RK611

DISKLESS CONT. NO. 4

MD-11-DZR6D-A

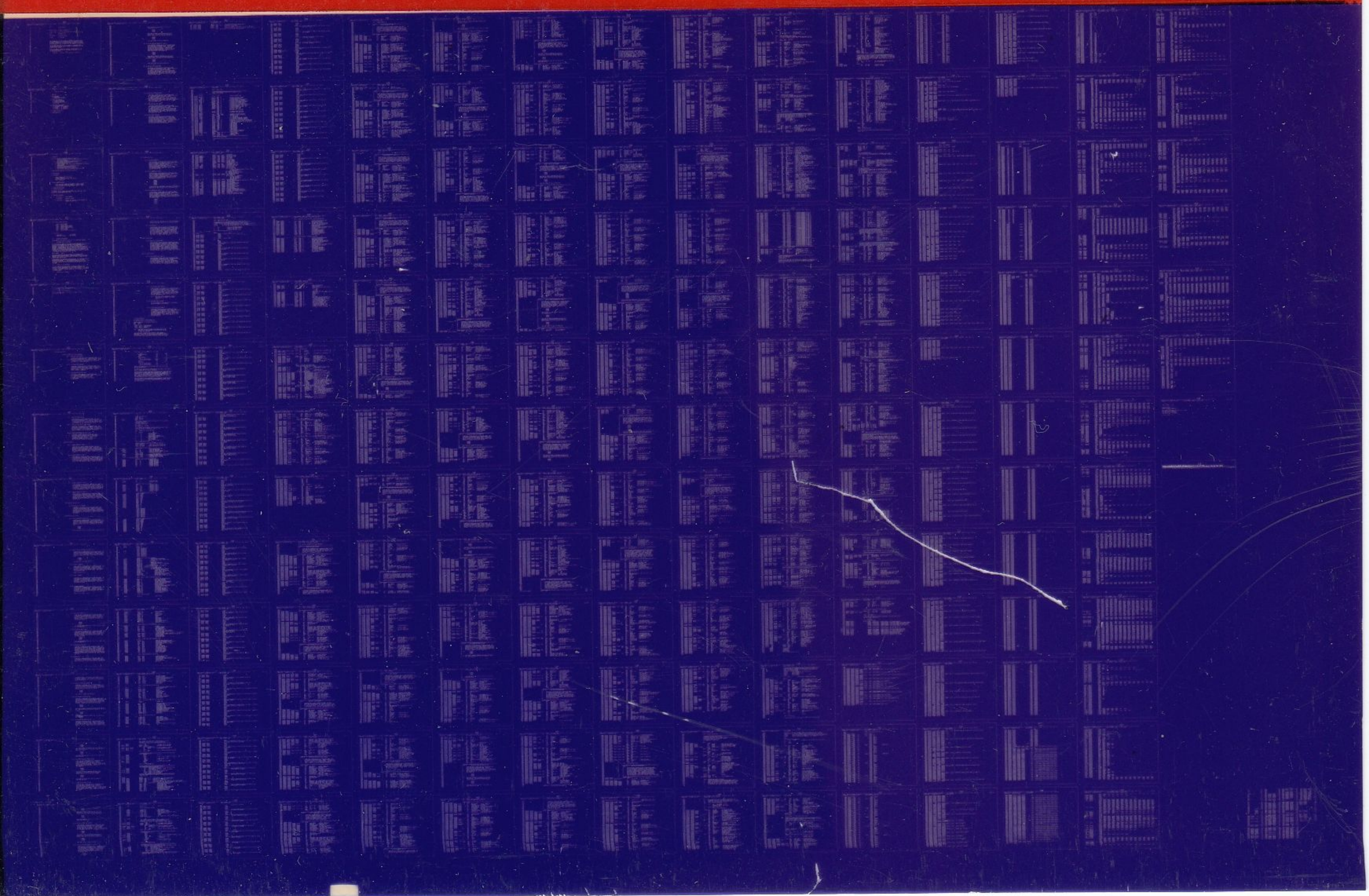
EP-DZR6D-A-DL-A

FICHE 1 OF 1

DEC 1976

digital

MADE IN USA



```
.REM    %
```

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZR6D-A-D

PRODUCT NAME: RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 4

DATE: DECEMBER, 1976

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: ROY SPITZER

TABLE OF CONTENTS

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 (DZR6A)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 2 (DZR6B)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3 (DZR6C)

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
                                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
```

```
161
162                     IF ↑S IS TYPED AT ANY TIME THE PROGRAM WILL GO INTO A STALL LOOP
163                     UNTIL A CONTROL Q (↑Q) IS TYPED.
164
165                     4.4     CONTROL Q (↑Q) OPERATION
166
167                     IF A ↑S HAS BEEN TYPED, TYPING THE ↑Q CANCELS THE STALL
168                     INITIATED BY THE ↑S.
169
```

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, 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 CONTROLLER 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.
```

```
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
```

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.

```
681
682
683                                        **ECC GENERATION TESTS
684
685
686                                              TEST 41 ECC INITIALIZATION
687
688                                                   CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
689                                                   PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
690                                                   DATA OF 10 WORDS TO AN RK06, IN 26 SECTOR
691                                                   FORMAT, CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
692                                                   SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
693                                                   A SECTOR PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY FO
694                                                   DATA WORDS OF ZEROES.  MAKE SURE THE ECC PATTERN
695                                                   REGISTER REMAINS ZERO.
696
697
698                                              TEST 42 ECC GENERATION (PART 1)
699
700                                                   CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
701                                                   PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
702                                                   DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
703                                                   FORMAT, CYLINER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
704                                                   SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
705                                                   PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY THE
706                                                   FOLLOWING SIX WORDS OF DATA:
707
708                                                        005001
709                                                        040040
710                                                        020004
711                                                        000064
712                                                        000000
713                                                        000000
714
715                                                   CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
716                                                   GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.
717
718
719                                         TEST 43 ECC GENERATION (PART 2)
720
721                                                   CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
722                                                   PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
723                                                   DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
724                                                   FORMAT, CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
725                                                   SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
726                                                   AND A GOOD HEADER.  CLOCK THROUGH ONLY THE FOLLOWING
727                                                   SIX WORDS OF DATA:
728
729                                                        177777
730                                                        177777
731                                                        177777
732                                                        177777
733                                                        177777
734                                                        177777
735
736
```

```
                                        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.

```
                                .
                                .NLIST  CND,MD,MC,TOC
                                .LIST   ME
                                .ENABL  ABS,AMA
167400                          $SWR=   167400
000001                          $TN=    1
                                .TITLE  RK611 DISKLESS CONTROLLER DIAGNOSTIC: P4 MD-11-DZR6DA
                                ;*COPYRIGHT (C) 1976
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY ROY SPITZER
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C2), SEPT 14, 1976.
                                ;*
                                .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
```

```
                        ;
                        ;BASIC DEFINITIONS
                        ;
000006                  SP=     %6              ;;STACK POINTER
000007                  PC=     %7              ;;PROGRAM COUNTER
                        ;
                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
000140                  PR3=    140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6=    300             ;;PRIORITY LEVEL 6
000340                  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
```

```
                        PACK=   03              ;PACK ACKNOWLEDGE
                        CLEAR=  05              ;DRIVE CLEAR
                        UNLOAD= 07              ;UNLOAD
                        SRTSPL= 11              ;START SPINDLE
                        RECAL=  13              ;RECALIBRATE
                        OFFSET= 15              ;OFFSET
                        SEEK=   17              ;SEEK
                        RDDATA= 21              ;READ DATA
                        WRDATA= 23              ;WRITE DATA
                        RDHEAD= 25              ;READ HEADER
                        WRHEAD= 27              ;WRITE HEADER AND DATA
                        WRTCHK= 31              ;WRITE CHECK
                        INTR=   300             ;GENERATE INTERRUPT TO CPU

                        .SBTTL  CONTROL AND STATUS REGISTER 1 BITS

                        GO=     BIT0            ;GO BIT
                        IE=     BIT6            ;INTERRUPT ENABLE
                        RDY=    BIT7            ;CONTROLLER READY
                        BA16=   BIT8            ;BUS ADDRESS BIT 16
                        BA17=   BIT9            ;BUS ADDRESS BIT 17
                        CDT=    BIT10           ;CONTROLLER DRIVE TYPE (0=RK06)
                        CTO=    BIT11           ;CONTROLLER TIMED OUT WAITING FOR
                                                ;  DRIVE RESPONSE
                        CFMT=   BIT12           ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
                        SPAR=   BIT13           ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
                        DI=     BIT14           ;DRIVE INTERRUPT
                        CERR=   BIT15           ;CONTROLLER ERROR
                        CCLR=   BIT15           ;CONTROLLER CLEAR

                        .SBTTL  CONTROL AND STATUS REGISTER 2 BITS

                        DRVMSK= 7               ;MASK FOR DRIVE SELECTION CODE
                        RLS=    BIT3            ;DESELECT OR RELEASE DRIVE IN BITS 0-2
                        BAI=    BIT4            ;BUS ADDRESS INCREMENT INHIBIT
                        SCLR=   BIT5            ;CLEAR CONTROLLER AND ALL DRIVES
                        IR=     BIT6            ;INPUT READY
                        OR=     BIT7            ;OUTPUT READY
                        UFE=    BIT8            ;UNIT FIELD ERROR
                        MDS=    BIT9            ;MULTIPLE DRIVE SELECT
                        PGE=    BIT10           ;PROGRAMMING ERROR
                        NEM=    BIT11           ;NON-EXISTENT MEMORY
                        NED=    BIT12           ;NON-EXISTENT DRIVE
                        UPE=    BIT13           ;UNIBUS PARITY ERROR
                        WCE=    BIT14           ;WRITE CHECK ERROR
                        DLT=    BIT15           ;DATA LATE ERROR

                        .SBTTL  ERROR REGISTER BIT DEFINITION

                        ILF=    BIT0            ;ILLEGAL FUNCTION CODE
                        SKI=    BIT1            ;SEEK INCOMPLETE
                        NXF=    BIT2            ;NON-EXECUTABLE DRIVE FUNCTION
                        DRPAR=  BIT3            ;DRIVE DETECTED DRIVE BUS PARITY ERROR
                        FMTE=   BIT4            ;FORMAT ERROR
                        DTYE=   BIT5            ;DRIVE TYPE ERROR
                        ECH=    BIT6            ;ECC HARD
```

```
1101            000200          BSE=    BIT7                    ;BAD SECTOR ERROR
1102            000400          HVRC=   BIT8                    ;HEADER VRC ERRROR
1103            001000          COE=    BIT9                    ;CYLINDER ADDRESS OVERFLOW ERROR
1104            002000          IDAE=   BIT10                   ;INVALID DISK ADDRESS ERROR
1105            004000          WLE=    BIT11                   ;WRITE LOCK ERROR
1106            010000          DTE=    BIT12                   ;DRIVE TIMING ERROR
1107            020000          OPI=    BIT13                   ;OPERATION (SEARCH) INCOMPLETE
1108            040000          UNS=    BIT14                   ;DRIVE UNSAFE
1109            100000          DCK=    BIT15                   ;DATA CHECK
1110
1111                            .SBTTL  STATUS REGISTER BIT DEFINITION
1112
1113            000001          DRA=    BIT0                    ;DRIVE AVAILABLE (CONTROLLER IS SET IF
1114                                                            ;  THIS BIT IS RESET)
1115            000004          OFST=   BIT2                    ;DRIVE OFFSET
1116            000010          ACLO=   BIT3                    ;AC LOW
1117            000020          SPDLSS= BIT4                    ;SPEED LOSS
1118            000040          DROT=   BIT5                    ;DRIVE OFF TRACK
1119            000100          VV=     BIT6                    ;VOLUME VALID
1120            000200          DRDY=   BIT7                    ;DRIVE READY
1121            000400          DDT=    BIT8                    ;DRIVE TYPE (0=RK06)
1122            004000          WRL=    BIT11                   ;WRITE LOCK
1123            020000          PIP=    BIT13                   ;POSITIONING IN PROGRESS
1124            040000          DSC=    BIT14                   ;DRIVE STATUS CHANGE
1125            100000          SVAL=   BIT15                   ;STATUS VALID
1126
1127                            .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION
1128
1129            000017          MESMSK= 17                      ;MESSAGE MASK
1130
1131            000020          PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
1132            000040          DMD=    BIT5                    ;DIAGNOSTIC MODE
1133            000100          MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
1134            000200          MIND=   BIT7                    ;MAINTENANCE INDEX
1135            000400          MCLK=   BIT8                    ;MAINTENANCE CLOCK
1136            001000          MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
1137            002000          MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
1138            004000          PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
1139            010000          PCD=    BIT12                   ;PRECOMPENSATION DELAY
1140            020000          ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
1141            040000          WRTGAT= BIT14                   ;WRITE GATE
1142            100000          RDGATE= BIT15                   ;READ GATE
1143
1144                            .SBTTL  TRANSMITTED MESSAGE A
1145
1146            000020          S.SEEK= BIT4                    ;SEEK COMMAND
1147            000040          S.RECL= BIT5                    ;RECALIBRATE COMMAND
1148            000100          S.STSP= BIT6                    ;START SPINDLE COMMAND
1149            000200          S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
1150            000400          S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
1151            001000          S.FMT=  BIT9                    ;FORMAT
1152            002000          S.UNLD= BIT10                   ;UNLOAD
1153            004000          S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
1154                            .SBTTL  TRAP CATCHER
1155
1156            000000                  .=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  034076                        $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  034530                        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
```

```
                    100000                  RDGATE= BIT15                   ;READ GATE
                                            .SBTTL  TRANSMITTED MESSAGE A
                    000020                  S.SEEK= BIT4                    ;SEEK COMMAND
                    000040                  S.RECL= BIT5                    ;RECALIBRATE COMMAND
                    000100                  S.STSP= BIT6                    ;START SPINDLE COMMAND
                    000200                  S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
                    000400                  S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
                    001000                  S.FMT=  BIT9                    ;FORMAT
                    002000                  S.UNLD= BIT10                   ;UNLOAD
                    004000                  S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
                                            .SBTTL  TRAP CATCHER
                    000000                          .=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  034076                                      $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                    000052                          .=52
000052  000000                                      .WORD   0               ;;2)SET LOC.52 TO ZERO
                    000220                          .=$SVPC                 ;; RESTORE PC
                    000114                          .=MEMVEC
000114  034530                                      MEMERR                  ;MEMPARITY ERROR HANDLER
000116  000340                                      PR7
                    001000                          .=1000
                                            .SBTTL  APT PARAMETER BLOCK
                                            ;;**************************************************************
                                            ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                            ;;**************************************************************
                    001000                          .$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:
```

```
  1269  001000  000000                $HIBTS: .WORD   0         ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
  1270  001002  001214                $MBADR: .WORD   $MAIL     ;;ADDRESS OF APT MAILBOX (BITS 0-15)
  1271  001004  000000                $TSTM:  .WORD             ;;RUN TIM OF LONGEST TEST
  1272  001006  000000                $PASTM: .WORD             ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
  1273  001010  000000                $UNITM: .WORD             ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
  1274  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
```

```
1331  001214                  $MAIL:                  ;;APT MAILBOX
1332  001214  000000          $MSGTY: .WORD   AMSGTY  ;;MESSAGE TYPE CODE
1333  001216  000000          $FATAL: .WORD   AFATAL  ;;FATAL ERROR NUMBER
1334  001220  000000          $TESTN: .WORD   ATESTN  ;;TEST NUMBER
1335  001222  000000          $PASS:  .WORD   APASS   ;;PASS COUNT
1336  001224  000000          $DEVCT: .WORD   ADEVCT  ;;DEVICE COUNT
1337  001226  000000          $UNIT:  .WORD   AUNIT   ;;I/O UNIT NUMBER
1338  001230  000000          $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
1339  001232  000000          $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
1340  001234                  $ETABLE:                ;;APT ENVIRONMENT TABLE
1341  001234      000         $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
1342  001235      000         $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
1343  001236  000000          $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER-
1344  001240  000000          $USWR:  .WORD   AUSWR   ;;USER SWITCHES  -
1345  001242  000000          $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
1346                          ;*                      BITS 15-11=CPU TYPE
1347                          ;*                           11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1348                          ;*                           11/70=06,PDQ=07,Q=10
1349                          ;*                      BIT 10=REAL TIME CLOCK
1350                          ;*                      BIT  9=FLOATING POINT PROCESSOR
1351                          ;*                      BIT  8=MEMORY MANAGEMENT
1352  001244      000         $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
1353  001245      000         $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
1354                          ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
1355                          ;*                           900 NSEC CORE=001
1356                          ;*                           300 NSEC BIPOLAR=002
1357                          ;*                           500 NSEC MOS=003
1358  001246  000000          $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
1359                          .*                       MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1360  001250      000         $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
1361  001251      000         $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
1362  001252  000000          $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
1363  001254      000         $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
1364  001255      000         $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
1365  001256  000000          $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
1366  001260      000         $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
1367  001261      000         $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
1368  001262  000000          $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
1369  001264  000210          $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1370  001266  000000          $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1371  001270  177440          $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1372  001272  000000          $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
1373  001274  000000          $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
1374  001276  000000          $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
1375  001300                  $ETEND:
1376                          .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 (SERRPC).
                                ;*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 ENABLE TRAP
001300  046113                          EM000
001302  044120                          DH000C
001304  042460                          DT000
001306  043014                          DF000
                                ;       ERROR 2:  WRITE BIT ERROR
001310  000000                  EMW:    0
001312  000000                          0
001314  042464                          DT002
001316  043020                          DF002
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       CS1 INCORRECT
001320  046160                          EM300
001322  052054                          EM4000
001324  042506                          DT003
001326  043044                          DF003
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       MESS A INCORRECT
001330  046160                          EM300
001332  052072                          EM4001
001334  042506                          DT003
001336  043044                          DF003
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FOR READ DATA
                                ;       MESS B INCORRECT
001340  046160                          EM300
001342  052113                          EM4002
001344  042506                          DT003
001346  043044                          DF003
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
                                ;       CS1 INCORRECT
001350  046235                          EM301
001352  052054                          EM4000
001354  042506                          DT003
001356  043044                          DF003
                                ;       ERROR 7:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
                                ;       MESS A INCORRECT
001360  046235                          EM301
001362  052072                          EM4001
001364  042506                          DT003
001366  043044                          DF003
                                ;       ERROR 10:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE DATA
```

F03


```
1433                                    ;       MESS B INCORRECT
1434  001370  046235                            EM301
1435  001372  052113                            EM4002
1436  001374  042506                            DT003
1437  001376  043044                            DF003
1438                                    ;       ERROR 11:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1439                                    ;       CS1 INCORRECT
1440  001400  046313                            EM302
1441  001402  052054                            EM4000
1442  001404  042506                            DT003
1443  001406  043044                            DF003
1444                                    ;       ERROR 12:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1445                                    ;       MESS A INCORRECT
1446  001410  046313                            EM302
1447  001412  052072                            EM4001
1448  001414  042506                            DT003
1449  001416  043044                            DF003
1450                                    ;       ERROR 13:  ATTEMPTING TO CHECK SEEK MESSAGE FOR WRITE CHECK
1451                                    ;       MESS B INCORRECT
1452  001420  046313                            EM302
1453  001422  052113                            EM4002
1454  001424  042506                            DT003
1455  001426  043044                            DF003
1456                                    ;       ERROR 14:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1457                                    ;       CS1 INCORRECT
1458  001430  046372                            EM303
1459  001432  052054                            EM4000
1460  001434  042506                            DT003
1461  001436  043044                            DF003
1462                                    ;       ERROR 15:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1463                                    ;       MESS A INCORRECT
1464  001440  046372                            EM303
1465  001442  052072                            EM4001
1466  001444  042506                            DT003
1467  001446  043044                            DF003
1468                                    ;       ERROR 16:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR READ DATA
1469                                    ;       MESS B INCORRECT
1470  001450  046372                            EM303
1471  001452  052113                            EM4002
1472  001454  042506                            DT003
1473  001456  043044                            DF003
1474                                    ;       ERROR 17:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1475                                    ;       CS1 INCORRECT
1476  001460  046450                            EM304
1477  001462  052054                            EM4000
1478  001464  042506                            DT003
1479  001466  043044                            DF003
1480                                    ;       ERROR 20:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1481                                    ;       MESS A INCORRECT
1482  001470  046450                            EM304
1483  001472  052072                            EM4001
1484  001474  042506                            DT003
1485  001476  043044                            DF003
1486                                    ;       ERROR 21:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE DATA
1487                                    ;       MESS B INCORRECT
1488  001500  046450                            EM304
```

```
1489  001502  052113                    EM4002
1490  001504  042506                    DT003
1491  001506  043044                    DF003
1492                          ;         ERROR 22:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1493                          ;         CS1 INCORRECT
1494  001510  046527                    EM305
1495  001512  052054                    EM4000
1496  001514  042506                    DT003
1497  001516  043044                    DF003
1498                          ;         ERROR 23:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1499                          ;         MESS A INCORRECT
1500  001520  046527                    EM305
1501  001522  052072                    EM4001
1502  001524  042506                    DT003
1503  001526  043044                    DF003
1504                          ;         ERROR 24:  ATTEMPTING TO CHECK CLEAR MESSAGE FOR WRITE CHECK
1505                          ;         MESS B INCORRECT
1506  001530  046527                    EM305
1507  001532  052113                    EM4002
1508  001534  042506                    DT003
1509  001536  043044                    DF003
1510                          ;         ERROR 25:  ATTEMPTING TO CHECK HEADER GENERATION
1511                          ;         WITH VARIOUS CYLINDER VALUES
1512                          ;         CS1 INCORRECT
1513  001540  046607                    EM306
1514  001542  052054                    EM4000
1515  001544  042506                    DT003
1516  001546  043070                    DF025
1517                          ;         ERROR 26:  ATTEMPTING TO CHECK HEADER GENERATION
1518                          ;         WITH VARIOUS CYLINDER VALUES
1519                          ;         FIRST WORD OF HEADER INCORRECT
1520  001550  046607                    EM306
1521  001552  052134                    EM4003
1522  001554  042506                    DT003
1523  001556  043070                    DF025
1524                          ;         ERROR 27:  ATTEMPTING TO CHECK HEADER GENERATION
1525                          ;         WITH VARIOUS CYLINDER VALUES
1526                          ;         SECOND WORD OF HEADER INCORRECT
1527  001560  046607                    EM306
1528  001562  052164                    EM4004
1529  001564  042506                    DT003
1530  001566  043070                    DF025
1531                          ;         ERROR 30:  ATTEMPTING TO CHECK HEADER GENERATION
1532                          ;         WITH VARIOUS TRACK VALUES
1533                          ;         CS1 INCORRECT
1534  001570  046711                    EM307
1535  001572  052054                    EM4000
1536  001574  042506                    DT003
1537  001576  043070                    DF025
1538                          ;         ERROR 31:  ATTEMPTING TO CHECK HEADER GENERATION
1539                          ;         WITH VARIOUS TRACK VALUES
1540                          ;         FIRST WORD OF HEADER INCORRECT
1541  001600  046711                    EM307
1542  001602  052134                    EM4003
1543  001604  042506                    DT003
1544  001606  043070                    DF025
```

```
1545                                    ;       ERROR 32:  ATTEMPTING TO CHECK HEADER GENERATION
1546                                    ;       WITH VARIOUS TRACK VALUES
1547                                    ;       SECOND WORD OF HEADER INCORRECT
1548  001610  046711                            EM307
1549  001612  052164                            EM4004
1550  001614  042506                            DT003
1551  001616  043070                            DF025
1552                                    ;       ERROR 33:  ATTEMPTING TO CHECK HEADER GENERATION
1553                                    ;       WITH VARIOUS SECTOR VALUES
1554                                    ;       CS1 INCORRECT
1555  001620  047010                            EM308
1556  001622  052054                            EM4000
1557  001624  042506                            DT003
1558  001626  043070                            DF025
1559                                    ;       ERROR 34:  ATTEMPTING TO CHECK HEADER GENERATION
1560                                    ;       WITH VARIOUS SECTOR VALUES
1561                                    ;       FIRST WORD OF HEADER INCORRECT
1562  001630  047010                            EM308
1563  001632  052134                            EM4003
1564  001634  042506                            DT003
1565  001636  043070                            DF025
1566                                    ;       ERROR 35:  ATTEMPTING TO CHECK HEADER GENERATION
1567                                    ;       WITH VARIOUS SECTOR VALUES
1568                                    ;       SECOND WORD OF HEADER INCORRECT
1569  001640  047010                            EM308
1570  001642  052164                            EM4004
1571  001644  042506                            DT003
1572  001646  043070                            DF025
1573                                    ;       ERROR 36:  ATTEMPTING TO CHECK HEADER GENERATION
1574                                    ;       WITH VARIOUS FORMAT VALUES
1575                                    ;       CS1 INCORRECT
1576  001650  047110                            EM309
1577  001652  052054                            EM4000
1578  001654  042506                            DT003
1579  001656  043070                            DF025
1580                                    ;       ERROR 37:  ATTEMPTING TO CHECK HEADER GENERATION
1581                                    ;       WITH VARIOUS FORMAT VALUES
1582                                    ;       FIRST WORD OF HEADER INCORRECT
1583  001660  047110                            EM309
1584  001662  052134                            EM4003
1585  001664  042506                            DT003
1586  001666  043070                            DF025
1587                                    ;       ERROR 40:  ATTEMPTING TO CHECK HEADER GENERATION
1588                                    ;       WITH VARIOUS FORMAT VALUES
1589                                    ;       SECOND WORD OF HEADER INCORRECT
1590  001670  047110                            EM309
1591  001672  052164                            EM4004
1592  001674  042506                            DT003
1593  001676  043070                            DF025
1594                                    ;       ERROR 41:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1595                                    ;       CS1 INCORRECT
1596  001700  047210                            EM310
1597  001702  052054                            EM4000
1598  001704  042526                            DT041
1599  001706  043114                            DF041
1600                                    ;       ERROR 42:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
```

```
1601                                    ;       CS2 INCORRECT
1602  001710  047210                            EM310
1603  001712  052214                            EM4005
1604  001714  042526                            DT041
1605  001716  043114                            DF041
1606                                    ;       ERROR 43:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1607                                    ;       ERROR REGISTER INCORRECT
1608  001720  047210                            EM310
1609  001722  052232                            EM4006
1610  001724  042526                            DT041
1611  001726  043114                            DF041
1612                                    ;       ERROR 44:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1613                                    ;       BUS ADD INCORRECT
1614  001730  047210                            EM310
1615  001732  052256                            EM4007
1616  001734  042526                            DT041
1617  001736  043114                            DF041
1618                                    ;       ERROR 45:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1619                                    ;       WORD COUNT INCORRECT
1620  001740  047210                            EM310
1621  001742  052304                            EM4008
1622  001744  042526                            DT041
1623  001746  043114                            DF041
1624                                    ;       ERROR 46:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1625                                    ;       CS1 INCORRECT AFTER READING DATA BUFFER
1626  001750  047210                            EM310
1627  001752  052331                            EM4009
1628  001754  042556                            DT046
1629  001756  043150                            DF046
1630                                    ;       ERROR 47:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1631                                    ;       CS2 INCORRECT AFTER READING DATA BUFFER
1632  001760  047210                            EM310
1633  001762  052401                            EM4010
1634  001764  042556                            DT046
1635  001766  043150                            DF046
1636                                    ;       ERROR 50:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1637                                    ;       ERROR REG INCORRECT AFTER READING DATA BUFFER
1638  001770  047210                            EM310
1639  001772  052451                            EM4011
1640  001774  042556                            DT046
1641  001776  043150                            DF046
1642                                    ;       ERROR 51:  ATTEMPTING TO CHECK NPR TRANSFER FOR WRITE DATA
1643                                    ;       DATA READ FROM MEMORY INCORRECT
1644  002000  047210                            EM310
1645  002002  052527                            EM4012
1646  002004  042576                            DT051
1647  002006  043174                            DF051
1648                                    ;       ERROR 52: ATTEMPTING TO CHECK HEADER RECOGNITION
1649                                    ;       CS1 INCORRECT
1650  002010  047275                            EM311
1651  002012  052054                            EM4000
1652  002014  042610                            DT052
1653  002016  043220                            DF052
1654                                    ;       ERROR 53: ATTEMPTING TO CHECK HEADER RECOGNITION
1655                                    ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1656  002020  047275                            EM311
```

```
1657  002022  052567                    EM4013
1658  002024  042624                    DT053
1659  002026  043244                    DF053
1660                            ;       ERROR 54: ATTEMPTING TO CHECK SECTOR INCREMENT
1661                            ;       DISK ADDRESS REG INCORRECT
1662  002030  047344                    EM312
1663  002032  052635                    EM4014
1664  002034  042634                    DT054
1665  002036  043270                    DF054
1666                            ;       ERROR 55: ATTEMPTING TO CHECK SECTOR INCREMENT
1667                            ;       CYLINDER ADDRESS INCORRECT
1668  002040  047344                    EM312
1669  002042  052671                    EM4015
1670  002044  042634                    DT054
1671  002046  043270                    DF054
1672                            ;       ERROR 56: ATTEMPTING TO CHECK TRACK INCREMENT
1673                            ;       DISK ADDRESS REG INCORRECT
1674  002050  047411                    EM313
1675  002052  052635                    EM4014
1676  002054  042634                    DT054
1677  002056  043270                    DF054
1678                            ;       ERROR 57: ATTEMPTING TO CHECK TRACK INCREMENT
1679                            ;       CYLINDER ADDRESS INCORRECT
1680  002060  047411                    EM313
1681  002062  052671                    EM4015
1682  002064  042634                    DT054
1683  002066  043270                    DF054
1684                            ;       ERROR 60: ATTEMPTING TO CHECK CYLINDER INCREMENT
1685                            ;       DISK ADDRESS INCORRECT
1686  002070  047455                    EM314
1687  002072  052635                    EM4014
1688  002074  042634                    DT054
1689  002076  043270                    DF054
1690                            ;       ERROR 61: ATTEMPTING TO CHECK CYLINDER INCREMENT
1691                            ;       CYLINDER ADDRESS INCORRECT
1692  002100  047455                    EM314
1693  002102  052671                    EM4015
1694  002104  042634                    DT054
1695  002106  043270                    DF054
1696                            ;       ERROR 62: ATTEMPTING TO CHECK SECTOR PULSE DETECTION WITH
1697                            ;               WRITE DATA
1698                            ;       MAINT. REG. 1 INCORRECT
1699  002110  047524                    EM315
1700  002112  052731                    EM4016
1701  002114  042624                    DT053
1702  002116  043244                    DF053
1703                            ;       ERROR 63: ATTEMPTING TO FORCE BAD SECTOR ERROR
1704                            ;       CS1 INCORRECT
1705  002120  047620                    EM316
1706  002122  052054                    EM4000
1707  002124  042556                    DT046
1708  002126  043150                    DF046
1709                            ;       ERROR 64: ATTEMPTING TO FORCE BAD SECTOR ERROR
1710                            ;       CS2 INCORRECT
1711  002130  047620                    EM316
1712  002132  052214                    EM4005
```

```
1713  002134  042556                      DT046
1714  002136  043150                      DF046
1715                              ;       ERROR 65: ATTEMPTING TO FORCE BAD SECTOR ERROR
1716                              ;       ERROR REG INCORRECT
1717  002140  047620                      EM316
1718  002142  052232                      EM4006
1719  002144  042556                      DT046
1720  002146  043150                      DF046
1721                              ;       ERROR 66: ATTEMPTING TO FORCE HEADER VRC ERROR
1722                              ;       WHEN BAD SECTOR PRESENT
1723                              ;       CS1 INCORRECT
1724  002150  047665                      EM317
1725  002152  052054                      EM4000
1726  002154  042556                      DT046
1727  002156  043150                      DF046
1728                              ;       ERROR 67: ATTEMPTING TO FORCE HEADER VRC ERROR
1729                              ;       WHEN BAD SECTOR PRESENT
1730                              ;       CS2 INCORRECT
1731  002160  047665                      EM317
1732  002162  052214                      EM4005
1733  002164  042556                      DT046
1734  002166  043150                      DF046
1735                              ;       ERROR 70: ATTEMPTING TO FORCE HEADER VRC ERROR
1736                              ;       WHEN BAD SECTOR PRESENT
1737                              ;       ERROR REG INCORRECT
1738  002170  047665                      EM317
1739  002172  052232                      EM4006
1740  002174  042556                      DT046
1741  002176  043150                      DF046
1742                              ;       ERROR 71: ATTEMPTING TO FORCE HVRC ERROR
1743                              ;       CS1 INCORRECT
1744  002200  047763                      EM318
1745  002202  052054                      EM4000
1746  002204  042650                      DT071
1747  002206  043314                      DF071
1748                              ;       ERROR 72: ATTEMPTING TO FORCE HVRC ERROR
1749                              ;       CS2 INCORRECT
1750  002210  047763                      EM318
1751  002212  052214                      EM4005
1752  002214  042650                      DT071
1753  002216  043314                      DF071
1754                              ;       ERROR 73: ATTEMPTING TO FORCE HVRC ERROR
1755                              ;       ERROR REG INCORRECT
1756  002220  047763                      EM318
1757  002222  052232                      EM4006
1758  002224  042650                      DT071
1759  002226  043314                      DF071
1760                              ;       ERROR 74: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1761                              ;       CS1 INCORRECT
1762  002230  050022                      EM319
1763  002232  052054                      EM4000
1764  002234  042676                      DT074
1765  002236  043350                      DF074
1766                              ;       ERROR 75: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1767                              ;       CS2 INCORRECT
1768  002240  050022                      EM319
```

```
1769  002242  052214                  EM4005
1770  002244  042676                  DT074
1771  002246  043350                  DF074
1772                          ;       ERROR 76: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1773                          ;       ERROR REG INCORRECT
1774  002250  050022                  EM319
1775  002252  052232                  EM4006
1776  002254  042676                  DT074
1777  002256  043350                  DF074
1778                          ;       ERROR 77: ATTEMPTING TO FORCE OPERATION INCOMPLETE
1779                          ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1780  002260  050022                  EM319
1781  002262  052567                  EM4013
1782  002264  042720                  DT077
1783  002266  043374                  DF077
1784                          ;       ERROR 100: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1785                          ;       CS1 INCORRECT
1786  002270  050073                  EM320
1787  002272  052054                  EM4000
1788  002274  042676                  DT074
1789  002276  043350                  DF074
1790                          ;       ERROR 101: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1791                          ;       CS2 INCORRECT
1792  002300  050073                  EM320
1793  002302  052214                  EM4005
1794  002304  042676                  DT074
1795  002306  043350                  DF074
1796                          ;       ERROR 102: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1797                          ;       ERROR REG INCORRECT
1798  002310  050073                  EM320
1799  002312  052232                  EM4006
1800  002314  042676                  DT074
1801  002316  043350                  DF074
1802                          ;       ERROR 103: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 37
1803                          ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1804  002320  050073                  EM320
1805  002322  052567                  EM4013
1806  002324  042720                  DT077
1807  002326  043374                  DF077
1808                          ;       ERROR 104: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1809                          ;       CS1 INCORRECT
1810  002330  050157                  EM321
1811  002332  052054                  EM4000
1812  002334  042676                  DT074
1813  002336  043350                  DF074
1814                          ;       ERROR 105: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1815                          ;       CS2 INCORRECT
1816  002340  050157                  EM321
1817  002342  052214                  EM4005
1818  002344  042676                  DT074
1819  002346  043350                  DF074
1820                          ;       ERROR 106: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1821                          ;       ERROR REG INCORRECT
1822  002350  050157                  EM321
1823  002352  052232                  EM4006
1824  002354  042676                  DT074
```

```
1825  002356  043350                          DF074
1826                                  ;       ERROR 107: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 36
1827                                  ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1828  002360  050157                          EM321
1829  002362  052567                          EM4013
1830  002364  042720                          DT077
1831  002366  043374                          DF077
1832                                  ;       ERROR 110: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1833                                  ;       CS1 INCORRECT
1834  002370  050243                          EM322
1835  002372  052054                          EM4000
1836  002374  042676                          DT074
1837  002376  043350                          DF074
1838                                  ;       ERROR 111: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1839                                  ;       CS2 INCORRECT
1840  002400  050243                          EM322
1841  002402  052214                          EM4005
1842  002404  042676                          DT074
1843  002406  043350                          DF074
1844                                  ;       ERROR 112: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1845                                  ;       ERROR REG INCORRECT
1846  002410  050243                          EM322
1847  002412  052232                          EM4006
1848  002414  042676                          DT074
1849  002416  043350                          DF074
1850                                  ;       ERROR 113: ATTEMPTING TO FORCE OPI WITH HVRC ERROR ON HEADER 0
1851                                  ;       MR1 INCORRECT AFTER GAP IN WRITE DATA
1852  002420  050243                          EM322
1853  002422  052567                          EM4013
1854  002424  042720                          DT077
1855  002426  043374                          DF077
1856                                  ;       ERROR 114:  CHECKING HEADER RECOGINTION WITH PREVIOUS BAD
1857                                  ;                   SECTOR ERROR CS1 INCORRECT
1858  002430  050326                          EM323
1859  002432  052054                          EM4000
1860  002434  042676                          DT074
1861  002436  043350                          DF074
1862                                  ;       ERROR 115:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1863                                  ;                   SECTOR ERROR CS2 INCORRECT
1864  002440  050326                          EM323
1865  002442  052214                          EM4005
1866  002444  042676                          DT074
1867  002446  043350                          DF074
1868                                  ;       ERROR 116:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1869                                  ;                   SECTOR ERROR  ERROR INCORRECT
1870  002450  050326                          EM323
1871  002452  052232                          EM4006
1872  002454  042676                          DT074
1873  002456  043350                          DF074
1874                                  ;       ERROR 117:  CHECKING HEADER RECOGNITION WITH PREVIOUS BAD
1875                                  ;                   SECTOR ERROR MR1 INCORRECT
1876  002460  050326                          EM323
1877  002462  052567                          EM4013
1878  002464  042720                          DT077
1879  002466  043374                          DF077
1880                                  ;       ERROR 120: CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
```

```
1881                                    ;               VRC ERROR CS1 INCORRECT
1882  002470  050421                                   EM324
1883  002472  052054                                   EM4000
1884  002474  042676                                   DT074
1885  002476  043350                                   DF074
1886                                    ;               ERROR 121:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1887                                    ;                           VRC ERROR CS2 INCORRECT
1888  002500  050421                                   EM324
1889  002502  052214                                   EM4005
1890  002504  042676                                   DT074
1891  002506  043350                                   DF074
1892                                    ;               ERROR 122:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1893                                    ;                           VRC ERROR  ERROR REG INCORRECT
1894  002510  050421                                   EM324
1895  002512  052232                                   EM4006
1896  002514  042676                                   DT074
1897  002516  043350                                   DF074
1898                                    ;               ERROR 123:  CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER
1899                                    ;                           VRC ERROR MR1 INCORRECT
1900  002520  050421                                   EM324
1901  002522  052567                                   EM4013
1902  002524  042720                                   DT077
1903  002526  043374                                   DF077
1904                                    ;               ERROR 124:  FORCING BAD SECTOR ERROR WITH PREV HEADER
1905                                    ;                           VRC ERROR CS1 INCORRECT
1906  002530  050514                                   EM325
1907  002532  052054                                   EM4000
1908  002534  042676                                   DT074
1909  002536  043350                                   DF074
1910                                    ;               ERROR 125:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1911                                    ;                           CS2 INCORRECT
1912  002540  050514                                   EM325
1913  002542  052214                                   EM4005
1914  002544  042676                                   DT074
1915  002546  043350                                   DF074
1916                                    ;               ERROR 126:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1917                                    ;                           ERROR REG INCORRECT
1918  002550  050514                                   EM325
1919  002552  052232                                   EM4006
1920  002554  042676                                   DT074
1921  002556  043350                                   DF074
1922                                    ;               ERROR 127:  FORCING BAD SECTOR ERROR WITH PREV HEADER VRC ERROR
1923                                    ;                           MR1 INCORRECT
1924  002560  050514                                   EM325
1925  002562  052567                                   EM4013
1926  002564  042720                                   DT077
1927  002566  043374                                   DF077
1928                                    ;               ERRROR 130:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1929                                    ;                            CS1 INCORRECT
1930  002570  050604                                   EM326
1931  002572  052054                                   EM4000
1932  002574  042676                                   DT074
1933  002576  043350                                   DF074
1934                                    ;               ERROR 131:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1935                                    ;                           CS2 INCORRECT
1936  002600  050604                                   EM326
```

```
1937  002602  052214                          EM4005
1938  002604  042676                          DT074
1939  002606  043350                          DF074
1940                              ;           ERROR 132:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1941                              ;                       ERROR REG INCORRECT
1942  002610  050604                          EM326
1943  002612  052232                          EM4006
1944  002614  042676                          DT074
1945  002616  043350                          DF074
1946                              ;           ERROR 133:  FORCING HEADER VRC ERROR WITH PREV BAD SECTOR ERROR
1947                              ;                       MR1 INCORRECT
1948  002620  050604                          EM326
1949  002622  052567                          EM4013
1950  002624  042720                          DT077
1951  002626  043374                          DF077
1952                              ;           ERROR 134:  ATTEMPTING TO CHECK ECC PATTERN CLEARING
1953                              ;                       ECC PATTERN INCORRECT
1954  002630  051023                          EM329
1955  002632  052747                          EM4017
1956  002634  042732                          DT134
1957  002636  043420                          DF134
1958                              ;           ERROR 135:  ATTEMPTING TO CHECK ECC GENERATION
1959                              ;                       ECC PATTERN INCORRECT
1960  002640  051074                          EM330
1961  002642  052747                          EM4017
1962  002644  042732                          DT134
1963  002646  043420                          DF134
1964                              ;           ERROR 136: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1965                              ;           CS1 INCORRECT
1966  002650  051137                          EM331
1967  002652  052054                          EM4000
1968  002654  042556                          DT046
1969  002656  043150                          DF046
1970                              ;           ERROR 137: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1971                              ;           CS2 INCORRECT
1972  002660  051137                          EM331
1973  002662  052214                          EM4005
1974  002664  042556                          DT046
1975  002666  043150                          DF046
1976                              ;           ERROR 140: ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR
1977                              ;           ERROR REG. INCORRECT
1978  002670  051137                          EM331
1979  002672  052232                          EM4006
1980  002674  042556                          DT046
1981  002676  043150                          DF046
1982                              ;           ERROR 141: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1983                              ;           CS1 INCORRECT
1984  002700  051224                          EM332
1985  002702  052054                          EM4000
1986  002704  042556                          DT046
1987  002706  043150                          DF046
1988                              ;           ERROR 142: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1989                              ;           CS2 INCORRECT
1990  002710  051224                          EM332
1991  002712  052214                          EM4005
1992  002714  042556                          DT046
```

```
1993  002716  043150                          DF046
1994                                ;         ERROR 143: ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR
1995                                ;         ERROR REG. INCORRECT
1996  002720  051224                          EM332
1997  002722  052232                          EM4006
1998  002724  042556                          DT046
1999  002726  043150                          DF046
2000                                ;         ERROR 144: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2001                                ;         CS1 INCORRECT
2002  002730  051405                          EM335
2003  002732  052054                          EM4000
2004  002734  042744                          DT144
2005  002736  043444                          DF144
2006                                ;         ERROR 145: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2007                                ;         CS2 INCORRECT
2008  002740  051405                          EM335
2009  002742  052214                          EM4005
2010  002744  042744                          DT144
2011  002746  043444                          DF144
2012                                ;         ERROR 146: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2013                                ;         ERROR REG. INCORRECT
2014  002750  051405                          EM335
2015  002752  052232                          EM4006
2016  002754  042744                          DT144
2017  002756  043444                          DF144
2018                                ;         ERROR 147: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2019                                ;         BUS ADDRESS INCORRECT
2020  002760  051405                          EM335
2021  002762  052256                          EM4007
2022  002764  042744                          DT144
2023  002766  043444                          DF144
2024                                ;         ERROR 150: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2025                                ;         WORD COUNT INCORRECT
2026  002770  051405                          EM335
2027  002772  052304                          EM4008
2028  002774  042744                          DT144
2029  002776  043444                          DF144
2030                                ;         ERROR 151: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2031                                ;         CYLINDER ADD INCORRECT
2032  003000  051405                          EM335
2033  003002  052671                          EM4015
2034  003004  042744                          DT144
2035  003006  043444                          DF144
2036                                ;         ERROR 152: ATTEMPTING COMPLETE EXECUTION OF WRITE DATA
2037                                ;         DISK ADDRESS INCORRECT
2038  003010  051405                          EM335
2039  003012  052635                          EM4014
2040  003014  042744                          DT144
2041  003016  043444                          DF144
2042                                ;         ERROR 153: ATTEMPTING ERROR CLEAR WITH CONTROLLER CLEAR
2043                                ;         CS1 INCORRECT
2044  003020  051461                          EM336
2045  003022  052054                          EM4000
2046  003024  042610                          DT052
2047  003026  043220                          DF052
2048                                ;         ERROR 154: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
```

```
2049                                    ;       CS1 INCORRECT
2050  003030  051536                            EM337
2051  003032  052054                            EM4000
2052  003034  042744                            DT144
2053  003036  043444                            DF144
2054                                    ;       ERROR 155: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2055                                    ;       CS2 INCORRECT
2056  003040  051536                            EM337
2057  003042  052214                            EM4005
2058  003044  042744                            DT144
2059  003046  043444                            DF144
2060                                    ;       ERROR 156: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2061                                    ;       ERROR REGISTER INCORRECT
2062  003050  051536                            EM337
2063  003052  052232                            EM4006
2064  003054  042744                            DT144
2065  003056  043444                            DF144
2066                                    ;       ERROR 157: ATTEMPTIN PARTIAL SECTOR WRITE WITH ZERO FILL
2067                                    ;       BUS ADDRESS INCORRECT
2068  003060  051536                            EM337
2069  003062  052256                            EM4007
2070  003064  042744                            DT144
2071  003066  043444                            DF144
2072                                    ;       ERROR 160: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2073                                    ;       WORD COUNT INCORRECT
2074  003070  051536                            EM337
2075  003072  052304                            EM4008
2076  003074  042744                            DT144
2077  003076  043444                            DF144
2078                                    ;       ERROR 161: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2079                                    ;       CYLINDER ADDRESS INCORRECT
2080  003100  051536                            EM337
2081  003102  052671                            EM4015
2082  003104  042744                            DT144
2083  003106  043444                            DF144
2084                                    ;       ERROR 162: ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL
2085                                    ;       DISK ADDRESS INCORRECT
2086  003110  051536                            EM337
2087  003112  052635                            EM4014
2088  003114  042744                            DT144
2089  003116  043444                            DF144
2090                                    ;       ERROR 163: ATTEMPTING WRITE DATA IN 18 BIT MODE
2091                                    ;       RKECPT INCORRECT
2092  003120  052007                            EM340
2093  003122  052747                            EM4017
2094  003124  043004                            DT151
2095  003126  043500                            DF151
2096                                    ;       ERROR 164: ATTEMPTING WRITE DATA IN 18 BIT MODE
2097                                    ;       RKECPT INCORRECT
2098  003130  052007                            EM340
2099  003132  052747                            EM4017
2100  003134  042732                            DT134
2101  003136  043420                            DF134
2102
```

```
2103                                    .SBTTL  TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER
2104
2105  003140  000000                    T.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
2106  003142  000000                    T.WC:   .WORD   0               ;WORD COUNT REGISTER
2107  003144  000000                    T.BA:   .WORD   0               ;BUS ADDRESS REGISTER
2108  003146  000000                    T.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2109  003150  000000                    T.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
2110  003152  000000                    T.DS:   .WORD   0               ;DRIVE STATUS REGISTER
2111  003154  000000                    T.ER:   .WORD   0               ;ERROR REGISTER
2112  003156  000000                    T.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2113  003160  000000                    T.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
2114  003162  000000                    T.DB:   .WORD   0               ;DATA BUFFER
2115  003164  000000                    T.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
2116  003166  000000                    T.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
2117  003170  000000                    T.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
2118  003172  000000                    T.ECPS: .WORD   0               ;ECC POSITION INFORMATION
2119  003174  000000                    T.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
2120  003176  000000                    T.SPAR: .WORD   0               ;SPARE REGISTER
2121
2122                                    .SBTTL  EXPECTED RK611 CONTROLLER REGISTERS
2123
2124  003200  000000                    E.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
2125  003202  000000                    E.WC:   .WORD   0               ;WORD COUNT REGISTER
2126  003204  000000                    E.BA:   .WORD   0               ;BUS ADDRESS REGISTER
2127  003206  000000                    E.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2128  003210  000000                    E.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
2129  003212  000000                    E.DS:   .WORD   0               ;DRIVE STATUS REGISTER
2130  003214  000000                    E.ER:   .WORD   0               ;ERROR REGISTER
2131  003216  000000                    E.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2132  003220  000000                    E.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
2133  003222  000000                    E.DB:   .WORD   0               ;DATA BUFFER
2134  003224  000000                    E.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
2135  003226  000000                    E.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
2136  003230  000000                    E.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
2137  003232  000000                    E.ECPS: .WORD   0               ;ECC POSITION INFORMATION
2138  003234  000000                    E.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
2139  003236  000000                    E.SPAR: .WORD   0               ;SPARE REGISTER
```

```
                                .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
```

```
                                        .SBTTL  PROGRAM SETUP

003314  012737  000001  003246  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
003322  000406                  RESTRT: BR      START1
                                        MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
003324  012737  177777  003246          BR      START1
003332  000402
                                START:  CLR     SRTFLG          ;CLEAR START FLAG
003334  005037  003246          START1: RESET                   ;RESET THE WHOLE SYSTEM
003340  000005                          CLRB    $ERFLG          ;CLEAR ERROR FLAG
003342  105037  001103                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
003346  012706  001100                  JSR     PC,$TKINT       ;INIT KEYBOARD
003352  004737  040552                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
003356  012746  000340                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
003362  012746  003370                  RTI                     ;LOAD PSW
003366  000002

003370                          1$:
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
003370  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
003374  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
003376  022706  001140                  CMP     #SWR,R6 ;;DONE?
003402  001374                          BNE     .-6             ;;LOOP BACK IF NO
003404  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
003410  012737  034650  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
003416  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
003424  012737  037406  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
003432  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
003440  012737  042370  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
003446  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
003454  012737  042234  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
003462  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
003470  013737  033742  033734          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
```

```
2222  003616  005037  001222                        CLR     $PASS           ;;CLEAR PASS COUNT
2223  003622  132737  000200  001235                BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
2224  003630  001403                                BEQ     67$             ;;YES,USE NON-APT SWITCH
2225  003632  012737  001236  001140                MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
2226  003640                                67$:
2227  003640  005037  003250                        CLR     ERRCNT
2228                                        .SBTTL  TYPE PROGRAM NAME
2229                                        ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
2230  003644  005227  177777                        INC     #-1             ;;FIRST TIME?
2231  003650  001063                                BNE     68$             ;;BRANCH IF NO
2232  003652  022737  034076  000042                CMP     #$ENDAD,@#42    ;;ACT-11?
2233  003660  001457                                BEQ     68$             ;;BRANCH IF YES
2234  003662  104401  003730                        TYPE    ,69$            ;;TYPE ASCIZ STRING
2235                                        .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
2236  003666  005737  000042                        TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
2237  003672  001012                                BNE     70$             ;;BRANCH IF YES
2238  003674  123727  001234  000001                CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
2239  003702  001406                                BEQ     70$             ;;BRANCH IF YES
2240  003704  023727  001140  000176                CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
2241  003712  001005                                BNE     71$             ;;BRANCH IF NO
2242  003714  104406                                GTSWR                   ;;GET SOFT-SWR SETTINGS
2243  003716  000403                                BR      71$
2244  003720  112737  000001  001134  70$:          MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2245  003726                                71$:
2246  003726  000434                                BR      68$             ;;GET OVER THE ASCIZ
2247                                        ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 4 MAINDEC-11-DZR6D-A/<CRLF>
2248  004020                                68$:
2249  004020  005227  177777                        INC     #-1             ;TYPE RUN TIME MESSAGE FIRST PASS ONLY
2250  004024  001002                                BNE     2$
2251  004026  104401  043673                        TYPE    ,OPR006
2252  004032  022737  000001  003246  2$:           CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2253  004040  001117                                BNE     15$             ;NO, CONTINUE SETUP
2254  004042  104401  043524          5$:           TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (   ) ="
2255  004046  013746  001270                        MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2256  004052  104402                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2257  004054  104401  043553                        TYPE    ,OPR002
2258  004060  104412                                RDOCT                   ;GET VALUE
2259  004062  012637  001160                        MOV     (SP)+,$TMPO
2260  004066  001407                                BEQ     7$              ;CHECK IF <CR>
2261  004070  022737  160000  001160                CMP     #160000,$TMPO   ;CHECK IF IN I/O PAGE
2262  004076  101361                                BHI     5$
2263  004100  013737  001160  001270                MOV     $TMPO,$BASE     ;LOAD NEW BUS ADDRESS
2264  004106  104401  043561          7$:           TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (   ) ="
2265  004112  013746  001264                        MOV     $VECT1,-(SP)    ;GET VECTOR ADDRESS FOR TYPE OUT
2266  004116  042716  160000                        BIC     #160000,(SP)    ;CLEAR PRIORITY BITS
2267  004122  104402                                TYPOC
2268  004124  104401  043553                        TYPE    ,OPR002
2269  004130  104412                                RDOCT                   ;GET VALUE
2270  004132  012637  001160                        MOV     (SP)+,$TMPO
2271  004136  001407                                BEQ     10$             ;CHECK IF <CR>
2272  004140  022737  001000  001160                CMP     #1000,$TMPO     ;CHECK IF LEGAL
2273  004146  101757                                BLOS    7$
2274  004150  013737  001160  001264                MOV     $TMPO,$VECT1    ;LOAD NEW VECTOR ADDRESS
2275  004156  104401  043611          10$:          TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (   ) ="
2276  004162  005046                                CLR     -(SP)           ;MAKE ROOM ON THE STACK
2277  004164  113716  001265                        MOVB    $VECT1+1,(SP)   ;GET PRIORITY
```

```
2278  004170  006216                        ASR     (SP)            ;SHIF RIGH 5 BITS
2279  004172  006216                        ASR     (SP)
2280  004174  006216                        ASR     (SP)
2281  004176  006216                        ASR     (SP)
2282  004200  006216                        ASR     (SP)
2283  004202  104402                        TYPOC
2284  004204  104401  043553                TYPE    ,OPR002
2285  004210  104412                        RDOCT                   ;GET VALUE
2286  004212  012637  001160                MOV     (SP)+,$TMP0
2287  004216  001430                        BEQ     15$             ;CHECK FOR DEFAULT
2288  004220  022737  000007  001160        CMP     #7,$TMP0        ;CHECK IF LEGAL
2289  004226  103753                        BLO     10$
2290  004230  022737  000004  001160        CMP     #4,$TMP0
2291  004236  101347                        BHI     10$
2292  004240  006337  001160                ASL     $TMP0           ;SHIFT 5 BITS LEFT
2293  004244  006337  001160                ASL     $TMP0
2294  004250  006337  001160                ASL     $TMP0
2295  004254  006337  001160                ASL     $TMP0
2296  004260  006337  001160                ASL     $TMP0
2297  004264  042737  160000  001264        BIC     #160000,$VECT1  ;GET PRIORITY BITS
2298  004272  153737  001160  001265        BISB    $TMP0,$VECT1+1
2299  004300  013737  001264  003240  15$:   MOV     $VECT1,RKVEC
2300  004306  042737  160000  003240        BIC     #160000,RKVEC   ;GET VECTOR
2301  004314  113737  001265  003242        MOVB    $VECT1+1,RKPRI  ;GET PRIORITY
2302  004322  013702  001270                MOV     $BASE,R2        ;SET '611 BASE
2303  004326  005037  001202                CLR     $ESCAPE         ;CLEAR ESCAPE
2304  004332  004737  034402        NEWPAS: JSR     PC,PARCHK       ;ENABLE MEMORY PARITY
2305  004336  012746  000000                MOV     #PRO,-(SP)      ;LOCK OUT INTERRUPTS
2306  004342  012746  004350                MOV     #TST1,-(SP)
2307  004346  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.
                        ;*
                        ;;*****************************************************************
004350  000004         TST1:   SCOPE
004352  012737  000062  001200        MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
004360  013702  001270              MOV     $BASE,R2        ;LOAD RK611 BASE
004364  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004372  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004400  012762  177777  000002        MOV,    #-1,RKWC(R2)    ;LOAD WORD COUNT
004406  012762  055220  000004        MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
004414  012762  001777  000020        MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004422  012762  003400  000006        MOV     #3400,RKDA(R2)  ;LOAD TRACK
004430  012762  000007  000010        MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004436  012762  012021  000000        MOV     #CDT!CFMT!RDDATA,RKCS1(R2)  ;ISSUE RDDATA WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004444  012700  000016              MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004450  012762  000440  000026  1$:  MOV     #DMD!MCLK,RKMR1(R2)
004456  012762  000040  000026        MOV     #DMD,RKMR1(R2)
004464  005300                      DEC     R0
004466  001370                      BNE     1$
004470  016237  000000  003140        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
004476  016237  000034  003166        MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
004504  016237  000036  003170        MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
004512  012737  012021  003200        MOV     #CDT!CFMT!RDDATA,E.CS1  ;LOAD EXPECTED CS1
004520  012737  071027  003226        MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
004526  012737  037760  003230        MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
004534  023737  003200  003140        CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
004542  001405                      BEQ     2$              ;YES, CHECK MESSAGE A
004544  104003                      ERROR   3               ;CS1 INCORRECT
004546  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004554  000412                      BR      TST2            ;;GO TO NEXT TEST

004556  023737  003226  003166  2$:  CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
004564  001401                      BEQ     3$              ;YES, CHECK MESSAGE B
004566  104004                      ERROR   4               ;MESS A INCORRECT
004570  023737  003230  003170  3$:  CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
004576  001401                      BEQ     TST2            ;;YES, GO ON TO NEXT TEST
004600  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
                        ;*      PROFER MESSAGE IS ASSEMBLED.
```

