  MOV     $BASE,R2            ;LOAD RK611 BASE
017606  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
017614  012700  002500                  MOV     #2500,R0                    ;SET COUNT FOR STALL
017620  005300                  2$:     DEC     R0                  ;DEC COUNT
017622  001376                          BNE     2$                  ;LOOP UNTIL 0
017624  012762  000040  000026          MOV     #DMD,RKMR1(R2)      ;PUT RK611 IN DIAGNOSTIC MODE
017632  012762  055216  000004          MOV     #BUFF,RKBA(R2)      ;LOAD DUMMY BUFFER ADDRESS
017640  012762  177777  000002          MOV     #-1,RKWC(R2)        ;WORD COUNT = 1
017646  012762  000240  000020          MOV     #240,RKDCYL(R2)     ;LOAD CYLINDER
017654  012762  000001  000006          MOV     #1,RKDA(R2)         ;LOAD TRACK AND SECTOR
017662  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)   ;ISSUE WRITE DATA
017670  012700  000426                  MOV     #69.*4+2,R0         ;ISSUE ENOUGH CLODKS UNTIL READY
                                                                    ;  FOR SECTOR PULSE
017674  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
017702  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
4215  017710  005300                          DEC     R0
4216  017712  001370                          BNE     1$
4217  017714  012705  000040                  MOV     #32.,R5         ;LOAD HEADER COUNT
4218  017720  012703  054074                  MOV     #OPI2,R3        ;LOAD ADDRESS OF HEADERS
4219  017724  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
4220  017732  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4221  017740  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
4222  017744  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
4223  017752  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
4224  017756  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4225  017764  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4226  017772  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
4227  020000  001460                          BEQ     26$             ;YES - SKIP TO ERROR TEST
4228  020002  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4229  020006  005037  003256                  CLR     M1.BIT
4230  020012  012700  000377                  MOV     #255.,R0
4231  020016  004737  037026          10$:    JSR     PC,RDBIT
4232  020022  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4233  020024  001374                          BNE     10$
4234  020026  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4235  020034  004737  037026                  JSR     PC,RDBIT
4236  020040  012701  000003                  MOV     #3,R1           ;SIMULATE OPI
4237  020044  012304          12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4238  020046  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4239  020052  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4240  020060  006004                          ROR     R4              ;GET NEXT BIT
4241  020062  103403                          BCS     17$
4242  020064  005037  003254                  CLR     PR.BIT
4243  020070  000403                          BR      18$
4244
4245  020072  012737  000001  003254  17$:    MOV     #1,PR.BIT
4246  020100  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4247  020104  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4248  020106  001361                          BNE     15$             ;NO, CONTINUE
4249  020110  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
4250  020112  001354                          BNE     12$             ;NO,CONTINUE
4251  020114  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4252  020120  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4253  020126  005037  003254                  CLR     PR.BIT
4254  020132  004737  037026                  JSR     PC,RDBIT
4255  020136  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4256  020140  001367                          BNE     25$             ;NO, CONTINUE
4257  020142  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
4258  020150  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4259  020156  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
4260  020164  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4261  020172  001401                          BEQ     30$             ;YES, CONTINUE
4262  020174  104100                          ERROR   100             ;CS1 INCORRECT
4263  020176  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4264  020204  001401                          BEQ     31$             ;YES, CONTINUE
4265  020206  104101                          ERROR   101             ;CS2 INCORRECT
4266  020210  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4267  020216  001401                          BEQ     32$             ;YES, CONTINUE
4268  020220  104102                          ERROR   102             ;ERROR REG INCORRECT
4269  020222  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4270  020230  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
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4271  020236  001401                          BEQ     34$             ;YES, CONTINUE
4272  020240  104103                          ERROR   103             ;MR1 INCORRECT
4273  020242  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4274  020246  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
4275  020254  001011                          BNE     35$             ;NO, CHECK IF FINSHED
4276  020256  012737  020400  003214          MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
4277  020264  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
4278  020272  052737  100200  003200          BIS     #RDY!CERR,E.CS1
4279  020300  005305                  35$:    DEC     R5              ;CHECK IF FINISHED
4280  020302  001402                          BEQ     37$             ;YES - SKIP
4281  020304  000137  017756                  JMP     5$              ;DO NEXT SECTOR
4282  020310  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4283  020316  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4284  020324  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4285  020332  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4286  020340  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
4287  020346  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4288  020354  001401                          BEQ     TST33           ;;GO TO NEXT TEST
4289  020356  104153                          ERROR   153
4290
4291                                  ;;*****************************************************************
4292                                  ;*TEST 33       OPI AND PREVIOUS HEADER VRC (PART 1)
4293                                  ;*
4294                                  ;*      CLEAR THE RK611 CONTROLLER WITH A  CONTROLLER CLEAR.
4295                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4296                                  ;*      DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
4297                                  ;*      CYLINDER 300, HEAD 0, SECTOR 1.  CLOCK THROUGH
4298                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A
4299                                  ;*      SECTOR PULSE AND 30 HEADERS CONSISTING OF THE
4300                                  ;*      FOLLOWING 3 WORDS:
4301                                  ;*
4302                                  ;*              000300
4303                                  ;*              140000
4304                                  ;*              140300
4305                                  ;*
4306                                  ;*      THEN SIMULATE A 3 WORD HEADER CONSISTING ON
4307                                  ;*      THE FOLLOWING DATA:
4308                                  ;*
4309                                  ;*              000300
4310                                  ;*              140000
4311                                  ;*              140200
4312                                  ;*
4313                                  ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
4314                                  ;*      DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
4315                                  ;*      HEADER CONSISTING OF THE FOLLOWING THREE WORDS:
4316                                  ;*
4317                                  ;*              000300
4318                                  ;*              140000
4319                                  ;*              140300
4320                                  ;*
4321                                  ;*      MAKE SURE HEADER VRC AND OPI ERRORS SET.
4322                                  ;*
4323                                  ;*****************************************************************
4324  020360  000004                  TST33:  SCOPE
4325  020362  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4326  020370  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
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4327  020374  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4328  020402  012700  002500                  MOV     #2500,R0                ;SET COUNT FOR STALL
4329  020406  005300                  2$:     DEC     R0                      ;DEC COUNT
4330  020410  001376                          BNE     2$                      ;LOOP UNTIL 0
4331  020412  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4332  020420  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
4333  020426  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
4334  020434  012762  000300  000020          MOV     #300,RKDCYL(R2) ;LOAD CYLINDER
4335  020442  012762  000001  000006          MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
4336  020450  012762  000023  000000          MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
4337  020456  012700  000426                  MOV     #6* *4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4338                                                                  ;  FOR SECTOR PULSE
4339  020462  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4340  020470  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4341  020476  005300                          DEC     R0
4342  020500  001370                          BNE     1$
4343  020502  012705  000040                  MOV     #32.,R5         ;LOAD HEADER COUNT
4344  020506  012703  054374                  MOV     #OPI3,R3        ;LOAD ADDRESS OF HEADERS
4345  020512  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
4346  020520  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4347  020526  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
4348  020532  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
4349  020540  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
4350  020544  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4351  020552  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4352  020560  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
4353  020566  001460                          BEQ     26$             ;YES - SKIP TO ERROR TEST
4354  020570  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4355  020574  005037  003256                  CLR     M1.BIT
4356  020600  012700  000377                  MOV     #255.,R0
4357  020604  004737  037026          10$:    JSR     PC,RDBIT
4358  020610  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4359  020612  001374                          BNE     10$
4360  020614  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4361  020622  004737  037026                  JSR     PC,RDBIT
4362  020626  012701  000003                  MOV     #3,R1           ;SIMULATE OPI
4363  020632  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4364  020634  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4365  020640  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4366  020646  006004                          ROR     R4              ;GET NEXT BIT
4367  020650  103403                          BCS     17$
4368  020652  005037  003254                  CLR     PR.BIT
4369  020656  000403                          BR      18$
4370
4371  020660  012737  000001  003254  17$:    MOV     #1,PR.BIT
4372  020666  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4373  020672  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4374  020674  001361                          BNE     15$             ;NO, CONTINUE
4375  020676  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
4376  020700  001354                          BNE     12$             ;NO,CONTINUE
4377  020702  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4378  020706  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4379  020714  005037  003254                  CLR     PR.BIT
4380  020720  004737  037026                  JSR     PC,RDBIT
4381  020724  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4382  020726  001367                          BNE     25$             ;NO, CONTINUE
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4383  020730  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
4384  020736  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4385  020744  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
4386  020752  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4387  020760  001401                          BEQ     30$             ;YES, CONTINUE
4388  020762  104104                          ERROR   104             ;CS1 INCORRECT
4389  020764  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4390  020772  001401                          BEQ     31$             ;YES, CONTINUE
4391  020774  104105                          ERROR   105             ;CS2 INCORRECT
4392  020776  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4393  021004  001401                          BEQ     32$             ;YES, CONTINUE
4394  021006  104106                          ERROR   106             ;ERROR REG INCORRECT
4395  021010  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4396  021016  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
4397  021024  001401                          BEQ     34$             ;YES, CONTINUE
4398  021026  104107                          ERROR   107             ;MR1 INCORRECT
4399  021030  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4400  021034  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
4401  021042  001011                          BNE     35$             ;NO, CHECK IF FINSHED
4402  021044  012737  020400  003214          MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
4403  021052  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
4404  021060  052737  100200  003200          BIS     #RDY!CERR,E.CS1
4405  021066  005305                  35$:    DEC     R5              ;CHECK IF FINISHED
4406  021070  001402                          BEQ     37$             ;YES - SKIP
4407  021072  000137  020544                  JMP     5$              ;DO NEXT SECTOR
4408  021076  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4409  021104  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4410  021112  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;     CS2
4411  021120  016237  000014  003154          MOV     RKER(R2),T.ER   ;     ER
4412  021126  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
4413  021134  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4414  021142  001401                          BEQ     TST34           ;;GO TO NEXT TEST
4415  021144  104153                          ERROR   153
4416
4417                  ;*****************************************************************
4418                  ;*TEST 34       OPI AND PREVIOUS HEADER VRC (PART 2)
4419                  ;*
4420                  ;*       CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4421                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4422                  ;*       DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
4423                  ;*       CYLINDER 40, HEAD 0, SECTOR 1.  CLOCK THROUGH
4424                  ;*       SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
4425                  ;*       PULSE AND A HEADER CONSISTING OF THE FOLLOWING
4426                  ;*       THREE WORDS HAVING A BAD HEADER VRC:
4427                  ;*
4428                  ;*               000040
4429                  ;*               140000
4430                  ;*               140000
4431                  ;*
4432                  ;*       MAKE SURE NO ERROR IS  REPORTED AND WRITE GATE
4433                  ;*       DOES NOT SET.   SIMULATE A SECTOR PULSE AND 31
4434                  ;*       HEADERS CONSISTING OF THE FOLLOWING THREE WORDS:
4435                  ;*
4436                  ;*               000040
4437                  ;*               140000
4438                  ;*               140040
```

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4439                                        ;*
4440                                        ;*      MAKE SURE HEADER VRC AND OPI ERRORS SET.
4441                                        ;*
4442                                        ;**************************************************************
4443  021146  000004                        TST34:  SCOPE
4444  021150  012737  000012  001200                MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4445  021156  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
4446  021162  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4447  021170  012700  002500                        MOV     #2500,R0                ;SET COUNT FOR STALL
4448  021174  005300                        2$:     DEC     R0              ;DEC COUNT
4449  021176  001376                                BNE     2$              ;LOOP UNTIL 0
4450  021200  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4451  021206  012762  055216  000004                MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
4452  021214  012762  177777  000002                MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
4453  021222  012762  000040  000020                MOV     #40,RKDCYL(R2) ;LOAD CYLINDER
4454  021230  012762  000001  000006                MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
4455  021236  012762  000023  000000                MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
4456  021244  012700  000426                        MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4457                                                                          ;  FOR SECTOR PULSE
4458  021250  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4459  021256  012762  000040  000026                MOV     #DMD,RKMR1(R2)
4460  021264  005300                                DEC     R0
4461  021266  001370                                BNE     1$
4462  021270  012705  000040                        MOV     #32.,R5         ;LOAD HEADER COUNT
4463  021274  012703  054674                        MOV     #OPI4,R3        ;LOAD ADDRESS OF HEADERS
4464  021300  012737  000023  003200                MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
4465  021306  012737  000300  003210                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4466  021314  005037  003214                        CLR     E.ER            ;LOAD EXPECTED ERROR REG
4467  021320  012737  022040  003224                MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
4468  021326  005037  003310                        CLR     HDRCNT          ;INITIALIZE HEADER COUNT
4469  021332  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4470  021340  012762  000040  000026                MOV     #DMD,RKMR1(R2)
4471  021346  022737  000037  003310                CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
4472  021354  001460                                BEQ     26$             ;YES - SKIP TO ERROR TEST
4473  021356  005037  003254                        CLR     PR.BIT          ;GENERATE SYNCH
4474  021362  005037  003256                        CLR     M1.BIT
4475  021366  012700  000377                        MOV     #255.,R0
4476  021372  004737  037026                10$:    JSR     PC,RDBIT
4477  021376  005300                                DEC     R0              ;CHECK IF SYNCH FINISHED
4478  021400  001374                                BNE     10$
4479  021402  012737  000001  003254                MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4480  021410  004737  037026                        JSR     PC,RDBIT
4481  021414  012701  000003                        MOV     #3,R1           ;SIMULATE OPI
4482  021420  012304                        12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4483  021422  012700  000020                        MOV     #16.,R0         ;LOAD BITS PER WORD
4484  021426  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4485  021434  006004                                ROR     R4              ;GET NEXT BIT
4486  021436  103403                                BCS     17$
4487  021440  005037  003254                        CLR     PR.BIT
4488  021444  000403                                BR      18$
4489
4490  021446  012737  000001  003254  17$:    MOV     #1,PR.BIT
4491  021454  004737  037026                18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4492  021460  005300                                DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4493  021462  001361                                BNE     15$             ;NO, CONTINUE
4494  021464  005301                                DEC     R1              ;CHECK IF FINISHED WITH HEADER
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4495  021466  001354                          BNE     12$             ;NO,CONTINUE
4496  021470  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4497  021474  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4498  021502  005037  003254                  CLR     PR.BIT
4499  021506  004737  037026                  JSR     PC,RDBIT
4500  021512  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4501  021514  001367                          BNE     25$             ;NO, CONTINUE
4502  021516  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
4503  021524  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4504  021532  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
4505  021540  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4506  021546  001401                          BEQ     30$             ;YES, CONTINUE
4507  021550  104110                          ERROR   110             ;CS1 INCORRECT
4508  021552  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4509  021560  001401                          BEQ     31$             ;YES, CONTINUE
4510  021562  104111                          ERROR   111             ;CS2 INCORRECT
4511  021564  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4512  021572  001401                          BEQ     32$             ;YES, CONTINUE
4513  021574  104112                          ERROR   112             ;ERROR REG INCORRECT
4514  021576  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4515  021604  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
4516  021612  001401                          BEQ     34$             ;YES, CONTINUE
4517  021614  104113                          ERROR   113             ;MR1 INCORRECT
4518  021616  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4519  021622  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
4520  021630  001011                          BNE     35$             ;NO, CHECK IF FINSHED
4521  021632  012737  020400  003214          MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
4522  021640  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
4523  021646  052737  100200  003200          BIS     #RDY!CERR,E.CS1
4524  021654  005305          35$:    DEC     R5              ;CHECK IF FINISHED
4525  021656  001402                          BEQ     37$             ;YES - SKIP
4526  021660  000137  021332                  JMP     5$              ;DO NEXT SECTOR
4527  021664  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4528  021672  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4529  021700  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4530  021706  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4531  021714  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
4532  021722  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4533  021730  001401                          BEQ     TST35           ;;GO TO NEXT TEST
4534  021732  104153                          ERROR   153
4535
4536
4537                                  ;;*****************************************************************
4538                                  ;*TEST 35       BSE AND CONTROLLER ERROR
4539                                  ;*
4540                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4541                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
4542                                  ;*      OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
4543                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4544                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4545                                  ;*      AND A HEADER WITH A BSE ERROR.  MAKE SURE CONTROLLER
4546                                  ;*      ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
4547                                  ;*      CONTROLLER ERROR RESETS.
4548                                  ;*
4549                                  ;*****************************************************************
4550  021734  000004                  TST35:  SCOPE
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4551  021736  012737  000010  001200          MOV     #10,$TIMES          ;;DO 10 ITERATIONS
4552  021744  013702  001270                  MOV     $BASE,R2            ;LOAD RK611 BASE
4553  021750  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
4554  021756  012762  000040  000026          MOV     #DMD,RKMR1(R2)      ;PUT RK611 IN DIAGNOSTIC MODE
4555  021764  012762  055216  000004          MOV     #BUFF,RKBA(R2)      ;LOAD DUMMY BUS ADDRESS
4556  021772  012762  177777  000002          MOV     #-1,RKWC(R2)        ;WORD COUNT=1
4557  022000  012762  000000  000020          MOV     #0,RKDCYL(R2)   ;LOAD CYLINDER 11DMS
4558  022006  012762  000000  000006          MOV     #0,RKDA(R2)         ;LOAD TRACK AND SECTOR
4559  022014  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)           ;ISSUE COMMAND
4560  022022  012700  000426                  MOV     #69.*4+2,R0         ;ISSUE ENOUGH CLOCKS UNTIL
4561                                                                      ;  READY FOR SECTOR PULSE.
4562  022026  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4563  022034  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4564  022042  005300                          DEC     R0
4565  022044  001370                          BNE     1$
4566  022046  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4567  022054  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4568  022062  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
4569  022066  005037  003256                  CLR     M1.BIT
4570  022072  012700  000377                  MOV     #255.,R0
4571  022076  004737  037026          5$:     JSR     PC,RDBIT
4572  022102  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
4573  022104  001374                          BNE     5$
4574  022106  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH
4575  022114  004737  037026                  JSR     PC,RDBIT
4576  022120  012703  053372                  MOV     #HEAD2,R3           ;LOAD HEADER
4577  022124  012701  000003                  MOV     #3,R1               ;LOAD WORDS PER HEADER
4578  022130  012304                  10$:    MOV     (R3)+,R4            ;GET NEXT WORD
4579  022132  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
4580  022136  013737  003254  003256  12$:    MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
4581  022144  006004                          ROR     R4                  ;GET NEXT BIT
4582  022146  103403                          BCS     15$
4583  022150  005037  003254                  CLR     PR.BIT
4584  022154  000403                          BR      16$
4585
4586  022156  012737  000001  003254  15$:    MOV     #1,PR.BIT
4587  022164  004737  037026          16$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
4588  022170  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT WORD
4589  022172  001361                          BNE     12$                 ;NO, CONTINUE
4590  022174  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
4591  022176  001354                          BNE     10$                 ;NO, CONTINUE
4592  022200  012700  000101                  MOV     #65.,R0
4593  022204  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
4594  022212  005037  003254                  CLR     PR.BIT
4595  022216  004737  037026                  JSR     PC,RDBIT
4596  022222  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
4597  022224  001367                          BNE     20$                 ;NO, CONTINUE
4598  022226  012700  021200                  MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
4599  022232  012762  000440  000026  25$:    MOV     #DMD!MCLK,RKMR1(R2)
4600  022240  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4601  022246  005300                          DEC     R0
4602  022250  001370                          BNE     25$
4603  022252  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4604  022260  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4605  022266  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
4606  022274  012737  100222  003200          MOV     #CERR!RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
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 4607  022302  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4608  022310  012737  000200  003214          MOV     #BSE,E.ER       ;LOAD EXPECTED ERROR REG
 4609  022316  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4610  022324  001401                          BEQ     30$             ;YES, CONTINUE
 4611  022326  104136                          ERROR   136             ;CS1 INCORRECT
 4612  022330  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4613  022336  001401                          BEQ     32$             ;YES, CONTINUE
 4614  022340  104137                          ERROR   137             ;CS2 INCORRECT
 4615  022342  023737  003214  003154  32$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4616  022350  001401                          BEQ     35$             ;YES - SKIP
 4617  022352  104140                          ERROR   140             ;ERROR REG INCORRECT
 4618  022354  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4619  022362  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
 4620  022370  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
 4621  022376  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
 4622  022404  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
 4623  022412  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
 4624  022420  001401                          BEQ     TST36           ;GO TO NEXT TEST
 4625  022422  104153                          ERROR   153             ;ERROR DID NOT CLEAR
 4626
 4627                                  ;;*****************************************************************
 4628                                  ;*TEST 36       HVRC AND CONTROLLER ERROR
 4629                                  ;*
 4630                                  ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 4631                                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
 4632                                  ;*       OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
 4633                                  ;*       CYLINDER 300, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
 4634                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
 4635                                  ;*       AND A HEADER WITH A HVRC ERROR.  MAKE SURE CONTROLLER
 4636                                  ;*       ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
 4637                                  ;*       CONTROLLER ERROR RESETS.
 4638                                  ;*
 4639                                  ;;*****************************************************************
 4640  022424  000004                  TST36:  SCOPE
 4641  022426  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 4642  022434  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4643  022440  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4644  022446  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4645  022454  012762  055216  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
 4646  022462  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
 4647  022470  012762  000300  000020          MOV     #300,RKDCYL(R2) ;LOAD CYLINDER 11DMS
 4648  022476  012762  000000  000006          MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
 4649  022504  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)       ;ISSUE COMMAND
 4650  022512  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4651                                                                  ;  READY FOR SECTOR PULSE.
 4652  022516  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 4653  022524  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4654  022532  005300                          DEC     R0
 4655  022534  001370                          BNE     1$
 4656  022536  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 4657  022544  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4658  022552  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
 4659  022556  005037  003256                  CLR     M1.BIT
 4660  022562  012700  000377                  MOV     #255.,R0
 4661  022566  004737  037026          5$:     JSR     PC,RDBIT
 4662  022572  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
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4663  022574  001374                          BNE     5$
4664  022576  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH
4665  022604  004737  037026                  JSR     PC,RDBIT
4666  022610  012703  053474                  MOV     #HEAD10,R3      ;LOAD HEADER
4667  022614  012701  000003                  MOV     #3,R1           ;LOAD WORDS PER HEADER
4668  022620  012304                  10$:    MOV     (P3)+,R4        ;GET NEXT WORD
4669  022622  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4670  022626  013737  003254  003256  12$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4671  022634  006004                          ROR     R4              ;GET NEXT BIT
4672  022636  103403                          BCS     15$
4673  022640  005037  003254                  CLR     PR.BIT
4674  022644  000403                          BR      16$
4675
4676  022646  012737  000001  003254  15$:    MOV     #1,PR.BIT
4677  022654  004737  037026          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4678  022660  005300                          DEC     R0              ;CHECK IF READY FOR NEXT WORD
4679  022662  001361                          BNE     12$             ;NO, CONTINUE
4680  022664  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
4681  022666  001354                          BNE     10$             ;NO, CONTINUE
4682  022670  012700  000101                  MOV     #65.,R0
4683  022674  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4684  022702  005037  003254                  CLR     PR.BIT
4685  022706  004737  037026                  JSR     PC,RDBIT
4686  022712  005300                          DEC     R0              ;CHECK IF GAP FINISHED
4687  022714  001367                          BNE     20$             ;NO, CONTINUE
4689  022716  012700  021200                  MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
4689  022722  012762  000440  000026  25$:    MOV     #DMD!MCLK,RKMR1(R2)
4690  022730  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4691  022736  005300                          DEC     R0
4692  022740  001370                          BNE     25$
4693  022742  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4694  022750  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4695  022756  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
4696  022764  012737  100222  003200          MOV     #CERR!RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
4697  022772  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4698  023000  012737  000400  003214          MOV     #HVRC,E.ER      ;LOAD EXPECTED ERROR REG
4699  023006  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4700  023014  001401                          BEQ     30$             ;YES, CONTINUE
4701  023016  104141                          ERROR   141             ;CS1 INCORRECT
4702  023020  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4703  023026  001401                          BEQ     32$             ;YES, CONTINUE
4704  023030  104142                          ERROR   142             ;CS2 INCORRECT
4705  023032  023737  003214  003154  32$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4706  023040  001401                          BEQ     35$             ;YES - SKIP
4707  023042  104143                          ERROR   143             ;ERROR REG INCORRECT
4708  023044  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4709  023052  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4710  023060  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4711  023066  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4712  023074  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
4713  023102  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4714  023110  001401                          BEQ     TST37           ;;GO TO NEXT TEST
4715  0231.2  104153                          ERROR   153             ;ERROR DID NOT CLEAR
4716
4717                                  ;;*****************************************************************
4718                                  ;*TEST 37        READ DATA AND HVRC ERROR
```

```
                                        ;*
                                        ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                                        ;*      OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
                                        ;*      CYLINDER 300, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                                        ;*      AND A HEADER WITH A HVRC ERROR.  MAKE SURE CONTROLLER
                                        ;*      ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
                                        ;*      CONTROLLER ERROR RESETS.
                                        ;*
                                        ;**************************************************************
023114  000004                  T$T37:    SCOPE
023116  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
023124  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
023130  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
023136  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
023144  012762  055216  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
023152  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT=1
023160  012762  000300  000020            MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
023166  012762  000000  000006            MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
023174  012762  000021  000000            MOV     #RDDATA,RKCS1(R2)       ;ISSUE COMMAND
023202  012700  000426                    MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                  ;  READY FOR SECTOR PULSE.
023206  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
023214  012762  000040  000026            MOV     #DMD,RKMR1(R2)
023222  005300                            DEC     R0
023224  001370                            BNE     1$
023226  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
023234  012762  000040  000026            MOV     #DMD,RKMR1(R2)
023242  005037  003254                    CLR     PR.BIT          ;GENERATE SYNCH
023246  005037  003256                    CLR     M1.BIT
023252  012700  000377                    MOV     #255.,R0
023256  004737  037026          5$:       JSR     PC,RDBIT
023262  005300                            DEC     R0              ;CHECK IF SYNCH FINISHED
023264  001374                            BNE     5$
023266  012737  000001  003254            MOV     #1,PR.BIT       ;SIMULATE SYNCH
023274  004737  037026                    JSR     PC,RDBIT
023300  012703  053474                    MOV     #HEAD10,R3      ;LOAD HEADER
023304  012701  000003                    MOV     #3,R1           ;LOAD WORDS PER HEADER
023310  012304                  10$:      MOV     (R3)+,R4        ;GET NEXT WORD
023312  012700  000020                    MOV     #16.,R0         ;LOAD BITS PER WORD
023316  013737  003254  003256  12$:      MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
023324  006004                            ROR     R4              ;GET NEXT BIT
023326  103403                            BCS     15$
023330  005037  003254                    CLR     PR.BIT
023334  000403                            BR      16$

023336  012737  000001  003254  15$:      MOV     #1,PR.BIT
023344  004737  037026          16$:      JSR     PC,RDBIT        ;SIMULATE NEXT BIT
023350  005300                            DEC     R0              ;CHECK IF READY FOR NEXT WORD
023352  001361                            BNE     12$             ;NO, CONTINUE
023354  005301                            DEC     R1              ;CHECK IF FINISHED WITH HEADER
023356  001354                            BNE     10$             ;NO, CONTINUE
023360  012700  000101                    MOV     #65.,R0
023364  013737  003254  003256  20$:      MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
023372  005037  003254                    CLR     PR.BIT
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 4775  023376  004737  037026                    JSR     PC,RDBIT
 4776  023402  005300                            DEC     R0              ;CHECK IF GAP FINISHED
 4777  023404  001367                            BNE     20$             ;NO, CONTINUE
 4778  023406  012700  021200                    MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
 4779  023412  012762  000440  000026  25$:     MOV     #DMD!MCLK,RKMR1(R2)
 4780  023420  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 4781  023426  005300                            DEC     R0
 4782  023430  001370                            BNE     25$
 4783  023432  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;GET CS1
 4784  023440  016237  000010  003150            MOV     RKCS2(R2),T.CS2 ;GET CS2
 4785  023446  016237  000014  003154            MOV     RKER(R2),T.ER   ;GET ERROR REG
 4786  023454  012737  100220  003200            MOV     #CERR!RDY!RDDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
 4787  023462  012737  000100  003210            MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 4788  023470  012737  000400  003214            MOV     #HVRC,E.ER      ;LOAD EXPECTED ERROR REG
 4789  023476  023737  003200  003140            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4790  023504  001401                            BEQ     30$             ;YES, CONTINUE
 4791  023506  104141                            ERROR   141             ;CS1 INCORRECT
 4792  023510  023737  003210  003150  30$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4793  023516  001401                            BEQ     32$             ;YES, CONTINUE
 4794  023520  104142                            ERROR   142             ;CS2 INCORRECT
 4795  023522  023737  003214  003154  32$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4796  023530  001401                            BEQ     35$             ;YES - SKIP
 4797  023532  104143                            ERROR   143             ;ERROR REG INCORRECT
 4798  023534  012762  100000  000000  35$:     MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4799  023542  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;GET CS1
 4800  023550  016237  000010  003150            MOV     RKCS2(R2),T.CS2 ;    CS2
 4801  023556  016237  000014  003154            MOV     RKER(R2),T.ER   ;    ER
 4802  023564  012737  000200  003200            MOV     #200,E.CS1      ;SET EXPECTED CS1
 4803  023572  023737  003140  003200            CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
 4804  023600  001401                            BEQ     TST40           ;GO TO NEXT TEST
 4805  023602  104153                            ERROR   153             ;ERROR DID NOT CLEAR
 4806
 4807                                    ;;*****************************************************************
 4808                                    ;*TEST 40       WRITE CHECK AND HVRC
 4809                                    ;*
 4810                                    ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 4811                                    ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
 4812                                    ;*      CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
 4813                                    ;*      CYLINDER 300, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
 4814                                    ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE AND
 4815                                    ;*      A HEADER WITH A HEADER VRC ERROR.  MAKE SURE
 4816                                    ;*      HVRC AND CONTROLLER ERROR ARE SET. CLEAR CONTROLLER
 4817                                    ;*      AND MAKE SURE CONTROLLER ERROR RESETS.
 4818                                    ;*
 4819                                    ;*****************************************************************
 4820  023604  000004                    TST40:  SCOPE
 4821  023606  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 4822  023614  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
 4823  023620  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4824  023626  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4825  023634  012762  055216  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
 4826  023642  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT=1
 4827  023650  012762  000300  000020            MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
 4828  023656  012762  000000  000006            MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
 4829  023664  012762  000031  000000            MOV     #WRTCHK,RKCS1(R2)       ;ISSUE COMMAND
 4830  023672  012700  000426                    MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
```

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4831                                                            ;  READY FOR SECTOR PULSE.
4832  023676  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4833  023704  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4834  023712  005300                          DEC     R0
4835  023714  001370                          BNE     1$
4836  023716  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4837  023724  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4838  023732  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
4839  023736  005037  003256                  CLR     M1.BIT
4840  023742  012700  000377                  MOV     #255.,R0
4841  023746  004737  037026          5$:     JSR     PC,RDBIT
4842  023752  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
4843  023754  001374                          BNE     5$
4844  023756  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH
4845  023764  004737  037026                  JSR     PC,RDBIT
4846  023770  012703  053474                  MOV     #HEAD10,R3          ;LOAD HEADER
4847  023774  012701  000003                  MOV     #3,R1               ;LOAD WORDS PER HEADER
4848  024000  012304                  10$:    MOV     (R3)+,R4            ;GET NEXT WORD
4849  024002  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
4850  024006  013737  003254  003256  12$:    MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
4851  024014  006004                          ROR     R4                  ;GET NEXT BIT
4852  024016  103403                          BCS     15$
4853  024020  005037  003254                  CLR     PR.BIT
4854  024024  000403                          BR      16$
4855
4856  024026  012737  000001  003254  15$:    MOV     #1,PR.BIT
4857  024034  004737  037026          16$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
4858  024040  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT WORD
4859  024042  001361                          BNE     12$                 ;NO, CONTINUE
4860  024044  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
4861  024046  001354                          BNE     10$                 ;NO, CONTINUE
4862  024050  012700  000101                  MOV     #65.,R0
4863  024054  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
4864  024062  005037  003254                  CLR     PR.BIT
4865  024066  004737  037026                  JSR     PC,RDBIT
4866  024072  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
4867  024074  001367                          BNE     20$                 ;NO, CONTINUE
4868  024076  012700  021200                  MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMELE
4869  024102  012762  000440  000026  25$:    MOV     #DMD!MCLK,RKMR1(R2)
4870  024110  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4871  024116  005300                          DEC     R0
4872  024120  001370                          BNE     25$
4873  024122  016237  000000  003140          MOV     RKCS1(R2),T.CS1  ;GET CS1
4874  024130  016237  000010  003150          MOV     RKCS2(R2),T.CS2  ;GET CS2
4875  024136  016237  000014  003154          MOV     RKER(R2),T.ER    ;GET ERROR REG
4876  024144  012737  100230  003200          MOV     #CERR!RDY!WRTCHK&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
4877  024152  012737  000100  003210          MOV     #IR,E.CS2           ;LOAD EXPECTED CS2
4878  024160  012737  000400  003214          MOV     #HVRC,E.ER          ;LOAD EXPECTED ERROR REG
4879  024166  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
4880  024174  001401                          BEQ     30$                 ;YES, CONTINUE
4881  024176  104141                          ERROR   141                 ;CS1 INCORRECT
4882  024200  023737  003210  003150  30$:    CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
4883  024206  001401                          BEQ     32$                 ;YES, CONTINUE
4884  024210  104142                          ERROR   142                 ;CS2 INCORRECT
4885  024212  023737  003214  003154  32$:    CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
4886  024220  001401                          BEQ     35$                 ;YES - SKIP
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4887  024222  104143                                ERROR   143             ;ERROR REG INCORRECT
4888  024224  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4889  024232  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4890  024240  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;     CS2
4891  024246  016237  000014  003154          MOV     RKER(R2),T.ER   ;     ER
4892  024254  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
4893  024262  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4894  024270  001401                          BEQ     TST41           ;GO TO NEXT TEST
4895  024272  104153                          ERROR   153             ;ERROR DID NOT CLEAR
4896
4897
4898                                  .SBTTL  **ECC GENERATION TESTS
4899
4900                                  ;;*****************************************************************
4901                                  ;*TEST 41        ECC INITIALIZATION
4902                                  ;*
4903                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4904                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4905                                  ;*      DATA OF 10 WORDS TO AN RK06, IN 26 SECTOR
4906                                  ;*      FORMAT, CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
4907                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
4908                                  ;*      A SECTOR PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY FOUR
4909                                  ;*      DATA WORDS OF ZEROES.  MAKE SURE THE ECC PATTERN
4910                                  ;*      REGISTER REMAINS ZERO.
4911                                  ;*
4912                                  ;;*****************************************************************
4913  024274  000004                  TST41:  SCOPE
4914  024276  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4915  024304  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4916  024310  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4917  024316  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4918  024324  012762  053510  000004          MOV     #ECC1,RKBA(R2)  ;LOAD ADDRESS OF ECC DATA
4919  024332  012762  177770  000002          MOV     #-10,RKWC(R2)   ;WORD COUNT =10
4920  024340  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
4921  024346  012700  000450                  MOV     #8.*37.,R0      ;ISSUE ENOUGH CLOCKS UNTIL
4922                                                                  ;  READY FOR SECTOR PULSE
4923  024352  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4924  024360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4925  024366  00530C                          DEC     R0
4926  024370  001370                          BNE     1$
4927  024372  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4928  024400  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4929  024406  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4930  024412  005037  003256                  CLR     M1.BIT
4931  024416  012700  000377                  MOV     #255.,R0
4932  024422  004737  037026          5$:     JSR     PC,RDBIT
4933  024426  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4934  024430  001374                          BNE     5$
4935  024432  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4936  024440  004737  037026                  JSR     PC,RDBIT
4937  024444  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
4938  024450  012703  053364                  MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
4939  024454  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4940  024456  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4941  024462  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4942  024470  006004                          ROR     R4              ;GET NEXT BIT
```

