RK611

DISKLSS CONTROL PART 3

CZR6CC0

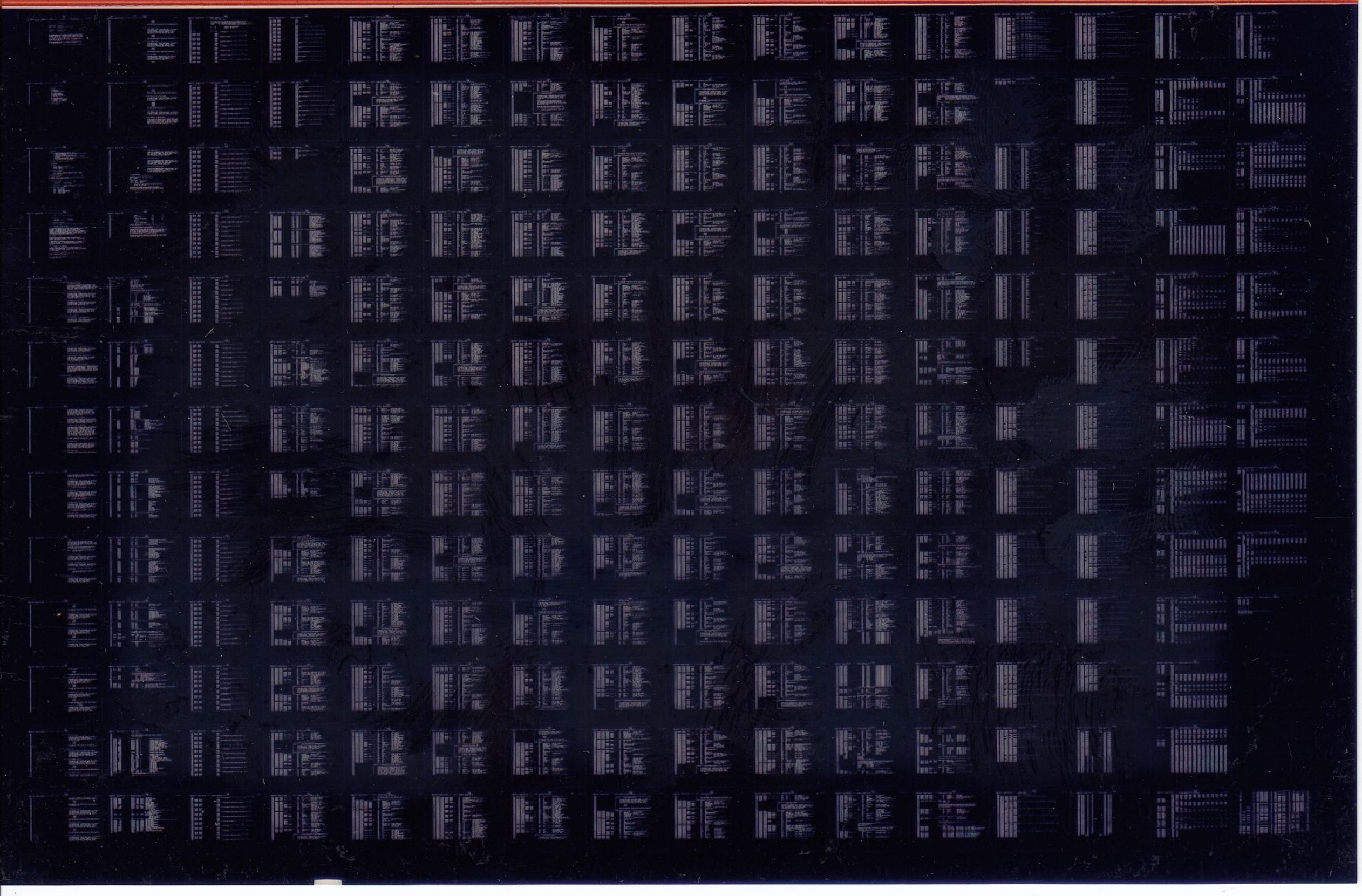
AH-9106C-MC

FICHE 1 OF 1

MAR 1978

digital

MADE IN USA



```
                        .REM    %
                                IDENTIFICATION


                        PRODUCT CODE:   AC-S104C-MC

                        PRODUCT NAME:   CZR6CCO RK611 DSKLS CTRL PRT 3

                        DATE:           FEB 1978

                        MAINTAINER:     DIAGNOSTIC GROUP

                        AUTHOR:         ROY SPITZER


                        THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT
                        NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL
                        EQUIPMENT CORPORATION.  DIGITAL EQUIPMENT CORPORATION ASSUMES
                        NO RESPONSIBILITY FOR ANY ERROR THAT MAY APPEAR IN THIS DOCUMENT.

                        THE SOFTWARE DESCRIBED IN THIS DOCUMENT IS FURNISHED UNDER A
                        LICENCE AND MAY ONLY BE USED OR COPIED IN ACCORDANCE WITH THE
                        TERMS OF SUCH LICENSE.

                        DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR
                        THE USE OF RELIABILITY OF ITS SOFTWARE ON EQUIPMENT THAT IS
                        NOT SUPLIED BY DIGITAL.

                             COPYRIGHT (C) 1976, 1978 BY DIGITAL EQUIPMENT CORPORATION
```