```
2364                                    ;*
2365                                    ;;*****************************************************************
2366  004602  000004                    TST2:   SCOPE
2367  004604  012737  000062  001200            MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
2368  004612  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2369  004616  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2370  004624  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2371  004632  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2372  004640  012762  055220  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2373  004646  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2374  004654  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2375  004662  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
2376  004670  012762  012023  000000            MOV     #CDT!CFMT!WRDATA,RKCS1(R2)  ;ISSUE WRDATA WITH CDT SET IN
2377                                                                    ;  24 SECTOR FORMAT
2378  004676  012700  000016                    MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
2379  004702  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)
2380  004710  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2381  004716  005300                            DEC     R0
2382  004720  001370                            BNE     1$
2383  004722  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
2384  004730  016237  000034  003166            MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
2385  004736  016237  000036  003170            MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
2386  004744  012737  012023  003200            MOV     #CDT!CFMT!WRDATA,E.CS1  ;LOAD EXPECTED CS1
2387  004752  012737  071227  003226            MOV     #S.SEEK!S.RTC!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2388  004760  012737  037760  003230            MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
2389  004766  023737  003200  003140            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2390  004774  001405                            BEQ     2$              ;YES, CHECK MESSAGE A
2391  004776  104006                            ERROR   6               ;CS1 INCORRECT
2392  005000  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2393  005006  000412                            BR      TST3            ;;GO TO NEXT TEST
2394
2395  005010  023737  003226  003166  2$:      CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2396  005016  001401                            BEQ     3$              ;YES, CHECK MESSAGE B
2397  005020  104007                            ERROR   7               ;MESS A INCORRECT
2398  005022  023737  003230  003170  3$:      CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2399  005030  001401                            BEQ     TST3            ;;YES, GO ON TO NEXT TEST
2400  005032  104010                            ERROR   10              ;MESS B INCORRECT
2401
2402                                    ;;*****************************************************************
2403                                    ;*TEST 3        SEEK MESSAGE FOR WRITE CHECK
2404                                    ;*
2405                                    ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2406                                    ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE CHECK
2407                                    ;*      OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
2408                                    ;*      CYLINDER 1777, HEAD 7, DRIVE 7.  CLOCK
2409                                    ;*      IN SEEK COMMAND.  MAKE SURE CORRECT MESSAGE
2410                                    ;*      IS ASSEMBLED.
2411                                    ;*
2412                                    ;;*****************************************************************
2413  005034  000004                    TST3:   SCOPE
2414  005036  012737  000050  001200            MOV     #50,$TIMES      ;;DO 50 ITERATIONS
2415  005044  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2416  005050  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2417  005056  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2418  005064  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2419  005072  012762  055220  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
```

```
2420  005100  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2421  005106  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2422  005114  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
2423  005122  012762  012031  000000          MOV     #CDT!CFMT!WRTCHK,RKCS1(R2)  ;ISSUE WRTCHK WITH CDT SET IN
2424                                                                  ;  24 SECTOR FORMAT
2425  005130  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
2426  005134  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2427  005142  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2428  005150  005300                          DEC     R0
2429  005152  001370                          BNE     1$
2430  005154  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
2431  005162  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
2432  005170  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
2433  005176  012737  012031  003200          MOV     #CDT!CFMT!WRTCHK,E.CS1  ;LOAD EXPECTED CS1
2434  005204  012737  071027  003226          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2435  005212  012737  037760  003230          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
2436  005220  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2437  005226  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
2438  005230  104011                          ERROR   11              ;CS1 INCORRECT
2439  005232  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2440  005240  000412                          BR      TST4            ;;GO TO NEXT TEST
2441
2442  005242  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2443  005250  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
2444  005252  104012                          ERROR   12              ;MESS A INCORRECT
2445  005254  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2446  005262  001401                          BEQ     TST4            ;;YES, GO ON TO NEXT TEST
2447  005264  104013                          ERROR   13              ;MESS B INCORRECT
2448
2449                                  ;;*****************************************************************
2450                                  ;*TEST 4        READ DATA CLEAR MESSAGE
2451                                  ;*
2452                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT THE
2453                                  ;*      CONTROLLER ON DIAGNOSTIC MODE.  ISSUE A READ DATA TO AN
2454                                  ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE
2455                                  ;*      7,  WORD COUNT 177777.  CLOCK IN THE SEEK MESSAGE AND THE
2456                                  ;*      CLEAR MESSAGE AND MAKE SURE THE CLEAR MESSAGE IS CORRECT.
2457                                  ;*
2458                                  ;;*****************************************************************
2459  005266  000004                  TST4:   SCOPE
2460  005270  012737  000062  001200          MOV     #50.,%TIMES     ;;DO 50. ITERATIONS
2461  005276  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2462  005302  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2463  005310  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2464  005316  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2465  005324  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2466  005332  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2467  005340  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2468  005346  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2469  005354  012762  012021  000000          MOV     #CDT!CFMT!RDDATA,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2470                                                                  ;  24 SECTOR FORMAT
2471  005362  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2472  005366  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2473  005374  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2474  005402  005300                          DEC     R0
2475  005404  001370                          BNE     1$
```

```
2476  005406  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2477  005414  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2478  005422  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2479  005430  012737  012021  003200          MOV     #CDT!CFMT!RDDATA,E.CS1  ;LOAD EXPECTED CS1
2480  005436  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2481  005444  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2482  005450  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2483  005456  001405                          BEQ     2$              ;YES, CHECK MESSB
2484  005460  104014                          ERROR   14              ;CS1 INCORRECT
2485  005462  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2486  005470  000412                          BR      TST5            ;;GO TO NEXT TEST
2487
2488  005472  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2489  005500  001401                          BEQ     3$              ;YES, CHECK MESS B
2490  005502  104015                          ERROR   15              ;MESS A INCORRECT
2491  005504  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2492  005512  001401                          BEQ     TST5            ;;YES, GO ON TO NEXT TEST
2493  005514  104016                          ERROR   16              ;MESS B INCORRECT
2494
2495                                  ;;*****************************************************************
2496                                  ;*TEST 5        WRITE DATA AND DRIVE CLEAR MESSAGE
2497                                  ;*
2498                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2499                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
2500                                  ;*      ONE WORD TO AN RK06 IN 24 SECTOR FORMAT,  CYLINDER 1777,
2501                                  ;*      TRACK 7, DRIVE 7.  CLOCK IN SEEK MESSAGE AND DRIVE CLEAR.
2502                                  ;*      CHECK IF PROPER DRIVE CLEAR MESSAGE IS ASSEMBLED.
2503                                  ;*
2504                                  ;*****************************************************************
2505  005516  000004                  TST5:   SCOPE
2506  005520  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
2507  005526  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2508  005532  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2509  005540  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2510  005546  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2511  005554  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2512  005562  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2513  005570  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2514  005576  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2515  005604  012762  012023  000000          MOV     #CDT!CFMT!WRDATA,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2516                                                                  ;  24 SECTOR FORMAT
2517  005612  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2518  005616  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2519  005624  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2520  005632  005300                          DEC     R0
2521  005634  001370                          BNE     1$
2522  005636  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2523  005644  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2524  005652  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2525  005660  012737  012023  003200          MOV     #CDT!CFMT!WRDATA,E.CS1  ;LOAD EXPECTED CS1
2526  005666  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2527  005674  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2528  005700  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2529  005706  001405                          BEQ     2$              ;YES, CHECK MESSB
2530  005710  104017                          ERROR   17              ;CS1 INCORRECT
2531  005712  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
```

```
2532  005720  000412                          BR      TST6            ;;GO TO NEXT TEST
2533
2534  005722  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2535  005730  001401                          BEQ     3$              ;YES, CHECK MESS B
2536  005732  104020                          ERROR   20              ;MESS A INCORRECT
2537  005734  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2538  005742  001401                          BEQ     TST6            ;;YES, GO ON TO NEXT TEST
2539  005744  104021                          ERROR   21              ;MESS B INCORRECT
2540
2541                                  ;;*****************************************************************
2542                                  ;*TEST 6        DRIVE CLEAR MESSAGE FOR WRITE CHECK
2543                                  ;*
2544                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2545                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2546                                  ;*      CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
2547                                  ;*      CYLINDER 1777, HEAD 7, DRIVE 7.  CLOCK
2548                                  ;*      THROUGH SEEK MESSAGE AND CLOCK IN DRIVE CLEAR.
2549                                  ;*      MAKE SURE CORRECT MESSAGE IS ASSEMBLED.
2550                                  ;*
2551                                  ;*****************************************************************
2552  005746  000004                  TST6:   SCOPE
2553  005750  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
2554  005756  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2555  005762  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2556  005770  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2557  005776  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2558  006004  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2559  006012  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2560  006020  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2561  006026  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2562  006034  012762  012031  000000          MOV     #CDT!CFMT!WRTCHK,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2563                                                                  ;  24 SECTOR FORMAT
2564  006042  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2565  006046  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2566  006054  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2567  006062  005300                          DEC     R0
2568  006064  001370                          BNE     1$
2569  006066  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2570  006074  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2571  006102  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2572  006110  012737  012031  003200          MOV     #CDT!CFMT!WRTCHK,E.CS1  ;LOAD EXPECTED CS1
2573  006116  012737  071407  003226          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2574  006124  005037  003230                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2575  006130  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2576  006136  001405                          BEQ     2$              ;YES, CHECK MESSB
2577  006140  104022                          ERROR   22              ;CS1 INCORRECT
2578  006142  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2579  006150  000412                          BR      TST7            ;;GO TO NEXT TEST
2580
2581  006152  023737  003226  003166  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2582  006160  001401                          BEQ     3$              ;YES, CHECK MESS B
2583  006162  104023                          ERROR   23              ;MESS A INCORRECT
2584  006164  023737  003230  003170  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2585  006172  001401                          BEQ     TST7            ;;YES, GO ON TO NEXT TEST
2586  006174  104024                          ERROR   24              ;MESS B INCORRECT
2587
```

```
                                .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.
                                ;*
                                ;;*****************************************************************
006176  000004                  TST7:   SCOPE
006200  012[illegible]  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
006206  013[illegible]  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
006212  005037  003220                          CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
006216  005037  003206                          CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
006222  012737  000021  003200                  MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
006230  012737  006236  001110                  MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                        ;  SUBTEST LOOP
006236                          1$:
006236  004737  036010                          JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
006242  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006250  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
006256  012762  177777  000002                  MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
006264  012762  055220  000004                  MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
006272  013762  003220  000020                  MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
006300  013762  003206  000006                  MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
006306  013762  003200  000000                  MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
006314  012700  000426                          MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
006320  012762  000440  000026  5$:             MOV     #DMD!MCLK,RKMR1(R2)
006326  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
006334  005300                                  DEC     R0
006336  001370                                  BNE     5$
006340  016237  000000  003140                  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
006346  016237  000034  003166                  MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
006354  016237  000036  003170                  MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
006362  023737  003200  003140                  CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
006370  001405                                  BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
006372  104025                                  ERROR   25              ;CS1 INCORRECT
006374  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
006402  000412                                  BR      15$             ;YES, CHECK SECOND WORD OF HEADER

006404  023737  003226  003166  6$:             CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
006412  001401                                  BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
006414  104026                                  ERROR   26              ;FIRST WORD OF HEADER INCORRECT
006416  023737  003230  003170  7$:             CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
006424  001401                                  BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
006426  104027                                  ERROR   27              ;SECOND WORD INCORRECT
006430  104415                          15$:    SCOP1                   ;LOOP ON ERROR
006432  005237  003220                          INC     E.DCYL          ;INCREMENT EXPECTED CYLINDER
006436  022737  000633  003220                  CMP     #633,E.DCYL     ;CHECK IF VALUE OF CYLINDER OVERFLOW DETECTION
006444  001002                                  BNE     16$             ;NO, CONTINUE
```

```
                                        INC     E.DCYL          ;USE 634
                                        CMP     #1777,E.DCYL    ;CHECK IF FINISHED
                                        BHIS    1$              ;NO, GO TO NEXT CONFIGURATION

                                ;;*******************************************************************
                                ;*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 1-7.
                                ;*
                                ;;*******************************************************************
                                TST10:  SCOPE
                                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                                        MOV     $BASE,R2        ;LOAD RK611 BASE
                                        CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
                                        CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
                                        MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
                                        MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                ;  SUBTEST LOOP

                                1$:
                                        JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
                                        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
                                        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
                                        MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
                                        MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
                                        MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
                                        MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
                                        MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
                                        MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
                                5$:     MOV     #DMD!MCLK,RKMR1(R2)
                                        MOV     #DMD,RKMR1(R2)
                                        DEC     R0
                                        BNE     5$
                                        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
                                        MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
                                        MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
                                        CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
                                        BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
                                        ERROR   30              ;CS1 INCORRECT
                                        MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
                                        BR      15$             ;YES, CHECK SECOND WORD OF HEADER

                                6$:     CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
                                        BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
                                        ERROR   31              ;FIRST WORD OF HEADER INCORRECT
                                7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
                                        BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
                                        ERROR   32              ;SECOND WORD INCORRECT
                                15$:    SCOP1                   ;LOOP ON ERROR
                                        INCB    E.DA+1          ;INCREMENT TRACK
                                        CMPB    #7,E.DA+1       ;CHECK IF FINISHED
```

```
2700  006730  103274                          BHIS    1$              ;NO, GO TO NEXT CONFIGURATION
2701
2702                                  ;;*****************************************************************
2703                                  ;*TEST 11       HEADER GENERATION (PART 3)
2704                                  ;*
2705                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2706                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA OF
2707                                  ;*      ONE WORD FOR AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD
2708                                  ;*      0, SECTOR 0.  CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES.
2709                                  ;*      CHECK MAINTENANCE REGISTER 2 AND MAINTENANCE REGISTER 3
2710                                  ;*      TO MAKE SURE HEADER IS CORRECT.  REPEAT FOR SECTORS 1-25.
2711                                  ;*
2712                                  ;;*****************************************************************
2713  006732  000004                  TST11:  SCOPE
2714  006734  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2715  006742  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2716  006746  005037  003220                  CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
2717  006752  005037  003206                  CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
2718  006756  012737  000021  003200          MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
2719  006764  012737  006772  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
2720                                                                  ;  SUBTEST LOOP
2721
2722  006772                          1$:
2723  006772  004737  036010                  JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
2724  006776  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2725  007004  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
2726  007012  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
2727  007020  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
2728  007026  013762  003220  000020          MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
2729  007034  013762  003206  000006          MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
2730  007042  013762  003200  000000          MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
2731  007050  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
2732  007054  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2733  007062  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2734  007070  005300                          DEC     R0
2735  007072  001370                          BNE     5$
2736  007074  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2737  007102  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
2738  007110  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
2739  007116  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
2740  007124  001405                          BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
2741  007126  104033                          ERROR   33              ;CS1 INCORRECT
2742  007130  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2743  007136  000412                          BR      15$             ;YES, CHECK SECOND WORD OF HEADER
2744
2745  007140  023737  003226  003166  6$:     CMP     E.MR2,T.MR2     ;CHECK IF FIRST WORD OF HEADER CORRECT
2746  007146  001401                          BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
2747  007150  104034                          ERROR   34              ;FIRST WORD OF HEADER INCORRECT
2748  007152  023737  003230  003170  7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
2749  007160  001401                          BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
2750  007162  104035                          ERROR   35              ;SECOND WORD INCORRECT
2751  007164  104415                  15$:    SCOP1                   ;LOOP ON ERROR
2752  007166  105237  003206                  INCB    E.DA            ;INCREMENT SECTOR
2753  007172  122737  000025  003206          CMPB    #25,E.DA        ;CHECK IF FINISHED
2754  007200  103274                          BHIS    1$              ;NO, GO TO NEXT CONFIGURATION
2755
```

```
                                ;;*****************************************************************
                                ;*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.
                                ;*
                                ;;*****************************************************************
007202  000004                  TST12:  SCOPE
007204  012737  000062  001200          MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
007212  013702  001270          1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
007216  005037  003220                  CLR     E.DCYL          ;INITIALIZE CYLINDER ADD
007222  005037  003206                  CLR     E.DA            ;INITIALIZE TRACK AND SECTOR
007226  012737  000021  003200          MOV     #RDDATA,E.CS1   ;INITIALIZE FORMAT
007234  012737  007242  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                ;  SUBTEST LOOP
007242                          1$:
007242  004737  036010                  JSR     PC,CALHDR       ;CALULATE EXPECTED HEADER
007246  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007254  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IM MAINTENANCE MODE
007262  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
007270  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
007276  013762  003220  000020          MOV     E.DCYL,RKDCYL(R2) ;LOAD CYLINDER NUMBER
007304  013762  003206  000006          MOV     E.DA,RKDA(R2)   ;LOAD TRACK AND SECTOR
007312  013762  003200  000000          MOV     E.CS1,RKCS1(R2) ;LOAD COMMAND AND FORMAT
007320  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL HEADER GENERATION
007324  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
007332  012762  000040  000026          MOV     #DMD,RKMR1(R2)
007340  005300                          DEC     R0
007342  001370                          BNE     5$
007344  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
007352  016237  000034  003166          MOV     RKMR2(R2),T.MR2 ;STORE FIRST HEADER WORD
007360  016237  000036  003170          MOV     RKMR3(R2),T.MR3 ;STORE SECOND WORD
007366  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATRUS REG 1 CORRECT
007374  001405                          BEQ     6$              ;YES, CHECK FIRST LINE OF HEADER
007376  104036                          ERROR   36              ;CS1 INCORRECT
007400  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
007406  000412                          BR      15$             ;YES, CHECK SECOND WORD OF HEADER

007410  023737  003226  003166  6$:     CMP     E.MR2,T.MR2     ;CHEC  IF FIRST WORD OF HEADER CORRECT
007416  001401                          BEQ     7$              ;YES, CHECK IF SECOND WORD OF HEADER CORRECT
007420  104037                          ERROR   37              ;FIRST WORD OF HEADER INCORRECT
007422  023737  003230  003170  7$:     CMP     E.MR3,T.MR3     ;CHECK IF SECOND WORD OF HEADER CORRECT
007430  001401                          BEQ     15$             ;YES,CHECK IF LOOP ON ERROR
007432  104040                          ERROR   40              ;SECOND WORD INCORRECT
007434  104415                  15$:    SCOP1                   ;LOOP ON ERROR
007436  032737  010000  003200          BIT     #CFMT,E.CS1     ;CHECK IF FINISHED
007444  001004                          BNE     TST13           ;;YES, GO TO NEXT TEST
007446  052737  010000  003200          BIS     #CFMT,E.CS1     ;USE 24 SECTOR FORMAT
007454  000672                          BR      1$
```

```
                        .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.
                        ;*
                        ;;*****************************************************************
007456  000004         TST13:  SCOPE
007460  012737  000062  001200        MOV     #50.,$TIMES     ;;DO 50. ITERATIONS
007466  013702  001270        MOV     $BASE,R2        ;LOAD RK611 BASE
007472  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007500  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
007506  012762  177675  000002        MOV     #-67.,RKWC(R2)  ;WORD COUNT=67
007514  012762  053156  000004        MOV     #NPRBUF,RKBA(R2)  ;LOAD BUFFER ADDRESS
007522  012762  000023  000000        MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRDATA
007530  012700  004724        MOV     #68.*37.,R0     ;ISSUE ENOUGH CLOCKS FOR 68
007534  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)  ;  NPR TRANSFERS
007542  012762  000040  000026        MOV     #DMD,RKMR1(R2)
007550  005300        DEC     R0
007552  001370        BNE     1$
007554  016237  000000  003140        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
007562  016237  000010  003150        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
007570  016237  000002  003142        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
007576  016237  000004  003144        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
007604  016237  000014  003154        MOV     RKER(R2),T.ER   ;STORE ERROR REG.
007612  012737  000023  003200        MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
007620  012737  000200  003210        MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
007626  012737  177777  003202        MOV     #-1,E.WC        ;LOAD EXPECTED WORD COUNT
007634  012737  053362  003204        MOV     #NPRBUF+<66.*2>,E.BA  ;LOAD EXPECTED BUS ADDRESS
007642  005037  003214        CLR     E.ER            ;LOAD EXPECTED ERROR REG
007646  023737  003200  003140        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
007654  001405        BEQ     5$              ;YES, CHECK CS2
007656  104041        ERROR   41              ;CS1 INCORRECT
007660  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
007666  000517        BR      TST14           ;;GO TO NEXT TEST
                        
007670  023737  003210  003150  5$:   CMP     E.CS2,T.CS2     ;CHECK CS2
007676  001401        BEQ     6$              ;NO, CHECK BUS ADDRESS
007700  104042        ERROR   42              ;CS2 INCORRECT
007702  023737  003204  003144  6$:   CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
007710  001401        BEQ     7$              ;YES, CHECK WORD COUNT
007712  104044        ERROR   44              ;BUS ADDRESS INCORRECT
007714  023737  003202  003142  7$:   CMP     E.WC,T.WC       ;CHECK WORD COUNT
007722  001401        BEQ     8$              ;YES, CONTINUE
007724  104045        ERROR   45              ;WORD COUNT INCORRECT
007726  023737  003214  003154  8$:   CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
007734  001401        BEQ     10$             ;YES, CONTINUE
007736  104043        ERROR   43              ;ERROR REG INCORRECT
007740  012703  053156        10$:   MOV     #NPRBUF,R3      ;LOAD ADDRESS OR START OF BUFFER
```

```
2868  007744  012701  000101                  MOV     #65.,R1          ;LOAD COUNT FOR SICO
2869  007750  005037  003264                  CLR     WRDCNT           ;INITIALIZE WORD COUNT
2870  007754  012737  000300  003210          MOV     #IR!OR,E.CS2     ;LOAD EXPECTED CS2
2871  007762  012337  003222          15$:    MOV     (R3)+,E.DB       ;LOAD EXPECTED DATA
2872  007766  016237  000024  003162          MOV     RKDB(R2),T.DB    ;GET DATA READ
2873  007774  012700  000020                  MOV     #20,R0           ;SET COUNT TO WAIT FOR SILO
2874  010000  005300                  16$:    DEC     R0               ;DEC COUNT
2875  010002  001376                          BNE     16$              ;WAIT FOR 0
2876  010004  016237  000000  003140          MOV     RKCS1(R2),T.CS1  ;STORE CS1
2877  010012  016237  000010  003150          MOV     RKCS2(R2),T.CS2  ;STORE CS2
2878  010020  016237  000014  003154          MOV     RKER(R2),T.ER    ;STORE ERROR REG.
2879  010026  023737  003200  003140          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
2880  010034  001405                          BEQ     20$              ;YES, CONTINUE
2881  010036  104046                          ERROR   46               ;CS1 INCORRECT
2882  010040  012762  100000  000000          MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2883  010046  000427                          BR      TST14            ;;GO ON TO NEXT TEST
2884
2885  010050  023737  003210  003150  20$:    CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
2886  010056  001401                          BEQ     21$              ;YES, CONTINUE
2887  010060  104047                          ERROR   47               ;CS2 INCORRECT
2888  010062  023737  003214  003154  21$:    CMP     E.ER,T.ER        ;CHECK ERROR REG CORRECT
2889  010070  001401                          BEQ     22$              ;YES, CONTINUE
2890  010072  104050                          ERROR   50               ;ERROR REG INCORRECT
2891  010074  023737  003222  003162  22$:    CMP     E.DB,T.DB        ;CHECK DATA CORRECT
2892  010102  001401                          BEQ     25$              ;YES, CONTINUE
2893  010104  104051                          ERROR   51               ;DATA INCORRECT
2894  010106  005237  003264          25$:    INC     WRDCNT           ;INCREMENT WORD COUNT
2895  010112  005301                          DEC     R1
2896  010114  001003                          BNE     26$              ;CHECK IF LAST WORD
2897  010116  012737  000100  003210          MOV     #IR,E.CS2        ;UPDATE EXPECTED CS2
2898  010124  100316                  26$:    BPL     15$              ;CHECK IF FINISHED
2899
2900                                  .SBTTL  **HEADER RECOGNITION TESTS
2901
2902                                  ;;*****************************************************************
2903                                  ;*TEST 14       WRITE DATA HEADER RECOGNITION
2904                                  ;*
2905                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2906                                  ;*      CONTROLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE
2907                                  ;*      WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
2908                                  ;*      SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
2909                                  ;*      SIMULATE A SECTOR PULSE AND A HEADER WITH THE FOLLOWING
2910                                  ;*      DATA:
2911                                  ;*
2912                                  ;*              000000
2913                                  ;*              140000
2914                                  ;*              140000
2915                                  ;*
2916                                  ;*      MAKE SURE WRITE GATE SETS SHOWING CORRECT HEADER RECOGNITION.
2917                                  ;*
2918                                  ;*****************************************************************
2919  010126  000004          TST14:  SCOPE
2920  010130  012737  000012  001200          MOV     #10.,$TIMES      ;;DO 10. ITERATIONS
2921  010136  013702  001270                  MOV     $BASE,R2         ;LOAD RK611 BASE
2922  010142  012762  100000  000000          MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2923  010150  012762  000040  000026          MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN DIAGNOSTIC MODE
```

```
 2924  010156  012762  177777  000002          MOV     #-1,RKWC(R2)     ;WORD COUNT=1
 2925  010164  012762  055220  000004          MOV     #BUFF,RKBA(R2)   ;LOAD DUMMY BUS ADDRESS
 2926  010172  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
 2927  010200  012700  000426                  MOV     #69.*4+2,R0      ;ISSUE ENOUGH CLOCKS UNITL READY
 2928                                                                     ;  FOR SECTOR PULSE
 2929  010204  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 2930  010212  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 2931  010220  005300                          DEC     R0
 2932  010222  001370                          BNE     1$
 2933  010224  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 2934  010232  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 2935  010240  012737  000023  003200          MOV     #WRDATA,E.CS1    ;STORE EXPECTED CS1
 2936  010246  005037  003254                  CLR     PR.BIT           ;GENERATE SYNCH
 2937  010252  005037  003256                  CLR     M1.BIT
 2938  010256  005037  003262                  CLR     BITCNT
 2939  010262  012700  000377                  MOV     #255.,R0
 2940  010266  004737  037030          5$:     JSR     PC,RDBIT
 2941  010272  016237  000000  003140          MOV     RKCS1(R2),T.CS1
 2942  010300  023737  003200  003140          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
 2943  010306  001112                          BNE     63$              ;NO, REPORT ERROR
 2944  010310  005237  003262                  INC     BITCNT           ;INCREMENT BIT COUNT
 2945  010314  005300                          DEC     R0               ;CHECK IF SYNCH FINISHED
 2946  010316  001363                          BNE     5$
 2947  010320  012737  000001  003254          MOV     #1,PR.BIT        ;SIMULATE SYNCH BIT
 2948  010326  004737  037030                  JSR     PC,RDBIT
 2949  010332  016237  000000  003140          MOV     RKCS1(R2),T.CS1
 2950  010340  023737  003200  003140          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
 2951  010346  001072                          BNE     63$              ;NO, REPORT CS1
 2952  010350  005237  003262                  INC     BITCNT           ;INCREMENT BIT COUNT
 2953  010354  012703  053366                  MOV     #HEAD1,R3        ;SIMULATE GOOD HEADER
 2954  010360  012701  000003                  MOV     #3,R1
 2955  010364  012304                  12$:    MOV     (R3)+,R4         ;GET NEXT HEADER WORD
 2956  010366  012700  000020                  MOV     #16.,R0          ;LOAD BITS PER WORD
 2957  010372  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT    ;STORE PREVIOUS BIT
 2958  010400  006004                          ROR     R4               ;GET NEXT BIT
 2959  010402  103403                          BCS     17$
 2960  010404  005037  003254                  CLR     PR.BIT
 2961  010410  000403                          BR      18$
 2962
 2963  010412  012737  000001  003254  17$:    MOV     #1,PR.BIT
 2964  010420  004737  037030          18$:    JSR     PC,RDBIT         ;SIMULATE NEXT BIT
 2965  010424  016237  000000  003140          MOV     RKCS1(R2),T.CS1  ;GET CS1
 2966  010432  023737  003200  003140          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
 2967  010440  001035                          BNE     63$              ;NO, REPORT ERROR
 2968  010442  005237  003262                  INC     BITCNT           ;INCREMENT BIT COUNT
 2969  010446  005300                          DEC     R0               ;CHECK IF READY FOR NEXT HEADER WORD
 2970  010450  001350                          BNE     15$              ;NO, CONTINUE
 2971  010452  005301                          DEC     R1               ;CHECK IF FINISHED WITH HEAD
 2972  010454  001343                          BNE     12$              ;NO, CONTINUE
 2973  010456  012700  000105                  MOV     #69.,R0          ;LOAD COUNT FOR GAP
 2974  010462  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT    ;SIMULATE GAP
 2975  010470  005037  003254                  CLR     PR.BIT
 2976  010474  004737  037030                  JSR     PC,RDBIT
 2977  010500  005300                          DEC     R0
 2978  010502  001367                          BNE     25$
 2979  010504  016237  000026  003164          MOV     RKMR1(R2),T.MR1  ;GET MR1
```

```
                                                MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;LOAD EXPECTED MR1
                                                CMP     E.MR1,T.MR1     ;CHECK IF WRITE GATE SET
                                                BEQ     TST15           ;;YES, GO ON TO NEXT TEST
                                                ERROR   53
                                                BR      TST15           ;;GO ON TO NEXT TEST

                                        63$:    MOV     RKCS2(R2),T.CS2 ;STORE CS2 FOR PRINT OUT
                                                MOV     RKER(R2),T.ER   ;STORE ERROR REG FOR PRINT OUT
                                                ERROR   52              ;REPORT ERROR

                                        ;;*****************************************************************
                                        ;*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.
                                        ;*
                                        ;;*****************************************************************
                                        TST15:  SCOPE
                                                MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                                                MOV     $BASE,R2        ;LOAD RK611 BASE
                                                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
                                                MOV     #700,R0         ;SET STALL COUNT
                                        4$:     DEC     R0              ;DEC COUNT
                                                BNE     4$              ;LOOP UNTIL ZERO
                                                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
                                                MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
                                                MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
                                                MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
                                                MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTILL READY
                                                                        ; FOR SECTOR PULSE
                                        1$:     MOV     #DMD!MCLK,RKMR1(R2)
                                                MOV     #DMD,RKMR1(R2)
                                                DEC     R0
                                                BNE     1$
                                                MOV     #4,R0           ;SIMULATE INDEX PULSE
                                                MOV     #DMD!MIND,RKMR1(R2)
                                        2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
                                                MOV     #DMD!MIND,RKMR1(R2)
                                                DEC     R0
                                                BNE     2$
                                                MOV     #DMD,RKMR1(R2)
                                                CLR     PR.BIT          ;GENERATE SYNCH
                                                CLR     M1.BIT
                                                MOV     #255.,R0
                                        5$:     JSR     PC,RDBIT
                                                DEC     R0
```

```
3036  010742  001374                          BNE     5$
3037  010744  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3038  010752  004737  037030                  JSR     PC,RDBIT
3039  010756  012703  053366                  MOV     #HEAD1,R3       ;SIMULATE GOOD HEADER
3040  010762  012701  000003                  MOV     #3,R1
3041  010766  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3042  010770  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORDS
3043  010774  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
3044  011002  006004                          ROR     R4              ;GET NEXT BIT
3045  011004  103403                          BCS     17$
3046  011006  005037  003254                  CLR     PR.BIT
3047  011012  000403                          BR      18$
3048
3049  011014  012737  000001  003254  17$:    MOV     #1,PR.BIT
3050  011022  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3051  011026  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3052  011030  001361                          BNE     15$             ;NO,CONTINUE
3053  011032  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3054  011034  001354                          BNE     12$             ;NO,CONTINUE
3055  011036  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3056  011042  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3057  011050  005037  003254                  CLR     PR.BIT
3058  011054  004737  037030                  JSR     PC,RDBIT
3059  011060  005300                          DEC     R0
3060  011062  001367                          BNE     25$
3061  011064  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;GET MR1
3062  011072  012737  022040  003224          MOV     #DMD!ECCW!MEWD,E.MR1 ;LOAD EXPECTDED MR1
3063  011100  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF WRITE GATE DID NOT SET
3064  011106  001401                          BEQ     TST16           ;;YES, GO ON TO NEXT TEST
3065  011110  104053                          ERROR   53
3066
3067                                  ;;*****************************************************************
3068                                  ;*TEST 16       SECTOR INCREMENT
3069                                  ;*
3070                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3071                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE WORD
3072                                  ;*      TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0,
3073                                  ;*      SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3074                                  ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
3075                                  ;*      THAT WRITE GATE SETS,
3076                                  ;*
3077                                  ;*      REPEAT FOR SECTOR 1-24.
3078                                  ;*
3079                                  ;;*****************************************************************
3080  011112  000004                  TST16:  SCOPE
3081  011114  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3082  011122  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3083  011126  005037  003300                  CLR     CYLN            ;INITIALIZE CYLINDER
3084  011132  005037  003276                  CLR     SECTOR          ;INITIALIZE TRACK AND SECTOR
3085  011136  012737  011144  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3086                                                                  ;  SUBTEST LOOP
3087
3088  011144                          1$:
3089  011144  004737  035626                  JSR     PC,INCHDR       ;GENERATE HEADER WORDS
3090  011150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
3091  011156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
```

```
3092  011164  013762  003300  000020          MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
3093  011172  013762  003276  000006          MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
3094  011200  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3095  011206  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3096  011214  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3097  011222  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3098                                                                  ;  FOR SECTOR PULSE
3099  011226  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3100  011234  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3101  011242  005300                          DEC     R0
3102  011244  001370                          BNE     5$
3103  011246  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3104  011254  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3105  011262  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
3106  011266  005037  003256                  CLR     M1.BIT
3107  011272  012700  000377                  MOV     #255.,R0
3108  011276  004737  037030          10$:    JSR     PC,RDBIT
3109  011302  005300                          DEC     R0
3110  011304  001374                          BNE     10$
3111  011306  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3112  011314  004737  037030                  JSR     PC,RDBIT
3113  011320  012703  003302                  MOV     #HEADER,R3      ;SIMULATE HEADER
3114  011324  012701  000003                  MOV     #3,R1
3115  011330  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3116  011332  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
3117  011336  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT
3118  011344  006004                          ROR     R4
3119  011346  103403                          BCS     17$
3120  011350  005037  003254                  CLR     PR.BIT
3121  011354  000403                          BR      18$
3122
3123  011356  012737  000001  003254  17$:    MOV     #1,PR.BIT
3124  011364  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3125  011370  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3126  011372  001361                          BNE     15$             ;NO, CONTINUE
3127  011374  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3128  011376  001354                          BNE     12$             ;NO, CONTINUE
3129  011400  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3130  011404  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3131  011412  005037  003254                  CLR     PR.BIT
3132  011416  004737  037030                  JSR     PC,RDBIT
3133  011422  005300                          DEC     R0              ;CHECK IF GAP FINISHED
3134  011424  001367                          BNE     25$             ;NO, CONTINUE
3135  011426  016237  000006  003146          MOV     RKDA(R2),T.DA   ;GET DISK ADDRESS REG
3136  011434  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL  ;GET CYLINDER ADD REG.
3137  011442  023737  003206  003146          CMP     E.DA,T.DA       ;CHECK DISK ADD CORRECT
3138  011450  001401                          BEQ     30$             ;YES, CONTINUE
3139  011452  104054                          ERROR   54              ;DISK ADDRESS INCORRECT
3140  011454  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL   ;CHECK IF CYLINDER ADD CORRECT
3141  011462  001401                          BEQ     32$             ;YES, CHECK IF LOOP ON ERROR
3142  011464  104002                          ERROR   R2              ;CYLINDER INCORRECT
3143  011466  104415                  32$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3144  011470  105237  003276                  INCB    SECTOR          ;INCREMENT SECTOR
3145  011474  122737  000026  003276          CMPB    #26,SECTOR      ;CHECK IF ALL SECTOR TRIED
3146  011502  001220                          BNE     1$              ;NO, TRY NEXT VALUE
3147
```

```
                                ;;*****************************************************************
                                ;*TEST 17       TRACK INCREMENT
                                ;*
                                ;*      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 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
                                ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
                                ;*      THAT WRITE GATE SETS.
                                ;*
                                ;*      REPEAT FOR TRACK = 1.
                                ;*
                                ;;*****************************************************************
011504  000004                 TST17:  SCOPE
011506  012737  000012  001200         MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
011514  013702  001270                 MOV     $BASE,R2        ;LOAD RK611 BASE
011520  005037  003300                 CLR     CYLN            ;INITIALIZE CYLINDER
011524  012737  000025  003276         MOV     #25,SECTOR      ;INITIALIZE TRACK AND SECTOR
011532  012737  011540  001110         MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                ;  SUBTEST LOOP
011540                          1$:
011540  004737  035626                 JSR     PC,INCHDR       ;GENERATE HEADER WORDS
011544  012762  100000  000000         MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
011552  012762  000040  000026         MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
011560  013762  003300  000020         MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
011566  013762  003276  000006         MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
011574  012762  177777  000002         MOV     #-1,RKWC(R2)    ;WORD COUNT=1
011602  012762  055220  000004         MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
011610  012762  000023  000000         MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
011616  012700  000426                 MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                ;  FOR SECTOR PULSE
011622  012762  000440  000026  5$:    MOV     #DMD!MCLK,RKMR1(R2)
011630  012762  000040  000026         MOV     #DMD,RKMR1(R2)
011636  005300                 DEC     R0
011640  001370                 BNE     5$
011642  012762  000140  000026         MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
011650  012762  000040  000026         MOV     #DMD,RKMR1(R2)
011656  005037  003254                 CLR     PR.BIT          ;GENERATE SYNCH
011662  005037  003256                 CLR     M1.BIT
011666  012700  000377                 MOV     #255.,R0
011672  004737  037030         10$:    JSR     PC,RDBIT
011676  005300                 DEC     R0
011700  001374                 BNE     10$
011702  012737  000001  003254         MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
011710  004737  037030                 JSR     PC,RDBIT
011714  012703  003302                 MOV     #HEADER,R3      ;SIMULATE HEADER
011720  012701  000003                 MOV     #3,R1
011724  012304                 12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
011726  012700  000020                 MOV     #16.,R0         ;LOAD BITS PER WORD
011732  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT
011740  006004                 ROR     R4
011742  103403                 BCS     17$
011744  005037  003254                 CLR     PR.BIT
011750  000403                 BR      18$
```

```
3204  011752  012737  000001  003254  17$:    MOV     #1,PR.BIT
3205  011760  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3206  011764  005300                  DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3207  011766  001361                  BNE     15$             ;NO, CONTINUE
3208  011770  005301                  DEC     R1              ;CHECK IF FINISHED WITH HEADER
3209  011772  001354                  BNE     12$             ;NO, CONTINUE
3210  011774  012700  000100          MOV     #64.,R0         ;LOAD COUNT FOR GAP
3211  012000  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3212  012006  005037  003254          CLR     PR.BIT
3213  012012  004737  037030          JSR     PC,RDBIT
3214  012016  005300                  DEC     R0              ;CHECK IF GAP FINISHED
3215  012020  001367                  BNE     25$             ;NO, CONTINUE
3216  012022  016237  000006  003146  MOV     RKDA(R2),T.DA   ;GET DISK ADDRESS REG
3217  012030  016237  000020  003160  MOV     RKDCYL(R2),T.DCYL  ;GET CYLINDER ADD REG.
3218  012036  023737  003206  003146  CMP     E.DA,T.DA       ;CHECK DISK ADD CORRECT
3219  012044  001401                  BEQ     30$             ;YES, CONTINUE
3220  012046  104056                  ERROR   56              ;DISK ADDRESS INCORRECT
3221  012050  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL   ;CHECK IF CYLINDER ADD CORRECT
3222  012056  001401                  BEQ     32$             ;YES, CHECK IF LOOP ON ERROR
3223  012060  104002                  ERROR   R2              ;CYLINDER INCORRECT
3224  012062  104415                  32$:    SCOP1           ;CHECK IF LOOP ON ERROR
3225  012064  105237  003277          INCB    TRACK           ;INCREMENT TRACK
3226  012070  122737  000003  003277  CMPB    #3,TRACK        ;CHECK IF ALL TRACKS TRIED
3227  012076  001220                  BNE     1$              ;NO, TRY NEXT VALUE
3228
3229                                  ;;*****************************************************************
3230                                  ;*TEST 20       CYLINDER INCREMENT
3231                                  ;*
3232                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3233                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF ONE WORD
3234                                  ;*      TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 2,
3235                                  ;*      SECTOR 25.  CLOCK IN BOTH SEEK AND DRIVE CLEAR MESSAGES.
3236                                  ;*      SIMULATE SECTOR PULSE AND PROPER HEADER,  MAKE SURE
3237                                  ;*      THAT WRITE GATE SETS.
3238                                  ;*
3239                                  ;*      REPEAT FOR CYLINDER = 1-632.
3240                                  ;*
3241                                  ;*****************************************************************
3242  012100  000004                  TST20:  SCOPE
3243  012102  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3244  012110  013702  001270          MOV     $BASE,R2        ;LOAD RK611 BASE
3245  012114  005037  003300          CLR     CYLN            ;INITIALIZE CYLINDER
3246  012120  012737  001025  003276  MOV     #1025,SECTOR    ;INITIALIZE TRACK AND SECTOR
3247  012126  012737  012134  001110  MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3248                                                          ;  SUBTEST LOOP
3249
3250  012134                          1$:
3251  012134  004737  035626          JSR     PC,INCHDR       ;GENERATE HEADER WORDS
3252  012140  012762  100000  000000  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611 CONTROLLER
3253  012146  012762  000040  000026  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3254  012154  013762  003300  000020  MOV     CYLN,RKDCYL(R2) ;LOAD DESIRED CYLINDER
3255  012162  013762  003276  000006  MOV     SECTOR,RKDA(R2) ;LOAD DESIRED TRACK/SECTOR
3256  012170  012762  177777  000002  MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3257  012176  012762  055220  000004  MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3258  012204  012762  000023  000000  MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3259  012212  012700  000426          MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
```

```
3260                                                                    ;  FOR SECTOR PULSE
3261  012216  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3262  012224  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3263  012232  005300                          DEC     R0
3264  012234  001370                          BNE     5$
3265  012236  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3266  012244  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3267  012252  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
3268  012256  005037  003256                  CLR     M1.BIT
3269  012262  012700  000377                  MOV     #255.,R0
3270  012266  004737  037030          10$:    JSR     PC,RDBIT
3271  012272  005300                          DEC     R0
3272  012274  001374                          BNE     10$
3273  012276  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH BIT
3274  012304  004737  037030                  JSR     PC,RDBIT
3275  012310  012703  003302                  MOV     #HEADER,R3          ;SIMULATE HEADER
3276  012314  012701  000003                  MOV     #3,R1
3277  012320  012304                  12$:    MOV     (R3)+,R4            ;GET NEXT HEADER WORD
3278  012322  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
3279  012326  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT
3280  012334  006004                          ROR     R4
3281  012336  103403                          BCS     17$
3282  012340  005037  003254                  CLR     PR.BIT
3283  012344  000403                          BR      18$
3284
3285  012346  012737  000001  003254  17$:    MOV     #1,PR.BIT
3286  012354  004737  037030          18$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
3287  012360  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT HEADER WORD
3288  012362  001361                          BNE     15$                 ;NO, CONTINUE
3289  012364  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
3290  012366  001354                          BNE     12$                 ;NO, CONTINUE
3291  012370  012700  000100                  MOV     #64.,R0             ;LOAD COUNT FOR GAP
3292  012374  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
3293  012402  005037  003254                  CLR     PR.BIT
3294  012406  004737  037030                  JSR     PC,RDBIT
3295  012412  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
3296  012414  001367                          BNE     25$                 ;NO, CONTINUE
3297  012416  016237  000006  003146          MOV     RKDA(R2),T.DA       ;GET DISK ADDRESS REG
3298  012424  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL   ;GET CYLINDER ADD REG.
3299  012432  023737  003206  003146          CMP     E.DA,T.DA           ;CHECK DISK ADD CORRECT
3300  012440  001401                          BEQ     30$                 ;YES, CONTINUE
3301  012442  104060                          ERROR   60                  ;DISK ADDRESS INCORRECT
3302  012444  023737  003220  003160  30$:    CMP     E.DCYL,T.DCYL       ;CHECK IF CYLINDER ADD CORRECT
3303  012452  001401                          BEQ     32$                 ;YES, CHECK IF LOOP ON ERROR
3304  012454  104002                          ERROR   R2                  ;CYLINDER INCORRECT
3305  012456  104415                  32$:    SCOP1                       ;CHECK IF LOOP ON ERROR
3306  012460  005237  003300                  INC     CYLN                ;INCREMENT CYLINDER
3307  012464  022737  000633  003300          CMP     #633,CYLN           ;CHECK IF ALL CYLINDER TRIED
3308  012472  001220                          BNE     1$                  ;NO, TRY NEXT VALUE
3309
3310                                  ;;*****************************************************************
3311                                  ;*TEST 21       BAD SECTOR ERROR (PART 1)
3312                                  ;*
3313                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3314                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3315                                  ;*      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 ADDRESS
                                        ;*      IS NOT INCREMENTED.
                                        ;*
                                        ;;*****************************************************************
012474  000004                  TST21:  SCOPE
012476  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
012504  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
012510  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
012516  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
012524  012762  000000  000020          MOV     #0,RKDCYL(R2)   ;LOAD CYLINDER
012532  012762  000000  000006          MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
012540  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
012546  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
012554  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
012562  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                ;  FOR SECTOR PULSE
012566  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
012574  012762  000040  000026          MOV     #DMD,RKMR1(R2)
012602  005300                          DEC     R0
012604  001370                          BNE     1$
012606  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
012614  012762  000040  000026          MOV     #DMD,RKMR1(R2)
012622  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
012626  005037  003256                  CLR     M1.BIT
012632  012700  000377                  MOV     #255.,R0
012636  004737  037030          5$:     JSR     PC,RDBIT
012642  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
012644  001374                          BNE     5$
012646  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
012654  004737  037030                  JSR     PC,RDBIT
012660  012703  053374                  MOV     #HEAD2,R3       ;SIMULATE HEADER ERROR
012664  012701  000003                  MOV     #3,R1
012670  012304          12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
012672  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
012676  013737  003254  003256  15$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
012704  006004                          ROR     R4              ;GET NEXT BIT
012706  103403                          BCS     17$
012710  005037  003254                  CLR     PR.BIT
012714  000403                          BR      18$
012716  012737  000001  003254  17$:     MOV     #1,PR.BIT
012724  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
012730  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
012732  001361                          BNE     15$             ;NO, CONTINUE
012734  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEAD2
012736  001354                          BNE     12$             ;NO, CONTINUE
012740  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
012744  013737  003254  003256  25$:     MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
```

```
3372  012752  005037  003254                  CLR     PR.BIT
3373  012756  004737  037030                  JSR     PC,RDBIT
3374  012762  005300                          DEC     R0                      ;CHECK IF GAP FINISHED
3375  012764  001367                          BNE     25$                     ;NO, CONTINUE
3376  012766  016237  000000  003140          MOV     RKCS1(R2),T.CS1         ;GET CS1
3377  012774  016237  000010  003150          MOV     RKCS2(R2),T.CS2         ;GET CS2
3378  013002  016237  000014  003154          MOV     RKER(R2),T.ER           ;GET ERROR REG
3379  013010  012737  000023  003200          MOV     #WRDATA,E.CS1           ;LOAD EXPECTED CS1
3380  013016  012737  000300  003210          MOV     #IR!OR,E.CS2            ;LOAD EXPECTED CS2
3381  013024  012737  000200  003214          MOV     #BSE,E.ER               ;LOAD EXPECTED ERROR REG.
3382  013032  023737  003200  003140          CMP     E.CS1,T.CS1             ;CHECK CS1 CORRECT
3383  013040  001401                          BEQ     30$                     ;YES, CHECK CS2
3384  013042  104063                          ERROR   63                      ;CS1 INCORRECT
3385  013044  023737  003210  003150  30$:    CMP     E.CS2,T.CS2             ;CHECK CS2 CORRECT
3386  013052  001401                          BEQ     32$                     ;YES, CHECK ERROR REG.
3387  013054  104064                          ERROR   64                      ;CS2 INCORRECT
3388  013056  023737  003214  003154  32$:    CMP     E.ER,T.ER               ;CHECK ERROR REG CORRECT
3389  013064  001401                          BEQ     TST22                   ;YES, GO ON TO NEXT TEST
3390  013066  104065                          ERROR   65                      ;ERROR REG INCORRECT
3391
3392                                  ;;*****************************************************************
3393                                  ;*TEST 22       BAD SECTOR ERROR (PART 2)
3394                                  ;*
3395                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3396                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3397                                  ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0,
3398                                  ;*      HEAD 0, SECTOR 0.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3399                                  ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER WITH
3400                                  ;*      THE FOLLOWING DATA:
3401                                  ;*
3402                                  ;*              000000
3403                                  ;*              100000
3404                                  ;*              100000
3405                                  ;*
3406                                  ;*      MAKE SURE BAD SECTOR ERROR SETS.  CHECK THAT DISK ADDRESS
3407                                  ;*      IS NOT INCREMENTED.
3408                                  ;*
3409                                  ;*****************************************************************
3410  013070  000004                  TST22:  SCOPE
3411  013072  012737  000012  001200          MOV     #10.,$TIMES             ;;DO 10. ITERATIONS
3412  013100  013702  001270                  MOV     $BASE,R2                ;LOAD RK611 BASE
3413  013104  012762  100000  000000          MOV     #CCLR,RKCS1(R2)         ;CLEAR RK611
3414  013112  012762  000040  000026          MOV     #DMD,RKMR1(R2)          ;PUT RK611 IN DIAGNOSTIC MODE
3415  013120  012762  000000  000020          MOV     #0,RKDCYL(R2)           ;LOAD CYLINDER
3416  013126  012762  000000  000006          MOV     #0,RKDA(R2)             ;LOAD TRACK AND SECTOR
3417  013134  012762  177777  000002          MOV     #-1,RKWC(R2)            ;WORD COUNT=1
3418  013142  012762  055220  000004          MOV     #BUFF,RKBA(R2)          ;LOAD DUMMY BUS ADDRESS
3419  013150  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)       ;ISSUE WRITE DATA
3420  013156  012700  000426                  MOV     #69.*4+2,R0             ;ISSUE ENOUGH CLOCKS UNTIL READY
3421                                                                          ;  FOR SECTOR PULSE
3422  013162  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3423  013170  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3424  013176  005300                          DEC     R0
3425  013200  001370                          BNE     1$
3426  013202  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)      ;SIMULATE SECTOR PULSE
3427  013210  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
3428  013216  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
3429  013222  005037  003256                  CLR     M1.BIT
3430  013226  012700  000377                  MOV     #255.,R0
3431  013232  004737  037030          5$:     JSR     PC,RDBIT
3432  013236  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
3433  013240  001374                          BNE     5$
3434  013242  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
3435  013250  004737  037030                  JSR     PC,RDBIT
3436  013254  012703  053402                  MOV     #HEAD3,R3       ;SIMULATE HEADER ERROR
3437  013260  012701  000003                  MOV     #3,R1
3438  013264  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3439  013266  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
3440  013272  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
3441  013300  006004                          ROR     R4              ;GET NEXT BIT
3442  013302  103403                          BCS     17$
3443  013304  005037  003254                  CLR     PR.BIT
3444  013310  000403                          BR      18$
3445
3446  013312  012737  000001  003254  17$:    MOV     #1,PR.BIT
3447  013320  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3448  013324  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3449  013326  001361                          BNE     15$             ;NO, CONTINUE
3450  013330  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEAD3
3451  013332  001354                          BNE     12$             ;NO, CONTINUE
3452  013334  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3453  013340  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3454  013346  005037  003254                  CLR     PR.BIT
3455  013352  004737  037030                  JSR     PC,RDBIT
3456  013356  005300                          DEC     R0              ;CHECK IF GAP FINISHED
3457  013360  001367                          BNE     25$             ;NO, CONTINUE
3458  013362  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
3459  013370  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
3460  013376  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
3461  013404  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
3462  013412  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3463  013420  012737  000200  003214          MOV     #BSE,E.ER       ;LOAD EXPECTED ERROR REG.
3464  013426  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3465  013434  001401                          BEQ     30$             ;YES, CHECK CS2
3466  013436  104063                          ERROR   63              ;CS1 INCORRECT
3467  013440  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3468  013446  001401                          BEQ     32$             ;YES, CHECK ERROR REG.
3469  013450  104064                          ERROR   64              ;CS2 INCORRECT
3470  013452  023737  003214  003154  32$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3471  013460  001401                          BEQ     TST23           ;;YES, GO ON TO NEXT TEST
3472  013462  104065                          ERROR   65              ;ERROR REG INCORRECT
3473
3474                                  ;;*****************************************************************
3475                                  ;*TEST 23       OPERATION INCOMPLETE
3476                                  ;*
3477                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3478                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3479                                  ;*      ONE WORD TO AN RK06 IN 24 SECTOR FORMAT, CYLINDER 1253,
3480                                  ;*      HEAD 2, SECTOR 23.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3481                                  ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND 32 SECTORS WITH
3482                                  ;*      1 BIT DIFFERENT IN 30 BITS OF OPI DETERMININATION. ALL
3483                                  ;*      SIMULATED HEADERS, HAVE GOOD HEADER VRC.  MAKE SURE ONLY
```

```
                                        ;*      OPERATION INCOMPLETE AND CONTROLLER ARE THE ONLY ERRORS
                                        ;*      THAT SET.
                                        ;*
                                        ;;*********************************************************************
013464  000004                        TST23:  SCOPE
013466  012737  000012  001200                MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
013474  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
013500  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
013506  012700  002500                        MOV     #2500,R0                ;SET COUNT FOR STALL
013512  005300                        2$:     DEC     R0              ;DEC COUNT
013514  001376                                BNE     2$              ;LOOP UNTIL 0
013516  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
013524  012762  055220  000004                MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
013532  012762  177777  000002                MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
013540  012762  001253  000020                MOV     #1253,RKDCYL(R2) ;LOAD CYLINDER
013546  012762  001023  000006                MOV     #1023,RKDA(R2)  ;LOAD TRACK AND SECTOR
013554  012762  010023  000000                MOV     #WRDATA!CFMT,RKCS1(R2) ;ISSUE WRITE DATA
013562  012700  000426                        MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                        ;  FOR SECTOR PULSE
013566  012762  000440  000026        1$:     MOV     #DMD!MCLK,RKMR1(R2)
013574  012762  000040  000026                MOV     #DMD,RKMR1(R2)
013602  005300                                DEC     R0
013604  001370                                BNE     1$
013606  012705  000040                        MOV     #32.,R5         ;LOAD HEADER COUNT
013612  012703  053576                        MOV     #OPI1,R3        ;LOAD ADDRESS OF HEADERS
013616  012737  010023  003200                MOV     #WRDATA!CFMT,E.CS1      ;LOAD EXPECTED CS1
013624  012737  000300  003210                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
013632  005037  003214                        CLR     E.ER            ;LOAD EXPECTED ERROR REG
013636  012737  022040  003224                MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
013644  005037  003310                        CLR     HDRCNT          ;INITIALIZE HEADER COUNT
013650  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
013656  012762  000040  000026                MOV     #DMD,RKMR1(R2)
013664  022737  000037  003310                CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
013672  001460                                BEQ     26$             ;YES - SKIP TO ERROR TEST
013674  005037  003254                        CLR     PR.BIT          ;GENERATE SYNCH
013700  005037  003256                        CLR     M1.BIT
013704  012700  000377                        MOV     #255.,R0
013710  004737  037030            10$:        JSR     PC,RDBIT
013714  005300                                DEC     R0              ;CHECK IF SYNCH FINISHED
013716  001374                                BNE     10$
013720  012737  000001  003254                MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
013726  004737  037030                        JSR     PC,RDBIT
013732  012701  000003                        MOV     #3,R1           ;SIMULATE OPI
013736  012304                        12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
013740  012700  000020                        MOV     #16.,R0         ;LOAD BITS PER WORD
013744  013737  003254  003256  15$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
013752  006004                                ROR     R4              ;GET NEXT BIT
013754  103403                                BCS     17$
013756  005037  003254                        CLR     PR.BIT
013762  000403                                BR      18$

013764  012737  000001  003254  17$:     MOV     #1,PR.BIT
013772  004737  037030            18$:        JSR     PC,RDBIT        ;SIMULATE NEXT BIT
013776  005300                                DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
014000  001361                                BNE     15$             ;NO, CONTINUE
014002  005301                                DEC     R1              ;CHECK IF FINISHED WITH HEADER
```