```
4943  024472  103403                        BCS     17$
4944  024474  005037  003254                CLR     PR.BIT
4945  024500  000403                        BR      18$
4946
4947  024502  012737  000001  003254  17$:  MOV     #1,PR.BIT
4948  024510  004737  037026          18$:  JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4949  024514  005300                        DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4950  024516  001361                        BNE     15$             ;NO, CONTINUE
4951  024520  005301                        DEC     R1              ;CHECK IF FINISHED WITH HEADER
4952  024522  001354                        BNE     12$             ;NO, CONTINUE
4953  024524  012700  000101                MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FROM READ TO WRITE
4954  024530  013737  003254  003256  20$:  MOV     PR.BIT,M1.BIT
4955  024536  005037  003254                CLR     PR.BIT
4956  024542  004737  037026                JSR     PC,RDBIT
4957  024546  005300                        DEC     R0              ;CHECK IF GAP FINISHED
4958  024550  001367                        BNE     20$             ;NO, CONTINUE
4959  024552  012700  000400                MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
4960  024556  012737  050670  001310        MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
4961  024564  005037  003252                CLR     P1.BIT          ;INITIALIZE BITS
4962  024570  005037  003254                CLR     PR.BIT
4963  024574  005037  003256                CLR     M1.BIT
4964  024600  005037  003260                CLR     M2.BIT
4965  024604  005037  003262                CLR     BITCNT          ;INITIALIZE BIT COUNT
4966  024610  012737  062040  003224        MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1 ;LOAD EXPECTED MR1
4967  024616  004737  036300          25$:  JSR     PC,WRTBIT       ;WRITE BIT
4968  024622  104002                        ERROR   2               ;DATA INCORRECT
4969  024624  005237  003262                INC     BITCNT          ;INCREMENT BIT COUNT
4970  024630  005300                        DEC     R0              ;CHECK IF FINISHED
4971  024632  001371                        BNE     25$             ;NO, CONTINUE
4972  024634  012737  000001  003252        MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
4973  024642  004737  036300                JSR     PC,WRTBIT
4974  024646  104002                        ERROR   2
4975  024650  005037  003262                CLR     BITCNT          ;CLEAR BIT COUNT
4976  024654  012737  050742  001310        MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
4977  024662  005037  003234                CLR     E.ECPT          ;CLEAR EXPECTED ECC PATTERN
4978  024666  012703  053510                MOV     #ECC1,R3        ;LOAD START OF DATA
4979  024672  012701  000004                MOV     #4,R1           ;LOAD COUNT
4980  024676  012304          30$:  MOV     (R3)+,R4        ;GET NEXT WORD
4981  024700  012700  000020                MOV     #16.,R0         ;LOAD BITS PER WORD
4982  024704  013737  003256  003260  32$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
4983  024712  013737  003254  003256        MOV     PR.BIT,M1.BIT
4984  024720  013737  003252  003254        MOV     P1.BIT,PR.BIT
4985  024726  006004                        ROR     R4              ;GET NEXT BIT
4986  024730  103403                        BCS     34$
4987  024732  005037  003252                CLR     P1.BIT
4988  024736  000403                        BR      35$
4989
4990  024740  012737  000001  003252  34$:  MOV     #1,P1.BIT
4991  024746  004737  036300          35$:  JSR     PC,WRTBIT       ;SIMULATE BIT
4992  024752  104002                        ERROR   2
4993  024754  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
4994  024762  023737  003234  003174        CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
4995  024770  001401                        BEQ     37$             ;YES, CONTINUE
4996  024772  104134                        ERROR   134             ;ECC PATTERN NOT ZERO
4997  024774  005237  003262          37$:  INC     BITCNT          ;INCREMENT BIT COUNT
4998  025000  005300                        DEC     R0              ;CHECK IF FINISHED WITH WORD
```

```
4999  025002  001340                        BNE     32$             ;NO, CONTINUE
5000  025004  005301                        DEC     R1              ;CHECK IF FINISHED WITH TEST
5001  025006  001333                        BNE     30$             ;NO, CONTINUE
5002
5003                                  ;;*****************************************************************
5004                                  ;*TEST 42       ECC GENERATION (PART 1)
5005                                  ;*
5006                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5007                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5008                                  ;*      DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
5009                                  ;*      FORMAT, CYLINER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
5010                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
5011                                  ;*      PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY THE
5012                                  ;*      FOLLOWING SIX WORDS OF DATA:
5013                                  ;*
5014                                  ;*              005001
5015                                  ;*              040040
5016                                  ;*              020004
5017                                  ;*              000064
5018                                  ;*              000000
5019                                  ;*              000000
5020                                  ;*
5021                                  ;*      CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
5022                                  ;*      GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.
5023                                  ;*
5024                                  ;*****************************************************************
5025  025010  000004                  TST42:  SCOPE
5026  025012  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5027  025020  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5028  025024  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5029  025032  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5030  025040  012762  053530  000004          MOV     #ECC2,RKBA(R2)  ;LOAD ECC DATA
5031  025046  012762  177766  000002          MOV     #-12.,RKWC(R2)  ;WORD COUNT=12
5032  025054  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
5033  025062  012700  000562                  MOV     #10.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5034                                                                  ;  READY FOR SECTOR PULSE
5035  025066  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5036  025074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5037  025102  005300                          DEC     R0
5038  025104  001370                          BNE     1$
5039  025106  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5040  025114  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5041  025122  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
5042  025126  005037  003256                  CLR     M1.BIT
5043  025132  012700  000377                  MOV     #255.,R0
5044  025136  004737  037026          5$:     JSR     PC,RDBIT
5045  025142  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
5046  025144  001374                          BNE     5$
5047  025146  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
5048  025154  004737  037026                  JSR     PC,RDBIT
5049  025160  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
5050  025164  012703  053364                  MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
5051  025170  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
5052  025172  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5053  025176  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5054  025204  006004                          ROR     R4              ;GET NEXT BIT
```

```
5055  025206  103403                          BCS     17$
5056  025210  005037  003254                  CLR     PR.BIT
5057  025214  000403                          BR      18$
5058
5059  025216  012737  000001  003254  17$:    MOV     #1,PR.BIT
5060  025224  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5061  025230  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
5062  025232  001361                          BNE     15$             ;NO, CONTINUE
5063  025234  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
5064  025236  001354                          BNE     12$             ;NO, CONTINUE
5065  025240  012700  000101                  MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FORM READ TO WRITE
5066  025244  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT
5067  025252  005037  003254                  CLR     PR.BIT
5068  025256  004737  037026                  JSR     PC,RDBIT
5069  025262  005300                          DEC     R0              ;CHECK IF GAP FINISHED
5070  025264  001367                          BNE     20$             ;NO, CONTINUE
5071  025266  012700  000400                  MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
5072  025272  012737  050670  001310          MOV     #EM327,EMW      ;LOAD ERROR
5073  025300  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS
5074  025304  005037  003254                  CLR     PR.BIT
5075  025310  005037  003256                  CLR     M1.BIT
5076  025314  005037  003260                  CLR     M2.BIT
5077  025320  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5078  025324  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5079  025332  004737  036300          25$:    JSR     PC,WRTBIT       ;WRITE BIT
5080  025336  104002                          ERROR   2               ;DATA INCORRECT
5081  025340  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
5082  025344  005300                          DEC     R0              ;CHECK IF FINISHED
5083  025346  001371                          BNE     25$             ;NO, CONTINUE
5084  025350  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
5085  025356  004737  036300                  JSR     PC,WRTBIT
5086  025362  104002                          ERROR   2
5087  025364  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5088  025370  012737  050742  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5089  025376  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC
5090  025402  005037  003270                  CLR     ECCLO
5091  025406  012703  053530                  MOV     #ECC2,R3        ;LOAD START OF DATA
5092  025412  012701  000006                  MOV     #6,R1           ;LOAD COUNT
5093  025416  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT BIT
5094  025420  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5095  025424  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5096  025432  013737  003254  003256          MOV     PR.BIT,M1.BIT
5097  025440  013737  003252  003254          MOV     P1.BIT,PR.BIT
5098  025446  006004                          ROR     R4              ;GET NEXT BIT
5099  025450  103403                          BCS     34$
5100  025452  005037  003252                  CLR     P1.BIT
5101  025456  000403                          BR      35$
5102
5103  025460  012737  000001  003252  34$:    MOV     #1,P1.BIT
5104  025466  004737  036300          35$:    JSR     PC,WRTBIT       ;SIMULATE BIT
5105  025472  104002                          ERROR   2
5106  025474  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
5107  025502  004737  036132                  JSR     PC,ECCGEN       ;GENERATE EXPECTED ECC PAT
5108  025506  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5109  025514  001401                          BEQ     37$             ;YES, CONTINUE
5110  025516  104135                          ERROR   135             ;ECC PATTERN INCORRECT
```

```
                                37$:    INC     BITCNT          ;INCREMENT BIT COUNT
                                        DEC     R0              ;CHECK IF FINISHED WITH WORD
                                        BNE     32$             ;NO, CONTINUE
                                        DEC     R1              ;CHECK IF FINISHED WITH TEST
                                        BNE     30$             ;NO, CONTINUE

                        ;;*****************************************************************
                        ;*TEST 43        ECC GENERATION (PART 2)
                        ;*
                        ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        ;*      DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
                        ;*      FORMAT, CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
                        ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                        ;*      AND A GOOD HEADER.  CLOCK THROUGH ONLY THE FOLLOWING
                        ;*      SIX WORDS OF DATA:
                        ;*
                        ;*              177777
                        ;*              177777
                        ;*              177777
                        ;*              177777
                        ;*              177777
                        ;*              177777
                        ;*
                        ;*      CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
                        ;*      GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.
                        ;*
                        ;*****************************************************************
000004                  ;ST43:  SCOPE
000012  001200                 MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
100000  000000                 MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
000040  000026                 MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
053550  000004                 MOV     #ECC3,RKBA(R2)  ;LOAD ECC DATA
177766  000002                 MOV     #-12,RKWC(R2)   ;WORD COUNT=12
000023  000000                 MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
000562                          MOV     #10.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                        ;  READY FOR SECTOR PULSE
000440  000026          1$:    MOV     #DMD!MCLK,RKMR1(R2)
000040  000026                 MOV     #DMD,RKMR1(R2)
005300                          DEC     R0
001370                          BNE     1$
000140  000026                 MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
000040  000026                 MOV     #DMD,RKMR1(R2)
003254                          CLR     PR.BIT          ;GENERATE SYNCH
003256                          CLR     M1.BIT
000377                          MOV     #255.,R0
037026                  5$:     JSR     PC,RDBIT
005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
001374                          BNE     5$
000001  003254                 MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
037026                          JSR     PC,RDBIT
000003                          MOV     #3,R1           ;SIMULATE HEADER
053364                          MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
000020                          MOV     #16.,R0         ;LOAD BITS PER WORD
```

```
 5167  025722  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5168  025730  006004                          ROR     R4              ;GET NEXT BIT
 5169  025732  103403                          BCS     17$
 5170  025734  005037  003254                  CLR     PR.BIT
 5171  025740  000403                          BR      18$
 5172
 5173  025742  012737  000001  003254  17$:    MOV     #1,PR.BIT
 5174  025750  004737  037026          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
 5175  025754  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
 5176  025756  001361                          BNE     15$             ;NO, CONTINUE
 5177  025760  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
 5178  025762  001354                          BNE     12$             ;NO, CONTINUE
 5179  025764  012700  000101                  MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FORM READ TO WRITE
 5180  025770  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT
 5181  025776  005037  003254                  CLR     PR.BIT
 5182  026002  004737  037026                  JSR     PC,RDBIT
 5183  026006  005300                          DEC     R0              ;CHECK IF GAP FINISHED
 5184  026010  001367                          BNE     20$             ;NO, CONTINUE
 5185  026012  012700  000400                  MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
 5186  026016  012737  050670  001310          MOV     #EM327,EMW      ;LOAD ERROR
 5187  026024  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS
 5188  026030  005037  003254                  CLR     PR.BIT
 5189  026034  005037  003256                  CLR     M1.BIT
 5190  026040  005037  003260                  CLR     M2.BIT
 5191  026044  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5192  026050  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
 5193  026056  004737  036300          25$:    JSR     PC,WRTBIT       ;WRITE BIT
 5194  026062  104002                          ERROR   2               ;DATA INCORRECT
 5195  026064  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
 5196  026070  005300                          DEC     R0              ;CHECK IF FINISHED
 5197  026072  001371                          BNE     25$             ;NO, CONTINUE
 5198  026074  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
 5199  026102  004737  036300                  JSR     PC,WRTBIT
 5200  026106  104002                          ERROR   2
 5201  026110  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 5202  026114  012737  050742  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
 5203  026122  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC
 5204  026126  005037  003270                  CLR     ECCLO
 5205  026132  012703  053550                  MOV     #ECC3,R3        ;LOAD START OF DATA
 5206  026136  012701  000006                  MOV     #6,R1           ;LOAD COUNT
 5207  026142  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT BIT
 5208  026144  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
 5209  026150  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5210  026156  013737  003254  003256          MOV     PR.BIT,M1.BIT
 5211  026164  013737  003252  003254          MOV     P1.BIT,PR.BIT
 5212  026172  006004                          ROR     R4              ;GET NEXT BIT
 5213  026174  103403                          BCS     34$
 5214  026176  005037  003252                  CLR     P1.BIT
 5215  026202  000403                          BR      35$
 5216
 5217  026204  012737  000001  003252  34$:    MOV     #1,P1.BIT
 5218  026212  004737  036300          35$:    JSR     PC,WRTBIT       ;SIMULATE BIT
 5219  026216  104002                          ERROR   2
 5220  026220  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
 522   026226  004737  036132                  JSR     PC,ECCGEN       ;GENERATE EXPECTED ECC PAT
 522   026232  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
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5223   026240   001401                          BEQ     37$             ;YES, CONTINUE
5224   026242   104135                          ERROR   135             ;ECC PATTERN INCORRECT
5225   026244   005237   003262        37$:     INC     BITCNT          ;INCREMENT BIT COUNT
5226   026250   005300                          DEC     R0              ;CHECK IF FINISHED WITH WORD
5227   026252   001336                          BNE     32$             ;NO, CONTINUE
5228   026254   005301                          DEC     R1              ;CHECK IF FINISHED WITH TEST
5229   026256   001331                          BNE     30$             ;NO, CONTINUE
5230
5231                                    ;;*****************************************************************
5232                                    ;*TEST 44       ECC WRITING
5233                                    ;*
5234                                    ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5235                                    ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5236                                    ;*      DATA OF 400 WORDS.  TO AN RK06 IN 26 SECTOR FORMAT,
5237                                    ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5238                                    ;*      AND DRIVE CLEAR MESSAGE.  SIMULATE A SECTOR PULSE
5239                                    ;*      AND A GOOD HEADER.  CLOCK THROUGH ALL 400 WORDS
5240                                    ;*      AND THE TWO ECC WORDS.  MAKE SURE THE TWO ECC WORDS
5241                                    ;*      ARE CORRECT AND WRITTEN PROPERLY.  CHECK BUS ADDRESS,
5242                                    ;*      WORD COUNT, CYLINDER, TRACK, AND SECTOR.
5243                                    ;*
5244                                    ;;*****************************************************************
5245   026260   000004                  T$T44:  SCOPE
5246   026262   012737   000012  001200        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5247
5248   026270   013702   001270                MOV     $BASE,R2        ;LOAD RK611 BASE
5249   026274   012762   100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5250   026302   012762   000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5251   026310   012762   056216  000004        MOV     #ECCBUF,RKBA(R2)  ;LOAD ADDRESS
5252   026316   012762   177400  000002        MOV     #-400,RKWC(R2)  ;WORD COUNT=400
5253   026324   012762   000023  000000        MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
5254   026332   012700   004612                MOV     #66.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5255                                                                    ;  READY FOR SECTOR PULSE
5256   026336   012762   000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
5257   026344   012762   000040  000026        MOV     #DMD,RKMR1(R2)
5258   026352   005300                        DEC     R0
5259   026354   001370                        BNE     1$
5260   026356   012762   000140  000026        MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5261   026364   012762   000040  000026        MOV     #DMD,RKMR1(R2)
5262   026372   005037   003254                CLR     PR.BIT
5263   026376   005037   003256                CLR     M1.BIT
5264   026402   012700   000377                MOV     #255.,R0
5265   026406   004737   037026        5$:     JSR     PC,RDBIT
5266   026412   005300                        DEC     R0              ;CHECK IF SYNCH FINISHED
5267   026414   001374                        BNE     5$
5268   026416   012737   000001  003254        MOV     #1,PR.BIT       ;SIMULATE SYNCH
5269   026424   004737   037026                JSR     PC,RDBIT
5270   026430   012703   053064                MOV     #HEAD1,R3       ;LOAD HEADER
5271   026434   012701   000003                MOV     #3,R1           ;LOAD WORDS PER HEADER
5272   026440   012304                10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5273   026442   012700   000020                MOV     #16.,R0         ;LOAD BITS PER
5274   026446   013737   003254  003256  12$:  MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5275   026454   006004                        ROR     R4              ;GET NEXT BIT
5276   026456   103403                        BCS     15$
5277   026460   005037   003254                CLR     PR.BIT
5278   026464   000403                        BR      16$
```

```
5279
5280  026466  012737  000001  003254  15$:    MOV     #1,PR.BIT
5281  026474  004737  037026          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5282  026500  005300                          DEC     R0              ;CHECK IF READY FOR NEXT WORD
5283  026502  001361                          BNE     12$             ;NO, CONTINUE
5284  026504  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
5285  026506  001354                          BNE     10$             ;NO, CONTINUE
5286  026510  012700  000101                  MOV     #65.,R0
5287  026514  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5288  026522  005037  003254                  CLR     PR.BIT
5289  026526  004737  037026                  JSR     PC,RDBIT
5290  026532  005300                          DEC     R0              ;CHECK IF GAP FINISHED
5291  026534  001367                          BNE     20$             ;NO, CONTINUE
5292  026536  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS FOR SYNCH
5293  026542  005037  003254                  CLR     PR.BIT
5294  026546  005037  003256                  CLR     M1.BIT
5295  026552  005037  003260                  CLR     M2.BIT
5296  026556  012737  050670  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5297  026564  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5298  026570  012700  000400                  MOV     #256.,R0        ;LOAD SYNCH COUNT AND WRITE SYNCH
5299  026574  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5300  026602  004737  036300          25$:    JSR     PC,WRTBIT
5301  026606  104002                          ERROR   2
5302  026610  005237  003262                  INC     BITCNT          ;CLEAR BIT COUNT
5303  026614  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
5304  026616  001371                          BNE     25$             ;NO, CONTINUE
5305  026620  012737  000001  003252          MOV     #1,P1.BIT       ;WRITE SYNCH BIT
5306  026626  004737  036300                  JSR     PC,WRTBIT
5307  026632  104002                          ERROR   2
5308  026634  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC GENERATOR
5309  026640  005037  003270                  CLR     ECCLO
5310  026644  012737  050742  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5311  026652  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5312  026656  012701  000400                  MOV     #256.,R1        ;LOAD WORDS PER SECTOR
5313  026662  012703  056216                  MOV     #ECCBUF,R3      ;LOAD ADDRESS OF BUFFER
5314  026666  012304          30$:    MOV     (R3)+,R4        ;GET NEXT WORD
5315  026670  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5316  026674  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5317  026702  013737  003254  003256          MOV     PR.BIT,M1.BIT
5318  026710  013737  003252  003254          MOV     P1.BIT,PR.BIT
5319  026716  006004                          ROR     R4              ;DETERMINE NEXT BIT
5320  026720  103403                          BCS     34$
5321  026722  005037  003252                  CLR     P1.BIT
5322  026726  000403                          BR      35$
5323
5324  026730  012737  000001  003252  34$:    MOV     #1,P1.BIT
5325  026736  004737  036300          35$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5326  026742  104002                          ERROR   2
5327  026744  004737  036132                  JSR     PC,ECCGEN       ;GENERATE ECC
5328  026750  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
5329  026756  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5330  026764  001401                          BEQ     37$             ;YES, CONTINUE
5331  026766  104135                          ERROR   135             ;ECC PATTERN INCORRECT
5332  026770  005237  003262          37$:    INC     BITCNT          ;INCREMENT BIT COUNT
5333  026774  022700  000002                  CMP     #2,R0           ;IF THE NEXT BIT IS THE LAST BIT OF
5334  027000  001006                          BNE     28$             ;THE LAST DATA WORD, ECCW MUST BE RESET
```