TABLE OF CONTENTS

```
                                1.0 ABSTRACT

                THE RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3
                        A. TESTS THE LOADING OF THE DRIVE BUS MESSAGE SHIFT REGISTER
                           FOR CLASS B COMMANDS.
                        B. TESTS INDEX AND SECTOR PULSE DETECTION.
                        C. TESTS SILO AND NPR TRANSFERS FROM MEMORY IN 16 AND 18
                           BIT MODE.
                        D. TESTS NON-EXISTANT MEMORY AND UNIBUS PARITY ERROR DETECTION.
                        E. TESTS READ AND WRITE MFM LOOPBACK.
                        F. TESTS CLASS B INSTRUCTION ERRORS.

                NO RK06 DRIVE IS REQUIRED FOR PROGRAM EXECUTION.


                2.0 REQUIREMENTS

                2.1 EQUIPMENT

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


                2.2 PRELIMINARY PROGRAMS

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

                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

3.5 RUN TIME

FIRST PASS	30 SECONDS
SUBSEQUENT FASSES	8:40 MINUTES

4.0 OPERATING PROCEDURES

THE PROGRAM IS EXECUTED BY STARTING AT THE APPROPIATE ADDRESS.

4.1 'SOFTWARE' SWITCH REGISTER

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

SWR = NNNNNN NEW ='

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

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

4.2 CONTROL C (↑C) OPERATION

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

4.3 CONTROL S (↑S) OPERATION

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

4.4 CONTROL Q (↑Q) OPERATION

IF A ↑S HAS BEEN TYPED, TYPING THE ↑Q CANCELS THE STALL INITIATED BY THE ↑S.

```
                                5.0 PROGRAM DESCRIPTION

                                        **DRIVE MESSAGES FOR CLASS 8 INSTRUCTIONS

                                                TEST 1  READ HEADER SEEK MESSAGE

                                                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                                        PUT THE RK611 CONTROLLER IN DIAGNOSTIC MODE.  ISSUE
                                                        A READ HEADER TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0
                                                        HEAD 0, DRIVE 0. CLOCK IN SEEK MESSAGE INTO SHIFT REGIST
                                                        VERIFY THAT A SEEK IS LOADED WITH THE PROPER BITS IN
                                                        MESSAGE SET.  REPEAT FOR A READ HEADER WITH CDT SET
                                                        IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.


                                                TEST 2  WRITE HEADER SEEK MESSAGE

                                                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                                        CLOCK IN SEEK MESSAGE INTO SHIFT REGISTER.  VERIFY
                                                        THAT A SEEK IS LOADED WITH THE RTC BIT SET.  REPEAT
                                                        FOR A WRITE HEADER WITH CDT SET IN 24 SECTOR FORMAT,
                                                        CYLINDER 1777, HEAD 7, DRIVE 7.


                                                TEST 3  READ HEADER DRIVE CLEAR MESSAGE

                                                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                                        IN DIAGNOSTIC MODE.  ISSUE A READ HEADER WITH CDT SET
                                                        IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
                                                        CLOCK SEEK MESSAGE AND MAKE SURE A DRIVE CLEAR IS
                                                        GENERATED AND THE PROPER BITS ARE SET.


                                                TEST 4  WRITE HEADER DRIVE CLEAR MESSAGE

                                                        CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
                                                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER WITH CDT SET
                                                        IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
                                                        CLOCK SEEK MESSAGE AND LOAD GENERATED DRIVE CLEAR
                                                        INTO SHIFT REGISTER.  MAKE SURE THE DRIVE CLEAR IS
                                                        GENERATED AND THE PROPER BITS ARE SET.


                                        **INDEX AND SECTOR PULSE DETECT ON

                                                TEST 5  SECTOR PULSE DETECT IN READ HEADER (PART 1)

                                                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                                        IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                                                        IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
                                                        CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
                                                        SIMULATE SECTOR PULSE, 255 ZEROES AND A ONE.
```

```
                        MAKE SURE READ GATE DOES SET.