```
3540  014004  001354                          BNE     12$             ;NO,CONTINUE
3541  014006  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
3542  014012  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3543  014020  005037  003254                  CLR     PR.BIT
3544  014024  004737  037030                  JSR     PC,RDBIT
3545  014030  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
3546  014032  001367                          BNE     25$             ;NO, CONTINUE
3547  014034  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
3548  014042  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
3549  014050  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
3550  014056  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3551  014064  001401                          BEQ     30$             ;YES, CONTINUE
3552  014066  104074                          ERROR   74              ;CS1 INCORRECT
3553  014070  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3554  014076  001401                          BEQ     31$             ;YES, CONTINUE
3555  014100  104075                          ERROR   75              ;CS2 INCORRECT
3556  014102  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3557  014110  001401                          BEQ     32$             ;YES, CONTINUE
3558  014112  104076                          ERROR   76              ;ERROR REG INCORRECT
3559  014114  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
3560  014122  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
3561  014130  001401                          BEQ     34$             ;YES, CONTINUE
3562  014132  104077                          ERROR   77              ;MR1 INCORRECT
3563  014134  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
3564  014140  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
3565  014146  001011                          BNE     35$             ;NO, CHECK IF FINSHED
3566  014150  012737  020000  003214          MOV     #OPI,E.ER       ;LOAD ERROR BIT
3567  014156  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
3568  014164  052737  100200  003200          BIS     #RDY!CERR,E.CS1
3569  014172  005305                  35$:    DEC     R5              ;CHECK IF FINISHED
3570  014174  001402                          BEQ     37$             ;YES - SKIP
3571  014176  000137  013650                  JMP     5$              ;DO NEXT SECTOR
3572  014202  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3573  014210  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
3574  014216  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;     CS2
3575  014224  016237  000014  003154          MOV     RKER(R2),T.ER   ;     ER
3576  014232  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
3577  014240  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
3578  014246  001401                          BEQ     TST24           ;;GO TO NEXT TEST
3579  014250  104153                          ERROR   153
3580
3581                                  ;;*****************************************************************
3582                                  ;*TEST 24       HEADER VRC
3583                                  ;*
3584                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3585                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3586                                  ;*      ONE WORD WITH CDT SET IN 24 SECTOR FORMAT, CYLINDER 1253,
3587                                  ;*      HEAD 2, SECTOR 23.  CLOCK IN BOTH SEEK AND DRIVE CLEAR
3588                                  ;*      MESSAGES SIMULATE A SECTOR PULSE AND HEADER WITH BIT 0
3589                                  ;*      OF THE VRC INCORRECT.  MAKE SURE ONLY HEADER VRC AND
3590                                  ;*      CONTROLLER ERROR ARE THE ONLY ERRORS SET.  REPEAT FOR
3591                                  ;*      BITS 1-15 OF VRC.
3592                                  ;*
3593                                  ;;*****************************************************************
3594  014252  000004                  TST24:  SCOPE
3595  014254  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
```

```
3596  014262  013702  001270                  MOV     $BASE,R2          ;LOAD RK611 BASE
3597  014266  012737  012023  003200          MOV     #CFMT!CDT!WRDATA,E.CS1 ;LOAD EXPECTED CS1
3598  014274  012737  000300  003210          MOV     #IR!OR,E.CS2      ;LOAD EXPECTED CS2
3599  014302  012737  000400  003214          MOV     #HVRC,E.ER        ;LOAD EXPECTED ERROR REGISTER
3600  014310  012737  000001  001170          MOV     #1,$TMP4          ;INITIALIZE BIT FOR VRC ERROR
3601  014316  012737  014324  001110          MOV     #1$,$LPERR        ;LOAD LOOP ON ERROR LOCATION FOR
3602                                                                    ;  SUBTEST LOOP
3603
3604  014324                          1$:
3605  014324  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3606  014332  012700  002000                  MOV     #2000,R0                ;SET COUNT FOR STALL
3607  014336  005300                  2$:     DEC     R0              ;DEC COUNT
3608  014340  001376                          BNE     2$              ;LOOP UNTIL 0
3609  014342  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
3610  014350  012737  140370  055202          MOV     #140370,VRCHDR+4 ;LOAD VRC
3611  014356  033737  001170  055202          BIT     $TMP4,VRCHDR+4  ;MAKE ONE BIT BAD
3612  014364  001404                          BEQ     3$
3613  014366  043737  001170  055202          BIC     $TMP4,VRCHDR+4
3614  014374  000403                          BR      5$
3615
3616  014376  053737  001170  055202  3$:     BIS     $TMP4,VRCHDR+4
3617  014404  012762  055220  000004  5$:     MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY ADDRESS
3618  014412  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
3619  014420  012762  001023  000006          MOV     #1023,RKDA(R2)  ;LOAD TRACK 2 SECTOR 23
3620  014426  012762  001253  000020          MOV     #1253,RKDCYL(R2) ;LOAD CYLINDER 1253
3621  014434  012762  012023  000000          MOV     #CFMT!CDT!WRDATA,RKCS1(R2) ;ISSUE COMMAND
3622  014442  012700  000426                  MOV     #69.*4+2,R0     ;LOAD COUNT UNTIL READY FOR SECTOR
3623  014446  012762  000440  000026  10$:     MOV     #DMD!MCLK,RKMR1(R2)
3624  014454  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3625  014462  005300                          DEC     R0
3626  014464  001370                          BNE     10$
3627  014466  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
3628  014474  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3629  014502  005037  003254                  CLR     PR.BIT          ;INITIAL BITS
3630  014506  005037  003256                  CLR     M1.BIT
3631  014512  012700  000377                  MOV     #255.,R0        ;SIMULATE SYNCH
3632  014516  004737  037030          15$:    JSR     PC,RDBIT
3633  014522  005300                          DEC     R0
3634  014524  001374                          BNE     15$
3635  014526  012737  000001  003254          MOV     #1,PR.BIT       ;GENERATE SYNCH BIT
3636  014534  004737  037030                  JSR     PC,RDBIT        ;SIMULSTE SYNC 1 BIT
3637  014540  012703  055176                  MOV     #VRCHDR,R3      ;LOAD ADDRESS OF HEADER
3638  014544  012701  000003                  MOV     #3,R1           ;LOAD HEADER COUNT
3639  014550  012304                  17$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
3640  014552  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
3641  014556  013737  003254  003256  20$:     MOV     PR.BIT,M1.BIT   ;SIMULATE NEXT BIT
3642  014564  006004                          ROR     R4
3643  014566  103403                          BCS     23$
3644  014570  005037  003254                  CLR     PR.BIT
3645  014574  000403                          BR      25$
3646
3647  014576  012737  000001  003254  23$:     MOV     #1,PR.BIT
3648  014604  004737  037030          25$:    JSR     PC,RDBIT
3649  014610  005300                          DEC     R0              ;CHECK IF FINISHED WITH WORD
3650  014612  001361                          BNE     20$             ;NO, CONTINUE
3651  014614  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
```

```
3652  014616  001354                          BNE     17$             ;NO, CONTINUE
3653  014620  012700  000100                  MOV     #64.,R0         ;SIMULATE GAP
3654  014624  013737  003254  003256  30$:    MOV     PR.BIT,M1.BIT
3655  014632  005037  003254                  CLR     PR.BIT
3656  014636  004737  037030                  JSR     PC,RDBIT
3657  014642  005300                          DEC     R0
3658  014644  001367                          BNE     30$
3659  014646  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;STORE CS1
3660  014654  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;STORE CS2
3661  014662  016237  000014  003154          MOV     RKER(R2),T.ER   ;STORE ERROR REG
3662  014670  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3663  014676  001401                          BEQ     35$             ;YES, CHECK CS2
3664  014700  104071                          ERROR   71              ;CS1 INCORRECT
3665  014702  023737  003210  003150  35$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3666  014710  001401                          BEQ     37$             ;YES, CHECK ERROR REG
3667  014712  104072                          ERROR   72              ;CS2 INCORRECT
3668  014714  023737  003214  003154  37$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3669  014722  001401                          BEQ     40$             ;YES, CHECK IF LOOP ON ERROR
3670  014724  104073                          ERROR   73              ;ERROR REG INCORRECT
3671  014726  104415                  40$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3672  014730  006337  001170                  ASL     $TMP4           ;GET NEXT PATTERN
3673  014734  103402                          BCS     TST25           ;;CHECK IF FINISHED
3674  014736  000137  014324                  JMP     1$              ;NO, CONTINUE
3675
3676                                  ;;*****************************************************************
3677                                  ;*TEST 25       BAD SECTOR ERROR AND HEADER VRC
3678                                  ;*
3679                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3680                                  ;*      CONTROLLER IN MAINTENANCE MODE.  ISSUE A WRITE DATA OF
3681                                  ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 300.
3682                                  ;*      HEAD 1, SECTOR 17, CLOCK IN BOTH SEEK AND DRIVE CLEAR
3683                                  ;*      MESSAGES.  SIMULATE THE FOLLOWING HEADER:
3684                                  ;*
3685                                  ;*              000300
3686                                  ;*              040057
3687                                  ;*              040356
3688                                  ;*
3689                                  ;*      MAKE SURE ONLY HEADER VRC ERROR SETS.
3690                                  ;*
3691                                  ;*****************************************************************
3692  014742  000004                  TST25:  SCOPE
3693  014744  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3694  014752  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3695  014756  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3696  014764  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3697  014772  012762  000300  000020          MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER
3698  015000  012762  000417  000006          MOV     #417,RKDA(R2)   ;LOAD TRACK AND SECTOR
3699  015006  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
3700  015014  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
3701  015022  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
3702  015030  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
3703                                                                  ;  FOR SECTOR PULSE
3704  015034  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3705  015042  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3706  015050  005300                          DEC     R0
3707  015052  001370                          BNE     1$
```

```
3708  015054  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
3709  015062  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3710  015070  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
3711  015074  005037  003256                  CLR     M1.BIT
3712  015100  012700  000377                  MOV     #255.,R0
3713  015104  004737  037030          5$:     JSR     PC,RDBIT
3714  015110  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
3715  015112  001374                          BNE     5$
3716  015114  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH BIT
3717  015122  004737  037030                  JSR     PC,RDBIT
3718  015126  012703  053410                  MOV     #HEAD4,R3           ;SIMULATE HEADER ERROR
3719  015132  012701  000003                  MOV     #3,R1
3720  015136  012304                  12$:    MOV     (R3)+,R4            ;GET NEXT HEADER WORD
3721  015140  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
3722  015144  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
3723  015152  006004                          ROR     R4                  ;GET NEXT BIT
3724  015154  103403                          BCS     17$
3725  015156  005037  003254                  CLR     PR.BIT
3726  015162  000403                          BR      18$
3727
3728  015164  012737  000001  003254  17$:    MOV     #1,PR.BIT
3729  015172  004737  037030          18$:    JSR     PC,RDBIT            ;SIMULATE NEXT BIT
3730  015176  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT HEADER WORD
3731  015200  001361                          BNE     15$                 ;NO, CONTINUE
3732  015202  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEAD4
3733  015204  001354                          BNE     12$                 ;NO, CONTINUE
3734  015206  012700  000100                  MOV     #64.,R0             ;LOAD COUNT FOR GAP
3735  015212  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
3736  015220  005037  003254                  CLR     PR.BIT
3737  015224  004737  037030                  JSR     PC,RDBIT
3738  015230  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
3739  015232  001367                          BNE     25$                 ;NO, CONTINUE
3740  015234  016237  000000  003140          MOV     RKCS1(R2),T.CS1     ;GET CS1
3741  015242  016237  000010  003150          MOV     RKCS2(R2),T.CS2     ;GET CS2
3742  015250  016237  000014  003154          MOV     RKER(R2),T.ER       ;GET ERROR REG
3743  015256  012737  000023  003200          MOV     #WRDATA,E.CS1       ;LOAD EXPECTED CS1
3744  015264  012737  000300  003210          MOV     #IR!OR,E.CS2        ;LOAD EXPECTED CS2
3745  015272  012737  000400  003214          MOV     #HVRC,E.ER          ;LOAD EXPECTED ERROR REG.
3746  015300  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
3747  015306  001401                          BEQ     30$                 ;YES, CHECK CS2
3748  015310  104066                          ERROR   66                  ;CS1 INCORRECT
3749  015312  023737  003210  003150  30$:    CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
3750  015320  001401                          BEQ     32$                 ;YES, CHECK ERROR REG.
3751  015322  104067                          ERROR   67                  ;CS2 INCORRECT
3752  015324  023737  003214  003154  32$:    CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
3753  015332  001401                          BEQ     TST26               ;;YES, GO ON TO NEXT TEST
3754  015334  104070                          ERROR   70                  ;ERROR REG INCORRECT
3755
3756                          ;;*****************************************************************
3757                          ;*TEST 26       GOOD HEADER AND PREVIOUS BSE
3758                          ;*
3759                          ;*      CLEAR RK611 CONTROLLER WITH CONTROLLER CLEAR.  PUT
3760                          ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA OF
3761                          ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 100,
3762                          ;*      HEAD 0, SECTOR 1.  CLOCK THROUGH SEEK AND DRIVE CLEAR
3763                          ;*      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 FOLLOWING
                                        ;*      3 WORDS:
                                        ;*
                                        ;*              000100
                                        ;*              140001
                                        ;*              140101
                                        ;*
                                        ;*      MAKE SURE WRITE GATE SETS INDICATING THAT HEADER HAS
                                        ;*      BEEN RECOGNIZED.
                                        ;*
                                        ;;*****************************************************************
015336  000004                  TST26:  SCOPE
015340  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
015346  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
015352  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
015360  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
015366  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
015374  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT -1
015402  012762  000001  000006          MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
015410  012762  000100  000020          MOV     #100,RKDCYL(R2) ;LOAD CYLINDER
015416  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
015424  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                        ;  FOR SECTOR PULSE
015430  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
015436  012762  000040  000026          MOV     #DMD,RKMR1(R2)
015444  005300                          DEC     R0
015446  001370                          BNE     1$
015450  012705  000002                  MOV     #2,R5           ;LOAD HEADER COUNT
015454  012703  053416                  MOV     #HEAD5,R3       ;LOAD ADDRESS OF HEADERS
015460  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
015466  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
015474  005037  003214                  CLR     E.ER            ;LOAD EXPECTED MR1
015500  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
015506  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
015512  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
015520  012762  000040  000026          MOV     #DMD,RKMR1(R2)
015526  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
015532  005037  003256                  CLR     M1.BIT
015536  012700  000377                  MOV     #255.,R0
015542  004737  037030          10$:    JSR     PC,RDBIT
015546  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
015550  001374                          BNE     10$
015552  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
015560  004737  037030                  JSR     PC,RDBIT
015564  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
015570  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
015572  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
015576  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
015604  006004                          ROR     R4              ;GET NEXT BIT
```

```
3820  015606  103403                          BCS     17$
3821  015610  005037  003254                  CLR     PR.BIT
3822  015614  000403                          BR      18$
3823
3824  015616  012737  000001  003254  17$:    MOV     #1,PR.BIT
3825  015624  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
3826  015630  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
3827  015632  001361                          BNE     15$             ;NO, CONTINUE
3828  015634  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
3829  015636  001354                          BNE     12$             ;NO, CONTINUE
3830  015640  012700  000102                  MOV     #66.,R0         ;LOAD COUNT FOR GAP
3831                                                                  ;  PLUS 2 COUNTS FOR WRTGAT TO SET
3832  015644  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3833  015652  005037  003254                  CLR     PR.BIT
3834  015656  004737  037030                  JSR     PC,RDBIT
3835  015662  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
3836  015664  001367                          BNE     25$             ;NO, CONTINUE
3837  015666  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
3838  015674  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
3839  015702  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
3840  015710  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3841  015716  001401                          BEQ     30$             ;YES, CONTINUE
3842  015720  104114                          ERROR   114             ;CS1 INCORRECT
3843  015722  023737  003210  0031[illegible] 30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3844  015730  001401                          BEQ     31$             ;YES, CONTINUE
3845  015732  104115                          ERROR   115             ;CS2 INCORRECT
3846  015734  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3847  015742  001401                          BEQ     32$             ;YES, CONTINUE
3848  015744  104116                          ERROR   116             ;ERROR REG INCORRECT
3849  015746  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
3850  015754  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
3851  015762  001401                          BEQ     34$             ;YES, CONTINUE
3852  015764  104117                          ERROR   117             ;MR1 INCORRECT
3853  015766  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
3854  015772  012737  062040  003224          MOV     #WRTGAT!DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
3855  016000  005305                          DEC     R5              ;CHECK IF FINISHED
3856  016002  001402                          BEQ     TST27           ;;YES, GO ON TO NEXT TEST
3857  016004  000137  015512                  JMP     5$
3858
3859                          ;;*****************************************************************
3860                          ;*TEST 27       GOOD HEADER AND PREVIOUS HVRC
3861                          ;*
3862                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
3863                          ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA OF
3864                          ;*      ONE WORD TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 200,
3865                          ;*      HEAD 0, SECTOR 1.  CLOCK THROUGH SEEK AND DRIVE CLEAR
3866                          ;*      MESSAGES.  SIMULATE A SECTOR PULSE AND A HEADER OF THE
3867                          ;*      FOLLOWING 3 WORDS WITH A BAD HEADER VRC:
3868                          ;*
3869                          ;*              000200
3870                          ;*              140000
3871                          ;*              140000
3872                          ;*
3873                          ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE DOES NOT
3874                          ;*      SET.  SIMULATE A SECTOR PULSE AND A HEADER OF THE
3875                          ;*      FOLLOWING 3 WORDS:
```

```
                                        ;*
                                        ;*              000200
                                        ;*              140001
                                        ;*              140201
                                        ;*
                                        ;*      MAKE SURE WRITE GATE SEES INDICATING THAT HEADER HAS
                                        ;*      BEEN RECOGNIZED.
                                        ;*
                                        ;;*****************************************************************
016010  000004                          TST27:  SCOPE
016012  012737  000012  001200                  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
016020  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
016024  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
016032  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
016040  012762  055220  000004                  MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
016046  012762  177777  000002                  MOV     #-1,RKWC(R2)    ;WORD COUNT -1
016054  012762  000001  000006                  MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
016062  012762  000200  000020                  MOV     #200,RKDCYL(R2) ;LOAD CYLINDER
016070  012762  000023  000000                  MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
016076  012700  000426                          MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                        ;  FOR SECTOR PULSE
016102  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
016110  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
016116  005300                                  DEC     R0
016120  001370                                  BNE     1$
016122  012705  000002                          MOV     #2,R5           ;LOAD HEADER COUNT
016126  012703  053432                          MOV     #HEAD6,R3       ;LOAD ADDRESS OF HEADERS
016132  012737  000023  003200                  MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
016140  012737  000300  003210                  MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
016146  005037  003214                          CLR     E.ER            ;LOAD EXPECTED MR1
016152  012737  022040  003224                  MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
016160  005037  003310                          CLR     HDRCNT          ;INITIALIZE HEADER COUNT
016164  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
016172  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
016200  005037  003254                          CLR     PR.BIT          ;GENERATE SYNCH
016204  005037  003256                          CLR     M1.BIT
016210  012700  000377                          MOV     #255.,R0
016214  004737  037030          10$:    JSR     PC,RDBIT
016220  005300                                  DEC     R0              ;CHECK IF SYNCH FINISHED
016222  001374                                  BNE     10$
016224  012737  000001  003254                  MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
016232  004737  037030                          JSR     PC,RDBIT
016236  012701  000003                          MOV     #3,R1           ;SIMULATE HEADER
016242  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
016244  012700  000020                          MOV     #16.,R0         ;LOAD BITS PER WORD
016250  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
016256  006004                                  ROR     R4              ;GET NEXT BIT
016260  103403                                  BCS     17$
016262  005037  003254                          CLR     PR.BIT
016266  000403                                  BR      18$

016270  012737  000001  003254  17$:    MOV     #1,PR.BIT
016276  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
016302  005300                                  DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
016304  001361                                  BNE     15$             ;NO, CONTINUE
016306  005301                                  DEC     R1              ;CHECK IF FINISHED WITH HEADER
```

```
3932  016310  001354                          BNE     12$             ;NO, CONTINUE
3933  016312  012700  000102                  MOV     #66.,R0         ;LOAD COUNT FOR GAP
3934                                                                    ;  PLUS 2 COUNTS FOR WRTGAT TO SET
3935  016316  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
3936  016324  005037  003254                  CLR     PR.BIT
3937  016330  004737  037030                  JSR     PC,RDBIT
3938  016334  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
3939  016336  001367                          BNE     25$             ;NO, CONTINUE
3940  016340  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
3941  016346  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
3942  016354  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
3943  016362  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3944  016370  001401                          BEQ     30$             ;YES, CONTINUE
3945  016372  104120                          ERROR   120             ;CS1 INCORRECT
3946  016374  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
3947  016402  001401                          BEQ     31$             ;YES, CONTINUE
3948  016404  104121                          ERROR   121             ;CS2 INCORRECT
3949  016406  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3950  016414  001401                          BEQ     32$             ;YES, CONTINUE
3951  016416  104122                          ERROR   122             ;ERROR REG INCORRECT
3952  016420  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
3953  016426  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
3954  016434  001401                          BEQ     34$             ;YES, CONTINUE
3955  016436  104123                          ERROR   123             ;MR1 INCORRECT
3956  016440  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
3957  016444  012737  062040  003224          MOV     #WRTGAT!DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
3958  016452  005305                          DEC     R5              ;CHECK IF FINISHED
3959  016454  001402                          BEQ     TST30           ;;YES, GO ON TO NEXT TEST
3960  016456  000137  016164                  JMP     5$
3961
3962                          ;;*****************************************************************
3963                          ;*TEST 30       BAD SECTOR ERROR AND PREVIOUS HVRC
3964                          ;*
3965                          ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3966                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A
3967                          ;*      WRITE DATA OF ONE WORD TO AN RK06 IN 26 SECTOR
3968                          ;*      FORMAT, CYLINDER 400, HEAD 0, SECTOR 1.  CLOCK THROUGH
3969                          ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
3970                          ;*      AND A HEADER OF THE FOLLOWING 3 WORDS WITH A
3971                          ;*      BAD HEADER VRC:
3972                          ;*
3973                          ;*              000400
3974                          ;*              140000
3975                          ;*              140000
3976                          ;*
3977                          ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
3978                          ;*      DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
3979                          ;*      HEADER CONSISTING OF THE FOLLOWING 3 WORDS:
3980                          ;*
3981                          ;*              000400    .
3982                          ;*              040001    .
3983                          ;*              040401    .
3984                          ;*
3985                          ;*      MAKE SURE BAD SECTOR ERROR SETS AND HEADER VRC
3986                          ;*      ERROR DOES NOT SET.
3987                          ;*
```

```
                                        ;;*****************************************************************
016462 000004                           ;TST30:  SCOPE
016464 012737 000012 001200                      MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
016472 013702 001270                             MOV     $BASE,R2        ;LOAD RK611 BASE
016476 012762 100000 000000                      MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
016504 012762 000040 000026                      MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
016512 012762 055220 000004                      MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
016520 012762 177777 000002                      MOV     #-1,RKWC(R2)    ;WORD COUNT -1
016526 012762 000001 000006                      MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
016534 012762 000400 000020                      MOV     #400,RKDCYL(R2) ;LOAD CYLINDER
016542 012762 000023 000000                      MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
016550 012700 000426                             MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
                                                                         ;  FOR SECTOR PULSE
016554 012762 000440 000026 1$:          MOV     #DMD!MCLK,RKMR1(R2)
016562 012762 000040 000026                      MOV     #DMD,RKMR1(R2)
016570 005300                                    DEC     R0
016572 001370                                    BNE     1$
016574 012705 000002                             MOV     #2,R5           ;LOAD HEADER COUNT
016600 012703 053446                             MOV     #HEAD7,R3       ;LOAD ADDRESS OF HEADERS
016604 012737 000023 003200                      MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
016612 012737 000300 003210                      MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
016620 005037 003214                             CLR     E.ER            ;LOAD EXPECTED MR1
016624 012737 022040 003224                      MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
016632 005037 003310                             CLR     HDRCNT          ;INITIALIZE HEADER COUNT
016636 012762 000140 000026 5$:          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
016644 012762 000040 000026                      MOV     #DMD,RKMR1(R2)
016652 005037 003254                             CLR     PR.BIT          ;GENERATE SYNCH
016656 005037 003256                             CLR     M1.BIT
016662 012700 000377                             MOV     #255.,R0
016666 004737 037030             10$:    JSR     PC,RDBIT
016672 005300                                    DEC     R0              ;CHECK IF SYNCH FINISHED
016674 001374                                    BNE     10$
016676 012737 000001 003254                      MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
016704 004737 037030                             JSR     PC,RDBIT
016710 012701 000003                             MOV     #3,R1           ;SIMULATE HEADER
016714 012304                    12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
016716 012700 000020                             MOV     #16.,R0         ;LOAD BITS PER WORD
016722 013737 003254 003256 15$:         MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
016730 006004                                    ROR     R4              ;GET NEXT BIT
016732 103403                                    BCS     17$
016734 005037 003254                             CLR     PR.BIT
016740 000403                                    BR      18$
                                        ;
016742 012737 000001 003254 17$:         MOV     #1,PR.BIT
016750 004737 037030             18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
016754 005300                                    DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
016756 001361                                    BNE     15$             ;NO, CONTINUE
016760 005301                                    DEC     R1              ;CHECK IF FINISHED WITH HEADER
016762 001354                                    BNE     12$             ;NO, CONTINUE
016764 012700 000102                             MOV     #66.,R0         ;LOAD COUNT FOR GAP
                                                                         ;  PLUS 2 COUNTS FOR WRTGAT TO SET
016770 013737 003254 003256 25$:         MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
016776 005037 003254                             CLR     PR.BIT
017002 004737 037030                             JSR     PC,RDBIT
017006 005300                                    DEC     R0              ;CHECK IF GAP IS FINISHED
017010 001367                                    BNE     25$             ;NO, CONTINUE
```

```
4044  017012  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4045  017020  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4046  017026  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
4047  017034  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4048  017042  001401                          BEQ     30$             ;YES, CONTINUE
4049  017044  104124                          ERROR   124             ;CS1 INCORRECT
4050  017046  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4051  017054  001401                          BEQ     31$             ;YES, CONTINUE
4052  017056  104125                          ERROR   125             ;CS2 INCORRECT
4053  017060  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4054  017066  001401                          BEQ     32$             ;YES, CONTINUE
4055  017070  104126                          ERROR   126             ;ERROR REG INCORRECT
4056  017072  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4057  017100  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
4058  017106  001401                          BEQ     34$             ;YES, CONTINUE
4059  017110  104127                          ERROR   127             ;MR1 INCORRECT
4060  017112  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4061  017116  012737  000200  003214          MOV     #BSE,E.ER       ;LOAD EXPECTER ERROR REG
4062  017124  005305                          DEC     R5              ;CHECK IF FINISHED
4063  017126  001402                          BEQ     TST31           ;;YES, GO ON TO NEXT TEST
4064  017130  000137  016636                  JMP     5$
4065
4066                          ;;*****************************************************************
4067                          ;*TEST 31       HEADER VRC AND PREVIOUS BSE
4068                          ;*
4069                          ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4070                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A
4071                          ;*      WRITE DATA OR ONE WORD TO AN RK06 IN 26 SECTOR
4072                          ;*      FORMAT, CYLINDER 140, HEAD 0, SECTOR 1.  CLOCK THROUGH
4073                          ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4074                          ;*      AND A HEADER OF THE FOLLOWING 3 WORDS WITH A HEADER
4075                          ;*      VRC ERROR:
4076                          ;*
4077                          ;*              000140
4078                          ;*              040000
4079                          ;*              040140
4080                          ;*
4081                          ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
4082                          ;*      DOES NOT SET.  STIMULATE A SECTOR PULSE AND A
4083                          ;*      HEADER CONSISTING OF THE FOLLOWING THREE WORDS:
4084                          ;*
4085                          ;*              000140
4086                          ;*              140001
4087                          ;*              140101
4088                          ;*
4089                          ;*      MAKE SURE HEADER VRC ERROR SETS AND BAD SECTOR
4090                          ;*      ERROR DOES NOT SET.
4091                          ;*
4092                          ;*****************************************************************
4093  017134  000004          TST31:  SCOPE
4094  017136  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4095  017144  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4096  017150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4097  017156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4098  017164  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
4099  017172  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT -1
```

```
4100  017200  012762  000001  000006          MOV     #1,RKDA(R2)       ;LOAD TRACK AND SECTOR
4101  017206  012762  000140  000020          MOV     #140,RKDCYL(R2)   ;LOAD CYLINDER
4102  017214  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)   ;ISSUE WRITE DATA
4103  017222  012700  000426                  MOV     #69.*4+2,R0       ;ISSUE ENOUGH CLOCKS UNTIL READY
4104                                                                    ;  FOR SECTOR PULSE
4105  017226  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4106  017234  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4107  017242  005300                          DEC     R0
4108  017244  001370                          BNE     1$
4109  017246  012705  000002                  MOV     #2,R5             ;LOAD HEADER COUNT
4110  017252  012703  053462                  MOV     #HEAD8,R3         ;LOAD ADDRESS OF HEADERS
4111  017256  012737  000023  003200          MOV     #WRDATA,E.CS1     ;LOAD EXPECTED CS1
4112  017264  012737  000300  003210          MOV     #IR!OR,E.CS2      ;LOAD EXPECTED CS2
4113  017272  005037  003214                  CLR     E.ER              ;LOAD EXPECTED MR1
4114  017276  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MR1
4115  017304  005037  003310                  CLR     HDRCNT            ;INITIALIZE HEADER COUNT
4116  017310  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4117  017316  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4118  017324  005037  003254                  CLR     PR.BIT            ;GENERATE SYNCH
4119  017330  005037  003256                  CLR     M1.BIT
4120  017334  012700  000377                  MOV     #255.,R0
4121  017340  004737  037030          10$:    JSR     PC,RDBIT
4122  017344  005300                          DEC     R0                ;CHECK IF SYNCH FINISHED
4123  017346  001374                          BNE     10$
4124  017350  012737  000001  003254          MOV     #1,PR.BIT         ;SIMULATE SYNCH BIT
4125  017356  004737  037030                  JSR     PC,RDBIT
4126  017362  012701  000003                  MOV     #3,R1             ;SIMULATE HEADER
4127  017366  012304                  12$:    MOV     (R3)+,R4          ;GET NEXT HEADER WORD
4128  017370  012700  000020                  MOV     #16.,R0           ;LOAD BITS PER WORD
4129  017374  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT     ;STORE PREVIOUS BIT
4130  017402  006004                          ROR     R4                ;GET NEXT BIT
4131  017404  103403                          BCS     17$
4132  017406  005037  003254                  CLR     PR.BIT
4133  017412  000403                          BR      18$
4134
4135  017414  012737  000001  003254  17$:    MOV     #1,PR.BIT
4136  017422  004737  037030          18$:    JSR     PC,RDBIT          ;SIMULATE NEXT BIT
4137  017426  005300                          DEC     R0                ;CHECK IF READY FOR NEXT HEADER WORD
4138  017430  001361                          BNE     15$               ;NO, CONTINUE
4139  017432  005301                          DEC     R1                ;CHECK IF FINISHED WITH HEADER
4140  017434  001354                          BNE     12$               ;NO, CONTINUE
4141  017436  012700  000102                  MOV     #66.,R0           ;LOAD COUNT FOR GAP
4142                                                                    ;  PLUS 2 COUNTS FOR WRTGAT TO SET
4143  017442  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT     ;SIMULATE GAP
4144  017450  005037  003254                  CLR     PR.BIT
4145  017454  004737  037030                  JSR     PC,RDBIT
4146  017460  005300                          DEC     R0                ;CHECK IF GAP IS FINISHED
4147  017462  001367                          BNE     25$               ;NO, CONTINUE
4148  017464  016237  000000  003140          MOV     RKCS1(R2),T.CS1   ;GET CS1
4149  017472  016237  000010  003150          MOV     RKCS2(R2),T.CS2   ;GET CS2
4150  017500  016237  000014  003154          MOV     RKER(R2),T.ER     ;GET ERROR REG
4151  017506  023737  003200  003140          CMP     E.CS1,T.CS1       ;CHECK CS1 CORRECT
4152  017514  001401                          BEQ     30$               ;YES, CONTINUE
4153  017516  104130                          ERROR   130               ;CS1 INCORRECT
4154  017520  023737  003210  003150  30$:    CMP     E.CS2,T.CS2       ;CHECK CS2 CORRECT
4155  017526  001401                          BEQ     31$               ;YES, CONTINUE
```

```
                017530  104131                          ERROR   131             ;CS2 INCORRECT
                017532  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
                017540  001401                          BEQ     32$             ;YES, CONTINUE
                017542  104132                          ERROR   132             ;ERROR REG INCORRECT
4160            017544  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4161            017552  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK WRITE GATE CORRECT
4162            017560  001401                          BEQ     34$             ;YES, CONTINUE
4163            017562  104133                          ERROR   133             ;MR1 INCORRECT
4164            017564  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4165            017570  012737  000400  003214          MOV     #HVRC,E.ER      ;LOAD EXPECTER ERROR REG
4166            017576  005305                          DEC     R5              ;CHECK IF FINISHED
4167            017600  001402                          BEQ     TST32           ;;YES, GO ON TO NEXT TEST
4168            017602  000137  017310                  JMP     5$
4169
4170                                    ;;*****************************************************************
4171                                    ;*TEST 32       OPI AND HVRC ON LAST HEADER
4172                                    ;*
4173                                    ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4174                                    ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4175                                    ;*      DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
4176                                    ;*      CYLINDER 240, HEAD 0, SECTOR 1.  CLOCK THROUGH
4177                                    ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4178                                    ;*      AND 30 HEADERS CONSISTING OF THE FOLLOWING 3 WORDS:
4179                                    ;*
4180                                    ;*              000240
4181                                    ;*              140000
4182                                    ;*              140240
4183                                    ;*
4184                                    ;*      MAKE SURE NO ERROR IS REPORTED AND WRITE GATE
4185                                    ;*      DOES NOT SET.  SIMULATE A SECTOR PULSE AND A
4186                                    ;*      HEADER CONSISTING OF THE FOLLOWING THREE WORDS:
4187                                    ;*
4188                                    ;*              000240
4189                                    ;*              140000
4190                                    ;*              140040
4191                                    ;*
4192                                    ;*      MAKE SURE HEADER VRC AND OPI ERROR SET.
4193                                    ;*
4194                                    ;;*****************************************************************
4195            017606  000004          TST32:  SCOPE
4196            017610  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4197            017616  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4198            017622  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4199            017630  012700  002500                  MOV     #2500,R0                ;SET COUNT FOR STALL
4200            017634  005300                  2$:     DEC     R0              ;DEC COUNT
4201            017636  001376                          BNE     2$              ;LOOP UNTIL 0
4202            017640  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4203            017646  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
4204            017654  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
4205            017662  012762  000240  000020          MOV     #240,RKDCYL(R2) ;LOAD CYLINDER
4206            017670  012762  000001  000006          MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
4207            017676  012762  000023  000000          MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
4208            017704  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLODKS UNTIL READY
4209                                                                            ;  FOR SECTOR PULSE
4210            017710  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4211            017716  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
4212  017724  005300                          DEC     R0
4213  017726  001370                          BNE     1$
4214  017730  012705  000040                  MOV     #32.,R5         ;LOAD HEADER COUNT
4215  017734  012703  054076                  MOV     #OPI2,R3        ;LOAD ADDRESS OF HEADERS
4216  017740  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
4217  017746  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4218  017754  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
4219  017760  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
4220  017766  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
4221  017772  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4222  020000  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4223  020006  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
4224  020014  001460                          BEQ     26$             ;YES - SKIP TO ERROR TEST
4225  020016  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4226  020022  005037  003256                  CLR     M1.BIT
4227  020026  012700  000377                  MOV     #255.,R0
4228  020032  004737  037030          10$:    JSR     PC,RDBIT
4229  020036  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4230  020040  001374                          BNE     10$
4231  020042  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4232  020050  004737  037030                  JSR     PC,RDBIT
4233  020054  012701  000003                  MOV     #3,R1           ;SIMULATE OPI
4234  020060  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4235  020062  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4236  020066  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4237  020074  006004                          ROR     R4              ;GET NEXT BIT
4238  020076  103403                          BCS     17$
4239  020100  005037  003254                  CLR     PR.BIT
4240  020104  000403                          BR      18$
4241
4242  020106  012737  000001  003254  17$:    MOV     #1,PR.BIT
4243  020114  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4244  020120  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4245  020122  001361                          BNE     15$             ;NO, CONTINUE
4246  020124  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
4247  020126  001354                          BNE     12$             ;NO,CONTINUE
4248  020130  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4249  020134  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4250  020142  005037  003254                  CLR     PR.BIT
4251  020146  004737  037030                  JSR     PC,RDBIT
4252  020152  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4253  020154  001367                          BNE     25$             ;NO, CONTINUE
4254  020156  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
4255  020164  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4256  020172  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
4257  020200  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4258  020206  001401                          BEQ     30$             ;YES, CONTINUE
4259  020210  104100                          ERROR   100             ;CS1 INCORRECT
4260  020212  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4261  020220  001401                          BEQ     31$             ;YES, CONTINUE
4262  020222  104101                          ERROR   101             ;CS2 INCORRECT
4263  020224  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4264  020232  001401                          BEQ     32$             ;YES, CONTINUE
4265  020234  104102                          ERROR   102             ;ERROR REG INCORRECT
4266  020236  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4267  020244  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
```

```
                                                BEQ     34$             ;YES, CONTINUE
                                                ERROR   103             ;MR1 INCORRECT
                                        34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
                                                CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
                                                BNE     35$             ;NO, CHECK IF FINSHED
                                                MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
                                                BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
                                                BIS     #RDY!CERR,E.CS1
                                        35$:    DEC     R5              ;CHECK IF FINISHED
                                                BEQ     37$             ;YES - SKIP
                                                JMP     5$              ;DO NEXT SECTOR
                                        37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
                                                MOV     RKCS1(R2),T.CS1 ;GET CS1
                                                MOV     RKCS2(R2),T.CS2 ;    CS2
                                                MOV     RKER(R2),T.ER   ;    ER
                                                MOV     #RDY,E.CS1      ;SET EXPECTED CS1
                                                CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
                                                BEQ     TST33           ;;GO TO NEXT TEST
                                                ERROR   153

;;*****************************************************************
;*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.
;*
;;*****************************************************************
TST33:  SCOPE
        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
        MOV     $BASE,R2        ;LOAD RK611 BASE
```

```
4324  020410  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4325  020416  012700  002500                  MOV     #2500,R0                ;SET COUNT FOR STALL
4326  020422  005300                  2$:     DEC     R0              ;DEC COUNT
4327  020424  001376                          BNE     2$              ;LOOP UNTIL 0
4328  020426  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4329  020434  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
4330  020442  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
4331  020450  012762  000300  000020          MOV     #300,RKDCYL(R2) ;LOAD CYLINDER
4332  020456  012762  000001  000006          MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
4333  020464  012762  000023  000000          MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
4334  020472  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLODKS UNTIL READY
4335                                                                  ;  FOR SECTOR PULSE
4336  020476  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4337  020504  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4338  020512  005300                          DEC     R0
4339  020514  001370                          BNE     1$
4340  020516  012705  000040                  MOV     #32.,R5         ;LOAD HEADER COUNT
4341  020522  012703  054376                  MOV     #OPI3,R3        ;LOAD ADDRESS OF HEADERS
4342  020526  012737  000023  003200          MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
4343  020534  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4344  020542  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
4345  020546  012737  022040  003224          MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
4346  020554  005037  003310                  CLR     HDRCNT          ;INITIALIZE HEADER COUNT
4347  020560  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4348  020566  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4349  020574  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
4350  020602  001460                          BEQ     26$             ;YES - SKIP TO ERROR TEST
4351  020604  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4352  020610  005037  003256                  CLR     M1.BIT
4353  020614  012700  000377                  MOV     #255.,R0
4354  020620  004737  037030          10$:    JSR     PC,RDBIT
4355  020624  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4356  020626  001374                          BNE     10$
4357  020630  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4358  020636  004737  037030                  JSR     PC,RDBIT
4359  020642  012701  000003                  MOV     #3,R1           ;SIMULATE OPI
4360  020646  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4361  020650  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4362  020654  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4363  020662  006004                          ROR     R4              ;GET NEXT BIT
4364  020664  103403                          BCS     17$
4365  020666  005037  003254                  CLR     PR.BIT
4366  020672  000403                          BR      18$
4367
4368  020674  012737  000001  003254  17$:    MOV     #1,PR.BIT
4369  020702  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4370  020706  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4371  020710  001361                          BNE     15$             ;NO, CONTINUE
4372  020712  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
4373  020714  001354                          BNE     12$             ;NO,CONTINUE
4374  020716  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4375  020722  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4376  020730  005037  003254                  CLR     PR.BIT
4377  020734  004737  037030                  JSR     PC,RDBIT
4378  020740  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4379  020742  001367                          BNE     25$             ;NO, CONTINUE
```

```
 4380  020744  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
 4381  020752  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
 4382  020760  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
 4383  020766  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4384  020774  001401                          BEQ     30$             ;YES, CONTINUE
 4385  020776  104104                          ERROR   104             ;CS1 INCORRECT
 4386  021000  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4387  021006  001401                          BEQ     31$             ;YES, CONTINUE
 4388  021010  104105                          ERROR   105             ;CS2 INCORRECT
 4389  021012  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4390  021020  001401                          BEQ     32$             ;YES, CONTINUE
 4391  021022  104106                          ERROR   106             ;ERROR REG INCORRECT
 4392  021024  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
 4393  021032  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
 4394  021040  001401                          BEQ     34$             ;YES, CONTINUE
 4395  021042  104107                          ERROR   107             ;MR1 INCORRECT
 4396  021044  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
 4397  021050  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
 4398  021056  001011                          BNE     35$             ;NO, CHECK IF FINSHED
 4399  021060  012737  020400  003214          MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
 4400  021066  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
 4401  021074  052737  100200  003200          BIS     #RDY!CERR,E.CS1
 4402  021102  005305                  35$:    DEC     R5              ;CHECK IF FINISHED
 4403  021104  001402                          BEQ     37$             ;YES - SKIP
 4404  021106  000137  020560                  JMP     5$              ;DO NEXT SECTOR
 4405  021112  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4406  021120  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
 4407  021126  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
 4408  021134  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
 4409  021142  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
 4410  021150  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
 4411  021156  001401                          BEQ     TST34           ;;GO TO NEXT TEST
 4412  021160  104153                          ERROR   153
 4413
 4414                          ;;*****************************************************************
 4415                          ;*TEST 34       OPI AND PREVIOUS HEADER VRC (PART 2)
 4416                          ;*
 4417                          ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 4418                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
 4419                          ;*      DATA OF ONE WORD TO AN RK06 IN 26 SECTOR FORMAT,
 4420                          ;*      CYLINDER 40, HEAD 0, SECTOR 1.  CLOCK THROUGH
 4421                          ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
 4422                          ;*      PULSE AND A HEADER CONSISTING OF THE FOLLOWING
 4423                          ;*      THREE WORDS HAVING A BAD HEADER VRC:
 4424                          ;*
 4425                          ;*              000040
 4426                          ;*              140000
 4427                          ;*              140000
 4428                          ;*
 4429                          ;*      MAKE SURE NO ERROR IS  REPORTED AND WRITE GATE
 4430                          ;*      DOES NOT SET.   SIMULATE A SECTOR PULSE AND 31
 4431                          ;*      HEADERS CONSISTING OF THE FOLLOWING THREE WORDS:
 4432                          ;*
 4433                          ;*              000040
 4434                          ;*              140000
 4435                          ;*              140040
```

```
                                        ;*
                                        ;*      MAKE SURE HEADER VRC AND OPI ERRORS SET.
                                        ;*
                                        ;;*****************************************************************
021162  000004                        TST34:  SCOPE
021164  012737  000012  001200                MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
021172  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
021176  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
021204  012700  002500                        MOV     #2500,R0                ;SET COUNT FOR STALL
021210  005300                        2$:     DEC     R0              ;DEC COUNT
021212  001376                                BNE     2$              ;LOOP UNTIL 0
021214  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
021222  012762  055220  000004                MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUFFER ADDRESS
021230  012762  177777  000002                MOV     #-1,RKWC(R2)    ;WORD COUNT = 1
021236  012762  000040  000020                MOV     #40,RKDCYL(R2) ;LOAD CYLINDER
021244  012762  000001  000006                MOV     #1,RKDA(R2)     ;LOAD TRACK AND SECTOR
021252  012762  000023  000000                MOV     #WRDATA,RKCS1(R2) ;ISSUE WRITE DATA
021260  012700  000426                        MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLODKS UNTIL READY
                                                                        ;  FOR SECTOR PULSE
021264  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
021272  012762  000040  000026                MOV     #DMD,RKMR1(R2)
021300  005300                                DEC     R0
021302  001370                                BNE     1$
021304  012705  000040                        MOV     #32.,R5         ;LOAD HEADER COUNT
021310  012703  054676                        MOV     #OPI4,R3        ;LOAD ADDRESS OF HEADERS
021314  012737  000023  003200                MOV     #WRDATA,E.CS1   ;LOAD EXPECTED CS1
021322  012737  000300  003210                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
021330  005037  003214                        CLR     E.ER            ;LOAD EXPECTED ERROR REG
021334  012737  022040  003224                MOV     #DMD!MEWD!ECCW,E.MR1 ;LOAD EXPECTED MR1
021342  005037  003310                        CLR     HDRCNT          ;INITIALIZE HEADER COUNT
021346  012762  000140  000026  5$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
021354  012762  000040  000026                MOV     #DMD,RKMR1(R2)
021362  022737  000037  003310                CMP     #31.,HDRCNT     ;CHECK IF ALL HEADERS DONE
021370  001460                                BEQ     26$             ;YES - SKIP TO ERROR TEST
021372  005037  003254                        CLR     PR.BIT          ;GENERATE SYNCH
021376  005037  003256                        CLR     M1.BIT
021402  012700  000377                        MOV     #255.,R0
021406  004737  037030            10$:        JSR     PC,RDBIT
021412  005300                                DEC     R0              ;CHECK IF SYNCH FINISHED
021414  001374                                BNE     10$
021416  012737  000001  003254                MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
021424  004737  037030                        JSR     PC,RDBIT
021430  012701  000003                        MOV     #3,R1           ;SIMULATE OPI
021434  012304                    12$:        MOV     (R3)+,R4        ;GET NEXT HEADER WORD
021436  012700  000020                        MOV     #16.,R0         ;LOAD BITS PER WORD
021442  013737  003254  003256  15$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
021450  006004                                ROR     R4              ;GET NEXT BIT
021452  103403                                BCS     17$
021454  005037  003254                        CLR     PR.BIT
021460  000403                                BR      18$

021462  012737  000001  003254  17$:     MOV     #1,PR.BIT
021470  004737  037030            18$:        JSR     PC,RDBIT        ;SIMULATE NEXT BIT
021474  005300                                DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
021476  001361                                BNE     15$             ;NO, CONTINUE
021500  005301                                DEC     R1              ;CHECK IF FINISHED WITH HEADER
```

```
4492  021502  001354                          BNE     12$             ;NO,CONTINUE
4493  021504  012700  000100                  MOV     #64.,R0         ;LOAD COUNT FOR GAP
4494  021510  013737  003254  003256  25$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
4495  021516  005037  003254                  CLR     PR.BIT
4496  021522  004737  037030                  JSR     PC,RDBIT
4497  021526  005300                          DEC     R0              ;CHECK IF GAP IS FINISHED
4498  021530  001367                          BNE     25$             ;NO, CONTINUE
4499  021532  016237  000000  003140  26$:    MOV     RKCS1(R2),T.CS1 ;GET CS1
4500  021540  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4501  021546  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG.
4502  021554  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4503  021562  001401                          BEQ     30$             ;YES, CONTINUE
4504  021564  104110                          ERROR   110             ;CS1 INCORRECT
4505  021566  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4506  021574  001401                          BEQ     31$             ;YES, CONTINUE
4507  021576  104111                          ERROR   111             ;CS2 INCORRECT
4508  021600  023737  003214  003154  31$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4509  021606  001401                          BEQ     32$             ;YES, CONTINUE
4510  021610  104112                          ERROR   112             ;ERROR REG INCORRECT
4511  021612  016237  000026  003164  32$:    MOV     RKMR1(R2),T.MR1 ;GET MR1
4512  021620  023737  003224  003164          CMP     E.MR1,T.MR1     ;CHECK TO MAKE SURE WRITE GATE DID NOT SET
4513  021626  001401                          BEQ     34$             ;YES, CONTINUE
4514  021630  104113                          ERROR   113             ;MR1 INCORRECT
4515  021632  005237  003310          34$:    INC     HDRCNT          ;INCREMENT HEADER COUNT
4516  021636  022737  000037  003310          CMP     #31.,HDRCNT     ;CHECK IF LAST HEADER
4517  021644  001011                          BNE     35$             ;NO, CHECK IF FINSHED
4518  021646  012737  020400  003214          MOV     #OPI!HVRC,E.ER  ;LOAD ERROR BIT
4519  021654  042737  000001  003200          BIC     #GO,E.CS1       ;ADJUST E.CS1 FOR END OF OP CONTENTS
4520  021662  052737  100200  003200          BIS     #RDY!CERR,E.CS1
4521  021670  005305                  35$:    DEC     R5              ;CHECK IF FINISHED
4522  021672  001402                          BEQ     37$             ;YES - SKIP
4523  021674  000137  021346                  JMP     5$              ;DO NEXT SECTOR
4524  021700  012762  100000  000000  37$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4525  021706  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4526  021714  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4527  021722  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4528  021730  012737  000200  003200          MOV     #RDY,E.CS1      ;SET EXPECTED CS1
4529  021736  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4530  021744  001401                          BEQ     TST35           ;;GO TO NEXT TEST
4531  021746  104153                          ERROR   153
4532
4533
4534                                  ;;*****************************************************************
4535                                  ;*TEST 35       BSE AND CONTROLLER ERROR
4536                                  ;*
4537                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4538                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
4539                                  ;*      OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
4540                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4541                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4542                                  ;*      AND A HEADER WITH A BSE ERROR.  MAKE SURE CONTROLLER
4543                                  ;*      ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
4544                                  ;*      CONTROLLER ERROR RESETS.
4545                                  ;*
4546                                  ;;*****************************************************************
4547  021750  000004                  TST35:  SCOPE
```

```
4548  021752  012737  000010  001200          MOV   #10,$TIMES      ;;DO 10 ITERATIONS
4549  021760  013702  001270                  MOV   $BASE,R2        ;LOAD RK611 BASE
4550  021764  012762  100000  000000          MOV   #CCLR,RKCS1(R2) ;CLEAR RK611
4551  021772  012762  000040  000026          MOV   #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4552  022000  012762  055220  000004          MOV   #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
4553  022006  012762  177777  000002          MOV   #-1,RKWC(R2)    ;WORD COUNT=1
4554  022014  012762  000000  000020          MOV   #0,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
4555  022022  012762  000000  000006          MOV   #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
4556  022030  012762  000023  000000          MOV   #WRDATA,RKCS1(R2)       ;ISSUE COMMAND
4557  022036  012700  000426                  MOV   #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4558                                                                ;  READY FOR SECTOR PULSE.
4559  022042  012762  000440  000026  1$:     MOV   #DMD!MCLK,RKMR1(R2)
4560  022050  012762  000040  000026          MOV   #DMD,RKMR1(R2)
4561  022056  005300                          DEC   R0
4562  022060  001370                          BNE   1$
4563  022062  012762  000140  000026          MOV   #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4564  022070  012762  000040  000026          MOV   #DMD,RKMR1(R2)
4565  022076  005037  003254                  CLR   PR.BIT          ;GENERATE SYNCH
4566  022102  005037  003256                  CLR   M1.BIT
4567  022106  012700  000377                  MOV   #255.,R0
4568  022112  004737  037030          5$:     JSR   PC,RDBIT
4569  022116  005300                          DEC   R0              ;CHECK IF SYNCH FINISHED
4570  022120  001374                          BNE   5$
4571  022122  012737  000001  003254          MOV   #1,PR.BIT       ;SIMULATE SYNCH
4572  022130  004737  037030                  JSR   PC,RDBIT
4573  022134  012703  053374                  MOV   #HEAD2,R3       ;LOAD HEADER
4574  022140  012701  000003                  MOV   #3,R1           ;LOAD WORDS PER HEADER
4575  022144  012304                  10$:    MOV   (R3)+,R4        ;GET NEXT WORD
4576  022146  012700  000020                  MOV   #16.,R0         ;LOAD BITS PER WORD
4577  022152  013737  003254  003256  12$:    MOV   PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4578  022160  006004                          ROR   R4              ;GET NEXT BIT
4579  022162  103403                          BCS   15$
4580  022164  005037  003254                  CLR   PR.BIT
4581  022170  000403                          BR    16$
4582
4583  022172  012737  000001  003254  15$:    MOV   #1,PR.BIT
4584  022200  004737  037030          16$:    JSR   PC,RDBIT        ;SIMULATE NEXT BIT
4585  022204  005300                          DEC   R0              ;CHECK IF READY FOR NEXT WORD
4586  022206  001361                          BNE   12$             ;NO, CONTINUE
4587  022210  005301                          DEC   R1              ;CHECK IF FINISHED WITH HEADER
4588  022212  001354                          BNE   10$             ;NO, CONTINUE
4589  022214  012700  000101                  MOV   #65.,R0
4590  022220  013737  003254  003256  20$:    MOV   PR.BIT,M1.BIT   ;SIMULATE GAP
4591  022226  005037  003254                  CLR   PR.BIT
4592  022232  004737  037030                  JSR   PC,RDBIT
4593  022236  005300                          DEC   R0              ;CHECK IF GAP FINISHED
4594  022240  001367                          BNE   20$             ;NO, CONTINUE
4595  022242  012700  021200                  MOV   #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
4596  022246  012762  000440  000026  25$:    MOV   #DMD!MCLK,RKMR1(R2)
4597  022254  012762  000040  000026          MOV   #DMD,RKMR1(R2)
4598  022262  005300                          DEC   R0
4599  022264  001370                          BNE   25$
4600  022266  016237  000000  003140          MOV   RKCS1(R2),T.CS1 ;GET CS1
4601  022274  016237  000010  003150          MOV   RKCS2(R2),T.CS2 ;GET CS2
4602  022302  016237  000014  003154          MOV   RKER(R2),T.ER   ;GET ERROR REG
4603  022310  012737  100222  003200          MOV   #CERR!RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
```

```
4604  022316  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4605  022324  012737  000200  003214          MOV     #BSE,E.ER       ;LOAD EXPECTED ERROR REG
4606  022332  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4607  022340  001401                          BEQ     30$             ;YES, CONTINUE
4608  022342  104136                          ERROR   136             ;CS1 INCORRECT
4609  022344  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4610  022352  001401                          BEQ     32$             ;YES, CONTINUE
4611  022354  104137                          ERROR   137             ;CS2 INCORRECT
4612  022356  023737  003214  003154  32$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4613  022364  001401                          BEQ     35$             ;YES - SKIP
4614  022366  104140                          ERROR   140             ;ERROR REG INCORRECT
4615  022370  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4616  022376  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4617  022404  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4618  022412  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4619  022420  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
4620  022426  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4621  022434  001401                          BEQ     TST36           ;;GO TO NEXT TEST
4622  022436  104153                          ERROR   153             ;ERROR DID NOT CLEAR
4623
4624                                  ;;*****************************************************************
4625                                  ;*TEST 36       HVRC AND CONTROLLER ERROR
4626                                  ;*
4627                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4628                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
4629                                  ;*      OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
4630                                  ;*      CYLINDER 300, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4631                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
4632                                  ;*      AND A HEADER WITH A HVRC ERROR.  MAKE SURE CONTROLLER
4633                                  ;*      ERROR AND HVRC SET. CLEAR CONTROLLER AND MAKE SURE
4634                                  ;*      CONTROLLER ERROR RESETS.
4635                                  ;*
4636                                  ;*****************************************************************
4637  022440  000004                  TST36:  SCOPE
4638  022442  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4639  022450  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4640  022454  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4641  022462  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4642  022470  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
4643  022476  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
4644  022504  012762  000300  000020          MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
4645  022512  012762  000000  000006          MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
4646  022520  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)       ;ISSUE COMMAND
4647  022526  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4648                                                                  ;  READY FOR SECTOR PULSE.
4649  022532  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4650  022540  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4651  022546  005300                          DEC     R0
4652  022550  001370                          BNE     1$
4653  022552  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4654  022560  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4655  022566  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4656  022572  005037  003256                  CLR     M1.BIT
4657  022576  012700  000377                  MOV     #255.,R0
4658  022602  004737  037030          5$:     JSR     PC,RDBIT
4659  022606  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
```

```
 4660  022610  001374                          BNE     5$
 4661  022612  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH
 4662  022620  004737  037030                  JSR     PC,RDBIT
 4663  022624  012703  053476                  MOV     #HEAD10,R3      ;LOAD HEADER
 4664  022630  012701  000003                  MOV     #3,R1           ;LOAD WORDS PER HEADER
 4665  022634  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 4666  022636  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
 4667  022642  013737  003254  003256  12$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 4668  022650  006004                          ROR     R4              ;GET NEXT BIT
 4669  022652  103403                          BCS     15$
 4670  022654  005037  003254                  CLR     PR.BIT
 4671  022660  000403                          BR      16$
 4672
 4673  022662  012737  000001  003254  15$:    MOV     #1,PR.BIT
 4674  022670  004737  037030          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
 4675  022674  005300                          DEC     R0              ;CHECK IF READY FOR NEXT WORD
 4676  022676  001361                          BNE     12$             ;NO, CONTINUE
 4677  022700  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
 4678  022702  001354                          BNE     10$             ;NO, CONTINUE
 4679  022704  012700  000101                  MOV     #65.,R0
 4680  022710  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
 4681  022716  005037  003254                  CLR     PR.BIT
 4682  022722  004737  037030                  JSR     PC,RDBIT
 4683  022726  005300                          DEC     R0              ;CHECK IF GAP FINISHED
 4684  022730  001367                          BNE     20$             ;NO, CONTINUE
 4685  022732  012700  021200                  MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
 4686  022736  012762  000440  000026  25$:    MOV     #DMD!MCLK,RKMR1(R2)
 4687  022744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4688  022752  005300                          DEC     R0
 4689  022754  001370                          BNE     25$
 4690  022756  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
 4691  022764  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
 4692  022772  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
 4693  023000  012737  100222  003200          MOV     #CERR!RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
 4694  023006  012737  000300  003210          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4695  023014  012737  000400  003214          MOV     #HVRC,E.ER      ;LOAD EXPECTED ERROR REG
 4696  023022  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4697  023030  001401                          BEQ     30$             ;YES, CONTINUE
 4698  023032  104141                          ERROR   141             ;CS1 INCORRECT
 4699  023034  023737  003210  003150  30$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4700  023042  001401                          BEQ     32$             ;YES, CONTINUE
 4701  023044  104142                          ERROR   142             ;CS2 INCORRECT
 4702  023046  023737  003214  003154  32$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4703  023054  001401                          BEQ     35$             ;YES - SKIP
 4704  023056  104143                          ERROR   143             ;ERROR REG INCORRECT
 4705  023060  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4706  023066  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
 4707  023074  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
 4708  023102  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
 4709  023110  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
 4710  023116  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
 4711  023124  001401                          BEQ     TST37           ;;GO TO NEXT TEST
 4712  023126  104153                          ERROR   153             ;ERROR DID NOT CLEAR
 4713
 4714                          ;;*************************************************************
 4715                          ;*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.
                                        ;*
                                        ;;*****************************************************************
023130  000004                  TST37:  SCOPE
023132  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
023140  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
023144  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
023152  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
023160  012762  055220  000004          MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
023166  012762  177777  000002          MOV     #-1,RKWC(R2)    ;WORD COUNT=1
023174  012762  000300  000020          MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
023202  012762  000000  000006          MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
023210  012762  000021  000000          MOV     #RDDATA,RKCS1(R2)       ;ISSUE COMMAND
023216  012700  000426                  MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR SECTOR PULSE.
023222  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
023230  012762  000040  000026          MOV     #DMD,RKMR1(R2)
023236  005300                          DEC     R0
023240  001370                          BNE     1$
023242  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
023250  012762  000040  000026          MOV     #DMD,RKMR1(R2)
023256  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
023262  005037  003256                  CLR     M1.BIT
023266  012700  000377                  MOV     #255.,R0
023272  004737  037030          5$:     JSR     PC,RDBIT
023276  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
023300  001374                          BNE     5$
023302  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH
023310  004737  037030                  JSR     PC,RDBIT
023314  012703  053476                  MOV     #HEAD10,R3      ;LOAD HEADER
023320  012701  000003                  MOV     #3,R1           ;LOAD WORDS PER HEADER
023324  012304          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
023326  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
023332  013737  003254  003256  12$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
023340  006004                          ROR     R4              ;GET NEXT BIT
023342  103403                          BCS     15$
023344  005037  003254                  CLR     PR.BIT
023350  000403                          BR      16$
023352  012737  000001  003254  15$:    MOV     #1,PR.BIT
023360  004737  037030          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
023364  005300                          DEC     R0              ;CHECK IF READY FOR NEXT WORD
023366  001361                          BNE     12$             ;NO, CONTINUE
023370  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
023372  001354                          BNE     10$             ;NO, CONTINUE
023374  012700  000101                  MOV     #65.,R0
023400  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
023406  005037  003254                  CLR     PR.BIT
```