```
5335  027002  022701  000001              CMP     #1,R1           ;IN THE EXPECTED MR1 TC INDICATE ECC
5336  027006  001003                      BNE     28$             ;BEING WRITTEN
5337  027010  042737  020000  003224      B       #ECCW,E.MR1
5338  027016  005300              28$:    D       R0              ;CHECK IF THROUGH WITH WORD
5339  027020  001325                      BNE     32$             ;NO, CONTINUE
5340  027022  005301                      DEC     R1              ;CHECK IF AT END OF SECTOR
5341  027024  001320                      BNE     30$             ;NO, CONTINUE
5342  027026  012737  051307  001310      MOV     #EM333,EMW      ;LOAD ERROR MESSAGE
5343  027034  005037  003262              CLR     BITCNT          ;INITIALIZE BIT COUNT
5344  027040  012701  000002              MOV     #2,R1           ;LOAD NUMBER OF ECO WORDS
5345  027044  012703  003266              MOV     #ECCHI,R3       ;LOAD ADDRESS OF ECC
5346  027050  012304              40$:    MOV     (R3)+,R4        ;GET NEXT ECC WORD
5347  027052  012700  000020              MOV     #16.,R0         ;LOAD BITS PER WORD
5348  027056  013737  003256  003260  42$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5349  027064  013737  003254  003256      MOV     PR.BIT,M1.BIT
5350  027072  013737  003252  003254      MOV     P1.BIT,PR.BIT
5351  027100  006004                      ROR     R4              ;DETERMINE NEXT BIT
5352  027102  103403                      BCS     44$
5353  027104  005037  003252              CLR     P1.BIT
5354  027110  000403                      BR      45$
5355
5356  027112  012737  000001  003252  44$:  MOV     #1,P1.BIT
5357  027120  004737  036300          45$:  JSR     PC,WRTBIT       ;WRITE NEXT BIT
5358  027124  104002                      ERROR   2
5359  027126  005237  003262              INC     BITCNT          ;INCREMENT BIT COUNT
5360  027132  022700  000002              CMP     #2,R0           ;IF THE LAST BIT OF THE LAST ECC WORD
5361  027136  001006                      BNE     46$             ;IS BEING WRITTEN, ECCW MUST BE SET
5362  027140  022701  000001              CMP     #1,R1           ;IN EXPECTED MR1 TO INDICATE ECC
5363  027144  001003                      BNE     46$             ;WRITING IS DONE
5364  027146  052737  020000  003224      BIS     #ECCW,E.MR1
5365  027154  005300              46$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5366  027156  001337                      BNE     42$             ;NO, CONTINUE
5367  027160  005301                      DEC     R1              ;CHECK IF FINISH WITH ECC
5368  027162  001332                      BNE     40$             ;NO, CONTINUE
5369  027164  012737  051345  001310      MOV     #EM334,EMW      ;LOAD ERROR MESSAGE
5370  027172  005037  003262              CLR     BITCNT          ;CLEAR BIT COUNT
5371  027176  012700  000017              MOV     #15.,R0         ;LOAD POSTAMBLE BIT COUNT
5372  027202  013737  003256  003260  47$:  MOV     M1.BIT,M2.BIT   ;SHIFT BIT
5373  027210  013737  003254  003256      MOV     PR.BIT,M1.BIT
5374  027216  013737  003252  003254      MOV     P1.BIT,PR.BIT
5375  027224  005037  003252              CLR     P1.BIT
5376  027230  004737  036300              JSR     PC,WRTBIT       ;WRITE NEXT BIT
5377  027234  104002                      ERROR   2
5378  027236  005237  003262              INC     BITCNT          ;INCREMENT BIT COUNT
5379  027242  005300                      DEC     R0              ;CHECK IF THROUGH WITH POSTAMBLE
5380  027244  001356                      BNE     47$             ;NO, CONTINUE
5381  027246  012700  000014              MOV     #3*4,R0         ;ISSUE CLOCKS TO COMPLETE COMMAND
5382  027252  012762  000440  000026  50$:  MOV     #DMD!MCLK,RKMR1(R2) ;ISSUE CLOCK PULSES
5383  027260  012762  000040  000026      MOV     #DMD,RKMR1(R2)
5384  027266  005300                      DEC     R0
5385  027270  001370                      BNE     50$
5386  027272  016237  000000  003140      MOV     RKCS1(R2),T.CS1 ;SAVE CS1
5387  027300  016237  000010  003150      MOV     RKCS2(R2),T.CS2 ;SAVE CS2
5388  027306  016237  000014  003154      MOV     RKER(R2),T.ER   ;SAVE ERROR REG
5389  027314  012737  000222  003200      MOV     #RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
5390  027322  012737  000100  003210      MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
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5391  027330  005037  003214                    CLR     E.ER              ;LOAD EXPECTED ERROR REG.
5392  027334  016237  000020  003160            MOV     RKDCYL(R2),T.DCYL  ;SAVE CYLINDER ADDR REG
5393  027342  016237  000006  003146            MOV     RKDA(R2),T.DA     ;SAVE DISK AND REG
5394  027350  016237  000004  003144            MOV     RKBA(R2),T.BA     ;SAVE BUS ADD REG
5395  027356  016237  000002  003142            MOV     RKWC(R2),T.WC     ;SAVE WORD COUNT
5396  027364  005037  003220                    CLR     E.DCYL            ;LOAD EXPECTED CYLINDER AND REG.
5397  027370  012737  000001  003206            MOV     #1,E.DA           ;LOAD EXPECTED DISK
5398  027376  012737  057216  003204            MOV     #ECCBUF+<400*2>,E.BA  ;LOAD EXPECTED
5399  027404  005037  003202                    CLR     E.WC              ;LOAD EXPECTED ECC WORD
5400  027410  023737  003200  003140            CMP     E.CS1,T.CS1       ;CHECK CS1
5401  027416  001401                            BEQ     55$
5402  027420  104144                            ERROR   144
5403  027422  023737  003210  003150  55$:     CMP     E.CS2,T.CS2       ;CHECK CS2
5404  027430  001401                            BEQ     56$
5405  027432  104145                            ERROR   145
5406  027434  023737  003214  003154  56$:     CMP     E.ER,T.ER         ;CHECK ERROR REG
5407  027442  001401                            BEQ     57$
5408  027444  104146                            ERROR   146
5409  027446  023737  003204  003144  57$:     CMP     E.BA,T.BA         ;CHECK BUS ADD
5410  027454  001401                            BEQ     58$
5411  027456  104147                            ERROR   147
5412  027460  023737  003202  003142  58$:     CMP     E.WC,T.WC         ;CHECK WORD COUNT
5413  027466  001401                            BEQ     59$
5414  027470  104150                            ERROR   150
5415  027472  023737  003220  003160  59$:     CMP     E.DCYL,T.DCYL     ;CHECK CYLINDER ADD
5416  027500  001401                            BEQ     60$
5417  027502  104151                            ERROR   151
5418  027504  023737  003206  003146  60$:     CMP     E.DA,T.DA         ;CHECK DISK ADDR.
5419  027512  001401                            BEQ     TST45             ;;YES, GO ON TO NEXT TEST
5420  027514  104152                            ERROR   152
5421
5422                                    .SBTTL  **PARTIAL WRITE DATA
5423
5424                                    ;;*****************************************************************
5425                                    ;*TEST 45       ZERO FILL ON WRITE DATA
5426                                    ;*
5427                                    ;*       CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5428                                    ;*       PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5429                                    ;*       DATA OF 103 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
5430                                    ;*       CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5431                                    ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5432                                    ;*       AND A GOOD HEADER.  CLOCK THROUGH ALL 400 WORDS AND
5433                                    ;*       THE TWO ECC WORDS.  CHECK THE SECTOR FOR ZERO FILL
5434                                    ;*       AND MAKE SURE THE TWO ECC WORDS ARE WRITTEN PROPERLY.
5435                                    ;*       CHECK BUS ADDRESS, WORD COUNT, CYLINDER, TRACK, AND SECTOR.
5436                                    ;*
5437                                    ;*****************************************************************
5438  027516  000004                    TST45:  SCOPE
5439  027520  012737  000012  001200            MOV     #10.,$TIMES       ;;DO 10. ITERATIONS
5440
5441  027526  013702  001270                    MOV     $BASE,R2          ;LOAD RK611 BASE
5442  027532  012762  100000  000000            MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
5443  027540  012762  000040  000026            MOV     #DMD,RKMR1(R2)    ;PUT RK611 IN DIAGNOSTIC MODE
5444  027546  012762  056216  000004            MOV     #ECCBUF,RKBA(R2)  ;LOAD ADDRESS
5445  027554  012762  177675  000002            MOV     #-103,RKWC(R2)    ;WORD COUNT=400
5446  027562  012762  000023  000000            MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
```

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5447  027570  012700  004612                    MOV     #66.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5448                                                                      ;  READY FOR SECTOR PULSE
5449  027574  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
5450  027602  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5451  027610  005300                            DEC     R0
5452  027612  001370                            BNE     1$
5453  027614  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5454  027622  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5455  027630  005037  003254                    CLR     PR.BIT
5456  027634  005037  003256                    CLR     M1.BIT
5457  027640  012700  000377                    MOV     #255.,R0
5458  027644  004737  037026          5$:       JSR     PC,RDBIT
5459  027650  005300                            DEC     R0              ;CHECK IF SYNCH FINISHED
5460  027652  001374                            BNE     5$
5461  027654  012737  000001  003254            MOV     #1,PR.BIT       ;SIMULATE SYNCH
5462  027662  004737  037026                    JSR     PC,RDBIT
5463  027666  012703  053364                    MOV     #HEAD1,R3       ;LOAD HEADER
5464  027672  012701  000003                    MOV     #3,R1           ;LOAD WORDS PER HEADER
5465  027676  012304                  10$:      MOV     (R3)+,R4        ;GET NEXT WORD
5466  027700  012700  000020                    MOV     #16.,R0         ;LOAD BITS PER
5467  027704  013737  003254  003256  12$:      MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5468  027712  006004                            ROR     R4              ;GET NEXT BIT
5469  027714  103403                            BCS     15$
5470  027716  005037  003254                    CLR     PR.BIT
5471  027722  000403                            BR      16$
5472
5473  027724  012737  000001  003254  15$:      MOV     #1,PR.BIT
5474  027732  004737  037026          16$:      JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5475  027736  005300                            DEC     R0              ;CHECK IF READY FOR NEXT WORD
5476  027740  001361                            BNE     12$             ;NO, CONTINUE
5477  027742  005301                            DEC     R1              ;CHECK IF FINISHED WITH HEADER
5478  027744  001354                            BNE     10$             ;NO, CONTINUE
5479  027746  012700  000101                    MOV     #65.,R0
5480  027752  013737  003254  003256  20$:      MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5481  027760  005037  003254                    CLR     PR.BIT
5482  027764  004737  037026                    JSR     PC,RDBIT
5483  027770  005300                            DEC     R0              ;CHECK IF GAP FINISHED
5484  027772  001367                            BNE     20$             ;NO, CONTINUE
5485  027774  005037  003252                    CLR     P1.BIT          ;INITIALIZE BITS FOR SYNCH
5486  030000  005037  003254                    CLR     PR.BIT
5487  030004  005037  003256                    CLR     M1.BIT
5488  030010  005037  003260                    CLR     M2.BIT
5489  030014  012737  050670  001310            MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5490  030022  005037  003262                    CLR     BITCNT          ;INITIALIZE BIT COUNT
5491  030026  012700  000400                    MOV     #256.,R0        ;LOAD SYNCH COUNT AND WRITE SYNCH
5492  030032  012737  062040  003224            MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5493  030040  004737  036300          25$:      JSR     PC,WRTBIT
5494  030044  104002                            ERROR   2
5495  030046  005237  003262                    INC     BITCNT          ;CLEAR BIT COUNT
5496  030052  005300                            DEC     R0              ;CHECK IF SYNCH FINISHED
5497  030054  001371                            BNE     25$             ;NO, CONTINUE
5498  030056  012737  000001  003252            MOV     #1,P1.BIT       ;WRITE SYNCH BIT
5499  030064  004737  036300                    JSR     PC,WRTBIT
5500  030070  104002                            ERROR   2
5501  030072  005037  003266                    CLR     ECCHI           ;INITIALIZE ECC GENERATOR
5502  030076  005037  003270                    CLR     ECCLO
```

```
5503  030102  012737  050742  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5504  030110  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5505  030114  012701  000400                  MOV     #256.,R1        ;LOAD WORDS PER SECTOR
5506  030120  012703  056216                  MOV     #ECCBUF,R3      ;LOAD ADDRESS OF BUFFER
5507  030124  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT WORD
5508  030126  012700  000020          31$:    MOV     #16.,R0         ;LOAD BITS PER WORD
5509  030132  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5510  030140  013737  003254  003256          MOV     PR.BIT,M1.BIT
5511  030146  013737  003252  003254          MOV     P1.BIT,PR.BIT
5512  030154  006004                          ROR     R4              ;DETERMINE NEXT BIT
5513  030156  103403                          BCS     34$
5514  030160  005037  003252                  CLR     P1.BIT
5515  030164  000403                          BR      35$
5516
5517  030166  012737  000001  003252  34$:    MOV     #1,P1.BIT
5518  030174  004737  036300          35$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5519  030200  104002                          ERROR   2
5520  030202  004737  036132                  JSR     PC,ECCGEN       ;GENERATE ECC
5521  030206  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
5522  030214  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5523  030222  001401                          BEQ     37$             ;YES, CONTINUE
5524  030224  104135                          ERROR   135             ;ECC PATTERN INCORRECT
5525  030226  005237  003262          37$:    INC     BITCNT          ;INCREMENT BIT COUNT
5526  030232  022700  000002                  CMP     #2,R0           ;IF THE NEXT BIT IS THE LAST BIT OF
5527  030236  001006                          BNE     28$             ;THE LAST DATA WORD, ECCW MUST BE RESET
5528  030240  022701  000001                  CMP     #1,R1           ;IN THE EXPECTED MR1 TO INDICATE ECC
5529  030244  001003                          BNE     28$             ;BEING WRITTEN
5530  030246  042737  020000  003224          BIC     #ECCW,E.MR1
5531  030254  005300                  28$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5532  030256  001325                          BNE     32$             ;NO, CONTINUE
5533  030260  005301                          DEC     R1              ;CHECK IF AT END OF SECTOR
5534  030262  001405                          BEQ     39$             ;YES -SKIP
5535  030264  022703  056424                  CMP     #ECCBUF+<103*2>,R3  ;CHECK IF 103 WORDS TRANSFERED
5536  030270  003315                          BGT     30$             ;NO - GO TO GET NEXT WORD
5537  030272  005004                          CLR     R4              ;ELSE CLEAR R4 FOR ZEROS
5538  030274  000714                          BR      31$             ;GO SIMULATE REST OF SECTOR
5539  030276  012737  051307  001310  39$:    MOV     #EM333,EMW      ;LOAD ERROR MESSAGE
5540  030304  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5541  030310  012701  000002                  MOV     #2,R1           ;LOAD NUMBER OF ECC WORDS
5542  030314  012703  003266                  MOV     #ECCHI,R3       ;LOAD ADDRESS OF ECC
5543  030320  012304                  40$:    MOV     (R3)+,R4        ;GET NEXT ECC WORD
5544  030322  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5545  030326  013737  003256  003260  42$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5546  030334  013737  003254  003256          MOV     PR.BIT,M1.BIT
5547  030342  013737  003252  003254          MOV     P1.BIT,PR.BIT
5548  030350  006004                          ROR     R4              ;DETERMINE NEXT BIT
5549  030352  103403                          BCS     44$
5550  030354  005037  003252                  CLR     P1.BIT
5551  030360  000403                          BR      45$
5552
5553  030362  012737  000001  003252  44$:    MOV     #1,P1.BIT
5554  030370  004737  036300          45$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5555  030374  104002                          ERROR   2
5556  030376  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
5557  030402  022700  000002                  CMP     #2,R0           ;IF THE LAST BIT OF THE LAST ECC WORD
5558  030406  001006                          BNE     46$             ;IS BEING WRITTEN, ECCW MUST BE SET
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```
5559  030410  022701  000001              CMP     #1,R1           ;IN EXPECTED MR1 TO INDICATE ECC
5560  030414  001003                      BNE     46$             ;WRITING IS DONE
5561  030416  052737  020000  003224      BIS     #ECCW,E.MR1
5562  030424  005300              46$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5563  030426  001337                      BNE     42$             ;NO, CONTINUE
5564  030430  005301                      DEC     R1              ;CHECK IF FINISH WITH ECC
5565  030432  001332                      BNE     40$             ;NO, CONTINUE
5566  030434  012737  051345  001310      MOV     #EM334,EMW      ;LOAD ERROR MESSAGE
5567  030442  005037  003262              CLR     BITCNT          ;CLEAR BIT COUNT
5568  030446  012700  000017              MOV     #15.,R0         ;LOAD POSTAMBLE BIT COUNT
5569  030452  013737  003256  003260  47$:  MOV     M1.BIT,M2.BIT   ;SHIFT BIT
5570  030460  013737  003254  003256      MOV     PR.BIT,M1.BIT
5571  030466  013737  003252  003254      MOV     P1.BIT,PR.BIT
5572  030474  005037  003252              CLR     P1.BIT
5573  030500  004737  036300              JSR     PC,WRTBIT       ;WRITE NEXT BIT
5574  030504  104002                      ERROR   2
5575  030506  005237  003262              INC     BITCNT          ;INCREMENT BIT COUNT
5576  030512  005300                      DEC     R0              ;CHECK IF THROUGH WITH POSTAMBLE
5577  030514  001356                      BNE     47$             ;NO, CONTINUE
5578  030516  012700  000014              MOV     #3*4,R0         ;ISSUE CLOCKS TO COMPLETE COMMAND
5579  030522  012762  000440  000026  50$:  MOV     #DMD!MCLK,RKMR1(R2) ;ISSUE CLOCK PULSES
5580  030530  012762  000040  000026      MOV     #DMD,RKMR1(R2)
5581  030536  005300                      DEC     R0
5582  030540  001370                      BNE     50$
5583  030542  016237  000000  003140      MOV     RKCS1(R2),T.CS1 ;SAVE CS1
5584  030550  016237  000010  003150      MOV     RKCS2(R2),T.CS2 ;SAVE CS2
5585  030556  016237  000014  003154      MOV     RKER(R2),T.ER   ;SAVE ERROR REG
5586  030564  012737  000222  003200      MOV     #RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
5587  030572  012737  000100  003210      MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
5588  030600  005037  003214              CLR     E.ER            ;LOAD EXPECTED ERROR REG.
5589  030604  016237  000020  003160      MOV     RKDCYL(R2),T.DCYL  ;SAVE CYLINDER ADDR REG
5590  030612  016237  000006  003146      MOV     RKDA(R2),T.DA   ;SAVE DISK AND REG
5591  030620  016237  000004  003144      MOV     RKBA(R2),T.BA   ;SAVE BUS ADD REG
5592  030626  016237  000002  003142      MOV     RKWC(R2),T.WC   ;SAVE WORD COUNT
5593  030634  005037  003220              CLR     E.DCYL          ;LOAD EXPECTED CYLINDER AND REG.
5594  030640  012737  000001  003206      MOV     #1,E.DA         ;LOAD EXPECTED DISK
5595  030646  012737  056424  003204      MOV     #ECCBUF+<103*2>,E.BA  ;LOAD EXPECTED
5596  030654  005037  003202              CLR     E.WC            ;LOAD EXPECTED ECC WORD
5597  030660  023737  003200  003140      CMP     E.CS1,T.CS1     ;CHECK CS1
5598  030666  001401                      BEQ     55$
5599  030670  104154                      ERROR   154
5600  030672  023737  003210  003150  55$:  CMP     E.CS2,T.CS2     ;CHECK CS2
5601  030700  001401                      BEQ     56$
5602  030702  104155                      ERROR   155
5603  030704  023737  003214  003154  56$:  CMP     E.ER,T.ER       ;CHECK ERROR REG
5604  030712  001401                      BEQ     57$
5605  030714  104156                      ERROR   156
5606  030716  023737  003204  003144  57$:  CMP     E.BA,T.BA       ;CHECK BUS ADD
5607  030724  001401                      BEQ     58$
5608  030726  104157                      ERROR   157
5609  030730  023737  003202  003142  58$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT
5610  030736  001401                      BEQ     59$
5611  030740  104160                      ERROR   160
5612  030742  023737  003220  003160  59$:  CMP     E.DCYL,T.DCYL   ;CHECK CYLINDER ADD
5613  030750  001401                      BEQ     60$
5614  030752  104161                      ERROR   161
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5615  030754  023737  003206  003146  60$:    CMP     E.DA,T.DA       ;CHECK DISK ADDR.
5616  030762  001401                          BEQ     TST46           ;;YES, GO ON TO NEXT TEST
5617  030764  104162                          ERROR   162
5618                                  .SBTTL  **18 BIT FORMAT WRITES
5619
5620                                  ;;*****************************************************************
5621                                  ;*TEST 46        18 BIT WRITE DATA (PART 1)
5622                                  ;*
5623                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5624                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
5625                                  ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
5626                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5627                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5628                                  ;*      AND A GOOD HEADER.  CLOCK THROUGH 6 WORDS OF 177777.
5629                                  ;*      VERIFY THAT TWO ZERO BITS ARE PRESENT FOR EACH WORD.
5630                                  ;*
5631                                  ;;*****************************************************************
5632  030766  000004                  TST46:  SCOPE
5633  030770  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5634
5635  030776  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5636  031002  012762  100000  000000          MOV     #CCLR,RKCS1(R2)  ;CLEAR CONTROLLER
5637  031010  012700  002000                  MOV     #2000,R0                ;SET A STALL COUNT
5638  031014  005300                  5$:     DEC     R0              ;LOOP UNTIL COUNT 0
5639  031016  001376                          BNE     5$
5640
5641  031020  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SET DIAGNOSTIC MODE
5642  031026  012762  055202  000004          MOV     #MOD2BF,RKBA(R2)  ;LOAD BUFFER ADDRESS
5643  031034  012762  177400  000002          MOV     #-400,RKWC(R2)          ; --- WORD COUNT
5644  031042  012762  010023  000000          MOV     #WRDATA!CFMT,RKCS1(R2)  ; --- START COMMAND
5645  031050  012700  005136                  MOV     #66.*40.+<4.*3.+2>,R0  ;ISSUE ENOUGH CLOCKS UNTIL
5646                                                                  ;  READY FOR SECTOR PULSE
5647  031054  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
5648  031062  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5649  031070  005300                          DEC     R0
5650  031072  001370                          BNE     7$
5651
5652  031074  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5653  031102  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5654
5655  031110  005037  003254                  CLR     PR.BIT          ;GENERATE SYNC
5656  031114  005037  003256                  CLR     M1.BIT
5657  031120  012700  000377                  MOV     #255.,R0
5658
5659  031124  004737  037026          9$:     JSR     PC,RDBIT        ;SIMULATE SYNC 0 BITS
5660  031130  005300                          DEC     R0
5661  031132  001374                          BNE     9$
5662
5663  031134  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNC 1 BIT
5664  031142  004737  037026                  JSR     PC,RDBIT
5665
5666  031146  012703  053502                  MOV     #HEAD11,R3      ;SIMULATE HEADER
5667  031152  012701  000003                  MOV     #3,R1           ;  CYL 0 TRK 0, SEC 0
5668  031156  012304                  11$:    MOV     (R3)+,R4        ;GET HEADER WORD
5669  031160  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5670  031164  013737  003254  003256  13$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
```

```
 5671  031172  006004                          ROR     R4              ;GET NEXT BIT
 5672  031174  103403                          BCS     15$
 5673  031176  005037  003254                  CLR     PR.BIT
 5674  031202  000403                          BR      16$
 5675
 5676  031204  012737  000001  003254  15$:    MOV     #1,PR.BIT
 5677  031212  004737  037026          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
 5678  031216  005300                          DEC     R0              ;READY FOR NEXT HEADER WORD?
 5679  031220  001361                          BNE     13$             ;NO - GET NEXT BIT THIS WORD
 5680  031222  005301                          DEC     R1              ;HEADER DONE?
 5681  031224  001354                          BNE     11$             ;NO - GET NEXT HEADER WORD
 5682  031226  012700  000101                  MOV     #65.,R0         ;SET COUNT FOR GAP.
 5683  031232  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
 5684  031240  005037  003254                  CLR     PR.BIT
 5685  031244  004737  037026                  JSR     PC,RDBIT
 5686  031250  005300                          DEC     R0
 5687  031252  001367                          BNE     20$
 5688  031254  012700  000400                  MOV     #256.,R0        ;SET COUNT FOR WRITE DATA SYNC
 5689  031260  012737  050670  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
 5690  031266  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
 5691  031272  005037  003254                  CLR     PR.BIT
 5692  031276  005037  003256                  CLR     M1.BIT
 5693  031302  005037  003260                  CLR     M2.BIT
 5694  031306  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
 5695  031312  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
 5696  031320  004737  036300          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
 5697  031324  104002                          ERROR   2
 5698  031326  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
 5699  031332  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
 5700  031334  001371                          BNE     22$
 5701  031336  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
 5702  031344  004737  036300                  JSR     PC,WRTBIT
 5703  031350  104002                          ERROR   2
 5704  031352  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
 5705  031356  005037  003270                  CLR     ECCLO
 5706  031362  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 5707  031366  012703  055202                  MOV     #MOD2BF,R3      ;SET DATA POINTER
 5708  031372  012701  000006                  MOV     #6.,R1  ;SET DATA COUNT
 5709  031376  012304                  24$:    MOV     (R3)+,R4        ;GET DATA WORD
 5710  031400  012737  051613  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
 5711  031406  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
 5712  031412  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5713  031420  013737  003254  003256          MOV     PR.BIT,M1.BIT
 5714  031426  013737  003252  003254          MOV     P1.BIT,PR.BIT
 5715  031434  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
 5716  031436  006004                          ROR     R4
 5717  031440  103403                          BCS     27$
 5718  031442  005037  003252                  CLR     P1.BIT
 5719  031446  000403                          BR      28$
 5720
 5721  031450  012737  000001  003252  27$:    MOV     #1,P1.BIT
 5722  031456  004737  036300          28$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
 5723  031462  104002                          ERROR   2
 5724  031464  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
 5725  031472  004737  036132                  JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
 5726  031476  023737  003174  003234          CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
```

```
5727  031504  001401                          BEQ     29$             ;YES - SKIP
5728  031506  104164                          ERROR   164
5729  031510  005237  003262          29$:    INC     BITCNT
5730  031514  005300                          DEC     R0
5731  031516  020027  000002                  CMP     R0,#2           ;1ST 16 BITS JUST DONE?
5732  031522  001403                          BEQ     31$             ;YES - SKIP
5733  031524  005700                          TST     R0              ;ELSE TEST IF WORD DONE
5734  031526  001331                          BNE     25$             ;NO - DO NEXT BIT
5735  031530  000406                          BR      32$             ;ELSE DO NEXT WORD
5736  031532  012737  051701  001310  31$:    MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
5737  031540  012704  000000                  MOV     #0,R4   ;SET UPPER BITS OF WORD
5738  031544  000722                          BR      25$             ;GO DO BITS
5739
5740  031546  005301                  32$:    DEC     R1              ;ALL WORDS DONE?
5741  031550  001312                          BNE     24$             ;NO - GET NEXT WORD
5742
5743                                  ;;*****************************************************************
5744                                  ;*TEST 47       18 BIT WRITE DATA (PART 2)
5745                                  ;*
5746                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5747                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
5748                                  ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
5749                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5750                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5751                                  ;*      AND A GOOD HEADER.  CLOCK THROUGH 6 WORDS OF 177777
5752                                  ;*      WITH BAD PARITY SET.  VERIFY WRITING OF TWO PARITY
5753                                  ;*      BITS ON SIMULATED DISK.
5754                                  ;*
5755                                  ;*      NOTE:   THIS TEST IS ONLY EXECUTED IF MEMORY
5756                                  ;*              PARITY ENABLE IS PRESENT FOR BUFFER
5757                                  ;*              LOCATION.
5758                                  ;*
5759                                  ;;*****************************************************************
5760  031552  000004                  TST47:  SCOPE
5761  031554  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5762
5763  031562  005737  003274                  TST     MEMPAR          ;CHECK IF MEMORY PARITY AVAIL.
5764  031566  001017                          BNE     2$              ;YES - SKIP
5765  031570                          1$:
5766  031570  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
5767  031576  005227  177777                  INC     #-1             ;ONLY DO ONCE
5768  031602  001007                          BNE     64$             ;NO, GO TO NEXT TEST
5769  031604  104401  044041                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
5770  031610  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
5771  031614  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
5772  031616  104401  044051                  TYPE    ,TSTBY2
5773  031622  000137  032424          64$:    JMP     @TST50          ;GO TO NEXT TEST
5774
5775  031626  004237  034102          2$:     JSR     R2,WRTPAR
5776  031632  000006                          6
5777  031634  057216                          BADPAR
5778  031636  005700                          TST     R0
5779  031640  001353                          BNE     1$
5780  031642  013737  031650  001110          MOV     3$,$LPERR
5781
5782  031650                          3$:
```

```
5783
5784  031650  013702  001270                  MOV     $BASE,R2          ;LOAD RK611 BASE
5785  031654  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR CONTROLLER
5786  031662  012700  002000                  MOV     #2000,R0                  ;SET A STALL COUNT
5787  031666  005300                  5$:     DEC     R0                ;LOOP UNTIL COUNT 0
5788  031670  001376                          BNE     5$
5789
5790  031672  012762  000040  000026          MOV     #DMD,RKMR1(R2)    ;SET DIAGNOSTIC MODE
5791  031700  012762  057216  000004          MOV     #BADPAR,RKBA(R2)  ;LOAD BUFFER ADDRESS
5792  031706  012762  177400  000002          MOV     #-400,RKWC(R2)            ; --- WORD COUNT
5793  031714  012762  010023  000000          MOV     #WRDATA!CFMT,RKCS1(R2)    ; --- START COMMAND
5794  031722  012700  005136                  MOV     #66.*40.+(4.*3.+2),R0  ;ISSUE ENOUGH CLOCKS UNTIL
5795                                                                         ;  READY FOR SECTOR PULSE
5796  031726  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
5797  031734  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5798  031742  005300                          DEC     R0
5799  031744  001370                          BNE     7$
5800
5801  031746  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5802  031754  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5803
5804  031762  005037  003254                  CLR     PR.BIT            ;GENERATE SYNC
5805  031766  005037  003256                  CLR     M1.BIT
5806  031772  012700  000377                  MOV     #255.,R0
5807
5808  031776  004737  037026          9$:     JSR     PC,RDBIT          ;SIMULATE SYNC 0 BITS
5809  032002  005300                          DEC     R0
5810  032004  001374                          BNE     9$
5811
5812  032006  012737  000001  003254          MOV     #1,PR.BIT         ;SIMULATE SYNC 1 BIT
5813  032014  004737  037026                  JSR     PC,RDBIT
5814
5815  032020  012703  053502                  MOV     #HEAD11,R3        ;SIMULATE HEADER
5816  032024  012701  000003                  MOV     #3,R1             ;  CYL 0 TRK 0, SEC 0
5817  032030  012304                  11$:    MOV     (R3)+,R4          ;GET HEADER WORD
5818  032032  012700  000020                  MOV     #16.,R0           ;LOAD BITS PER WORD
5819  032036  013737  003254  003256  13$:     MOV     PR.BIT,M1.BIT     ;STORE PREVIOUS BIT
5820  032044  006004                          ROR     R4                ;GET NEXT BIT
5821  032046  103403                          BCS     15$
5822  032050  005037  003254                  CLR     PR.BIT
5823  032054  000403                          BR      16$
5824
5825  032056  012737  000001  003254  15$:     MOV     #1,PR.BIT
5826  032064  004737  037026          16$:    JSR     PC,RDBIT          ;SIMULATE NEXT BIT
5827  032070  005300                          DEC     R0                ;READY FOR NEXT HEADER WORD?
5828  032072  001361                          BNE     13$               ;NO - GET NEXT BIT THIS WORD
5829  032074  005301                          DEC     R1                ;HEADER DONE?
5830  032076  001354                          BNE     11$               ;NO - GET NEXT HEADER WORD
5831  032100  012700  000101                  MOV     #65.,R0           ;SET COUNT FOR GAP.
5832  032104  013737  003254  003256  20$:     MOV     PR.BIT,M1.BIT     ;SIMULATE GAP
5833  032112  005037  003254                  CLR     PR.BIT
5834  032116  004737  037026                  JSR     PC,RDBIT
5835  032122  005300                          DEC     R0
5836  032124  001367                          BNE     20$
5837  032126  012700  000400                  MOV     #256.,R0          ;SET COUNT FOR WRITE DATA SYNC
5838  032132  012737  050670  001310          MOV     #EM327,EMW        ;LOAD ERROR MESSAGE
```

```
5839  032140  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
5840  032144  005037  003254                  CLR     PR.BIT
5841  032150  005037  003256                  CLR     M1.BIT
5842  032154  005037  003260                  CLR     M2.BIT
5843  032160  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
5844  032164  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1   ;SET EXPECTED MR1
5845  032172  004737  036300          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
5846  032176  104002                          ERROR   2
5847  032200  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
5848  032204  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
5849  032206  001371                          BNE     22$
5850  032210  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
5851  032216  004737  036300                  JSR     PC,WRTBIT
5852  032222  104002                          ERROR   2
5853  032224  005C37  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
5854  032230  005037  003270                  CLR     ECCLO
5855  032234  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5856  032240  012703  055202                  MOV     #MOD2BF,R3      ;SET DATA POINTER
5857  032244  012701  000006                  MOV     #6.,R1  ;SET DATA COUNT
5858  032250  012304          24$:    MOV     (R3)+,R4        ;GET DATA WORD
5859  032252  012737  051613  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
5860  032260  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
5861  032264  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5862  032272  013737  003254  003256          MOV     PR.BIT,M1.BIT
5863  032300  013737  003252  003254          MOV     P1.BIT,PR.BIT
5864  032306  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
5865  032310  006004                          ROR     R4
5866  032312  103403                          BCS     27$
5867  032314  005037  003252                  CLR     P1.BIT
5868  032320  000403                          BR      28$
5869
5870  032322  012737  000001  003252  27$:    MOV     #1,P1.BIT
5871  032330  004737  036300          28$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
5872  032334  104002                          ERROR   2
5873  032336  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
5874  032344  004737  036132                  JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
5875  032350  023737  003174  003234          CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
5876  032356  001401                          BEQ     29$             ;YES - SKIP
5877  032360  104164                          ERROR   164
5878  032362  005237  003262          29$:    INC     BITCNT
5879  032366  005300                          DEC     R0
5880  032370  020027  000002                  CMP     R0,#2           ;1ST 16 BITS JUST DONE?
5881  032374  001403                          BEQ     31$             ;YES - SKIP
5882  032376  005700                          TST     R0              ;ELSE TEST IF WORD DONE
5883  032400  001331                          BNE     25$             ;NO - DO NEXT BIT
5884  032402  000406                          BR      32$             ;ELSE DO NEXT WORD
5885  032404  012737  051701  001310  31$:    MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
5886  032412  012704  000002                  MOV     #2,R4   ;SET UPPER BITS OF WORD
5887  032416  000722                          BR      25$             ;GO DO BITS
5888
5889  032420  005301          32$:    DEC     R1              ;ALL WORDS DONE?
5890  032422  001312                          BNE     24$             ;NO - GET NEXT WORD
5891
5892
5893                          ;;*****************************************************************
5894                          ;*TEST 50        CLEAR BAD PARITY BUFFER
```

```
                                        ;*
                                        ;*      THE SOLE PURPOSE OF THIS TEST IS TO CLEAR BADPAR
                                        ;*      BUFFER AND REMOVE THE BAD PARITY
                                        ;*
                                        ;;*****************************************************************
032424  000004                          T$T50:  SCOPE
032426  012737  000001  001200                  MOV     #1,$TIMES       ;;DO 1 ITERATION
032434  012700  000006                          MOV     #6,R0
032440  012701  057216                          MOV     #BADPAR,R1
032444  012721  177777                  1$:     MOV     #-1,(R1)+
032450  005300                                  DEC     R0
032452  001374                                  BNE     1$
                                        ;;*****************************************************************
                                        ;*TEST 51        18 BIT WRITE DATA (PART 3)
                                        ;*
                                        ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
                                        ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                                        ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                                        ;*      AND A GOOD HEADER.  CLOCK THROUGH 400 18 BIT WORDS
                                        ;*      AND THE 32 BIT ECC.  VERIFY THAT THE ECC IS
                                        ;*      WRITTEN CORRECTLY.
                                        ;*
                                        ;;*****************************************************************
032454  000004                          T$T51:  SCOPE
032456  012737  000012  001200                  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS

032464  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
032470  012762  100000  000000                  MOV     #CCLR,RKCS1(R2)  ;CLEAR CONTROLLER
032476  012700  002000                          MOV     #2000,R0                ;SET A STALL COUNT
032502  005300                          5$:     DEC     R0              ;LOOP UNTIL COUNT 0
032504  001376                                  BNE     5$

032506  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;SET DIAGNOSTIC MODE
032514  012762  056216  000004                  MOV     #ECCBUF,RKBA(R2)  ;LOAD BUFFER ADDRESS
032522  012762  177400  000002                  MOV     #-400,RKWC(R2)          ; --- WORD COUNT
032530  012762  010023  000000                  MOV     #WRDATA!CFMT,RKCS1(R2)  ; --- START COMMAND
032536  012700  005136                          MOV     #66.*40.+<4.*3.+2>,R0  ;ISSUE ENOUGH CLOCKS UNTIL
                                                                                ;  READY FOR SECTOR PULSE
032542  012762  000440  000026          7$:     MOV     #DMD!MCLK,RKMR1(R2)
032550  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
032556  005300                                  DEC     R0
032560  001370                                  BNE     7$

032562  012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
032570  012762  000040  000026                  MOV     #DMD,RKMR1(R2)

032576  005037  003254                          CLR     PR.BIT          ;GENERATE SYNC
032602  005037  003256                          CLR     M1.BIT
032606  012700  000377                          MOV     #255.,R0

032612  004737  037026          9$:     JSR     PC,RDBIT        ;SIMULATE SYNC 0 BITS
032616  005300                                  DEC     R0
032620  001374                                  BNE     9$
```

```
5951
5952  032622  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNC 1 BIT
5953  032630  004737  037026                  JSR     PC,RDBIT
5954
5955  032634  012703  053502                  MOV     #HEAD11,R3      ;SIMULATE HEADER
5956  032640  012701  000003                  MOV     #3,R1           ;  CYL 0 TRK 0, SEC 0
5957  032644  012304                  11$:    MOV     (R3)+,R4        ;GET HEADER WORD
5958  032646  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5959  032652  013737  003254  003256  13$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5960  032660  006004                          ROR     R4              ;GET NEXT BIT
5961  032662  103403                          BCS     15$
5962  032664  005037  003254                  CLR     PR.BIT
5963  032670  000403                          BR      16$
5964
5965  032672  012737  000001  003254  15$:    MOV     #1,PR.BIT
5966  032700  004737  037026          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5967  032704  005300                          DEC     R0              ;READY FOR NEXT HEADER WORD?
5968  032706  001361                          BNE     13$             ;NO - GET NEXT BIT THIS WORD
5969  032710  005301                          DEC     R1              ;HEADER DONE?
5970  032712  001354                          BNE     11$             ;NO - GET NEXT HEADER WORD
5971  032714  012700  000101                  MOV     #65.,R0         ;SET COUNT FOR GAP.
5972  032720  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5973  032726  005037  003254                  CLR     PR.BIT
5974  032732  004737  037026                  JSR     PC,RDBIT
5975  032736  005300                          DEC     R0
5976  032740  001367                          BNE     20$
5977  032742  012700  000400                  MOV     #256.,R0        ;SET COUNT FOR WRITE DATA SYNC
5978  032746  012737  050670  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5979  032754  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
5980  032760  005037  003254                  CLR     PR.BIT
5981  032764  005037  003256                  CLR     M1.BIT
5982  032770  005037  003260                  CLR     M2.BIT
5983  032774  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
5984  033000  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5985  033006  004737  036300          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
5986  033012  104002                          ERROR   2
5987  033014  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
5988  033020  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
5989  033022  001371                          BNE     22$
5990  033024  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
5991  033032  004737  036300                  JSR     PC,WRTBIT
5992  033036  104002                          ERROR   2
5993  033040  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
5994  033044  005037  003270                  CLR     ECCLO
5995  033050  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5996  033054  012703  056216                  MOV     #ECCBUF,R3      ;SET DATA POINTER
5997  033060  012701  000377                  MOV     #255.,R1        ;SET DATA COUNT
5998  033064  012304                  24$:    MOV     (R3)+,R4        ;GET DATA WORD
5999  033066  012737  051613  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
6000  033074  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
6001  033100  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6002  033106  013737  003254  003256          MOV     PR.BIT,M1.BIT
6003  033114  013737  003252  003254          MOV     P1.BIT,PR.BIT
6004  033122  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
6005  033124  006004                          ROR     R4
6006  033126  103403                          BCS     27$
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```
6007  033130  005037  003252                CLR     P1.BIT
6008  033134  000403                        BR      28$
6009
6010  033136  012737  000001  003252  27$:  MOV     #1,P1.BIT
6011  033144  004737  036300          28$:  JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
6012  033150  104002                        ERROR   2
6013  033152  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
6014  033160  004737  036132                JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
6015  033164  023737  003174  003234        CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
6016  033172  001401                        BEQ     29$             ;YES - SKIP
6017  033174  104164                        ERROR   164
6018  033176  005237  003262          29$:  INC     BITCNT
6019  033202  005300                        DEC     R0
6020  033204  020027  000002                CMP     R0,#2           ;1ST 16 BITS JUST DONE?
6021  033210  001403                        BEQ     31$             ;YES - SKIP
6022  033212  005700                        TST     R0              ;ELSE TEST IF WORD DONE
6023  033214  001331                        BNE     25$             ;NO - DO NEXT BIT
6024  033216  000406                        BR      32$             ;ELSE DO NEXT WORD
6025  033220  012737  051701  001310  31$:  MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
6026  033226  012704  000000                MOV     #0,R4   ;SET UPPER BITS OF WORD
6027  033232  000722                        BR      25$             ;GO DO BITS
6028
6029  033234  005301          32$:  DEC     R1              ;ALL WORDS DONE?
6030  033236  001312                        BNE     24$             ;NO - GET NEXT WORD
6031
6032  033240  012737  051613  001310        MOV     #EM338,EMW      ;SET ERROR MESSAGE
6033  033246  012304                        MOV     (R3)+,R4        ;GET LAST WORD
6034  033250  012700  000022                MOV     #18.,R0         ;SET BIT COUNT
6035  033254  013737  003256  003260  34$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6036  033262  013737  003254  003256        MOV     PR.BIT,M1.BIT
6037  033270  013737  003252  003254        MOV     P1.BIT,PR.BIT
6038  033276  000241                        CLC                     ;CLEAR CARRY
6039  033300  006004                        ROR     R4              ;TEST NEXT BIT
6040  033302  103403                        BCS     36$             ;SKIP IF A ONE
6041  033304  005037  003252                CLR     P1.BIT          ;ELSE SET NEXT BIT FOR ZERO
6042  033310  000403                        BR      37$
6043
6044  033312  012737  000001  003252  36$:  MOV     #1,P1.BIT       ;SET NEXT BIT FOR 1
6045  033320  004737  036300          37$:  JSR     PC,WRTBIT       ;SIMULATE BIT
6046  033324  104002                        ERROR   2
6047  033326  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
6048  033334  004737  036132                JSR     PC,ECCGEN       ;GENERATE ECC PATTERN
6049  033340  023737  003174  003234        CMP     T.ECPT,E.ECPT   ;TEST IF CORRECT
6050  033346  001401                        BEQ     39$             ;YES - SKIP
6051  033350  104164                        ERROR   164             ;ELSE REPORT
6052  033352  005237  003262          39$:  INC     BITCNT          ;BUMP BIT COUNT
6053  033356  022700  000002                CMP     #2,R0           ;IF NEXT BIT IS THE LAST DATA BIT
6054  033362  001003                        BNE     41$             ;ECCW MUST BE RESET TO INDICATE
6055  033364  042737  020000  003224        BIC     #ECCW,E.MR1             ;ECC BEING WRITTEN
6056  033372  005300          41$:  DEC     R0
6057  033374  022700  000002                CMP     #2,R0           ;TEST IF 1ST 16 BITS DONE
6058  033400  001403                        BEQ     42$             ;YES - SKIP
6059  033402  005700                        TST     R0              ;ELSE TEST IF WORD DONE
6060  033404  001323                        BNE     34$             ;NO - SKIP
6061  033406  000406                        BR      45$             ;ELSE GO TO ECC PROCESSING
6062
```

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 6063  033410  012737  051701  001310  42$:    MOV     #EM339,EMW      ;SET MESSAGE FOR BITS 16 AND 17
 6064  033416  012704  000000                  MOV     #0,R4           ;SET UP UPPER BITS
 6065  033422  000714                          BR      34$             ;GO DO LAST TWO BITS
 6066  033424  012737  051307  001310  45$:    MOV     #EM333,EMW      ;MESSAGE (ECC WRITE)
 6067  033432  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 6068  033436  012703  003266                  MOV     #ECCHI,R3       ;LOAD POINTER TO ECC WORDS
 6069  033442  012701  000002                  MOV     #2,R1           ;SET FOR 2 WORDS
 6070  033446  012304                  43$:    MOV     (R3)+,R4        ;GET ECC WORD
 6071  033450  012700  000020                  MOV     #16.,R0         ;SET BIT COUNT
 6072  033454  013737  003256  003260  44$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6073  033462  013737  003254  003256          MOV     PR.BIT,M1.BIT
 6074  033470  013737  003252  003254          MOV     P1.BIT,PR.BIT
 6075  033476  006004                          ROR     R4              ;LOAD NEXT BIT
 6076  033500  103403                          BCS     46$
 6077  033502  005037  003252                  CLR     P1.BIT
 6078  033506  000403                          BR      47$
 6079
 6080  033510  012737  000001  003252  46$:    MOV     #1,P1.BIT
 6081  033516  004737  036300          47$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
 6082  033522  104002                          ERROR   2
 6083  033524  022700  000002                  CMP     #2,R0           ;IF THIS BIT IS THE LAST ECC BIT
 6084  033530  001006                          BNE     49$             ;ECCW MUST BE SET TO INDICATE
 6085  033532  022701  000001                  CMP     #1,R1           ;ECC IS DONE
 6086  033536  001003                          BNE     49$
 6087  033540  052737  020000  003224          BIS     #ECCW,E.MR1
 6088  033546  005237  003262          49$:    INC     BITCNT          ;BUMP BIT COUNT
 6089  033552  005300                          DEC     R0              ;TEST IF LAST BIT THIS WORD IS DONE
 6090  033554  001337                          BNE     44$             ;NO - LOOP
 6091  033556  005301                          DEC     R1              ;TEST IF BOTH WORDS WRITTEN
 6092  033560  001332                          BNE     43$             ;NO - LOOP
 6093  033562  012737  051345  001310          MOV     #EM334,EMW      ;LOAD MESSAGE (POSTAMBLE)
 6094  033570  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 6095  033574  012700  000017                  MOV     #15.,R0         ;SET GAP COUNT
 6096  033600  013737  003256  003260  51$:    MOV     M1.BIT,M2.BIT   ;SHIFT REST OF BITS
 6097  033606  013737  003254  003256          MOV     PR.BIT,M1.BIT
 6098  033614  013737  003252  003254          MOV     P1.BIT,PR.BIT
 6099  033622  005037  003252                  CLR     P1.BIT          ;CLEAR NEXT BIT
 6100  033626  004737  036300                  JSR     PC,WRTBIT       ;SIMULATE BIT
 6101  033632  104002                          ERROR   2
 6102  033634  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
 6103  033640  005300                          DEC     R0              ;GAP WRITTEN?
 6104  033642  001356                          BNE     51$             ;NO - LOOP
 6105  033644  012737  000001  003234          MOV     #1,E.ECPT       ;SET EXPECTED PATTERN
 6106  033652  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET '611 PATTERN
 6107  033660  023737  003174  003234          CMP     T.ECPT,E.ECPT   ;TEST IF EQUAL
 6108  033666  001401                          BEQ     56$             ;YES - SKIP
 6109  033670  104163                          ERROR   163             ;ELSE REPORT
 6110  033672                          56$:
```

```
                                        .SBTTL  END OF PASS ROUTINE

                                        ;;**********************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;*TYPE "END PASS #XXXXX TOTAL NUMBER OF ERRORS SINCE LAST REPORT YYYYY"
                                        ;*WHERE XXXXX AND YYYYY ARE DECIMAL NUMBERS
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO TST1

033672                                  $EOP:
033672  000004                                SCOPE
033674  005037  001102                        CLR     $TSTNM          ;;ZERO THE TEST NUMBER
033700  005037  001200                        CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
033704  005237  001222                        INC     $PASS           ;;INCREMENT THE PASS NUMBER
033710  042737  100000  001222                BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
033716  005327                              DEC     (PC)+           ;;LOOP?
033720  000001                        $EOPCT: .WORD   1
033722  003063                              BGT     $DOAGN          ;;YES
033724  012737                              MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
033726  000001                        $ENDCT: .WORD   1
033730  033720                              $EOPCT
033732  104401  033740                      TYPE    ,65$            ;;TYPE ASCIZ STRING
033736  000407                              BR      64$             ;;GET OVER THE ASCIZ
                                    ;;65$:  .ASCIZ  <12><15>/END PASS #/
033756                              64$:
033756  013746  001222                      MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                    ;;TYPE PASS NUMBER
033762  104405                              TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
033764  104401  033772                      TYPE    ,67$            ;;TYPE ASCIZ STRING
033770  000421                              BR      66$             ;;GET OVER THE ASCIZ
                                    ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
034034                              66$:
034034  013746  001112                      MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                    ;;TOTAL NUMBER OF ERRORS
034040  104405                              TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
034042  104401  001211                      TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
034046  005037  001112                      CLR     $ERTTL          ;;CLEAR ERROR TOTAL
034052  013700  000042              $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
034056  001405                              BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
034060  000005                              RESET                   ;;CLEAR THE WORLD
034062  004710                      $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
034064  000240                              NOP                     ;;SAVE ROOM
034066  000240                              NOP                     ;;FOR
034070  000240                              NOP                     ;;ACT11
034072                              $DOAGN:
034072  000137                              JMP     @(PC)+          ;;RETURN
034074  004334                      $RTNAD: .WORD   TST1
034076     377     377     000      $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
034102                                      .EVEN