                TEST 6  SECTOR PULSE DETECT IN READ HEADER (PART 2)

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                        IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
                        CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
                        SIMULATE INDEX PULSE, 255 ZEROES AND A ONE.

                        MAKE SURE READ GATE DOES NOT SET.


                TEST 7  SECTOR PULSE DETECT IN READ HEADER (PART 3)

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        CLOCK BOTH SEEK AND DRIVE CHECK MESSAGES.
                        SIMULATE 255 ZEROES AND A ONE.

                        MAKE SURE READ GATE DOES NOT SET.


                TEST 10 INDEX PULSE DETECTION IN WRITE HEADER

                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
                        THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
                        TO AN RK06, IN 26 SECTOR FORMAT, TO CYLINDER 0, HEAD 0,
                        DRIVE 0, WITH A ONE WORD TRANSFER.  CLOCK THROUGH THE
                        SEEK AND THE DRIVE CLEAR MESSAGES.  ISSUE 200 CONTROLLER
                        CLOCKS AND MAKE SURE WRITE GATE DOES NOT SET.  SIMULATE
                        SECTOR PULSE AND 200 CONTROLLER CLOCKS MAKING SURE WRITE
                        GATE DOES NOT SET.  SIMULATE INDEX PULSE AND MAKE SURE
                        WRITE GATE SETS.


        **NPR READING OF MEMORY

                TEST 11 NPR OUTPUT DATA TRANSFER

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 777, HEAD 7, DRIVE 7.
                        SPECIFY A ONE WORD DATA TRANSFER.  CLOCK BOTH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE INDEX PULSE.
                        CLOCK IN FIRST WORD OF NPR TRANSFER.  CHECK INPUT READY,
                        OUTPUT READY, BUS  ADDRESS, WORD COUNT, AND CONTENTS OF
                        THE SILO.  REPEAT FOR 8 DIFFERENT DATA PATTERNS.


                TEST 12 PARTIAL SILO FILLING

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
```

IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
SPECIFY A ONE WORD DATA TRANSFER. CLOCK IN ALL
SPECIFIED WORDS INTO THE SILO. CHECK WORD COUNT,
BUS ADDRESS, INPUT READY, AND OUTPUT READY. MAKE
SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
INTO THE SILO. CHECK THE SILO FOR CORRECT DATA.
REPEAT FOR WORD COUNTS 2-65.

TEST 13 SILO FILLING WITH NPR TRANSFERS

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
SPECIFY A 66 WORD DATA TRANSFER, CLOCK IN ALL 66 WORDS
INTO THE SILO. CHECK INPUT READY, OUTPUT READY, BUS
ADDRESS, WORD COUNT, AND CONTENTS OF THE SILO.

TEST 14 SILO CAPICITY WITH NPR TRANSFERS

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
SPECIFY A 68 WORD DATA TRANSFER. CLOCK IN 66
WORDS INTO THE SILO. MAKE SURE THAT SILO WILL STOP
FILLING AT 66 WORDS. TAKE ONE WORD FROM SILO AND
CHECK IT. CLOCK IN NEXT WORD. MAKE SURE NO MORE
THAN ONE WORD IS CLOCKED IN THE SILO. TAKE ONE
WORD FROM SILO AND CHECK IT. CLOCK IN NEXT WORD.
CLOCK IN NEXT WORD. MAKE SURE NO MORE THAN ONE WORD IS
CLOCKED IN THE SILO. TAKE ONE WORD FROM SILO AND
CHECK IT. ATTEMPT TO CLOCK IN NEXT WORD AND

MAKE SURE NO WORDS ARE CLOCK INTO SILO. UNLOAD THE
SILO AND MAKE SURE ALL THE WORDS ARE CORRECT.

TEST 15 BUS ADDRESS INHIBIT

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN
RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
SPECIFY A 66 WORD DATA TRANSFER WITH BUS ADDRESS
INHIBIT INCREMENT. CHECK WORD COUNT, BUS ADDRESS,
INPUT READY, OUTPUT READY, AND MAKE SURE ALL THE
WORDS IN THE SILO ARE THE CORRECT SAME WORD.

TEST 16 NON-EXISTENT MEMORY

CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06

```
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TO A NON-EXISTENT ADDRESS
                        (760000) AND MAKE SURE THE NON-EXISTENT  MEMORY ERROR
                        OCCURS IN THE RK611 CONTROLLER.


TEST 17 BUS ADDRESS BIT 16

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO  AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TRANSFER FROM 200000.
                        READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
                        REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 177776.
                        CHECK BUS ADDRESS AND WORD COUNT.