```
 4772  023412  004737  037030                    JSR     PC,RDBIT
 4773  023416  005300                            DEC     R0              ;CHECK IF GAP FINISHED
 4774  023420  001367                            BNE     20$             ;NO, CONTINUE
 4775  023422  012700  021200                    MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
 4776  023426  012762  000440  000026  25$:     MOV     #DMD!MCLK,RKMR1(R2)
 4777  023434  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 4778  023442  005300                            DEC     R0
 4779  023444  001370                            BNE     25$
 4780  023446  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;GET CS1
 4781  023454  016237  000010  003150            MOV     RKCS2(R2),T.CS2 ;GET CS2
 4782  023462  016237  000014  003154            MOV     RKER(R2),T.ER   ;GET ERROR REG
 4783  023470  012737  100220  003200            MOV     #CERR!RDY!RDDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
 4784  023476  012737  000100  003210            MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 4785  023504  012737  000400  003214            MOV     #HVRC,E.ER      ;LOAD EXPECTED ERROR REG
 4786  023512  023737  003200  003140            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4787  023520  001401                            BEQ     30$             ;YES, CONTINUE
 4788  023522  104141                            ERROR   141             ;CS1 INCORRECT
 4789  023524  023737  003210  003150  30$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4790  023532  001401                            BEQ     32$             ;YES, CONTINUE
 4791  023534  104142                            ERROR   142             ;CS2 INCORRECT
 4792  023536  023737  003214  003154  32$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4793  023544  001401                            BEQ     35$             ;YES - SKIP
 4794  023546  104143                            ERROR   143             ;ERROR REG INCORRECT
 4795  023550  012762  100000  000000  35$:     MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4796  023556  016237  000000  003140            MOV     RKCS1(R2),T.CS1 ;GET CS1
 4797  023564  016237  000010  003150            MOV     RKCS2(R2),T.CS2 ;    CS2
 4798  023572  016237  000014  003154            MOV     RKER(R2),T.ER   ;    ER
 4799  023600  012737  000200  003200            MOV     #200,E.CS1      ;SET EXPECTED CS1
 4800  023606  023737  003140  003200            CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
 4801  023614  001401                            BEQ     TST40           ;;GO TO NEXT TEST
 4802  023616  104153                            ERROR   153             ;ERROR DID NOT CLEAR
 4803
 4804                                    ;;*****************************************************************
 4805                                    ;*TEST 40       WRITE CHECK AND HVRC
 4806                                    ;*
 4807                                    ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 4808                                    ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
 4809                                    ;*      CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
 4810                                    ;*      CYLINDER 300, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
 4811                                    ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE AND
 4812                                    ;*      A HEADER WITH A HEADER VRC ERROR.  MAKE SURE
 4813                                    ;*      HVRC AND CONTROLLER ERROR ARE SET. CLEAR CONTROLLER
 4814                                    ;*      AND MAKE SURE CONTROLLER ERROR RESETS.
 4815                                    ;*
 4816                                    ;;*****************************************************************
 4817  023620  000004                    TST40:  SCOPE
 4818  023622  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 4819  023630  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
 4820  023634  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4821  023642  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4822  023650  012762  055220  000004            MOV     #BUFF,RKBA(R2)  ;LOAD DUMMY BUS ADDRESS
 4823  023656  012762  177777  000002            MOV     #-1,RKWC(R2)    ;WORD COUNT=1
 4824  023664  012762  000300  000020            MOV     #300,RKDCYL(R2)  ;LOAD CYLINDER 11DMS
 4825  023672  012762  000000  000006            MOV     #0,RKDA(R2)     ;LOAD TRACK AND SECTOR
 4826  023700  012762  000031  000000            MOV     #WRTCHK,RKCS1(R2)       ;ISSUE COMMAND
 4827  023706  012700  000426                    MOV     #69.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
```

```
4828                                                    ;  READY FOR SECTOR PULSE.
4829  023712  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4830  023720  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4831  023726  005300                          DEC     R0
4832  023730  001370                          BNE     1$
4833  023732  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4834  023740  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4835  023746  005037  003254                  CLR     PR.BIT              ;GENERATE SYNCH
4836  023752  005037  003256                  CLR     M1.BIT
4837  023756  012700  000377                  MOV     #255.,R0
4838  023762  004737  037030          5$:     JSR     PC,RDBIT
4839  023766  005300                          DEC     R0                  ;CHECK IF SYNCH FINISHED
4840  023770  001374                          BNE     5$
4841  023772  012737  000001  003254          MOV     #1,PR.BIT           ;SIMULATE SYNCH
4842  024000  004737  037030                  JSR     PC,RDBIT
4843  024004  012703  053476                  MOV     #HEAD10,R3          ;LOAD HEADER
4844  024010  012701  000003                  MOV     #3,R1               ;LOAD WORDS PER HEADER
4845  024014  012304                  10$:     MOV     (R3)+,R4            ;GET NEXT WORD
4846  024016  012700  000020                  MOV     #16.,R0             ;LOAD BITS PER WORD
4847  024022  013737  003254  003256  12$:     MOV     PR.BIT,M1.BIT       ;STORE PREVIOUS BIT
4848  024030  006004                          ROR     R4                  ;GET NEXT BIT
4849  024032  103403                          BCS     15$
4850  024034  005037  003254                  CLR     PR.BIT
4851  024040  000403                          BR      16$
4852
4853  024042  012737  000001  003254  15$:     MOV     #1,PR.BIT
4854  024050  004737  037030          16$:     JSR     PC,RDBIT            ;SIMULATE NEXT BIT
4855  024054  005300                          DEC     R0                  ;CHECK IF READY FOR NEXT WORD
4856  024056  001361                          BNE     12$                 ;NO, CONTINUE
4857  024060  005301                          DEC     R1                  ;CHECK IF FINISHED WITH HEADER
4858  024062  001354                          BNE     10$                 ;NO, CONTINUE
4859  024064  012700  000101                  MOV     #65.,R0
4860  024070  013737  003254  003256  20$:     MOV     PR.BIT,M1.BIT       ;SIMULATE GAP
4861  024076  005037  003254                  CLR     PR.BIT
4862  024102  004737  037030                  JSR     PC,RDBIT
4863  024106  005300                          DEC     R0                  ;CHECK IF GAP FINISHED
4864  024110  001367                          BNE     20$                 ;NO, CONTINUE
4865  024112  012700  021200                  MOV     #2*<256.+<16.*256.>+64.>,R0  ;LOAD COUNT UNTIL POSTAMBLE
4866  024116  012762  000440  000026  25$:     MOV     #DMD!MCLK,RKMR1(R2)
4867  024124  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4868  024132  005300                          DEC     R0
4869  024134  001370                          BNE     25$
4870  024136  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4871  024144  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;GET CS2
4872  024152  016237  000014  003154          MOV     RKER(R2),T.ER   ;GET ERROR REG
4873  024160  012737  100230  003200          MOV     #CERR!RDY!WRTCHK$<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
4874  024166  012737  000100  003210          MOV     #IR,E.CS2           ;LOAD EXPECTED CS2
4875  024174  012737  000400  003214          MOV     #HVRC,E.ER          ;LOAD EXPECTED ERROR REG
4876  024202  023737  003200  003140          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
4877  024210  001401                          BEQ     30$                 ;YES, CONTINUE
4878  024212  104141                          ERROR   141                 ;CS1 INCORRECT
4879  024214  023737  003210  003150  30$:     CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
4880  024222  001401                          BEQ     32$                 ;YES, CONTINUE
4881  024224  104142                          ERROR   142                 ;CS2 INCORRECT
4882  024226  023737  003214  003154  32$:     CMP     E.ER,T.ER           ;CHECK ERROR REG CORRECT
4883  024234  001401                          BEQ     35$                 ;YES - SKIP
```

```
4884  024236  104143                          ERROR   143             ;ERROR REG INCORRECT
4885  024240  012762  100000  000000  35$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4886  024246  016237  000000  003140          MOV     RKCS1(R2),T.CS1 ;GET CS1
4887  024254  016237  000010  003150          MOV     RKCS2(R2),T.CS2 ;    CS2
4888  024262  016237  000014  003154          MOV     RKER(R2),T.ER   ;    ER
4889  024270  012737  000200  003200          MOV     #200,E.CS1      ;SET EXPECTED CS1
4890  024276  023737  003140  003200          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
4891  024304  001401                          BEQ     TST41           ;;GO TO NEXT TEST
4892  024306  104153                          ERROR   153             ;ERROR DID NOT CLEAR
4893
4894
4895                                  .SBTTL  **ECC GENERATION TESTS
4896
4897                                  ;;*****************************************************************
4898                                  ;*TEST 41       ECC INITIALIZATION
4899                                  ;*
4900                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4901                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4902                                  ;*      DATA OF 10 WORDS TO AN RK06, IN 26 SECTOR
4903                                  ;*      FORMAT, CYLINDER 0, HEAD 0, SECTOR 3.  CLOCK THROUGH
4904                                  ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
4905                                  ;*      A SECTOR PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY FOUR
4906                                  ;*      DATA WORDS OF ZEROES.  MAKE SURE THE ECC PATTERN
4907                                  ;*      REGISTER REMAINS ZERO.
4908                                  ;*
4909                                  ;;*****************************************************************
4910  024310  000004                  TST41:  SCOPE
4911  024312  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
4912  024320  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4913  024324  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4914  024332  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4915  024340  012762  053512  000004          MOV     #ECC1,RKBA(R2)  ;LOAD ADDRESS OF ECC DATA
4916  024346  012762  177770  000002          MOV     #-10,RKWC(R2)   ;WORD COUNT =10
4917  024354  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
4918  024362  012700  000450                  MOV     #8.*37.,R0      ;ISSUE ENOUGH CLOCKS UNTIL
4919                                                                  ;  READY FOR SECTOR PULSE
4920  024366  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
4921  024374  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4922  024402  005300                          DEC     R0
4923  024404  001370                          BNE     1$
4924  024406  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4925  024414  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4926  024422  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
4927  024426  005037  003256                  CLR     M1.BIT
4928  024432  012700  000377                  MOV     #255.,R0
4929  024436  004737  037030          5$:     JSR     PC,RDBIT
4930  024442  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
4931  024444  001374                          BNE     5$
4932  024446  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
4933  024454  004737  037030                  JSR     PC,RDBIT
4934  024460  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
4935  024464  012703  053366                  MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
4936  024470  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
4937  024472  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
4938  024476  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4939  024504  006004                          ROR     R4              ;GET NEXT BIT
```

```
4940  024506  103403                        BCS     17$
4941  024510  005037  003254                CLR     PR.BIT
4942  024514  000403                        BR      18$
4943
4944  024516  012737  000001  003254  17$:  MOV     #1,PR.BIT
4945  024524  004737  037030          18$:  JSR     PC,RDBIT        ;SIMULATE NEXT BIT
4946  024530  005300                        DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
4947  024532  001361                        BNE     15$             ;NO, CONTINUE
4948  024534  005301                        DEC     R1              ;CHECK IF FINISHED WITH HEADER
4949  024536  001354                        BNE     12$             ;NO, CONTINUE
4950  024540  012700  000101                MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FROM READ TO WRITE
4951  024544  013737  003254  003256  20$:  MOV     PR.BIT,M1.BIT
4952  024552  005037  003254                CLR     PR.BIT
4953  024556  004737  037030                JSR     PC,RDBIT
4954  024562  005300                        DEC     R0              ;CHECK IF GAP FINISHED
4955  024564  001367                        BNE     20$             ;NO, CONTINUE
4956  024566  012700  000400                MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
4957  024572  012737  050672  001310        MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
4958  024600  005037  003252                CLR     P1.BIT          ;INITIALIZE BITS
4959  024604  005037  003254                CLR     PR.BIT
4960  024610  005037  003256                CLR     M1.BIT
4961  024614  005037  003260                CLR     M2.BIT
4962  024620  005037  003262                CLR     BITCNT          ;INITIALIZE BIT COUNT
4963  024624  012737  062040  003224        MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1 ;LOAD EXPECTED MR1
4964  024632  004737  036302          25$:  JSR     PC,WRTBIT       ;WRITE BIT
4965  024636  104002                        ERROR   2               ;DATA INCORRECT
4966  024640  005237  003262                INC     BITCNT          ;INCREMENT BIT COUNT
4967  024644  005300                        DEC     R0              ;CHECK IF FINISHED
4968  024646  001371                        BNE     25$             ;NO, CONTINUE
4969  024650  012737  000001  003252        MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
4970  024656  004737  036302                JSR     PC,WRTBIT
4971  024662  104002                        ERROR   2
4972  024664  005037  003262                CLR     BITCNT          ;CLEAR BIT COUNT
4973  024670  012737  050744  001310        MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
4974  024676  005037  003234                CLR     E.ECPT          ;CLEAR EXPECTED ECC PATTERN
4975  024702  012703  053512                MOV     #ECC1,R3        ;LOAD START OF DATA
4976  024706  012701  000004                MOV     #4,R1           ;LOAD COUNT
4977  024712  012304          30$:  MOV     (R3)+,R4        ;GET NEXT WORD
4978  024714  012700  000020                MOV     #16.,R0         ;LOAD BITS PER WORD
4979  024720  013737  003256  003260  32$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
4980  024726  013737  003254  003256        MOV     PR.BIT,M1.BIT
4981  024734  013737  003252  003254        MOV     P1.BIT,PR.BIT
4982  024742  006004                        ROR     R4              ;GET NEXT BIT
4983  024744  103403                        BCS     34$
4984  024746  005037  003252                CLR     P1.BIT
4985  024752  000403                        BR      35$
4986
4987  024754  012737  000001  003252  34$:  MOV     #1,P1.BIT
4988  024762  004737  036302          35$:  JSR     PC,WRTBIT       ;SIMULATE BIT
4989  024766  104002                        ERROR   2
4990  024770  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
4991  024776  023737  003234  003174        CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
4992  025004  001401                        BEQ     37$             ;YES, CONTINUE
4993  025006  104134                        ERROR   134             ;ECC PATTERN NOT ZERO
4994  025010  005237  003262          37$:  INC     BITCNT          ;INCREMENT BIT COUNT
4995  025014  005300                        DEC     R0              ;CHECK IF FINISHED WITH WORD
```

```
 4996  025016  001340                        BNE     32$             ;NO, CONTINUE
 4997  025020  005301                        DEC     R1              ;CHECK IF FINISHED WITH TEST
 4998  025022  001333                        BNE     30$             ;NO, CONTINUE
 4999
 5000                                ;;*****************************************************************
 5001                                ;*TEST 42       ECC GENERATION (PART 1)
 5002                                ;*
 5003                                ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 5004                                ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
 5005                                ;*      DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
 5006                                ;*      FORMAT, CYLINER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
 5007                                ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR
 5008                                ;*      PULSE AND A GOOD HEADER.  CLOCK THROUGH ONLY THE
 5009                                ;*      FOLLOWING SIX WORDS OF DATA:
 5010                                ;*
 5011                                ;*              005001
 5012                                ;*              040040
 5013                                ;*              020004
 5014                                ;*              000064
 5015                                ;*              000000
 5016                                ;*              000000
 5017                                ;*
 5018                                ;*      CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
 5019                                ;*      GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.
 5020                                ;*
 5021                                ;;*****************************************************************
 5022  025024  000004                TST42:  SCOPE
 5023  025026  012737  000012  001200        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 5024  025034  013702  001270                MOV     $BASE,R2        ;LOAD RK611 BASE
 5025  025040  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5026  025046  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 5027  025054  012762  053532  000004        MOV     #ECC2,RKBA(R2)  ;LOAD ECC DATA
 5028  025062  012762  177766  000002        MOV     #-12,RKWC(R2)   ;WORD COUNT=12
 5029  025070  012762  000023  000000        MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
 5030  025076  012700  000562                MOV     #10.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 5031                                                                ;  READY FOR SECTOR PULSE
 5032  025102  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
 5033  025110  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 5034  025116  005300                        DEC     R0
 5035  025120  001370                        BNE     1$
 5036  025122  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 5037  025130  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 5038  025136  005037  003254                CLR     PR.BIT          ;GENERATE SYNCH
 5039  025142  005037  003256                CLR     M1.BIT
 5040  025146  012700  000377                MOV     #255.,R0
 5041  025152  004737  037030          5$:   JSR     PC,RDBIT
 5042  025156  005300                        DEC     R0              ;CHECK IF SYNCH FINISHED
 5043  025160  001374                        BNE     5$
 5044  025162  012737  000001  003254        MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
 5045  025170  004737  037030                JSR     PC,RDBIT
 5046  025174  012701  000003                MOV     #3,R1           ;SIMULATE HEADER
 5047  025200  012703  053366                MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
 5048  025204  012304                  12$:  MOV     (R3)+,R4        ;GET NEXT HEADER WORD
 5049  025206  012700  000020                MOV     #16.,R0         ;LOAD BITS PER WORD
 5050  025212  013737  003254  003256  15$:  MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5051  025220  006004                        ROR     R4              ;GET NEXT BIT
```

```
5052  025222  103403                          BCS     17$
5053  025224  005037  003254                  CLR     PR.BIT
5054  025230  000403                          BR      18$
5055
5056  025232  012737  000001  003254  17$:    MOV     #1,PR.BIT
5057  025240  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5058  025244  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
5059  025246  001361                          BNE     15$             ;NO, CONTINUE
5060  025250  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
5061  025252  001354                          BNE     12$             ;NO, CONTINUE
5062  025254  012700  000101                  MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FORM READ TO WRITE
5063  025260  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT
5064  025266  005037  003254                  CLR     PR.BIT
5065  025272  004737  037030                  JSR     PC,RDBIT
5066  025276  005300                          DEC     R0              ;CHECK IF GAP FINISHED
5067  025300  001367                          BNE     20$             ;NO, CONTINUE
5068  025302  012700  000400                  MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
5069  025306  012737  050672  001310          MOV     #EM327,EMW      ;LOAD ERROR
5070  025314  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS
5071  025320  005037  003254                  CLR     PR.BIT
5072  025324  005037  003256                  CLR     M1.BIT
5073  025330  005037  003260                  CLR     M2.BIT
5074  025334  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5075  025340  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5076  025346  004737  036302          25$:    JSR     PC,WRTBIT       ;WRITE BIT
5077  025352  104002                          ERROR   2               ;DATA INCORRECT
5078  025354  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
5079  025360  005300                          DEC     R0              ;CHECK IF FINISHED
5080  025362  001371                          BNE     25$             ;NO, CONTINUE
5081  025364  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
5082  025372  004737  036302                  JSR     PC,WRTBIT
5083  025376  104002                          ERROR   2
5084  025400  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5085  025404  012737  050744  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5086  025412  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC
5087  025416  005037  003270                  CLR     ECCLO
5088  025422  012703  053532                  MOV     #ECC2,R3        ;LOAD START OF DATA
5089  025426  012701  000006                  MOV     #6,R1           ;LOAD COUNT
5090  025432  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT BIT
5091  025434  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5092  025440  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5093  025446  013737  003254  003256          MOV     PR.BIT,M1.BIT
5094  025454  013737  003252  003254          MOV     P1.BIT,PR.BIT
5095  025462  006004                          ROR     R4              ;GET NEXT BIT
5096  025464  103403                          BCS     34$
5097  025466  005037  003252                  CLR     P1.BIT
5098  025472  000403                          BR      35$
5099
5100  025474  012737  000001  003252  34$:    MOV     #1,P1.BIT
5101  025502  004737  036302          35$:    JSR     PC,WRTBIT       ;SIMULATE BIT
5102  025506  104002                          ERROR   2
5103  025510  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
5104  025516  004737  036134                  JSR     PC,ECCGEN       ;GENERATE EXPECTED ECC PAT
5105  025522  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5106  025530  001401                          BEQ     37$             ;YES, CONTINUE
5107  025532  104135                          ERROR   135             ;ECC PATTERN INCORRECT
```

```
5108  025534  005237  003262          37$:    INC     BITCNT          ;INCREMENT BIT COUNT
5109  025540  005300                          DEC     R0              ;CHECK IF FINISHED WITH WORD
5110  025542  001336                          BNE     32$             ;NO, CONTINUE
5111  025544  005301                          DEC     R1              ;CHECK IF FINISHED WITH TEST
5112  025546  001331                          BNE     30$             ;NO, CONTINUE
5113
5114                          ;;*****************************************************************
5115                          ;*TEST 43       ECC GENERATION (PART 2)
5116                          ;*
5117                          ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5118                          ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5119                          ;*      DATA OF 12 WORDS TO AN RK06, IN 26 SECTOR
5120                          ;*      FORMAT, CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH
5121                          ;*      SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5122                          ;*      AND A GOOD HEADER.  CLOCK THROUGH ONLY THE FOLLOWING
5123                          ;*      SIX WORDS OF DATA:
5124                          ;*
5125                          ;*              177777
5126                          ;*              177777
5127                          ;*              177777
5128                          ;*              177777
5129                          ;*              177777
5130                          ;*              177777
5131                          ;*
5132                          ;*      CLOCK IN EACH BIT INDIVIDUALLY AND CHECK FOR PROPER ECC
5133                          ;*      GENERATION AS SEEN THROUGH THE ECC PATTERN REGISTER.
5134                          ;*
5135                          ;*****************************************************************
5136  025550  000004          T$T43:  SCOPE
5137  025552  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5138  025560  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5139  025564  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5140  025572  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5141  025600  012762  053552  000004          MOV     #ECC3,RKBA(R2)  ;LOAD ECC DATA
5142  025606  012762  177766  000002          MOV     #-12,RKWC(R2)   ;WORD COUNT=12
5143  025614  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
5144  025622  012700  000562                  MOV     #10.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5145                                                                  ;  READY FOR SECTOR PULSE
5146  025626  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5147  025634  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5148  025642  005300                          DEC     R0
5149  025644  001370                          BNE     1$
5150  025646  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5151  025654  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5152  025662  005037  003254                  CLR     PR.BIT          ;GENERATE SYNCH
5153  025666  005037  003256                  CLR     M1.BIT
5154  025672  012700  000377                  MOV     #255.,R0
5155  025676  004737  037030          5$:     JSR     PC,RDBIT
5156  025702  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
5157  025704  001374                          BNE     5$
5158  025706  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNCH BIT
5159  025714  004737  037030                  JSR     PC,RDBIT
5160  025720  012701  000003                  MOV     #3,R1           ;SIMULATE HEADER
5161  025724  012703  053366                  MOV     #HEAD1,R3       ;  CYL 0, TRK 0, SECTOR 0
5162  025730  012304                  12$:    MOV     (R3)+,R4        ;GET NEXT HEADER WORD
5163  025732  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
```

```
 5164  025736  013737  003254  003256  15$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5165  025744  006004                          ROR     R4              ;GET NEXT BIT
 5166  025746  103403                          BCS     17$
 5167  025750  005037  003254                  CLR     PR.BIT
 5168  025754  000403                          BR      18$
 5169
 5170  025756  012737  000001  003254  17$:    MOV     #1,PR.BIT
 5171  025764  004737  037030          18$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
 5172  025770  005300                          DEC     R0              ;CHECK IF READY FOR NEXT HEADER WORD
 5173  025772  001361                          BNE     15$             ;NO, CONTINUE
 5174  025774  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
 5175  025776  001354                          BNE     12$             ;NO, CONTINUE
 5176  026000  012700  000101                  MOV     #65.,R0         ;SIMULATE GAP +1 FOR SWITCH FORM READ TO WRITE
 5177  026004  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT
 5178  026012  005037  003254                  CLR     PR.BIT
 5179  026016  004737  037030                  JSR     PC,RDBIT
 5180  026022  005300                          DEC     R0              ;CHECK IF GAP FINISHED
 5181  026024  001367                          BNE     20$             ;NO, CONTINUE
 5182  026026  012700  000400                  MOV     #256.,R0        ;LOAD COUNT FOR SYNCH FIELD
 5183  026032  012737  050672  001310          MOV     #EM327,EMW      ;LOAD ERROR
 5184  026040  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS
 5185  026044  005037  003254                  CLR     PR.BIT
 5186  026050  005037  003256                  CLR     M1.BIT
 5187  026054  005037  003260                  CLR     M2.BIT
 5188  026060  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5189  026064  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
 5190  026072  004737  036302          25$:    JSR     PC,WRTBIT       ;WRITE BIT
 5191  026076  104002                          ERROR   2               ;DATA INCORRECT
 5192  026100  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
 5193  026104  005300                          DEC     R0              ;CHECK IF FINISHED
 5194  026106  001371                          BNE     25$             ;NO, CONTINUE
 5195  026110  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNCH BIT
 5196  026116  004737  036302                  JSR     PC,WRTBIT
 5197  026122  104002                          ERROR   2
 5198  026124  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 5199  026130  012737  050744  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
 5200  026136  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC
 5201  026142  005037  003270                  CLR     ECCLO
 5202  026146  012703  053552                  MOV     #ECC3,R3        ;LOAD START OF DATA
 5203  026152  012701  000006                  MOV     #6,R1           ;LOAD COUNT
 5204  026156  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT BIT
 5205  026160  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
 5206  026164  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5207  026172  013737  003254  003256          MOV     PR.BIT,M1.BIT
 5208  026200  013737  003252  003254          MOV     P1.BIT,PR.BIT
 5209  026206  006004                          ROR     R4              ;GET NEXT BIT
 5210  026210  103403                          BCS     34$
 5211  026212  005037  003252                  CLR     P1.BIT
 5212  026216  000403                          BR      35$
 5213
 5214  026220  012737  000001  003252  34$:    MOV     #1,P1.BIT
 5215  026226  004737  036302          35$:    JSR     PC,WRTBIT       ;SIMULATE BIT
 5216  026232  104002                          ERROR   2
 5217  026234  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;STORE ECC WORD
 5218  026242  004737  036134                  JSR     PC,ECCGEN       ;GENERATE EXPECTED ECC PAT
 5219  026246  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
```

```
                                        BEQ     37$             ;YES, CONTINUE
                                        ERROR   135             ;ECC PATTERN INCORRECT
003262                          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 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.
                                ;*
                                ;;*******************************************************************
000004                          TST44:  SCOPE
012737  000012  001200                  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS

013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
012762  056220  000004                  MOV     #ECCBUF,RKBA(R2)  ;LOAD ADDRESS
012762  177400  000002                  MOV     #-400,RKWC(R2)  ;WORD COUNT=400
012762  000023  000000                  MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
012700  004612                          MOV     #66.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR SECTOR PULSE
012762  000440  000026          1$:     MOV     #DMD!MCLK,RKMR1(R2)
012762  000040  000026                  MOV     #DMD,RKMR1(R2)
005300                                  DEC     R0
001370                                  BNE     1$
012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
012762  000040  000026                  MOV     #DMD,RKMR1(R2)
005037  003254                          CLR     PR.BIT
005037  003256                          CLR     M1.BIT
012700  000377                          MOV     #255.,R0
004737  037030                  5$:     JSR     PC,RDBIT
005300                                  DEC     R0              ;CHECK IF SYNCH FINISHED
001374                                  BNE     5$
012737  000001  003254                  MOV     #1,PR.BIT       ;SIMULATE SYNCH
004737  037030                          JSR     PC,RDBIT
012703  053366                          MOV     #HEAD1,R3       ;LOAD HEADER
012701  000003                          MOV     #3,R1           ;LOAD WORDS PER HEADER
012304                          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
012700  000020                          MOV     #16.,R0         ;LOAD BITS PER
013737  003254  003256          12$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
006004                                  ROR     R4              ;GET NEXT BIT
103403                                  BCS     15$
005037  003254                          CLR     PR.BIT
000403                                  BR      16$
```

```
5276
5277  026502  012737  000001  003254  15$:    MOV     #1,PR.BIT
5278  026510  004737  037030          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5279  026514  005300                          DEC     R0              ;CHECK IF READY FOR NEXT WORD
5280  026516  001361                          BNE     12$             ;NO, CONTINUE
5281  026520  005301                          DEC     R1              ;CHECK IF FINISHED WITH HEADER
5282  026522  001354                          BNE     10$             ;NO, CONTINUE
5283  026524  012700  000101                  MOV     #65.,R0
5284  026530  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5285  026536  005037  003254                  CLR     PR.BIT
5286  026542  004737  037030                  JSR     PC,RDBIT
5287  026546  005300                          DEC     R0              ;CHECK IF GAP FINISHED
5288  026550  001367                          BNE     20$             ;NO, CONTINUE
5289  026552  005037  003252                  CLR     P1.BIT          ;INITIALIZE BITS FOR SYNCH
5290  026556  005037  003254                  CLR     PR.BIT
5291  026562  005037  003256                  CLR     M1.BIT
5292  026566  005037  003260                  CLR     M2.BIT
5293  026572  012737  050672  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5294  026600  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5295  026604  012700  000400                  MOV     #256.,R0        ;LOAD SYNCH COUNT AND WRITE SYNCH
5296  026610  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5297  026616  004737  036302          25$:    JSR     PC,WRTBIT
5298  026622  104002                          ERROR   2
5299  026624  005237  003262                  INC     BITCNT          ;CLEAR BIT COUNT
5300  026630  005300                          DEC     R0              ;CHECK IF SYNCH FINISHED
5301  026632  001371                          BNE     25$             ;NO, CONTINUE
5302  026634  012737  000001  003252          MOV     #1,P1.BIT       ;WRITE SYNCH BIT
5303  026642  004737  036302                  JSR     PC,WRTBIT
5304  026646  104002                          ERROR   2
5305  026650  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC GENERATOR
5306  026654  005037  003270                  CLR     ECCLO
5307  026660  012737  050744  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5308  026666  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5309  026672  012701  000400                  MOV     #256.,R1        ;LOAD WORDS PER SECTOR
5310  026676  012703  056220                  MOV     #ECCBUF,R3      ;LOAD ADDRESS OF BUFFER
5311  026702  012304          30$:    MOV     (R3)+,R4        ;GET NEXT WORD
5312  026704  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5313  026710  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5314  026716  013737  003254  003256          MOV     PR.BIT,M1.BIT
5315  026724  013737  003252  003254          MOV     P1.BIT,PR.BIT
5316  026732  006004                          ROR     R4              ;DETERMINE NEXT BIT
5317  026734  103403                          BCS     34$
5318  026736  005037  003252                  CLR     P1.BIT
5319  026742  000403                          BR      35$
5320
5321  026744  012737  000001  003252  34$:    MOV     #1,P1.BIT
5322  026752  004737  036302          35$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5323  026756  104002                          ERROR   2
5324  026760  004737  036134                  JSR     PC,ECCGEN       ;GENERATE ECC
5325  026764  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
5326  026772  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5327  027000  001401                          BEQ     37$             ;YES, CONTINUE
5328  027002  104135                          ERROR   135             ;ECC PATTERN INCORRECT
5329  027004  005237  003262          37$:    INC     BITCNT          ;INCREMENT BIT COUNT
5330  027010  022700  000002                  CMP     #2,R0           ;IF THE NEXT BIT IS THE LAST BIT OF
5331  027014  001006                          BNE     28$             ;THE LAST DATA WORD, ECCW MUST BE RESET
```

```
5332  027016  022701  000001              CMP     #1,R1           ;IN THE EXPECTED MR1 TO INDICATE ECC
5333  027022  001003                      BNE     28$             ;BEING WRITTEN
5334  027024  042737  020000  003224      BIC     #ECCW,E.MR1
5335  027032  005300              28$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5336  027034  001325                      BNE     32$             ;NO, CONTINUE
5337  027036  005301                      DEC     R1              ;CHECK IF AT END OF SECTOR
5338  027040  001320                      BNE     30$             ;NO, CONTINUE
5339  027042  012737  051311  001310      MOV     #EM333,EMW      ;LOAD ERROR MESSAGE
5340  027050  005037  003262              CLR     BITCNT          ;INITIALIZE BIT COUNT
5341  027054  012701  000002              MOV     #2,R1           ;LOAD NUMBER OF ECO WORDS
5342  027060  012703  003266              MOV     #ECCHI,R3       ;LOAD ADDRESS OF ECC
5343  027064  012304              40$:    MOV     (R3)+,R4        ;GET NEXT ECC WORD
5344  027066  012700  000020              MOV     #16.,R0         ;LOAD BITS PER WORD
5345  027072  013737  003256  003260  42$: MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5346  027100  013737  003254  003256      MOV     PR.BIT,M1.BIT
5347  027106  013737  003252  003254      MOV     P1.BIT,PR.BIT
5348  027114  006004                      ROR     R4              ;DETERMINE NEXT BIT
5349  027116  103403                      BCS     44$
5350  027120  005037  003252              CLR     P1.BIT
5351  027124  000403                      BR      45$
5352
5353  027126  012737  000001  003252  44$: MOV     #1,P1.BIT
5354  027134  004737  036302          45$: JSR     PC,WRTBIT       ;WRITE NEXT BIT
5355  027140  104002                      ERROR   2
5356  027142  005237  003262              INC     BITCNT          ;INCREMENT BIT COUNT
5357  027146  022700  000002              CMP     #2,R0           ;IF THE LAST BIT OF THE LAST ECC WORD
5358  027152  001006                      BNE     46$             ;IS BEING WRITTEN, ECCW MUST BE SET
5359  027154  022701  000001              CMP     #1,R1           ;IN EXPECTED MR1 TO INDICATE ECC
5360  027160  001003                      BNE     46$             ;WRITING IS DONE
5361  027162  052737  020000  003224      BIS     #ECCW,E.MR1
5362  027170  005300              46$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5363  027172  001337                      BNE     42$             ;NO, CONTINUE
5364  027174  005301                      DEC     R1              ;CHECK IF FINISH WITH ECC
5365  027176  001332                      BNE     40$             ;NO, CONTINUE
5366  027200  012737  051347  001310      MOV     #EM334,EMW      ;LOAD ERROR MESSAGE
5367  027206  005037  003262              CLR     BITCNT          ;CLEAR BIT COUNT
5368  027212  012700  000017              MOV     #15.,R0         ;LOAD POSTAMBLE BIT COUNT
5369  027216  013737  003256  003260  47$: MOV     M1.BIT,M2.BIT   ;SHIFT BIT
5370  027224  013737  003254  003256      MOV     PR.BIT,M1.BIT
5371  027232  013737  003252  003254      MOV     P1.BIT,PR.BIT
5372  027240  005037  003252              CLR     P1.BIT
5373  027244  004737  036302              JSR     PC,WRTBIT       ;WRITE NEXT BIT
5374  027250  104002                      ERROR   2
5375  027252  005237  003262              INC     BITCNT          ;INCREMENT BIT COUNT
5376  027256  005300                      DEC     R0              ;CHECK IF THROUGH WITH POSTAMBLE
5377  027260  001356                      BNE     47$             ;NO, CONTINUE
5378  027262  012700  000014              MOV     #3*4,R0         ;ISSUE CLOCKS TO COMPLETE COMMAND
5379  027266  012762  000440  000026  50$: MOV     #DMD!MCLK,RKMR1(R2) ;ISSUE CLOCK PULSES
5380  027274  012762  000040  000026      MOV     #DMD,RKMR1(R2)
5381  027302  005300                      DEC     R0
5382  027304  001370                      BNE     50$
5383  027306  016237  000000  003140      MOV     RKCS1(R2),T.CS1 ;SAVE CS1
5384  027314  016237  000010  003150      MOV     RKCS2(R2),T.CS2 ;SAVE CS2
5385  027322  016237  000014  003154      MOV     RKER(R2),T.ER   ;SAVE ERROR REG
5386  027330  012737  000222  003200      MOV     #RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
5387  027336  012737  000100  003210      MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
```

```
5388  027344  005037  003214                  CLR     E.ER            ;LOAD EXPECTED ERROR REG.
5389  027350  016237  000020  003160          MOV     RKDCYL(R2),T.DCYL  ;SAVE CYLINDER ADDR REG
5390  027356  016237  000006  003146          MOV     RKDA(R2),T.DA   ;SAVE DISK AND REG
5391  027364  016237  000004  003144          MOV     RKBA(R2),T.BA   ;SAVE BUS ADD REG
5392  027372  016237  000002  003142          MOV     RKWC(R2),T.WC   ;SAVE WORD COUNT
5393  027400  005037  003220                  CLR     E.DCYL          ;LOAD EXPECTED CYLINDER AND REG.
5394  027404  012737  000001  003206          MOV     #1,E.DA         ;LOAD EXPECTED DISK
5395  027412  012737  057220  003204          MOV     #ECCBUF+<400*2>,E.BA  ;LOAD EXPECTED
5396  027420  005037  003202                  CLR     E.WC            ;LOAD EXPECTED ECC WORD
5397  027424  023737  003200  003140          CMP     E.CS1,T.CS1     ;CHECK CS1
5398  027432  001401                          BEQ     55$
5399  027434  104144                          ERROR   144
5400  027436  023737  003210  003150  55$:    CMP     E.CS2,T.CS2     ;CHECK CS2
5401  027444  001401                          BEQ     56$
5402  027446  104145                          ERROR   145
5403  027450  023737  003214  003154  56$:    CMP     E.ER,T.ER       ;CHECK ERROR REG
5404  027456  001401                          BEQ     57$
5405  027460  104146                          ERROR   146
5406  027462  023737  003204  003144  57$:    CMP     E.BA,T.BA       ;CHECK BUS ADD
5407  027470  001401                          BEQ     58$
5408  027472  104147                          ERROR   147
5409  027474  023737  003202  003142  58$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT
5410  027502  001401                          BEQ     59$
5411  027504  104150                          ERROR   150
5412  027506  023737  003220  003160  59$:    CMP     E.DCYL,T.DCYL   ;CHECK CYLINDER ADD
5413  027514  001401                          BEQ     60$
5414  027516  104151                          ERROR   151
5415  027520  023737  003206  003146  60$:    CMP     E.DA,T.DA       ;CHECK DISK ADDR.
5416  027526  001401                          BEQ     TST45           ;;YES, GO ON TO NEXT TEST
5417  027530  104152                          ERROR   152
5418
5419                                  .SBTTL  **PARTIAL WRITE DATA
5420
5421                                  ;;*****************************************************************
5422                                  ;*TEST 45       ZERO FILL ON WRITE DATA
5423                                  ;*
5424                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5425                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5426                                  ;*      DATA OF 103 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
5427                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5428                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5429                                  ;*      AND A GOOD HEADER.  CLOCK THROUGH ALL 400 WORDS AND
5430                                  ;*      THE TWO ECC WORDS.  CHECK THE SECTOR FOR ZERO FILL
5431                                  ;*      AND MAKE SURE THE TWO ECC WORDS ARE WRITTEN PROPERLY.
5432                                  ;*      CHECK BUS ADDRESS, WORD COUNT, CYLINDER, TRACK, AND SECTOR.
5433                                  ;*
5434                                  ;;*****************************************************************
5435  027532  000004                  TST45:  SCOPE
5436  027534  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5437
5438  027542  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5439  027546  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5440  027554  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5441  027562  012762  056220  000004          MOV     #ECCBUF,RKBA(R2)  ;LOAD ADDRESS
5442  027570  012762  177675  000002          MOV     #-103,RKWC(R2)  ;WORD COUNT=400
5443  027576  012762  000023  000000          MOV     #WRDATA,RKCS1(R2)  ;ISSUE WRITE DATA
```

```
5444  027604  012700  004612                MOV     #66.*37.,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5445                                                                  ;  READY FOR SECTOR PULSE
5446  027610  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
5447  027616  012762  000040  000026        MOV     #DMD,RKMR1(R2)
5448  027624  005300                        DEC     R0
5449  027626  001370                        BNE     1$
5450  027630  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5451  027636  012762  000040  000026        MOV     #DMD,RKMR1(R2)
5452  027644  005037  003254                CLR     PR.BIT
5453  027650  005037  003256                CLR     M1.BIT
5454  027654  012700  000377                MOV     #255.,R0
5455  027660  004737  037030          5$:   JSR     PC,RDBIT
5456  027664  005300                        DEC     R0              ;CHECK IF SYNCH FINISHED
5457  027666  001374                        BNE     5$
5458  027670  012737  000001  003254        MOV     #1,PR.BIT       ;SIMULATE SYNCH
5459  027676  004737  037030                JSR     PC,RDBIT
5460  027702  012703  053366                MOV     #HEAD1,R3       ;LOAD HEADER
5461  027706  012701  000003                MOV     #3,R1           ;LOAD WORDS PER HEADER
5462  027712  012304          10$:  MOV     (R3)+,R4        ;GET NEXT WORD
5463  027714  012700  000020                MOV     #16.,R0         ;LOAD BITS PER
5464  027720  013737  003254  003256  12$:   MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5465  027726  006004                        ROR     R4              ;GET NEXT BIT
5466  027730  103403                        BCS     15$
5467  027732  005037  003254                CLR     PR.BIT
5468  027736  000403                        BR      16$
5469
5470  027740  012737  000001  003254  15$:   MOV     #1,PR.BIT
5471  027746  004737  037030          16$:  JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5472  027752  005300                        DEC     R0              ;CHECK IF READY FOR NEXT WORD
5473  027754  001361                        BNE     12$             ;NO, CONTINUE
5474  027756  005301                        DEC     R1              ;CHECK IF FINISHED WITH HEADER
5475  027760  001354                        BNE     10$             ;NO, CONTINUE
5476  027762  012700  000101                MOV     #65.,R0
5477  027766  013737  003254  003256  20$:   MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5478  027774  005037  003254                CLR     PR.BIT
5479  030000  004737  037030                JSR     PC,RDBIT
5480  030004  005300                        DEC     R0              ;CHECK IF GAP FINISHED
5481  030006  001367                        BNE     20$             ;NO, CONTINUE
5482  030010  005037  003252                CLR     P1.BIT          ;INITIALIZE BITS FOR SYNCH
5483  030014  005037  003254                CLR     PR.BIT
5484  030020  005037  003256                CLR     M1.BIT
5485  030024  005037  003260                CLR     M2.BIT
5486  030030  012737  050672  001310        MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5487  030036  005037  003262                CLR     BITCNT          ;INITIALIZE BIT COUNT
5488  030042  012700  000400                MOV     #256.,R0        ;LOAD SYNCH COUNT AND WRITE SYNCH
5489  030046  012737  062040  003224        MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5490  030054  004737  036302          25$:  JSR     PC,WRTBIT
5491  030060  104002                        ERROR   2
5492  030062  005237  003262                INC     BITCNT          ;CLEAR BIT COUNT
5493  030066  005300                        DEC     R0              ;CHECK IF SYNCH FINISHED
5494  030070  001371                        BNE     25$             ;NO, CONTINUE
5495  030072  012737  000001  003252        MOV     #1,P1.BIT       ;WRITE SYNCH BIT
5496  030100  004737  036302                JSR     PC,WRTBIT
5497  030104  104002                        ERROR   2
5498  030106  005037  003266                CLR     ECCHI           ;INITIALIZE ECC GENERATOR
5499  030112  005037  003270                CLR     ECCLO
```

```
5500  030116  012737  050744  001310          MOV     #EM328,EMW      ;LOAD ERROR MESSAGE
5501  030124  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5502  030130  012701  000400                  MOV     #256.,R1        ;LOAD WORDS PER SECTOR
5503  030134  012703  056220                  MOV     #ECCBUF,R3      ;LOAD ADDRESS OF BUFFER
5504  030140  012304                  30$:    MOV     (R3)+,R4        ;GET NEXT WORD
5505  030142  012700  000020          31$:    MOV     #16.,R0         ;LOAD BITS PER WORD
5506  030146  013737  003256  003260  32$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5507  030154  013737  003254  003256          MOV     PR.BIT,M1.BIT
5508  030162  013737  003252  003254          MOV     P1.BIT,PR.BIT
5509  030170  006004                          ROR     R4              ;DETERMINE NEXT BIT
5510  030172  103403                          BCS     34$
5511  030174  005037  003252                  CLR     P1.BIT
5512  030200  000403                          BR      35$
5513
5514  030202  012737  000001  003252  34$:    MOV     #1,P1.BIT
5515  030210  004737  036302          35$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5516  030214  104002                          ERROR   2
5517  030216  004737  036134                  JSR     PC,ECCGEN       ;GENERATE ECC
5518  030222  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
5519  030230  023737  003234  003174          CMP     E.ECPT,T.ECPT   ;CHECK ECC PATTERN CORRECT
5520  030236  001401                          BEQ     37$             ;YES, CONTINUE
5521  030240  104135                          ERROR   135             ;ECC PATTERN INCORRECT
5522  030242  005237  003262          37$:    INC     BITCNT          ;INCREMENT BIT COUNT
5523  030246  022700  000002                  CMP     #2,R0           ;IF THE NEXT BIT IS THE LAST BIT OF
5524  030252  001006                          BNE     28$             ;THE LAST DATA WORD, ECCW MUST BE RESET
5525  030254  022701  000001                  CMP     #1,R1           ;IN THE EXPECTED MR1 TO INDICATE ECC
5526  030260  001003                          BNE     28$             ;BEING WRITTEN
5527  030262  042737  020000  003224          BIC     #ECCW,E.MR1
5528  030270  005300                  28$:    DEC     R0              ;CHECK IF THROUGH WITH WORD
5529  030272  001325                          BNE     32$             ;NO, CONTINUE
5530  030274  005301                          DEC     R1              ;CHECK IF AT END OF SECTOR
5531  030276  001405                          BEQ     39$             ;YES -SKIP
5532  030300  022703  056426                  CMP     #ECCBUF+<103*2>,R3  ;CHECK IF 103 WORDS TRANSFERED
5533  030304  003315                          BGT     30$             ;NO - GO TO GET NEXT WORD
5534  030306  005004                          CLR     R4              ;ELSE CLEAR R4 FOR ZEROS
5535  030310  000714                          BR      31$             ;GO SIMULATE REST OF SECTOR
5536  030312  012737  051311  001310  39$:    MOV     #EM333,EMW      ;LOAD ERROR MESSAGE
5537  030320  005037  003262                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5538  030324  012701  000002                  MOV     #2,R1           ;LOAD NUMBER OF ECO WORDS
5539  030330  012703  003266                  MOV     #ECCHI,R3       ;LOAD ADDRESS OF ECC
5540  030334  012304                  40$:    MOV     (R3)+,R4        ;GET NEXT ECC WORD
5541  030336  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5542  030342  013737  003256  003260  42$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5543  030350  013737  003254  003256          MOV     PR.BIT,M1.BIT
5544  030356  013737  003252  003254          MOV     P1.BIT,PR.BIT
5545  030364  006004                          ROR     R4              ;DETERMINE NEXT BIT
5546  030366  103403                          BCS     44$
5547  030370  005037  003252                  CLR     P1.BIT
5548  030374  000403                          BR      45$
5549
5550  030376  012737  000001  003252  44$:    MOV     #1,P1.BIT
5551  030404  004737  036302          45$:    JSR     PC,WRTBIT       ;WRITE NEXT BIT
5552  030410  104002                          ERROR   2
5553  030412  005237  003262                  INC     BITCNT          ;INCREMENT BIT COUNT
5554  030416  022700  000002                  CMP     #2,R0           ;IF THE LAST BIT OF THE LAST ECC WORD
5555  030422  001006                          BNE     46$             ;IS BEING WRITTEN, ECCW MUST BE SET
```

```
5556  030424  022701  000001            CMP     #1,R1                   ;IN EXPECTED MR1 TO INDICATE ECC
5557  030430  001003                    BNE     46$                     ;WRITING IS DONE
5558  030432  052737  020000  003224    BIS     #ECCW,E.MR1
5559  030440  005300              46$:  DEC     R0                      ;CHECK IF THROUGH WITH WORD
5560  030442  001337                    BNE     42$                     ;NO, CONTINUE
5561  030444  005301                    DEC     R1                      ;CHECK IF FINISH WITH ECC
5562  030446  001332                    BNE     40$                     ;NO, CONTINUE
5563  030450  012737  051347  001310    MOV     #EM334,EMW              ;LOAD ERROR MESSAGE
5564  030456  005037  003262            CLR     BITCNT                  ;CLEAR BIT COUNT
5565  030462  012700  000017            MOV     #15.,R0                 ;LOAD POSTAMBLE BIT COUNT
5566  030466  013737  003256  003260  47$:  MOV     M1.BIT,M2.BIT           ;SHIFT BIT
5567  030474  013737  003254  003256      MOV     PR.BIT,M1.BIT
5568  030502  013737  003252  003254      MOV     P1.BIT,PR.BIT
5569  030510  005037  003252            CLR     P1.BIT
5570  030514  004737  036302            JSR     PC,WRTBIT               ;WRITE NEXT BIT
5571  030520  104002                    ERROR   2
5572  030522  005237  003262            INC     BITCNT                  ;INCREMENT BIT COUNT
5573  030526  005300                    DEC     R0                      ;CHECK IF THROUGH WITH POSTAMBLE
5574  030530  001356                    BNE     47$                     ;NO, CONTINUE
5575  030532  012700  000014            MOV     #3*4,R0                 ;ISSUE CLOCKS TO COMPLETE COMMAND
5576  030536  012762  000440  000026  50$:  MOV     #DMD!MCLK,RKMR1(R2)     ;ISSUE CLOCK PULSES
5577  030544  012762  000040  000026      MOV     #DMD,RKMR1(R2)
5578  030552  005300                    DEC     R0
5579  030554  001370                    BNE     50$
5580  030556  016237  000000  003140    MOV     RKCS1(R2),T.CS1         ;SAVE CS1
5581  030564  016237  000010  003150    MOV     RKCS2(R2),T.CS2         ;SAVE CS2
5582  030572  016237  000014  003154    MOV     RKER(R2),T.ER           ;SAVE ERROR REG
5583  030600  012737  000222  003200    MOV     #RDY!WRDATA&<^C<GO>>,E.CS1  ;LOAD EXPECTED CS1
5584  030606  012737  000100  003210    MOV     #IR,E.CS2               ;LOAD EXPECTED CS2
5585  030614  005037  003214            CLR     E.ER                    ;LOAD EXPECTED ERROR REG.
5586  030620  016237  000020  003160    MOV     RKDCYL(R2),T.DCYL       ;SAVE CYLINDER ADDR REG
5587  030626  016237  000006  003146    MOV     RKDA(R2),T.DA           ;SAVE DISK AND REG
5588  030634  016237  000004  003144    MOV     RKBA(R2),T.BA           ;SAVE BUS ADD REG
5589  030642  016237  000002  003142    MOV     RKWC(R2),T.WC           ;SAVE WORD COUNT
5590  030650  005037  003220            CLR     E.DCYL                  ;LOAD EXPECTED CYLINDER AND REG.
5591  030654  012737  000001  003206    MOV     #1,E.DA                 ;LOAD EXPECTED DISK
5592  030662  012737  056426  003204    MOV     #ECCBUF+<103*2>,E.BA    ;LOAD EXPECTED
5593  030670  005037  003202            CLR     E.WC                    ;LOAD EXPECTED ECC WORD
5594  030674  023737  003200  003140    CMP     E.CS1,T.CS1             ;CHECK CS1
5595  030702  001401                    BEQ     55$
5596  030704  104154                    ERROR   154
5597  030706  023737  003210  003150  55$:  CMP     E.CS2,T.CS2             ;CHECK CS2
5598  030714  001401                    BEQ     56$
5599  030716  104155                    ERROR   155
5600  030720  023737  003214  003154  56$:  CMP     E.ER,T.ER               ;CHECK ERROR REG
5601  030726  001401                    BEQ     57$
5602  030730  104156                    ERROR   156
5603  030732  023737  003204  003144  57$:  CMP     E.BA,T.BA               ;CHECK BUS ADD
5604  030740  001401                    BEQ     58$
5605  030742  104157                    ERROR   157
5606  030744  023737  003202  003142  58$:  CMP     E.WC,T.WC               ;CHECK WORD COUNT
5607  030752  001401                    BEQ     59$
5608  030754  104160                    ERROR   160
5609  030756  023737  003220  003160  59$:  CMP     E.DCYL,T.DCYL           ;CHECK CYLINDER ADD
5610  030764  001401                    BEQ     60$
5611  030766  104161                    ERROR   161
```

```
                                60$:    CMP     E.DA,T.DA       ;CHECK DISK ADDR.
                                        BEQ     TST46           ;;YES, GO ON TO NEXT TEST
                                        ERROR   162
                                .SBTTL  **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.
                                ;*
                                ;;*****************************************************************
031002  000004                 TST46:  SCOPE
031004  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS

031012  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
031016  012762  100000  000000          MOV     #CCLR,RKCS1(R2)  ;CLEAR CONTROLLER
031024  012700  002000                  MOV     #2000,R0                ;SET A STALL COUNT
031030  005300                  5$:     DEC     R0              ;LOOP UNTIL COUNT 0
031032  001376                          BNE     5$

031034  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SET DIAGNOSTIC MODE
031042  012762  055204  000004          MOV     #MOD2BF,RKBA(R2)  ;LOAD BUFFER ADDRESS
031050  012762  177400  000002          MOV     #-400,RKWC(R2)          ; --- WORD COUNT
031056  012762  010023  000000          MOV     #WRDATA!CFMT,RKCS1(R2)  ; --- START COMMAND
031064  012700  005136                  MOV     #66.*40.+<4.*3.+2>,R0  ;ISSUE ENOUGH CLOCKS UNTIL
                                                                        ;  READY FOR SECTOR PULSE
031070  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
031076  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031104  005300                          DEC     R0
031106  001370                          BNE     7$

031110  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
031116  012762  000040  000026          MOV     #DMD,RKMR1(R2)

031124  005037  003254                  CLR     PR.BIT          ;GENERATE SYNC
031130  005037  003256                  CLR     M1.BIT
031134  012700  000377                  MOV     #255.,R0

031140  004737  037030          9$:     JSR     PC,RDBIT        ;SIMULATE SYNC 0 BITS
031144  005300                          DEC     R0
031146  001374                          BNE     9$

031150  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNC 1 BIT
031156  004737  037030                  JSR     PC,RDBIT

031162  012703  053504                  MOV     #HEAD11,R3      ;SIMULATE HEADER
031166  012701  000003                  MOV     #3,R1           ;  CYL 0 TRK 0, SEC 0
031172  012304                  11$:    MOV     (R3)+,R4        ;GET HEADER WORD
031174  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
031200  013737  003254  003256  13$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
```

```
5668  031206  006004                          ROR     R4              ;GET NEXT BIT
5669  031210  103403                          BCS     15$
5670  031212  005037  003254                  CLR     PR.BIT
5671  031216  000403                          BR      16$
5672
5673  031220  012737  000001  003254  15$:    MOV     #1,PR.BIT
5674  031226  004737  037030          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5675  031232  005300                          DEC     R0              ;READY FOR NEXT HEADER WORD?
5676  031234  001361                          BNE     13$             ;NO - GET NEXT BIT THIS WORD
5677  031236  005301                          DEC     R1              ;HEADER DONE?
5678  031240  001354                          BNE     11$             ;NO - GET NEXT HEADER WORD
5679  031242  012700  000101                  MOV     #65.,R0         ;SET COUNT FOR GAP.
5680  031246  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5681  031254  005037  003254                  CLR     PR.BIT
5682  031260  004737  037030                  JSR     PC,RDBIT
5683  031264  005300                          DEC     R0
5684  031266  001367                          BNE     20$
5685  031270  012700  000400                  MOV     #256.,R0        ;SET COUNT FOR WRITE DATA SYNC
5686  031274  012737  050672  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5687  031302  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
5688  031306  005037  003254                  CLR     PR.BIT
5689  031312  005037  003256                  CLR     M1.BIT
5690  031316  005037  003260                  CLR     M2.BIT
5691  031322  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
5692  031326  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
5693  031334  004737  036302          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
5694  031340  104002                          ERROR   2
5695  031342  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
5696  031346  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
5697  031350  001371                          BNE     22$
5698  031352  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
5699  031360  004737  036302                  JSR     PC,WRTBIT
5700  031364  104002                          ERROR   2
5701  031366  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
5702  031372  005037  003270                  CLR     ECCLO
5703  031376  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5704  031402  012703  055204                  MOV     #MOD2BF,R3      ;SET DATA POINTER
5705  031406  012701  000006                  MOV     #6.,R1  ;SET DATA COUNT
5706  031412  012304          24$:    MOV     (R3)+,R4        ;GET DATA WORD
5707  031414  012737  051615  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
5708  031422  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
5709  031426  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5710  031434  013737  003254  003256          MOV     PR.BIT,M1.BIT
5711  031442  013737  003252  003254          MOV     P1.BIT,PR.BIT
5712  031450  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
5713  031452  006004                          ROR     R4
5714  031454  103403                          BCS     27$
5715  031456  005037  003252                  CLR     P1.BIT
5716  031462  000403                          BR      28$
5717
5718  031464  012737  000001  003252  27$:    MOV     #1,P1.BIT
5719  031472  004737  036302          28$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
5720  031476  104002                          ERROR   2
5721  031500  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
5722  031506  004737  036134                  JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
5723  031512  023737  003174  003234          CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
```