                                        .SBTTL  GENERATE BAD PARITY IN MEMORY
                                        ;*      THIS ROUTINE ATTEMPTS TO GENERATE BAD PARITY WORDS IN
                                        ;*      MEMORY. THE NUMBER OF WORDS TO BE GENERATED AND THE AREA
                                        ;*      WHERE THEY ARE TO BE PLACED IS SPECIFIED IN THE WORDS
                                        ;*      FOLLOWING THE CALL. IF ALL THE SPECIFIED WORDS CANNOT
                                        ;*      BE GENERATED, THE BUFFER IS CLEARED OF BAD PARITY WORDS.
```

```
                                        ;*
                                        ;*      RO IS USED AS A FLAG TO INDICATE IF BAD PARITY WAS
                                        ;*      GENERATED. IF RO IS 0 WHEN THE ROUTINE RETURNS TO CALLER
                                        ;*      PARITY WAS MADE BAD IN ALL THE DESIRED WORDS. IF RO IS ALL
                                        ;*      ONES IT WAS NOT SUCCESSFUL.
                                        ;*
                                        ;*      CALL:   JSR     R2,WRTPAR
                                        ;*              POINTER TO AREA TO BE ALTERED
                                        ;*              NUMBER OF WORDS
                                        ;*      RETURN: RTS     R2
                                        ;*              WITH RO AS SUCCESS FLAG

034102  011200                  WRTPAR: MOV     (R2),R0         ;GET BUFFER POINTER
034104  016201  000002                  MOV     2(R2),R1        ;GET NUMBER OF WORDS
034110  012703  172100                  MOV     #MEMBAS,R3      ;GET BASE OF VECTOR AREA
034114  013704  003274                  MOV     MEMPAR,R4       ;STORE FLAGS
034120  012705  000020                  MOV     #16.,R5         ;GET NUMBER OF REGISTERS
034124  006004              5$:         ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
034126  103002                          BCC     7$              ;NO, TRY NEXT BANK
034130  012713  000005                  MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
034134  062703  000002          7$:     ADD     #2,R3           ;CALCULATE NEXT ADDRESS
034140  005305                          DEC     R5              ;CHECK IF FINISHED
034142  001370                          BNE     5$              ;NO, GET NEXT PARITY MEMORY ADDRESS
034144  012721  177777          8$:     MOV     #-1,(R1)+       ;WRITE BAD PARITY
034150  005300                          DEC     R0              ;LOOP UNTIL ALL LOCATIONS WRITTEN
034152  001374                          BNE     8$
034154  012703  172100                  MOV     #MEMBAS,R3      ;LOAD BASE OF CONTROL REGS
034160  013704  003274                  MOV     MEMPAR,R4       ;LOAD FLAGS
034164  012705  000020                  MOV     #16.,R5         ;GET NUMBER OF REGISTERS
034170  006004              15$:        ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
034172  103002                          BCC     17$
034174  012713  000001                  MOV     #PAR.EN,(R3)    ;ALLOW PARITY DETECTION
034200  062703  000002          17$:    ADD     #2,R3           ;CHECK IF FINISHED
034204  005305                          DEC     R5              ;CHECK IF FINISHED
034206  001370                          BNE     15$             ;NO, GET NEXT PARITY MEMORY ADDRESS
034210  012737  034360  000114          MOV     #30$,MEMVEC     ;SET PARITY TRAP VECTOR
034216  011200                          MOV     (R2),R0         ;NUMBER OF WORDS
034220  016201  000002                  MOV     2(R2),R1        ;BUFFER POINTER
034224  010004                          MOV     R0,R4           ;STORE NUMBER
034226  005721              10$:        TST     (R1)+           ;TEST FIRST BUFFER WORD - SHOULD GET
034230  000240                          NOP                     ;TRAP WHICH DECREMENTS R4
034232  000240                          NOP
034234  005300              11$:        DEC     R0              ;DEC NUMBER OF WORDS COUNTER
034236  001373                          BNE     10$             ;ALL CHECKED? NO - SKIP
034240  005704                          TST     R4              ;TEST IF ALL LOCATIONS BAD
034242  001444                          BEQ     20$             ;YES - SKIP
034244  011200                          MOV     (R2),R0         ;GET NUMBER OF WORDS
034246  016201  000002                  MOV     2(R2),R1        ;BUFFER POINTER
034252  012721  000000          12$:    MOV     #0,(R1)+        ;CLEAR ALL OF AREA THAT WAS MADE BAD
034256  005300                          DEC     R0
034260  001374                          BNE     12$
034262  012700  177777                  MOV     #-1,R0          ;SET FLAG THAT COULDN'T SET BAD PARITY
034266  012703  172100          13$:    MOV     #MEMBAS,R3      ;LOAD BASE OF CONTROL REGISTERS
034272  013704  003274                  MOV     MEMPAR,R4       ;NOW SET UP TO CLEAR PARITY
034276  012705  000020                  MOV     #16.,R5         ;CONTROL REGISTERS AND SET
034302  006004              14$:        ROR     R4              ;ENABLE WHERE APPLICABLE
```

```
6223  034304  103002                        BCC     18$
6224  034306  012713  000001                MOV     #PAR.EN,(R3)
6225  034312  062703  000002        18$:    ADD     #2,R3
6226  034316  005305                        DEC     R5
6227  034320  001370                        BNE     14$
6228  034322  022222                        CMP     (P2)+,(R2)+     ;SET POINTER FOR RETURN
6229  034324  012737  034526  000114        MOV     #MEMERR,MEMVEC  ;RESET TRAP VECTOR
6230  034332  012737  000340  000116        MOV     #PR7,MEMVEC+2
6231  034340  012746  000000                MOV     #PR0,-(SP)      ;RESET PRIOTITY TO 0
6232  034344  012746  034352                MOV     #19$,-(SP)
6233  034350  000002                        RTI
6234
6235  034352  000202        19$:    RTS     R2
6236
6237  034354  005000        20$:    CLR     R0              ;CLEAR FLAG - BAD PARITY SET UP
6238  034356  000743                BR      13$
6239
6240  034360  005304        30$:    DEC     R4              ;DEC THE COUNTER
6241  034362  022626                CMP     (SP)+,(SP)+     ;CLEAN STACK
6242  034364  000723                BR      11$             ;GO CHECK NEXT LOCATION
6243
6244                        .SBTTL  CHECK FOR MEMORY CHECK ENABLE
6245                        ;*      THIS ROUTINE CHECKS ALL AVAILABLE MEMORY FOR PARITY OPTION.
6246                        ;*      IF OPTION IS PRESENT, PARITY DETECT IS ENABLED ON THAT BANK.
6247                        ;*
6248                        ;*      CALL:   JSR     PC,PARCHK
6249                        ;*      RETURN: RTS     PC
6250
6251  034366  012737  034464  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
6252  034374  012737  000340  000006        MOV     #PR7,ERRVEC+2
6253  034402  005037  003274                CLR     MEMPAR          ;CLEAR FLAG
6254  034406  012703  172100                MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
6255                                                                ;  MEMORY CHECK ENABLE AVAILIBLE
6256  034412  012704  000001                MOV     #1,R4           ;INITIALIZE MASK
6257  034416  012713  000001        16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
6258  034422  005713                        TST     (R3)
6259  034424  050437  003274                BIS     R4,MEMPAR       ;SET FLAG
6260  034430  052713  007740        1$:     BIS     #7740,(R3)      ;SET BIT 5 TO BIT 11
6261  034434  032713  007740                BIT     #7740,(R3)      ;ARE THEY SETED ?
6262  034440  001003                        BNE     2$              ;
6263  034442  005037  003274                CLR     MEMPAR          ;
6264  034446  000411                        BR      22$             ;
6265  034450                        2$:
6266                                                                ;THE ABOVE 6 LONES ADDED 24-OCT-77
6267  034450  062703  000002                ADD     #2,R3           ;BUMP TO NEXT CSR
6268  034454  000241                        CLC
6269  034456  006104                        ROL     R4              ;CHECK IF FINISHED
6270  034460  001356                        BNE     16$             ;NO, SET UP NEXT MEMORY PARITY MODULE
6271  034462  000403                        BR      22$             ;RESTORE TRAP VECTOR
6272
6273  034464  022626        20$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
6274  034466  005037  003274                CLR     MEMPAR          ;24-OCT-77
6275                        ;               ADD     #2,R3
6276                        ;               CLC
6277                        ;               ROL     R4              ;CHECK IF FINISHED
6278                        ;               BNE     16$             ;NO, GET NEXT LOCATION
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 6279  034472  012737  000006  000004  22$:    MOV     #ERRVEC+2,ERRVEC  ;RESTORE TRAP CATCHER
 6280  034500  005037  000006                  CLR     ERRVEC+2
 6281  034504  005737  003274                  TST     MEMPAR            ;CHECK IF MEMORY CHECK ENABLE AVAILIABLE
 6282  034510  001005                          BNE     25$               ;YES, RETURN
 6283  034512  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC  ;RESTORE TRAP CATCHER
 6284  034520  005037  000116                  CLR     MEMVEC+2
 6285  034524  000207                  25$:    RTS     PC                ;RETURN
 6286                                  .SBTTL  MEMORY CHECK ENABLE TRAP
 6287                                  ;*      THIS ROUTINE HANDLES ANY PARITY TRAP. THE LOCATION WHERE
 6288                                  ;*      PARITY WAS BAD IS REPORTED.
 6289
 6290  034526  012737  034542  001202  MEMERR: MOV     #10$,$ESCAPE      ;LOAD ESCAPE
 6291  034534  011637  003244                  MOV     (SP),TRAPPC       ;STORE PC
 6292  034540  104001                          ERROR   1                 ;REPORT MEM PARITY ERROR
 6293  034542  005037  001202          10$:    CLR     $ESCAPE           ;CLEAR ESCAPE
 6294  034546  032777  001000  144364          BIT     #SW9,@SWR         ;CHECK IF LOOP ON ERROR
 6295  034554  001001                          BNE     15$               ;YES, FORCE STACK AND TRY AGAIN
 6296  034556  000002                          RTI                       ;NO, RETURN
 6297
 6298  034560  012706  001100          15$:    MOV     #STACK,SP         ;INITIALIZE STACK
 6299  034564  000177  144320                  JMP     @$LPERR           ;LOOP ON ERROR
 6300
 6301                                  .SBTTL  CONTROLLED HALT ROUTINE
 6302                                  ;*      THIS ROUTINE IS ENTERED WHEN A ↑C IS ENTERED IN THE KEYBOARD.
 6303                                  ;*      IF NO MONITOR IS PRESENT THE PROGRAM HALTS ELSE THE PROGRAM
 6304                                  ;*      IS FORCED TO LAST PASS AND JUMPS TO END OF PASS.
 6305
 6306  034570  013702  001270  CTRHLT: MOV     $BASE,R2          ;SET '611 BASE
 6307  034574  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR CONTROLLER
 6308  034602  104401  043631                  TYPE    ,OPROOS           ;TYPE HALT MESSAGE
 6309  034606  012706  001100                  MOV     #STACK,SP         ;CLEAR STACK
 6310  034612  005037  001202                  CLR     $ESCAPE           ;CLEAR ESCAPE
 6311  034616  105037  001103                  CLRB    $ERFLG            ;CLEAR ERROR FLAG
 6312  034622  005737  000042                  TST     42                ;TEST IF STAND ALONE
 6313  034626  001404                          BEQ     1$                ;YES - SKIP
 6314  034630  005037  033720                  CLR     $EOPCT            ;ZERO PASS COUNT
 6315  034634  000137  033672                  JMP     $EOP              ;GO TO END OF PASS
 6316
 6317  034640  000000                  1$:     HALT                      ;HALT PROGRAM
 6318  034642  000137  003340                  JMP     START1            ;GO TO RESTART IF CONTINUE
 6319
 6320                                  .SBTTL  SCOPE HANDLER ROUTINE
 6321
 6322                                  ;;**********************************************************
 6323                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
 6324                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
 6325                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
 6326                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 6327                                  ;*SW14=1         LOOP ON TEST
 6328                                  ;*SW11=1         INHIBIT ITERATIONS
 6329                                  ;*SW09=1         LOOP ON ERROR
 6330                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
 6331                                  ;*CALL
 6332                                  ;*      SCOPE           ;;SCOPE=IOT
 6333
 6334  034646                  $SCOPE:
```

```
6335  034646  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
6336  034650  032777  040000  144262  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
6337  034656  001131                          BNE     $OVER           ;;YES IF SW14=1
6338                                  ;*****START OF CODE FOR THE XOR TESTER*****
6339  034660  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
6340                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
6341  034662  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
6342  034666  012737  034706  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
6343  034674  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
6344  034700  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6345  034704  000500                          BR      $SVLAD          ;;GO TO THE NEXT TEST
6346  034706  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
6347  034710  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6348  034714  000440                          BR      7$              ;;LOOP ON THE PRESENT TEST
6349  034716                          6$:;*****END OF CODE FOR THE XOR TESTER*****
6350  034716  032777  000400  144214          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
6351  034724  001421                          BEQ     2$              ;;BR IF NO
6352  034726  005046                          CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
6353  034730  117716  144204                  MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
6354  034734  001414                          BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
6355  034736  022716  000051                  CMP     #51,(SP)        ;;CHECK THE NUMBER IN THE SWR
6356  034742  002411                          BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
6357  034744  011637  001102                  MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
6358  034750  005316                          DEC     (SP)            ;;BACKUP BY ONE
6359  034752  006316                          ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
6360  034754  062716  035160                  ADD     #$SW08TBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
6361  034760  013637  001106                  MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
6362  034764  000466                          BR      $OVER           ;;GO LOOP ON THE TEST
6363  034766  005726                  8$:     TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
6364  034770  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
6365  034774  001421                          BEQ     3$              ;;BR IF NO
6366  034776  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
6367  035004  101015                          BHI     3$              ;;BR IF NO
6368  035006  032777  001000  144124          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
6369  035014  001404                          BEQ     4$              ;;BR IF NO
6370  035016  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
6371  035024  000446                          BR      $OVER
6372  035026  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
6373  035032  005037  001200                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
6374  035036  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
6375  035040  032777  004000  144072  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
6376  035046  001011                          BNE     1$              ;;BR IF YES
6377  035050  005737  001222                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
6378  035054  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
6379  035056  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
6380  035062  023737  001200  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
6381  035070  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
6382  035072  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
6383  035100  013737  035156  001200          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
6384  035106  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
6385  035112  113737  001102  001220          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
6386  035120  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
6387  035124  011637  001110                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
6388  035130  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
6389  035134  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
6390  035142  013777  001102  143772  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
```

```
6391  035150  013716  001106                MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
6392  035154  000002                        RTI                     ;;FIXES PS
6393  035156  003720              $MXCNT: 2000.                     ;;MAX. NUMBER OF ITERATIONS
6394  035160                      $SW08TBL:
6395  035160  004336                        .WORD   TST1+2          ;;STARTING ADDRESS OF TEST 1
6396  035162  004570                        .WORD   TST2+2          ;;STARTING ADDRESS OF TEST 2
6397  035164  005022                        .WORD   TST3+2          ;;STARTING ADDRESS OF TEST 3
6398  035166  005254                        .WORD   TST4+2          ;;STARTING ADDRESS OF TEST 4
6399  035170  005504                        .WORD   TST5+2          ;;STARTING ADDRESS OF TEST 5
6400  035172  005734                        .WORD   TST6+2          ;;STARTING ADDRESS OF TEST 6
6401  035174  006164                        .WORD   TST7+2          ;;STARTING ADDRESS OF TEST 7
6402  035176  006450                        .WORD   TST10+2         ;;STARTING ADDRESS OF TEST 10
6403  035200  006720                        .WORD   TST11+2         ;;STARTING ADDRESS OF TEST 11
6404  035202  007170                        .WORD   TST12+2         ;;STARTING ADDRESS OF TEST 12
6405  035204  007444                        .WORD   TST13+2         ;;STARTING ADDRESS OF TEST 13
6406  035206  010114                        .WORD   TST14+2         ;;STARTING ADDRESS OF TEST 14
6407  035210  010540                        .WORD   TST15+2         ;;STARTING ADDRESS OF TEST 15
6408  035212  011100                        .WORD   TST16+2         ;;STARTING ADDRESS OF TEST 16
6409  035214  011472                        .WORD   TST17+2         ;;STARTING ADDRESS OF TEST 17
6410  035216  012066                        .WORD   TST20+2         ;;STARTING ADDRESS OF TEST 20
6411  035220  012462                        .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
6412  035222  013056                        .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
6413  035224  013452                        .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
6414  035226  014240                        .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
6415  035230  014730                        .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
6416  035232  015324                        .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
6417  035234  015776                        .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
6418  035236  016450                        .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
6419  035240  017122                        .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
6420  035242  017574                        .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
6421  035244  020362                        .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
6422  035246  021150                        .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
6423  035250  021736                        .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
6424  035252  022426                        .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
6425  035254  023116                        .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
6426  035256  023605                        .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
6427  035260  024276                        .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
6428  035262  025012                        .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
6429  035264  025536                        .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
6430  035266  026262                        .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
6431  035270  027520                        .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
6432  035272  030770                        .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
6433  035274  031554                        .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
6434  035276  032426                        .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
6435  035300  032456                        .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
6436                      ;;*****************************************************************
6437                      .SBTTL  LOOP ON INTERNAL ERROR
6438
6439  035302  032777  001000  143630  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6440  035310  001405                        BEQ     5$              ;NO RETURN
6441  035312  105737  001103                TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
6442  035316  001402                        BEQ     5$              ;NO, RETURN
6443  035320  013716  001110                MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
6444  035324  000002              5$:       RTI                     ;RETURN
6445
6446                      ;;*****************************************************************
```

```
                                .SBTTL  TYPE ERROR ROUTINE
                                ;*ENTRY JSR PC,TYPERR
                                ;*RETURN RTS PC
                                ;*
                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
                                ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
                                ;*ENTRIES TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
                                ;*THE ERROR.
                                ;;*****************************************************************
035326  104413                  TYPERR: SAVREG
035330  113737  001102  001220          MOVB    $TSTNM,$TESTN   ;GET TEST NUMBER
035336  042737  177400  001220          BIC     #177400,$TESTN  ;CLEAR UNUSED BITS
035344  113700  001114                  MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
035350  042700  177400                  BIC     #177400,R0      ;CLEAR UNUSED BITS
035354  005300                          DEC     R0              ;FORM INDEX FOR ERROR TABLE
035356  006300                          ASL     R0
035360  006300                          ASL     R0
035362  006300                          ASL     R0
035364  062700  001300          1$:     ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
035370  012037  035404                  MOV     (R0)+,2$        ;GET EM POINTER
035374  001404                          BEQ     3$              ;BRANCH IF THERE ISN'T ONE
035376  104401  001211                  TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
035402  104401                          TYPE                    ;TYPE ERROR MESSAGE (EM)
035404  000000          2$:     .WORD   0                       ;EM POINTER GOES HERE
035406  012037  035422          3$:     MOV     (R0)+,4$        ;GET DH POINTER
035412  001404                          BEQ     5$              ;BRANCH IF THERE ISN'T ONE
035414  104401  001211                  TYPE    ,$CRLF          ;TYPE CR-LF
035420  104401                          TYPE                    ;TYPE DATA HEADER
035422  000000          4$:     .WORD   0                       ;DH POINTER GOES HERE
035424  012001          5$:     MOV     (R0)+,R1        ;GET DT POINTER
035426  001445                  BEQ     20$             ;BRANCH IF THERE ARE NONE
035430  005004                  CLR     R4              ;RESET INDENT SWITCH
035432  012000                  MOV     (R0)+,R0        ;GET DF POINTER
035434  012002                  MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
035436  104401  001211          TYPE    ,$CRLF
035442  112003          10$:    MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
035444  105720                  TSTB    (R0)+           ;BUMP PAST FORMAT WORD
035446  005703                  TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
035450  001416                  BEQ     14$             ;NO - SKIP DATA PRINT
035452  005704                  TST     R4              ;CHECK IF INDENT WORDS
035454  001004                  BNE     12$             ;YES, GO INDENT
035456  013146          11$:    MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
035460  104402                  TYPOC                   ;TYPE IT
035462  005303                  DEC     R3              ;MORE DATA WORDS
035464  001403                  BEQ     13$             ;NO-BRANCH
035466  104401  043751  12$:    TYPE    ,SPACE2         ;TYPE SEPARATORS
035472  000771                  BR      11$             ;LOOP
035474  104401  001211  13$:    TYPE    ,$CRLF          ;TYPE <CR><LF>
035500  005710                  TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
035502  001401                  BEQ     14$             ;NO, DO NOT CHANGE INDENT
035504  005104                  COM     R4              ;CHANGE INDENT
035506  005302          14$:    DEC     R2              ;MORE DH'S?
035510  003414                  BLE     20$             ;NO-BRANCH
035512  012037  035532  15$:    MOV     (R0)+,18$       ;GET NEXT DH POINTER
035516  001751                  BEQ     10$             ;IF NO HEADER GET DATA
035520  005704                  TST     R4              ;INDENT?
```

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6503  035522  001402                        BEQ     17$             ;NO-BRANCH
6504  035524  104401  043751                TYPE    ,SPACE2         ;INDENT
6505  035530  104401                17$:    TYPE                    ;TYPE DH
6506  035532  000000                18$:    .WORD   0               ;DH POINTER GOES HERE
6507  035534  104401  001211                TYPE    ,$CRLF
6508  035540  000740                        BR      10$             ;LOOP
6509  035542  104414                20$:    RESREG
6510  035544  005237  003250                INC     ERRCNT          ;INCREMENT ERROR COUNT
6511  035550  032777  010000  143362        BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
6512  035556  001421                        BEQ     25$             ;NO, RETURN
6513  035560  022737  000024  003250        CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
6514  035566  103015                        BHIS    25$             ;NO, RETURN
6515  035570  104401  043754                TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
6516                                                                ;  ERROR THRESHOLD EXCEEDED"
6517  035574  005737  000042                TST     42              ;CHECK IF IN CHAIN MODE
6518  035600  001407                        BEQ     30$             ;NO, HALT
6519  035602  012737  000001  033720        MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
6520  035610  012706  001100                MOV     #STACK,SP       ;INITIALIZE STACK
6521  035614  000137  033672                JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
6522  035620  000000                30$:    HALT
6523  035622  000207                25$:    RTS     PC
6524
6525                                        .SBTTL  GENERATE HEADERS FOR SECTOR, TRACK, AND CYLINDER INCREMENTS
6526
6527  035624  013737  003300  003302  INCHDR: MOV     CYLN,HEADER     ;LOAD HEADER WORD 1
6528  035632  005037  003304                CLR     HEADER+2        ;CALCULATE HEADER WORD 2
6529  035636  113737  003277  003305        MOVB    TRACK,HEADER+3
6530  035644  006237  003304                ASR     HEADER+2
6531  035650  006237  003304                ASR     HEADER+2
6532  035654  006237  003304                ASR     HEADER+2
6533  035660  153737  003276  003304        BISB    SECTOR,HEADER+2
6534  035666  052737  140000  003304        BIS     #140000,HEADER+2
6535  035674  013746  003302                MOV     HEADER,-(SP)    ;GENERATE XOR
6536  035700  013737  003304  003306        MOV     HEADER+2,HEADER+4
6537  035706  043737  003302  003306        BIC     HEADER,HEADER+4
6538  035714  043716  003304                BIC     HEADER+2,(SP)
6539  035720  052637  003306                BIS     (SP)+,HEADER+4
6540  035724  013737  003300  003220        MOV     CYLN,E.DCYL     ;INCREMENT DISK ADDRESS
6541  035732  013737  003276  003206        MOV     SECTOR,E.DA
6542  035740  105237  003206                INCB    E.DA
6543  035744  122737  000026  003206        CMPB    #26,E.DA
6544  035752  001014                        BNE     10$
6545  035754  105037  003206                CLRB    E.DA
6546  035760  105237  003207                INCB    E.DA+1
6547  035764  122737  000003  003207        CMPB    #3,E.DA+1
6548  035772  001004                        BNE     10$
6549  035774  005037  003206                CLR     E.DA
6550  036000  005237  003220                INC     E.DCYL
6551  036004  000207                10$:    RTS     PC              ;RETURN
6552
6553                                        .SBTTL  CALCULATE EXPECTED HEADER
6554
6555  036006  005003                CALHDR: CLR     R3              ;CLEAR EXPECTED FIRST WORD
6556  036010  013701  003220                MOV     E.DCYL,R1       ;STORE CYLINDER
6557  036014  001406                        BEQ     5$              ;CHECK IF ZERO
6558  036016  012700  000020                MOV     #16.,R0         ;LOAD SHIFT COUNT
```

```
6559  036022  006101                  1$:     ROL     R1              ;CALCULATE FIRST WORD
6560  036024  006003                          ROR     R3
6561  036026  005300                          DEC     R0
6562  036030  001374                          BNE     1$
6563  036032  010337  003226          5$:     MOV     R3,E.MR2        ;LOAD FIRST WORD
6564  036036  013746  003206                  MOV     E.DA,-(SP)      ;GET TRACK AND SECTOR
6565  036042  001410                          BEQ     7$              ;CHECK IF TRACK = 0 AND SECTOR = 0
6566  036044  042716  000377                  BIC     #377,(SP)       ;CLEAR SECTOR BITS
6567  036050  001403                          BEQ     6$              ;CHECK TRACK = 0
6568  036052  006216                          ASR     (SP)            ;SHIFT HEAD 3 BITS RIGHT
6569  036054  006216                          ASR     (SP)
6570  036056  006216                          ASR     (SP)
6571  036060  153716  003206          6$:     BISB    E.DA,(SP)       ;OR IN SECTOR BITS
6572  036064  012601                  7$:     MOV     (SP)+,R1
6573  036066  032737  010000  003200          BIT     #CFMT,E.CS1     ;CHECK FORMAT = 24 SECTOR
6574  036074  001402                          BEQ     8$              ;NO, CALCULATE SECOND WORD
6575  036076  052701  001000                  BIS     #BIT9,R1        ;SET FORMAT BIT
6576  036102  005003                  8$:     CLR     R3              ;CLEAR EXPECTED SECOND WORD
6577  036104  005701                          TST     R1              ;CHECK IF WORD = 0
6578  036106  001406                          BEQ     15$             ;YES, RETURN
6579  036110  012700  000020                  MOV     #16.,R0         ;LOAD SHIFT COUNT
6580  036114  006101                  10$:    ROL     R1
6581  036116  006003                          ROR     R3
6582  036120  005300                          DEC     R0
6583  036122  001374                          BNE     10$
6584  036124  010337  003230          15$:    MOV     R3,E.MR3        ;LOAD SECOND WORD
6585  036130  000207                          RTS     PC              ;RETURN
6586
6587                                  ;;*****************************************************************
6588                                  .SBTTL  GENERATE ECC WORD
6589
6590  036132  005737  003252          ECCGEN: TST     P1.BIT          ;CHECK IF 1
6591  036136  001410                          BEQ     3$              ;NO, CHECK IF BIT 31 = 1
6592  036140  032737  000001  003266          BIT     #1,ECCHI        ;NO, CHECK IF BIT 31 = 1
6593  036146  001410                          BEQ     5$              ;NO, SET ECC XORED BIT
6594  036150  005037  003272          1$:     CLR     ECCXOR          ;CLEAR ECC XORED BIT
6595  036154  000241                          CLC                     ;CLEAR CARRY FLOP
6596  036156  000410                          BR      7$              ;SHIFT IN ECC BIT
6597
6598  036160  032737  000001  003266  3$:     BIT     #1,ECCHI        ;CHECK IF BIT 31 = 1
6599  036166  001770                          BEQ     1$              ;NO, CLEAR ECC XORED BIT
6600  036170  012737  000001  003272  5$:     MOV     #1,ECCXOR       ;SET ECC XOR
6601  036176  000261                          SEC                     ;SET CARRY FLOP
6602  036200  006037  003270          7$:     ROR     ECCLO
6603  036204  006037  003266                  ROR     ECCHI
6604  036210  005737  003272                  TST     ECCXOR          ;CHECK IF XOR NEEDED
6605  036214  001422                          BEQ     10$             ;NO, RETURN
6606  036216  012746  020020                  MOV     #BIT13!BIT4,-(SP) ;DO XOR OF ECC BITS
6607  036222  043716  003270                  BIC     ECCLO,(SP)      ;  0, 2, 11, 21, 23
6608  036226  042737  020020  003270          BIC     #BIT13!BIT4,ECCLO
6609  036234  052637  003270                  BIS     (SP)+,ECCLO
6610  036240  012746  002400                  MOV     #BIT10!BIT8,-(SP)
6611  036244  043716  003266                  BIC     ECCHI,(SP)
6612  036250  042737  002400  003266          BIC     #BIT10!BIT8,ECCHI
6613  036256  052637  003266                  BIS     (SP)+,ECCHI
6614  036262  013737  003266  003234  10$:    MOV     ECCHI,E.ECPT    ;STORE ECC PATTERN
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 6615  036270  042737  174000  003234          BIC     #174000,E.ECPT  ;MASK UNSEEN BITS
 6616  036276  000207                          RTS     PC              ;RETURN
 6617                                  ;;*****************************************************************
 6618                                  .SBTTL  SIMULATE ONE BIT WRITE IN MAINTENCE MODE
 6619
 6620  036300  052737  042040  003224  WRTBIT: BIS     #DMD!MEWD!WRTGAT,E.MR1 ;INITIALIZE
 6621  036306  042737  114000  003224          BIC     #RDGATE!PCA!PCD,E.MR1  ;  EXPECTED MR1
 6622  036314  005737  003254                  TST     PR.BIT          ;CHECK IF ONE
 6623  036320  001122                          BNE     20$             ;YES, SIMULATE A ONE
 6624  036322  005737  003256                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
 6625  036326  001023                          BNE     10$             ;YES, NO TRANSITION
 6626  036330  042737  002000  003224          BIC     #MEWD,E.MR1     ;INDICATE TRANSITION
 6627  036336  005737  003252                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
 6628  036342  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
 6629  036344  005737  003260                  TST     M2.BIT          ;CHECK FOR PRECOMP. DELAY
 6630  036350  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
 6631  036352  052737  010000  003224          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
 6632  036360  000406                          BR      10$             ;CLOCK IN ZERO
 6633
 6634  036362  005737  003260          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
 6635  036366  001003                          BNE     10$             ;CLOCK IN ZERO
 6636  036370  052737  004000  003224          BIS     #PCA,E.MR1      ;SET PRECOMPENSATION ADVANCE
 6637  036376  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
 6638  036404  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6639  036412  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
 6640  036420  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
 6641  036426  001416                          BEQ     15$             ;YES, CLOCK IN REST OF BIT
 6642  036430  012737  036450  001202          MOV     #13$,$ESCAPE    ;LOAD ESCAPE
 6643  036436  012737  052773  001312          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
 6644  036444  011646                          MOV     (SP),-(SP)      ;STORE RETURN
 6645  036446  000207                          RTS     PC              ;REPORT ERROR
 6646  036450  032777  001000  142462  13$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6647  036456  001402                          BEQ     15$             ;NO, CONTINUE
 6648  036460  000137  037012                  JMP     63$             ;GO LOOP ON ERROR
 6649
 6650  036464  052737  002000  003224  15$:    BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
 6651  036472  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
 6652  036500  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6653  036506  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
 6654  036514  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
 6655  036522  001414                          BEQ     18$             ;YES, RETURN
 6656  036524  012737  036544  001202          MOV     #17$,$ESCAPE    ;LOAD ESCAPE
 6657  036532  012737  053063  001312          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
 6658  036540  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
 6659  036542  000207                          RTS     PC              ;REPORT ERROR
 6660
 6661  036544  032777  001000  142366  17$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6662  036552  001117                          BNE     63$
 6663  036554  005037  001202          18$:    CLR     $ESCAPE         ;CLEAR ESCAPE
 6664  036560  062716  000002                  ADD     #2,(SP)         ;ADJUST ESCAPE
 6665  036564  000207                          RTS     PC              ;RETURN
 6666
 6667
 6668  036566  005737  003252          20$:    TST     P1.BIT          ;CHECK IF NEXT BIT A ONE
 6669  036572  001007                          BNE     30$             ;YES, CHECK FOR PRECOMP. DELAY
 6670  036574  005737  003256                  TST     M1.BIT          ;CHECK FOR PRECOMP. ADVANCE
```

```
6671  036600  001412                          BEQ     40$             ;NO, CHECK MR1
6672  036602  052737  004000  003224          BIS     #PCA,E.MR1      ;SET PRECOMP ADVANCE
6673  036610  000406                          BR      40$             ;CHECK MR1
6674
6675  036612  005737  003256          30$:    TST     M1.BIT          ;CHECK FOR PRECOMP. DELAY
6676  036616  001003                          BNE     40$             ;NO, CHECK MR1
6677  036620  052737  010000  003224          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
6678  036626  012762  000440  000026  40$:    MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
6679  036634  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6680  036642  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6681  036650  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6682  036656  001414                          BEQ     45$             ;YES, CLOCK IN REST OF BIT
6683  036660  012737  036700  001202          MOV     #42$,$ESCAPE    ;LOAD ESCAPE
6684  036666  012737  052773  001312          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6685  036674  011646                          MOV     (SP),-(SP)      ;STORE RETURN
6686  036676  000207                          RTS     PC              ;REPORT ERROR
6687
6688  036700  032777  001000  142232  42$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6689  036706  001041                          BNE     63$             ;YES, LOOP ERROR
6690  036710  042737  002000  003224  45$:    BIC     #MEWD,E.MR1     ;INDICATE A TRANSITION
6691  036716  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK TRANSITION
6692  036724  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6693  036732  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6694  036740  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6695  036746  001414                          BEQ     50$             ;YES, RETURN
6696  036750  012737  036770  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE
6697  036756  012737  053063  001312          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
6698  036764  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6699  036766  000207                          RTS     PC              ;REPORT ERROR
6700
6701  036770  032777  001000  142142  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6702  036776  001005                          BNE     63$             ;YES, REPORT ERROR
6703  037000  005037  001202          50$:    CLR     $ESCAPE         ;LOAD ESCAPE
6704  037004  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
6705  037010  000207                          RTS     PC              ;RETURN
6706
6707  037012  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
6708  037016  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
6709  037022  000177  142062                  JMP     @$LPERR         ;JUMP TO LOOP ADDRESS
6710
6711                                  ;;*****************************************************************
6712                                  .SBTTL  SIMULATE ONE BIT OF READ DATA IN MAINTENENCE MODE
6713
6714  037026  105737  003254          RDBIT:  TSTB    PR.BIT          ;CHECK IF ONE
6715  037032  001024                          BNE     10$             ;YES, SIMULATE ONE
6716  037034  105737  003256                  TSTB    M1.BIT          ;CHECK IF PREVIOUS ONE
6717  037040  001404                          BEQ     4$              ;INSERT TRANSITION
6718  037042  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;DO NOT INSERT TRANSITION
6719  037050  000403                          BR      5$              ;CLOCK IN ZERO
6720
6721  037052  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2) ;INSERT TRANSITION
6722  037060  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
6723  037066  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
6724  037074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6725  037102  000207                          RTS     PC              ;RETURN
6726
```

```
 6727  037104  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN ONE
 6728  037112  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6729  037120  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
 6730  037126  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6731  037134  000207                          RTS     PC                  ;RETURN
 6732                                  .SBTTL  APT COMMUNICATIONS ROUTINE
 6733
 6734                                  ;;******************************************************************
 6735  037136  112737  000001  037402  $ATY1:  MOVB    #1,$FFLG            ;;TO REPORT FATAL ERROR
 6736  037144  112737  000001  037400  $ATY3:  MOVB    #1,$MFLG            ;;TO TYPE A MESSAGE
 6737  037152  000403                          BR      $ATYC
 6738  037154  112737  000001  037402  $ATY4:  MOVB    #1,$FFLG            ;;TO ONLY REPORT FATAL ERROR
 6739  037162                          $ATYC:
 6740  037162  010046                          MOV     R0,-(SP)            ;;PUSH R0 ON STACK
 6741  037164  010146                          MOV     R1,-(SP)            ;;PUSH R1 ON STACK
 6742  037166  105737  037400                  TSTB    $MFLG               ;;SHOULD TYPE A MESSAGE?
 6743  037172  001450                          BEQ     5$                  ;;IF NOT:  BR
 6744  037174  122737  000001  001234          CMPB    #APTENV,$ENV        ;;OPERATING UNDER APT?
 6745  037202  001031                          BNE     3$                  ;;IF NOT:  BR
 6746  037204  132737  000100  001235          BITB    #APTSPOOL,$ENVM     ;;SHOULD SPOOL MESSAGES?
 6747  037212  001425                          BEQ     3$                  ;;IF NOT:  BR
 6748  037214  017600  000004                  MOV     @4(SP),R0           ;;GET MESSAGE ADDR.
 6749  037220  062766  000002  000004          ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
 6750  037226  005737  001214          1$:     TST     $MSGTYPE            ;;SEE IF DONE W/ LAST XMISSION?
 6751  037232  001375                          BNE     1$                  ;;IF NOT:  WAIT
 6752  037234  010037  001230                  MOV     R0,$MSGAD           ;;PUT ADDR IN MAILBOX
 6753  037240  105720                  2$:     TSTB    (R0)+               ;;FIND END OF MESSAGE
 6754  037242  001376                          BNE     2$
 6755  037244  163700  001230                  SUB     $MSGAD,R0           ;;SUB START OF MESSAGE
 6756  037250  006200                          ASR     R0                  ;;GET MESSAGE LNGTH IN WORDS
 6757  037252  010037  001232                  MOV     R0,$MSGLGT          ;;PUT LENGTH IN MAILBOX
 6758  037256  012737  000004  001214          MOV     #4,$MSGTYPE         ;;TELL APT TO TAKE MSG.
 6759  037264  000413                          BR      5$
 6760  037266  017637  000004  037312  3$:     MOV     @4(SP),4$           ;;PUT MSG ADDR IN JSR LINKAGE
 6761  037274  062766  000002  000004          ADD     #2,4(SP)                    ;;BUMP RETURN ADDRESS
 6762  037302  013746  177776                  MOV     177776,-(SP)        ;;PUSH 177776 ON STACK
 6763  037306  004737  037604                  JSR     PC,$TYPE            ;;CALL TYPE MACRO
 6764  037312  000000                  4$:     .WORD   0
 6765  037314                          5$:
 6766  037314  105737  037402          10$:    TSTB    $FFLG               ;;SHOULD REPORT FATAL ERROR?
 6767  037320  001416                          BEQ     12$                 ;;IF NOT:  BR
 6768  037322  005737  001234                  TST     $ENV                ;;RUNNING UNDER APT?
 6769  037326  001413                          BEQ     12$                 ;;IF NOT:  BR
 6770  037330  005737  001214          11$:    TST     $MSGTYPE            ;;FINISHED LAST MESSAGE?
 6771  037334  001375                          BNE     11$                 ;;IF NOT:  WAIT
 6772  037336  017637  000004  001216          MOV     @4(SP),$FATAL       ;;GET ERROR #
 6773  037344  062766  000002  000004          ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
 6774  037352  005237  001214                  INC     $MSGTYPE            ;;TELL APT TO TAKE ERROR
 6775  037356  105037  037402          12$:    CLRB    $FFLG               ;;CLEAR FATAL FLAG
 6776  037362  105037  037401                  CLRB    $LFLG               ;;CLEAR LOG FLAG
 6777  037366  105037  037400                  CLRB    $MFLG               ;;CLEAR MESSAGE FLAG
 6778  037372  012601                          MOV     (SP)+,R1            ;;POP STACK INTO R1
 6779  037374  012600                          MOV     (SP)+,R0            ;;POP STACK INTO R0
 6780  037376  000207                          RTS     PC                  ;;RETURN
 6781  037400     000          $MFLG:  .BYTE   0                   ;;MESSG. FLAG
 6782  037401     000          $LFLG:  .BYTE   0                   ;;LOG FLAG
```

```
 6783  037402  000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
 6784          037404                       .EVEN
 6785          000200               APTSIZE=200
 6786          000001               APTENV=001
 6787          000100               APTSPOOL=100
 6788          000040               APTCSUP=040
 6789                               .SBTTL  ERROR HANDLER ROUTINE
 6790
 6791                               ;;*****************************************************************
 6792                               ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 6793                               ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 6794                               ;*AND GO TO TYPERR ON ERROR
 6795                               ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 6796                               ;*SW15=1        HALT ON ERROR
 6797                               ;*SW13=1        INHIBIT ERROR TYPEOUTS
 6798                               ;*SW10=1        BELL ON ERROR
 6799                               ;*SW09=1        LOOP ON ERROR
 6800                               ;*CALL
 6801                               ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 6802
 6803  037404                       $ERROR:
 6804  037404  104407                       CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 6805  037406  105237  001103       7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 6806  037412  001775                       BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 6807  037414  013777  001102  141520       MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
 6808  037422  032777  002000  141510       BIT     #BIT10,@SWR     ;;BELL ON ERROR?
 6809  037430  001402                       BEQ     1$              ;;NO - SKIP
 6810  037432  104401  001204               TYPE    ,$BELL          ;;RING BELL
 6811  037436  005237  001112       1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
 6812  037442  011637  001116               MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
 6813  037446  162737  000002  001116       SUB     #2,$ERRPC
 6814  037454  117737  141436  001114       MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
 6815  037462  032777  020000  141450       BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
 6816  037470  001004                       BNE     20$             ;;SKIP TYPEOUTS
 6817  037472  004737  035326               JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
 6818  037476  104401  001211               TYPE    ,$CRLF
 6819  037502                       20$:
 6820  037502  122737  000001  001234       CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 6821  037510  001007                       BNE     2$              ;;NO,SKIP APT ERROR REPORT
 6822  037512  113737  001114  037524       MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
 6823  037520  004737  037154               JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
 6824  037524  000                  21$:    .BYTE   0
 6825  037525  000                          .BYTE   0
 6826  037526  000777               22$:    BR      22$             ;;APT ERROR LOOP
 6827  037530  005777  141404       2$:     TST     @SWR            ;;HALT ON ERROR
 6828  037534  100002                       BPL     3$              ;;SKIP IF CONTINUE
 6829  037536  000000                       HALT                    ;;HALT ON ERROR!
 6830  037540  104407                       CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 6831  037542  032777  001000  141370  3$:  BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
 6832  037550  001402                       BEQ     4$              ;;BR IF NO
 6833  037552  013716  001110               MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
 6834  037556  005737  001202       4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
 6835  037562  001402                       BEQ     5$              ;;BR IF NONE
 6836  037564  013716  001202               MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
 6837  037570                       5$:
 6838  037570  022737  034062  000042       CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
```

```
6839  037576  001001                        BNE     6$              ;;BRANCH IF NO
6840  037600  000000                        HALT                    ;;YES
6841  037602                          6$:
6842  037602  000002                        RTI                     ;;RETURN
6843
6844                                  .SBTTL  TYPE ROUTINE
6845
6846                                  ;;**************************************************************
6847                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
6848                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
6849                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
6850                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
6851                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
6852                                  ;*
6853                                  ;*CALL:
6854                                  ;*1) USING A TRAP INSTRUCTION
6855                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
6856                                  ;*OR
6857                                  ;*      TYPE
6858                                  ;*      MESADR
6859                                  ;*
6860
6861  037604  105737  001157          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
6862  037610  100002                          BPL     1$              ;;BR IF YES
6863  037612  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
6864  037614  000430                          BR      3$              ;;LEAVE
6865  037616  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
6866  037620  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
6867  037624  122737  000001  001234          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
6868  037632  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
6869  037634  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
6870  037642  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
6871  037644  010037  037654                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
6872  037650  004737  037144                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
6873  037654  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
6874  037656  132737  000040  001235  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
6875  037664  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
6876  037666  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
6877  037670  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
6878  037672  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
6879  037674  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
6880  037676  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
6881  037702  000002                          RTI                     ;;RETURN
6882  037704  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
6883  037710  001430                          BEQ     8$
6884  037712  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
6885  037716  001006                          BNE     5$
6886  037720  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
6887  037722  104401                          TYPE                    ;;TYPE A CR AND LF
6888  037724  001211                          $CRLF
6889  037726  105037  040062                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
6890  037732  000755                          BR      2$              ;;GET NEXT CHARACTER
6891  037734  004737  040016          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
6892  037740  123726  001155          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
6893  037744  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
6894  037746  013746  001154                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
```

```
6895
6896  037752  105366  000001          7$:     DECB    1(SP)           ;;AND THE NULL CHAR.
6897  037756  002770                          BLT     6$              ;;DOES A NULL NEED TO BE TYPED?
6898  037760  004737  040016                  JSR     PC,$TYPEC       ;;BR IF NO--GO POP THE NULL OFF OF STACK
6899  037764  105337  040062                  DECB    $CHARCNT        ;;GO TYPE A NULL
6900  037770  000770                          BR      7$              ;;DO NOT COUNT AS A COUNT
6901                                                                  ;;LOOP
6902                                  ;HORIZONTAL TAB PROCESSOR
6903
6904  037772  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
6905  037776  004737  040016          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
6906  040002  132737  000007  040062          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
6907  040010  001372                          BNE     9$              ;;TAB STOP
6908  040012  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
6909  040014  000724                          BR      2$              ;;GET NEXT CHARACTER
6910  040016  105777  141126          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
6911  040022  100375                          BPL     $TYPEC
6912  040024  116677  000002  141120          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
6913  040032  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
6914  040040  001003                          BNE     1$              ;;BRANCH IF NO
6915  040042  105037  040062                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
6916  040046  000406                          BR      $TYPEX          ;;EXIT
6917  040050  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
6918  040056  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
6919  040060  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
6920  040062  000000          $CHARCNT:.WORD  0                       ;;CHARACTER COUNT STORAGE
6921  040064  000207          $TYPEX: RTS     PC
6922
6923                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
6924
6925                                  ;;**************************************************************
6926                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
6927                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
6928                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
6929                                  ;*CALL:
6930                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6931                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
6932                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
6933                                  ;*      .BYTE   M               ;;M=1 OR 0
6934                                  ;*                                      ;;1=TYPE LEADING ZEROS
6935                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
6936                                  ;*
6937                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
6938                                  ;*$TYPOS OR $TYPOC
6939                                  ;*CALL:
6940                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6941                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
6942                                  ;*
6943                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
6944                                  ;*CALL:
6945                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6946                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
6947
6948  040066  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
6949  040072  116637  000001  040311          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
6950  040100  112637  040313                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
```

```
6951  040104  062716  000002                        ADD     #2,(SP)          ;;ADJUST RETURN ADDRESS
6952  040110  000406                                BR      $TYPON
6953  040112  112737  000001  040311  $TYPOC:       MOVB    #1,$OFILL        ;;SET THE ZERO FILL SWITCH
6954  040120  112737  000006  040313                MOVB    #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
6955  040126  112737  000005  040310  $TYPON:       MOVB    #5,$OCNT         ;;SET THE ITERATION COUNT
6956  040134  010346                                MOV     R3,-(SP)         ;;SAVE R3
6957  040136  010446                                MOV     R4,-(SP)         ;;SAVE R4
6958  040140  010546                                MOV     R5,-(SP)         ;;SAVE R5
6959  040142  113704  040313                        MOVB    $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
6960  040146  005404                                NEG     R4
6961  040150  062704  000006                        ADD     #6,R4            ;;SUBTRACT IT FOR MAX. ALLOWED
6962  040154  110437  040312                        MOVB    R4,$OMODE        ;;SAVE IT FOR USE
6963  040160  113704  040311                        MOVB    $OFILL,R4        ;;GET THE ZERO FILL SWITCH
6964  040164  016605  000012                        MOV     12(SP),R5        ;;PICKUP THE INPUT NUMBER
6965  040170  005003                                CLR     R3               ;;CLEAR THE OUTPUT WORD
6966  040172  006105                        1$:     ROL     R5               ;;ROTATE MSB INTO "C"
6967  040174  000404                                BR      3$               ;;GO DO MSB
6968  040176  006105                        2$:     ROL     R5               ;;FORM THIS DIGIT
6969  040200  006105                                ROL     R5
6970  040202  006105                                ROL     R5
6971  040204  010503                                MOV     R5,R3
6972  040206  006103                        3$:     ROL     R3               ;;GET LSB OF THIS DIGIT
6973  040210  105337  040312                        DECB    $OMODE           ;;TYPE THIS DIGIT?
6974  040214  100016                                BPL     7$               ;;BR IF NO
6975  040216  042703  177770                        BIC     #177770,R3       ;;GET RID OF JUNK
6976  040222  001002                                BNE     4$               ;;TEST FOR 0
6977  040224  005704                                TST     R4               ;;SUPPRESS THIS 0?
6978  040226  001403                                BEQ     5$               ;;BR IF YES
6979  040230  005204                        4$:     INC     R4               ;;DON'T SUPPRESS ANYMORE 0'S
6980  040232  052703  000060                        BIS     #'0,R3           ;;MAKE THIS DIGIT ASCII
6981  040236  052703  000040                5$:     BIS     #' ,R3           ;;MAKE ASCII IF NOT ALREADY
6982  040242  110337  040306                        MOVB    R3,8$            ;;SAVE FOR TYPING
6983  040246  104401  040306                        TYPE    ,8$              ;;GO TYPE THIS DIGIT
6984  040252  105337  040310                7$:     DECB    $OCNT            ;;COUNT BY 1
6985  040256  003347                                BGT     2$               ;;BR IF MORE TO DO
6986  040260  002402                                BLT     6$               ;;BR IF DONE
6987  040262  005204                                INC     R4               ;;INSURE LAST DIGIT ISN'T A BLANK
6988  040264  000744                                BR      2$               ;;GO DO THE LAST DIGIT
6989  040266  012605                        6$:     MOV     (SP)+,R5         ;;RESTORE R5
6990  040270  012604                                MOV     (SP)+,R4         ;;RESTORE R4
6991  040272  012603                                MOV     (SP)+,R3         ;;RESTORE R3
6992  040274  016666  000002  000004                MOV     2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
6993  040302  012616                                MOV     (SP)+,(SP)
6994  040304  000002                                RTI                      ;;RETURN
6995  040306     000                 8$:     .BYTE   0                ;;STORAGE FOR ASCII DIGIT
6996  040307     000                         .BYTE   0                ;;TERMINATOR FOR TYPE ROUTINE
6997  040310     000                 $OCNT:  .BYTE   0                ;;OCTAL DIGIT COUNTER
6998  040311     000                 $OFILL: .BYTE   0                ;;ZERO FILL SWITCH
6999  040312  000000                 $OMODE: .WORD   0                ;;NUMBER OF DIGITS TO TYPE
7000                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
7001
7002                                ;;**************************************************************
7003                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
7004                                ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
7005                                ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
7006                                ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
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                                        ;*REPLACED WITH SPACES.
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                                        ;*      TYPDS                   ;;GO TO THE ROUTINE
                                        $TYPDS:
                                                MOV     R0,-(SP)        ;;PUSH R0 ON STACK
                                                MOV     R1,-(SP)        ;;PUSH R1 ON STACK
                                                MOV     R2,-(SP)        ;;PUSH R2 ON STACK
                                                MOV     R3,-(SP)        ;;PUSH R3 ON STACK
                                                MOV     R5,-(SP)        ;;PUSH R5 ON STACK
040326  012746  020200                          MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
040332  016605  000020                          MOV     20(SP),R5       ;;GET THE INPUT NUMBER
040336  100004                                 BPL     1$              ;;BR IF INPUT IS POS.
040340  005405                                 NEG     R5              ;;MAKE THE BINARY NUMBER POS.
040342  112766  000055  000001                  MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
040350  005000                        1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
040352  012703  040530                          MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
040356  112723  000040                          MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
040362  005002                        2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
040364  016001  040520                          MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
040370  160105                        3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
040372  002402                                BLT     4$              ;;BR IF DONE
040374  005202                                INC     R2              ;;INCREASE THE BCD DIGIT BY 1
040376  000774                                BR      3$
040400  060105                        4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
040402  005702                                TST     R2              ;;CHECK IF BCD DIGIT=0
040404  001002                                BNE     5$              ;;FALL THROUGH IF 0
040406  105716                                TSTB    (SP)            ;;STILL DOING LEADING 0'S?
040410  100407                                BMI     7$              ;;BR IF YES
040412  106316                        5$:     ASLB    (SP)            ;;MSD?
040414  103003                                BCC     6$              ;;BR IF NO
040416  116663  000001  177777                MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
040424  052702  000060                6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
040430  052702  000040                7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
040434  110223                                MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
040436  005720                                TST     (R0)+           ;;JUST INCREMENTING
040440  020027  000010                        CMP     R0,#10          ;;CHECK THE TABLE INDEX
040444  002746                                BLT     2$              ;;GO DO THE NEXT DIGIT
040446  003002                                BGT     8$              ;;GO TO EXIT
040450  010502                                MOV     R5,R2           ;;GET THE LSD
040452  000764                                BR      6$              ;;GO CHANGE TO ASCII
040454  105726                        8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
040456  100003                                BPL     9$              ;;BR IF NO
040460  116663  177777  177776                MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
040466  105013                        9$:     CLRB    (R3)            ;;SET THE TERMINATOR
040470  012605                                MOV     (SP)+,R5        ;;POP STACK INTO R5
040472  012603                                MOV     (SP)+,R3        ;;POP STACK INTO R3
040474  012602                                MOV     (SP)+,R2        ;;POP STACK INTO R2
040476  012601                                MOV     (SP)+,R1        ;;POP STACK INTO R1
040500  012600                                MOV     (SP)+,R0        ;;POP STACK INTO R0
040502  104401  040530                        TYPC    $DBLK           ;;NOW TYPE THE NUMBER
040506  016666  000002  000004                MOV     2(SP),4(SP)     ;;ADJUST THE STACK
040514  012616                                MOV     (SP)+,(SP)
040516  000002                                RTI                     ;;RETURN TO USER
040520  023420                        $DTBL:  10000.
```

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7063  040522  001750                        1000.
7064  040524  000144                        100.
7065  040526  000012                        10.
7066  040530  000004              $DBLK:    .BLKW   4
7067                              .SBTTL    TTY INPUT ROUTINE
7068
7069                              ;;*****************************************************************
7070                              .ENABL    LSB
7071  040540  000000              $TKCNT:   .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
7072  040542  000000              $TKQIN:   .WORD   0               ;;INPUT POINTER
7073  040544  000000              $TKQOUT:  .WORD   0               ;;OUTPUT POINTER
7074  040546  000001              $TKQSRT:  .BLKB   1               ;;TTY KEYBOARD QUEUE
7075          040547              $TKQEND=.
7076          040550              .EVEN
7077
7078                              ;*TK INITIALIZE ROUTINE
7079                              ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
7080                              ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
7081                              ;
7082                              ;*CALL:
7083                              ;*        JSR     PC,$TKINT
7084                              ;*        RETURN
7085                              ;
7086  040550  005037  040540     $TKINT:   CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
7087  040554  012737  040546  040542       MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
7088  040562  013737  040542  040544       MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
7089  040570  012737  040620  000060       MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
7090  040576  012737  000200  000062       MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
7091  040604  005777  140336               TST     @$TKB           ;;CLEAR DONE FLAG
7092  040610  012777  000100  140326       MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
7093  040616  000207                       RTS     PC              ;;RETURN TO CALLER
7094
7095                              ;*TK SERVICE ROUTINE
7096                              ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
7097                              ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
7098                              ;*IT IN THE QUEUE.
7099                              ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
7100                              ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
7101                              ;
7102  040620  117746  140322     $TKSRV:   MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
7103  040624  042716  177600               BIC     #↑C177,(SP)     ;;STRIP THE JUNK
7104  040630  021627  000003               CMP     (SP),#3         ;;IS IT A CONTROL C?
7105  040634  001007                       BNE     1$              ;;BRANCH IF NO
7106  040636  104401  041734               TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (↑C)
7107  040642  004737  040550               JSR     PC,$TKINT       ;;INIT THE KEYBOARD
7108  040646  005726                       TST     (SP)+           ;;CLEAN UP STACK
7109  040650  000137  034570               JMP     CTRHLT          ;;CONTROL C RESTART
7110  040654  021627  000007     1$:       CMP     (SP),#7         ;;IS IT A CONTROL G?
7111  040660  001004                       BNE     2$              ;;BRANCH IF NO
7112  040662  022737  000176  001140       CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
7113  040670  001500                       BEQ     6$              ;;GO TO SWR CHANGE
7114
7115  040672              2$:
7116  040672  022737  000001  040540       CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
7117  040700  001004                       BNE     3$              ;;BRANCH IF NO
7118  040702  104401  001204               TYPE    ,$BELL          ;;RING THE TTY BELL
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7119  040706  005726                        TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
7120  040710  000451                        BR      5$              ;;EXIT
7121  040712  021627  000023        3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
7122  040716  001021                        BNE     32$             ;;BRANCH IF NO
7123  040720  005077  140220                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7124  040724  005726                        TST     (SP)+           ;;CLEAN CHAR OFF STACK
7125  040726  105777  140212        31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
7126  040732  100375                        BPL     31$             ;;LOOP UNTIL ITS THERE
7127  040734  117746  140206                MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
7128  040740  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
7129  040744  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
7130  040750  001366                        BNE     31$             ;;BRANCH IF NO
7131  040752  012777  000100  140164        MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
7132  040760  000002                        RTI                     ;;RETURN
7133  040762  005237  040540        32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
7134  040766  021627  000140                CMP     (SP),#140       ;;IS IT UPPER CASE?
7135  040772  002405                        BLT     4$              ;;BRANCH IF YES
7136  040774  021627  000175                CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
7137  041000  003002                        BGT     4$              ;;BRANCH IF YES
7138  041002  042716  000040                BIC     #40,(SP)        ;;MAKE IT UPPER CASE
7139  041006  112677  177530        4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
7140  041012  005237  040542                INC     $TKQIN          ;;UPDATE THE POINTER
7141  041016  023727  040542  040547        CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
7142  041024  001003                        BNE     5$              ;;BRANCH IF NO
7143  041026  012737  040546  040542        MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
7144  041034  000002                5$:     RTI                     ;;RETURN
7145
7146                                        ;;*****************************************************************
7147                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
7148                                        ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
7149                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
7150                                        ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
7151  041036  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
7152  041044  001124                        BNE     15$             ;;EXIT IF NOT
7153  041046  105777  140072                TSTB    @$TKS           ;;IS A CHAR WAITING?
7154  041052  100121                        BPL     15$             ;;IF NOT, EXIT
7155  041054  117746  140066                MOVB    @$TKB,-(SP)     ;;YES
7156  041060  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
7157  041064  021627  000007                CMP     (SP),#7         ;;IS IT A CONTROL-G?
7158  041070  001300                        BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
7159                                                                ;;AND EXIT
7160
7161                                        ;;*****************************************************************
7162                                        ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
7163                                        ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
7164                                        ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
7165  041072  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
7166  041100  001674                        BEQ     2$              ;;BRANCH IF YES
7167  041102  005726                        TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
7168  041104  004737  040550                JSR     PC,$TTINT       ;;FLUSH THE TTY INPUT QUEUE
7169  041110  005077  140030                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7170  041114  112737  000001  001135        MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
7171
7172  041122  104401  041746                TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
7173  041126  104401  041753        $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
7174  041132  013746  000176                MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
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7175  041136  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
7176  041140  104401  041764                TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
7177  041144  005046                19$:    CLR     -(SP)           ;;CLEAR COUNTER
7178  041146  005046                        CLR     -(SP)           ;;THE NEW SWR
7179  041150  105777  137770        7$:     TSTB    @$TKS           ;;CHAR THERE?
7180  041154  100375                        BPL     7$              ;;IF NOT TRY AGAIN
7181
7182  041156  117746  137764                MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
7183  041162  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
7184
7185  041166  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL-C?
7186  041172  001015                        BNE     9$              ;;BRANCH IF NOT
7187  041174  104401  041734                TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (^C)
7188  041200  062706  000006                ADD     #6,SP           ;;CLEAN UP STACK
7189  041204  123727  001135  000001        CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
7190  041212  001003                        BNE     8$              ;;BRANCH IF NO
7191  041214  012777  000100  137722        MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
7192  041222  000137  034570        8$:     JMP     CTRLC           ;;CONTROL-C RESTART
7193
7194
7195  041226  021627  000025        9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
7196  041232  001005                        BNE     10$             ;;BRANCH IF NOT
7197  041234  104401  041741                TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
7198  041240  062706  000006        20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
7199  041244  000737                        BR      19$             ;;LET'S TRY IT AGAIN
7200
7201
7202  041246  021627  000015        10$:    CMP     (SP),#15        ;;IS IT A <CR>?
7203  041252  001022                        BNE     16$             ;;BRANCH IF NO
7204  041254  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
7205  041260  001403                        BEQ     11$             ;;BRANCH IF YES
7206  041262  016677  000002  137650        MOV     2(SP),@SWR      ;;SAVE NEW SWR
7207  041270  062706  000006        11$:    ADD     #6,SP           ;;CLEAR UP STACK
7208  041274  104401  001211        14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
7209  041300  123727  001135  000001        CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
7210  041306  001003                        BNE     15$             ;;BRANCH IF NOT
7211  041310  012777  000100  137626        MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
7212  041316  000002                15$:    RTI                     ;;RETURN
7213  041320  004737  040016        16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
7214  041324  021627  000060                CMP     (SP),#60        ;;CHAR < 0?
7215  041330  002420                        BLT     18$             ;;BRANCH IF YES
7216  041332  021627  000067                CMP     (SP),#67        ;;CHAR > 7?
7217  041336  003015                        BGT     18$             ;;BRANCH IF YES
7218  041340  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
7219  041344  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
7220  041350  001403                        BEQ     17$             ;;BRANCH IF YES
7221  041352  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
7222  041354  006316                        ASL     (SP)            ;;   CHAR OVER TO MAKE
7223  041356  006316                        ASL     (SP)            ;;   ROOM FOR NEW ONE.
7224  041360  005266  000002        17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
7225  041364  056616  177776                BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
7226  041370  000667                        BR      7$              ;;GET THE NEXT ONE
7227  041372  104401  001210        18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
7228  041376  000720                        BR      20$             ;;SIMULATE CONTROL-U
7229                                .DSABL  LSB
7230
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7231
7232                            ;;*****************************************************************
7233                            ;*THIS ROUTINE WILL INPLT A SINGLE CHARACTER FROM THE TTY
7234                            ;*CALL:
7235                            ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
7236                            ;*      RETURN HEPE             ;;CHARACTER IS ON THE STACK
7237                            ;*                              ;;WITH PARITY BIT STRIPPED OFF
7238                            ;
7239
7240  041400  011646            $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
7241  041402  016666  000004  000002  MOV     4(SP),2(SP)     ;;THE PS
7242  041410  005066  000004          CLR     4(SP)           ;;GET READY FOR A CHARACTER
7243  041414  005046                  CLR     -(SP)           ;;PUT NEW PS ON STACK
7244  041416  012746  041424          MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
7245  041422  000002                  RTI                     ;;POP NEW PC AND PS
7246  041424                  64$:
7247  041424  005737  040540  1$:     TST     $TKCNT          ;,WAIT ON A CHARACTER
7248  041430  001775                  BEQ     1$
7249  041432  005337  040540          DEC     $TKCNT          ;;DECREMENT THE COUNTER
7250  041436  117766  177102  000004  MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
7251  041444  005237  040544          INC     $TKQOUT         ;;UPDATE THE POINTER
7252  041450  023727  040544  040547  CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
7253  041456  001003                  BNE     2$              ;;BRANCH IF NO
7254  041460  012737  040546  040544  MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
7255  041466  000002          2$:     RTI                     ;;RETURN
7256                            ;;*****************************************************************
7257                            ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
7258                            ;*CALL:
7259                            ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
7260                            ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
7261                            ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
7262
7263  041470  010346            $RDLIN: MOV     R3, (SP)        ;;SAVE R3
7264  041472  005046                  CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
7265  041474  012703  041724  1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
7266  041500  022703  041734  2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
7267  041504  101456                  BLOS    4$              ;;BR IF YES
7268  041506  104410                  RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
7269  041510  112613                  MOVB    (SP)+,(R3)      ;;GET CHARACTER
7270  041512  122713  000177  10$:     CMPB    #177,(R3)       ;;IS IT A RUBOUT
7271  041516  001022                  BNE     5$              ;;BR IF NO
7272  041520  005716                  TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
7273  041522  001007                  BNE     6$              ;;BR IF NO
7274  041524  112737  000134  041722  MOVB    #'\,9$          ;;TYPE A BACK SLASH
7275  041532  104401  041722          TYPE    .9$
7276  041536  012716  177777          MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
7277  041542  005303          6$:     DEC     R3              ;;BACKUP BY ONE
7278  041544  020327  041724          CMP     R3,#$TTYIN      ;;STACK EMPTY?
7279  041550  103434                  BLO     4$              ;;BR IF YES
7280  041552  111337  041722          MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
7281  041556  104401  041722          TYPE    .9$             ;;GO TYPE
7282  041562  000746                  BR      2$              ;;GO READ ANOTHER CHAR.
7283  041564  005716          5$:     TST     (SP)            ;;RUBOUT KEY SET?
7284  041566  001406                  BEQ     7$              ;;BR IF NO
7285  041570  112737  000134  041722  MOVB    #'\,9$          ;;TYPE A BACK SLASH
7286  041576  104401  041722          TYPE    .9$
```

```
7287  041602  005016                        CLR     (SP)            ;;CLEAR THE RUBOUT KEY
7288  041604  122713  000025        7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
7289  041610  001003                        BNE     8$              ;;BR IF NO
7290  041612  104401  041741                TYPE    $CNTLU          ;;TYPE A CONTROL "U"
7291  041616  000726                        BR      1$              ;;GO START OVER
7292  041620  122713  000022        8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
7293  041624  001011                        BNE     3$              ;;BRANCH IF NO
7294  041626  105013                        CLRB    (R3)            ;;CLEAR THE CHARACTER
7295  041630  104401  001211                TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
7296  041634  104401  041724                TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
7297  041640  000717                        BR      2$              ;;GO PICKUP ANOTHER CHACTER
7298  041642  104401  001210        4$:     TYPE    ,$QUES          ;;TYPE A '?'
7299  041646  000712                        BR      1$              ;;CLEAR THE BUFFER AND LOOP
7300  041650  111337  041722        3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
7301  041654  104401  041722                TYPE    ,9$
7302  041660  122723  000015                CMPB    #15,(R3)+       ;;CHECK FOR RETURN
7303  041664  001305                        BNE     2$              ;;LOOP IF NOT RETURN
7304  041666  105063  177777                CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
7305  041672  104401  001212                TYPE    ,$LF            ;;TYPE A LINE FEED
7306  041676  005726                        TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
7307  041700  012603                        MOV     (SP)+,R3        ;;RESTORE R3
7308  041702  011646                        MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
7309  041704  016666  000004  000002        MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
7310  041712  012766  041724  000004        MOV     #$TTYIN,4(SP)
7311  041720  000002                        RTI                     ;;RETURN
7312  041722     000        9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
7313  041723     000                .BYTE   0                       ;;TERMINATOR
7314  041724  000010        $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
7315  041734  041536  005015  000  $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
7316  041741     136  006525  000012 $CNTLU: .ASCIZ  /↑U/<15><12>  ;;CONTROL "U"
7317  041746  043536  005015  000  $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
7318  041753     015  051412  051127 $MSWR:  .ASCIZ  <15><12>/SWR = /
7319  041760  036440  000040
7320  041764  020040  042516  020127 $MNEW:  .ASCIZ  /  NEW = /
7321  041772  020075     000
7322          041776                .EVEN
7323                                .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
7324
7325                                ;;*****************************************************************
7326                                ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
7327                                ;*CHANGE IT TO BINARY.
7328                                ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
7329                                ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
7330                                ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
7331                                ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
7332                                ;*CALL:
7333                                ;*      RDOCT                   ;;READ AN OCTAL NUMBER
7334                                ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
7335                                ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
7336
7337  041776  011646        $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
7338  042000  016666  000004  000002        MOV     4(SP),2(SP)     ;;INPUT NUMBER
7339  042006  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7340  042010  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7341  042012  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
7342  042014  104411        1$:     RDLIN                   ;;READ AN ASCIZ LINE
```

```
7343  042016  012600                    MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
7344  042020  010037  042124            MOV     R0,5$           ;;AND SAVE IT
7345  042024  005001                    CLR     R1              ;;CLEAR DATA WORD
7346  042026  005002                    CLR     R2
7347  042030  112046              2$:   MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
7348  042032  001420                    BEQ     3$              ;;IF ZERO GET OUT
7349  042034  122716  000060            CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
7350  042040  003026                    BGT     4$              ;;IS AN OCTAL DIGIT
7351  042042  122716  000067            CMPB    #'7,(SP)
7352  042046  002423                    BLT     4$
7353  042050  006301                    ASL     R1              ;;*2
7354  042052  006102                    ROL     R2
7355  042054  006301                    ASL     R1              ;;*4
7356  042056  006102                    ROL     R2
7357  042060  006301                    ASL     R1              ;;*8
7358  042062  006102                    ROL     R2
7359  042064  042716  177770            BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
7360  042070  062601                    ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
7361  042072  000756                    BR      2$              ;;LOOP
7362  042074  005726              3$:   TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
7363  042076  010166  000012            MOV     R1,12(SP)       ;;SAVE THE RESULT
7364  042102  010237  042134            MOV     R2,$HIOCT
7365  042106  012602                    MOV     (SP)+,R2        ;;POP STACK INTO R2
7366  042110  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
7367  042112  012600                    MOV     (SP)+,R0        ;;POP STACK INTO R0
7368  042114  000002                    RTI                     ;;RETURN
7369  042116  005726              4$:   TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
7370  042120  105010                    CLRB    (R0)            ;;SET A TERMINATOR
7371  042122  104401                    TYPE                    ;;TYPE UP THRU THE BAD CHAR.
7372  042124  000000              5$:   .WORD   0
7373  042126  104401  001210            TYPE    $QUES           ;;"?" "CR" & "LF"
7374  042132  000730                    BR      1$              ;;TRY AGAIN
7375  042134  000000              $HIOCT: .WORD 0               ;;HIGH ORDER BITS GO HERE
7376                                    .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
7377
7378                                    ;;**********************************************************************
7379                                    ;*SAVE R0-R5
7380                                    ;*CALL:
7381                                    ;*      SAVREG
7382                                    ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
7383                                    ;*
7384                                    ;*TOP---(+16)
7385                                    ;* +2---(+18)
7386                                    ;* +4---R5
7387                                    ;* +6---R4
7388                                    ;* +8---R3
7389                                    ;*+10---R2
7390                                    ;*+12---R1
7391                                    ;*+14---R0
7392
7393  042136                            $SAVREG:
7394  042136  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7395  042140  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7396  042142  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
7397  042144  010346                            MOV     R3,-(SP)        ;;PUSH R3 ON STACK
7398  042146  010446                            MOV     R4,-(SP)        ;;PUSH R4 ON STACK
```