```
5724  031520  001401                        BEQ     29$             ;YES - SKIP
5725  031522  104164                        ERROR   164
5726  031524  005237  003262        29$:    INC     BITCNT
5727  031530  005300                        DEC     R0
5728  031532  020027  000002                CMP     R0,#2           ;1ST 16 BITS JUST DONE?
5729  031536  001403                        BEQ     31$             ;YES - SKIP
5730  031540  005700                        TST     R0              ;ELSE TEST IF WORD DONE
5731  031542  001331                        BNE     25$             ;NO - DO NEXT BIT
5732  031544  000406                        BR      32$             ;ELSE DO NEXT WORD
5733  031546  012737  051703  001310  31$:  MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
5734  031554  012704  000000                MOV     #0,R4   ;SET UPPER BITS OF WORD
5735  031560  000722                        BR      25$             ;GO DO BITS
5736
5737  031562  005301                32$:    DEC     R1              ;ALL WORDS DONE?
5738  031564  001312                        BNE     24$             ;NO - GET NEXT WORD
5739
5740                        ;;*****************************************************************
5741                        ;*TEST 47       18 BIT WRITE DATA (PART 2)
5742                        ;*
5743                        ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5744                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
5745                        ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
5746                        ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5747                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
5748                        ;*      AND A GOOD HEADER.  CLOCK THROUGH 6 WORDS OF 177777
5749                        ;*      WITH BAD PARITY SET.  VERIFY WRITING OF TWO PARITY
5750                        ;*      BITS ON SIMULATED DISK.
5751                        ;*
5752                        ;*      NOTE:   THIS TEST IS ONLY EXECUTED IF MEMORY
5753                        ;*              PARITY ENABLE IS PRESENT FOR BUFFER
5754                        ;*              LOCATION.
5755                        ;*
5756                        ;;*****************************************************************
5757  031566  000004        TST47:  SCOPE
5758  031570  012737  000012  001200        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
5759
5760  031576  005737  003274                TST     MEMPAR          ;CHECK IF MEMORY PARITY AVAIL.
5761  031602  001017                        BNE     2$              ;YES - SKIP
5762  031604                        1$:
5763  031604  012737  000001  001200        MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
5764  031612  005227  177777                INC     #-1             ;ONLY DO ONCE
5765  031616  001007                        BNE     64$             ;NO, GO TO NEXT TEST
5766  031620  104401  044043                TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
5767  031624  013746  001220                MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
5768  031630  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
5769  031632  104401  044053                TYPE    ,TSTBY2
5770  031636  000137  032440        64$:    JMP     TST50           ;GO TO NEXT TEST
5771
5772  031642  004237  034116        2$:     JSR     R2,WRTPAR
5773  031646  000006                        6
5774  031650  057220                        BADPAR
5775  031652  005700                        TST     R0
5776  031654  001353                        BNE     1$
5777  031656  013737  031664  001110        MOV     3$,$LPERR
5778
5779  031664                        3$:
```

```
5780
5781  031664  013702  001270                  MOV     $BASE,R2          ;LOAD RK611 BASE
5782  031670  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR CONTROLLER
5783  031676  012700  002000                  MOV     #2000,R0                  ;SET A STALL COUNT
5784  031702  005300                  5$:     DEC     R0                ;LOOP UNTIL COUNT 0
5785  031704  001376                          BNE     5$
5786
5787  031706  012762  000040  000026          MOV     #DMD,RKMR1(R2)    ;SET DIAGNOSTIC MODE
5788  031714  012762  057220  000004          MOV     #BADPAR,RKBA(R2)  ;LOAD BUFFER ADDRESS
5789  031722  012762  177400  000002          MOV     #-400,RKWC(R2)            ; --- WORD COUNT
5790  031730  012762  010023  000000          MOV     #WRDATA!CFMT,RKCS1(R2)    ; --- START COMMAND
5791  031736  012700  005136                  MOV     #66.*40.+(4.*3.+2),R0     ;ISSUE ENOUGH CLOCKS UNTIL
5792                                                                            ;  READY FOR SECTOR PULSE
5793  031742  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
5794  031750  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5795  031756  005300                          DEC     R0
5796  031760  001370                          BNE     7$
5797
5798  031762  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5799  031770  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5800
5801  031776  005037  003254                  CLR     PR.BIT            ;GENERATE SYNC
5802  032002  005037  003256                  CLR     M1.BIT
5803  032006  012700  000377                  MOV     #255.,R0
5804
5805  032012  004737  037030          9$:     JSR     PC,RDBIT          ;SIMULATE SYNC 0 BITS
5806  032016  005300                          DEC     R0
5807  032020  001374                          BNE     9$
5808
5809  032022  012737  000001  003254          MOV     #1,PR.BIT         ;SIMULATE SYNC 1 BIT
5810  032030  004737  037030                  JSR     PC,RDBIT
5811
5812  032034  012703  053504                  MOV     #HEAD11,R3        ;SIMULATE HEADER
5813  032040  012701  000003                  MOV     #3,R1             ;  CYL 0 TRK 0, SEC 0
5814  032044  012304                  11$:     MOV     (R3)+,R4          ;GET HEADER WORD
5815  032046  012700  000020                  MOV     #16.,R0           ;LOAD BITS PER WORD
5816  032052  013737  003254  003256  13$:     MOV     PR.BIT,M1.BIT     ;STORE PREVIOUS BIT
5817  032060  006004                          ROR     R4                ;GET NEXT BIT
5818  032062  103403                          BCS     15$
5819  032064  005037  003254                  CLR     PR.BIT
5820  032070  000403                          BR      16$
5821
5822  032072  012737  000001  003254  15$:     MOV     #1,PR.BIT
5823  032100  004737  037030          16$:     JSR     PC,RDBIT          ;SIMULATE NEXT BIT
5824  032104  005300                          DEC     R0                ;READY FOR NEXT HEADER WORD?
5825  032106  001361                          BNE     13$               ;NO - GET NEXT BIT THIS WORD
5826  032110  005301                          DEC     R1                ;HEADER DONE?
5827  032112  001354                          BNE     11$               ;NO - GET NEXT HEADER WORD
5828  032114  012700  000101                  MOV     #65.,R0           ;SET COUNT FOR GAP.
5829  032120  013737  003254  003256  20$:     MOV     PR.BIT,M1.BIT     ;SIMULATE GAP
5830  032126  005037  003254                  CLR     PR.BIT
5831  032132  004737  037030                  JSR     PC,RDBIT
5832  032136  005300                          DEC     R0
5833  032140  001367                          BNE     20$
5834  032142  012700  000400                  MOV     #256.,R0          ;SET COUNT FOR WRITE DATA SYNC
5835  032146  012737  050672  001310          MOV     #EM327,EMW        ;LOAD ERROR MESSAGE
```

```
 5836  032154  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
 5837  032160  005037  003254                  CLR     PR.BIT
 5838  032164  005037  003256                  CLR     M1.BIT
 5839  032170  005037  003260                  CLR     M2.BIT
 5840  032174  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
 5841  032200  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1  ;SET EXPECTED MR1
 5842  032206  004737  036302          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
 5843  032212  104002                          ERROR   2
 5844  032214  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
 5845  032220  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
 5846  032222  001371                          BNE     22$
 5847  032224  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
 5848  032232  004737  036302                  JSR     PC,WRTBIT
 5849  032236  104002                          ERROR   2
 5850  032240  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
 5851  032244  005037  003270                  CLR     ECCLO
 5852  032250  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 5853  032254  012703  055204                  MOV     #MOD2BF,R3      ;SET DATA POINTER
 5854  032260  012701  000006                  MOV     #6.,R1  ;SET DATA COUNT
 5855  032264  012304                  24$:    MOV     (R3)+,R4        ;GET DATA WORD
 5856  032266  012737  051615  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
 5857  032274  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
 5858  032300  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5859  032306  013737  003254  003256          MOV     PR.BIT,M1.BIT
 5860  032314  013737  003252  003254          MOV     P1.BIT,PR.BIT
 5861  032322  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
 5862  032324  006004                          ROR     R4
 5863  032326  103403                          BCS     27$
 5864  032330  005037  003252                  CLR     P1.BIT
 5865  032334  000403                          BR      28$
 5866
 5867  032336  012737  000001  003252  27$:    MOV     #1,P1.BIT
 5868  032344  004737  036302          28$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
 5869  032350  104002                          ERROR   2
 5870  032352  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
 5871  032360  004737  036134                  JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
 5872  032364  023737  003174  003234          CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
 5873  032372  001401                          BEQ     29$             ;YES - SKIP
 5874  032374  104164                          ERROR   164
 5875  032376  005237  003262          29$:    INC     BITCNT
 5876  032402  005300                          DEC     R0
 5877  032404  020027  000002                  CMP     R0,#2           ;1ST 16 BITS JUST DONE?
 5878  032410  001403                          BEQ     31$             ;YES - SKIP
 5879  032412  005700                          TST     R0              ;ELSE TEST IF WORD DONE
 5880  032414  001331                          BNE     25$             ;NO - DO NEXT BIT
 5881  032416  000406                          BR      32$             ;ELSE DO NEXT WORD
 5882  032420  012737  051703  001310  31$:    MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
 5883  032426  012704  000002                  MOV     #2,R4   ;SET UPPER BITS OF WORD
 5884  032432  000722                          BR      25$             ;GO DO BITS
 5885
 5886  032434  005301                  32$:    DEC     R1              ;ALL WORDS DONE?
 5887  032436  001312                          BNE     24$             ;NO - GET NEXT WORD
 5888
 5889
 5890                                  ;;*****************************************************************
 5891                                  ;*TEST 50       CLEAR BAD PARITY BUFFER
```

```
                                        ;*
                                        ;*      THE SOLE PURPOSE OF THIS TEST IS TO CLEAR BADPAR
                                        ;*      BUFFER AND REMOVE THE BAD PARITY.
                                        ;*
                                        ;;*****************************************************************
032440  000004                  TST50:  SCOPE
032442  012737  000001  001200          MOV     #1,$TIMES       ;;DO 1 ITERATION
032450  012700  000006                  MOV     #6,R0
032454  012701  057220                  MOV     #BADPAR, R1
032460  012721  177777          1$:     MOV     #-1,(R1)+
032464  005300                          DEC     R0
032466  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.
                                        ;*
                                        ;;*****************************************************************
032470  000004                  TST51:  SCOPE
032472  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS

032500  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
032504  012762  100000  000000          MOV     #CCLR,RKCS1(R2)  ;CLEAR CONTROLLER
032512  012700  002000                  MOV     #2000,R0                ;SET A STALL COUNT
032516  005300                  5$:     DEC     R0              ;LOOP UNTIL COUNT 0
032520  001376                          BNE     5$

032522  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SET DIAGNOSTIC MODE
032530  012762  056220  000004          MOV     #ECCBUF,RKBA(R2)  ;LOAD BUFFER ADDRESS
032536  012762  177400  000002          MOV     #-400,RKWC(R2)          ; --- WORD COUNT
032544  012762  010023  000000          MOV     #WRDATA!CFMT,RKCS1(R2)  ; --- START COMMAND
032552  012700  005136                  MOV     #66.*40.+<4.*3.+2>,R0  ;ISSUE ENOUGH CLOCKS UNTIL
                                                                        ;  READY FOR SECTOR PULSE
032556  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
032564  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032572  005300                          DEC     R0
032574  001370                          BNE     7$

032576  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
032604  012762  000040  000026          MOV     #DMD,RKMR1(R2)

032612  005037  003254                  CLR     PR.BIT          ;GENERATE SYNC
032616  005037  003256                  CLR     M1.BIT
032622  012700  000377                  MOV     #255.,R0

032626  004737  037030          9$:     JSR     PC,RDBIT        ;SIMULATE SYNC 0 BITS
032632  005300                          DEC     R0
032634  001374                          BNE     9$
```

```
5948
5949  032636  012737  000001  003254          MOV     #1,PR.BIT       ;SIMULATE SYNC 1 BIT
5950  032644  004737  037030                  JSR     PC,RDBIT
5951
5952  032650  012703  053504                  MOV     #HEAD11,R3      ;SIMULATE HEADER
5953  032654  012701  000003                  MOV     #3,R1           ;  CYL 0 TRK 0, SEC 0
5954  032660  012304                  11$:    MOV     (R3)+,R4        ;GET HEADER WORD
5955  032662  012700  000020                  MOV     #16.,R0         ;LOAD BITS PER WORD
5956  032666  013737  003254  003256  13$:    MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5957  032674  006004                          ROR     R4              ;GET NEXT BIT
5958  032676  103403                          BCS     15$
5959  032700  005037  003254                  CLR     PR.BIT
5960  032704  000403                          BR      16$
5961
5962  032706  012737  000001  003254  15$:    MOV     #1,PR.BIT
5963  032714  004737  037030          16$:    JSR     PC,RDBIT        ;SIMULATE NEXT BIT
5964  032720  005300                          DEC     R0              ;READY FOR NEXT HEADER WORD?
5965  032722  001361                          BNE     13$             ;NO - GET NEXT BIT THIS WORD
5966  032724  005301                          DEC     R1              ;HEADER DONE?
5967  032726  001354                          BNE     11$             ;NO - GET NEXT HEADER WORD
5968  032730  012700  000101                  MOV     #65.,R0         ;SET COUNT FOR GAP.
5969  032734  013737  003254  003256  20$:    MOV     PR.BIT,M1.BIT   ;SIMULATE GAP
5970  032742  005037  003254                  CLR     PR.BIT
5971  032746  004737  037030                  JSR     PC,RDBIT
5972  032752  005300                          DEC     R0
5973  032754  001367                          BNE     20$
5974  032756  012700  000400                  MOV     #256.,R0        ;SET COUNT FOR WRITE DATA SYNC
5975  032762  012737  050672  001310          MOV     #EM327,EMW      ;LOAD ERROR MESSAGE
5976  032770  005037  003252                  CLR     P1.BIT          ;CLEAR BITS
5977  032774  005037  003254                  CLR     PR.BIT
5978  033000  005037  003256                  CLR     M1.BIT
5979  033004  005037  003260                  CLR     M2.BIT
5980  033010  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNTER
5981  033014  012737  062040  003224          MOV     #DMD!ECCW!MEWD!WRTGAT,E.MR1   ;SET EXPECTED MR1
5982  033022  004737  036302          22$:    JSR     PC,WRTBIT       ;SIMULATE SYNC 0
5983  033026  104002                          ERROR   2
5984  033030  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
5985  033034  005300                          DEC     R0              ;LOOP UNTIL SYNC 0 WRITTEN
5986  033036  001371                          BNE     22$
5987  033040  012737  000001  003252          MOV     #1,P1.BIT       ;SIMULATE SYNC 1
5988  033046  004737  036302                  JSR     PC,WRTBIT
5989  033052  104002                          ERROR   2
5990  033054  005037  003266                  CLR     ECCHI           ;INITIALIZE ECC WORDS.
5991  033060  005037  003270                  CLR     ECCLO
5992  033064  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
5993  033070  012703  056220                  MOV     #ECCBUF,R3      ;SET DATA POINTER
5994  033074  012701  000377                  MOV     #255.,R1        ;SET DATA COUNT
5995  033100  012304                  24$:    MOV     (R3)+,R4        ;GET DATA WORD
5996  033102  012737  051615  001310          MOV     #EM338,EMW      ;LOAD MESSAGE (18 BIT DATA WRITE)
5997  033110  012700  000022                  MOV     #18.,R0         ;LOAD BITS PER WORD
5998  033114  013737  003256  003260  25$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5999  033122  013737  003254  003256          MOV     PR.BIT,M1.BIT
6000  033130  013737  003252  003254          MOV     P1.BIT,PR.BIT
6001  033136  000241                          CLC                     ;CLEAR CARRY & GET NEXT BIT
6002  033140  006004                          ROR     R4
6003  033142  103403                          BCS     27$
```

```
 6004  033144  005037  003252                CLR     P1.BIT
 6005  033150  000403                        BR      28$
 6006
 6007  033152  012737  000001  003252  27$:  MOV     #1,P1.BIT
 6008  033160  004737  036302          28$:  JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
 6009  033164  104002                        ERROR   2
 6010  033166  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;GET ECC PATTERN
 6011  033174  004737  036134                JSR     PC,ECCGEN       ;COMPUTE EXPECTED ECC
 6012  033200  023737  003174  003234        CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
 6013  033206  001401                        BEQ     29$             ;YES - SKIP
 6014  033210  104164                        ERROR   164
 6015  033212  005237  003262          29$:  INC     BITCNT
 6016  033216  005300                        DEC     R0
 6017  033220  020027  000002                CMP     R0,#2           ;1ST 16 BITS JUST DONE?
 6018  033224  001403                        BEQ     31$             ;YES - SKIP
 6019  033226  005700                        TST     R0              ;ELSE TEST IF WORD DONE
 6020  033230  001331                        BNE     25$             ;NO - DO NEXT BIT
 6021  033232  000406                        BR      32$             ;ELSE DO NEXT WORD
 6022  033234  012737  051703  001310  31$:  MOV     #EM339,EMW      ;LOAD MESSAGE (BIT 16.17)
 6023  033242  012704  000000                MOV     #0,R4   ;SET UPPER BITS OF WORD
 6024  033246  000722                        BR      25$             ;GO DO BITS
 6025
 6026  033250  005301                  32$:  DEC     R1              ;ALL WORDS DONE?
 6027  033252  001312                        BNE     24$             ;NO - GET NEXT WORD
 6028
 6029  033254  012737  051615  001310        MOV     #EM338,EMW      ;SET ERROR MESSAGE
 6030  033262  012304                        MOV     (R3)+,R4        ;GET LAST WORD
 6031  033264  012700  000022                MOV     #18.,R0         ;SET BIT COUNT
 6032  033270  013737  003256  003260  34$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6033  033276  013737  003254  003256        MOV     PR.BIT,M1.BIT
 6034  033304  013737  003252  003254        MOV     P1.BIT,PR.BIT
 6035  033312  000241                        CLC                     ;CLEAR CARRY
 6036  033314  006004                        ROR     R4              ;TEST NEXT BIT
 6037  033316  103403                        BCS     36$             ;SKIP IF A ONE
 6038  033320  005037  003252                CLR     P1.BIT          ;ELSE SET NEXT BIT FOR ZERO
 6039  033324  000403                        BR      37$
 6040
 6041  033326  012737  000001  003252  36$:  MOV     #1,P1.BIT       ;SET NEXT BIT FOR 1
 6042  033334  004737  036302          37$:  JSR     PC,WRTBIT       ;SIMULATE BIT
 6043  033340  104002                        ERROR   2
 6044  033342  016237  000032  003174        MOV     RKECPT(R2),T.ECPT  ;GET PATTERN
 6045  033350  004737  036134                JSR     PC,ECCGEN       ;GENERATE ECC PATTERN
 6046  033354  023737  003174  003234        CMP     T.ECPT,E.ECPT   ;TEST IF CORRECT
 6047  033362  001401                        BEQ     39$             ;YES - SKIP
 6048  033364  104164                        ERROR   164             ;ELSE REPORT
 6049  033366  005237  003262          39$:  INC     BITCNT          ;BUMP BIT COUNT
 6050  033372  022700  000002                CMP     #2,R0           ;IF NEXT BIT IS THE LAST DATA BIT
 6051  033376  001003                        BNE     41$             ;ECCW MUST BE RESET TO INDICATE
 6052  033400  042737  020000  003224        BIC     #ECCW,E.MR1             ;ECC BEING WRITTEN
 6053  033406  005300                  41$:  DEC     R0
 6054  033410  022700  000002                CMP     #2,R0           ;TEST IF 1ST 16 BITS DONE
 6055  033414  001403                        BEQ     42$             ;YES - SKIP
 6056  033416  005700                        TST     R0              ;ELSE TEST IF WORD DONE
 6057  033420  001323                        BNE     34$             ;NO - SKIP
 6058  033422  000406                        BR      45$             ;ELSE GO TO ECC PROCESSING
 6059
```

```
 6060  033424  012737  051703  001310  42$:    MOV     #EM339,EMW      ;SET MESSAGE FOR BITS 16 AND 17
 6061  033432  012704  000000                  MOV     #0,R4           ;SET UP UPPER BITS
 6062  033436  000714                          BR      34$             ;GO DO LAST TWO BITS
 6063  033440  012737  051311  001310  45$:    MOV     #EM333,EMW      ;MESSAGE (ECC WRITE)
 6064  033446  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 6065  033452  012703  003266                  MOV     #ECCHI,R3       ;LOAD POINTER TO ECC WORDS
 6066  033456  012701  000002                  MOV     #2,R1           ;SET FOR 2 WORDS
 6067  033462  012304                  43$:    MOV     (R3)+,R4        ;GET ECC WORD
 6068  033464  012700  000020                  MOV     #16.,R0         ;SET BIT COUNT
 6069  033470  013737  003256  003260  44$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6070  033476  013737  003254  003256          MOV     PR.BIT,M1.BIT
 6071  033504  013737  003252  003254          MOV     P1.BIT,PR.BIT
 6072  033512  006004                          ROR     R4              ;LOAD NEXT BIT
 6073  033514  103403                          BCS     46$
 6074  033516  005037  003252                  CLR     P1.BIT
 6075  033522  000403                          BR      47$
 6076
 6077  033524  012737  000001  003252  46$:    MOV     #1,P1.BIT
 6078  033532  004737  036302          47$:    JSR     PC,WRTBIT       ;SIMULATE NEXT BIT
 6079  033536  104002                          ERROR   2
 6080  033540  022700  000002                  CMP     #2,R0           ;IF THIS BIT IS THE LAST ECC BIT
 6081  033544  001006                          BNE     49$             ;ECCW MUST BE SET TO INDICATE
 6082  033546  022701  000001                  CMP     #1,R1           ;ECC IS DONE
 6083  033552  001003                          BNE     49$
 6084  033554  052737  020000  003224          BIS     #ECCW,E.MR1
 6085  033562  005237  003262          49$:    INC     BITCNT          ;BUMP BIT COUNT
 6086  033566  005300                          DEC     R0              ;TEST IF LAST BIT THIS WORD IS DONE
 6087  033570  001337                          BNE     44$             ;NO - LOOP
 6088  033572  005301                          DEC     R1              ;TEST IF BOTH WORDS WRITTEN
 6089  033574  001332                          BNE     43$             ;NO - LOOP
 6090  033576  012737  051347  001310          MOV     #EM334,EMW      ;LOAD MESSAGE (POSTAMBLE)
 6091  033604  005037  003262                  CLR     BITCNT          ;CLEAR BIT COUNT
 6092  033610  012700  000017                  MOV     #15.,R0         ;SET GAP COUNT
 6093  033614  013737  003256  003260  51$:    MOV     M1.BIT,M2.BIT   ;SHIFT REST OF BITS
 6094  033622  013737  003254  003256          MOV     PR.BIT, M1.BIT
 6095  033630  013737  003252  003254          MOV     P1.BIT,PR.BIT
 6096  033636  005037  003252                  CLR     P1.BIT          ;CLEAR NEXT BIT
 6097  033642  004737  036302                  JSR     PC,WRTBIT       ;SIMULATE BIT
 6098  033646  104002                          ERROR   2
 6099  033650  005237  003262                  INC     BITCNT          ;BUMP BIT COUNT
 6100  033654  005300                          DEC     R0              ;GAP WRITTEN?
 6101  033656  001356                          BNE     51$             ;NO - LOOP
 6102  033660  012737  000001  003234          MOV     #1,E.ECPT       ;SET EXPECTED PATTERN
 6103  033666  016237  000032  003174          MOV     RKECPT(R2),T.ECPT  ;GET '611 PATTERN
 6104  033674  023737  003174  003234          CMP     T.ECPT, E.ECPT  ;TEST IF EQUAL
 6105  033702  001401                          BEQ     56$             ;YES - SKIP
 6106  033704  104163                          ERROR   163             ;ELSE REPORT
 6107  033706                          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

033706                          $EOP:
033706  000004                            SCOPE
033710  005037  001102                    CLR     $TSTNM          ;;ZERO THE TEST NUMBER
033714  005037  001200                    CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
033720  005237  001222                    INC     $PASS           ;;INCREMENT THE PASS NUMBER
033724  042737  100000  001222            BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
033732  005327                          $EOPCT: DEC     (PC)+           ;;LOOP?
033734  000001                                  .WORD   1
033736  003063                          $ENDCT: BGT     $DOAGN          ;;YES
033740  012737                                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
033742  000001                                  .WORD   1
033744  033734                                  $EOPCT
033746  104401  033754                        TYPE    ,65$            ;;TYPE ASCIZ STRING
033752  000407                                BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <12><15>/END PASS #/
033772                          64$:
033772  013746  001222                        MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                        ;;TYPE PASS NUMBER
033776  104405                              TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
034000  104401  034006                      TYPE    ,67$            ;;TYPE ASCIZ STRING
034004  000421                              BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
034050                          66$:
034050  013746  001112                        MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                        ;;TOTAL NUMBER OF ERRORS
034054  104405                              TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
034056  104401  001211                      TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
034062  005037  001112                      CLR     $ERTTL          ;;CLEAR ERROR TOTAL
034066  013700  000042                  $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
034072  001405                              BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
034074  000005                              RESET                   ;;CLEAR THE WORLD
034076  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
034100  000240                              NOP                     ;;SAVE ROOM
034102  000240                              NOP                     ;;FOR
034104  000240                              NOP                     ;;ACT11
034106                          $DOAGN:
034106  000137                              JMP     @(PC)+          ;;RETURN
034110  004350                          $RTNAD: .WORD   TST1
034112     377     377     000  $ENULL: .BYTE   -1,-1,0          ;;NULL CHARACTER STRING
034116                                  .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.
```

```
                                ;*
                                ;*      R0 IS USED AS A FLAG TO INDICATE IF BAD PARITY WAS
                                ;*      GENERATED. IF R0 IS 0 WHEN THE ROUTINE RETURNS TO CALLER
                                ;*      PARITY WAS MADE BAD IN ALL THE DESIRED WORDS. IF R0 IS ALL
                                ;*      ONES IT WAS NOT SUCCESSFUL.
                                ;*
                                ;*      CALL:   JSR     R2,WRTPAR
                                ;*              POINTER TO AREA TO BE ALTERED
                                ;*              NUMBER OF WORDS
                                ;*      RETURN: RTS     R2
                                ;*              WITH R0 AS SUCCESS FLAG

034116  011200          WRTPAR: MOV     (R2),R0         ;GET BUFFER POINTER
034120  016201  000002          MOV     2(R2),R1        ;GET NUMBER OF WORDS
034124  012703  172100          MOV     #MEMBAS,R3      ;GET BASE OF VECTOR AREA
034130  013704  003274          MOV     MEMPAR,R4       ;STORE FLAGS
034134  012705  000020          MOV     #16.,R5         ;GET NUMBER OF REGISTERS
034140  006004          5$:     ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
034142  103002                  BCC     7$              ;NO, TRY NEXT BANK
034144  012713  000005          MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
034150  062703  000002  7$:     ADD     #2,R3           ;CALCULATE NEXT ADDRESS
034154  005305                  DEC     R5              ;CHECK IF FINISHED
034156  001370                  BNE     5$              ;NO, GET NEXT PARITY MEMORY ADDRESS
034160  012721  177777  8$:     MOV     #-1,(R1)+       ;WRITE BAD PARITY
034164  005300                  DEC     R0              ;LOOP UNTIL ALL LOCATIONS WRITTEN
034166  001374                  BNE     8$
034170  012703  172100          MOV     #MEMBAS,R3      ;LOAD BASE OF CONTROL REGS
034174  013704  003274          MOV     MEMPAR,R4       ;LOAD FLAGS
034200  012705  000020          MOV     #16.,R5         ;GET NUMBER OF REGISTERS
034204  006004          15$:    ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
034206  103002                  BCC     17$
034210  012713  000001          MOV     #PAR.EN,(R3)    ;ALLOW PARITY DETECTION
034214  062703  000002  17$:    ADD     #2,R3           ;CHECK IF FINISHED
034220  005305                  DEC     R5              ;CHECK IF FINISHED
034222  001370                  BNE     15$             ;NO, GET NEXT PARITY MEMORY ADDRESS
034224  012737  034374  000114  MOV     #30$,MEMVEC     ;SET PARITY TRAP VECTOR
034232  011200                  MOV     (R2),R0         ;NUMBER OF WORDS
034234  016201  000002          MOV     2(R2),R1        ;BUFFER POINTER
034240  010004                  MOV     R0,R4           ;STORE NUMBER
034242  005721          10$:    TST     (R1)+           ;TEST FIRST BUFFER WORD - SHOULD GET
034244  000240                  NOP                     ;TRAP WHICH DECREMENTS R4
034246  000240                  NOP
034250  005300          11$:    DEC     R0              ;DEC NUMBER OF WORDS COUNTER
034252  001373                  BNE     10$             ;ALL CHECKED? NO - SKIP
034254  005704                  TST     R4              ;TEST IF ALL LOCATIONS BAD
034256  001444                  BEQ     20$             ;YES - SKIP
034260  011200                  MOV     (R2),R0         ;GET NUMBER OF WORDS
034262  016201  000002          MOV     2(R2),R1        ;BUFFER POINTER
034266  012721  000000  12$:    MOV     #0,(R1)+        ;CLEAR ALL OF AREA THAT WAS MADE BAD
034272  005300                  DEC     R0
034274  001374                  BNE     12$
034276  012700  177777          MOV     #-1,R0          ;SET FLAG THAT COULDN'T SET BAD PARITY
034302  012703  172100  13$:    MOV     #MEMBAS,R3      ;LOAD BASE OF CONTROL REGISTERS
034306  013704  003274          MOV     MEMPAR,R4       ;NOW SET UP TO CLEAR PARITY
034312  012705  000020          MOV     #16.,R5         ;CONTROL REGISTERS AND SET
034316  006004          14$:    ROR     R4              ;ENABLE WHERE APPLICABLE
```

```
6220  034320  103002                        BCC     18$
6221  034322  012713  000001                MOV     #PAR.EN,(R3)
6222  034326  062703  000002        18$:    ADD     #2,R3
6223  034332  005305                        DEC     R5
6224  034334  001370                        BNE     14$
6225  034336  022222                        CMP     (R2)+,(R2)+     ;SET POINTER FOR RETURN
6226  034340  012737  034530  000114        MOV     #MEMERR,MEMVEC  ;RESET TRAP VECTOR
6227  034346  012737  000340  000116        MOV     #PR7,MEMVEC+2
6228  034354  012746  000000                MOV     #PR0,-(SP)      ;RESET PRIOTITY TO 0
6229  034360  012746  034366                MOV     #19$,-(SP)
6230  034364  000002                        RTI
6231
6232  034366  000202        19$:    RTS     R2
6233
6234  034370  005000        20$:    CLR     R0              ;CLEAR FLAG - BAD PARITY SET UP
6235  034372  000743                BR      13$
6236
6237  034374  005304        30$:    DEC     R4              ;DEC THE COUNTER
6238  034376  022626                CMP     (SP)+,(SP)+     ;CLEAN STACK
6239  034400  000723                BR      11$             ;GO CHECK NEXT LOCATION
6240
6241                        .SBTTL  CHECK FOR MEMORY CHECK ENABLE
6242                        ;*      THIS ROUTINE CHECKS ALL AVAILABLE MEMORY FOR PARITY OPTION.
6243                        ;*      IF OPTION IS PRESENT, PARITY DETECT IS ENABLED ON THAT BANK.
6244                        ;*
6245                        ;*      CALL:   JSR     PC,PARCHK
6246                        ;*      RETURN: RTS     PC
6247
6248  034402  012737  034460  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
6249  034410  012737  000340  000006          MOV     #PR7,ERRVEC+2
6250  034416  005037  003274                  CLR     MEMPAR          ;CLEAR FLAG
6251  034422  012703  172100                  MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
6252                                                                  ;  MEMORY CHECK ENABLE AVAILIBLE
6253  034426  012704  000001                  MOV     #1,R4           ;INITIALIZE MASK
6254  034432  012713  000001          16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
6255  034436  005713                  TST     (R3)
6256  034440  050437  003274                  BIS     R4,MEMPAR       ;SET FLAG
6257  034444  062703  000002                  ADD     #2,R3           ;BUMP TO NEXT CSR
6258  034450  000241                          CLC
6259  034452  006104                          ROL     R4              ;CHECK IF FINISHED
6260  034454  001366                          BNE     16$             ;NO, SET UP NEXT MEMORY PARITY MODULE
6261  034456  000406                          BR      22$             ;RESTORE TRAP VECTOR
6262
6263  034460  022626          20$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
6264  034462  062703  000002                  ADD     #2,R3
6265  034466  000241                          CLC
6266  034470  006104                          ROL     R4              ;CHECK IF FINISHED
6267  034472  001357                          BNE     16$             ;NO, GET NEXT LOCATION
6268  034474  012737  000006  000004  22$:    MOV     #ERRVEC+2,ERRVEC  ;RESTORE TRAP CATCHER
6269  034502  005037  000006                  CLR     ERRVEC+2
6270  034506  005737  003274                  TST     MEMPAR          ;CHECK IF MEMORY CHECK ENABLE AVAILIABLE
6271  034512  001005                          BNE     25$             ;YES, RETURN
6272  034514  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC ;RESTORE TRAP CATCHER
6273  034522  005037  000116                  CLR     MEMVEC+2
6274  034526  000207          25$:    RTS     PC              ;RETURN
6275                        .SBTTL  MEMORY CHECK ENABLE TRAP
```

```
                                        ;*      THIS ROUTINE HANDLES ANY PARITY TRAP. THE LOCATION WHERE
                                        ;*      PARITY WAS BAD IS REPORTED.
                                        ;
034530  012737  034544  001202  MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
034536  011637  003244                  MOV     (SP),TRAPPC     ;STORE PC
034542  104001                          ERROR   1               ;REPORT MEM PARITY ERROR
034544  005037  001202          10$:    CLR     $ESCAPE         ;CLEAR ESCAPE
034550  032777  001000  144362          BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
034556  001001                          BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
034560  000002                          RTI                     ;NO, RETURN
                                        ;
034562  012706  001100          15$:    MOV     #STACK,SP       ;INITIALIZE STACK
034566  000177  144316                  JMP     @$LPERR         ;LOOP ON ERROR
                                        ;
                                .SBTTL  CONTROLLED HALT ROUTINE
                                        ;*      THIS ROUTINE IS ENTERED WHEN A ↑C IS ENTERED IN THE KEYBOARD.
                                        ;*      IF NO MONITOR IS PRESENT THE PROGRAM HALTS ELSE THE PROGRAM
                                        ;*      IS FORCED TO LAST PASS AND JUMPS TO END OF PASS.
                                        ;
034572  013702  001270          CTRHLT: MOV     $BASE,R2        ;SET '611 BASE
034576  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
034604  104401  043633                  TYPE    ,OPROOS         ;TYPE HALT MESSAGE
034610  012706  001100                  MOV     #STACK,SP       ;CLEAR STACK
034614  005037  001202                  CLR     $ESCAPE         ;CLEAR ESCAPE
034620  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
034624  005737  000042                  TST     42              ;TEST IF STAND ALONE
034630  001404                          BEQ     1$              ;YES - SKIP
034632  005037  033734                  CLR     $EOPCT          ;ZERO PASS COUNT
034636  000137  033706                  JMP     $EOP            ;GO TO END OF PASS
                                        ;
034642  000000          1$:     HALT                            ;HALT PROGRAM
034644  000137  003340                  JMP     START1          ;GO TO RESTART IF CONTINUE
                                        ;
                                .SBTTL  SCOPE HANDLER ROUTINE
                                        ;
                                        ;;**********************************************************************
                                        ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                        ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                        ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                        ;*SW14=1        LOOP ON TEST
                                        ;*SW11=1        INHIBIT ITERATIONS
                                        ;*SW09=1        LOOP ON ERROR
                                        ;*SW08=1        LOOP ON TEST IN SWR<7:0>
                                        ;*CALL
                                        ;*      SCOPE           ;;SCOPE=IOT
                                        ;
034650                          $SCOPE:
034650  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
034652  032777  040000  144260  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
034660  001131                          BNE     $OVER           ;;YES IF SW14=1
                                        ;#####START OF CODE FOR THE XOR TESTER#####
034662  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
034664  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
034670  012737  034710  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
```

```
6332  034676  005737  177060              TST     @#177060        ;;TIME OUT ON XOR?
6333  034702  012637  000004              MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6334  034706  000500                      BR      $SVLAD          ;;GO TO THE NEXT TEST
6335  034710  022626                5$:   CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
6336  034712  012637  000004              MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6337  034716  000440                      BR      7$              ;;LOOP ON THE PRESENT TEST
6338  034720                        6$:;*****END OF CODE FOR THE XOR TESTER*****
6339  034720  032777  000400  144212      BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
6340  034726  001421                      BEQ     2$              ;;BR IF NO
6341  034730  005046                      CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
6342  034732  117716  144202              MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
6343  034736  001414                      BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
6344  034740  022716  000051              CMP     #51,(SP)        ;;CHECK THE NUMBER IN THE SWR
6345  034744  002411                      BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
6346  034746  011637  001102              MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
6347  034752  005316                      DEC     (SP)            ;;BACKUP BY ONE
6348  034754  006316                      ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
6349  034756  062716  035162              ADD     #$SWO8TBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
6350  034762  013637  001106              MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
6351  034766  000466                      BR      $OVER           ;;GO LOOP ON THE TEST
6352  034770  005726                8$:   TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
6353  034772  105737  001103        2$:   TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
6354  034776  001421                      BEQ     3$              ;;BR IF NO
6355  035000  123737  001115  001103      CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
6356  035006  101015                      BHI     3$              ;;BR IF NO
6357  035010  032777  001000  144122      BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
6358  035016  001404                      BEQ     4$              ;;BR IF NO
6359  035020  013737  001110  001106  7$:  MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
6360  035026  000446                      BR      $OVER
6361  035030  105037  001103        4$:   CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
6362  035034  005037  001200              CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
6363  035040  000415                      BR      1$              ;;ESCAPE TO THE NEXT TEST
6364  035042  032777  004000  144070  3$:  BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
6365  035050  001011                      BNE     1$              ;;BR IF YES
6366  035052  005737  001222              TST     $PASS           ;;IF FIRST PASS OF PROGRAM
6367  035056  001406                      BEQ     1$              ;;      INHIBIT ITERATIONS
6368  035060  005237  001104              INC     $ICNT           ;;INCREMENT ITERATION COUNT
6369  035064  023737  001200  001104      CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
6370  035072  002024                      BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
6371  035074  012737  000001  001104  1$:  MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
6372  035102  013737  035160  001200      MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
6373  035110  105237  001102        $SVLAD: INCB  $TSTNM          ;;COUNT TEST NUMBERS
6374  035114  113737  001102  001220      MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
6375  035122  011637  001106              MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
6376  035126  011637  001110              MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
6377  035132  005037  001202              CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
6378  035136  112737  000001  001115      MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
6379  035144  013777  001102  143770  $OVER: MOV    $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
6380  035152  013716  001106              MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
6381  035156  000002                      RTI                     ;;FIXES PS
6382  035160  003720                $MXCNT: 2000.                 ;;MAX. NUMBER OF ITERATIONS
6383  035162                        $SWO8TBL:
6384  035162  004352                      .WORD   TST1+2          ;;STARTING ADDRESS OF TEST 1
6385  035164  004604                      .WORD   TST2+2          ;;STARTING ADDRESS OF TEST 2
6386  035166  005036                      .WORD   TST3+2          ;;STARTING ADDRESS OF TEST 3
6387  035170  005270                      .WORD   TST4+2          ;;STARTING ADDRESS OF TEST 4
```

```
 6388  035172  005520                        .WORD   TST5+2          ;;STARTING ADDRESS OF TEST 5
 6389  035174  005750                        .WORD   TST6+2          ;;STARTING ADDRESS OF TEST 6
 6390  035176  006200                        .WORD   TST7+2          ;;STARTING ADDRESS OF TEST 7
 6391  035200  006464                        .WORD   TST10+2         ;;STARTING ADDRESS OF TEST 10
 6392  035202  006734                        .WORD   TST11+2         ;;STARTING ADDRESS OF TEST 11
 6393  035204  007204                        .WORD   TST12+2         ;;STARTING ADDRESS OF TEST 12
 6394  035206  007460                        .WORD   TST13+2         ;;STARTING ADDRESS OF TEST 13
 6395  035210  010130                        .WORD   TST14+2         ;;STARTING ADDRESS OF TEST 14
 6396  035212  010554                        .WORD   TST15+2         ;;STARTING ADDRESS OF TEST 15
 6397  035214  011114                        .WORD   TST16+2         ;;STARTING ADDRESS OF TEST 16
 6398  035216  011506                        .WORD   TST17+2         ;;STARTING ADDRESS OF TEST 17
 6399  035220  012102                        .WORD   TST20+2         ;;STARTING ADDRESS OF TEST 20
 6400  035222  012476                        .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
 6401  035224  013072                        .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
 6402  035226  013466                        .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
 6403  035230  014254                        .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
 6404  035232  014744                        .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
 6405  035234  015340                        .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
 6406  035236  016012                        .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
 6407  035240  016464                        .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
 6408  035242  017136                        .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
 6409  035244  017610                        .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
 6410  035246  020376                        .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
 6411  035250  021164                        .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
 6412  035252  021752                        .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
 6413  035254  022442                        .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
 6414  035256  023132                        .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
 6415  035260  023622                        .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
 6416  035262  024312                        .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
 6417  035264  025026                        .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
 6418  035266  025552                        .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
 6419  035270  026276                        .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
 6420  035272  027534                        .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
 6421  035274  031004                        .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
 6422  035276  031570                        .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
 6423  035300  032442                        .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
 6424  035302  032472                        .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
 6425                          ;;*****************************************************************
 6426                          .SBTTL  LOOP ON INTERNAL ERROR
 6427
 6428  035304  032777  001000  143626  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6429  035312  001405                        BEQ     5$              ;NO RETURN
 6430  035314  105737  001103                TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
 6431  035320  001402                        BEQ     5$              ;NO, RETURN
 6432  035322  013716  001110                MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
 6433  035326  000002                5$:     RTI                     ;RETURN
 6434
 6435                          ;;*****************************************************************
 6436                          .SBTTL  TYPE ERROR ROUTINE
 6437                          ;*ENTRY JSR PC,TYPERR
 6438                          ;*RETURN RTS PC
 6439                          ;*
 6440                          ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
 6441                          ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
 6442                          ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
 6443                          ;*THE ERROR.
```

```
6444                                    ;;*****************************************************************
6445  035330  104413                    TYPERR: SAVREG
6446  035332  113737  001102  001220            MOVB    $TSTNM,$TESTN   ;GET TEST NUMBER
6447  035340  042737  177400  001220            BIC     #177400,$TESTN  ;CLEAR UNUSED BITS
6448  035346  113700  001114                    MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
6449  035352  042700  177400                    BIC     #177400,R0      ;CLEAR UNUSED BITS
6450  035356  005300                            DEC     R0              ;FORM INDEX FOR ERROR TABLE
6451  035360  006300                            ASL     R0
6452  035362  006300                            ASL     R0
6453  035364  006300                            ASL     R0
6454  035366  062700  001300          1$:       ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
6455  035372  012037  035406                    MOV     (R0)+,2$        ;GET EM POINTER
6456  035376  001404                            BEQ     3$              ;BRANCH IF THERE ISN'T ONE
6457  035400  104401  001211                    TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
6458  035404  104401                            TYPE                    ;TYPE ERROR MESSAGE (EM)
6459  035406  000000          2$:       .WORD   0                       ;EM POINTER GOES HERE
6460  035410  012037  035424          3$:       MOV     (R0)+,4$        ;GET DH POINTER
6461  035414  001404                            BEQ     5$              ;BRANCH IF THERE ISN'T ONE
6462  035416  104401  001211                    TYPE    ,$CRLF          ;TYPE CR-LF
6463  035422  104401                            TYPE                    ;TYPE DATA HEADER
6464  035424  000000          4$:       .WORD   0                       ;DH POINTER GOES HERE
6465  035426  012001          5$:       MOV     (R0)+,R1        ;GET DT POINTER
6466  035430  001445                            BEQ     20$             ;BRANCH IF THERE ARE NONE
6467  035432  005004                            CLR     R4              ;RESET INDENT SWITCH
6468  035434  012000                            MOV     (R0)+,R0        ;GET DF POINTER
6469  035436  012002                            MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
6470  035440  104401  001211                    TYPE    ,$CRLF
6471  035444  112003          10$:      MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
6472  035446  105720                            TSTB    (R0)+           ;BUMP PAST FORMAT WORD
6473  035450  005703                            TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
6474  035452  001416                            BEQ     14$             ;NO - SKIP DATA PRINT
6475  035454  005704                            TST     R4              ;CHECK IF INDENT WORDS
6476  035456  001004                            BNE     12$             ;YES, GO INDENT
6477  035460  013146          11$:      MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
6478  035462  104402                            TYPOC                   ;TYPE IT
6479  035464  005303                            DEC     R3              ;MORE DATA WORDS
6480  035466  001403                            BEQ     13$             ;NO-BRANCH
6481  035470  104401  043753          12$:      TYPE    ,SPACE2         ;TYPE SEPARATORS
6482  035474  000771                            BR      11$             ;LOOP
6483  035476  104401  001211          13$:      TYPE    ,$CRLF          ;TYPE <CR><LF>
6484  035502  005710                            TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
6485  035504  001401                            BEQ     14$             ;NO, DO NOT CHANGE INDENT
6486  035506  005104                            COM     R4              ;CHANGE INDENT
6487  035510  005302          14$:      DEC     R2              ;MORE DH'S?
6488  035512  003414                            BLE     20$             ;NO-BRANCH
6489  035514  012037  035534          15$:      MOV     (R0)+,18$       ;GET NEXT DH POINTER
6490  035520  001751                            BEQ     10$             ;IF NO HEADER GET DATA
6491  035522  005704                            TST     R4              ;INDENT?
6492  035524  001402                            BEQ     17$             ;NO-BRANCH
6493  035526  104401  043753                    TYPE    ,SPACE2         ;INDENT
6494  035532  104401          17$:      TYPE                    ;TYPE DH
6495  035534  000000          18$:      .WORD   0               ;DH POINTER GOES HERE
6496  035536  104401  001211                    TYPE    ,$CRLF
6497  035542  000740                            BR      10$             ;LOOP
6498  035544  104414          20$:      RESREG
6499  035546  005237  003250                    INC     ERRCNT          ;INCREMENT ERROR COUNT
```

```
 6500  035552  032777  010000  143360          BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
 6501  035560  001421                          BEQ     25$             ;NO, RETURN
 6502  035562  022737  000024  003250          CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
 6503  035570  103015                          BHIS    25$             ;NO, RETURN
 6504  035572  104401  043756                  TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
 6505                                                                  ;  ERROR THRESHOLD EXCEEDED"
 6506  035576  005737  000042                  TST     42              ;CHECK IF IN CHAIN MODE
 6507  035602  001407                          BEQ     30$             ;NO, HALT
 6508  035604  012737  000001  033734          MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
 6509  035612  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK
 6510  035616  000137  033706                  JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
 6511  035622  000000                  30$:    HALT
 6512  035624  000207                  25$:    RTS     PC
 6513
 6514                                  .SBTTL  GENERATE HEADERS FOR SECTOR, TRACK, AND CYLINDER INCREMENTS
 6515
 6516  035626  013737  003300  003302  INCHDR: MOV     CYLN,HEADER     ;LOAD HEADER WORD 1
 6517  035634  005037  003304                  CLR     HEADER+2        ;CALCULATE HEADER WORD 2
 6518  035640  113737  003277  003305          MOVB    TRACK,HEADER+3
 6519  035646  006237  003304                  ASR     HEADER+2
 6520  035652  006237  003304                  ASR     HEADER+2
 6521  035656  006237  003304                  ASR     HEADER+2
 6522  035662  153737  003276  003304          BISB    SECTOR,HEADER+2
 6523  035670  052737  140000  003304          BIS     #140000,HEADER+2
 6524  035676  013746  003302                  MOV     HEADER,-(SP)    ;GENERATE XOR
 6525  035702  013737  003304  003306          MOV     HEADER+2,HEADER+4
 6526  035710  043737  003302  003306          BIC     HEADER,HEADER+4
 6527  035716  043716  003304                  BIC     HEADER+2,(SP)
 6528  035722  052637  003306                  BIS     (SP)+,HEADER+4
 6529  035726  013737  003300  003220          MOV     CYLN,E.DCYL     ;INCREMENT DISK ADDRESS
 6530  035734  013737  003276  003206          MOV     SECTOR,E.DA
 6531  035742  105237  003206                  INCB    E.DA
 6532  035746  122737  000026  003206          CMPB    #26,E.DA
 6533  035754  001014                          BNE     10$
 6534  035756  105037  003206                  CLRB    E.DA
 6535  035762  105237  003207                  INCB    E.DA+1
 6536  035766  122737  000003  003207          CMPB    #3,E.DA+1
 6537  035774  001004                          BNE     10$
 6538  035776  005037  003206                  CLR     E.DA
 6539  036002  005237  003220                  INC     E.DCYL
 6540  036006  000207                  10$:    RTS     PC              ;RETURN
 6541
 6542                                  .SBTTL  CALCULATE EXPECTED HEADER
 6543
 6544  036010  005003                  CALHDR: CLR     R3              ;CLEAR EXPECTED FIRST WORD
 6545  036012  013701  003220                  MOV     E.DCYL,R1       ;STORE CYLINDER
 6546  036016  001406                          BEQ     5$              ;CHECK IF ZERO
 6547  036020  012700  000020                  MOV     #16.,R0         ;LOAD SHIFT COUNT
 6548  036024  006101                  1$:     ROL     R1              ;CALCULATE FIRST WORD
 6549  036026  006003                          ROR     R3
 6550  036030  005300                          DEC     R0
 6551  036032  001374                          BNE     1$
 6552  036034  010337  003226          5$:     MOV     R3,E.MR2        ;LOAD FIRST WORD
 6553  036040  013746  003206                  MOV     E.DA,-(SP)      ;GET TRACK AND SECTOR
 6554  036044  001410                          BEQ     7$              ;CHECK IF TRACK = 0 AND SECTOR = 0
 6555  036046  042716  000377                  BIC     #377,(SP)       ;CLEAR SECTOR BITS
```

```
6556  036052  001403                          BEQ     6$              ;CHECK TRACK = 0
6557  036054  006216                          ASR     (SP)            ;SHIFT HEAD 3 BITS RIGHT
6558  036056  006216                          ASR     (SP)
6559  036060  006216                          ASR     (SP)
6560  036062  153716  003206          6$:     BISB    E.DA,(SP)       ;OR IN SECTOR BITS
6561  036066  012601                  7$:     MOV     (SP)+,R1
6562  036070  032737  010000  003200          BIT     #CFMT,E.CS1     ;CHECK FORMAT = 24 SECTOR
6563  036076  001402                          BEQ     8$              ;NO, CALCULATE SECOND WORD
6564  036100  052701  001000                  BIS     #BIT9,R1        ;SET FORMAT BIT
6565  036104  005003                  8$:     CLR     R3              ;CLEAR EXPECTED SECOND WORD
6566  036106  005701                          TST     R1              ;CHECK IF WORD = 0
6567  036110  001406                          BEQ     15$             ;YES, RETURN
6568  036112  012700  000020                  MOV     #16.,R0         ;LOAD SHIFT COUNT
6569  036116  006101                  10$:    ROL     R1
6570  036120  006003                          ROR     R3
6571  036122  005300                          DEC     R0
6572  036124  001374                          BNE     10$
6573  036126  010337  003230          15$:    MOV     R3,E.MR3        ;LOAD SECOND WORD
6574  036132  000207                          RTS     PC              ;RETURN
6575
6576                                  ;;*****************************************************************
6577                                  .SBTTL  GENERATE ECC WORD
6578
6579  036134  005737  003252          ECCGEN: TST     P1.BIT          ;CHECK IF 1
6580  036140  001410                          BEQ     3$              ;NO, CHECK IF BIT 31 = 1
6581  036142  032737  000001  003266          BIT     #1,ECCHI        ;NO, CHECK IF BIT 31 = 1
6582  036150  001410                          BEQ     5$              ;NO, SET ECC XORED BIT
6583  036152  005037  003272          1$:     CLR     ECCXOR          ;CLEAR ECC XORED BIT
6584  036156  000241                          CLC                     ;CLEAR CARRY FLOP
6585  036160  000410                          BR      7$              ;SHIFT IN ECC BIT
6586
6587  036162  032737  000001  003266  3$:     BIT     #1,ECCHI        ;CHECK IF BIT 31 = 1
6588  036170  001770                          BEQ     1$              ;NO, CLEAR ECC XORED BIT
6589  036172  012737  000001  003272  5$:     MOV     #1,ECCXOR       ;SET ECC XOR
6590  036200  000261                          SEC                     ;SET CARRY FLOP
6591  036202  006037  003270          7$:     ROR     ECCLO
6592  036206  006037  003266                  ROR     ECCHI
6593  036212  005737  003272                  TST     ECCXOR          ;CHECK IF XOR NEEDED
6594  036216  001422                          BEQ     10$             ;NO, RETURN
6595  036220  012746  020020                  MOV     #BIT13!BIT4,-(SP) ;DO XOR OF ECC BITS
6596  036224  043716  003270                  BIC     ECCLO,(SP)      ;  0, 2, 11, 21, 23
6597  036230  042737  020020  003270          BIC     #BIT13!BIT4,ECCLO
6598  036236  052637  003270                  BIS     (SP)+,ECCLO
6599  036242  012746  002400                  MOV     #BIT10!BIT8,-(SP)
6600  036246  043716  003266                  BIC     ECCHI,(SP)
6601  036252  042737  002400  003266          BIC     #BIT10!BIT8,ECCHI
6602  036260  052637  003266                  BIS     (SP)+,ECCHI
6603  036264  013737  003266  003234  10$:    MOV     ECCHI,E.ECPT    ;STORE ECC PATTERN
6604  036272  042737  174000  003234          BIC     #174000,E.ECPT  ;MASK UNSEEN BITS
6605  036300  000207                          RTS     PC              ;RETURN
6606                                  ;;*****************************************************************
6607                                  .SBTTL  SIMULATE ONE BIT WRITE IN MAINTENCE MODE
6608
6609  036302  052737  042040  003224  WRTBIT: BIS     #DMD!MEWD!WRTGAT,E.MR1 ;INITIALIZE
6610  036310  042737  114000  003224          BIC     #RDGATE!PCA!PCD,E.MR1  ;  EXPECTED MR1
6611  036316  005737  003254                  TST     PR.BIT          ;CHECK IF ONE
```

```
6612  036322  001122                        BNE     20$             ;YES, SIMULATE A ONE
6613  036324  005737  003256                TST     M1.BIT          ;CHECK IF PREVIOUS ONE
6614  036330  001023                        BNE     10$             ;YES, NO TRANSITION
6615  036332  042737  002000  003224        BIC     #MEWD,E.MR1     ;INDICATE TRANSITION
6616  036340  005737  003252                TST     P1.BIT          ;CHECK IF NEXT BIT = 1
6617  036344  001007                        BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
6618  036346  005737  003260                TST     M2.BIT          ;CHECK FOR PRECOMP. DELAY
6619  036352  001412                        BEQ     10$             ;NO, CLOCK IN ZERO
6620  036354  052737  010000  003224        BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
6621  036362  000406                        BR      10$             ;CLOCK IN ZERO
6622
6623  036364  005737  003260          5$:   TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
6624  036370  001003                        BNE     10$             ;CLOCK IN
6625  036372  052737  004000  003224        BIS     #PCA,E.MR1      ;SET PRECOMPENSATION
6626  036400  012762  000440  000026  10$:  MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
6627  036406  012762  000040  000026        MOV     #DMD,RKMR1(R2)
6628  036414  016237  000026  003164        MOV     RKMR1(R2),T.MR1 ;STORE MR1
6629  036422  023737  003164  003224        CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6630  036430  001416                        BEQ     15$             ;YES, CLOCK IN REST OF BIT
6631  036432  012737  036452  001202        MOV     #13$,$ESCAPE    ;LOAD ESCAPE
6632  036440  012737  052775  001312        MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6633  036446  011646                        MOV     (SP),-(SP)      ;STORE RETURN
6634  036450  000207                        RTS     PC              ;REPORT ERROR
6635  036452  032777  001000  142460  13$:  BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6636  036460  001402                        BEQ     15$             ;NO, CONTINUE
6637  036462  000137  037014                JMP     63$             ;GO LOOP ON ERROR
6638
6639  036466  052737  002000  003224  15$:  BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
6640  036474  012762  000440  000026        MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
6641  036502  012762  000040  000026        MOV     #DMD,RKMR1(R2)
6642  036510  016237  000026  003164        MOV     RKMR1(R2),T.MR1 ;STORE MR1
6643  036516  023737  003164  003224        CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6644  036524  001414                        BEQ     18$             ;YES, RETURN
6645  036526  012737  036546  001202        MOV     #17$,$ESCAPE    ;LOAD ESCAPE
6646  036534  012737  053065  001312        MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
6647  036542  011646                        MOV     (SP),-(SP)      ;SAVE RETURN
6648  036544  000207                        RTS     PC              ;REPORT ERROR
6649
6650  036546  032777  001000  142364  17$:  BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6651  036554  001117                        BNE     63$
6652  036556  005037  001202          18$:  CLR     $ESCAPE         ;CLEAR ESCAPE
6653  036562  062716  000002                ADD     #2,(SP)         ;ADJUST ESCAPE
6654  036566  000207                        RTS     PC              ;RETURN
6655
6656
6657  036570  005737  003252          20$:  TST     P1.BIT          ;CHECK IF NEXT BIT A ONE
6658  036574  001007                        BNE     30$             ;YES, CHECK FOR PRECOMP. DELAY
6659  036576  005737  003256                TST     M1.BIT          ;CHECK FOR PRECOMP. ADVANCE
6660  036602  001412                        BEQ     40$             ;NO, CHECK MR1
6661  036604  052737  004000  003224        BIS     #PCA,E.MR1      ;SET PRECOMP ADVANCE
6662  036612  000406                        BR      40$             ;CHECK MR1
6663
6664  036614  005737  003256          30$:  TST     M1.BIT          ;CHECK FOR PRECOMP. DELAY
6665  036620  001003                        BNE     40$             ;NO, CHECK MR1
6666  036622  052737  010000  003224        BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
6667  036630  012762  000440  000026  40$:  MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN DATA BIT
```