```
7399  042150  010546                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
7400  042152  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
7401  042156  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
7402  042162  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
7403  042166  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
7404  042172  000002                        RTI
7405
7406                                  ;*RESTORE R0-R5
7407                                  ;*CALL:
7408                                  ;*      RESREG
7409  042174                          $RESREG:
7410  042174  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
7411  042200  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
7412  042204  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
7413  042210  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
7414  042214  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
7415  042216  012604                        MOV     (SP)+,R4        ;;POP STACK INTO R4
7416  042220  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
7417  042222  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
7418  042224  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
7419  042226  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
7420  042230  000002                        RTI
7421
7422                                   .SBTTL  POWER DOWN AND UP ROUTINE
7423
7424                                  ;;*******************************************************************
7425
7426                                  ;POWER DOWN ROUTINE
7427  042232  017737  136702  003312  $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
7428  042240  012737  042260  000024          MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
7429  042246  012737  000340  000026          MOV     #PR7,PWRVEC+2
7430  042254  000000                        HALT
7431  042256  000776                        BR      .-2     ;HANG UP
7432
7433                                  ;;*******************************************************************
7434
7435                                  ;POWER UP ROUTINE
7436  042260  005037  042354          $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
7437  042264  012737  000144  042356          MOV     #100.,$PWRCT+2
7438  042272  005237  042354          1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
7439  042276  001375                        BNE     1$
7440  042300  005337  042356                DEC     $PWRCT+2
7441  042304  001372                        BNE     1$
7442  042306  012737  042232  000024          MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
7443  042314  012737  000340  000026          MOV     #PR7,PWRVEC+2
7444  042322  012706  001100                MOV     #STACK,SP       ;FORCE STACK
7445  042326  104401  042360                TYPE    ,$POWER         ;TYPE POWER
7446  042332  004737  034366                JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
7447  042336  013777  003312  136574        MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
7448  042344  013702  001270                MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
7449  042350  000177  136532                JMP     @$LPADR ;GO BACK TO LAST TEST
7450
7451  042354  000000  000000  $PWRCT: .WORD   0,0              ;TELETYPE TIME OUT
7452  042360  047520  042527  000122  $POWER: .ASCIZ  /POWER/
7453                                          .EVEN
7454                                   .SBTTL  TRAP DECODER
```

```
7455
7456                                    ;;*****************************************************************
7457                                    ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
7458                                    ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
7459                                    ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
7460                                    ;*GO TO THAT ROUTINE.
7461
7462  042366  010046                    $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
7463  042370  016600  000002                    MOV     2(SP),R0        ;;GET TRAP ADDRESS
7464  042374  005740                            TST     -(R0)           ;;BACKUP BY 2
7465  042376  111000                            MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
7466  042400  006300                            ASL     R0              ;;POSITION FOR INDEXING
7467  042402  016000  042422                    MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
7468  042406  000200                            RTS     R0              ;;GO TO ROUTINE
7469
7470
7471                                    ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
7472
7473  042410  011646                    $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
7474  042412  016666  000004  000002            MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
7475  042420  000002                            RTI                     ;;RESTORE THE PSW
7476
7477                                    .SBTTL  TRAP TABLE
7478
7479                                    ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
7480                                    ;*BY THE "TRAP" INSTRUCTION.
7481
7482                                    ;       ROUTINE
7483                                    ;       -------
7484  042422  042410                    $TRPAD: .WORD   $TRAP2
7485  042424  037604                            $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
7486  042426  040112                            $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
7487  042430  040066                            $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
7488  042432  040126                            $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
7489  042434  040314                            $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
7490
7491  042436  041126                            $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
7492
7493  042440  041036                            $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
7494  042442  041400                            $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
7495  042444  041470                            $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
7496  042446  041776                            $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
7497  042450  042136                            $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
7498  042452  042174                            $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
7499  042454  035302                            SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
                                                .SBTTL  DATA TABLE FOR PRINT OUT
                                                
042456  001220  003244                  DT000:  .WORD   $TESTN,TRAPPC
042462  001220  001116  003224          DT002:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT
042470  003164  003252  003254
042476  003256  003260  003262
042504  001220  001116  003200          DT003:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MR3
042512  003140  003226  003166
042520  003230  003170
042524  001220  001116  003200          DT041:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER,E.BA,T.BA,E.WC,T.WC
042532  003140  003210  003150
042540  003214  003154  003204
042546  003144  003202  003142
042554  001220  001116  003200          DT046:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
042562  003140  003210  003150
042570  003214  003154
042574  001220  001116  003222          DT051:  .WORD   $TESTN,$ERRPC,E.DB,T.DB,WRDCNT
042602  003162  003264
042606  001220  001116  003200          DT052:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,T.CS2,T.ER
042614  003140  003150  003154
042622  001220  001116  003224          DT053:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
042630  003164
042632  001220  001116  003220          DT054:  .WORD   $TESTN,$ERRPC,E.DCYL,T.DCYL,E.DA,T.DA
042640  003160  003206  003146
042646  001220  001116  003200          DT071:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
042654  003140  003210  003150
042662  003214  003154
042666  055174  055176  055200                  .WORD   VRCHDR,VRCHDR+2,VRCHDR+4
042674  001220  001116  003200          DT074:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER,HDRCNT
042702  003140  003210  003150
042710  003214  003154  003310
042716  001220  001116  003224          DT077:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,HDRCNT
042724  003164  003310
042730  001220  001116  003234          DT134:  .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT,BITCNT
042736  003174  003262
042742  001220  001116  003200          DT144:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
042750  003140  003210  003150
042756  003214  003154
042762  003204  003144  003202                  .WORD   E.BA,T.BA,E.WC,T.WC,E.DCYL,T.DCYL,E.DA,T.DA
042770  003142  003220  003160
042776  003206  003146
043002  001220  001116  003234          DT151:  .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT
043010  003174
```

```
                                        .SBTTL  DATA FORMAT FOR PRINT OUT
                                DF000:  .WORD   1
                                        .BYTE   2,0
                                DF002:  .WORD   5
                                        .BYTE   0,0
                                        .WORD   DH00A
                                        .BYTE   0,0
                                        .WORD   DH00B
                                        .BYTE   2,0
                                        .WORD   DH02A
                                        .BYTE   0,0
                                        .WORD   DH02B
                                        .BYTE   7,0
                                DF003:  .WORD   5               ;ERROR 3-24
                                        .BYTE   0,0
                                        .WORD   DH00A
                                        .BYTE   0,0
                                        .WORD   DH00B
                                        .BYTE   2,0
                                        .WORD   DH03A
                                        .BYTE   0,0
                                        .WORD   DH03B
                                        .BYTE   6,0
                                DF025:  .WORD   5               ;ERROR 25-40
                                        .BYTE   0,0
                                        .WORD   DH00A
                                        .BYTE   0,0
                                        .WORD   DH00B
                                        .BYTE   2,0
                                        .WORD   DH25A
                                        .BYTE   0,0
                                        .WORD   DH25B
                                        .BYTE   6,0
                                DF041:  .WORD   7
                                        .BYTE   0,0
                                        .WORD   DH00A
                                        .BYTE   0,0
                                        .WORD   DH00B
                                        .BYTE   2,0
                                        .WORD   DH41A
                                        .BYTE   0,0
                                        .WORD   DH41B
                                        .BYTE   6,0
                                        .WORD   DH41C
                                        .BYTE   0,0
                                        .WORD   DH41D
                                        .BYTE   4,0
                                DF046:  .WORD   5
                                        .BYTE   0,0
                                        .WORD   DH00A
                                        .BYTE   0,0
                                        .WORD   DH00B
                                        .BYTE   2,0
                                        .WORD   DH41A
                                        .BYTE   0,0
```

```
7599  043166  044675                        .WORD   DH041B
7600  043170     006  000                   .BYTE   6,0
7601  043172  000005                DF051:  .WORD   5
7602  043174     000  000                   .BYTE   0,0
7603  043176  044065                        .WORD   DH000A
7604  043200     000  000                   .BYTE   0,0
7605  043202  044103                        .WORD   DH000B
7606  043204     002  000                   .BYTE   2,0
7607  043206  045046                        .WORD   DH051A
7608  043210     000  000                   .BYTE   0,0
7609  043212  045073                        .WORD   DH051B
7610  043214     003  000                   .BYTE   3,0
7611    3216  000005                DF052:  .WORD   5
7612  043220     000  000                   .BYTE   0,0
7613  043222  044065                        .WORD   DH000A
7614  043224     000  000                   .BYTE   0,0
7615  043226  044103                        .WORD   DH000B
7616  043230     002  000                   .BYTE   2,0
7617  043232  045121                        .WORD   DH052A
7618  043234     000  000                   .BYTE   0,0
7619  043236  045140                        .WORD   DH052B
7620  043240     004  000                   .BYTE   4,0
7621  043242  000005                DF053:  .WORD   5
7622  043244     000  000                   .BYTE   0,0
7623  043246  044065                        .WORD   DH000A
7624  043250     000  000                   .BYTE   0,0
7625  043252  044103                        .WORD   DH000B
7626  043254     002  000                   .BYTE   2,0
7627  043256  045175                        .WORD   DH053A
7628  043260     000  000                   .BYTE   0,0
7629  043262  045214                        .WORD   DH053B
7630  043264     002  000                   .BYTE   2,0
7631  043266  000005                DF054:  .WORD   5               ;ERROR-54-61
7632  043270     000  000                   .BYTE   0,0
7633  043272  044065                        .WORD   DH000A
7634  043274     000  000                   .BYTE   0,0
7635  043276  044103                        .WORD   DH000B
7636  043300     002  000                   .BYTE   2,0
7637  043302  045232                        .WORD   DH054A
7638  043304     000  000                   .BYTE   0,0
7639  043306  045271                        .WORD   DH054B
7640  043310     004  000                   .BYTE   4,0
7641  043312  000007                DF071:  .WORD   7               ;ERRORS 71-73
7642  043314     000  000                   .BYTE   0,0
7643  043316  044065                        .WORD   DH000A
7644  043320     000  000                   .BYTE   0,0
7645  043322  044103                        .WORD   DH000B
7646  043324     002  000                   .BYTE   2,0
7647  043326  044616                        .WORD   DH041A
7648  043330     000  000                   .BYTE   0,0
7649  043332  044675                        .WORD   DH041B
7650  043334     006  000                   .BYTE   6,0
7651  043336  045326                        .WORD   DH071A
7652  043340     000  000                   .BYTE   0,0
7653  043342  045347                        .WORD   DH071B
7654  043344     003  000                   .BYTE   3,0
```

```
7655  043346  000005                DF074:  .WORD   5
7656  043350     000      000               .BYTE   0,0
7657  043352  044065                        .WORD   DH000A
7658  043354     000      000               .BYTE   0,0
7659  043356  044103                        .WORD   DH000B
7660  043360     002      000               .BYTE   2,0
7661  043362  045376                        .WORD   DH074A
7662  043364     000      000               .BYTE   0,0
7663  043366  045465                        .WORD   DH074B
7664  043370     007      000               .BYTE   7,0
7665  043372  000005                DF077:  .WORD   5
7666  043374     000      000               .BYTE   0,0
7667  043376  044065                        .WORD   DH000A
7668  043400     000      000               .BYTE   0,0
7669  043402  044103                        .WORD   DH000B
7670  043404     002      000               .BYTE   2,0
7671  043406  045551                        .WORD   DH077A
7672  043410     000      000               .BYTE   0,0
7673  043412  045600                        .WORD   DH077B
7674  043414     003      000               .BYTE   3,0
7675  043416  000005                DF134:  .WORD   5
7676  043420     000      000               .BYTE   0,0
7677  043422  044065                        .WORD   DH000A
7678  043424     000      000               .BYTE   0,0
7679  043426  044103                        .WORD   DH000B
7680  043430     002      000               .BYTE   2,0
7681  043432  045624                        .WORD   DH134A
7682  043434     000      000               .BYTE   0,0
7683  043436  045650                        .WORD   DH134B
7684  043440     003      000               .BYTE   3,0
7685  043442  000007                DF144:  .WORD   7
7686  043444     000      000               .BYTE   0,0
7687  043446  044065                        .WORD   DH000A
7688  043450     000      000               .BYTE   0,0
7689  043452  044103                        .WORD   DH000B
7690  043454     002      000               .BYTE   2,0
7691  043456  044616                        .WORD   DH041A
7692  043460     000      000               .BYTE   0,0
7693  043462  044675                        .WORD   DH041B
7694  043464     006      000               .BYTE   6,0
7695  043466  045676                        .WORD   DH144A
7696  043470     000      000               .BYTE   0,0
7697  043472  045775                        .WORD   DH144B
7698  043474     010      000               .BYTE   10,0
7699  043476  000005                DF151:  .WORD   5
7700  043500     000      000               .BYTE   0,0
7701  043502  044065                        .WORD   DH000A
7702  043504     000      000               .BYTE   0,0
7703  043506  044103                        .WORD   DH000B
7704  043510     002      000               .BYTE   2,0
7705  043512  045121                        .WORD   DH052A
7706  043514     000      000               .BYTE   0,0
7707  043516  046072                        .WORD   DH151A
7708  043520     002      000               .BYTE   2,0
```

```
                                        .SBTTL  ASCII MESSAGES
                                
043522  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 BUS ADDRESS ( /
043530  020061  052502  020123
043536  042101  051104  051505
043544  020123  020050     000
043551     040  020051  020075  OPR002: .ASCIZ  / ) = /
043556     000
043557     122  033113  030461  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
043564  053040  041505  047524
043572  020122  042101  051104
043600  051505  020123  020050
043606     000
043607     122  033113  030461  OPR004: .ASCIZ  /RK611 PRIORITY ( /
043614  050040  044522  051117
043622  052111  020131  020050
043630     000
043631     015  025012  025052  OPR005: .ASCIZ  <15><12>/*****  PROGRAM HALTED *****/<15><12>
043636  025052  020040  051120
043644  043517  040522  020115
043652  040510  052114  042105
043660  025040  025052  025052
043666  005015     000
043671     015  051412  041505  OPR006: .ASCIZ  <15><12>/SECOND PASS RUN TIME IS APPROX 3:15 MINUTES/<15><12>
043676  047117  020104  040520
043704  051523  051040  047125
043712  052040  046511  020105
043720  051511  040440  050120
043726  047522  020130  035063
043734  032461  046440  047111
043742  052125  051505  005015
043750     000
043751     040  000040        SPACE2: .ASCIZ  /  /
043754  005015  051120  043517  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
043762  040522  020115  041101
043770  051117  042524  020104
043776  042502  040503  051525
044004  020105  051105  047522
044012  020122  044124  042522
044020  044123  046117  020104
044026  054105  042503  042105
044034  042105  005015     000
044041     015  052012  051505  TSTBY1: .ASCIZ  <15><12>/TEST /
044046  020124     000
044051     040  054502  040520  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
044056  051523  042105  005015
044064     000
```

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                                                .SBTTL  DATA HEADERS
                                        
044065  124     051505  020124  DH000A: .ASCIZ  /TEST    ERROR/
044072  020040  042440  051122
044100  051117  000
044103  116     046525  020040  DH000B: .ASCIZ  /NUM     PC/
044110  020040  050040  000103
044116  042524  052123  020040  DH000C: .ASCII  /TEST    TRAP/<15><12>
044124  020040  051124  050101
044132  005015
044134  052516  020115  020040          .ASCIZ  /NUM     PC/
044142  020040  041520  000
044147  105     050130  041505  DH002A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT/
044154  020124  040440  052103
044162  040525  020114  050040
044170  042522  042523  052116
044176  050040  042522  042523
044204  052116  050040  042522
044212  042523  052116  050040
044220  042522  042523  052116
044226  041040  052111  000
044233  122     046513  030522  DH002B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT/
044240  020040  051040  046513
044246  030522  020040  041040
044254  052111  030453  020040
044262  041040  052111  020040
044270  020040  041040  052111
044276  030455  020040  041040
044304  052111  031055  020040
044312  041440  052517  052116
044320  000
044321  105     050130  041505  DH003A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
044326  020124  040440  052103
044334  040525  020114  042440
044342  050130  041505  020124
044350  040440  052103  040525
044356  020114  042440  050130
044364  041505  020124  040440
044372  052103  040525  000114
044400  045522  051503  020061  DH003B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
044406  020040  045522  051503
044414  020061  020040  042515
044422  051523  040440  020040
044430  042515  051523  040440
044436  020040  042515  051523
044444  041040  020040  042515
044452  051523  041040  000
044457  105     050130  041505  DH025A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
044464  020124  040440  052103
044472  040525  020114  042440
044500  050130  041505  020124
044506  040440  052103  040525
044514  020114  042440  050130
044522  041505  020124  040440
044530  052103  040525  000114
044536  045522  051503  020061  DH025B: .ASCIZ  /RKCS1   RKCS1   HD WD 1  HD WD 1  HD WD 2  HD WD 2
```

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7812  044544  020040  045522  051503
7813  044552  020061  020040  042110
7814  044560  053440  020104  020061
7815  044566  042110  053440  020104
7816  044574  020061  042110  053440
7817  044602  020104  020062  042110
7818  044610  053440  020104  000062
7819  044616  054105  042520  052103  DH041A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
7820  044624  020040  041501  052524
7821  044632  046101  020040  054105
7822  044640  042520  052103  020040
7823  044646  041501  052524  046101
7824  044654  020040  054105  042520
7825  044662  052103  020040  041501
7826  044670  052524  046101     000
7827  044675     122  041513  030523  DH041B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKER    RKER/
7828  044702  020040  051040  041513
7829  044710  030523  020040  051040
7830  044716  041513  031123  020040
7831  044724  051040  041513  031123
7832  044732  020040  051040  042513
7833  044740  020122  020040  051040
7834  044746  042513  000122
7835  044752  054105  042520  052103  DH041C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
7836  044760  020040  041501  052524
7837  044766  046101  020040  054105
7838  044774  042520  052103  020040
7839  045002  041501  052524  046101
7840  045010     000
7841  045011     122  041113  020101  DH041D: .ASCIZ  /RKBA    RKBA    RKWC    RKWC/
7842  045016  020040  051040  041113
7843  045024  020101  020040  051040
7844  045032  053513  020103  020040
7845  045040  051040  053513  000103
7846  045046  040504  040524  020040  DH051A: .ASCIZ  /DATA    DATA    WORD/
7847  045054  020040  040504  040524
7848  045062  020040  020040  047527
7849  045070  042122     000
7850  045073     105  050130  041505  DH051B: .ASCIZ  /EXPECT  READ    COUNT/
7851  045100  020124  051040  040505
7852  045106  020104  020040  041440
7853  045114  052517  052116     000
7854  045121     105  050130  041505  DH052A: .ASCIZ  /EXPECT  ACTUAL/
7855  045126  020124  040440  052103
7856  045134  040525  000114
7857  045140  045522  051503  020061  DH052B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKER/
7858  045146  020040  045522  051503
7859  045154  020061  020040  045522
7860  045162  051503  020062  020040
7861  045170  045522  051105     000
7862  045175     105  050130  041505  DH053A: .ASCIZ  /EXPECT  ACTUAL/
7863  045202  020124  040440  052103
7864  045210  040525  000114
7865  045214  045522  051115  020061  DH053B: .ASCIZ  /RKMR1   RKMR1/
7866  045222  020040  045522  051115
7867  045230  000061
```

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 7868  045232  054105  042520  052103  DH054A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 7869  045240  020040  041501  052524
 7870  045246  046101  020040  054105
 7871  045254  042520  052103  020040
 7872  045262  041501  052524  046101
 7873  045270     000
 7874  045271     122  042113  054503  DH054B: .ASCIZ  /RKDCYL  RKDCYL  RKDA    RKDA/
 7875  045276  020114  051040  042113
 7876  045304  054503  020114  051040
 7877  045312  042113  020101  020040
 7878  045320  051040  042113  000101
 7879  045326  042510  042101  051105  DH071A: .ASCIZ  /HEADER SIMULATED/
 7880  045334  051440  046511  046125
 7881  045342  052101  042105     000
 7882  045347     127  051117  020104  DH071B: .ASCIZ  /WORD 1  WORD 2  WORD 3/
 7883  045354  020061  053440  051117
 7884  045362  020104  020062  053440
 7885  045370  051117  020104  000063
 7886  045376  054105  042520  052103  DH074A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  HEADER/
 7887  045404  020040  041501  052524
 7888  045412  046101  020040  054105
 7889  045420  042520  052103  020040
 7890  045426  041501  052524  046101
 7891  045434  020040  054105  042520
 7892  045442  052103  020040  041501
 7893  045450  052524  046101  020040
 7894  045456  042510  042101  051105
 7895  045464     000
 7896  045465     122  041513  030523  DH074B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKER    RKER    NUM/
 7897  045472  020040  051040  041513
 7898  045500  030523  020040  051040
 7899  045506  041513  031123  020040
 7900  045514  051040  041513  031123
 7901  045522  020040  051040  042513
 7902  045530  020122  020040  051040
 7903  045536  042513  020122  020040
 7904  045544  047040  046525     000
 7905  045551     105  050130  041505  DH077A: .ASCIZ  /EXPECT  ACTUAL  HEADER/
 7906  045556  020124  040440  052103
 7907  045564  040525  020114  044040
 7908  045572  040505  042504  000122
 7909  045600  045522  051115  020061  DH077B: .ASCIZ  /RKMR1   RKMR1   NUM/
 7910  045606  020040  045522  051115
 7911  045614  020061  020040  052516
 7912  045622  000115
 7913  045624  054105  042520  052103  DH134A: .ASCIZ  /EXPECT  ACTUAL  BIT/
 7914  045632  020040  041501  052524
 7915  045640  046101  020040  044502
 7916  045646  000124
 7917  045650  045522  041505  052120  DH134B: .ASCIZ  /RKECPT  RKECPT  COUNT/
 7918  045656  020040  045522  041505
 7919  045664  052120  020040  047503
 7920  045672  047125  000124
 7921  045676  054105  042520  052103  DH144A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 7922  045704  020040  041501  052524
 7923  045712  046101  020040  054105
```

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 7924  045720  042520  052103  020040
 7925  045726  041501  052524  046101
 7926  045734  020040  054105  042520
 7927  045742  052103  020040  041501
 7928  045750  052524  046101  020040
 7929  045756  054105  042520  052103
 7930  045764  020040  041501  052524
 7931  045772  046101     000
 7932  045775     122  041113  020101  DH144B: .ASCIZ  /RKBA    RKBA    RKWC    RKWC    RKDCYL  RKDCYL  RKDA    RKDA/
 7933  046002  020040  051040  041113
 7934  046010  020101  020040  051040
 7935  046016  053513  020103  020040
 7936  046024  051040  053513  020103
 7937  046032  020040  051040  042113
 7938  046040  054503  020114  051040
 7939  046046  042113  054503  020114
 7940  046054  051040  042113  020101
 7941  046062  020040  051040  042113
 7942  046070  000101
 7943  046072  045522  041505  052120  DH15:A: .ASCIZ  /RKECPT  RKECPT/
 7944  046100  020040  045522  041505
 7945  046106  052120     000
```

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                                        .SBTTL  ERROR MESSAGES
                                
7948  046111     125  042516  050130  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
7949  046116  041505  042524  020104
7950  046124  042515  047515  054522
7951  046132  050040  051101  052111
7952  046140  020131  047105  041101
7953  046146  042514  052040  040522
7954  046154  000120
7955  046156  052101  042524  050115  EM300:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM READ DATA/
7956  046164  044524  043516  052040
7957  046172  020117  044103  041505
7958  046200  020113  042523  045505
7959  046206  046440  051505  020123
7960  046214  051106  046517  051040
7961  046222  040505  020104  040504
7962  046230  040524     000
7963  046233     101  052124  046505  EM301:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM WRITE DATA/
7964  046240  052120  047111  020107
7965  046246  047524  041440  042510
7966  046254  045503  051440  042505
7967  046262  020113  042515  051523
7968  046270  043040  047522  020115
7969  046276  051127  052111  020105
7970  046304  040504  040524     000
7971  046311     101  052124  046505  EM302:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM WRITE CHECK/
7972  046316  052120  047111  020107
7973  046324  047524  041440  042510
7974  046332  045503  051440  042505
7975  046340  020113  042515  051523
7976  046346  043040  047522  020115
7977  046354  051127  052111  020105
7978  046362  044103  041505  000113
7979  046370  052101  042524  050115  EM303:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM READ DATA/
7980  046376  044524  043516  052040
7981  046404  020117  044103  041505
7982  046412  020113  046103  040505
7983  046420  020122  042515  051523
7984  046426  043040  047522  020115
7985  046434  042522  042101  042040
7986  046442  052101  000101
7987  046446  052101  042524  050115  EM304:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM WRITE DATA/
7988  046454  044524  043516  052040
7989  046462  020117  044103  041505
7990  046470  020113  046103  040505
7991  046476  020122  042515  051523
7992  046504  043040  047522  020115
7993  046512  051127  052111  020105
7994  046520  040504  040524     000
7995  046525     101  052124  046505  EM305:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM WRITE CHECK/
7996  046532  052120  047111  020107
7997  046540  047524  041440  042510
7998  046546  045503  041440  042514
7999  046554  051101  046440  051505
8000  046562  020123  051106  046517
8001  046570  053440  044522  042524
```

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8002  046576  041440  042510  045503
8003  046604     000
8004  046605     101  052124  046505  EM306:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8005  046612  052120  047111  020107
8006  046620  047524  041440  042510
8007  046626  045503  044040  040505
8008  046634  020104  042507  042516
8009  046642  040522  044524  047117
8010  046650  005015
8011  046652  044527  044124  053040          .ASCIZ  /WITH VARIOUS CYLINDER VALUES/
8012  046660  051101  047511  051525
8013  046666  041440  046131  047111
8014  046674  042504  020122  040526
8015  046702  052514  051505     000
8016  046707     101  052124  046505  EM307:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8017  046714  052120  047111  020107
8018  046722  047524  041440  042510
8019  046730  045503  044040  040505
8020  046736  020104  042507  042516
8021  046744  040522  044524  047117
8022  046752  005015
8023  046754  044527  044124  053040          .ASCIZ  /WITH VARIOUS TRACK VALUES/
8024  046762  051101  047511  051525
8025  046770  052040  040522  045503
8026  046776  053040  046101  042525
8027  047004  000123
8028  047006  052101  042524  050115  EM308:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8029  047014  044524  043516  052040
8030  047022  020117  044103  041505
8031  047030  020113  042510  042101
8032  047036  043440  047105  051105
8033  047044  052101  047511  006516
8034  047052     012
8035  047053     127  052111  020110          .ASCIZ  /WITH VARIOUS SECTOR VALUES/
8036  047060  040526  044522  052517
8037  047066  020123  042523  052103
8038  047074  051117  053040  046101
8039  047102  042525  000123
8040  047106  052101  042524  050115  EM309:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8041  047114  044524  043516  052040
8042  047122  020117  044103  041505
8043  047130  020113  042510  042101
8044  047136  043440  047105  051105
8045  047144  052101  047511  006516
8046  047152     012
8047  047153     127  052111  020110          .ASCIZ  /WITH VARIOUS FORMAT VALUES/
8048  047160  040526  044522  052517
8049  047166  020123  047506  046522
8050  047174  052101  053040  046101
8051  047202  042525  000123
8052  047206  052101  042524  050115  EM310:  .ASCIZ  /ATTEMPTING TO CHECK NPR DATA TRANSFER FOR WRITE DATA/
8053  047214  044524  043516  052040
8054  047222  020117  044103  041505
8055  047230  020113  050116  020122
8056  047236  040504  040524  052040
8057  047244  040522  051516  042506
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8058  047252  020122  047506  020122
8059  047260  051127  052111  020105
8060  047266  040504  040524     000
8061  047273     101  052124  046505  EM311:  .ASCIZ  /ATTEMPTING TO CHECK HEADER RECOGNITION/
8062  047300  052120  047111  020107
8063  047306  047524  041440  042510
8064  047314  045503  044040  040505
8065  047322  042504  020122  042522
8066  047330  047503  047107  052111
8067  047336  047511  000116
8068  047342  052101  042524  050115  EM312:  .ASCIZ  /ATTEMPTING TO CHECK SECTOR INCREMENT/
8069  047350  044524  043516  052040
8070  047356  020117  044103  041505
8071  047364  020113  042523  052103
8072  047372  051117  044440  041516
8073  047400  042522  042515  052116
8074  047406     000
8075  047407     101  052124  046505  EM313:  .ASCIZ  /ATTEMPTING TO CHECK TRACK INCREMENT/
8076  047414  052120  047111  020107
8077  047422  047524  041440  042510
8078  047430  045503  052040  040522
8079  047436  045503  044440  041516
8080  047444  042522  042515  052116
8081  047452     000
8082  047453     101  052124  046505  EM314:  .ASCIZ  /ATTEMPTING TO CHECK CYLINDER INCREMENT/
8083  047460  052120  047111  020107
8084  047466  047524  041440  042510
8085  047474  045503  041440  046131
8086  047502  047111  042504  020122
8087  047510  047111  051103  046505
8088  047516  047105  000124
8089  047522  052101  042524  050115  EM315:  .ASCII  /ATTEMPTING TO CHECK SECTOR PULSE DETECTION/<15><12>
8090  047530  044524  043516  052040
8091  047536  020117  044103  041505
8092  047544  020113  042523  052103
8093  047552  051117  050040  046125
8094  047560  042523  042040  052105
8095  047566  041505  044524  047117
8096  047574  005015
8097  047576  044527  044124  053440          .ASCIZ  /WITH WRITE DATA/
8098  047604  044522  042524  042040
8099  047612  052101  000101
8100  047616  052101  042524  050115  EM316:  .ASCIZ  /ATTEMPTING TO FORCE BAD SECTOR ERROR/
8101  047624  044524  043516  052040
8102  047632  020117  047506  041522
8103  047640  020105  040502  020104
8104  047646  042523  052103  051117
8105  047654  042440  051122  051117
8106  047662     000
8107  047663     101  052124  046505  EM317:  .ASCII  /ATTEMPTING TO FORCE HEADER VRC ERROR/<15><12>
8108  047670  052120  047111  020107
8109  047676  047524  043040  051117
8110  047704  042503  044040  040505
8111  047712  042504  020122  051126
8112  047720  020103  051105  047522
8113  047726  006522     012
```

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8114  047731     127  052111  020110          .ASCIZ  /WITH BAD SECTOR PRESENT/
8115  047736  040502  020104  042523
8116  047744  052103  051117  050040
8117  047752  042522  042523  052116
8118  047760     000
8119  047761     101  052124  046505  EM318:  .ASCIZ  /ATTEMPTING TO FORCE HVRC ERROR/
8120  047766  052120  047111  020107
8121  047774  047524  043040  051117
8122  050002  042503  044040  051126
8123  050010  020103  051105  047522
8124  050016  000122
8125  050020  052101  042524  050115  EM319:  .ASCIZ  /ATTEMPTING TO FORCE OPERATION INCOMPLETE/
8126  050026  044524  043516  052040
8127  050034  020117  047506  041522
8128  050042  020105  050117  051105
8129  050050  052101  047511  020116
8130  050056  047111  047503  050115
8131  050064  042514  042524     000
8132  050071     101  052124  046505  EM320:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 37/
8133  050076  044520  043516  052040
8134  050104  020117  047506  041522
8135  050112  020105  050117  020111
8136  050120  044527  044124  044040
8137  050126  051126  020103  051105
8138  050134  047522  020122  047117
8139  050142  044040  040505  042504
8140  050150  020122  033463     000
8141  050155     101  052124  046505  EM321:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 36/
8142  050162  044520  043516  052040
8143  050170  020117  047506  041522
8144  050176  020105  050117  020111
8145  050204  044527  044124  044040
8146  050212  051126  020103  051105
8147  050220  047522  020122  047117
8148  050226  044040  040505  042504
8149  050234  020122  033063     000
8150  050241     101  052124  046505  EM322:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 0/
8151  050246  044520  043516  052040
8152  050254  020117  047506  041522
8153  050262  020105  050117  020111
8154  050270  044527  044124  044040
8155  050276  051126  020103  051105
8156  050304  047522  020122  047117
8157  050312  044040  040505  042504
8158  050320  020122  000060
8159  050324  044103  041505  044513  EM323:  .ASCIZ  /CHECKING HEADER RECOGNITION WITH PREVIOUS BAD SECTOR ERROR/
8160  050332  043516  044040  040505
8161  050340  042504  020122  042522
8162  050346  047503  047107  052111
8163  050354  047511  020116  044527
8164  050362  044124  050040  042522
8165  050370  044526  052517  020123
8166  050376  040502  020104  042523
8167  050404  052103  051117  042440
8168  050412  051122  051117     000
8169  050417     103  042510  045503  EM324:  .ASCIZ  /CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER VRC ERROR/
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8170  050424  047111  020107  042510
8171  050432  042101  051105  051040
8172  050440  041505  043517  044516
8173  050446  044524  047117  053440
8174  050454  052111  020110  051120
8175  050462  053105  047511  051525
8176  050470  044040  040505  042504
8177  050476  020122  051126  020103
8178  050504  051105  047522  000122
8179  050512  047506  041522  047111  EM325:  .ASCIZ  /FORCING BAD SECTOR ERROR WITH PREVIOUS HEADER VRC ERROR/
8180  050520  020107  040502  020104
8 81  050526  042523  052103  051117
8182  050534  042440  051122  051117
8183  050542  053440  052111  020110
8184  050550  051120  053105  047511
8185  050556  051525  044040  040505
8186  050564  042504  020122  051126
8187  050572  020103  051105  047522
8188  050600  000122
8189  050602  047506  041522  047111  EM326:  .ASCIZ  /FORCING HEAD VRC ERROR WITH PREVIOUS BAD SECTOR ERROR/
8190  050610  020107  042510  042101
8191  050616  053040  041522  042440
8192  050624  051122  051117  053440
8193  050632  052111  020110  051120
8194  050640  053105  047511  051525
8195  050646  041040  042101  051440
8196  050654  041505  047524  020122
8197  050662  051105  047522  000122
8198  050670  052101  042524  050115  EM327:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH WITH WRITE DATA/
8199  050676  044524  043516  052040
8200  050704  020117  051127  052111
8201  050712  020105  054523  041516
8202  050720  020110  044527  044124
8203  050726  053440  044522  042524
8204  050734  042040  052101  000101
8205  050742  052101  042524  050115  EM328:  .ASCIZ  /ATTEMPTING TO WRITE DATA FIELD WITH WRITE DATA/
8206  050750  044524  043516  052040
8207  050756  020117  051127  052111
8208  050764  020105  040504  040524
8209  050772  043040  042511  042114
8210  051000  053440  052111  020110
8211  051006  051127  052111  020105
8212  051014  040504  040524     000
8213  051021     101  052124  046505  EM329:  .ASCIZ  /ATTEMPTING TO CHECK ECC PATTERN CLEARING/
8214  051026  052120  047111  020107
8215  051034  047524  041440  042510
8216  051042  045503  042440  041503
8217  051050  050040  052101  042524
8218  051056  047122  041440  042514
8219  051064  051101  047111  000107
8220  051072  052101  042524  050115  EM330:  .ASCIZ  /ATTEMPTING TO CHECK ECC GENERATION/
8221  051100  044524  043516  052040
8222  051106  020117  044103  041505
8223  051114  020113  041505  020103
8224  051122  042507  042516  040522
8225  051130  044524  047117     000
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8226  051135     101  052124  046505  EM331:  .ASCIZ  /ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR/
8227  051142  052120  047111  020107
8228  051150  040502  020104  042523
8229  051156  052103  051117  042440
8230  051164  051122  051117  051440
8231  051172  052105  044524  043516
8232  051200  041440  047117  051124
8233  051206  046117  042514  020122
8234  051214  051105  047522  000122
8235  051222  052101  042524  050115  EM332:  .ASCIZ  /ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR/
8236  051230  044524  043516  044040
8237  051236  040505  042504  020122
8238  051244  051126  020103  051105
8239  051252  047522  020122  042523
8240  051260  052124  047111  020107
8241  051266  047503  052116  047522
8242  051274  046114  051105  042440
8243  051302  051122  051117     000
8244  051307     101  052124  046505  EM333:  .ASCIZ  /ATTEMPTING TO WRITE ECC WORDS/
8245  051314  052120  047111  020107
8246  051322  047524  053440  044522
8247  051330  042524  042440  041503
8248  051336  053440  051117  051504
8249  051344     000
8250  051345     101  052124  046505  EM334:  .ASCIZ  /ATTEMPTING TO WRITE POSTAMBLE/
8251  051352  052120  047111  020107
8252  051360  047524  053440  044522
8253  051366  042524  050040  051517
8254  051374  040524  041115  042514
8255  051402     000
8256  051403     101  052124  046505  EM335:  .ASCIZ  /ATTEMPTING COMPLETE EXECUTION OF WRITE DATA/
8257  051410  052120  047111  020107
8258  051416  047503  050115  042514
8259  051424  042524  042440  042530
8260  051432  052503  044524  047117
8261  051440  047440  020106  051127
8262  051446  052111  020105  040504
8263  051454  040524     000
8264  051457     101  052124  046505  EM336:  .ASCIZ  /ATTEMPTING ERROR CLEAR WITH CONTROLLER CLEAR/
8265  051464  052120  047111  020107
8266  051472  051105  047522  020122
8267  051500  046103  040505  020122
8268  051506  044527  044124  041440
8269  051514  047117  051124  046117
8270  051522  042514  020122  046103
8271  051530  040505  000122
8272  051534  052101  042524  050115  EM337:  .ASCIZ  /ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL/
8273  051542  044524  043516  050040
8274  051550  051101  044524  046101
8275  051556  051440  041505  047524
8276  051564  020122  051127  052111
8277  051572  020105  044527  044124
8278  051600  055040  051105  020117
8279  051606  044506  046114     000
8280  051613     101  052124  046505  EM338:  .ASCIZ  /ATTEMPTING TO WRITE 18 BIT DATA FIELD WITH WRITE DATA/
8281  051620  052120  047111  020107
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8282  051626  047524  053440  044522
8283  051634  042524  030440  020070
8284  051642  044502  020124  040504
8285  051650  040524  043040  042511
8286  051656  042114  053440  052111
8287  051664  020110  051127  052111
8288  051672  020105  040504  040524
8289  051700     000
8290  051701     101  052124  046505  EM339:   .ASCII  /ATTEMPTING TO WRITE BIT 16-17 OF 18 BIT/
8291  051706  052120  047111  020107
8292  051714  047524  053440  044522
8293  051722  042524  041040  052111
8294  051730  030440  026466  033461
8295  051736  047440  020106  034061
8296  051744  041040  052111
8297  051750  005015  040504  040524          .ASCIZ  <15><12>/DATA FIELD WITH WRITE DATA/
8298  051756  043040  042511  042114
8299  051764  053440  052111  020110
8300  051772  051127  052111  020105
8301  052000  040504  040524     000
8302  052005     101  052124  046505  EM340:   .ASCIZ  /ATTEMPTING WRITE DATA IN 18 BIT MODE/
8303  052012  052120  047111  020107
8304  052020  051127  052111  020105
8305  052026  040504  040524  044440
8306  052034  020116  034061  041040
8307  052042  052111  046440  042117
8308  052050  000105
8309  052052  051503  020061  047111  EM4000:  .ASCIZ  /CS1 INCORRECT/
8310  052060  047503  051122  041505
8311  052066  000124
8312  052070  042515  051523  040440  EM4001:  .ASCIZ  /MESS A INCORRECT/
8313  052076  044440  041516  051117
8314  052104  042522  052103     000
8315  052111     115  051505  020123  EM4002:  .ASCIZ  /MESS B INCORRECT/
8316  052116  020102  047111  047503
8317  052124  051122  041505  000124
8318  052132  042510  042101  051105  EM4003:  .ASCIZ  /HEADER WORD 1 INCORRECT/
8319  052140  053440  051117  020104
8320  052146  020061  047111  047503
8321  052154  051122  041505  000124
8322  052162  042510  042101  051105  EM4004:  .ASCIZ  /HEADER WORD 2 INCORRECT/
8323  052170  053440  051117  020104
8324  052176  020062  047111  047503
8325  052204  051122  041505  000124
8326  052212  051503  020062  047111  EM4005:  .ASCIZ  /CS2 INCORRECT/
8327  052220  047503  051122  041505
8328  052226  000124
8329  052230  051105  047522  020122  EM4006:  .ASCIZ  /ERROR REG INCORRECT/
8330  052236  042522  020107  047111
8331  052244  047503  051122  041505
8332  052252  000124
8333  052254  052502  020123  042101  EM4007:  .ASCIZ  /BUS ADDRESS INCORRECT/
8334  052262  051104  051505  020123
8335  052270  047111  047503  051122
8336  052276  041505  000124
8337  052302  047527  042122  041440  EM4008:  .ASCIZ  /WORD COUNT INCORRECT/
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8338  052310  052517  052116  044440
8339  052316  041516  051117  042522
8340  052324  052103     000
8341  052327     103  030523  044440  EM4009: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
8342  052334  041516  051117  042522
8343  052342  052103  040440  052106
8344  052350  051105  051040  040505
8345  052356  044504  043516  042040
8346  052364  052101  020101  052502
8347  052372  043106  051105     000
8348  052377     103  031123  044440  EM4010: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
8349  052404  041516  051117  042522
8350  052412  052103  040440  052106
8351  052420  051105  051040  040505
8352  052426  044504  043516  042040
8353  052434  052101  020101  052502
8354  052442  043106  051105     000
8355  052447     105  051122  051117  EM4011: .ASCIZ  /ERROR REG INCORRECT AFTER READING DATA BUFFER/
8356  052454  051040  043505  044440
8357  052462  041516  051117  042522
8358  052470  052103  040440  052106
8359  052476  051105  051040  040505
8360  052504  044504  043516  042040
8361  052512  052101  020101  052502
8362  052520  043106  051105     000
8363  052525     104  052101  020101  EM4012: .ASCIZ  /DATA READ FROM MEMOR/ INCORRECT/
8364  052532  042522  042101  043040
8365  052540  047522  020115  042515
8366  052546  047515  054522  044440
8367  052554  041516  051117  042522
8368  052562  052103     000
8369  052565     115  030522  044440  EM4013: .ASCIZ  /MR1 INCORRECT AFTER GAP IN WRITE DATA/
8370  052572  041516  051117  042522
8371  052600  052103  040440  052106
8372  052606  051105  043440  050101
8373  052614  044440  020116  051127
8374  052622  052111  020105  040504
8375  052630  040524     000
8376  052633     104  051511  020113  EM4014: .ASCIZ  /DISK ADDRESS REG. INCORRECT/
8377  052640  042101  051104  051505
8378  052646  020123  042522  027107
8379  052654  044440  041516  051117
8380  052662  042522  052103     000
8381  052667     103  046131  047111  EM4015: .ASCIZ  /CYLINDER ADDRESS REG. INCORRECT/
8382  052674  042504  020122  042101
8383  052702  051104  051505  020123
8384  052710  042522  027107  044440
8385  052716  041516  051117  042522
8386  052724  052103     000
8387  052727     115  030522  044440  EM4016: .ASCIZ  /MR1 INCORRECT/
8388  052734  041516  051117  042522
8389  052742  052103     000
8390  052745     105  041503  050040  EM4017: .ASCIZ  /ECC PAT REG INCORRECT/
8391  052752  052101  051040  043505
8392  052760  044440  041516  051117
8393  052766  042522  052103     000
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 8394  052773     115  030522  044440  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISION OF MAINT CLOCK/
 8395  053000  041516  051117  042522
 8396  053006  052103  047440  020116
 8397  053014  051461  020124  047504
 8398  053022  047127  040527  042122
 8399  053030  052040  040522  051516
 8400  053036  051511  047511  020116
 8401  053044  043117  046440  044501
 8402  053052  052116  041440  047514
 8403  053060  045503     000
 8404  053063     115  030522  044440  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSITION OF MAINT CLOCK/
 8405  053070  041516  051117  042522
 8406  053076  052103  047440  020116
 8407  053104  047062  020104  047504
 8408  053112  047127  040527  042122
 8409  053120  052040  040522  051516
 8410  053126  052111  047511  020116
 8411  053134  043117  046440  044501
 8412  053142  052116  041440  047514
 8413  053150  045503     000
```

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                                        .SBTTL  DATA BUFFERS

                                        .EVEN
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8418  053154    000       000                   .BYTE   0,0
8419  053156    001       001                   .BYTE   1,1
8420  053160    002       002                   .BYTE   2,2
8421  053162    003       003                   .BYTE   3,3
8422  053164    004       004                   .BYTE   4,4
8423  053166    005       005                   .BYTE   5,5
8424  053170    006       006                   .BYTE   6,6
8425  053172    007       007                   .BYTE   7,7
8426  053174    010       010                   .BYTE   10,10
8427  053176    011       011                   .BYTE   11,11
8428  053200    012       012                   .BYTE   12,12
8429  053202    013       013                   .BYTE   13,13
8430  053204    014       014                   .BYTE   14,14
8431  053206    015       015                   .BYTE   15,15
8432  053210    016       016                   .BYTE   16,16
8433  053212    017       017                   .BYTE   17,17
8434  053214    020       020                   .BYTE   20,20
8435  053216    021       021                   .BYTE   21,21
8436  053220    022       022                   .BYTE   22,22
8437  053222    023       023                   .BYTE   23,23
8438  053224    024       024                   .BYTE   24,24
8439  053226    025       025                   .BYTE   25,25
8440  053230    026       026                   .BYTE   26,26
8441  053232    027       027                   .BYTE   27,27
8442  053234    030       030                   .BYTE   30,30
8443  053236    031       031                   .BYTE   31,31
8444  053240    032       032                   .BYTE   32,32
8445  053242    033       033                   .BYTE   33,33
8446  053244    034       034                   .BYTE   34,34
8447  053246    035       035                   .BYTE   35,35
8448  053250    036       036                   .BYTE   36,36
8449  053252    037       037                   .BYTE   37,37
8450  053254    040       040                   .BYTE   40,40
8451  053256    041       041                   .BYTE   41,41
8452  053260    042       042                   .BYTE   42,42
8453  053262    043       043                   .BYTE   43,43
8454  053264    044       044                   .BYTE   44,44
8455  053266    045       045                   .BYTE   45,45
8456  053270    046       046                   .BYTE   46,46
8457  053272    047       047                   .BYTE   47,47
8458  053274    050       050                   .BYTE   50,50
8459  053276    051       051                   .BYTE   51,51
8460  053300    052       052                   .BYTE   52,52
8461  053302    053       053                   .BYTE   53,53
8462  053304    054       054                   .BYTE   54,54
8463  053306    055       055                   .BYTE   55,55
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8465  053312    057       057                   .BYTE   57,57
8466  053314    060       060                   .BYTE   60,60
8467  053316    061       061                   .BYTE   61,61
8468  053320    062       062                   .BYTE   62,62
8469  053322    063       063                   .BYTE   63,63
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8474  053334  070     070                    .BYTE   70,70
8475  053336  071     071                    .BYTE   71,71
8476  053340  072     072                    .BYTE   72,72
8477  053342  073     073                    .BYTE   73,73
8478  053344  074     074                    .BYTE   74,74
8479  053346  075     075                    .BYTE   75,75
8480  053350  076     076                    .BYTE   76,76
8481  053352  077     077                    .BYTE   77,77
8482  053354  100     100                    .BYTE   100,100
8483  053356  101     101                    .BYTE   101,101
8484  053360  102     102                    .BYTE   102,102
8485  053362  103     103                    .BYTE   103,103
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8488  053370  140000                         .WORD   140000
8489  053372  000000                 HEAD2:  .WORD   000000
8490  053374  040000                         .WORD   040000
8491  053376  040000                         .WORD   040000
8492  053400  000000                 HEAD3:  .WORD   000000
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8494  053404  100000                         .WORD   100000
8495  053406  000300                 HEAD4:  .WORD   000300
8496  053410  040057                         .WORD   040057
8497  053412  040356                         .WORD   040356
8498  053414  000100                 HEAD5:  .WORD   000100
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8501  053422  000100                         .WORD   000100
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8503  053426  140101                         .WORD   140101
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8515  053456  040401                         .WORD   040401
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8872  055002  140040                .WORD   140040
8873  055004  000040                .WORD   000040
8874  055006  140000                .WORD   140000
8875  055010  140040                .WORD   140040
8876  055012  000040                .WORD   000040
8877  055014  140000                .WORD   140000
8878  055016  140040                .WORD   140040
8879  055020  000040                .WORD   000040
8880  055022  140000                .WORD   140000
8881  055024  140040                .WORD   140040
8882  055026  000040                .WORD   000040
8883  055030  140000                .WORD   140000
8884  055032  140040                .WORD   140040
8885  055034  000040                .WORD   000040
8886  055036  140000                .WORD   140000
8887  055040  140040                .WORD   140040
8888  055042  000040                .WORD   000040
8889  055044  140000                .WORD   140000
8890  055046  140040                .WORD   140040
8891  055050  000040                .WORD   000040
8892  055052  140000                .WORD   140000
8893  055054  140040                .WORD   140040
8894  055056  000040                .WORD   000040
8895  055060  140000                .WORD   140000
8896  055062  140040                .WORD   140040
8897  055064  000040                .WORD   000040
8898  055066  140000                .WORD   140000
8899  055070  140040                .WORD   140040
8900  055072  000040                .WORD   000040
8901  055074  140000                .WORD   140000
8902  055076  140040                .WORD   140040
8903  055100  000040                .WORD   000040
8904  055102  140000                .WORD   140000
8905  055104  140040                .WORD   140040
8906  055106  000040                .WORD   000040
8907  055110  140000                .WORD   140000
8908  055112  140040                .WORD   140040
8909  055114  000040                .WORD   000040
8910  055116  140000                .WORD   140000
8911  055120  140040                .WORD   140040
8912  055122  000040                .WORD   000040
8913  055124  140000                .WORD   140000
8914  055126  140040                .WORD   140040
8915  055130  000040                .WORD   000040
8916  055132  140000                .WORD   140000
8917  055134  140040                .WORD   140040
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 8918  055136  000040                          .WORD   000040
 8919  055140  140000                          .WORD   140000
 8920  055142  140040                          .WORD   140040
 8921  055144  000040                          .WORD   000040
 8922  055146  140000                          .WORD   140000
 8923  055150  140040                          .WORD   140040
 8924  055152  000040                          .WORD   000040
 8925  055154  140000                          .WORD   140000
 8926  055156  140040                          .WORD   140040
 8927  055160  000040                          .WORD   000040
 8928  055162  140000                          .WORD   140000
 8929  055164  140040                          .WORD   140040
 8930  055166  000040                          .WORD   000040
 8931  055170  140000                          .WORD   140000
 8932  055172  140040                          .WORD   140040
 8933  055174  001253                  VRCHDR: .WORD   001253
 8934  055176  141123                          .WORD   141123
 8935  055200  140370                          .WORD   140370
 8936  055202  177777  177777  177777  MOD2BF: .WORD   177777,177777,177777,177777,177777,177777
 8937  055210  177777  177777  177777
 8938  055216  000400                  BUFF:   .BLKW   400
 8939  056216  125252  125252  125252  ECCBUF: .WORD   125252,125252,125252,125252,125252,125252
 8940  056224  125252  125252  125252
 8941  056232  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
 8942  056240  177777  177777  177777
 8943  056246  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
 8944  056254  177777  000000  000000
 8945  056262  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000
 8946  056270  000000  000000  000000
 8947  056276  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
 8948  056304  025252  052525  052525
 8949  056312  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
 8950  056320  150442  064221  132110
 8951  056326  055044  026422  013211           WORD   055044,026422,013211,105504,042642,021321
 8952  056334  105504  042642  021321
 8953  056342  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
 8954  056350  011055  104426  042213
 8955  056356  133333  066666  155555          .WORD   133333,066666,155555,155555,133333,066666
 8956  056364  155555  133333  066666
 8957  056372  066666  155555  155555          .WORD   066666,155555,155555,133333,133333,133333
 8958  056400  133333  133333  133333
 8959  056406  133333  133333  133333          .WORD   133333,133333,133333,133333,177777,177777
 8960  056414  133333  177777  177777
 8961  056422  177777  052525  052525          .WORD   177777,052525,052525,052525,177777,177777
 8962  056430  052525  177777  177777
 8963  056436  052525  052525  177777          .WORD   052525,052525,177777,052525,177252,177252
 8964  056444  052525  177252  177252
 8965  056452  172765  172765  072307          .WORD   172765,172765,072307,135143,156461,167230
 8966  056460  135143  156461  167230
 8967  056466  073514  035646  016723          .WORD   073514,035646,016723,107351,143564,061672
 8968  056474  107351  143564  061672
 8969  056502  030735  114356  046167          .WORD   030735,114356,046167,123073,151453,164616
 8970  056510  123073  151453  164616
 8971  056516  125252  125252  125252          .WORD   125252,125252,125252,125252,125252,125252
 8972  056524  125252  125252  125252
 8973  056532  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
```

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8975  056546  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
8976  056554  177777  000000  000000
8977  056562  000000  000000  000000          .WORD   0C0000,000000,000000,000000,000000,000000
8978  056570  000000  000000  000000
8979  056576  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
8980  056604  025252  052525  052525
8981  056612  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
8982  056620  150442  064221  132110
8983  056626  055044  026422  013211          .WORD   055044,026422,013211,105504,042642,021321
8984  056634  105504  042642  021321
8985  056642  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
8986  056650  011055  104426  042213
8987  056656  133333  066666  155555          .WORD   133333,066666,155555,155555,133333,066666
8988  056664  155555  133333  066666
8989  056672  066666  155555  155555          .WORD   066666,155555,155555,133333,133333,133333
8990  056700  133333  133333  133333
8991  056706  133333  133333  133333          .WORD   133333,133333,133333,133333,177777,177777
8992  056714  133333  177777  177777
8993  056722  177777  052525  052525          .WORD   177777,052525,052525,052525,177777,177777
8994  056730  052525  177777  177777
8995  056736  052525  052525  177777          .WORD   052525,052525,177777,052525,177252,177252
8996  056744  052525  177252  177252
8997  056752  172765  172765  072307          .WORD   172765,172765,072307,135143,156461,167230
8998  056760  135143  156461  167230
8999  056766  073514  035646  016723          .WORD   073514,035646,016723,107351,143564,061672
9000  056774  107351  143564  061672
9001  057002  030735  114356  046167          .WORD   030735,114356,046167,123073,151453;164616
9002  057010  123073  151453  164616
9003  057016  125252  125252  125252          .WORD   125252,125252,125252,125252,125252,125252
9004  057024  125252  125252  125252
9005  057032  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
9006  057040  177777  177777  177777
9007  057046  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
9008  057054  177777  000000  000000
9009  057062  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000
9010  057070  000000  000000  000000
9011  057076  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
9012  057104  025252  052525  052525
9013  057112  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
9014  057120  150442  064221  132110
9015  057126  055044  026422  013211          .WORD   055044,026422,013211,105504,042642,021321
9016  057134  105504  042642  021321
9017  057142  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
9018  057150  011055  104426  042213
9019  057156  177777  177777  177777          .WORD   177777,177777,177777,177777,177777,177777
9020  057164  177777  177777  177777
9021  057172  177777  177777  177777          .WORD   177777,177777,177777,177777,177777,177777
9022  057200  177777  177777  177777
9023  057206  177777  177777  177777          .WORD   177777,177777,177777,177777
9024  057214  177777
9025  057216  177777  177777  177777  BADPAR: .WORD   177777,177777,177777,177777,177777,177777
9026  057224  177777  177777  177777
9027          000001                  .END
```

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ABASE = 177440          1024*   1333    1374
ABORT   043754          6515    7742*
ACDW1 = 000000          1333    1376
ACDW2 = 000000          1333    1377
ACLO  = 000010          1119*
ACPUOP= 000000          1333    1348
ADDW0 = 000000          1333
ADDW1 = 000000          1333
ADDW10= 000000          1333
ADDW11= 000000          1333
ADDW12= 000000          1333
ADDW13= 000000          1333
ADDW14= 000000          1333
ADDW15= 000000          1333
ADDW2 = 000000          1333
ADDW3 = 000000          1333
ADDW4 = 000000          1333
ADDW5 = 000000          1333
ADDW6 = 000000          1333
ADDW7 = 000000          1333
ADDW8 = 000000          1333
ADDW9 = 000000          1333
ADEVCT= 000000          1333    1339
ADEVM = 000000          1333    1375
AENV  = 000000          1333    1344
AENVM = 000000          1333    1345
AFATAL= 000000          1333    1336
AMADR1= 000000          1333    1361
AMADR2= 000000          1333    1365
AMADR3= 000000          1333    1368
AMADR4= 000000          1333    1371
AMAMS1= 000000          1333    1355
AMAMS2= 000000          1333    1363
AMAMS3= 000000          1333    1366
AMAMS4= 000000          1333    1369
AMSGAD= 000000          1333    1341
AMSGLG= 000000          1333    1342
AMSGTY= 000000          1333    1335
AMTYP1= 000000          1333    1356
AMTYP2= 000000          1333    1364
AMTYP3= 000000          1333    1367
AMTYP4= 000000          1333    1370
APASS = 000000          1333    1338
APRIOR= 000240          1023*   1333
APTCSU= 000040          6788*   6874
APTENV= 000001          6744    6786*   6820    6867
APTSIZ= 000200          2226    6785*
APTSPO= 000100          6746    6787*   6869
ASWREG= 000000          1333    1346
ATESTN= 000000          1333    1337
AUNIT = 000000          1333    1340
AUSWR = 000000          1333    1347
AVECT1= 000210          1022*   1333    1372
AVECT2= 000000          1333    1373
BADPAR  057216          5777    5791    5903    9025*
BAI   = 000020          1082*
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BA16   = 000400          1067#
BA17   = 001000          1068#
BITCNT  003262          2157#  2941*  2947*  2955*  2971*  4965*  4969*  4975*  4997*  5077*  5081*  5087*  5111*
                        5191*  5195*  5201*  5225*  5297*  5302*  5311*  5332*  5343*  5359*  5370*  5378*  5490*
                        5495*  5504*  5525*  5540*  5556*  5567*  5575*  5694*  5698*  5706*  5729*  5843*  5847*
                        5855*  5878*  5983*  5987*  5995*  6018*  6052*  6067*  6088*  6094*  6102*  7503   7533
BIT0   = 000001          1003#  1064   1097   1116
BIT00  = 000001           993#  1003
BIT01  = 000002           992#  1002
BIT02  = 000004           991#  1001
BIT03  = 000010           990#  1000
BIT04  = 000020           989#   999
BIT05  = 000040           988#   998
BIT06  = 000100           987#   997
BIT07  = 000200           986#   996
BIT08  = 000400           985#   995  6350
BIT09  = 001000           984#   994  6368   6831
BIT1   = 000002          1002#  1098
BIT10  = 002000           983#  1069  1088   1107   1140   1155   1211   1226   6610   6612   6808
BIT11  = 004000           982#  1070  1089   1108   1125   1141   1156   1212   1227   6375
BIT12  = 010000           981#  1072  1090   1109   1142   1213
BIT13  = 020000           980#  1073  1091   1110   1126   1143   1214   6606   6608   6815
BIT14  = 040000           979#  1074  1092   1111   1127   1144   1215   6336
BIT15  = 100000           978#  1075  1076   1093   1112   1128   1145   1216
BIT2   = 000004          1001#  1099  1118
BIT3   = 000010          1000#  1081  1100   1119
BIT4   = 000020           999#  1082  1101   1120   1134   1149   1220   6606   6608
BIT5   = 000040           998#  1083  1102   1121   1135   1150   1221
BIT6   = 000100           997#  1065  1084   1103   1122   1136   1151   1207   1222
BIT7   = 000200           996#  1066  1085   1104   1123   1137   1152   1208   1223
BIT8   = 000400           995#  1067  1086   1105   1124   1138   1153   1209   1224   6610   6612
BIT9   = 001000           994#  1068  1087   1106   1139   1154   1210   1225   6575
BPTVEC= 000014          1010#
BSE    = 000200          1104#  3384  3466   4064   4608
BUFF    055216          2329   2375  2422   2468   2514   2561   2619   2676   2730   2785   2928   3019   3098
                        3179   3260  3339   3421   3499   3620   3703   3790   3893   3997   4101   4206   4332
                        4451   4555  4645   4735   4825   8938#
CALHDR  036006          2615   2672  2726   2781   6555#
CCLR   = 100000         1076#  2326  2349   2372   2395   2419   2442   2465   2488   2511   2534   2558   2581
                        2616   2634  2673   2691   2727   2745   2782   2800   2832   2855   2885   2925   3013
                        3093   3174  3255   3334   3416   3494   3575   3608   3698   3788   3891   3995   4099
                        4201   4282  4327   4408   4446   4527   4553   4618   4643   4708   4733   4798   4823
                        4888   4916  5028   5142   5249   5442   5636   5785   5925   6307
CDT    = 002000         1069#  2333  2343   2379   2389   2426   2436   2472   2482   2518   2528   2565   2575
                        3600   3624
CERR   = 100000         1075#  3571  4278   4404   4523   4606   4696   4786   4876
CFMT   = 010000         1072#  2333  2343   2379   2389   2426   2436   2472   2482   2518   2528   2565   2575
                        2810   2812  3503   3512   3600   3624   5644   5793   5933   6573
CKSWR  = 104407         6335   6804  6830   7493#
CLEAR  = 000005         1049#
COE    = 001000         1106#
CR     = 000015          918#  6913  6923
CRLF   = 000200          919#  2251  6884   6923
CTO    = 004000         1070#
CTRHLT  034570          6306#  7109  7192
CYLN    003300          2165#  3086* 3095   3167*  3176   3248*  3257   3309*  3310   6527   6540
```

```
DCK    = 100000          1112#
DDC    = 000104          8417#  8418   8419#  8420#  8421#  8422#  8423#  8424#  8425#  8426#  8427#  8428#  8429#
                         8430#  8431#  8432#  8433#  8434#  8435#  8436#  8437#  8438#  8439#  8440#  8441#  8442#
                         8443#  8444#  8445#  8446#  8447#  8448#  8449#  8450#  8451#  8452#  8453#  8454#  8455#
                         8456#  8457#  8458#  8459#  8460#  8461#  8462#  8463#  8464#  8465#  8466#  8467#  8468#
                         8469#  8470#  8471#  8472#  8473#  8474#  8475#  8476#  8477#  8478#  8479#  8480#  8481#
                         8482#  8483#  8484#  8485#  8466#
DDISP  = 177570           925#  1306   2214
DDT    = 000400          1124#
DF000    043012          1399   7545#
DF002    043016          1404   7547#
DF003    043042          1410   1416   1422   1428   1434   1440   1446   1452   1458   1464   1470   1476   1482
                         1488   1494   1500   1506   1512   7557#
DF025    043066          1519   1526   1533   1540   1547   1554   1561   1568   1575   1582   1589   1596   7567#
DF041    043112          1602   1608   1614   1620   1626   7577#
DF046    043146          1632   1638   1644   1711   1717   1723   1730   1737   1744   1972   1978   1984   1990
                         1996   2002   7591#
DF051    043172          1650   7601#
DF052    043216          1656   2050   7611#
DF053    043242          1662   1705   7621#
DF054    043266          1668   1674   1680   1686   1692   1698   7631#
DF071    043312          1750   1756   1762   7641#
DF074    043346          1768   1774   1780   1792   1798   1804   1816   1822   1828   1840   1846   1852   1864
                         1870   1876   1888   1894   1900   1912   1918   1924   1936   1942   1948   7655#
DF077    043372          1786   1810   1834   1858   1882   1906   1930   1954   7665#
DF134    043416          1960   1966   2104   7675#
DF144    043442          2008   2014   2020   2026   2032   2038   2044   2056   2062   2068   2074   2080   2086
                         2092   7685#
DF151    043476          2098   7699#
DH000A   044065          7549   7559   7569   7579   7593   7603   7613   7623   7633   7643   7657   7667   7677
                         7687   7701   7758#
DH000B   044103          7551   7561   7571   7581   7595   7605   7615   7625   7635   7645   7659   7669   7679
                         7689   7703   7761#
DH000C   044116          1397   7763#
DH002A   044147          7553   7768#
DH002B   044233          7555   7777#
DH003A   044321          7563   7787#
DH003B   044400          7565   7795#
DH025A   044457          7573   7803#
DH025B   044536          7575   7811#
DH041A   044616          7583   7597   7647   7691   7819#
DH041B   044675          7585   7599   7649   7693   7827#
DH041C   044752          7587   7835#
DH041D   045011          7589   7841#
DH051A   045046          7607   7846#
DH051B   045073          7609   7850#
DH052A   045121          7617   7705   7854#
DH052B   045140          7619   7857#
DH053A   045175          7627   7862#
DH053B   045214          7629   7865#
DH054A   045232          7637   7868#
DH054B   045271          7639   7874#
DH071A   045326          7651   7879#
DH071B   045347          7653   7882#
DH074A   045376          7661   7886#
DH074B   045465          7663   7896#
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DH077A  045551          7671    7905#
DH077B  045600          7673    7909#
DH134A  045624          7681    7913#
DH134B  045650          7683    7917#
DH144A  045676          7695    7921#
DH144B  045775          7697    7932#
DH151A  046072          7707    7943#
DI     = 040000         1074#
DISPLA  001142          1306#   2214#   2222*   6390*   6807*
DISPRE  000174          1164#   1235#   2222
DLT    = 100000         1093#
DMD    = 000040         1135#   2327    2336    2337    2373    2382    2383    2420    2429    2430    2466    2475    2476
                        2512    2521    2522    2559    2568    2569    2617    2624    2625    2674    2681    2682    2728
                        2735    2736    2783    2790    2791    2833    2838    2839    2926    2932    2933    2936    2937
                        2983    3017    3023    3024    3028    3029    3030    3033    3065    3094    3102    3103    3106
                        3107    3175    3183    3184    3187    3188    3256    3264    3265    3268    3269    3335    3343
                        3344    3347    3348    3417    3425    3426    3429    3430    3498    3506    3507    3515    3517
                        3518    3612    3626    3627    3630    3631    3699    3707    3708    3711    3712    3789    3797
                        3798    3806    3808    3809    3857    3892    3900    3901    3909    3911    3912    3960    3996
                        4004    4005    4013    4015    4016    4100    4108    4109    4117    4119    4120    4205    4213
                        4214    4222    4224    4225    4331    4339    4340    4348    4350    4351    4450    4458    4459
                        4467    4469    4470    4554    4562    4563    4566    4567    4599    4600    4644    4652    4653
                        4656    4657    4689    4690    4734    4742    4743    4746    4747    4779    4780    4824    4832
                        4833    4836    4837    4869    4870    4917    4923    4924    4927    4928    4966    5029    5035
                        5036    5039    5040    5078    5143    5149    5150    5153    5154    5192    5250    5256    5257
                        5260    5261    5299    5382    5383    5443    5449    5450    5453    5454    5492    5579    5580
                        5641    5647    5648    5652    5653    5695    5790    5796    5797    5801    5802    5844    5930
                        5936    5937    5941    5942    5984    6620    6637    6638    6651    6652    6678    6679    6691
                        6692    6718    6721    6722    6723    6724    6727    6728    6729    6730
DRA    = 000001         1116#
DRDY   = 000200         1123#
DROT   = 000040         1121#
DRPAR  = 000010         1100#
DRVMSK= 000007          1080#
DSC    = 040000         1127#
DSWR   = 177570          924#   1305    2213
DTE    = 010000         1109#
DTYE   = 000040         1102#
DT000   042456          1398    7502#
DT002   042462          1403    7503#
DT003   042504          1409    1415    1421    1427    1433    1439    1445    1451    1457    1463    1469    1475    1481
                        1487    1493    1499    1505    1511    1518    1525    1532    1539    1546    1553    1560    1567
                        1574    1581    1588    1595    7506#
DT041   042524          1601    1607    1613    1619    1625    7509#
DT046   042554          1631    1637    1643    1710    1716    1722    1729    1736    1743    1971    1977    1983    1989
                        1995    2001    7513#
DT051   042574          1649    7516#
DT052   042606          1655    2049    7518#
DT053   042622          1661    1704    7520#
DT054   042632          1667    1673    1679    1685    1691    1697    7522#
DT071   042646          1749    1755    1761    7524#
DT074   042674          1767    1773    1779    1791    1797    1803    1815    1821    1827    1839    1845    1851    1863
                        1869    1875    1887    1893    1899    1911    1917    1923    1935    1941    1947    7528#
DT077   042716          1785    1809    1833    1857    1881    1905    1929    1953    7531#
DT134   042730          1959    1965    2103    7533#
DT144   042742          2007    2013    2019    2025    2031    2037    2043    2055    2061    2067    2073    2079    2085
```

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                        2091    7535#
DT1S1   043002          2097    7541#
ECCBUF  056216          5251    5313    5398    5444    5506    5535    5595    5931    5996    8939#
ECCGEN  036132          5107    5221    5327    5520    5725    5874    6014    6048    6590#
ECCHI   003266          2159#   5089#   5203#   5308#   5345    5501#   5542    5704#   5853#   5993#   6068    6592    6598
                        6603#   6611    6612#   6613#   6614
ECCLO   003270          2160#   5090#   5204#   5309#   5502#   5705#   5854#   5994#   6602#   6607    6608#   6609#
ECCW  = 020000          1143#   1214#   2983    3065    3515    3806    3857    3909    3960    4013    4117    4222    4348
                        4467    4966    5078    5192    5299    5337    5364    5492    5530    5561    5695    5844    5984
                        6055    6087
ECCXOR  003272          2161#   6594#   6600#   6604
ECC1    053510          4918    4978    8528#
ECC2    053530          5030    5091    8531#
ECC3    053550          5144    5205    8539#
ECH   = 000100          1103#
EMTVEC= 000030          1013#   2197#   2198#
EMW     001310          1401#   4960#   4976#   5072#   5088#   5186#   5202#   5296#   5310#   5342#   5369#   5489#   5503#
                        5539#   5566#   5689#   5710#   5736#   5838#   5859#   5885#   5978#   5999#   6025#   6032#   6063#
                        6066#   6093#   6643#   6657#   6684#   6697#
EMW2    052773          6643    6684    8394#
EMW4    053063          6657    6697    8404#
EM000   046111          1396    7948#
EM300   046156          1407    1413    1419    7955#
EM301   046233          1425    1431    1437    7963#
EM302   046311          1443    1449    1455    7971#
EM303   046370          1461    1467    1473    7979#
EM304   046446          1479    1485    1491    7987#
EM305   046525          1497    1503    1509    7995#
EM306   046605          1516    1523    1530    8004#
EM307   046707          1537    1544    1551    8016#
EM308   047006          1558    1565    1572    8028#
EM309   047106          1579    1586    1593    8040#
EM310   047206          1599    1605    1611    1617    1623    1629    1635    1641    1647    8052#
EM311   047273          1653    1659    8061#
EM312   047342          1665    1671    8068#
EM313   047407          1677    1683    8075#
EM314   047453          1689    1695    8082#
EM315   047522          1702    8089#
EM316   047616          1708    1714    1720    8100#
EM317   047663          1727    1734    1741    8107#
EM318   047761          1747    1753    1759    8119#
EM319   050020          1765    1771    1777    1783    8125#
EM320   050071          1789    1795    1801    1807    8132#
EM321   050155          1813    1819    1825    1831    8141#
EM322   050241          1837    1843    1849    1855    8150#
EM323   050324          1861    1867    1873    1879    8159#
EM324   050417          1885    1891    1897    1903    8169#
EM325   050512          1909    1915    1921    1927    8179#
EM326   050602          1933    1939    1945    1951    8189#
EM327   050670          4960    5072    5186    5296    5489    5689    5838    5978    8198#
EM328   050742          4976    5088    5202    5310    5503    8205#
EM329   051021          1957    8213#
EM330   051072          1963    8220#
EM331   051135          1969    1975    1981    8226#
EM332   051222          1987    1993    1999    8235#
EM333   051307          5342    5539    6066    8244#
```