```
6668  036636  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6669  036644  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6670  036652  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6671  036660  001414                          BEQ     45$             ;YES, CLOCK IN REST OF BIT
6672  036662  012737  036702  001202          MOV     #42$,$ESCAPE    ;LOAD ESCAPE
6673  036670  012737  052775  001312          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6674  036676  011646                          MOV     (SP),-(SP)      ;STORE RETURN
6675  036700  000207                          RTS     PC              ;REPORT ERROR
6676
6677  036702  032777  001000  142230  42$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6678  036710  001041                          BNE     63$             ;YES, LOOP ERROR
6679  036712  042737  002000  003224  45$:    BIC     #MEWD,E.MR1     ;INDICATE A TRANSITION
6680  036720  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK TRANSITION
6681  036726  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6682  036734  016237  000026  003164          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6683  036742  023737  003164  003224          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6684  036750  001414                          BEQ     50$             ;YES, RETURN
6685  036752  012737  036772  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE
6686  036760  012737  053065  001312          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
6687  036766  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6688  036770  000207                          RTS     PC              ;REPORT ERROR
6689
6690  036772  032777  001000  142140  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6691  037000  001005                          BNE     63$             ;YES, REPORT ERROR
6692  037002  005037  001202          50$:    CLR     $ESCAPE         ;LOAD ESCAPE
6693  037006  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
6694  037012  000207                          RTS     PC              ;RETURN
6695
6696  037014  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
6697  037020  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
6698  037024  000177  142060                  JMP     @$LPERR         ;JUMP TO LOOP ADDRESS
6699
6700                                  ;;*****************************************************************
6701                                  .SBTTL  SIMULATE ONE BIT OF READ DATA IN MAINTENENCE MODE
6702
6703  037030  105737  003254          RDBIT:  TSTB    PR.BIT          ;CHECK IF ONE
6704  037034  001024                          BNE     10$             ;YES, SIMULATE ONE
6705  037036  105737  003256                  TSTB    M1.BIT          ;CHECK IF PREVIOUS ONE
6706  037042  001404                          BEQ     4$              ;INSERT TRANSITION
6707  037044  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;DO NOT INSERT TRANSITION
6708  037052  000403                          BR      5$              ;CLOCK IN ZERO
6709
6710  037054  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2) ;INSERT TRANSITION
6711  037062  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
6712  037070  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
6713  037076  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6714  037104  000207                          RTS     PC              ;RETURN
6715
6716  037106  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK IN ONE
6717  037114  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6718  037122  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
6719  037130  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6720  037136  000207                          RTS     PC              ;RETURN
6721                                  .SBTTL  APT COMMUNICATIONS ROUTINE
6722
6723                                  ;;*****************************************************************
```

```
6724  037140  112737  000001  037404  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
6725  037146  112737  000001  037402  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
6726  037154  000403                  BR      $ATYC
6727  037156  112737  000001  037404  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
6728  037164                          $ATYC:
6729  037164  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
6730  037166  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
6731  037170  105737  037402                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
6732  037174  001450                          BEQ     5$              ;;IF NOT:  BR
6733  037176  122737  000001  001234          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
6734  037204  001031                          BNE     3$              ;;IF NOT:  BR
6735  037206  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
6736  037214  001425                          BEQ     3$              ;;IF NOT:  BR
6737  037216  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
6738  037222  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
6739  037230  005737  001214          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
6740  037234  001375                          BNE     1$              ;;IF NOT:  WAIT
6741  037236  010037  001230                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
6742  037242  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
6743  037244  001376                          BNE     2$
6744  037246  163700  001230                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
6745  037252  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
6746  037254  010037  001232                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
6747  037260  012737  000004  001214          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
6748  037266  000413                          BR      5$
6749  037270  017637  000004  037314  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
6750  037276  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
6751  037304  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
6752  037310  004737  037606                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
6753  037314  000000                  4$:     .WORD   0
6754  037316                          5$:
6755  037316  105737  037404          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
6756  037322  001416                          BEQ     12$             ;;IF NOT:  BR
6757  037324  005737  001234                  TST     $ENV            ;;RUNNING UNDER APT?
6758  037330  001413                          BEQ     12$             ;;IF NOT:  BR
6759  037332  005737  001214          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
6760  037336  001375                          BNE     11$             ;;IF NOT:  WAIT
6761  037340  017637  000004  001216          MOV     @4(SP),$FATAL   ;;GET ERROR #
6762  037346  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
6763  037354  005237  001214                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
6764  037360  105037  037404          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
6765  037364  105037  037403                  CLRB    $LFLG           ;;CLEAR LOG FLAG
6766  037370  105037  037402                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
6767  037374  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
6768  037376  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
6769  037400  000207                          RTS     PC              ;;RETURN
6770  037402     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
6771  037403     000          $LFLG:  .BYTE   0               ;;LOG FLAG
6772  037404     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
6773          037406                  .EVEN
6774          000200          APTSIZE=200
6775          000001          APTENV=001
6776          000100          APTSPOOL=100
6777          000040          APTCSUP=040
6778                          .SBTTL  ERROR HANDLER ROUTINE
6779
```

```
 6780                                   ;;**********************************************************************
 6781                                   ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 6782                                   ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 6783                                   ;*AND GO TO TYPERR ON ERROR
 6784                                   ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 6785                                   ;*SW15=1        HALT ON ERROR
 6786                                   ;*SW13=1        INHIBIT ERROR TYPEOUTS
 6787                                   ;*SW10=1        BELL ON ERROR
 6788                                   ;*SW09=1        LOOP ON ERROR
 6789                                   ;*CALL
 6790                                   ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 6791
 6792  037406                           $ERROR:
 6793  037406  104407                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 6794  037410  105237  001103           7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 6795  037414  001775                          BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 6796  037416  013777  001102  141516          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
 6797  037424  032777  002000  141506          BIT     #BIT10,@SWR     ;;BELL ON ERROR?
 6798  037432  001402                          BEQ     1$              ;;NO - SKIP
 6799  037434  104401  001204                  TYPE    ,$BELL          ;;RING BELL
 6800  037440  005237  001112           1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
 6801  037444  011637  001116                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
 6802  037450  162737  000002  001116          SUB     #2,$ERRPC
 6803  037456  117737  141434  001114          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
 6804  037464  032777  020000  141446          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
 6805  037472  001004                          BNE     20$             ;;SKIP TYPEOUTS
 6806  037474  004737  035330                  JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
 6807  037500  104401  001211                  TYPE    ,$CRLF
 6808  037504                           20$:
 6809  037504  122737  000001  001234          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 6810  037512  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
 6811  037514  113737  001114  037526          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
 6812  037522  004737  037156                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
 6813  037526     000                  21$:    .BYTE   0
 6814  037527     000                          .BYTE   0
 6815  037530  000777                  22$:    BR      22$             ;;APT ERROR LOOP
 6816  037532  005777  141402           2$:     TST     @SWR            ;;HALT ON ERROR
 6817  037536  100002                          BPL     3$              ;;SKIP IF CONTINUE
 6818  037540  000000                          HALT                    ;;HALT ON ERROR!
 6819  037542  104407                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 6820  037544  032777  001000  141366   3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
 6821  037552  001402                          BEQ     4$              ;;BR IF NO
 6822  037554  013716  001110                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
 6823  037560  005737  001202           4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
 6824  037564  001402                          BEQ     5$              ;;BR IF NONE
 6825  037566  013716  001202                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
 6826  037572                           5$:
 6827  037572  022737  034076  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
 6828  037600  001001                          BNE     6$              ;;BRANCH IF NO
 6829  037602  000000                          HALT                    ;;YES
 6830  037604                           6$:
 6831  037604  000002                          RTI                     ;;RETURN
 6832
 6833                                   .SBTTL  TYPE ROUTINE
 6834
 6835                                   ;;**********************************************************************
```

```
                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                ;*
                                ;*CALL:
                                ;*1) USING A TRAP INSTRUCTION
                                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                ;*OR
                                ;*      TYPE
                                ;*      MESADR
                                ;*
                                $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
037606  105737  001157                  BPL     1$              ;;BR IF YES
037612  100002                          HALT                    ;;HALT HERE IF NO TERMINAL
037614  000000                          BR      3$              ;;LEAVE
037616  000430                  1$:     MOV     R0,-(SP)        ;;SAVE R0
037620  010046                          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
037622  017600  000002                  CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
037626  122737  000001  001234          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
037634  001011                          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
037636  132737  000100  001235          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
037644  001405                          MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
037646  010037  037656                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
037652  004737  037146          61$:    .WORD   0               ;;MESSAGE ADDRESS
037656  000000          62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
037660  132737  000040  001235          BNE     60$             ;;YES,SKIP TYPE OUT
037666  001003                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
037670  112046                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
037672  001005                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
037674  005726                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
037676  012600                  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
037700  062716  000002                  RTI                     ;;RETURN
037704  000002                  4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
037706  122716  000011                  BEQ     8$
037712  001430                          CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
037714  122716  000200                  BNE     5$
037720  001006                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
037722  005726                          TYPE                    ;;TYPE A CR AND LF
037724  104401                          $CRLF
037726  001211                          CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
037730  105037  040064                  BR      2$              ;;GET NEXT CHARACTER
037734  000755                  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
037736  004737  040020          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
037742  123726  001156                  BNE     2$              ;;IF NO GO GET NEXT CHAR.
037746  001350                          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
037750  013746  001154                                          ;;AND THE NULL CHAR.
                                7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
037754  105366  000001                  BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
037760  002770                          JSR     PC,$TYPEC       ;;GO TYPE A NULL
037762  004737  040020                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
037766  105337  040064                  BR      7$              ;;LOOP
037772  000770

                                ;HORIZONTAL TAB PROCESSOR
```

```
6892
6893  037774  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
6894  040000  004737  040020          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
6895  040004  132737  000007  040064          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
6896  040012  001372                          BNE     9$              ;;TAB STOP
6897  040014  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
6898  040016  000724                          BR      2$              ;;GET NEXT CHARACTER
6899  040020  105777  141124        $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
6900  040024  100375                          BPL     $TYPEC
6901  040026  116677  000002  141116        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
6902  040034  122766  000015  000002        CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
6903  040042  001003                          BNE     1$              ;;BRANCH IF NO
6904  040044  105037  040064                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
6905  040050  000406                          BR      $TYPEX          ;;EXIT
6906  040052  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
6907  040060  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
6908  040062  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
6909  040064  000000        $CHARCNT:.WORD   0               ;;CHARACTER COUNT STORAGE
6910  040066  000207        $TYPEX: RTS     PC
6911
6912                          .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
6913
6914                          ;;**************************************************************
6915                          ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
6916                          ;*OCTAL (ASCII) NUMBER AND TYPE IT.
6917                          ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
6918                          ;*CALL:
6919                          ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6920                          ;*      TYPOS                   ;;CALL FOR TYPEOUT
6921                          ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
6922                          ;*      .BYTE   M               ;;M=1 OR 0
6923                          ;*                                      ;;1=TYPE LEADING ZEROS
6924                          ;*                                      ;;0=SUPPRESS LEADING ZEROS
6925                          ;*
6926                          ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
6927                          ;*$TYPOS OR $TYPOC
6928                          ;*CALL:
6929                          ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6930                          ;*      TYPON                   ;;CALL FOR TYPEOUT
6931                          ;*
6932                          ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
6933                          ;*CALL:
6934                          ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
6935                          ;*      TYPOC                   ;;CALL FOR TYPEOUT
6936
6937  040070  017646  000000        $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
6938  040074  116637  000001  040313        MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
6939  040102  112637  040315                MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
6940  040106  062716  000002                ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
6941  040112  000406                        BR      $TYPON
6942  040114  112737  000001  040313  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
6943  040122  112737  000006  040315        MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
6944  040130  112737  000005  040312  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
6945  040136  010346                        MOV     R3,-(SP)        ;;SAVE R3
6946  040140  010446                        MOV     R4,-(SP)        ;;SAVE R4
6947  040142  010546                        MOV     R5,-(SP)        ;;SAVE R5
```

```
6948  040144  113704  040315          MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
6949  040150  005404                  NEG     R4
6950  040152  062704  000006          ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
6951  040156  110437  040314          MOVB    R4,$OMODE       ;;SAVE IT FOR USE
6952  040162  113704  040313          MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
6953  040166  016605  000012          MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
6954  040172  005003                  CLR     R3              ;;CLEAR THE OUTPUT WORD
6955  040174  006105          1$:     ROL     R5              ;;ROTATE MSB INTO "C"
6956  040176  000404                  BR      3$              ;;GO DO MSB
6957  040200  006105          2$:     ROL     R5              ;;FORM THIS DIGIT
6958  040202  006105                  ROL     R5
6959  040204  006105                  ROL     R5
6960  040206  010503                  MOV     R5,R3
6961  040210  006103          3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
6962  040212  105337  040314          DECB    $OMODE          ;;TYPE THIS DIGIT?
6963  040216  100016                  BPL     7$              ;;BR IF NO
6964  040220  042703  177770          BIC     #177770,R3      ;;GET RID OF JUNK
6965  040224  001002                  BNE     4$              ;;TEST FOR 0
6966  040226  005704                  TST     R4              ;;SUPPRESS THIS 0?
6967  040230  001403                  BEQ     5$              ;;BR IF YES
6968  040232  005204          4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
6969  040234  052703  000060          BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
6970  040240  052703  000040  5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
6971  040244  110337  040310          MOVB    R3,8$           ;;SAVE FOR TYPING
6972  040250  104401  040310          TYPE    ,8$             ;;GO TYPE THIS DIGIT
6973  040254  105337  040312  7$:     DECB    $OCNT           ;;COUNT BY 1
6974  040260  003347                  BGT     2$              ;;BR IF MORE TO DO
6975  040262  002402                  BLT     6$              ;;BR IF DONE
6976  040264  005204                  INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
6977  040266  000744                  BR      2$              ;;GO DO THE LAST DIGIT
6978  040270  012605          6$:     MOV     (SP)+,R5        ;;RESTORE R5
6979  040272  012604                  MOV     (SP)+,R4        ;;RESTORE R4
6980  040274  012603                  MOV     (SP)+,R3        ;;RESTORE R3
6981  040276  016666  000002  000004  MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
6982  040304  012616                  MOV     (SP)+,(SP)
6983  040306  000002                  RTI                     ;;RETURN
6984  040310      000          8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
6985  040311      000                  .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
6986  040312      000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
6987  040313      000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
6988  040314  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
6989                           .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
6990
6991                           ;;**************************************************************
6992                           ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
6993                           ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
6994                           ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
6995                           ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
6996                           ;*REPLACED WITH SPACES.
6997                           ;*CALL:
6998                           ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
6999                           ;*      TYPDS                   ;;GO TO THE ROUTINE
7000
7001  040316                   $TYPDS:
7002  040316  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7003  040320  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
```

```
7004  040322  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
7005  040324  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
7006  040326  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
7007  040330  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
7008  040334  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
7009  040340  100004                          BPL     1$              ;;BR IF INPUT IS POS.
7010  040342  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
7011  040344  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
7012  040352  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
7013  040354  012703  040532                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
7014  040360  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
7015  040364  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
7016  040366  016001  040522                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
7017  040372  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
7018  040374  002402                          BLT     4$              ;;BR IF DONE
7019  040376  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
7020  040400  000774                          BR      3$
7021  040402  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
7022  040404  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
7023  040406  001002                          BNE     5$              ;;FALL THROUGH IF 0
7024  040410  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
7025  040412  100407                          BMI     7$              ;;BR IF YES
7026  040414  106316                  5$:     ASLB    (SP)            ;;MSD?
7027  040416  103003                          BCC     6$              ;;BR IF NO
7028  040420  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
7029  040426  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
7030  040432  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
7031  040436  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
7032  040440  005720                          TST     (R0)+           ;;JUST INCREMENTING
7033  040442  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
7034  040446  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
7035  040450  003002                          BGT     8$              ;;GO TO EXIT
7036  040452  010502                          MOV     R5,R2           ;;GET THE LSD
7037  040454  000764                          BR      6$              ;;GO CHANGE TO ASCII
7038  040456  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
7039  040460  100003                          BPL     9$              ;;BR IF NO
7040  040462  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
7041  040470  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
7042  040472  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
7043  040474  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
7044  040476  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
7045  040500  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
7046  040502  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
7047  040504  104401  040532                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
7048  040510  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
7049  040516  012616                          MOV     (SP)+,(SP)
7050  040520  000002                          RTI                     ;;RETURN TO USER
7051  040522  023420                  $DTBL:  10000.
7052  040524  001750                          1000.
7053  040526  000144                          100.
7054  040530  000012                          10.
7055  040532  000004                  $DBLK:  .BLKW   4
7056                                  .SBTTL  TTY INPUT ROUTINE
7057
7058                                  ;;**********************************************************************
7059                                  .ENABL  LSB
```

```
7060  040542  000000                  $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
7061  040544  000000                  $TKQIN: .WORD   0               ;;INPUT POINTER
7062  040546  000000                  $TKQOUT: .WORD  0               ;;OUTPUT POINTER
7063  040550  000001                  $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
7064          040551                  $TKQEND=.
7065          040552                  .EVEN
7066
7067                                  ;*TK INITIALIZE ROUTINE
7068                                  ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
7069                                  ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
7070                                  ;
7071                                  ;*CALL:
7072                                  ;*      JSR     PC,$TKINT
7073                                  ;*      RETURN
7074                                  ;
7075  040552  005037  040542          $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
7076  040556  012737  040550  040544          MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
7077  040564  013737  040544  040546          MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
7078  040572  012737  040622  000060          MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
7079  040600  012737  000200  000062          MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
7080  040606  005777  140334                  TST     @$TKB           ;;CLEAR DONE FLAG
7081  040612  012777  000100  140324          MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
7082  040620  000207                          RTS     PC              ;;RETURN TO CALLER
7083
7084                                  ;*TK SERVICE ROUTINE
7085                                  ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
7086                                  ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
7087                                  ;*IT IN THE QUEUE.
7088                                  ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
7089                                  ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
7090                                  ;
7091  040622  117746  140320          $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
7092  040626  042716  177600                  BIC     #↑C177,(SP)     ;;STRIP THE JUNK
7093  040632  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL C?
7094  040636  001007                          BNE     1$              ;;BRANCH IF NO
7095  040640  104401  041736                  TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (↑C)
7096  040644  004737  040552                  JSR     PC,$TKINT       ;;INIT THE KEYBOARD
7097  040650  005726                          TST     (SP)+           ;;CLEAN UP STACK
7098  040652  000137  034572                  JMP     CTRHLT          ;;CONTROL C RESTART
7099  040656  021627  000007          1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
7100  040662  001004                          BNE     2$              ;;BRANCH IF NO
7101  040664  022737  000176  001140          CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
7102  040672  001500                          BEQ     6$              ;;GO TO SWR CHANGE
7103
7104  040674                          2$:
7105  040674  022737  000001  040542          CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
7106  040702  001004                          BNE     3$              ;;BRANCH IF NO
7107  040704  104401  001204                  TYPE    ,$BELL          ;;RING THE TTY BELL
7108  040710  005726                          TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
7109  040712  000451                          BR      5$              ;;EXIT
7110  040714  021627  000023          3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
7111  040720  001021                          BNE     32$             ;;BRANCH IF NO
7112  040722  005077  140216                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7113  040726  005726                          TST     (SP)+           ;;CLEAN CHAR OFF STACK
7114  040730  105777  140210          31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
7115  040734  100375                          BPL     31$             ;;LOOP UNTIL ITS THERE
```

```
 7116  040736  117746  140204                 MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
 7117  040742  042716  177600                 BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
 7118  040746  022627  000021                 CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
 7119  040752  001366                         BNE     31$             ;;BRANCH IF NO
 7120  040754  012777  000100  140162         MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
 7121  040762  000002                         RTI                     ;;RETURN
 7122  040764  005237  040542         32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
 7123  040770  021627  000140                 CMP     (SP),#140       ;;IS IT UPPER CASE?
 7124  040774  002405                         BLT     4$              ;;BRANCH IF YES
 7125  040776  021627  000175                 CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
 7126  041002  003002                         BGT     4$              ;;BRANCH IF YES
 7127  041004  042716  000040                 BIC     #40,(SP)        ;;MAKE IT UPPER CASE
 7128  041010  112677  177530         4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
 7129  041014  005237  040544                 INC     $TKQIN          ;;UPDATE THE POINTER
 7130  041020  023727  040544  040551         CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
 7131  041026  001003                         BNE     5$              ;;BRANCH IF NO
 7132  041030  012737  040550  040544         MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
 7133  041036  000002                 5$:     RTI                     ;;RETURN
 7134
 7135                                 ;;**************************************************************
 7136                                 ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
 7137                                 ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
 7138                                 ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
 7139                                 ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
 7140  041040  022737  000176  001140 $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
 7141  041046  001124                         BNE     15$             ;;EXIT IF NOT
 7142  041050  105777  140070                 TSTB    @$TKS           ;;IS A CHAR WAITING?
 7143  041054  100121                         BPL     15$             ;;IF NOT, EXIT
 7144  041056  117746  140064                 MOVB    @$TKB,-(SP)     ;;YES
 7145  041062  042716  177600                 BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
 7146  041066  021627  000007                 CMP     (SP),#7         ;;IS IT A CONTROL-G?
 7147  041072  001300                         BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
 7148                                                                 ;;AND EXIT
 7149
 7150                                 ;;**************************************************************
 7151                                 ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
 7152                                 ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
 7153                                 ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
 7154  041074  123727  001134  000001 6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
 7155  041102  001674                         BEQ     2$              ;;BRANCH IF YES
 7156  041104  005726                         TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
 7157  041106  004737  040552                 JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
 7158  041112  005077  140026                 CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
 7159  041116  112737  000001  001135         MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
 7160
 7161  041124  104401  041750                 TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
 7162  041130  104401  041755         $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
 7163  041134  013746  000176                 MOV     $WREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
 7164  041140  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 7165  041142  104401  041766                 TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
 7166  041146  005046                 19$:    CLR     -(SP)           ;;CLEAR COUNTER
 7167  041150  005046                         CLR     -(SP)           ;;THE NEW SWR
 7168  041152  105777  137766         7$:     TSTB    @$TKS           ;;CHAR THERE?
 7169  041156  100375                         BPL     7$              ;;IF NOT TRY AGAIN
 7170
 7171  041160  117746  137762                 MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
```

```
7172  041164  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
7173
7174  041170  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL-C?
7175  041174  001015                        BNE     9$              ;;BRANCH IF NOT
7176  041176  104401  041736                TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (^C)
7177  041202  062706  000006                ADD     #6,SP           ;;CLEAN UP STACK
7178  041206  123727  001135  000001        CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
7179  041214  001003                        BNE     8$              ;;BRANCH IF NO
7180  041216  012777  000100  137720        MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
7181  041224  000137  034572        8$:     JMP     CTRHLT          ;;CONTROL-C RESTART
7182
7183
7184  041230  021627  000025        9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
7185  041234  001005                        BNE     10$             ;;BRANCH IF NOT
7186  041236  104401  041743                TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
7187  041242  062706  000006        20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
7188  041246  000737                        BR      19$             ;;LET'S TRY IT AGAIN
7189
7190
7191  041250  021627  000015        10$:    CMP     (SP),#15        ;;IS IT A <CR>?
7192  041254  001022                        BNE     16$             ;;BRANCH IF NO
7193  041256  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
7194  041262  001403                        BEQ     11$             ;;BRANCH IF YES
7195  041264  016677  000002  137646        MOV     2(SP),@SWR      ;;SAVE NEW SWR
7196  041272  062706  000006        11$:    ADD     #6,SP           ;;CLEAR UP STACK
7197  041276  104401  001211        14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
7198  041302  123727  001135  000001        CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
7199  041310  001003                        BNE     15$             ;;BRANCH IF NOT
7200  041312  012777  000100  137624        MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
7201  041320  000002        15$:    RTI                             ;;RETURN
7202  041322  004737  040020        16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
7203  041326  021627  000060                CMP     (SP),#60        ;;CHAR < 0?
7204  041332  002420                        BLT     18$             ;;BRANCH IF YES
7205  041334  021627  000067                CMP     (SP),#67        ;;CHAR > 7?
7206  041340  003015                        BGT     18$             ;;BRANCH IF YES
7207  041342  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
7208  041346  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
7209  041352  001403                        BEQ     17$             ;;BRANCH IF YES
7210  041354  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
7211  041356  006316                        ASL     (SP)            ;;    CHAR OVER TO MAKE
7212  041360  006316                        ASL     (SP)            ;;    ROOM FOR NEW ONE.
7213  041362  005266  000002        17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
7214  041366  056616  177776                BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
7215  041372  000667                        BR      7$              ;;GET THE NEXT ONE
7216  041374  104401  001210        18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
7217  041400  000720                        BR      20$             ;;SIMULATE CONTROL-U
7218                                .DSABL  LSB
7219
7220
7221                                ;;*****************************************************************
7222                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
7223                                ;*CALL:
7224                                ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
7225                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
7226                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
7227                                ;
```

```
7228
7229  041402  011646                  $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
7230  041404  016666  000004  000002          MOV     4(SP),2(SP)     ;;THE PS
7231  041412  005066  000004                  CLR     4(SP)           ;;GET READY FOR A CHARACTER
7232  041416  005046                          CLR     -(SP)           ;;PUT NEW PS ON STACK
7233  041420  012746  041426                  MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
7234  041424  000002                          RTI                     ;;POP NEW PC AND PS
7235  041426                          64$:
7236  041426  005737  040542          1$:     TST     $TKCNT          ;;WAIT ON A CHARACTER
7237  041432  001775                          BEQ     1$
7238  041434  005337  040542                  DEC     $TKCNT          ;;DECREMENT THE COUNTER
7239  041440  117766  177102  000004          MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
7240  041446  005237  040546                  INC     $TKQOUT         ;;UPDATE THE POINTER
7241  041452  023727  040546  040551          CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
7242  041460  001003                          BNE     2$              ;;BRANCH IF NO
7243  041462  012737  040550  040546          MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
7244  041470  000002                  2$:     RTI                     ;;RETURN
7245                                  ;;**************************************************************
7246                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
7247                                  ;*CALL:
7248                                  ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
7249                                  ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
7250                                  ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
7251
7252  041472  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
7253  041474  005046                          CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
7254  041476  012703  041726          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
7255  041502  022703  041736          2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
7256  041506  101456                          BLOS    4$              ;;BR IF YES
7257  041510  104410                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
7258  041512  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
7259  041514  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
7260  041520  001022                          BNE     5$              ;;BR IF NO
7261  041522  005716                          TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
7262  041524  001007                          BNE     6$              ;;BR IF NO
7263  041526  112737  000134  041724          MOVB    #'\,9$          ;;TYPE A BACK SLASH
7264  041534  104401  041724                  TYPE    ,9$
7265  041540  012716  177777                  MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
7266  041544  005303                  6$:     DEC     R3              ;;BACKUP BY ONE
7267  041546  020327  041726                  CMP     R3,#$TTYIN      ;;STACK EMPTY?
7268  041552  103434                          BLO     4$              ;;BR IF YES
7269  041554  111337  041724                  MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
7270  041560  104401  041724                  TYPE    ,9$             ;;GO TYPE
7271  041564  000746                          BR      2$              ;;GO READ ANOTHER CHAR.
7272  041566  005716                  5$:     TST     (SP)            ;;RUBOUT KEY SET?
7273  041570  001406                          BEQ     7$              ;;BR IF NO
7274  041572  112737  000134  041724          MOVB    #'\,9$          ;;TYPE A BACK SLASH
7275  041600  104401  041724                  TYPE    ,9$
7276  041604  005016                          CLR     (SP)            ;;CLEAR THE RUBOUT KEY
7277  041606  122713  000025          7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
7278  041612  001003                          BNE     8$              ;;BR IF NO
7279  041614  104401  041743                  TYPE    ,$CNTLU         ;;TYPE A CONTROL "U"
7280  041620  000726                          BR      1$              ;;GO START OVER
7281  041622  122713  000022          8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
7282  041626  001011                          BNE     3$              ;;BRANCH IF NO
7283  041630  105013                          CLRB    (R3)            ;;CLEAR THE CHARACTER
```

```
7284  041632  104401  001211                    TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
7285  041636  104401  041726                    TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
7286  041642  000717                            BR      2$              ;;GO PICKUP ANOTHER CHACTER
7287  041644  104401  001210            4$:     TYPE    ,$QUES          ;;TYPE A '?'
7288  041650  000712                            BR      1$              ;;CLEAR THE BUFFER AND LOOP
7289  041652  111337  041724            3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
7290  041656  104401  041724                    TYPE    ,9$
7291  041662  122723  000015                    CMPB    #15,(R3)+       ;;CHECK FOR RETURN
7292  041666  001305                            BNE     2$              ;;LOOP IF NOT RETURN
7293  041670  105063  177777                    CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
7294  041674  104401  001212                    TYPE    ,$LF            ;;TYPE A LINE FEED
7295  041700  005726                            TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
7296  041702  012603                            MOV     (SP)+,R3        ;;RESTORE R3
7297  041704  011646                            MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
7298  041706  016666  000004  000002            MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
7299  041714  012766  041726  000004            MOV     #$TTYIN,4(SP)
7300  041722  000002                            RTI                     ;;RETURN
7301  041724     000            9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
7302  041725     000                    .BYTE   0                       ;;TERMINATOR
7303  041726  000010            $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
7304  041736  041536  005015     000    $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
7305  041743     136  006525  000012    $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
7306  041750  043536  005015     000    $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
7307  041755     015  051412  051127    $MSWR:  .ASCIZ  <15><12>/SWR = /
7308  041762  036440  000040
7309  041766  020040  042516  020127    $MNEW:  .ASCIZ  /  NEW = /
7310  041774  020075     000
7311           042000                    .EVEN
7312                                    .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
7313
7314                                    ;;*****************************************************************
7315                                    ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
7316                                    ;*CHANGE IT TO BINARY.
7317                                    ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
7318                                    ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
7319                                    ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
7320                                    ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
7321                                    ;*CALL:
7322                                    ;*      RDOCT                   ;;READ AN OCTAL NUMBER
7323                                    ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
7324                                    ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
7325
7326  042000  011646            $RDOCT: MOV     (SP),-(SP)              ;;PROVIDE SPACE FOR THE
7327  042002  016666  000004  000002            MOV     4(SP),2(SP)     ;;INPUT NUMBER
7328  042010  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7329  042012  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7330  042014  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
7331  042016  104411            1$:     RDLIN                           ;;READ AN ASCIZ LINE
7332  042020  012600                            MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
7333  042022  010037  042126                    MOV     R0,5$           ;;AND SAVE IT
7334  042026  005001                            CLR     R1              ;;CLEAR DATA WORD
7335  042030  005002                            CLR     R2
7336  042032  112046            2$:     MOVB    (R0)+,-(SP)             ;;PICKUP THIS CHARACTER
7337  042034  001420                            BEQ     3$              ;;IF ZERO GET OUT
7338  042036  122716  000060                    CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
7339  042042  003026                            BGT     4$              ;;IS AN OCTAL DIGIT
```

```
 7340  042044  122716  000067                 CMPB    #'7,(SP)
 7341  042050  002423                         BLT     4$
 7342  042052  006301                         ASL     R1              ;;*2
 7343  042054  006102                         ROL     R2
 7344  042056  006301                         ASL     R1              ;;*4
 7345  042060  006102                         ROL     R2
 7346  042062  006301                         ASL     R1              ;;*8
 7347  042064  006102                         ROL     R2
 7348  042066  042716  177770                 BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
 7349  042072  062601                         ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
 7350  042074  000756                         BR      2$              ;;LOOP
 7351  042076  005726                 3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 7352  042100  010166  000012                 MOV     R1,12(SP)       ;;SAVE THE RESULT
 7353  042104  010237  042136                 MOV     R2,$HIOCT
 7354  042110  012602                         MOV     (SP)+,R2        ;;POP STACK INTO R2
 7355  042112  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
 7356  042114  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
 7357  042116  000002                         RTI                     ;;RETURN
 7358  042120  005726                 4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
 7359  042122  105010                         CLRB    (R0)            ;;SET A TERMINATOR
 7360  042124  104401                         TYPE                    ;;TYPE UP THRU THE BAD CHAR.
 7361  042126  000000                 5$:     .WORD   0
 7362  042130  104401  001210                 TYPE    $QUES           ;;"?" "CR" & "LF"
       042134  000730                         BR      1$              ;;TRY AGAIN
 7364  042136  000000                 $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
 7365                                 .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
 7366
 7367                                 ;;**************************************************************
 7368                                 ;*SAVE R0-R5
 7369                                 ;*CALL:
 7370                                 ;*      SAVREG
 7371                                 ;*      RETURN          ;$SAVREG THE STACK WILL LOOK LIKE:
 7372                                 ;*
 7373                                 ;*TOP---(R0)
 7374                                 ;* +2---(+18)
 7375                                 ;* +4---R5
 7376                                 ;* +6---R4
 7377                                 ;* +8---R3
 7378                                 ;*+10---R2
 7379                                 ;*+12---R1
 7380                                 ;*+14---R0
 7381
 7382  042140                         $SAVREG:
 7383  042140  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7384  042142  010146                         MOV     R1,-(SP)        ;;    R1 ON STACK
 7385  042144  010246                         MOV     R2,-(SP)        ;;    R2 ON STACK
 7386  042146  010346                         MOV     R3,-(SP)        ;;    R3 ON STACK
 7387  042150  010446                         MOV     R4,-(SP)        ;;    R4 ON STACK
 7388  042152  010546                         MOV     R5,-(SP)        ;;PC  R5 ON STACK
 7389  042154  016646  000022                 MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
 7390  042160  016646  000022                 MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
 7391  042164  016646  000022                 MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
 7392  042170  016646  000022                 MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
 7393  042174  000002                         RTI
 7394
 7395                                 ;*RESTORE R0-R5
```

```
                                        ;*CALL:
                                        ;*      RESREG
042176                                  $RESREG:
042176  012666  000022                          MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
042202  012666  000022                          MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
042206  012666  000022                          MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
042212  012666  000022                          MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
042216  012605                                  MOV     (SP)+,R5        ;;POP STACK INTO R5
042220  012604                                  MOV     (SP)+,R4        ;;POP STACK INTO R4
042222  012603                                  MOV     (SP)+,R3        ;;POP STACK INTO R3
042224  012602                                  MOV     (SP)+,R2        ;;POP STACK INTO R2
042226  012601                                  MOV     (SP)+,R1        ;;POP STACK INTO R1
042230  012600                                  MOV     (SP)+,R0        ;;POP STACK INTO R0
042232  000002                                  RTI

                                        .SBTTL  POWER DOWN AND UP ROUTINE

                                        ;;**************************************************************

                                        ;POWER DOWN ROUTINE
042234  017737  136700  003312          $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
042242  012737  042262  000024                  MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
042250  012737  000340  000026                  MOV     #PR7,PWRVEC+2
042256  000000                                  HALT
042260  000776                                  BR      .-2     ;HANG UP

                                        ;;**************************************************************

                                        ;POWER UP ROUTINE
042262  005037  042356                  $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
042266  012737  000144  042360                  MOV     #100.,$PWRCT+2
042274  005237  042356                  1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
042300  001375                                  BNE     1$
042302  005337  042360                          DEC     $PWRCT+2
042306  001372                                  BNE     1$
042310  012737  042234  000024                  MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
042316  012737  000340  000026                  MOV     #PR7,PWRVEC+2
042324  012706  001100                          MOV     #STACK,SP       ;FORCE STACK
042330  104401  042362                          TYPE    ,$POWER         ;TYPE POWER
042334  004737  034402                          JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
042340  013777  003312  136572                  MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
042346  013702  001270                          MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
042352  000177  136530                          JMP     @$LPADR ;GO BACK TO LAST TEST

042356  000000  000000                  $PWRCT: .WORD   0,0             ;TELETYPE TIME OUT
042362  047520  042527  000122          $POWER: .ASCIZ  /POWER/
                                                .EVEN
                                        .SBTTL  TRAP DECODER

                                        ;;**************************************************************
                                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                        ;*GO TO THAT ROUTINE.

042370  010046                          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
```

```
 7452  042372  016600  000002                MOV     2(SP),R0        ;;GET TRAP ADDRESS
 7453  042376  005740                        TST     -(R0)           ;;BACKUP BY 2
 7454  042400  111000                        MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
 7455  042402  006300                        ASL     R0              ;;POSITION FOR INDEXING
 7456  042404  016000  042424                MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
 7457  042410  000200                        RTS     R0              ;;GO TO ROUTINE
 7458
 7459
 7460                                  ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
 7461
 7462  042412  011646                $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
 7463  042414  016666  000004  000002        MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
 7464  042422  000002                        RTI                     ;;RESTORE THE PSW
 7465
 7466                                  .SBTTL  TRAP TABLE
 7467
 7468                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
 7469                                  ;*BY THE "TRAP" INSTRUCTION.
 7470
 7471                                  ;       ROUTINE
 7472                                  ;       -------
 7473  042424  042412                $TRPAD: .WORD   $TRAP2
 7474  042426  037606                        $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
 7475  042430  040114                        $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
 7476  042432  040070                        $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
 7477  042434  040130                        $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
 7478  042436  040316                        $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
 7479
 7480  042440  041130                        $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
 7481
 7482  042442  041040                        $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
 7483  042444  041402                        $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
 7484  042446  041472                        $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
 7485  042450  042000                        $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
 7486  042452  042140                        $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
 7487  042454  042176                        $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
 7488  042456  035304                        SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
7489                                            .SBTTL  DATA TABLE FOR PRINT OUT
7490
7491  042460  001220  003244                    DTOOO:  .WORD   $TESTN,TRAPPC
7492  042464  001220  001116  003224            DTOO2:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT
7493  042472  003164  003252  003254
7494  042500  003256  003260  003262
7495  042506  001220  001116  003200            DTOO3:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MR3
7496  042514  003140  003226  003166
7497  042522  003230  003170
7498  042526  001220  001116  003200            DTO41:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER,E.BA,T.BA,E.WC,T.WC
7499  042534  003140  003210  003150
7500  042542  003214  003154  003204
7501  042550  003144  003202  003142
7502  042556  001220  001116  003200            DTO46:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
7503  042564  003140  003210  003150
7504  042572  003214  003154
7505  042576  001220  001116  003222            DTO51:  .WORD   $TESTN,$ERRPC,E.DB,T.DB,WRDCNT
7506  042604  003162  003264
7507  042610  001220  001116  003200            DTO52:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,T.CS2,T.ER
7508  042616  003140  003150  003154
7509  042624  001220  001116  003224            DTO53:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
7510  042632  003164
7511  042634  001220  001116  003220            DTO54:  .WORD   $TESTN,$ERRPC,E.DCYL,T.DCYL,E.DA,T.DA
7512  042642  003160  003206  003146
7513  042650  001220  001116  003200            DTO71:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
7514  042656  003140  003210  003150
7515  042664  003214  003154
7516  042670  055176  055200  055202                    .WORD   VRCHDR,VRCHDR+2,VRCHDR+4
7517  042676  001220  001116  003200            DTO74:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER,HDRCNT
7518  042704  003140  003210  003150
7519  042712  003214  003154  003310
7520  042720  001220  001116  003224            DTO77:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,HDRCNT
7521  042726  003164  003310
7522  042732  001220  001116  003234            DT134:  .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT,BITCNT
7523  042740  003174  003262
7524  042744  001220  001116  003200            DT144:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
7525  042752  003140  003210  003150
7526  042760  003214  003154
7527  042764  003204  003144  003202                    .WORD   E.BA,T.BA,E.WC,T.WC,E.DCYL,T.DCYL,E.DA,T.DA
7528  042772  003142  003220  003160
7529  043000  003206  003146
7530  043004  001220  001116  003234            DT151:  .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT
7531  043012  003174
```

```
                                        .SBTTL  DATA FORMAT FOR PRINT OUT

043014  000001          DF000:  .WORD   1
043016      002  000             .BYTE   2,0
043020  000005          DF002:  .WORD   5
043022      000  000             .BYTE   0,0
043024  044067                  .WORD   DH000A
043026      000  000             .BYTE   0,0
043030  044105                  .WORD   DH000B
043032      002  000             .BYTE   2,0
043034  044151                  .WORD   DH002A
043036      000  000             .BYTE   0,0
043040  044235                  .WORD   DH002B
043042      007  000             .BYTE   7,0
043044  000005          DF003:  .WORD   5               ;ERROR 3-24
043046      000  000             .BYTE   0,0
043050  044067                  .WORD   DH000A
043052      000  000             .BYTE   0,0
043054  044105                  .WORD   DH000B
043056      002  000             .BYTE   2,0
043060  044323                  .WORD   DH003A
043062      000  000             .BYTE   0,0
043064  044402                  .WORD   DH003B
043066      006  000             .BYTE   6,0
043070  000005          DF025:  .WORD   5               ;ERROR 25-40
043072      000  000             .BYTE   0,0
043074  044067                  .WORD   DH000A
043076      000  000             .BYTE   0,0
043100  044105                  .WORD   DH000B
043102      002  000             .BYTE   2,0
043104  044461                  .WORD   DH025A
043106      000  000             .BYTE   0,0
043110  044540                  .WORD   DH025B
043112      006  000             .BYTE   6,0
043114  000007          DF041:  .WORD   7
043116      000  000             .BYTE   0,0
043120  044067                  .WORD   DH000A
043122      000  000             .BYTE   0,0
043124  044105                  .WORD   DH000B
043126      002  000             .BYTE   2,0
043130  044620                  .WORD   DH041A
043132      000  000             .BYTE   0,0
043134  044677                  .WORD   DH041B
043136      006  000             .BYTE   6,0
043140  044754                  .WORD   DH041C
043142      000  000             .BYTE   0,0
043144  045013                  .WORD   DH041D
043146      004  000             .BYTE   4,0
043150  000005          DF046:  .WORD   5
043152      000  000             .BYTE   0,0
043154  044067                  .WORD   DH000A
043156      000  000             .BYTE   0,0
043160  044105                  .WORD   DH000B
043162      002  000             .BYTE   2,0
043164  044620                  .WORD   DH041A
043166      000  000             .BYTE   0,0
```

```
7588  043170  044677                        .WORD   DH041B
7589  043172     006  000                   .BYTE   6,0
7590  043174  000005                DF051:  .WORD   5
7591  043176     000  000                   .BYTE   0,0
7592  043200  044067                        .WORD   DH000A
7593  043202     000  000                   .BYTE   0,0
7594  043204  044105                        .WORD   DH000B
7595  043206     002  000                   .BYTE   2,0
7596  043210  045050                        .WORD   DH051A
7597  043212     000  000                   .BYTE   0,0
7598  043214  045075                        .WORD   DH051B
7599  043216     003  000                   .BYTE   3,0
7600  043220  000005                DF052:  .WORD   5
7601  043222     000  000                   .BYTE   0,0
7602  043224  044067                        .WORD   DH000A
7603  043226     000  000                   .BYTE   0,0
7604  043230  044105                        .WORD   DH000B
7605  043232     002  000                   .BYTE   2,0
7606  043234  045123                        .WORD   DH052A
7607  043236     000  000                   .BYTE   0,0
7608  043240  045142                        .WORD   DH052B
7609  043242     004  000                   .BYTE   4,0
7610  043244  000005                DF053:  .WORD   5
7611  043246     000  000                   .BYTE   0,0
7612  043250  044067                        .WORD   DH000A
7613  043252     000  000                   .BYTE   0,0
7614  043254  044105                        .WORD   DH000B
7615  043256     002  000                   .BYTE   2,0
7616  043260  045177                        .WORD   DH053A
7617  043262     000  000                   .BYTE   0,0
7618  043264  045216                        .WORD   DH053B
7619  043266     002  000                   .BYTE   2,0
7620  043270  000005                DF054:  .WORD   5               ;ERROR-54-61
7621  043272     000  000                   .BYTE   0,0
7622  043274  044067                        .WORD   DH000A
7623  043276     000  000                   .BYTE   0,0
7624  043300  044105                        .WORD   DH000B
7625  043302     002  000                   .BYTE   2,0
7626  043304  045234                        .WORD   DH054A
7627  043306     000  000                   .BYTE   0,0
7628  043310  045273                        .WORD   DH054B
7629  043312     004  000                   .BYTE   4,0
7630  043314  000007                DF071:  .WORD   7               ;ERRORS 71-73
7631  043316     000  000                   .BYTE   0,0
7632  043320  044067                        .WORD   DH000A
7633  043322     000  000                   .BYTE   0,0
7634  043324  044105                        .WORD   DH000B
7635  043326     002  000                   .BYTE   2,0
7636  043330  044620                        .WORD   DH041A
7637  043332     000  000                   .BYTE   0,0
7638  043334  044677                        .WORD   DH041B
7639  043336     006  000                   .BYTE   6,0
7640  043340  045330                        .WORD   DH071A
7641  043342     000  000                   .BYTE   0,0
7642  043344  045351                        .WORD   DH071B
7643  043346     003  000                   .BYTE   3,0
```

```
7644  043350  000005          DF074:  .WORD   5
7645  043352     000  000             .BYTE   0,0
7646  043354  044067                  .WORD   DH000A
7647  043356     000  000             .BYTE   0,0
7648  043360  044105                  .WORD   DH000B
7649  043362     002  000             .BYTE   2,0
7650  043364  045400                  .WORD   DH074A
7651  043366     000  000             .BYTE   0,0
7652  043370  045467                  .WORD   DH074B
7653  043372     007  000             .BYTE   7,0
7654  043374  000005          DF077:  .WORD   5
7655  043376     000  000             .BYTE   0,0
7656  043400  044067                  .WORD   DH000A
7657  043402     000  000             .BYTE   0,0
7658  043404  044105                  .WORD   DH000B
7659  043406     002  000             .BYTE   2,0
7660  043410  045553                  .WORD   DH077A
7661  043412     000  000             .BYTE   0,0
7662  043414  045602                  .WORD   DH077B
7663  043416     003  000             .BYTE   3,0
7664  043420  000005          DF134:  .WORD   5
7665  043422     000  000             .BYTE   0,0
7666  043424  044067                  .WORD   DH000A
7667  043426     000  000             .BYTE   0,0
7668  043430  044105                  .WORD   DH000B
7669  043432     002  000             .BYTE   2,0
7670  043434  045626                  .WORD   DH134A
7671  043436     000  000             .BYTE   0,0
7672  043440  045652                  .WORD   DH134B
7673  043442     003  000             .BYTE   3,0
7674  043444  000007          DF144:  .WORD   7
7675  043446     000  000             .BYTE   0,0
7676  043450  044067                  .WORD   DH000A
7677  043452     000  000             .BYTE   0,0
7678  043454  044105                  .WORD   DH000B
7679  043456     002  000             .BYTE   2,0
7680  043460  044620                  .WORD   DH041A
7681  043462     000  000             .BYTE   0,0
7682  043464  044677                  .WORD   DH041B
7683  043466     006  000             .BYTE   6,0
7684  043470  045700                  .WORD   DH144A
7685  043472     000  000             .BYTE   0,0
7686  043474  045777                  .WORD   DH144B
7687  043476     010  000             .BYTE   10,0
7688  043500  000005          DF151:  .WORD   5
7689  043502     000  000             .BYTE   0,0
7690  043504  044067                  .WORD   DH000A
7691  043506     000  000             .BYTE   0,0
7692  043510  044105                  .WORD   DH000B
7693  043512     002  000             .BYTE   2,0
7694  043514  045123                  .WORD   DH052A
7695  043516     000  000             .BYTE   0,0
7696  043520  046074                  .WORD   DH151A
7697  043522     002  000             .BYTE   2,0
```

```
                                .SBTTL  ASCII MESSAGES

043524  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 BUS ADDRESS ( /
043532  020061  052502  020123
043540  042101  051104  051505
043546  020123  020050     000
043553     040  020061  020075  OPR002: .ASCIZ  / ) = /
043560     000
043561     122  033113  030461  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
043566  053040  041505  047524
043574  020122  042101  051104
043602  051505  020123  020050
043610     000
043611     122  033113  030461  OPR004: .ASCIZ  /RK611 PRIORITY ( /
043616  050040  044522  051117
043624  052111  020131  020050
043632     000
043633     015  025012  025052  OPR005: .ASCIZ  <15><12>/*****  PROGRAM HALTED *****/<15><12>
043640  025052  020040  051120
043646  043517  040522  020115
043654  040510  052114  042105
043662  025040  025052  025052
043670  005015     000
043673     015  051412  041505  OPR006: .ASCIZ  <15><12>/SECOND PASS RUN TIME IS APPROX 3:15 MINUTES/<15><12>
043700  047117  020104  040520
043706  051523  051040  047125
043714  052040  046511  020105
043722  051511  040440  050120
043730  047522  020130  035063
043736  032461  046440  047111
043744  052125  051505  005015
043752     000
043753     040  000040          SPACE2: .ASCIZ  /  /
043756  005015  051120  043517  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
043764  040522  020115  041101
043772  051117  042524  020104
044000  042502  040503  051525
044006  020105  051105  047522
044014  020122  044124  042522
044022  044123  046117  020104
044030  054105  042503  042105
044036  042105  005015     000
044043     015  052012  051505  TSTBY1: .ASCIZ  <15><12>/TEST /
044050  020124     000
044053     040  054502  040520  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
044060  051523  042105  005015
044066     000
```

```
                                .SBTTL  DATA HEADERS

7747  044067     124  051505  020124  DH000A: .ASCIZ  /TEST    ERROR/
7748  044074  020040  042440  051122
7749  044102  051117     000
7750  044105     116  046525  020040  DH000B: .ASCIZ  /NUM     PC/
7751  044112  020040  050040  000103
7752  044120  042524  052123  020040  DH000C: .ASCII  /TEST    TRAP/<15><12>
7753  044126  020040  051124  050101
7754  044134  005015
7755  044136  052516  020115  020040          .ASCIZ  /NUM     PC/
7756  044144  020040  041520     000
7757  044151     105  050130  041505  DH002A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT/
7760  044156  020124  040440  052103
7761  044164  040525  020114  050040
7762  044172  042522  042523  052116
7763  044200  050040  042522  042523
7764  044206  052116  050040  042522
7765  044214  042523  052116  050040
7766  044222  042522  042523  052116
7767  044230  041040  052111     000
7770  044235     122  046513  030522  DH002B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT/
7771  044242  020040  051040  046513
7772  044250  030522  020040  041040
7773  044256  052111  030453  020040
7774  044264  041040  052111  020040
7775  044272  020040  041040  052111
7776  044300  030455  020040  041040
7777  044306  052111  031055  020040
7000  044314  041440  052517  052116
7001  044322     000
7002  044323     105  050130  041505  DH003A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
7003  044330  020124  040440  052103
7004  044336  040525  020114  042440
7005  044344  050130  041505  020124
7006  044352  040440  052103  040525
7007  044360  020114  042440  050130
7010  044366  041505  020124  040440
7011  044374  052103  040525  000114
7012  044402  045522  051503  020061  DH003B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
7013  044410  020040  045522  051503
7014  044416  020061  020040  042515
7015  044424  051523  040440  020040
7016  044432  042515  051523  040440
7017  044440  020040  042515  051523
7020  044446  041040  020040  042515
7021  044454  051523  041040     000
7022  044461     105  050130  041505  DH025A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
7023  044466  020124  040440  052103
7024  044474  040525  020114  042440
7025  044502  050130  041505  020124
7026  044510  040440  052103  040525
7027  044516  020114  042440  050130
7030  044524  041505  020124  040440
7031  044532  052103  040525  000114
7032  044540  045522  051503  020061  DH025B: .ASCIZ  /RKCS1   RKCS1   HD WD 1 HD WD 1 HD WD 2 HD WD 2/
```

```
7801  044546  020040  045522  051503
7802  044554  020061  020040  042110
7803  044562  053440  020104  020061
7804  044570  042110  053440  020104
7805  044576  020061  042110  053440
7806  044604  020104  020062  042110
7807  044612  053440  020104  000062
7808  044620  054105  042520  052103  DH041A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
7809  044626  020040  041501  052524
7810  044634  046101  020040  054105
7811  044642  042520  052103  020040
7812  044650  041501  052524  046101
7813  044656  020040  054105  042520
7814  044664  052103  020040  041501
7815  044672  052524  046101     000
7816  044677     122  041513  030523  DH041B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKER    RKER/
7817  044704  020040  051040  041513
7818  044712  030523  020040  051040
7819  044720  041513  031123  020040
7820  044726  051040  041513  031123
7821  044734  020040  051040  042513
7822  044742  020122  020040  051040
7823  044750  042513  000122
7824  044754  054105  042520  052103  DH041C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
7825  044762  020040  041501  052524
7826  044770  046101  020040  054105
7827  044776  042520  052103  020040
7828  045004  041501  052524  046101
7829  045012     000
7830  045013     122  041113  020101  DH041D: .ASCIZ  /RKBA    RKBA    RKWC    RKWC/
7831  045020  020040  051040  041113
7832  045026  020101  020040  051040
7833  045034  053513  020103  020040
7834  045042  051040  053513  000103
7835  045050  040504  040524  020040  DH051A: .ASCIZ  /DATA    DATA    WORD/
7836  045056  020040  040504  040524
7837  045064  020040  020040  047527
7838  045072  042122     000
7839  045075     105  050130  041505  DH051B: .ASCIZ  /EXPECT  READ    COUNT/
7840  045102  020124  051040  040505
7841  045110  020104  020040  041440
7842  045116  052517  052116     000
7843  045123     105  050130  041505  DH052A: .ASCIZ  /EXPECT  ACTUAL/
7844  045130  020124  040440  052103
7845  045136  040525  000114
7846  045142  045522  051503  020061  DH052B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKER/
7847  045150  020040  045522  051503
7848  045156  020061  020040  045522
7849  045164  051503  020062  020040
7850  045172  045522  051105     000
7851  045177     105  050130  041505  DH053A: .ASCIZ  /EXPECT  ACTUAL/
7852  045204  020124  040440  052103
7853  045212  040525  000114
7854  045216  045522  051115  020061  DH053B: .ASCIZ  /RKMR1   RKMR1/
7855  045224  020040  045522  051115
7856  045232  000061
```

```
 7857  045234  054105  042520  052103  DH054A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 7858  045242  020040  041501  052524
 7859  045250  046101  020040  054105
 7860  045256  042520  052103  020040
 7861  045264  041501  052524  046101
 7862  045272     000
 7863  045273     122  042113  054503  DH054B: .ASCIZ  /RKDCYL  RKDCYL  RKDA    RKDA/
 7864  045300  020114  051040  042113
 7865  045306  054503  020114  051040
 7866  045314  042113  020101  020040
 7867  045322  051040  042113  000101
 7868  045330  042510  042101  051105  DH071A: .ASCIZ  /HEADER SIMULATED/
 7869  045336  051440  046511  046125
 7870  045344  052101  042105     000
 7871  045351     127  051117  020104  DH071B: .ASCIZ  /WORD 1  WORD 2  WORD 3/
 7872  045356  020061  053440  051117
 7873  045364  020104  020062  053440
 7874  045372  051117  020104  000063
 7875  045400  054105  042520  052103  DH074A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  HEPDER/
 7876  045406  020040  041501  052524
 7877  045414  046101  020040  054105
 7878  045422  042520  052103  020040
 7879  045430  041501  052524  046101
 7880  045436  020040  054105  042520
 7881  045444  052103  020040  041501
 7882  045452  052524  046101  020040
 7883  045460  042510  042101  051105
 7884  045466     000
 7885  045467     122  041513  030523  DH074B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKER    RKER    NUM/
 7886  045474  020040  051040  041513
 7887  045502  030523  020040  051040
 7888  045510  041513  031123  020040
 7889  045516  051040  041513  031123
 7890  045524  020040  051040  042513
 7891  045532  020122  020040  051040
 7892  045540  042513  020122  020040
 7893  045546  047040  046525     000
 7894  045553     105  050130  041505  DH077A: .ASCIZ  /EXPECT  ACTUAL  HEADER/
 7895  045560  020124  040440  052103
 7896  045566  040525  020114  044040
 7897  045574  040505  042504  000122
 7898  045602  045522  051115  020061  DH077B: .ASCIZ  /RKMR1   RKMR1   NUM/
 7899  045610  020040  045522  051115
 7900  045616  020061  020040  052516
 7901  045624  000115
 7902  045626  054105  042520  052103  DH134A: .ASCIZ  /EXPECT  ACTUAL  BIT/
 7903  045634  020040  041501  052524
 7904  045642  046101  020040  044502
 7905  045650  000124
 7906  045652  045522  041505  052120  DH134B: .ASCIZ  /RKECPT  RKECPT  COUNT/
 7907  045660  020040  045522  041505
 7908  045666  052120  020040  047503
 7909  045674  047125  000124
 7910  045700  054105  042520  052103  DH144A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 7911  045706  020040  041501  052524
 7912  045714  046101  020040  054105
```