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EM334   051345          5369    5566    6093    8250#
EM335   051403          2005    2011    2017    2023    2029    2035    2041    8256#
EM336   051457          2047    8264#
EM337   051534          2053    2059    2065    2071    2077    2083    2089    8272#
EM338   051613          5710    5859    5999    6032    8280#
EM339   051701          573(    5885    6025    6063    8290#
EM340   052005          2095    2101    8302#
EM4000  052052          1408    1426    1444    1462    1480    1498    1517    1538    1559    1580    1600    1654    1709
                        1728    1748    1766    1790    1814    1838    1862    1886    1910    1934    1970    1988    2006
                        2048    2054    8309#
EM4001  052070          1414    1432    1450    1468    1486    1504    8312#
EM4002  052111          1420    1438    1456    1474    1492    1510    8315#
EM4003  052132          1524    1545    1566    1587    8318#
EM4004  052162          1531    1552    1573    1594    8322#
EM4005  052212          1606    1715    1735    1754    1772    1796    1820    1844    1868    1892    1916    1940    1976
                        1994    2012    2060    8326#
EM4006  052230          1612    1721    1742    1760    1778    1802    1826    1850    1874    1898    1922    1946    1982
                        2000    2018    2066    8329#
EM4007  052254          1618    2024    2072    8333#
EM4008  052302          1624    2030    2078    8337#
EM4009  052327          1630    8341#
EM4010  052377          1636    8348#
EM4011  052447          1642    8355#
EM4012  052525          1648    8363#
EM4013  052565          1660    1784    1808    1832    1856    1880    1904    1928    1952    8369#
EM4014  052633          1666    1678    1690    2042    2090    8376#
EM4015  052667          1672    1684    1696    2036    2084    8381#
EM4016  052727          1703    8387#
EM4017  052745          1958    1964    2096    2102    8390#
ERRCNT  003250          2152#   2230#   6510#   6513
ERRVEC= 000004          1006#   2211    2212#   2223#   6251#   6252#   6279#   6280#   6341    6342#   6344#   6347#
E.ASOF  003216          2134#
E.BA    003204          2129#   2850#   2861    5398#   5409    5595#   5606    7509    7538
E.CS1   003200          2127#   2343#   2346    2389#   2392    2436#   2439    2482#   2485    2528#   2531    2575#   2578
                        2610#   2622    2631    2667#   2679    2688    2721#   2733    2742    2776#   2788    2797    2810
                        2812#   2847#   2852    2882    2938#   2945    2953    2969    3382#   3385    3464#   3467    3512#
                        3553    3570#   3571#   3579#   3580    3600#   3665    3746#   3749    3803#   3843    3906#   3946
                        4010#   4050    4114#   4154    4219#   4260    4277#   4278#   4286#   4287    4345#   4386    4403#
                        4404#   4412#   4413    4464#   4505    4522#   4523#   4531#   4532    4606#   4609    4622#   4623
                        4696#   4699    4712#   4713    4786#   4789    4802#   4803    4876#   4879    4892#   4893    5389#
                        5400    5586#   5597    6572    7506    7509    7513    7518    7524    7528    7535
E.CS2   003210          2131#   2848#   2858    2873#   2888    2900#   3383#   3388    3465#   3470    3513#   3556    3601#
                        3668    3747#   3752    3804#   3846    3907#   3949    4011#   4053    4115#   4157    4220#   4263
                        4346#   4389    4465#   4508    4607#   4612    4697#   4702    4787#   4792    4877#   4882    5390#
                        5403    5587#   5600    7509    7513    7524    7528    7535
E.DA    003206          2130#   2609#   2621    2666#   2678    2701#   2702    2720#   2732    2755#   2756    2775#   2787
                        3140    3221    3302    5397#   5418    5594#   5615    6541#   6542#   6543    6545#   6546#   6547
                        6549#   6564    6571    7522    7538
E.DB    003222          2136#   2874#   2894    7516
E.DCYL  003220          2135#   2608#   2620    2644#   2645    2647#   2648    2665#   2677    2719#   2731    2774#   2786
                        3143    3224    3305    5396#   5415    5593#   5612    6540#   6550#   6556    7522    7538
E.DS    003212          2132#
E.ECPS  003232          2140#
E.ECPT  003234          2141#   4977#   4994    5108    5222    5329    5522    5726    5875    6015    6049    6105#   6107
                        6614#   6615#   7533    7541
E.ER    003214          2133#   2851#   2867    2891    3384#   3391    3466#   3473    3514#   3559    3569#   3602#   3671
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
                        3748*  3755   3805*  3849   3908*  3952   4012*  4056   4064*  4116*  4160   4168*  4221*
                        4266   4276*  4347*  4392   4402*  4466*  4511   4521*  4608*  4615   4698*  4705   4788*
                        4795   4878*  4885   5391*  5406   5588*  5603   7509   7513   7524   7528   7535
E.MR1     003224        2137*  2983*  2984   3065*  3066   3515*  3563   3806*  3853   3857*  3909*  3956   3960*
                        4013*  4060   4117*  4164   4222*  4270   4348*  4396   4467*  4515   4966*  5078*  5192*
                        5299*  5337*  5364*  5492*  5530*  5561*  5695*  5844*  5984*  6055*  6087*  6620*  6621*
                        6626*  6631*  6636*  6640   6650*  6654   6672*  6677*  6681   6690*  6694   7503   7520
                        7531
E.MR2     003226        2138*  2344*  2352   2390*  2398   2437*  2445   2483*  2491   2529*  2537   2576*  2584
                        2637   2694   2748   2803   6563*  7506
E.MR3     003230        2139*  2345*  2355   2391*  2401   2438*  2448   2484*  2494   2530*  2540   2577*  2587
                        2640   2697   2751   2806   6584*  7506
E.SPAR    003236        2142*
E.WC      003202        2128*  2849*  2864   5399*  5412   5596*  5609   7509   7538
FMTE    = 000020        1101*
GNS     = ****** U      1163   1234   2250   6134   6141   7485   7486   7487   7488   7489   7491   7493   7494
                        7495   7496   7497   7498   7499
GO      = 000001        1064*  3570   4277   4403   4522   4606   4696   4786   4876   5389   5586
GTSWR   = 104406        2245   7491*
HDRCNT    003310        2167*  3516*  3519   3566*  3567   3807*  3856*  3910*  3959*  4014*  4063*  4118*  4167*
                        4223*  4226   4273*  4274   4349*  4352   4399*  4400   4468*  4471   4518*  4519   7528
                        7531
HEADER    003302        2166*  3116   3197   3278   6527*  6528*  6529*  6530*  6531*  6532*  6533*  6534*  6535
                        6536*  6537*  6538   6539*
HEAD1     053364        2956   3042   4938   5050   5164   5270   5463   8486*
HEAD10    053474        4666   4756   4846   8522*
HEAD11    053502        5666   5815   5955   8525*
HEAD2     053372        3357   4576   8489*
HEAD3     053400        3439   8492*
HEAD4     053406        3721   8495*
HEAD5     053414        3802   8498*
HEAD6     053430        3905   8504*
HEAD7     053444        4009   8510*
HEAD8     053460        4113   8516*
HT      = 000011         916*  6882   6923
HVRC    = 000400        1105*  3602   3748   4168   4276   4402   4521   4698   4788   4878
IDAE    = 002000        1107*
IE      = 000100        1065*
ILF     = 000001        1097*
INCHDR    035624        3092   3173   3254   6527*
INTR    = 000300        1060*
IOTVEC  = 000020        1011*  2195*  2196*
IR      = 000100        1084*  2873   2900   3383   3465   3513   3601   3747   3804   3907   4011   4115   4220
                        4346   4465   4607   4697   4787   4877   5390   5587
LF      = 000012         917*  6917   6923
MCLK    = 000400        1138*  1209*  2336   2382   2429   2475   2521   2568   2624   2681   2735   2790   2838
                        2932   3023   3029   3102   3183   3264   3343   3425   3506   3626   3707   3797   3900
                        4004   4108   4213   4339   4458   4562   4599   4652   4689   4742   4779   4832   4869
                        4923   5035   5149   5256   5382   5449   5579   5647   5796   5936   6637   6651   6678
                        6691   6718   6721   6723   6727   6729
MDS     = 001000        1087*
MEMBAS  = 172100        1019*  6181   6193   6219   6254
MEMERR    034526        1182   1253   6229   6290*
MEMPAR    003274        2162*  5763   6182   6194   6220   6253*  6259*  6263*  6274*  6281
MEMVEC  = 000114        1018*  1181   1252   6202*  6229*  6230*  6283*  6284*
MERD    = 001000        1139*  1210*  6721   6729
```

```
MESMSK= 000017  1132#
MEWD  = 002000  1140#  1211#  2983  3065  3515  3806  3857  3909  3960  4013  4117  4222  4348
                4467   4966   5078  5192  5299  5492  5695  5844  5984  6620  6626  6650  6690
MIND  = 000200  1137#  1208#  3028  3029  3030
MOD2BF  055202  5642   5707   5856  8936#
MSP   = 000100  1136#  1207#  2936  3106  2187  3268  3347  3429  3517  3630  3711  3808  3911
                4015   4119   4224  4350  4469  4566  4656  4746  4836  4927  5039  5153  5260
                5453   5652   5801  5941
M1.BIT  003256  2155#  2940#  2960#  2977#  3035#  3046#  3059#  3109#  3120#  3133#  3190#  3201#  3214#
                3271#  3282#  3295#  3350#  3361#  3374#  3432#  3443#  3456#  3522#  3532#  3545#  3633#
                3644#  3657#  3714#  3725#  3738#  3811#  3821#  3835#  3914#  3924#  3938#  4018#  4028#
                4042#  4122#  4132#  4146#  4229#  4239#  4252#  4355#  4365#  4378#  4474#  4484#  4497#
                4569#  4580#  4593#  4659#  4670#  4683#  4749#  4760#  4773#  4839#  4850#  4863#  4930#
                4941#  4954#  4963#  4982   4983#  5042#  5053#  5066#  5075#  5095   5096#  5156#  5167#
                5180#  5189#  5209   5210#  5263#  5274#  5287#  5294#  5316   5317#  5348   5349#  5372
                5373#  5456#  5467#  5480#  5487#  5509   5510#  5545   5546#  5569   5570#  5656#  5670#
                5683#  5692#  5712   5713#  5805#  5819#  5832#  5841#  5861   5862#  5945#  5959#  5972#
                5981#  6001   6002#  6035   6036#  6072   6073#  6096   6097#  6624   6670   6675   6716
                7503
M2.BIT  003260  2156#  4964#  4982#  5076#  5095#  5190#  5209#  5295#  5316#  5348#  5372#  5488#  5509#
                5545#  5569#  5693#  5712#  5842#  5861#  5982#  6001#  6035#  6072#  6096#  6629   6634
                7503
NED   = 010000  1090#
NEM   = 004000  1089#
NEWPAS  004316  2307#
NPRBUF  053154  2835   2850   2870   8417#
NXF   = 000004  1099#
OFFSET= 000015  1053#
OFST  = 000004  1118#
OPI   = 020000  1110#  3569   4276   4402   4521
OPI1    053574  3511   8549#
OPI2    054074  4218   8645#
OPI3    054374  4344   8741#
OPI4    054674  4463   8837#
OPR001  043522  2257   7711#
OPR002  043551  2260   2271   2287   7715#
OPR003  043557  2267   7717#
OPR004  043607  2278   7722#
OPR005  043631  6308   7726#
OPR006  043671  2254   7732#
OR    = 000200  1085#  2848   2873   3383   3465   3513   3601   3747   3804   3907   4011   4115   4220
                4346   4465   4607   4697
PACK  = 000003  1048#
PARCHK  034366  2307   6251#  7446
PARM    003314  1170   1241   2171#
PAR.EN= 000001  1020#  6198   6224   6257
PAT   = 000020  1134#
PCA   = 004000  1141#  1212#  6621   6636   6672
PCD   = 010000  1142#  1213#  6621   6631   6677
PGE   = 002000  1088#
PIP   = 020000  1126#
PIRQ  = 177772   923#
PIRQVE= 000240  1017#
PR.BIT  003254  2154#  2939#  2950#  2960   2963#  2966#  2977   2978#  3034#  3040#  3046   3049#  3052#
                3059   3060#  3108#  3114#  3120   3123#  3126#  3133   3134#  3189#  3195#  3201   3204#
                3207#  3214   3215#  3270#  3276#  3282   3285#  3288#  3295   3296#  3349#  3355#  3361
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                    3364*  3367*  3374   3375*  3431*  3437*  3443   3446*  3449*  3456   3457*  3521*  3527*
                    3532   3535*  3538*  3545   3546*  3632*  3638*  3644   3647*  3650*  3657   3658*  3713*
                    3719*  3725   3728*  3731*  3738   3739*  3810*  3816*  3821   3824*  3827*  3835   3836*
                    3913*  3919*  3924   3927*  3930*  3938   3939*  4017*  4023*  4028   4031*  4034*  4042
                    4043*  4121*  4127*  4132   4135*  4138*  4146   4147*  4228*  4234*  4239   4242*  4245*
                    4252   4253*  4354*  4360*  4365   4368*  4371*  4378   4379*  4473*  4479*  4484   4487*
                    4490*  4497   4498*  4568*  4574*  4580   4583*  4586*  4593   4594*  4658*  4664*  4670
                    4673*  4676*  4683   4684*  4748*  4754*  4760   4763*  4766*  4773   4774*  4838*  4844*
                    4850   4853*  4856*  4863   4864*  4929*  4935*  4941   4944*  4947*  4954   4955*  4962*
                    4983   4984*  5041*  5047*  5053   5056*  5059*  5066   5067*  5074*  5096   5097*  5155*
                    5161*  5167   5170*  5173*  5180   5181*  5188*  5210   5211*  5262*  5268*  5274   5277*
                    5280*  5287   5288*  5293*  5317   5318*  5349   5350*  5373   5374*  5455*  5461*  5467
                    5470*  5473*  5480   5481*  5486*  5510   5511*  5546   5547*  5570   5571*  5655*  5663*
                    5670   5673*  5676*  5683   5684*  5691*  5713   5714*  5804*  5812*  5819   5822*  5825*
                    5832   5833*  5840*  5862   5863*  5944*  5952*  5959   5962*  5965*  5972   5973*  5980*
                    6002   6003*  6036   6037*  6073   6074*  6097   6098*  6622   6714   7503
PR0     = 000000     940*   2308   6231
PR1     = 000040     941*
PR2     = 000100     942*
PR3     = 000140     943*
PR4     = 000200     944*
PR5     = 000240     945*   1023   2146
PR6     = 000300     946*
PR7     = 000340     947*   1183   1254   2182   6230   6252   7429   7443
PS      = 177776     920*    921
PSW     = 177776     921*
PWRVEC= 000024      1012*  2201*  2202*  7428*  7429*  7442*  7443*
P1.BIT  003252      2153*  4961*  4972*  4984   4987*  4990*  5073*  5084*  5097   5100*  5103*  5187*  5198*
                    5211   5214*  5217*  5292*  5305*  5318   5321*  5324*  5350   5353*  5356*  5374   5375*
                    5485*  5498*  5511   5514*  5517*  5547   5550*  5553*  5571   5572*  5690*  5701*  5714
                    5718*  5721*  5839*  5850*  5863   5867*  5870*  5979*  5990*  6003   6007*  6010*  6037
                    6041*  6044*  6074   6077*  6080*  6098   6099*  6590   6627   6668   7503
RDBIT   037026      2943   2951   2967   2979   3037   3041   3053   3061   3111   3115   3127   3135   3192
                    3196   3208   3216   3273   3277   3289   3297   3352   3356   3368   3376   3434   3438
                    3450   3458   3524   3528   3539   3547   3635   3639   3651   3659   3716   3720   3732
                    3740   3813   3817   3828   3837   3916   3920   3931   3940   4020   4024   4035   4044
                    4124   4128   4139   4148   4231   4235   4246   4254   4357   4361   4372   4380   4476
                    4480   4491   4499   4571   4575   4587   4595   4661   4665   4677   4685   4751   4755
                    4767   4775   4841   4845   4857   4865   4932   4936   4948   4956   5044   5048   5060
                    5068   5158   5162   5174   5182   5265   5269   5281   5289   5458   5462   5474   5482
                    5659   5664   5677   5685   5808   5813   5826   5834   5948   5953   5966   5974   6714*
RDCHR = 104410      7268   7494*
RDDATA= 000021      1055*  2333   2343   2472   2482   2610   2667   2721   2776   4739   4786
RDGATE= 100000      1145*  1216*  6621
RDHEAD= 000025      1057*
RDLIN = 104411      7342   7495*
RDOCT = 104412      2261   2272   2288   7496*
RDY     = 000200    1066*  3571   3579   4278   4286   4404   4412   4523   4531   4606   4696   4786   4876
                    5389   5586
RECAL = 000013      1052*
RESREG= 104414      6509   7498*
RESTRT  003324      1168   1239   2174*
RESVEC= 000010      1007*
RKASOF= 000016      1035*
RKBA    = 000004    1030*  2329*  2375*  2422*  2468*  2514*  2561*  2619*  2676*  2730*  2785*  2835*  2845
                    2928*  3019*  3098*  3179*  3260*  3339*  3421*  3499*  3620*  3703*  3790*  3893*  3997*
```

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                    4101*  4206*  4332*  4451*  4555*  4645*  4735*  4825*  4918*  5030*  5144*  5251*  5394
                    5444*  5591   5642*  5791*  5931*
RKCS1  = 000000     1028*  2326*  2333*  2340   2349*  2372*  2379*  2386   2395*  2419*  2426*  2433   2442*
                    2465*  2472*  2479   2488*  2511*  2518*  2525   2534*  2558*  2565*  2572   2581*  2616*
                    2622*  2628   2634*  2673*  2679*  2685   2691*  2727*  2733*  2739   2745*  2782*  2788*
                    2794   2800*  2832*  2836*  2842   2855*  2879   2885*  2925*  2929*  2944   2952   2968
                    3013*  3020*  3093*  3099*  3174*  3180*  3255*  3261*  3334*  3340*  3379   3416*  3422*
                    3461   3494*  3503*  3550   3575*  3576   3608*  3624*  3662   3698*  3704*  3743   3788*
                    3794*  3840   3891*  3897*  3943   3995*  4001*  4047   4099*  4105*  4151   4201*  4210*
                    4257   4282*  4283   4327*  4336*  4383   4408*  4409   4446*  4455*  4502   4527*  4528
                    4553*  4559*  4603   4618*  4619   4643*  4649*  4693   4708*  4709   4733*  4739*  4783
                    4798*  4799   4823*  4829*  4873   4888*  4889   4916*  4920*  5028*  5032*  5142*  5146*
                    5249*  5253*  5386   5442*  5446*  5583   5636*  5644*  5785*  5793*  5925*  5933*  6307*
RKCS2  = 000010     1032*  2332*  2378*  2425*  2471*  2517*  2564*  2843   2880   2989   3380   3462   3551
                    3577   3663   3744   3841   3944   4048   4152   4258   4284   4384   4410   4503   4529
                    4604   4620   4694   4710   4784   4800   4874   4890   5387   5584
RKDA   = 000006     1031*  2331*  2377*  2424*  2470*  2516*  2563*  2621*  2678*  2732*  2787*  3096*  3138
                    3177*  3219   3258*  3300   3337*  3419*  3502*  3622*  3701*  3792*  3895*  3999*  4103*
                    4209*  4335*  4454*  4558*  4648*  4738*  4828*  5393   5590
RKDB   = 000024     1037*  2875
RKDCYL= 000020      1036*  2330*  2376*  2423*  2469*  2515*  2562*  2620*  2677*  2731*  2786*  3095*  3139
                    3176*  3220   3257*  3301   3336*  3418*  3501*  3623*  3700*  3793*  3896*  4000*  4104*
                    4208*  4334*  4453*  4557*  4647*  4737*  4827*  5392   5589
RKDS   = 000012     1033*
RKECPS= 000030      1041*
RKECPT= 000032      1042*  4993   5106   5220   5328   5521   5724   5873   6013   6047   6106
RKER   = 000014     1034*  2846   2881   2990   3381   3463   3552   3578   3664   3745   3842   3945   4049
                    4153   4259   4285   4385   4411   4504   4530   4605   4621   4695   4711   4785   4801
                    4875   4891   5388   5585
RKMR1  = 000026     1038*  2327*  2336*  2337*  2373*  2382*  2383*  2420*  2429*  2430*  2466*  2475*  2476*
                    2512*  2521*  2522*  2559*  2568*  2569*  2617*  2624*  2625*  2674*  2681*  2682*  2728*
                    2735*  2736*  2783*  2790*  2791*  2833*  2838*  2839*  2926*  2932*  2933*  2936*  2937*
                    2982   3017*  3023*  3024*  3028*  3029*  3030*  3033*  3064   3094*  3102*  3103*  3106*
                    3107*  3175*  3183*  3184*  3187*  3188*  3256*  3264*  3265*  3268*  3269*  3335*  3343*
                    3344*  3347*  3348*  3417*  3425*  3426*  3429*  3430*  3498*  3506*  3507*  3517*  3518*
                    3562   3612*  3626*  3627*  3630*  3631*  3699*  3707*  3708*  3711*  3712*  3789*  3797*
                    3798*  3808*  3809*  3852   3892*  3900*  3901*  3911*  3912*  3955   3996*  4004*  4005*
                    4015*  4016*  4059   4100*  4108*  4109*  4119*  4120*  4163   4205*  4213*  4214*  4224*
                    4225*  4269   4331*  4339*  4340*  4350*  4351*  4395   4450*  4458*  4459*  4469*  4470*
                    4514   4554*  4562*  4563*  4566*  4567*  4599*  4600*  4644*  4652*  4653*  4656*  4657*
                    4689*  4690*  4734*  4742*  4743*  4746*  4747*  4779*  4780*  4824*  4832*  4833*  4836*
                    4837*  4869*  4870*  4917*  4923*  4924*  4927*  4928*  5029*  5035*  5036*  5039*  5040*
                    5143*  5149*  5150*  5153*  5154*  5250*  5256*  5257*  5260*  5261*  5382*  5383*  5443*
                    5449*  5450*  5453*  5454*  5579*  5580*  5641*  5647*  5648*  5652*  5653*  5790*  5796*
                    5797*  5801*  5802*  5930*  5936*  5937*  5941*  5942*  6637*  6638*  6639   6651*  6652*
                    6653   6678*  6679*  6680   6691*  6692*  6693   6718*  6721*  6722*  6723*  6724*  6727*
                    6728*  6729*  6730*
RKMR2  = 000034     1039*  2341   2387   2434   2480   2526   2573   2629   2686   2740   2795
RKMR3  = 000036     1040*  2342   2388   2435   2481   2527   2574   2630   2687   2741   2796
RKPRI  = 003242     2146*  2304*
RKSPAR= 000022      1043*
RKVEC  = 003240     2145*  2302*  2303*
RKWC   = 000002     1029*  2328*  2374*  2421*  2467*  2513*  2560*  2618*  2675*  2729*  2784*  2834*  2844
                    2927*  3018*  3097*  3178*  3259*  3338*  3420*  3500*  3621*  3702*  3791*  3894*  3998*
                    4102*  4207*  4333*  4452*  4556*  4646*  4736*  4826*  4919*  5031*  5145*  5252*  5395
                    5445*  5592   5643*  5792*  5932*
```

```
RLS    = 000010          1081#
SAVREG= 104413           6456    7497#
SAVSWR  003312           2168#   7427*   7447
SCLR   = 000040          1083#
SCOP1  = 104415          2643    2700    2754    2809    3146    3227    3308    3674    7499#
SCOP1$  035302           6439#   7499
SECTOR  003276           2163#   3087*   3096    3147*   3148    3168*   3177    3249*   3258    6533    6541
SEEK   = 000017          1054#
SELDRV= 000001           1047#
SKI    = 000002          1098#
SPACE2  043751           6492    6504    7741#
SPAR   = 020000          1073#
SPDLSS= 000020           1120#
SRTFLG  003246           2148#   2171*   2174*   2177*   2255
SRTSPL= 000011           1051#
STACK  = 001100           911#   2180    2193    6298    6309    6520    6708    7444
START   OC3334           1167    1238    2177#
START1  003340           2172    2175    2178#   6318
STKLMT= 177774            922#
SVAL   = 100000          1128#
SWR     001140           1305#   2191    2213*   2215    2221*   2228*   2243    6294    6336    6350    6353    6368    6375
                         6439    6511    6646    6661    6688    6701    6808    6815    6827    6831    7112    7151    7206*
                         7427    7447*
SWREG   000176           1165#   1236#   2221    2243    7112    7151    7174
SW0    = 000001           975#
SW00   = 000001           965#    975
SW01   = 000002           964#    974
SW02   = 000004           963#    973
SW03   = 000010           962#    972
SW04   = 000020           961#    971
SW05   = 000040           960#    970
SW06   = 000100           959#    969
SW07   = 000200           958#    968
SW08   = 000400           957#    967
SW09   = 001000           956#    966
SW1    = 000002           974#
SW10   = 002000           955#
SW11   = 004000           954#
SW12   = 010000           953#    6511
SW13   = 020000           952#
SW14   = 040000           951#
SW15   = 100000           950#
SW2    = 000004           973#
SW3    = 000010           972#
SW4    = 000020           971#
SW5    = 000040           970#
SW6    = 000100           969#
SW7    = 000200           968#
SW8    = 000400           967#
SW9    = 001000           966#    6294    6439    6646    6661    6688    6701
S.CLR  = 000400          1153#   1224#   2483    2529    2576
S.FMT  = 001000          1154#   1225#   2344    2390    2437    2483    2529    2576
S.PACK= 004000           1156#   1227#
S.RECL= 000040           1150#   1221#
S.RTC  = 000200          1152#   1223#   2390
S.SEEK= 000020           1149#   1220#   2344    2390    2437
```

```
S.STSP= 000100           1151#  1222#
S.UNLD= 002000           1155#  1226#
TBITVE= 000014           1008#
TKVEC = 000060           1015#  7089*  7090*
TPVEC = 000064           1016#
TRACK   003277           2164#  3228*  3229   6529
TRAPPC  003244           2147#  6291*  7502
TRAPVE= 000034           1014#  2199*  2200*
TRTVEC= 000014           1009#
TSTBY1  044041           5769   7751#
TSTBY2  044051           5772   7753#
TST1    004334           2309   2323#  6157   6395
TST10   006446           2662#  6402
TST11   006716           2716#  6403
TST12   007166           2771#  6404
TST13   007442           2811   2829#  6405
TST14   010112           2856   2886   2922#  6406
TST15   010536           2985   2987   3010#  6407
TST16   011076           3067   3083#  6408
TST17   011470           3164#  6409
TST2    004566           2350   2356   2369#  6396
TST20   012064           3245#  6410
TST21   012460           3331#  6411
TST22   013054           3392   3413#  6412
TST23   013450           3474   3491#  6413
TST24   014236           3581   3597#  6414
TST25   014726           3676   3695#  6415
TST26   015322           3756   3785#  6416
TST27   015774           3859   3888#  6417
TST3    005020           2396   2402   2416#  6397
TST30   016446           3962   3992#  6418
TST31   017120           4066   4096#  6419
TST32   017572           4170   4198#  6420
TST33   020360           4288   4324#  6421
TST34   021146           4414   4443#  6422
TST35   021734           4533   4550#  6423
TST36   022424           4624   4640#  6424
TST37   023114           4714   4730#  6425
TST4    005252           2443   2449   2462#  6398
TST40   023604           4804   4820#  6426
TST41   024274           4894   4913#  6427
TST42   025010           5025#  6428
TST43   025534           5139#  6429
TST44   026260           5245#  6430
TST45   027516           5419   5438#  6431
TST46   030766           5616   5632#  6432
TST47   031552           5760#  6433
TST5    005502           2489   2495   2508#  6399
TST50   032424           5773   5900#  6434
TST51   032454           5920#  6435
TST6    005732           2535   2541   2555#  6400
TST7    006162           2582   2588   2605#  6401
TYPDS = 104405           6138   6145   7489#
TYPE  = 104401           2237   2254   2257   2260   2267   2271   2278   2297   5769   5772   6132   6139   6146
                         6308   6468   6469   6473   6474   6481   6492   6494   6504   6505   6507   6515   6810
                         6818   6887   6983   7058   7106   7118   7172   7173   7176   7187   7197   7208   7227
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                    7275   7281   7286   7290   7295   7296   7298   7301   7305   7371   7373   7445   7485#
TYPERR  035326      6456#  6817
TYPOC = 104402      2259   2270   2286   5771   6489   7175   7486#
TYPON = 104404      7488#
TYPOS = 104403      7487#
T.ASOF  003156      2115#
T.BA    003144      2110#  2845*  2861   5394*  5409   5591*  5606   7509   7538
T.CS1   003140      2108#  2340*  2346   2386*  2392   2433*  2439   2479*  2485   2525*  2531   2572*  2578
                    2628*  2631   2685*  2688   2739*  2742   2794*  2797   2842*  2852   2879*  2882   2944*
                    2945   2952*  2953   2968*  2969   3379*  3385   3461*  3467   3550*  3553   3576*  3580
                    3662*  3665   3743*  3749   3840*  3843   3943*  3946   4047*  4050   4151*  4154   4257*
                    4260   4283*  4287   4383*  4386   4409*  4413   4502*  4505   4528*  4532   4603*  4609
                    4619*  4623   4693*  4699   4709*  4713   4783*  4789   4799*  4803   4873*  4879   4889*
                    4893   5386*  5400   5583*  5597   7506   7509   7513   7518   7524   7528   7535
T.CS2   003150      2112#  2843*  2858   2880*  2888   2989*  3380*  3388   3462*  3470   3551*  3556   3577*
                    3663*  3668   3744*  3752   3841*  3846   3944*  3949   4048*  4053   4152*  4157   4258*
                    4263   4284*  4384*  4389   4410*  4503*  4508   4529*  4604*  4612   4620*  4694*  4702
                    4710*  4784*  4792   4800*  4874*  4882   4890*  5387*  5403   5584*  5600   7509   7513
                    7518   7524   7528   7535
T.DA    003146      2111#  3138*  3140   3219*  3221   3300*  3302   5393*  5418   5590*  5615   7522   7538
T.DB    003162      2117#  2875*  2894   7516
T.DCYL  003160      2116#  3139*  3143   3220*  3224   3301*  3305   5392*  5415   5589*  5612   7522   7538
T.DS    003152      2113#
T.ECPS  003172      2121#
T.ECPT  003174      2122#  4993*  4994   5106*  5108   5220*  5222   5328*  5329   5521*  5522   5724*  5726
                    5873*  5875   6013*  6015   6047*  6049   6106*  6107   7533   7541
T.ER    003154      2114#  2846*  2867   2881*  2891   2990*  3381*  3391   3463*  3473   3552*  3559   3578*
                    3664*  3671   3745*  3755   3842*  3849   3945*  3952   4049*  4056   4153*  4160   4259*
                    4266   4285*  4385*  4392   4411*  4504*  4511   4530*  4605*  4615   4621*  4695*  4705
                    4711*  4785*  4795   4801*  4875*  4885   4891*  5388*  5406   5585*  5603   7509   7513
                    7518   7524   7528   7535
T.MR1   003164      2118#  2982*  2984   3064*  3066   3562*  3563   3852*  3853   3955*  3956   4059*  4060
                    4163*  4164   4269*  4270   4395*  4396   4514*  4515   6639*  6640   6653*  6654   6680*
                    6681   6693*  6694   7503   7520   7531
T.MR2   003166      2119#  2341*  2352   2387*  2398   2434*  2445   2480*  2491   2526*  2537   2573*  2584
                    2629*  2637   2686*  2694   2740*  2748   2795*  2803   7506
T.MR3   003170      2120#  2342*  2355   2388*  2401   2435*  2448   2481*  2494   2527*  2540   2574*  2587
                    2630*  2640   2687*  2697   2741*  2751   2796*  2806   7506
T.SPAR  003176      2123#
T.WC    003142      2109#  2844*  2864   5395*  5412   5592*  5609   7509   7538
UFE     = 000400    1086#
UNLOAD= 000007      1050#
UNS     = 040000    1111#
UPE     = 020000    1091#
VRCHDR  055174      3613#  3614   3616*  3619*  3640   7527   8933#
VV      = 000100    1122#
WCE     = 040000    1092#
WLE     = 004000    1108#
WRDATA= 000023      1056#  2379   2389   2518   2528   2836   2847   2929   2938   3020   3099   3180   3261
                    3340   3382   3422   3464   3503   3512   3600   3624   3704   3746   3794   3803   3897
                    3906   4001   4010   4105   4114   4210   4219   4336   4345   4455   4464   4559   4606
                    4649   4696   4920   5032   5146   5253   5389   5446   5586   5644   5793   5933
WRDCNT  003264      2158#  2872*  2897*  7516
WRHEAD= 000027      1058#
WRL     = 004000    1125#
WRTBIT  036300      4967   4973   4991   5079   5085   5104   5193   5199   5219   5300   5306   5325   5357
```

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                        5376    5493    5499    5518    5554    5573    5696    5702    5722    5845    5851    5871    5985
                        5991    6011    6045    6081    6100    6620*
WRTCHK= 000031          1059*   2426    2436    2565    2575    4829    4876
WRTCAT= 040000          1144*   1215*   2983    3857    3960    4966    5078    5192    5299    5492    5695    5844    5984
                        6620
WRTPAR  034102          5775    6179*
WR.PAR= 000005          1021*   6186
$APTHD  001000          1194    1200*   1265    1271*
$ASTAT= ****** U        6766    6781
$ATYC   037162          6737    6739*
$ATY1   037136          6735*
$ATY3   037144          6736*   6872
$ATY4   037154          6738*   6823
$AUTOB  001134          1302*   2247*   7165    7322
$BASE   001270          1374*   2258    2266*   2305    2325    2371    2418    2464    2510    2557    2607    2664    2718
                        2773    2831    2924    3012    3085    3166    3247    3333    3415    3493    3599    3697    3787
                        3890    3994    4098    4200    4326    4445    4552    4642    4732    4822    4915    5027    5141
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        8477   8478  8479  8480  8481  8482  8483  8484  8485
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        5617   5697  5703  5723  5728  5846  5852  5872  5877  5986  5992  6012  6017  6046  6051
        6082   6101  6109  6292
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GETPRI  1018#
GETSWR  1018#  2238#
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HDRGEN  1278#  2607  2664  2718  2773
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LDLPER  1278#  2611  2668  2722  2777  3088  3169  3250  3604
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        4717#  4719  4807#  4809  4900#  4902  5003#  5005  5117#  5119  5231#  5233  5424#  5426  5620#
        5622   5743#  5745  5893#  5895  5907#  5909
MULT    1018#
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SEKMSG  1278#  2325  2371  2418
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SETTRA  7477#  7486  7487  7488  7489  7491  7493  7494  7495  7496  7497  7498  7499
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SLASH   1018#
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. ABS. 057232 000

ERRORS DETECTED: 0

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RUN-TIME: 31 26 2 SECONDS
RUN-TIME RATIO: 1188/60=19.6
CORE USED: 34K (67 PAGES)

DOCUMENT PAGES: 187