```
 7913  045722  042520  052103  020040
 7914  045730  041501  052524  046101
 7915  045736  020040  054105  042520
 7916  045744  052103  020040  041501
 7917  045752  052524  046101  020040
 7918  045760  054105  042520  052103
 7919  045766  020040  041501  052524
 7920  045774  046101     000
 7921  045777     122  041113  020101  DH144B: .ASCIZ  /RKBA    RKBA    RKWC    RKWC    RKDCYL  RKDCYL  RKDA    RKDA/
 7922  046004  020040  051040  041113
 7923  046012  020101  020040  051040
 7924  046020  053513  020103  020040
 7925  046026  051040  053513  020103
 7926  046034  020040  051040  042113
 7927  046042  054503  020114  051040
 7928  046050  042113  054503  020114
 7929  046056  051040  042113  020101
 7930  046064  020040  051040  042113
 7931  046072  000101
 7932  046074  045522  041505  052120  DH151A: .ASCIZ  /RKECPT  RKECPT/
 7933  046102  020040  045522  041505
 7934  046110  052120     000
```

```
                                        .SBTTL  ERROR MESSAGES
                                        
046113  000125  042516  050130  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
046120  041505  042524  020104
046126  042515  047515  054522
046134  050040  051101  052111
046142  020131  047105  041101
046150  042514  052040  040522
046156  000120
046160  052101  042524  050115  EM300:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM READ DATA/
046166  044524  043516  052040
046174  020117  044103  041505
046202  020113  042523  045505
046210  046440  051505  020123
046216  051106  046517  051040
046224  040505  020104  040504
046232  040524  000000
046235  000101  052124  046505  EM301:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM WRITE DATA/
046242  052120  047111  020107
046250  047524  041440  042510
046256  045503  051440  042505
046264  020113  042515  051523
046272  043040  047522  020115
046300  051127  052111  020105
046306  040504  040524  000000
046313  000101  052124  046505  EM302:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESS FROM WRITE CHECK/
046320  052120  047111  020107
046326  047524  041440  042510
046334  045503  051440  042505
046342  020113  042515  051523
046350  043040  047522  020115
046356  051127  052111  020105
046364  044103  041505  000113
046372  052101  042524  050115  EM303:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM READ DATA/
046400  044524  043516  052040
046406  020117  044103  041505
046414  020113  046103  040505
046422  020122  042515  051523
046430  043040  047522  020115
046436  042522  042101  042040
046444  052101  000101
046450  052101  042524  050115  EM304:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM WRITE DATA/
046456  044524  043516  052040
046464  020117  044103  041505
046472  020113  046103  040505
046500  020122  042515  051523
046506  043040  047522  020115
046514  051127  052111  020105
046522  040504  040524  000000
046527  000101  052124  046505  EM305:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR MESS FROM WRITE CHECK/
046534  052120  047111  020107
046542  047524  041440  042510
046550  045503  041440  042514
046556  051101  046440  051505
046564  020123  051106  046517
046572  053440  044522  042524
```

```
7991  046600  041440  042510  045503
7992  046606     000
7993  046607     101  052124  046505  EM306:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
7994  046614  052120  047111  020107
7995  046622  047524  041440  042510
7996  046630  045503  044040  040505
7997  046636  020104  042507  042516
7998  046644  040522  044524  047117
7999  046652  005015
8000  046654  044527  044124  053040          .ASCIZ  /WITH VARIOUS CYLINDER VALUES/
8001  046662  051101  047511  051525
8002  046670  041440  046131  047111
8003  046676  042504  020122  040526
8004  046704  052514  051505     000
8005  046711     101  052124  046505  EM307:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8006  046716  052120  047111  020107
8007  046724  047524  041440  042510
8008  046732  045503  044040  040505
8009  046740  020104  042507  042516
8010  046746  040522  044524  047117
8011  046754  005015
8012  046756  044527  044124  053040          .ASCIZ  /WITH VARIOUS TRACK VALUES/
8013  046764  051101  047511  051525
8014  046772  052040  040522  045503
8015  047000  053040  046101  042525
8016  047006  000123
8017  047010  052101  042524  050115  EM308:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8018  047016  044524  043516  052040
8019  047024  020117  044103  041505
8020  047032  020113  042510  042101
8021  047040  043440  047105  051105
8022  047046  052101  047511  006516
8023  047054     012
8024  047055     127  052111  020110          .ASCIZ  /WITH VARIOUS SECTOR VALUES/
8025  047062  040526  044522  052517
8026  047070  020123  042523  052103
8027  047076  051117  053040  046101
8028  047104  042525  000123
8029  047110  052101  042524  050115  EM309:  .ASCII  /ATTEMPTING TO CHECK HEAD GENERATION/<15><12>
8030  047116  044524  043516  052040
8031  047124  020117  044103  041505
8032  047132  020113  042510  042101
8033  047140  043440  047105  051105
8034  047146  052101  047511  006516
8035  047154     012
8036  047155     127  052111  020110          .ASCIZ  /WITH VARIOUS FORMAT VALUES/
8037  047162  040526  044522  052517
8038  047170  020123  047506  046522
8039  047176  052101  053040  046101
8040  047204  042525  000123
8041  047210  052101  042524  050115  EM310:  .ASCIZ  /ATTEMPTING TO CHECK NPR DATA TRANSFER FOR WRITE DATA/
8042  047216  044524  043516  052040
8043  047224  020117  044103  041505
8044  047232  020113  050116  020122
8045  047240  040504  040524  052040
8046  047246  040522  051516  042506
```

```
047254  020122  047506  020122
047262  051127  052111  020105
047270  040504  040524     000
047275     101  052124  046505  EM311:  .ASCIZ  /ATTEMPTING TO CHECK HEADER RECOGNITION/
047302  052120  047111  020107
047310  047524  041440  042510
047316  045503  044040  040505
047324  042504  020122  042522
047332  047503  047107  052111
047340  047511  000116
047344  052101  042524  050115  EM312:  .ASCIZ  /ATTEMPTING TO CHECK SECTOR INCREMENT/
[illegible]352  044524  043516  052040
[illegible]  020117  044103  041505
047[illegible]  [illegible]20113  042523  052103
04737[illegible]  [illegible]17  044440  041516
047402  04[illegible]  [illegible]515  052116
047410  [illegible]
047411     101  [illegible]  046505  EM313:  .ASCIZ  /ATTEMPTING TO CHECK TRACK INCREMENT/
047416  052120  047[illegible]  [illegible]20107
047424  047524  041440  [illegible]
047432  045503  052040  [illegible]
047440  045503  044440  04[illegible]
047446  042522  042515  05211[illegible]
047454     000
047455     101  052124  046505  EM314[illegible]  /ATTEMPTING TO CHECK CYLINDER INCREMENT/
047462  052120  047111  020107
047470  047524  041440  042510
047476  045503  041440  046131
047504  047111  042504  020122
047512  047111  051103  046505
047520  047105  000124
047524  052101  042524  050115  EM315:  .ASCII  /ATTEMPTING TO C[illegible]TOR PULSE DETECTION/<15><12>
047532  044524  043516  052040
047540  020117  044103  041505
047546  020113  042523  052103
047554  051117  050040  046125
047562  042523  042040  052105
047570  041505  044524  047117
047576  005015
047600  044527  044124  053440          .ASCIZ  /WITH WRITE DATA/
047606  044522  042524  042040
047614  052101  000101
047620  052101  042524  050115  EM316:  .ASCIZ  /ATTEMPTING TO FORCE BAD SECTOR ERROR/
047626  044524  043516  052040
047634  020117  047506  041522
047642  020105  040502  020104
047650  042523  052103  051117
047656  042440  051122  051117
047664     000
047665     101  052124  046505  EM317:  .ASCII  /ATTEMPTING TO FORCE HEADER VRC ERROR/<15><12>
047672  052120  047111  020107
047700  047524  043040  051117
047706  042503  044040  040505
047714  042504  020122  051126
047722  020103  051105  047522
047730  006522     012
```

```
8103  047733    127  052111  020110          .ASCIZ  /WITH BAD SECTOR PRESENT/
8104  047740 040502  020104  042523
8105  047746 052103  051117  050040
8106  047754 042522  042523  052116
8107  047762    000
8108  047763    101  052124  046505  EM318:  .ASCIZ  /ATTEMPTING TO FORCE HVRC ERROR/
8109  047770 052120  047111  020107
8110  047776 047524  043040  051117
8111  050004 042503  044040  051126
8112  050012 020103  051105  047522
8113  050020 000122
8114  050022 052101  042524  050115  EM319:  .ASCIZ  /ATTEMPTING TO FORCE OPERATION INCOMPLETE/
8115  050030 044524  043516  052040
8116  050036 020117  047506  041522
8117  050044 020105  050117  051105
8118  050052 052101  047511  020116
8119  050060 047111  047503  050115
8120  050066 042514  042524     000
8121  050073    101  052124  046505  EM320:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 37/
8122  050100 044520  043516  052040
8123  050106 020117  047506  041522
8124  050114 020105  050117  020111
8125  050122 044527  044124  044040
8126  050130 051126  020103  051105
8127  050136 047522  020122  047117
8128  050144 044040  040505  042504
8129  050152 020122  033463     000
8130  050157    101  052124  046505  EM321:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 36/
8131  050164 044520  043516  052040
8132  050172 020117  047506  041522
8133  050200 020105  050117  020111
8134  050206 044527  044124  044040
8135  050214 051126  020103  051105
8136  050222 047522  020122  047117
8137  050230 044040  040505  042504
8138  050236 020122  033063     000
8139  050243    101  052124  046505  EM322:  .ASCIZ  /ATTEMPING TO FORCE OPI WITH HVRC ERROR ON HEADER 0/
8140  050250 044520  043516  052040
8141  050256 020117  047506  041522
8142  050264 020105  050117  020111
8143  050272 044527  044124  044040
8144  050300 051126  020103  051105
8145  050306 047522  020122  047117
8146  050314 044040  040505  042504
8147  050322 020122  000060
8148  050326 044103  041505  044513  EM323:  .ASCIZ  /CHECKING HEADER RECOGNITION WITH PREVIOUS BAD SECTOR ERROR/
8149  050334 043516  044040  040505
8150  050342 042504  020122  042522
8151  050350 047503  047107  052111
8152  050356 047511  020116  044527
8153  050364 044124  050040  042522
8154  050372 044526  052517  020123
8155  050400 040502  020104  042523
8156  050406 052103  051117  042440
8157  050414 051122  051117     000
8158  050421    103  042510  045503  EM324:  .ASCIZ  /CHECKING HEADER RECOGNITION WITH PREVIOUS HEADER VRC ERROR/
```

```
8159  050426  047111  020107  042510
8160  050434  042101  051105  051040
8161  050442  041505  043517  044516
8162  050450  044524  047117  053440
8163  050456  052111  020110  051120
8164  050464  053105  047511  051525
8165  050472  044040  040505  042504
8166  050500  020122  051126  020103
8167  050506  051105  047522  000122
8168  050514  047506  041522  047111  EM325:  .ASCIZ  /FORCING BAD SECTOR ERROR WITH PREVIOUS HEADER VRC ERROR/
8169  050522  020107  040502  020104
8170  050530  042523  052103  051117
8171  050536  042440  051122  051117
8172  050544  053440  052111  020110
8173  050552  051120  053105  047511
8174  050560  051525  044040  040505
8175  050566  042504  020122  051126
8176  050574  020103  051105  047522
8177  050602  000122
8178  050604  047506  041522  047111  EM326:  .ASCIZ  /FORCING HEAD VRC ERROR WITH PREVIOUS BAD SECTOR ERROR/
8179  050612  020107  042510  042101
8180  050620  053040  041522  042440
8181  050626  051122  051117  053440
8182  050634  052111  020110  051120
8183  050642  053105  047511  051525
8184  050650  041040  042101  051440
8185  050656  041505  047524  020122
8186  050664  051105  047522  000122
8187  050672  052101  042524  050115  EM327:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH WITH WRITE DATA/
8188  050700  044524  043516  052040
8189  050706  020117  051127  052111
8190  050714  020105  054523  041516
8191  050722  020110  044527  044124
8192  050730  053440  044522  042524
8193  050736  042040  052101  000101
8194  050744  052101  042524  050115  EM328:  .ASCIZ  /ATTEMPTING TO WRITE DATA FIELD WITH WRITE DATA/
8195  050752  044524  043516  052040
8196  050760  020117  051127  052111
8197  050766  020105  040504  040524
8198  050774  043040  042511  042114
8199  051002  053440  052111  020110
8200  051010  051127  052111  020105
8201  051016  040504  040524      000
8202  051023      101  052124  046505  EM329:  .ASCIZ  /ATTEMPTING TO CHECK ECC PATTERN CLEARING/
8203  051030  052120  047111  020107
8204  051036  047524  041440  042510
8205  051044  045503  042440  041503
8206  051052  050040  052101  042524
8207  051060  047122  041440  042514
8208  051066  051101  047111  000107
8209  051074  052101  042524  050115  EM330:  .ASCIZ  /ATTEMPTING TO CHECK ECC GENERATION/
8210  051102  044524  043516  052040
8211  051110  020117  044103  041505
8212  051116  020113  041505  020103
8213  051124  042507  042516  040522
8214  051132  044524  047117      000
```

```
8215  051137  101  052124  046505  EM331:  .ASCIZ  /ATTEMPTING BAD SECTOR ERROR SETTING CONTROLLER ERROR/
8216  051144  052120  047111  020107
8217  051152  040502  020104  042523
8218  051160  052103  051117  042440
8219  051166  051122  051117  051440
8220  051174  052105  044524  043516
8221  051202  041440  047117  051124
8222  051210  046117  042514  020122
8223  051216  051105  047522  000122
8224  051224  052101  042524  050115  EM332:  .ASCIZ  /ATTEMPTING HEADER VRC ERROR SETTING CONTROLLER ERROR/
8225  051232  044524  043516  044040
8226  051240  040505  042504  020122
8227  051246  051126  020103  051105
8228  051254  047522  020122  042523
8229  051262  052124  047111  020107
8230  051270  047503  052116  047522
8231  051276  046114  051105  042440
8232  051304  051122  051117  000
8233  051311  101  052124  046505  EM333:  .ASCIZ  /ATTEMPTING TO WRITE ECC WORDS/
8234  051316  052120  047111  020107
8235  051324  047524  053440  044522
8236  051332  042524  042440  041503
8237  051340  053440  051117  051504
8238  051346  000
8239  051347  101  052124  046505  EM334:  .ASCIZ  /ATTEMPTING TO WRITE POSTAMBLE/
8240  051354  052120  047111  020107
8241  051362  047524  053440  044522
8242  051370  042524  050040  051517
8243  051376  040524  041115  042514
8244  051404  000
8245  051405  101  052124  046505  EM335:  .ASCIZ  /ATTEMPTING COMPLETE EXECUTION OF WRITE DATA/
8246  051412  052120  047111  020107
8247  051420  047503  050115  042514
8248  051426  042524  042440  042530
8249  051434  052503  044524  047117
8250  051442  047440  020106  051127
8251  051450  052111  020105  040504
8252  051456  040524  000
8253  051461  101  052124  046505  EM336:  .ASCIZ  /ATTEMPTING ERROR CLEAR WITH CONTROLLER CLEAR/
8254  051466  052120  047111  020107
8255  051474  051105  047522  020122
8256  051502  046103  040505  020122
8257  051510  044527  044124  041440
8258  051516  047117  051124  046117
8259  051524  042514  020122  046103
8260  051532  040505  000122
8261  051536  052101  042524  050115  EM337:  .ASCIZ  /ATTEMPTING PARTIAL SECTOR WRITE WITH ZERO FILL/
8262  051544  044524  043516  050040
8263  051552  051101  044524  046101
8264  051560  051440  041505  047524
8265  051566  020122  051127  052111
8266  051574  020105  044527  044124
8267  051602  055040  051105  020117
8268  051610  044506  046114  000
8269  051615  101  052124  046505  EM338:  .ASCIZ  /ATTEMPTING TO WRITE 18 BIT DATA FIELD WITH WRITE DATA/
8270  051622  052120  047111  020107
```

```
8271  051630  047524  053440  044522
8272  051636  042524  030440  020070
8273  051644  044502  020124  040504
8274  051652  040524  043040  042511
8275  051660  042114  053440  052111
8276  051666  020110  051127  052111
8277  051674  020105  040504  040524
8278  051702     000
8279  051703     101  052124  046505  EM339:  .ASCII  /ATTEMPTING TO WRITE BIT 16-17 OF 18 BIT/
8280  051710  052120  047111  020107
8281  051716  047524  053440  044522
8282  051724  042524  041040  052111
8283  051732  030440  026466  033461
8284  051740  047440  020106  034061
8285  051746  041040  052111
8286  051752  005015  040504  040524          .ASCIZ  <15><12>/DATA FIELD WITH WRITE DATA/
8287  051760  043040  042511  042114
8288  051766  053440  052111  020110
8289  051774  051127  052111  020105
8290  052002  040504  040524     000
8291  052007     101  052124  046505  EM340:  .ASCIZ  /ATTEMPTING WRITE DATA IN 18 BIT MODE/
8292  052014  052120  047111  020107
8293  052022  051127  052111  020105
8294  052030  040504  040524  044440
8295  052036  020116  034061  041040
8296  052044  052111  046440  042117
8297  052052  000105
8298  052054  051503  020061  047111  EM4000: .ASCIZ  /CS1 INCORRECT/
8299  052062  047503  051122  041505
8300  052070  000124
8301  052072  042515  051523  040440  EM4001: .ASCIZ  /MESS A INCORRECT/
8302  052100  044440  041516  051117
8303  052106  042522  052103     000
8304  052113     115  051505  020123  EM4002: .ASCIZ  /MESS B INCORRECT/
8305  052120  020102  047111  047503
8306  052126  051122  041505  000124
8307  052134  042510  042101  051105  EM4003: .ASCIZ  /HEADER WORD 1 INCORRECT/
8308  052142  053440  051117  020104
8309  052150  020061  047111  047503
8310  052156  051122  041505  000124
8311  052164  042510  042101  051105  EM4004: .ASCIZ  /HEADER WORD 2 INCORRECT/
8312  052172  053440  051117  020104
8313  052200  020062  047111  047503
8314  052206  051122  041505  000124
8315  052214  051503  020062  047111  EM4005: .ASCIZ  /CS2 INCORRECT/
8316  052222  047503  051122  041505
8317  052230  000124
8318  052232  051105  047522  020122  EM4006: .ASCIZ  /ERROR REG INCORRECT/
8319  052240  042522  020107  047111
8320  052246  047503  051122  041505
8321  052254  000124
8322  052256  052502  020123  042101  EM4007: .ASCIZ  /BUS ADDRESS INCORRECT/
8323  052264  051104  051505  020123
8324  052272  047111  047503  051122
8325  052300  041505  000124
8326  052304  047527  042122  041440  EM4008: .ASCIZ  /WORD COUNT INCORRECT/
```

```
8327  052312  052517  052116  044440
8328  052320  041516  051117  042522
8329  052326  052103     000
8330  052331     103  030523  044440  EM4009: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
8331  052336  041516  051117  042522
8332  052344  052103  040440  052106
8333  052352  051105  051040  040505
8334  052360  044504  043516  042040
8335  052366  052101  020101  052502
8336  052374  043106  051105     000
8337  052401     103  031123  044440  EM4010: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
8338  052406  041516  051117  042522
8339  052414  052103  040440  052106
8340  052422  051105  051040  040505
8341  052430  044504  043516  042040
8342  052436  052101  020101  052502
8343  052444  043106  051105     000
8344  052451     105  051122  051117  EM4011: .ASCIZ  /ERROR REG INCORRECT AFTER READING DATA BUFFER/
8345  052456  051040  043505  044440
8346  052464  041516  051117  042522
8347  052472  052103  040440  052106
8348  052500  051105  051040  040505
8349  052506  044504  043516  042040
8350  052514  052101  020101  052502
8351  052522  043106  051105     000
8352  052527     104  052101  020101  EM4012: .ASCIZ  /DATA READ FROM MEMORY INCORRECT/
8353  052534  042522  042101  043040
8354  052542  047522  020115  042515
8355  052550  047515  054522  044440
8356  052556  041516  051117  042522
8357  052564  052103     000
8358  052567     115  030522  044440  EM4013: .ASCIZ  /MR1 INCORRECT AFTER GAP IN WRITE DATA/
8359  052574  041516  051117  042522
8360  052602  052103  040440  052106
8361  052610  051105  043440  050101
8362  052616  044440  020116  051127
8363  052624  052111  020105  040504
8364  052632  040524     000
8365  052635     104  051511  020113  EM4014: .ASCIZ  /DISK ADDRESS REG. INCORRECT/
8366  052642  042101  051104  051505
8367  052650  020123  042522  027107
8368  052656  044440  041516  051117
8369  052664  042522  052103     000
8370  052671     103  046131  047111  EM4015: .ASCIZ  /CYLINDER ADDRESS REG. INCORRECT/
8371  052676  042504  020122  042101
8372  052704  051104  051505  020123
8373  052712  042522  027107  044440
8374  052720  041516  051117  042522
8375  052726  052103     000
8376  052731     115  030522  044440  EM4016: .ASCIZ  /MR1 INCORRECT/
8377  052736  041516  051117  042522
8378  052744  052103     000
8379  052747     105  041503  050040  EM4017: .ASCIZ  /ECC PAT REG INCORRECT/
8380  052754  052101  051040  043505
8381  052762  044440  041516  051117
8382  052770  042522  052103     000
```

```
 8383  052775     115  030522  044440  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISION OF MAINT CLOCK/
 8384  053002  041516  051117  042522
 8385  053010  052103  047440  020116
 8386  053016  051461  020124  047504
 8387  053024  047127  040527  042122
 8388  053032  052040  040522  051516
 8389  053040  051511  047511  020116
 8390  053046  043117  046440  044501
 8391  053054  052116  041440  047514
 8392  053062  045503     000
 8393  053065     115  030522  044440  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSITION OF MAINT CLOCK/
 8394  053072  041516  051117  042522
 8395  053100  052103  047440  020116
 8396  053106  047062  020104  047504
 8397  053114  047127  040527  042122
 8398  053122  052040  040522  051516
 8399  053130  052111  047511  020116
 8400  053136  043117  046440  044501
 8401  053144  052116  041440  047514
 8402  053152  045503     000
```

```
                                .SBTTL  DATA BUFFERS

                        053156  .EVEN
053156                  NPRBUF:
053156  000     000             .BYTE   0,0
053160  001     001             .BYTE   1,1
053162  002     002             .BYTE   2,2
053164  003     003             .BYTE   3,3
053166  004     004             .BYTE   4,4
053170  005     005             .BYTE   5,5
053172  006     006             .BYTE   6,6
053174  007     007             .BYTE   7,7
053176  010     010             .BYTE   10,10
053200  011     011             .BYTE   11,11
053202  012     012             .BYTE   12,12
053204  013     013             .BYTE   13,13
053206  014     014             .BYTE   14,14
053210  015     015             .BYTE   15,15
053212  016     016             .BYTE   16,16
053214  017     017             .BYTE   17,17
053216  020     020             .BYTE   20,20
053220  021     021             .BYTE   21,21
053222  022     022             .BYTE   22,22
053224  023     023             .BYTE   23,23
053226  024     024             .BYTE   24,24
053230  025     025             .BYTE   25,25
053232  026     026             .BYTE   26,26
053234  027     027             .BYTE   27,27
053236  030     030             .BYTE   30,30
053240  031     031             .BYTE   31,31
053242  032     032             .BYTE   32,32
053244  033     033             .BYTE   33,33
053246  034     034             .BYTE   34,34
053250  035     035             .BYTE   35,35
053252  036     036             .BYTE   36,36
053254  037     037             .BYTE   37,37
053256  040     040             .BYTE   40,40
053260  041     041             .BYTE   41,41
053262  042     042             .BYTE   42,42
053264  043     043             .BYTE   43,43
053266  044     044             .BYTE   44,44
053270  045     045             .BYTE   45,45
053272  046     046             .BYTE   46,46
053274  047     047             .BYTE   47,47
053276  050     050             .BYTE   50,50
053300  051     051             .BYTE   51,51
053302  052     052             .BYTE   52,52
053304  053     053             .BYTE   53,53
053306  054     054             .BYTE   54,54
053310  055     055             .BYTE   55,55
053312  056     056             .BYTE   56,56
053314  057     057             .BYTE   57,57
053316  060     060             .BYTE   60,60
053320  061     061             .BYTE   61,61
053322  062     062             .BYTE   62,62
053324  063     063             .BYTE   63,63
```

```
 8459  053326      064     064                    .BYTE   64,64
 8460  053330      065     065                    .BYTE   65,65
 8461  053332      066     066                    .BYTE   66,66
 8462  053334      067     067                    .BYTE   67,67
 8463  053336      070     070                    .BYTE   70,70
 8464  053340      071     071                    .BYTE   71,71
 8465  053342      072     072                    .BYTE   72,72
 8466  053344      073     073                    .BYTE   73,73
 8467  053346      074     074                    .BYTE   74,74
 8468  053350      075     075                    .BYTE   75,75
 8469  053352      076     076                    .BYTE   76,76
 8470  053354      077     077                    .BYTE   77,77
 8471  053356      100     100                    .BYTE   100,100
 8472  053360      101     101                    .BYTE   101,101
 8473  053362      102     102                    .BYTE   102,102
 8474  053364      103     103                    .BYTE   103,103
 8475  053366   000000                 HEAD1:     .WORD   000000
 8476  053370   140000                            .WORD   140000
 8477  053372   140000                            .WORD   140000
 8478  053374   000000                 HEAD2:     .WORD   000000
 8479  053376   040000                            .WORD   040000
 8480  053400   040000                            .WORD   040000
 8481  053402   000000                 HEAD3:     .WORD   000000
 8482  053404   100000                            .WORD   100000
 8483  053406   100000                            .WORD   100000
 8484  053410   000300                 HEAD4:     .WORD   000300
 8485  053412   040057                            .WORD   040057
 8486  053414   040356                            .WORD   040356
 8487  053416   000100                 HEAD5:     .WORD   000100
 8488  053420   040000                            .WORD   040000
 8489  053422   040100                            .WORD   040100
 8490  053424   000100                            .WORD   000100
 8491  053426   140001                            .WORD   140001
 8492  053430   140101                            .WORD   140101
 8493  053432   000200                 HEAD6:     .WORD   000200
 8494  053434   140000                            .WORD   140000
 8495  053436   140000                            .WORD   140000
 8496  053440   000200                            .WORD   000200
 8497  053442   140001                            .WORD   140001
 8498  053444   140201                            .WORD   140201
 8499  053446   000400                 HEAD7:     .WORD   000400
 8500  053450   140000                            .WORD   140000
 8501  053452   140000                            .WORD   140000
 8502  053454   000400                            .WORD   000400
 8503  053456   040001                            .WORD   040001
 8504  053460   040401                            .WORD   040401
 8505  053462   000140                 HEAD8:     .WORD   000140
 8506  053464   040000                            .WORD   040000
 8507  053466   040140                            .WORD   040140
 8508  053470   000140                            .WORD   000140
 8509  053472   140001                            .WORD   140001
 8510  053474   140101                            .WORD   140101
 8511  053476   000300                 HEAD10:    .WORD   000300
 8512  053500   140000                            .WORD   140000
 8513  053502   140000                            .WORD   140000
 8514  053504   000000                 HEAD11:    .WORD   000000
```

```
8515   053506   141000                          .WORD   141000
8516   053510   141000                          .WORD   141000
8517   053512   000000  000000  000000  ECC1:   .WORD   0,0,0,0,0,0,0,0
8518   053520   000000  000000  000000
8519   053526   000000  000000
8520   053532   005001                  ECC2:   .WORD   005001
8521   053534   040040                          .WORD   040040
8522   053536   020004                          .WORD   020004
8523   053540   000064                          .WORD   000064
8524   053542   000000                          .WORD   000000
8525   053544   000000                          .WORD   000000
8526   053546   000000                          .WORD   000000
8527   053550   000000                          .WORD   000000
8528   053552   177777                  ECC3:   .WORD   177777
8529   053554   177777                          .WORD   177777
8530   053556   177777                          .WORD   177777
8531   053560   177777                          .WORD   177777
8532   053562   177777                          .WORD   177777
8533   053564   177777                          .WORD   177777
8534   053566   177777                          .WORD   177777
8535   053570   177777                          .WORD   177777
8536   053572   177777                          .WORD   177777
8537   053574   177777                          .WORD   177777
8538   053576   001252                  OPI1:   .WORD   001252
8539   053600   141123                          .WORD   141123
8540   053602   140371                          .WORD   140371
8541   053604   001251                          .WORD   001251
8542   053606   141123                          .WORD   141123
8543   053610   140372                          .WORD   140372
8544   053612   001257                          .WORD   001257
8545   053614   141123                          .WORD   141123
8546   053616   140374                          .WORD   140374
8547   053620   001243                          .WORD   001243
8548   053622   141123                          .WORD   141123
8549   053624   140360                          .WORD   140360
8550   053626   001273                          .WORD   001273
8551   053630   141123                          .WORD   141123
8552   053632   140350                          .WORD   140350
8553   053634   001213                          .WORD   001213
8554   053636   141123                          .WORD   141123
8555   053640   140330                          .WORD   140330
8556   053642   001353                          .WORD   001353
8557   053644   141123                          .WORD   141123
8558   053646   140270                          .WORD   140270
8559   053650   001053                          .WORD   001053
8560   053652   141123                          .WORD   141123
8561   053654   140170                          .WORD   140170
8562   053656   001653                          .WORD   001653
8563   053660   141123                          .WORD   141123
8564   053662   140770                          .WORD   140770
8565   053664   000253                          .WORD   000253
8566   053666   141123                          .WORD   141123
8567   053670   141370                          .WORD   141370
8568   053672   003253                          .WORD   003253
8569   053674   141123                          .WORD   141123
8570   053676   142370                          .WORD   142370
```

```
 8571  053700  005253                    .WORD   005253
 8572  053702  141123                    .WORD   141123
 8573  053704  144370                    .WORD   144370
 8574  053706  011253                    .WORD   011253
 8575  053710  141123                    .WORD   141123
 8576  053712  150370                    .WORD   150370
 8577  053714  021253                    .WORD   021253
 8578  053716  141123                    .WORD   141123
 8579  053720  160370                    .WORD   160370
 8580  053722  041253                    .WORD   041253
 8581  053724  141123                    .WORD   141123
 8582  053726  100370                    .WORD   100370
 8583  053730  101253                    .WORD   101253
 8584  053732  141123                    .WORD   141123
 8585  053734  040370                    .WORD   040370
 8586  053736  001253                    .WORD   001253
 8587  053740  141122                    .WORD   141122
 8588  053742  140371                    .WORD   140371
 8589  053744  001253                    .WORD   001253
 8590  053746  141121                    .WORD   141121
 8591  053750  140372                    .WORD   140372
 8592  053752  001253                    .WORD   001253
 8593  053754  141127                    .WORD   141127
 8594  053756  140374                    .WORD   140374
 8595  053760  001253                    .WORD   001253
 8596  053762  141133                    .WORD   141133
 8597  053764  140360                    .WORD   140360
 8598  053766  001253                    .WORD   001253
 8599  053770  141103                    .WORD   141103
 8600  053772  140350                    .WORD   140350
 8601  053774  001253                    .WORD   001253
 8602  053776  141163                    .WORD   141163
 8603  054000  140330                    .WORD   140330
 8604  054002  001253                    .WORD   001253
 8605  054004  141023                    .WORD   141023
 8606  054006  140270                    .WORD   140270
 8607  054010  001253                    .WORD   001253
 8608  054012  141323                    .WORD   141323
 8609  054014  140170                    .WORD   140170
 8610  054016  001253                    .WORD   001253
 8611  054020  141523                    .WORD   141523
 8612  054022  140770                    .WORD   140770
 8613  054024  001253                    .WORD   001253
 8614  054026  140123                    .WORD   140123
 8615  054030  141370                    .WORD   141370
 8616  054032  001253                    .WORD   001253
 8617  054034  143123                    .WORD   143123
 8618  054036  142370                    .WORD   142370
 8619  054040  001253                    .WORD   001253
 8620  054042  145123                    .WORD   145123
 8621  054044  144370                    .WORD   144370
 8622  054046  001253                    .WORD   001253
 8623  054050  151123                    .WORD   151123
 8624  054052  150370                    .WORD   150370
 8625  054054  001253                    .WORD   001253
 8626  054056  161123                    .WORD   161123
```

```
 8627  054060  160370                          .WORD   160370
 8628  054062  001250                          .WORD   001250
 8629  054064  141123                          .WORD   141123
 8630  054066  140373                          .WORD   140373
 8631  054070  141253                          .WORD   141253
 8632  054072  141123                          .WORD   141123
 8633  054074  000370                          .WORD   000370
 8634  054076  000240                  OPI2:   .WORD   000240
 8635  054100  140000                          .WORD   140000
 8636  054102  140240                          .WORD   140240
 8637  054104  000240                          .WORD   000240
 8638  054106  140000                          .WORD   140000
 8639  054110  140240                          .WORD   140240
 8640  054112  000240                          .WORD   000240
 8641  054114  140000                          .WORD   140000
 8642  054116  140240                          .WORD   140240
 8643  054120  000240                          .WORD   000240
 8644  054122  140000                          .WORD   140000
 8645  054124  140240                          .WORD   140240
 8646  054126  000240                          .WORD   000240
 8647  054130  140000                          .WORD   140000
 8648  054132  140240                          .WORD   140240
 8649  054134  000240                          .WORD   000240
 8650  054136  140000                          .WORD   140000
 8651  054140  140240                          .WORD   140240
 8652  054142  000240                          .WORD   000240
 8653  054144  140000                          .WORD   140000
 8654  054146  140240                          .WORD   140240
 8655  054150  000240                          .WORD   000240
 8656  054152  140000                          .WORD   140000
 8657  054154  140240                          .WORD   140240
 8658  054156  000240                          .WORD   000240
 8659  054160  140000                          .WORD   140000
 8660  054162  140240                          .WORD   140240
 8661  054164  000240                          .WORD   000240
 8662  054166  140000                          .WORD   140000
 8663  054170  140240                          .WORD   140240
 8664  054172  000240                          .WORD   000240
 8665  054174  140000                          .WORD   140000
 8666  054176  140240                          .WORD   140240
 8667  054200  000240                          .WORD   000240
 8668  054202  140000                          .WORD   140000
 8669  054204  140240                          .WORD   140240
 8670  054206  000240                          .WORD   000240
 8671  054210  140000                          .WORD   140000
 8672  054212  140240                          .WORD   140240
 8673  054214  000240                          .WORD   000240
 8674  054216  140000                          .WORD   140000
 8675  054220  140240                          .WORD   140240
 8676  054222  000240                          .WORD   000240
 8677  054224  140000                          .WORD   140000
 8678  054226  140240                          .WORD   140240
 8679  054230  000240                          .WORD   000240
 8680  054232  140000                          .WORD   140000
 8681  054234  140240                          .WORD   140240
 8682  054236  000240                          .WORD   000240
```

```
 8683  054240  140000                          .WORD   140000
 8684  054242  140240                          .WORD   140240
 8685  054244  000240                          .WORD   000240
 8686  054246  140000                          .WORD   140000
 8687  054250  140240                          .WORD   140240
 8688  054252  000240                          .WORD   000240
 8689  054254  140000                          .WORD   140000
 8690  054256  140240                          .WORD   140240
 8691  054260  000240                          .WORD   000240
 8692  054262  140000                          .WORD   140000
 8693  054264  140240                          .WORD   140240
 8694  054266  000240                          .WORD   000240
 8695  054270  140000                          .WORD   140000
 8696  054272  140240                          .WORD   140240
 8697  054274  000240                          .WORD   000240
 8698  054276  140000                          .WORD   140000
 8699  054300  140240                          .WORD   140240
 8700  054302  000240                          .WORD   000240
 8701  054304  140000                          .WORD   140000
 8702  054306  140240                          .WORD   140240
 8703  054310  000240                          .WORD   000240
 8704  054312  140000                          .WORD   140000
 8705  054314  140240                          .WORD   140240
 8706  054316  000240                          .WORD   000240
 8707  054320  140000                          .WORD   140000
 8708  054322  140240                          .WORD   140240
 8709  054324  000240                          .WORD   000240
 8710  054326  140000                          .WORD   140000
 8711  054330  140240                          .WORD   140240
 8712  054332  000240                          .WORD   000240
 8713  054334  140000                          .WORD   140000
 8714  054336  140240                          .WORD   140240
 8715  054340  000240                          .WORD   000240
 8716  054342  140000                          .WORD   140000
 8717  054344  140240                          .WORD   140240
 8718  054346  000240                          .WORD   000240
 8719  054350  140000                          .WORD   140000
 8720  054352  140240                          .WORD   140240
 8721  054354  000240                          .WORD   000240
 8722  054356  140000                          .WORD   140000
 8723  054360  140240                          .WORD   140240
 8724  054362  000240                          .WORD   000240
 8725  054364  140000                          .WORD   140000
 8726  054366  140040                          .WORD   140040
 8727  054370  000240                          .WORD   000240
 8728  054372  140000                          .WORD   140000
 8729  054374  140040                          .WORD   140040
 8730  054376  000300                  OPI3:   .WORD   000300
 8731  054400  140000                          .WORD   140000
 8732  054402  140300                          .WORD   140300
 8733  054404  000300                          .WORD   000300
 8734  054406  140000                          .WORD   140000
 8735  054410  140300                          .WORD   140300
 8736  054412  000300                          .WORD   000300
 8737  054414  140000                          .WORD   140000
 8738  054416  140300                          .WORD   140300
```

J13


```
 8739  054420  000300                    .WORD   000300
 8740  054422  140000                    .WORD   140000
 8741  054424  140300                    .WORD   140300
 8742  054426  000300                    .WORD   000300
 8743  054430  140000                    .WORD   140000
 8744  054432  140300                    .WORD   140300
 8745  054434  000300                    .WORD   000300
 8746  054436  140000                    .WORD   140000
 8747  054440  140300                    .WORD   140300
 8748  054442  000300                    .WORD   000300
 8749  054444  140000                    .WORD   140000
 8750  054446  140300                    .WORD   140300
 8751  054450  000300                    .WORD   000300
 8752  054452  140000                    .WORD   140000
 8753  054454  140300                    .WORD   140300
 8754  054456  000300                    .WORD   000300
 8755  054460  140000                    .WORD   140000
 8756  054462  140300                    .WORD   140300
 8757  054464  000300                    .WORD   000300
 8758  054466  140000                    .WORD   140000
 8759  054470  140300                    .WORD   140300
 8760  054472  000300                    .WORD   000300
 8761  054474  140000                    .WORD   140000
 8762  054476  140300                    .WORD   140300
 8763  054500  000300                    .WORD   000300
 8764  054502  140000                    .WORD   140000
 8765  054504  140300                    .WORD   140300
 8766  054506  000300                    .WORD   000300
 8767  054510  140000                    .WORD   140000
 8768  054512  140300                    .WORD   140300
 8769  054514  000300                    .WORD   000300
 8770  054516  140000                    .WORD   140000
 8771  054520  140300                    .WORD   140300
 8772  054522  000300                    .WORD   000300
 8773  054524  140000                    .WORD   140000
 8774  054526  140300                    .WORD   140300
 8775  054530  000300                    .WORD   000300
 8776  054532  140000                    .WORD   140000
 8777  054534  140300                    .WORD   140300
 8778  054536  000300                    .WORD   000300
 8779  054540  140000                    .WORD   140000
 8780  054542  140300                    .WORD   140300
 8781  054544  000300                    .WORD   000300
       054546  140000                    .WORD   140000
               140300                    .WORD   140300
               000300                    .WORD   000300
 8785                                    .WORD   140000
 8786  054556                            .WORD   140300
 8787  054560  000300                    .WORD   000300
 8788  054562  140000                    .WORD   140000
 8789  054564  140300                    .WORD   140300
 8790  054566  000300                    .WORD   000300
 8791  054570  140000                    .WORD   140000
 8792  054572  140300                    .WORD   140300
 8793  054574  000300                    .WORD   000300
 8794  054576  140000                    .WORD   140000
```

```
 8795  054600  140300                          .WORD   140300
 8796  054602  000300                          .WORD   000300
 8797  054604  140000                          .WORD   140000
 8798  054606  140300                          .WORD   140300
 8799  054610  000300                          .WORD   000300
 8800  054612  140000                          .WORD   140000
 8801  054614  140300                          .WORD   140300
 8802  054616  000300                          .WORD   000300
 8803  054620  140000                          .WORD   140000
 8804  054622  140300                          .WORD   140300
 8805  054624  000300                          .WORD   000300
 8806  054626  140000                          .WORD   140000
 8807  054630  140300                          .WORD   140300
 8808  054632  000300                          .WORD   000300
 8809  054634  140000                          .WORD   140000
 8810  054636  140300                          .WORD   140300
 8811  054640  000300                          .WORD   000300
 8812  054642  140000                          .WORD   140000
 8813  054644  140300                          .WORD   140300
 8814  054646  000300                          .WORD   000300
 8815  054650  140000                          .WORD   140000
 8816  054652  140300                          .WORD   140300
 8817  054654  000300                          .WORD   000300
 8818  054656  140000                          .WORD   140000
 8819  054660  140300                          .WORD   140300
 8820  054662  000300                          .WORD   000300
 8821  054664  140000                          .WORD   140000
 8822  054666  140200                          .WORD   140200
 8823  054670  000300                          .WORD   000300
 8824  054672  140000                          .WORD   140000
 8825  054674  140300                          .WORD   140300
 8826  054676  000040              OPI4:       .WORD   000040
 8827  054700  140000                          .WORD   140000
 8828  054702  140000                          .WORD   140000
 8829  054704  000040                          .WORD   000040
 8830  054706  140000                          .WORD   140000
 8831  054710  140040                          .WORD   140040
 8832  054712  000040                          .WORD   000040
 8833  054714  140000                          .WORD   140000
 8834  054716  140040                          .WORD   140040
 8835  054720  000040                          .WORD   000040
 8836  054722  140000                          .WORD   140000
 8837  054724  140040                          .WORD   140040
 8838  054726  000040                          .WORD   000040
 8839  054730  140000                          .WORD   140000
 8840  054732  140040                          .WORD   140040
 8841  054734  000040                          .WORD   000040
 8842  054736  140000                          .WORD   140000
 8843  054740  140040                          .WORD   140040
 8844  054742  000040                          .WORD   000040
 8845  054744  140000                          .WORD   140000
 8846  054746  140040                          .WORD   140040
 8847  054750  000040                          .WORD   000040
 8848  054752  140000                          .WORD   140000
 8849  054754  140040                          .WORD   140040
 8850  054756  000040                          .WORD   000040
```

```
 8851  054760  140000                .WORD   140000
 8852  054762  140040                .WORD   140040
 8853  054764  000040                .WORD   000040
 8854  054766  140000                .WORD   140000
 8855  054770  140040                .WORD   140040
 8856  054772  000040                .WORD   000040
 8857  054774  140000                .WORD   140000
 8858  054776  140040                .WORD   140040
 8859  055000  000040                .WORD   000040
 8860  055002  140000                .WORD   140000
 8861  055004  140040                .WORD   140040
 8862  055006  000040                .WORD   000040
 8863  055010  140000                .WORD   140000
 8864  055012  140040                .WORD   140040
 8865  055014  000040                .WORD   000040
 8866  055016  140000                .WORD   140000
 8867  055020  140040                .WORD   140040
 8868  055022  000040                .WORD   000040
 8869  055024  140000                .WORD   140000
 8870  055026  140040                .WORD   140040
 8871  055030  000040                .WORD   000040
 8872  055032  140000                .WORD   140000
 8873  055034  140040                .WORD   140040
 8874  055036  000040                .WORD   000040
 8875  055040  140000                .WORD   140000
 8876  055042  140040                .WORD   140040
 8877  055044  000040                .WORD   000040
 8878  055046  140000                .WORD   140000
 8879  055050  140040                .WORD   140040
 8880  055052  000040                .WORD   000040
 8881  055054  140000                .WORD   140000
 8882  055056  140040                .WORD   140040
 8883  055060  000040                .WORD   000040
 8884  055062  140000                .WORD   140000
 8885  055064  140040                .WORD   140040
 8886  055066  000040                .WORD   000040
 8887  055070  140000                .WORD   140000
 8888  055072  140040                .WORD   140040
 8889  055074  000040                .WORD   000040
 8890  055076  140000                .WORD   140000
 8891  055100  140040                .WORD   140040
 8892  055102  000040                .WORD   000040
 8893  055104  140000                .WORD   140000
 8894  055106  140040                .WORD   140040
 8895  055110  000040                .WORD   000040
 8896  055112  140000                .WORD   140000
 8897  055114  140040                .WORD   140040
 8898  055116  000040                .WORD   000040
 8899  055120  140000                .WORD   140000
 8900  055122  140040                .WORD   140040
 8901  055124  000040                .WORD   000040
 8902  055126  140000                .WORD   140000
 8903  055130  140040                .WORD   140040
 8904  055132  000040                .WORD   000040
 8905  055134  140000                .WORD   140000
 8906  055136  140040                .WORD   140040
```

```
 8907  055140  000040                          .WORD   000040
 8908  055142  140000                          .WORD   140000
 8909  055144  140040                          .WORD   140040
 8910  055146  000040                          .WORD   000040
 8911  055150  140000                          .WORD   140000
 8912  055152  140040                          .WORD   140040
 8913  055154  000040                          .WORD   000040
 8914  055156  140000                          .WORD   140000
 8915  055160  140040                          .WORD   140040
 8916  055162  000040                          .WORD   000040
 8917  055164  140000                          .WORD   140000
 8918  055166  140040                          .WORD   140040
 8919  055170  000040                          .WORD   000040
 8920  055172  140000                          .WORD   140000
 8921  055174  140040                          .WORD   140040
 8922  055176  001253                  VRCHDR: .WORD   001253
 8923  055200  141123                          .WORD   141123
 8924  055202  140370                          .WORD   140370
 8925  055204  177777  177777  177777  MOD2BF: .WORD   177777,177777,177777,177777,177777,177777
 8926  055212  177777  177777  177777
 8927  055220  000400                  BUFF:   .BLKW   400
 8928  056220  125252  125252  125252  ECCBUF: .WORD   125252,125252,125252,125252,125252,125252
 8929  056226  125252  125252  125252
 8930  056234  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
 8931  056242  177777  177777  177777
 8932  056250  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
 8933  056256  177777  000000  000000
 8934  056264  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000
 8935  056272  000000  000000  000000
 8936  056300  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
 8937  056306  025252  052525  052525
 8938  056314  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
 8939  056322  150442  064221  132110
 8940  056330  055044  026422  013211          .WORD   055044,026422,013211,105504,042642,021321
 8941  056336  105504  042642  021321
 8942  056344  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
 8943  056352  011055  104426  042213
 8944  056360  133333  066666  155555          .WORD   133333,066666,155555,155555,133333,066666
 8945  056366  155555  133333  066666
 8946  056374  066666  155555  155555          .WORD   066666,155555,155555,133333,133333,133333
 8947  056402  133333  133333  133333
 8948  056410  133333  133333  133333          .WORD   133333,133333,133333,133333,177777,177777
 8949  056416  133333  177777  177777
 8950  056424  177777  052525  052525          .WORD   177777,052525,052525,052525,177777,177777
 8951  056432  052525  177777  177777
 8952  056440  052525  052525  177777          .WORD   052525,052525,177777,052525,177252,177252
 8953  056446  052525  177252  177252
 8954  056454  172765  172765  072307          .WORD   172765,172765,072307,135143,156461,167230
 8955  056462  135143  156461  167230
 8956  056470  073514  035646  016723          .WORD   073514,035646,016723,107351,143564,061672
 8957  056476  107351  143564  061672
 8958  056504  030735  114356  046167          .WORD   030735,114356,046167,123073,151453,164616
 8959  056512  123073  151453  164616
 8960  056520  125252  125252  125252          .WORD   125252,125252,125252,125252,125252,125252
 8961  056526  125252  125252  125252
 8962  056534  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
```

```
 8963  056542  177777  177777  177777
 8964  056550  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
 8965  056556  177777  000000  000000
 8966  056564  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000
 8967  056572  000000  000000  000000
 8968  056600  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
 8969  056606  025252  052525  052525
 8970  056614  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
 8971  056622  150442  064221  132110
 8972  056630  055044  026422  013211          .WORD   055044,026422,013211,105504,042642,021321
 8973  056636  105504  042642  021321
 8974  056644  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
 8975  056652  011055  104426  042213
 8976  056660  133333  066666  155555          .WORD   133333,066666,155555,155555,133333,066666
 8977  056666  155555  133333  066666
 8978  056674  066666  155555  155555          .WORD   066666,155555,155555,133333,133333,133333
 8979  056702  133333  133333  133333
 8980  056710  133333  133333  133333          .WORD   133333,133333,133333,133333,177777,177777
 8981  056716  133333  177777  177777
 8982  056724  177777  052525  052525          .WORD   177777,052525,052525,052525,177777,177777
 8983  056732  052525  177777  177777
 8984  056740  052525  052525  177777          .WORD   052525,052525,177777,052525,177252,177252
 8985  056746  052525  177252  177252
 8986  056754  172765  172765  072307          .WORD   172765,172765,072307,135143,156461,167230
 8987  056762  135143  156461  167230
 8988  056770  073514  035646  016723          .WORD   073514,035646,016723,107351,143564,061672
 8989  056776  107351  143564  061672
 8990  057004  030735  114356  046167          .WORD   030735,114356,046167,123073,151453,164616
 8991  057012  123073  151453  164616
 8992  057020  125252  125252  125252          .WORD   125252,125252,125252,125252,125252,125252
 8993  057026  125252  125252  125252
 8994  057034  125252  125252  177777          .WORD   125252,125252,177777,177777,177777,177777
 8995  057042  177777  177777  177777
 8996  057050  177777  177777  177777          .WORD   177777,177777,177777,177777,000000,000000
 8997  057056  177777  000000  000000
 8998  057064  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000
 8999  057072  000000  000000  000000
 9000  057100  052525  052525  052525          .WORD   052525,052525,052525,025252,052525,052525
 9001  057106  025252  052525  052525
 9002  057114  052525  052525  121105          .WORD   052525,052525,121105,150442,064221,132110
 9003  057122  150442  064221  132110
 9004  057130  055044  026422  013211          .WORD   055044,026422,013211,105504,042642,021321
 9005  057136  105504  042642  021321
 9006  057144  110550  044264  022132          .WORD   110550,044264,022132,011055,104426,042213
 9007  057152  011055  104426  042213
 9008  057160  177777  177777  177777          .WORD   177777,177777,177777,177777,177777,177777
 9009  057166  177777  177777  177777
 9010  057174  177777  177777  177777          .WORD   177777,177777,177777,177777,177777,177777
 9011  057202  177777  177777  177777
 9012  057210  177777  177777  177777          .WORD   177777,177777,177777,177777
 9013  057216  177777
 9014  057220  177777  177777  177777  BADPAR: .WORD   177777,177777,177777,177777,177777,177777
 9015  057226  177777  177777  177777
 9016          000001                  .END
```

```
ABASE = 177440          1021#   1330    1371
ABORT   043756          6504    7731#
ACDW1 = 000000          1330    1373
ACDW2 = 000000          1330    1374
ACLO  = 000010          1116#
ACPUOP= 000000          1330    1345
ADDW0 = 000000          1330
ADDW1 = 000000          1330
ADDW10= 000000          1330
ADDW11= 000000          1330
ADDW12= 000000          1330
ADDW13= 000000          1330
ADDW14= 000000          1330
ADDW15= 000000          1330
ADDW2 = 000000          1330
ADDW3 = 000000          1330
ADDW4 = 000000          1330
ADDW5 = 000000          1330
ADDW6 = 000000          1330
ADDW7 = 000000          1330
ADDW8 = 000000          1330
ADDW9 = 000000          1330
ADEVCT= 000000          1330    1336
ADEVM = 000000          1330    1372
AENV  = 000000          1330    1341
AENVM = 000000          1330    1342
AFATAL= 000000          1330    1333
AMADR1= 000000          1330    1358
AMADR2= 000000          1330    1362
AMADR3= 000000          1330    1365
AMADR4= 000000          1330    1368
AMAMS1= 000000          1330    1352
AMAMS2= 000000          1330    1360
AMAMS3= 000000          1330    1363
AMAMS4= 000000          1330    1366
AMSGAD= 000000          1330    1338
AMSGLG= 000000          1330    1339
AMSGTY= 000000          1330    1332
AMTYP1= 000000          1330    1353
AMTYP2= 000000          1330    1361
AMTYP3= 000000          1330    1364
AMTYP4= 000000          1330    1367
APASS = 000000          1330    1335
APRIOR= 000240          1020#   1330
APTCSU= 000040          6777#   6863
APTENV= 000001          6733    6775#   6809    6856
APTSIZ= 000200          2223    6774#
APTSPO= 000100          6735    6776#   6858
ASWREG= 000000          1330    1343
ATESTN= 000000          1330    1334
AUNIT = 000000          1330    1337
AUSWR = 000000          1330    1344
AVECT1= 000210          1019#   1330    1369
AVECT2= 000000          1330    1370
BADPAR  057220          5774    5788    5900    9014#
BAI   = 000020          1079#
```

```
BA16  = 000400          1064#
BA17  = 001000          1065#
BITCNT  003262          2154#  2938*  2944*  2952*  2968*  4962*  4966*  4972*  4994*  5074*  5078*  5084*  5108*
                        5188*  5192*  5198*  5222*  5294*  5299*  5308*  5329*  5340*  5356*  5367*  5375*  5487*
                        5492*  5501*  5522*  5537*  5553*  5564*  5572*  5691*  5695*  5703*  5726*  5840*  5844*
                        5852*  5875*  5980*  5984*  5992*  6015*  6049*  6064*  6085*  6091*  6099*  7492   7522
BIT0  = 000001          1000#  1061   1094   1113
BIT00 = 000001           990#  1000
BIT01 = 000002           989#   999
BIT02 = 000004           988#   998
BIT03 = 000010           987#   997
BIT04 = 000020           986#   996
BIT05 = 000040           985#   995
BIT06 = 000100           984#   994
BIT07 = 000200           983#   993
BIT08 = 000400           982#   992   6339
BIT09 = 001000           981#   991   6357   6820
BIT1  = 000002           999#  1095
BIT10 = 002000           980#  1066   1085   1104   1137   1152   1208   1223   6599   6601   6797
BIT11 = 004000           979#  1067   1086   1105   1122   1138   1153   1209   1224   6364
BIT12 = 010000           978#  1069   1087   1106   1139   1210
BIT13 = 020000           977#  1070   1088   1107   1123   1140   1211   6595   6597   6804
BIT14 = 040000           976#  1071   1089   1108   1124   1141   1212   6325
BIT15 = 100000           975#  1072   1073   1090   1109   1125   1142   1213
BIT2  = 000004           998#  1096   1115
BIT3  = 000010           997#  1078   1097   1116
BIT4  = 000020           996#  1079   1098   1117   1131   1146   1217   6595   6597
BIT5  = 000040           995#  1080   1099   1118   1132   1147   1218
BIT6  = 000100           994#  1062   1081   1100   1119   1133   1148   1204   1219
BIT7  = 000200           993#  1063   1082   1101   1120   1134   1149   1205   1220
BIT8  = 000400           992#  1064   1083   1102   1121   1135   1150   1206   1221   6599   6601
BIT9  = 001000           991#  1065   1084   1103   1136   1151   1207   1222   6564
BPTVEC= 000014          1007#
BSE   = 000200          1101#  3381   3463   4061   4605
BUFF    055220          2326   2372   2419   2465   2511   2558   2616   2673   2727   2782   2925   3016   3095
                        3176   3257   3336   3418   3496   3617   3700   3787   3890   3994   4098   4203   4329
                        4448   4552   4642   4732   4822   8927#
CALHDR  036010          2612   2669   2723   2778   6544#
CCLR  = 100000          1073#  2323   2346   2369   2392   2416   2439   2462   2485   2508   2531   2555   2578
                        2613   2631   2670   2688   2724   2742   2779   2797   2829   2852   2882   2922   3010
                        3090   3171   3252   3331   3413   3491   3572   3605   3695   3785   3888   3992   4096
                        4198   4279   4324   4405   4443   4524   4550   4615   4640   4705   4730   4795   4820
                        4885   4913   5025   5139   5246   5439   5633   5782   5922   6296
CDT   = 002000          1066#  2330   2340   2376   2386   2423   2433   2469   2479   2515   2525   2562   2572
                        3597   3621
CERR  = 100000          1072#  3568   4275   4401   4520   4603   4693   4783   4873
CFMT  = 010000          1069#  2330   2340   2376   2386   2423   2433   2469   2479   2515   2525   2562   2572
                        2807   2809   3500   3509   3597   3621   5641   5790   5930   6562
CKSWR = 104407          6324   6793   6819   7482#
CLEAR = 000005          1046#
COE   = 001000          1103#
CR    = 000015           915#  6902   6912
CRLF  = 000200           916#  2248   6873   6912
CTO   = 004000          1067#
CTRHLT  034572          6295#  7098   7181
CYLN    003300          2162#  3083*  3092   3164*  3173   3245*  3254   3306*  3307   6516   6529
```

```
DCK    = 100000          1109#
DDD    = 000104          8406#  8407   8408#  8409#  8410#  8411#  8412#  8413#  8414#  8415#  8416#  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#
DDISP  = 177570           922#  1303   2211
DDT    = 000400          1121#
DF000    043014          1396  7534#
DF002    043020          1401  7536#
DF003    043044          1407  1413   1419   1425   1431   1437   1443   1449   1455   1461   1467   1473   1479
                         1485  1491   1497   1503   1509   7546#
DF025    043070          1516  1523   1530   1537   1544   1552   1558   1565   1572   1579   1586   1593   7556#
DF041    043114          1599  1605   1611   1617   1623   7566#
DF046    043150          1629  1635   1641   1708   1714   1720   1727   1734   1741   1969   1975   1981   1987
                         1993  1999   7580#
DF051    043174          1647  7590#
DF052    043220          1653  2047   7600#
DF053    043244          1659  1702   7610#
DF054    043270          1665  1671   1677   1683   1689   1695   7620#
DF071    043314          1747  1753   1759   7630#
DF074    043350          1765  1771   1777   1789   1795   1801   1813   1819   1825   1837   1843   1849   1861
                         1867  1873   1885   1891   1897   1909   1915   1921   1933   1939   1945   7644#
DF077    043374          1783  1807   1831   1855   1879   1903   1927   1951   7654#
DF134    043420          1957  1963   2101   7664#
DF144    043444          2005  2011   2017   2023   2029   2035   2041   2053   2059   2065   2071   2077   2083
                         2089  7674#
DF151    043500          2095  7688#
DH000A   044067          7538  7548   7558   7568   7582   7592   7602   7612   7622   7632   7646   7656   7666
                         7676  7690   7747#
DH000B   044105          7540  7550   7560   7570   7584   7594   7604   7614   7624   7634   7648   7658   7668
                         7678  7692   7750#
DH000C   044120          1394  7752#
DH002A   044151          7542  7757#
DH002B   044235          7544  7766#
DH003A   044323          7552  7776#
DH003B   044402          7554  7784#
DH025A   044461          7562  7792#
DH025B   044540          7564  7800#
DH041A   044620          7572  7586   7636   7680   7808#
DH041B   044677          7574  7588   7638   7682   7816#
DH041C   044754          7576  7824#
DH041D   045013          7578  7830#
DH051A   045050          7596  7835#
DH051B   045075          7598  7839#
DH052A   045123          7606  7694   7843#
DH052B   045142          7608  7846#
DH053A   045177          7616  7851#
DH053B   045216          7618  7854#
DH054A   045234          7626  7857#
DH054B   045273          7628  7863#
DH071A   045330          7640  7868#
DH071B   045351          7642  7871#
DH074A   045400          7650  7875#
DH074B   045467          7652  7885#
```

```
DH077A  045553          7660    7894#
DH077B  045602          7662    7898#
DH134A  045626          7670    7902#
DH134B  045652          7672    7906#
DH144A  045700          7684    7910#
DH144B  045777          7686    7921#
DH151A  046074          7696    7932#
DI    = 040000          1071#
DISPLA  001142          1303#   2211*   2219*   6379*   6796*
DISPRE  000174          1161#   1232#   2219
DLT   = 100000          1090#
DMD   = 000040          1132#   2324    2333    2334    2370    2379    2380    2417    2426    2427    2463    2472    2473
                        2509    2518    2519    2556    2565    2566    2614    2621    2622    2671    2678    2679    2725
                        2732    2733    2780    2787    2788    2830    2835    2836    2923    2929    2930    2933    2934
                        2980    3014    3020    3021    3025    3026    3027    3030    3062    3091    3099    3100    3103
                        3104    3172    3180    3181    3184    3185    3253    3261    3262    3265    3266    3332    3340
                        3341    3344    3345    3414    3422    3423    3426    3427    3495    3503    3504    3512    3514
                        3515    3609    3623    3624    3627    3628    3696    3704    3705    3708    3709    3786    3794
                        3795    3803    3805    3806    3854    3889    3897    3898    3906    3908    3909    3957    3993
                        4001    4002    4010    4012    4013    4097    4105    4106    4114    4116    4117    4202    4210
                        4211    4219    4221    4222    4328    4336    4337    4345    4347    4348    4447    4455    4456
                        4464    4466    4467    4551    4559    4560    4563    4564    4596    4597    4641    4649    4650
                        4653    4654    4686    4687    4731    4739    4740    4743    4744    4776    4777    4821    4829
                        4830    4833    4834    4866    4867    4914    4920    4921    4924    4925    4963    5026    5032
                        5033    5036    5037    5075    5140    5146    5147    5150    5151    5189    5247    5253    5254
                        5257    5258    5296    5379    5380    5440    5446    5447    5450    5451    5489    5576    5577
                        5638    5644    5645    5649    5650    5692    5787    5793    5794    5798    5799    5841    5927
                        5933    5934    5938    5939    5981    6609    6626    6627    6640    6641    6667    6668    6680
                        6681    6707    6710    6711    6712    6713    6716    6717    6718    6719
DRA   = 000001          1113#
DRDY  = 000200          1120#
DROT  = 000040          1118#
DRPAR = 000010          1097#
DRVMSK= 000007          1077#
DSC   = 040000          1124#
DSWR  = 177570           921#   1302    2210
DTE   = 010000          1106#
DTYE  = 000040          1099#
DT000   042460          1395    7491#
DT002   042464          1400    7492#
DT003   042506          1406    1412    1418    1424    1430    1436    1442    1448    1454    1460    1466    1472    1478
                        1484    1490    1496    1502    1508    1515    1522    1529    1536    1543    1550    1557    1564
                        1571    1578    1585    1592    7495#
DT041   042526          1598    1604    1610    1616    1622    7498#
DT046   042556          1628    1634    1640    1707    1713    1719    1726    1733    1740    1968    1974    1980    1986
                        1992    1998    7502#
DT051   042576          1646    7505#
DT052   042610          1652    2046    7507#
DT053   042624          1658    1701    7509#
DT054   042634          1664    1670    1676    1682    1688    1694    7511#
DT071   042650          1746    1752    1758    7513#
DT074   042676          1764    1770    1776    1788    1794    1800    1812    1818    1824    1836    1842    1848    1860
                        1866    1872    1884    1890    1896    1908    1914    1920    1932    1938    1944    7517#
DT077   042720          1782    1806    1830    1854    1878    1902    1926    1950    7520#
DT134   042732          1956    1962    2100    7522#
DT144   042744          2004    2010    2016    2022    2028    2034    2040    2052    2058    2064    2070    2076    2082
```

```
                    2088    7524#
DT151   043004      2094    7530#
ECCBUF  056220      5248    5310    5395    5441    5503    5532    5592    5928    5993    8928#
ECCGEN  036134      5104    5218    5324    5517    5722    5871    6011    6045    6579#
ECCHI   003266      2156#   5086*   5200*   5305*   5342    5498*   5539    5701*   5850*   5990*   6065    6581    6587
                    6592*   6600    6601*   6602*   6603
ECCLO   003270      2157#   5087*   5201*   5306*   5499*   5702*   5851*   5991*   6591*   6596    6597*   6598*
ECCW  = 020000      1140#   1211#   2980    3062    3512    3803    3854    3906    3957    4010    4114    4219    4345
                    4464    4963    5075    5189    5296    5334    5361    5489    5527    5558    5692    5841    5981
                    6052    6084
ECCXOR  003272      2158#   6583*   6589*   6593
ECC1    053512      4915    4975    8517#
ECC2    053532      5027    5088    8520#
ECC3    053552      5141    5202    8528#
ECH   = 000100      1100#
EMTVEC= 000030      1010#   2194*   2195*
EMW     001310      1398#   4957*   4973*   5069*   5085*   5183*   5199*   5293*   5307*   5339*   5366*   5486*   5500*
                    5536*   5563*   5686*   5707*   5733*   5835*   5856*   5882*   5975*   5996*   6022*   6029*   6060*
                    6063*   6090*   6632*   6646*   6673*   6686*
EMW2    052775      6632    6673    8383#
EMW4    053065      6646    6686    8393#
EM000   046113      1393    7937#
EM300   046160      1404    1410    1416    7944#
EM301   046235      1422    1428    1434    7952#
EM302   046313      1440    1446    1452    7960#
EM303   046372      1458    1464    1470    7968#
EM304   046450      1476    1482    1488    7976#
EM305   046527      1494    1500    1506    7984#
EM306   046607      1513    1520    1527    7993#
EM307   046711      1534    1541    1548    8005#
EM308   047010      1555    1562    1569    8017#
EM309   047110      1576    1583    1590    8029#
EM310   047210      1596    1602    1608    1614    1620    1626    1632    1638    1644    8041#
EM311   047275      1650    1656    8050#
EM312   047344      1662    1668    8057#
EM313   047411      1674    1680    8064#
EM314   047455      1686    1692    8071#
EM315   047524      1699    8078#
EM316   047620      1705    1711    1717    8089#
EM317   047665      1724    1731    1738    8096#
EM318   047763      1744    1750    1756    8108#
EM319   050022      1762    1768    1774    1780    8114#
EM320   050073      1786    1792    1798    1804    8121#
EM321   050157      1810    1816    1822    1828    8130#
EM322   050243      1834    1840    1846    1852    8139#
EM323   050326      1858    1864    1870    1876    8148#
EM324   050421      1882    1888    1894    1900    8158#
EM325   050514      1906    1912    1918    1924    8168#
EM326   050604      1930    1936    1942    1948    8178#
EM327   050672      4957    5069    5183    5293    5486    5686    5835    5975    8187#
EM328   050744      4973    5085    5199    5307    5500    8194#
EM329   051023      1954    8202#
EM330   051074      1960    8209#
EM331   051137      1966    1972    1979    8215#
EM332   051224      1984    1990    1996    8224#
EM333   051311      5339    5536    6063    8233#
```

```
EM334   051347          5366    5563    6090    8239#
EM335   051405          2002    2008    2014    2020    2026    2032    2038    8245#
EM336   051461          2044    8253#
EM337   051536          2050    2056    2062    2068    2074    2080    2086    8261#
EM338   051615          5707    5856    5996    6029    8269#
EM339   051703          5733    5882    6022    6060    8279#
EM340   052007          2092    2098    8291#
EM4000  052054          1405    1423    1441    1459    1477    1495    1514    1535    1556    1577    1597    1651    1706
                        1725    1745    1763    1787    1811    1835    1859    1883    1907    1931    1967    1985    2003
                        2045    2051    8298#
EM4001  052072          1411    1429    1447    1465    1483    1501    8301#
EM4002  052113          1417    1435    1453    1471    1489    1507    8304#
EM4003  052134          1521    1542    1563    1584    8307#
EM4004  052164          1528    1549    1570    1591    8311#
EM4005  052214          1603    1712    1732    1751    1769    1793    1817    1841    1865    1889    1913    1937    1973
                        1991    2009    2057    8315#
EM4006  052232          1609    1718    1739    1757    1775    1799    1823    1847    1871    1895    1919    1943    1979
                        1997    2015    2063    8318#
EM4007  052256          1615    2021    2069    8322#
EM4008  052304          1621    2027    2075    8326#
EM4009  052331          1627    8330#
EM4010  052401          1633    8337#
EM4011  052451          1639    8344#
EM4012  052527          1645    8352#
EM4013  052567          1657    1781    1805    1829    1853    1877    1901    1925    1949    8358#
EM4014  052635          1663    1675    1687    2039    2087    8365#
EM4015  052671          1669    1681    1693    2033    2081    8370#
EM4016  052731          1700    8376#
EM4017  052747          1955    1961    2093    2099    8379#
ERRCNT  003250          2149#   2227*   6499*   6502
ERRVEC= 000004          1003#   2208    2209*   2220*   6248*   6249*   6268*   6269*   6330    6331*   6333*   6336*
E.ASOF  003216          2131#
E.BA    003204          2126#   2847*   2858    5395*   5406    5592*   5603    7498    7527
E.CS1   003200          2124#   2340*   2343    2386*   2389    2433*   2436    2479*   2482    2525*   2528    2572*   2575
                        2607*   2619    2628    2664*   2676    2685    2718*   2730    2739    2773*   2785    2794    2807
                        2809*   2844*   2849    2879    2935*   2942    2950    2966    3379*   3382    3461*   3464    3509*
                        3550    3567*   3568*   3576*   3577    3597*   3662    3743*   3746    3800*   3840    3903*   3943
                        4007*   4047    4111*   4151    4216*   4257    4274*   4275*   4283*   4284    4342*   4383    4400*
                        4401*   4409*   4410    4461*   4502    4519*   4520*   4528*   4529    4603*   4606    4619*   4620
                        4693*   4696    4709*   4710    4783*   4786    4799*   4800    4873*   4876    4889*   4890    5386*
                        5397    5583*   5594    6562    7495    7498    7502    7507    7513    7517    7524
E.CS2   003210          2128#   2845*   2855    2870*   2885    2897*   3380*   3385    3462*   3467    3510*   3553    3598*
                        3665    3744*   3749    3801*   3843    3904*   3946    4008*   4050    4112*   4154    4217*   4260
                        4343*   4386    4462*   4505    4604*   4609    4694*   4699    4784*   4789    4874*   4879    5387*
                        5400    5584*   5597    7498    7502    7513    7517    7524
E.DA    003206          2127#   2606*   2618    2663*   2675    2698*   2699    2717*   2729    2752*   2753    2772*   2784
                        3137    3219    3299    5394*   5415    5591*   5612    6530*   6531*   6532    6534*   6535*   6536
                        6538*   6553    6560    7511    7527
E.DB    003222          2133#   2871*   2891    7505
E.DCYL  003220          2132#   2605*   2617    2641*   2642    2644*   2645    2662*   2674    2716*   2728    2771*   2783
                        3140    3221    3302    5393*   5412    5590*   5609    6529*   6539*   6545    7511    7527
E.DS    003212          2129#
E.ECPS  003232          2137#
E.ECPT  003234          2138#   4974*   4991    5105    5219    5326    5519    5723    5872    6012    6046    6102*   6104
                        6603*   6604*   7522    7530
E.ER    003214          2130#   2848*   2864    2888    3381*   3388    3463*   3470    3511*   3556    3566*   3599*   3668
```

```
                    3745*  3752   3802*  3846   3905*  3949   4009*  4053   4061*  4113*  4157   4165*  4218*
                    4263   4273*  4344*  4389   4399*  4463*  4508   4518*  4605*  4612   4695*  4702   4785*
                    4792   4875*  4882   5388*  5403   5585*  5600   7498   7502   7513   7517   7524
E.MR1   003224      2134#  2980*  2981   3062*  3063   3512*  3560   3803*  3850   3854*  3906*  3953   3957*
                    4010*  4057   4114*  4161   4219*  4267   4345*  4393   4464*  4512   4963*  5075*  5189*
                    5296*  5334*  5361*  5489*  5527*  5558*  5692*  5841*  5981*  6052*  6084*  6609*  6610*
                    6615*  6620*  6625*  6629   6639*  6643   6661*  6666*  6670   6679*  6683   7492   7509
                    7520
E.MR2   003226      2135#  2341*  2349   2387*  2395   2434*  2442   2480*  2488   2526*  2534   2573*  2581
                    2634   2691   2745   2800   6552*  7495
E.MR3   003230      2136#  2342*  2352   2388*  2398   2435*  2445   2481*  2491   2527*  2537   2574*  2584
                    2637   2694   2748   2803   6573*  7495
E.SPAR  003236      2139#
E.WC    003202      2125#  2846*  2861   5396*  5409   5593*  5606   7498   7527
FMTE  = 000020      1098#
GNS   = ****** U    1160   1231   2247   6131   6138   7474   7475   7476   7477   7478   7480   7482   7483
                    7484   7485   7486   7487   7488
GO    = 000001      1061#  3567   4274   4400   4519   4603   4693   4783   4873   5386   5583
GTSWR = 104406      2242   7480#
HDRCNT  003310      2164#  3513*  3516   3563*  3564   3804*  3853*  3907*  3956*  4011*  4060*  4115*  4164*
                    4220*  4223   4270*  4271   4346*  4349   4396*  4397   4465*  4468   4515*  4516   7517
                    7520
HEADER  003302      2163#  3113   3194   3275   6516*  6517*  6518*  6519*  6520*  6521*  6522*  6523*  6524
                    6525*  6526*  6527   6528*
HEAD1   053366      2953   3039   4935   5047   5161   5267   5460   8475#
HEAD10  053476      4663   4753   4843   8511#
HEAD11  053504      5663   5812   5952   8514#
HEAD2   053374      3354   4573   8478#
HEAD3   053402      3436   8481#
HEAD4   053410      3718   8484#
HEAD5   053416      3799   8487#
HEAD6   053432      3902   8493#
HEAD7   053446      4006   8499#
HEAD8   053462      4110   8505#
HT    = 000011       913#  6871   6912
HVRC  = 000400      1102#  3599   3745   4165   4273   4399   4518   4695   4785   4875
IDAE  = 002000      1104#
IE    = 000100      1062#
ILF   = 000001      1094#
INCHDR  035626      3089   3170   3251   6516#
INTR  = 000300      1057#
IOTVEC= 000020      1008#  2192*  2193*
IR    = 000100      1081#  2870   2897   3380   3462   3510   3598   3744   3801   3904   4008   4112   4217
                    4343   4462   4604   4694   4784   4874   5387   5584
LF    = 000012       914#  6906   6912
MCLK  = 000400      1135#  1206#  2333   2379   2426   2472   2518   2565   2621   2678   2732   2787   2835
                    2929   3020   3026   3099   3180   3261   3340   3422   3503   3623   3704   3794   3897
                    4001   4105   4210   4336   4455   4559   4596   4649   4686   4739   4776   4829   4866
                    4920   5032   5146   5253   5379   5446   5576   5644   5793   5933   6626   6640   6667
                    6680   6707   6710   6712   6716   6718
MDS   = 001000      1084#
MEMBAS= 172100      1016#  6178   6190   6216   6251
MEMERR  034530      1179   1250   6226   6279#
MEMPAR  003274      2159#  5760   6179   6191   6217   6250*  6256*  6270
MEMVEC= 000114      1015#  1178   1249   6199*  6226*  6227*  6272*  6273*
MERD  = 001000      1136#  1207#  6710   6718
```

```
MESMSK= 000017  1129#
MEWD  = 002000  1137#  1208#  2980  3062  3512  3803  3854  3906  3957  4010  4114  4219  4345
                4464   4963   5075  5189  5296  5489  5692  5841  5981  6609  6615  6639  6679
MIND  = 000200  1134#  1205#  3025  3026  3027
MOD2BF  055204  5639   5704   5853  8925#
MSP   = 000100  1133#  1204#  2933  3103  3184  3265  3344  3426  3514  3627  3708  3805  3908
                4012   4116   4221  4347  4466  4563  4653  4743  4833  4924  5036  5150  5257
                5450   5649   5798  5938
M1.BIT  003256  2152#  2937*  2957*  2974*  3032*  3043*  3056*  3106*  3117*  3130*  3187*  3198*  3211*
                3268*  3279*  3292*  3347*  3358*  3371*  3429*  3440*  3453*  3519*  3529*  3542*  3630*
                3641*  3654*  3711*  3722*  3735*  3808*  3818*  3832*  3911*  3921*  3935*  4015*  4025*
                4039*  4119*  4129*  4143*  4226*  4236*  4249*  4352*  4362*  4375*  4471*  4481*  4494*
                4566*  4577*  4590*  4656*  4667*  4680*  4746*  4757*  4770*  4836*  4847*  4860*  4927*
                4938*  4951*  4960*  4979   4980*  5039*  5050*  5063*  5072*  5092   5093*  5153*  5164*
                5177*  5186*  5206   5207*  5260*  5271*  5284*  5291*  5313   5314*  5345   5346*  5369
                5370*  5453*  5464*  5477*  5484*  5506   5507*  5542   5543*  5566   5567*  5653*  5667*
                5680*  5689*  5709   5710*  5802*  5816*  5829*  5838*  5858   5859*  5942*  5956*  5969*
                5978*  5998   5999*  6032   6033*  6069   6070*  6093   6094*  6613   6659   6664   6705
                7492
M2.BIT  003260  2153#  4961*  4979*  5073*  5092*  5187*  5206*  5292*  5313*  5345*  5369*  5485*  5506*
                5542*  5566*  5690*  5709*  5839*  5858*  5979*  5998*  6032*  6069*  6093*  6618   6623
                7492
NED   = 010000  1087#
NEM   = 004000  1086#
NEWPAS  004332  2304#
NPRBUF  053156  2832   2847   2867   8406#
NXF   = 000004  1096#
OFFSET= 000015  1050#
OFST  = 000004  1115#
OPI   = 020000  1107#  3566   4273   4399   4518
OPI1    053576  3508   8538#
OPI2    054076  4215   8634#
OPI3    054376  4341   8730#
OPI4    054676  4460   8826#
OPRDO1  043524  2254   7700#
OPRDO2  043553  2257   2268   2284   7704#
OPRDO3  043561  2264   7706#
OPRDO4  043611  2275   7711#
OPRDO5  043633  6297   7715#
OPRDO6  043673  2251   7721#
OR    = 000200  1082#  2845   2870   3380   3462   3510   3598   3744   3801   3904   4008   4112   4217
                4343   4462   4604   4694
PACK  = 000003  1045#
PARCHK  034402  2304   6248#  7435
PARM    003314  1167   1238   2168#
PAR.EN= 000001  1017#  6195   6221   6254
PAT   = 000020  1131#
PCA   = 004000  1138#  1209#  6610   6625   6661
PCD   = 010000  1139#  1210#  6610   6620   6666
PGE   = 002000  1085#
PIP   = 020000  1123#
PIRQ  = 177772   920#
PIRQVE= 000240  1014#
PR.BIT  003254  2151#  2936*  2947*  2957   2960*  2963*  2974   2975*  3031*  3037*  3043   3046*  3049*
                3056   3057*  3105*  3111*  3117   3120*  3123*  3130   3131*  3186*  3192*  3198   3204*
                3204*  3211   3212*  3267*  3273*  3279   3282*  3285*  3292   3293*  3346*  3352*  3358
```

K14


```
                    4098*  4203*  4329*  4448*  4552*  4642*  4732*  4822*  4915*  5027*  5141*  5248*  5391
                    5441*  5588   5639*  5788*  5928*
RKCS1  = 000000     1025#  2323*  2330*  2337   2346*  2369*  2376*  2383   2392*  2416*  2423*  2430   2439*
                    2462*  2469*  2476   2485*  2508*  2515*  2522   2531*  2555*  2562*  2569   2578*  2613*
                    2619*  2625   2631*  2670*  2676*  2682   2688*  2724*  2730*  2736   2742*  2779*  2785*
                    2791   2797*  2829*  2833*  2839   2852*  2876   2882*  2922*  2926*  2941   2949   2965
                    3010*  3017*  3090*  3096*  3171*  3177*  3252*  3258*  3331*  3337*  3376   3413*  3419*
                    3458   3491*  3500*  3547   3572*  3573   3605*  3621*  3659   3695*  3701*  3740   3785*
                    3791*  3837   3888*  3894*  3940   3992*  3998*  4044   4096*  4102*  4148   4198*  4207*
                    4254   4279*  4280   4324*  4333*  4380   4405*  4406   4443*  4452*  4499   4524*  4525
                    4550*  4556*  4600   4615*  4616   4640*  4646*  4690   4705*  4706   4730*  4736*  4780
                    4795*  4796   4820*  4826*  4870   4885*  4886   4913*  4917*  5025*  5029*  5139*  5143*
                    5246*  5250*  5383   5439*  5443*  5580   5633*  5641*  5782*  5790*  5922*  5930*  6296*
RKCS2  = 000010     1029#  2329*  2375*  2422*  2468*  2514*  2561*  2840   2877   2986   3377   3459   3548
                    3574   3660   3741   3838   3941   4045   4149   4255   4281   4381   4407   4500   4526
                    4601   4617   4691   4707   4781   4797   4871   4887   5384   5581
RKDA   = 000006     1028#  2328*  2374*  2421*  2467*  2513*  2560*  2618*  2675*  2729*  2784*  3093*  3135
                    3174*  3216   3255*  3297   3334*  3416*  3499*  3619*  3698*  3789*  3892*  3996*  4100*
                    4206*  4332*  4451*  4555*  4645*  4735*  4825*  5390   5587
RKDB   = 000024     1034#  2872
RKDCYL= 000020      1033#  2327*  2373*  2420*  2466*  2512*  2559*  2617*  2674*  2728*  2783*  3092*  3136
                    3173*  3217   3254*  3298   3333*  3415*  3498*  3620*  3697*  3790*  3893*  3997*  4101*
                    4205*  4331*  4450*  4554*  4644*  4734*  4824*  5389   5586
RKDS   = 000012     1030#
RKECPS= 000030      1038#
RKECPT= 000032      1039#  4140   5103   5217   5325   5518   5721   5870   6010   6044   6103
RKER   = 000014     1031#  [illegible]43  2878   2987   3378   3460   3549   3575   3661   3742   3839   3942   4046
                    4150   [illegible]56  4282   4382   4408   4501   4527   4602   4618   4692   4708   4782   4798
                    4872   [illegible]888 5385   5582
RKMR1  = 000026     1[illegible]35#  [illegible]324*  2333*  2334*  2370*  2379*  2380*  2417*  2426*  2427*  2463*  2472*  2473*
                    [illegible]209*  [illegible]518*  2519*  2556*  2565*  2566*  2614*  2621*  2622*  2671*  2678*  2679*  2725*
                    [illegible]732*  2733*  2780*  2787*  2788*  2830*  2835*  2836*  2923*  2929*  2930*  2933*  2934*
                    [illegible]979   3014*  3020*  3021*  3025*  3026*  3027*  3030*  3061   3091*  3099*  3100*  3103*
                    [illegible]104*  3172*  3180*  3181*  3184*  3185*  3253*  3261*  3262*  3265*  3266*  3332*  3340*
                    3341*  3344*  3345*  3414*  3422*  3423*  3426*  3427*  3495*  3503*  3504*  3514*  3515*
                    3559   3609*  3623*  3624*  3627*  3628*  3696*  3704*  3705*  3708*  3709*  3786*  3794*
                    3795*  3805*  3806*  3849   3889*  3897*  3898*  3908*  3909*  3952   3993*  4001*  4002*
                    4012*  4013*  4056   4097*  4105*  4106*  4116*  4117*  4160   4202*  4210*  4211*  4221*
                    4222*  4266   4328*  4336*  4337*  4347*  4348*  4392   4447*  4455*  4456*  4466*  4467*
                    4511   4551*  4559*  4560*  4563*  4564*  4596*  4597*  4641*  4649*  4650*  4653*  4654*
                    4686*  4687*  4731*  4739*  4740*  4743*  4744*  4776*  4777*  4821*  4829*  4830*  4833*
                    4834*  4866*  4867*  4914*  4920*  4921*  4924*  4925*  5026*  5032*  5033*  5036*  5037*
                    5140*  5146*  5147*  5150*  5151*  5247*  5253*  5254*  5257*  5258*  5379*  5380*  5440*
                    5446*  5447*  5450*  5451*  5576*  5577*  5638*  5644*  5645*  5649*  5650*  5787*  5793*
                    5794*  5798*  5799*  5927*  5933*  5934*  5938*  5939*  6626*  6627*  6628   6640*  6641*
                    6642   6667*  6668*  6669   6680*  6681*  6682   6707*  6710*  6711*  6712*  6713*  6716*
                    6717*  6718*  6719*
RKMR2  = 000034     1036#  2338   2384   2431   2477   2523   2570   2626   2683   2737   2792
RKMR3  = 000036     1037#  2339   2385   2432   2478   2524   2571   2627   2684   2738   2793
RKPRI  = 003242     2143#  2301*
RKSPAR= 000022      1040#
RKVEC  = 003240     2142#  2299*  2300*
RKWC   = 000002     1026#  2325*  2371*  2418*  2464*  2510*  2557*  2615*  2672*  2726*  2781*  2831*  2841
                    2924*  3015*  3094*  3175*  3256*  3335*  3417*  3497*  3618*  3699*  3788*  3891*  3995*
                    4099*  4204*  4330*  4449*  4553*  4643*  4733*  4823*  4916*  5028*  5142*  5249*  5392
                    5442*  5589   5640*  5789*  5929*
```

DZR6DA.P11 28-SEP-76 15:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
RLS    = 000010          1078#
SAVREG= 104413           6445    7486#
SAVSWR  003312           2165#   7416*   7436
SCLR   = 000040          1080#
SCOP1  = 104415          2640    2697    2751    2806    3143    3224    3305    3671    7488#
SCOP1$  035304           6428#   7488
SECTOR  003276           2160#   3084*   3093    3144*   3145    3165*   3174    3246*   3255    6522    6530
SEEK   = 000017          1051#
SELDRV= 000001           1044#
SKT    = 000002          1095#
SPACE2  043753           6481    6493    7730#
SPAR   = 020000          1070#
SPDLSS= 000020           1117#
SRTFLG  003246           2145#   2168*   2171*   2174*   2252
SRTSPL= 000011           1048#
STACK  = 001100           908#   2177    2190    6287    6298    6509    6697    7433
START   003334           1164    1235    2174#
START1  003340           2169    2172    2175#   6307
STKLMT= 177774            919#
SVAL   = 100000          1125#
SWR     001140           1302#   2188    2210*   2212    2218*   2225*   2240    6283    6325    6339    6342    6357    6364
                         6428    6500    6635    6650    6677    6690    6797    6804    6816    6820    7101    7140    7195*
                         7416    7436*
SWREG   000176           1162#   1233#   2218    2240    7101    7140    7163
SW0    = 000001           972#
SW00   = 000001           962#    972
SW01   = 000002           961#    971
SW02   = 000004           960#    970
SW03   = 000010           959#    969
SW04   = 000020           958#    968
SW05   = 000040           957#    967
SW06   = 000100           956#    966
SW07   = 000200           955#    965
SW08   = 000400           954#    964
SW09   = 001000           953#    963
SW1    = 000002          1071#
SW10   = 002000           952#
SW11   = 004000           951#
SW12   = 010000           950#    6500
SW13   = 020000           949#
SW14   = 040000           948#
SW15   = 100000           947#
SW2    = 000004           970#
SW3    = 000010           969#
SW4    = 000020           968#
SW5    = 000040           967#
SW6    = 000100           966#
SW7    = 000200           965#
SW8    = 000400           964#
SW9    = 001000           963#    6283    6428    6635    6650    6677    6690
S.CLR  = 000400          1150#   1221#   2480    2526    2573
S.FMT  = 001000          1151#   1222#   2341    2387    2434    2480    2526    2573
S.PACK= 004000           1153#   1224#
S.RECL= 000040           1147#   1218#
S.RTC  = 000200          1149#   1220#   2387
S.SEEK= 000020           1146#   1217#   2341    2387    2434
```

M14


```
S.STSP= 000100          1148*   1219*
S.UNLD= 002000          1152*   1223*
TBITVE= 000014          1005*
TKVEC = 000060          1012*   7078*   7079*
TPVEC = 000064          1013*
TRACK   003277          2161*   3225*   3226    6518
TRAPPC  003244          2144*   6280*   7491
TRAPVE= 000034          1011*   2196*   2197*
TRTVEC= 000014          1006*
TSTBY1  044043          5766    7740*
TSTBY2  044053          5769    7742*
TST1    004350          2306    2320*   6154    6384
TST10   006462          2659*   6391
TST11   006732          2713*   6392
TST12   007202          2768*   6393
TST13   007456          2808    2826*   6394
TST14   010126          2853    2883    2919*   6395
TST15   010552          2982    2984    3007*   6396
TST16   011112          3064    3080*   6397
TST17   011504          3161*   6398
TST2    004602          2347    2353    2366*   6385
TST20   012100          3242*   6399
TST21   012474          3328*   6400
TST22   013070          3389    3410*   6401
TST23   013464          3471    3488*   6402
TST24   014252          3578    3594*   6403
TST25   014742          3673    3692*   6404
TST26   015336          3753    3782*   6405
TST27   016010          3856    3885*   6406
TST3    005034          2393    2399    2413*   6386
TST30   016462          3959    3989*   6407
TST31   017134          4063    4093*   6408
TST32   017606          4167    4195*   6409
TST33   020374          4285    4321*   6410
TST34   021162          4411    4440*   6411
TST35   021750          4530    4547*   6412
TST36   022440          4621    4637*   6413
TST37   023130          4711    4727*   6414
TST4    005266          2440    2446    2459*   6387
TST40   023620          4801    4817*   6415
TST41   024310          4891    4910*   6416
TST42   025024          5022*   6417
TST43   025550          5136*   6418
TST44   026274          5242*   6419
TST45   027532          5416    5435*   6420
TST46   031002          5613    5629*   6421
TST47   031566          5757*   6422
TST5    005516          2486    2492    2505*   6388
TST50   032440          5770    5897*   6423
TST51   032470          5917*   6424
TST6    005746          2532    2538    2552*   6389
TST7    006176          2579    2585    2602*   6390
TYPDS = 104405          6135    6142    7478*
TYPE  = 104401          2234    2251    2254    2257    2264    2268    2275    2284    5766    5769    6129    6136    6143
                        6297    6457    6458    6462    6463    6470    6481    6483    6493    6494    6496    6504    6799
                        6807    6876    6972    7047    7095    7107    7161    7162    7165    7176    7186    7197    7216
```

```
                    7264   7270   7275   7279   7284   7285   7287   7290   7294   7360   7362   7434   7474#
TYPERR  035330      6445#  6806
TYPOC = 104402      2256   2267   2283   5768   6478   7164   7475#
TYPON = 104404      7477#
TYPOS = 104403      7476#
T.ASOF  003156      2112#
T.BA    003144      2107#  2842*  2858   5391*  5406   5588*  5603   7498   7527
T.CS1   003140      2105#  2337*  2343   2383*  2389   2430*  2436   2476*  2482   2522*  2528   2569*  2575
                    2625*  2628   2682*  2685   2736*  2739   2791*  2794   2839*  2849   2876*  2879   2941*
                    2942   2949*  2950   2965*  2966   3376*  3382   3458*  3464   3547*  3550   3573*  3577
                    3659*  3662   3740*  3746   3837*  3840   3940*  3943   4044*  4047   4148*  4151   4254*
                    4257   4280*  4284   4380*  4383   4406*  4410   4499*  4502   4525*  4529   4600*  4606
                    4616*  4620   4690*  4696   4706*  4710   4780*  4786   4796*  4800   4870*  4876   4886*
                    4890   5383*  5397   5580*  5594   7495   7498   7502   7507   7513   7517   7524
T.CS2   003150      2109#  2840*  2855   2877*  2885   2986*  3377*  3385   3459*  3467   3548*  3553   3574*
                    3660*  3665   3741*  3749   3838*  3843   3941*  3946   4045*  4050   4149*  4154   4255*
                    4260   4281*  4381*  4386   4407*  4500*  4505   4526*  4601*  4609   4617*  4691*  4699
                    4707*  4781*  4789   4797*  4871*  4879   4887*  5384*  5400   5581*  5597   7498   7502
                    7507   7513   7517   7524
T.DA    003146      2108#  3135*  3137   3216*  3218   3297*  3299   5390*  5415   5587*  5612   7511   7527
T.DB    003162      2114#  2872*  2891   7505
T.DCYL  003160      2113#  3136*  3140   3217*  3221   3298*  3302   5389*  5412   5586*  5609   7511   7527
T.DS    003152      2110#
T.ECPS  003172      2118#
T.ECPT  003174      2119#  4990*  4991   5103*  5105   5217*  5219   5325*  5326   5518*  5519   5721*  5723
                    5870*  5872   6010*  6012   6044*  6046   6103*  6104   7522   7530
T.ER    003154      2111#  2843*  2864   2878*  2888   2987*  3378*  3388   3460*  3470   3549*  3556   3575*
                    3661*  3668   3742*  3752   3839*  3846   3942*  3949   4046*  4053   4150*  4157   4256*
                    4263   4282*  4382*  4389   4408*  4501*  4508   4527*  4602*  4612   4618*  4692*  4702
                    4708*  4782*  4792   4798*  4872*  4882   4888*  5385*  5403   5582*  5600   7498   7502
                    7507   7513   7517   7524
T.MR1   003164      2115#  2979*  2981   3061*  3063   3559*  3560   3849*  3850   3952*  3953   4056*  4057
                    4160*  4161   4266*  4267   4392*  4393   4511*  4512   6628*  6629   6642*  6643   6669*
                    6670   6682*  6683   7492   7509   7520
T.MR2   003166      2116#  2338*  2349   2384*  2395   2431*  2442   2477*  2488   2523*  2534   2570*  2581
                    2626*  2634   2683*  2691   2737*  2745   2792*  2800   7495
T.MR3   003170      2117#  2339*  2352   2385*  2398   2432*  2445   2478*  2491   2524*  2537   2571*  2584
                    2627*  2637   2684*  2694   2738*  2748   2793*  2803   7495
T.SPAR  003176      2120#
T.WC    003142      2106#  2841*  2861   5392*  5409   5589*  5606   7498   7527
UFE   = 000400      1083#
UNLOAD= 000007      1047#
UNS   = 040000      1108#
UPE   = 020000      1088#
VRCHDR  055176      3610*  3611   3613*  3616*  3637   7516   8922#
VV    = 000100      1119#
WCE   = 040000      1089#
WLE   = 004000      1105#
WRDATA= 000023      1053#  2376   2386   2515   2525   2833   2844   2926   2935   3017   3096   3177   3258
                    3337   3379   3419   3461   3500   3509   3597   3621   3701   3743   3791   3800   3894
                    3903   3998   4007   4102   4111   4207   4216   4333   4342   4452   4461   4556   4603
                    4646   4693   4917   5029   5143   5250   5386   5443   5583   5641   5790   5930
WRDCNT  003264      2155#  2869*  2894*  7505
WRHEAD= 000027      1055#
WRL   = 004000      1122#
WRTBIT  036302      4964   4970   4988   5076   5082   5101   5190   5196   5215   5297   5303   5322   5354
```

```
                        5373    5490    5496    5515    5551    5570    5693    5699    5719    5842    5848    5868    5982
                        5988    6008    6042    6078    6097    6609#
WRTCHK= 000031           1056#   2423    2433    2562    2572    4826    4873
WRTGAT= 040000           1141#   1212#   2980    3854    3957    4963    5075    5189    5296    5489    5692    5841    5981
                        6609
WRTPAR  034116           5772    6176#
WR.PAR= 000005           1018#   6183
$APTHD  001000           1191    1197#   1262    1268#
$ASTAT= ****** U         6755    6770
$ATYC   037164           6726    6728#
$ATY1   037140           6724#
$ATY3   037146           6725#   6861
$ATY4   037156           6727#   6812
$AUTOB  001134           1299#   2244*   7154    7311
$BASE   001270           1371#   2255    2263*   2302    2322    2368    2415    2461    2507    2554    2604    2661    2715
                        2770    2828    2921    3009    3082    3163    3244    3330    3412    3490    3596    3694    3784
                        3887    3991    4095    4197    4323    4442    4549    4639    4729    4819    4912    5024    5138
                        5245    5438    5632    5781    5921    6295    7437
$BDADR  001122           1294#
$BDDAT  001126           1296#
$BELL   001204           1322#   6799    6832    7107    7304
$CDW1   001274           1373#
$CDW2   001276           1374#
$CHARC  040064           6878*   6888*   6895    6904*   6909#
$CKSWR  041040           7140#   7482
$CMTAG  001100           1282#   2185    2186    2194    2200    2201    2202
$CM3    = 000000         1312#
$CM4    = 000010         1312#   1313#   1314#   1315#   1316#   1317#   1318#   1319#   1320#
$CNTLC  041736           7095    7176    7304#
$CNTLG  041750           7161    7306#
$CNTLU  041743           7186    7279    7305#
$CPUOP  001242           1345#
$CRLF   001211           1324#   6143    6457    6462    6470    6483    6496    6807    6832    6877    6912    7197    7284
                        7304    7365
$DBLK   040532           7013    7047    7055#
$DEVCT  001224           1336#
$DEVM   001272           1372#
$DOAGN  034106           6125    6146    6152#
$DTBL   040522           7016    7051#
$ENDAD  034076           1174    1245    2232    6148#   6827
$ENDCT  033742           2200    6127#
$ENULL  034112           6155#
$ENV    001234           1341#   2238    6733    6757    6809    6856
$ENVM   001235           1342#   2223    6735    6858    6863
$EOP    033706           6117#   6304    6510
$EOPCT  033734           2200*   6124#   6128    6303*   6508*
$ERFLG  001103           1285#   2176*   6300*   6314    6353    6355    6361*   6363    6430    6794*   6832
$ERMAX  001115           1291#   2203#   6355    6378*   6383
$ERROR  037406           2194    6792#
$ERRPC  001116           1292#   6801#   6802*   6803    6832    7492    7495    7498    7502    7505    7507    7509    7511
                        7513    7517    7520    7522    7524    7530
$ERRTB  001300           1391#   6454
$ERTTL  001112           1289#   6140    6144*   6800*   6832
$ESCAP  001202           1321#   2202*   2303*   6279*   6282*   6299*   6377*   6631*   6645*   6652*   6672*   6685*   6692*
                        6696*   6823    6825    6832
$ETABL  001234           1340#
```

```
$ETEND  001300          1203    1274    1375#
$FATAL  001216          1333#   6761*
$FFLG   037404          6724*   6727*   6755    6764*   6772#
$FILLC  001156          1310#   6881    6912
$FILLS  001155          1309#   6912
$GDADR  001120          1293#
$GDDAT  001124          1295#
$GET42  034066          6145#
$GTSWR  041130          7162#   7480
$HD     =  000000        893
$HIBTS  001000          1198#   1269#
$HIOCT  042136          7353*   7364#
$ICNT   001104          1286#   6368*   6369    6371*   6382
$INTAG  001135          1300#   7159*   7178    7198    7311
$ITEMB  001114          1290#   6448    6803*   6811    6832
$LF     001212          1325#   6832    6912    7294    7304    7365
$LFLG   037403          6765*   6771#
$LPADR  001106          1287#   2204*   6350*   6359*   6375*   6380    6382    7438
$LPERR  001110          1288#   2205*   2608*   2665*   2719*   2774*   3085*   3166*   3247*   3601*   5777*   6288    6359
                        6376*   6382    6432    6698    6822
$MADR1  001246          1358#
$MADR2  001252          1362#
$MADR3  001256          1365#
$MADR4  001262          1368#
$MAIL   001214          1199    1203    1270    1274    1331#   2222    2238    6374    6809    6856
$MAMS1  001244          1352#
$MAMS2  001250          1360#
$MAMS3  001254          1363#
$MAMS4  001260          1366#
$MBADR  001002          1199#   1270#
$MFLG   037402          6725*   6731    6766*   6770#
$MNEW   041766          7165    7309#
$MSGAD  001230          1338#   6741*   6744
$MSGLG  001232          1339#   6746*
$MSGTY  001214          1332#   6739    6747*   6759    6763*
$MSWR   041755          7162    7307#
$MTYP1  001245          1353#
$MTYP2  001251          1361#
$MTYP3  001255          1364#
$MTYP4  001261          1367#
$MXCNT  035160          6372    6382#
$NULL   001154          1308#   6883    6912
$NWTST=  000001         2310#   2312    2356#   2358    2402#   2404    2449#   2451    2495#   2497    2541#   2543    2590#
                        2592    2648#   2650    2702#   2704    2756#   2758    2814#   2816    2902#   2904    2990#   2992
                        3067#   3069    3148#   3150    3229#   3231    3310#   3312    3392#   3394    3474#   3476    3581#
                        3583    3676#   3678    3756#   3758    3859#   3861    3962#   3964    4066#   4068    4170#   4172
                        4288#   4290    4414#   4416    4534#   4536    4624#   4626    4714#   4716    4804#   4806    4897#
                        4899    5000#   5002    5114#   5116    5228#   5230    5421#   5423    5617#   5619    5740#   5742
                        5890#   5892    5904#   5906
$OCNT   040312          6944*   6973*   6986#
$OMODE  040314          6939*   6943*   6948    6951*   6962*   6988#
$OVER   035144          6326    6351    6360    6370    6379#
$PASS   001222          1335#   2222*   6121*   6122*   6133    6155    6366    6383
$PASTM  001006          1201#   1272#
$POWER  042362          7434    7441#
$PWRCT  042356          7425*   7426*   7427*   7429*   7440#
```

```
$PWRDN  042234          2198    7416#   7431
$PWRUP  042262          7417    7425#
$QUES   001210          1323#   6832    6912    7216    7287    7304    7362    7365
$RDCHR  041402          7229#   7483
$RDDEC= ****** U        7486
$RDLIN  041472          7252#   7484
$RDOCT  042000          7326#   7485
$RDSZ = 000010          7245#
$RESRE  042176          7398#   7487
$RTNAD  034110          6154#
$R2A  = ****** U        7488
$SAVRE  042140          7382#   7486
$SCOPE  034650          2192    6323#
$SETUP= 000137          2168#   2191    2192    2194    2196    2198    2200    2201    2202    2204    2232    2235    6119
                        6324    6793    6819    6827    7099    7104    7105    7135    7311
$STUP = 177777          2168#
$SVLAD  035110          6334    6373#
$SVPC = 000220          1172#   1177    1243#   1248
$SWR  = 167400           881#    893     897     898     899     900     901     902     903     904    1320    1321    1322
                        2201    2202    2204    2205    2321    2367    2414    2460    2506    2553    2603    2660    2714
                        2769    2827    2920    3008    3081    3162    3243    3329    3411    3489    3595    3693    3783
                        3886    3990    4094    4196    4322    4441    4548    4638    4728    4818    4911    5023    5137
                        5243    5436    5630    5758    5898    5918    6114    6120    6147    6153    6155    6315    6316
                        6317    6318    6319    6325    6337    6339    6340    6353    6354    6355    6362    6363    6364
                        6376    6379    6382    6784    6785    6786    6787    6788    6797    6804    6816    6820    6832
$SWREG  001236          1343#   2225
$SWRMK= 000000           904     905    6319    6320    6343
$SWOBT  035162          6349    6383#
$TESTN  001220          1334#   5767    6374*   6446*   6447*   7491    7492    7495    7498    7502    7505    7507    7509
                        7511    7513    7517    7520    7522    7524    7530
$TIMES  001200          1320#   2201*   2321*   2367*   2414*   2460*   2506*   2553*   2603*   2660*   2714*   2769*   2827*
                        2920*   3008*   3081*   3162*   3243*   3329*   3411*   3489*   3595*   3693*   3783*   3886*   3990*
                        4094*   4196*   4322*   4441*   4548*   4638*   4728*   4818*   4911*   5023*   5137*   5243*   5436*
                        5630*   5758*   5763*   5898*   5918*   6120*   6362*   6369    6372*   6382
$TKB    001146          1305#   7059    7080    7091    7116    7144    7171
$TKCNT  040542          7060#   7075*   7105    7122*   7236    7238*
$TKINT  040552          2178    7075#   7096    7157
$TKQEN= 040551          7064#   7130    7241
$TKQIN  040544          7061#   7076*   7077    7128*   7129*   7130    7132*
$TKQOU  040546          7062#   7077*   7239    7240*   7241    7243*
$TKQSR  040550          7063#   7076    7132    7243
$TKS    001144          1304#   7059    7081*   7112*   7114    7120*   7142    7158*   7168    7180*   7200*
$TKSRV  040622          7078    7091#
$TMPO   001160          1312#   2259*   2261    2263    2270*   2272    2274    2286*   2288    2290    2292*   2293*   2294*
                        2295*   2296*   2298
$TMP1   001162          1313#
$TMP2   001164          1314#
$TMP3   001166          1315#
$TMP4   001170          1316#   3600*   3611    3613    3616    3672*
$TMP5   001172          1317#
$TMP6   001174          1318#
$TMP7   001176          1319#
$TN   = 000052           882#    893    2310    2321#   2347    2353    2356    2367#   2393    2399    2402    2414#   2440
                        2446    2449    2460#   2486    2492    2495    2506#   2532    2538    2541    2553#   2579    2585
                        2590    2603#   2648    2660#   2702    2714#   2756    2769#   2808    2814    2827#   2853    2883
                        2902    2920#   2982    2984    2990    3008#   3064    3067    3081#   3148    3162#   3229    3243#
```

```
                        3310    3329#   3389    3392    3411#   3471    3474    3489#   3578    3581    3595#   3673    3676
                        3693#   3753    3756    3783#   3856    3859    3886#   3959    3962    3990#   4063    4066    4094#
                        4167    4170    4196#   4285    4288    4322#   4411    4414    4441#   4530    4534    4548#   4621
                        4624    4638#   4711    4714    4728#   4801    4804    4818#   4891    4897    4911#   5000    5023#
                        5114    5137#   5228    5243#   5416    5421    5436#   5613    5617    5630#   5740    5758#   5762
                        5890    5898#   5904    5918#   6344    6384
$TPB    001152          1307#   6901*   6912
$TPFLG  001157          1311#   6850    6912
$TPS    001150          1306#   6899    6912
$TRAP   042370          2196    7451#
$TRAP2  042412          7462#   7473
$TRP    = 000016        7466#   7475#   7476#   7477#   7478#   7479#   7480    7481#   7482    7483#   7484#   7485#   7486#
                        7487#   7488#   7489#
$TRPAD  042424          7456    7473#
$TSTM   001004          1200#   1271#
$TSTNM  001102          1284#   6119*   6314    6346*   6373*   6374    6379    6383    6446    6796    6832
$TTYIN  041726          7254    7255    7267    7285    7299    7303#
$TYPBN= ****** U        7479
$TYPDS  040316          7001#   7478
$TYPE   037606          6752    6850#   7466    7474
$TYPEC  040020          6880    6887    6894    6899#   6900    7202
$TYPEX  040066          6905    6907    6910#
$TYPOC  040114          6942#   7475
$TYPON  040130          6941    6944#   7477
$TYPOS  040070          6937#   7476
$UNIT   001226          1337#
$UNITM  001010          1202#   1273#
$USWR   001240          1344#
$VECT1  001264          1369#   2265    2274*   2277    2297*   2298*   2299    2301
$VECT2  001266          1370#
$XTSTR  034662          6328#
$$GET4= 000000          6147#
$$SWOB= 000052          6383#   6384    6385#   6386#   6387#   6388#   6389#   6390#   6391#   6392#   6393#   6394#   6395#
                        6396#   6397#   6398#   6399#   6400#   6401#   6402#   6403#   6404#   6405#   6406#   6407#   6408#
                        6409#   6410#   6411#   6412#   6413#   6414#   6415#   6416#   6417#   6418#   6419#   6420#   6421#
                        6422#   6423#   6424#   6425#
$OFILL  040313          6938*   6942*   6952    6987#
$OCAT=  ****** U        6325    6806
.       = 057234        1156#   1160#   1166#   1172    1173#   1175#   1177#   1178#   1181#   1187    1188#   1190#   1192#
                        1227#   1231#   1237#   1243    1244#   1246#   1248#   1249#   1252#   1258    1259#   1261#   1263#
                        1281#   1326    2189    2204    2205    2248#   6132#   6155    6156#   6382    6383    6773#   6832
                        6912    7055#   7059    7063#   7064    7065#   7303#   7304    7311#   7365    7420    8405#   8927#
.$ASTA= ****** U        6725    6728
.$X     = 001000        1187#   1192    1258#   1263
```

```
BSETST  1275#  3330  3412  3694
BYPASS  1275#  5762
CLRMSG  1275#  2461  2507  2554
CLRPSW  1275#
COMMEN  1015#
DDDGEN  8406#  8407  8408  8409  8410  8411  8412  8413  8414  8415  8416  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
ECCTST  1275#  5024  5138
ENDCOM  1015#
ERROR    909#  2345  2351  2354  2391  2397  2400  2438  2444  2447  2484  2490  2493  2530  2536
        2539   2577  2583  2586  2630  2636  2639  2687  2693  2696  2741  2747  2750  2796  2802
        2805   2851  2857  2860  2863  2866  2881  2887  2890  2893  2983  2988  3065  3139  3142
        3220   3223  3301  3304  3384  3387  3390  3466  3469  3472  3552  3555  3558  3562  3579
        3664   3667  3670  3748  3751  3754  3842  3845  3848  3852  3945  3948  3951  3955  4049
        4052   4055  4059  4153  4156  4159  4163  4259  4262  4265  4269  4286  4385  4388  4391
        4395   4412  4504  4507  4510  4514  4531  4608  4611  4614  4622  4698  4701  4704  4713
        4788   4791  4794  4802  4878  4881  4884  4892  4965  4971  4989  4993  5077  5083  5102
        5107   5191  5197  5216  5221  5298  5304  5323  5328  5355  5374  5399  5402  5405  5408
        5411   5414  5417  5491  5497  5516  5521  5552  5571  5596  5599  5602  5605  5608  5611
        5614   5694  5700  5720  5725  5843  5849  5869  5874  5983  5989  6009  6014  6043  6048
        6079   6098  6106  6281
ESCAPE  1015#
GETPRI  1015#
GETSWR  1015#  2235#
HDRERR  1275#  4549  4639  4729  4819
HDRGEN  1275#  2604  2661  2715  2770
INCHD   1275#  3082  3163  3244
LDLPER  1275#  2608  2665  2719  2774  3085  3166  3247  3601
MSG     2310#  2312  2356#  2358  2402#  2404  2449#  2451  2495#  2497  2541#  2543  2590#  2592  2648#
        2650   2702#  2704  2756#  2758  2814#  2816  2902#  2904  2990#  2992  3067#  3069  3148#  3150
        3229#  3231  3310#  3312  3392#  3394  3474#  3476  3581#  3583  3676#  3678  3756#  3758  3859#
        3861   3962#  3964  4066#  4068  4170#  4172  4288#  4290  4414#  4416  4533#  4536  4624#  4626
        4714#  4716  4804#  4806  4897#  4899  5000#  5002  5114#  5116  5228#  5230  5421#  5423  5617#
        5619   5740#  5742  5890#  5892  5904#  5906
MULT    1015#
NEWTST  1015#  2310  2356  2402  2449  2495  2541  2590  2648  2702  2756  2814  2902  2990  3067
        3148   3229  3310  3392  3474  3581  3676  3756  3859  3962  4066  4170  4288  4414  4534
        4624   4714  4804  4897  5000  5114  5228  5421  5617  5740  5890  5904
OPITST  1275#  3490  4197  4323  4442
POP     1015#  6767  6768  7042  7354  7403
PUSH    1015#  6728  6730  6751  7001  7328  7383
REPORT  1015#
SCOPE    910#  2320  2366  2413  2459  2505  2552  2602  2659  2713  2768  2826  2919  3007  3080
        3161   3242  3328  3410  3488  3594  3692  3782  3885  3989  4093  4195  4321  4440  4547
        4637   4727  4817  4910  5022  5136  5242  5435  5629  5757  5897  5917  6118
SEKMSG  1275#  2322  2368  2415
SETPRI  1015#  7232
SETTRA  7466#  7475  7476  7477  7478  7480  7482  7483  7484  7485  7486  7487  7489
SETUP   1015#  2183
SKIP    1015#  2347  2353  2393  2399  2440  2446  2486  2492  2532  2538  2579  2585  2808  2853
        2883   2982  2984  3064  3389  3471  3578  3673  3753  3856  3959  4063  4167  4285  4411
        4530   4621  4711  4801  4891  5416  5613
SLASH   1015#
```

```
SPACE   1015#
STARS   1015#  1170  1184  1186  1193  1241  1255  1257  1264  1277  1326  1329  2310  2319  2356
        2365   2402  2412  2449  2458  2495  2504  2541  2551  2590  2601  2648  2658  2702  2712
        2756   2767  2814  2825  2902  2918  2990  3006  3067  3079  3148  3160  3229  3241  3310
        3327   3392  3409  3474  3487  3581  3593  3676  3691  3756  3781  3859  3884  3962  3988
        4066   4092  4170  4194  4288  4320  4414  4439  4534  4546  4624  4636  4714  4726  4804
        4816   4897  4909  5000  5021  5114  5135  5228  5241  5421  5434  5617  5628  5740  5756
        5890   5896  5904  5916  6110  6311  6425  6435  6444  6576  6606  6700  6723  6780  6835
        6914   6991  7058  7135  7150  7221  7245  7314  7367  7413  7422  7445
SWRSU   1015#  2206#
TRMTRP  7466#
TWOHD   1275#  3784  3887  3991  4095
TYPBIN  1015#
TYPDEC  1015#  6133  6140
TYPNAM  1015#  2228
TYPNUM  1015#
TYPOCS  1015#
TYPOCT  1015#  2255  5767  7163
TYPTXT  1015#  6129  6136
WRT18B  1204#  5631  5779  5920
$$CMRE  1275#
$$CMTM  1275#  1312  1313  1314  1315  1316  1317  1318  1319
$$ESCA  1015#
$$NEWT  1015#  2310  2356  2402  2449  2495  2541  2590  2648  2702  2756  2814  2902  2990  3067
        3148   3229  3310  3392  3474  3581  3676  3756  3859  3962  4066  4170  4288  4414  4534
        4624   4714  4804  4897  5000  5114  5228  5421  5617  5740  5890  5904
$$SET   7466#  7475  7476  7477  7478  7480  7482  7483  7484  7485  7486  7487  7488
$$SETM  2222#
$$SKIP  1015#  2347  2353  2393  2399  2440  2446  2486  2492  2532  2538  2579  2585  2808  2853
        2883   2982  2984  3064  3389  3471  3578  3673  3753  3856  3959  4063  4167  4285  4411
        4530   4621  4711  4801  4891  5416  5613
.EQUAT   881#   905
.HEADE   881#   883
.KTII    881#
.SETUP   881#  2168
.SWRHI   881#   893
.SWRLO   881#   905#
.$ACTI   881#  1168  1239
.$APTB  1327#
.$APTH   881#  1182  1253
.$APTY   881#  6721
.$CATC   881#  1154  1225
.$CMTA   881#  1275
.$EOP    881#  6108
.$ERRO   881#  6778
.$ERRT   881#
.$POWE   881#
.$RDOC   881#  7312
.$READ   881#  7056
.$SAVE   881#  7365
.$SCOP   881#  6309
.$SIZE   881#
.$TRAP   881#  7[illegible]
.$TYPD   881#  6[illegible]
.$TYPE   881#  6833
.$TYPO   881#  6912
```

. ABS. 057234 000

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

DSKZ:DZR6DA,DSKZ:DZR6DA.SEQ/CRF/SOL/DOC=DZR6DA
RUN-TIME: 91 86 8 SECONDS
RUN-TIME RATIO: 292/186=1.5
CORE USED: 35K (69 PAGES)

DOCUMENT PAGES: 189

Spooler runtime 32 Seconds, 135 KCS, 852 disk reads, 0 disk writes, 189 pages

[redacted] Date 01-Dec-76 17:42:41 Monitor IPC-D 602 [680] **EDU**