                        NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 32K
                               OF MEMORY IS ON THE SYSTEM.


TEST 20 BUS ADDRESS BIT 17

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TRANSFER FROM 400000.
                        READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
                        REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 377776.
                        CHECK BUS ADDRESS AND WORD COUNT.

                        NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
                               OF MEMORY IS ON THE SYSTEM.


TEST 21 ADDRESSING GREATER THAN 96K

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TRANSFER FROM 600000.
                        READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
                        REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 577776.
                        CHECK BUS ADDRESS AND WORD COUNT.

                        NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 96K
                               OF MEMORY IS ON THE SYSTEM.


TEST 22 UNIBUS PARITY ERROR

                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TRANSFER FROM A LOCATION
                        WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY ERROR
```

```
                        OCCURS.

                        REPEAT FOR A ONE WORD DATA TRANSFER FROM THE
                        LOCATION PRIOR TO THE LOCATION WITH BAD PARITY.
                        MAKE SURE UNIBUS PARITY ERROR DOES NOT OCCUR.  REPEAT
                        FOR A ONE WORD DATA TRANSFER FROM THE LOCATION AFTER
                        THE LOCATION WITH BAD PARITY.  MAKE SURE UNIBUS PARITY
                        ERROR DOES NOT OCCUR.

                        REPEAT FOR A TWO WORD DATA TRANSFER STARTING WITH
                        THE ADDRESS PRIOR TO THE LOCATION WITH BAD PARITY.
                        MAKE SURE UNIBUS PARITY ERROR DOES OCCUR.

                        NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
                                EXISTS FOR SPECIFIED LOCATION AND IS NOT
                                RUN ON AN 11/70.


                TEST 23 SILO FILL IN 18 BIT MODE

                        CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0. DRIVE 0,
                        SPECIFY 66  WORD DATA TRANSFER.  CLOCK
                        ALL 66 WORD INTO THE SILO.  CHECK THAT ALL 66
                        WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).


                TEST 24 BIT 16 AND 17 READING WITH NPR

                        CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        SPECIFY ONE WORD DATA TRANSFER FROM A LOCATION


                        WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY
                        DOES NOT OCCUR.

                        NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
                                ENABLE EXISTS FOR SPECIFIED LOCATION AND
                                IS NOT RUN ON AN 11/70.


        **MFM READ LOOPBACK TESTS

                TEST 25 READ LOOPBACK (PART 1)

                        CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
                        SIMULATE SECTOR PULSE, 255 ZEROES, A
                        ONE, AND A HEADER CONSISTING OF THE THREE
```

FOLLOWING WORDS:

177777
000000
177777

MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 26 READ LOOPBACK (PART 2)

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
SIMULATE SECTOR PULSE, 255 ZEROES, A ONE,
AND A HEADER CONSISTING OF THE THREE
FOLLOWING WORDS:

000000
177777
000000

MAKE SURE THAT READY COMES UP AFTER THIRD WORD
IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 27 READ LOOPBACK (PART 3)

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MOVE. ISSUE A READ HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
SIMULATE SECTOR PULSE, 255 ZEROES, A
ONE, AND A HEADER CONSISTING OF THE THREE
FOLLOWING WORDS:

125252
052525
125252

MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 30 READ LOOPBACK (PART 4)

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
SIMULATE SECTOR PULSE, 225 ZEROES, A

ONE, AND A HEADER CONSISTING OF THE THREE
FOLLOWING WORDS:

044444
022222
111111

MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 31 READ LOOPBACK (PART 5)

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO AN RK06
26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
SIMULATE SECTOR PULSE, 255 ZEROES, A
ONE, AND A HEADER CONSISTING OF THE THREE
FOLLOWING WORDS.

052012
100520
052012

MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
IS TRANSRERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 32 READ HEADER IN 18 BIT MODE

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
SIMULATE SECTOR PULSE, 255 ZEROES, A
ONE, AND A HEADER CONSISTING OF THE THREE
FOLLOWING WORDS:

177777
000000
177777

MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

TEST 33 SYNCH DETECT IN READ HEADER

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
SIMULATE SECTOR PULSE AND 350 ZEROES. MAKE
SURE READY REMAINS RESET AND THE SILO REMAINS
EMPTY.

TEST 34 ZERO SYNCH ON READ

CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0. CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES, SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF BIT TIME, A ONE, AND A HEADER CONSISTING OF THE THREE FOLLOWING WORDS:

177777
000000
177777

MAKE SURE THAT READY COMES AFTER THE THIRD WORD IS TRANSFERRED. CHECK THE SILO FOR CORRECT CONTENTS.

**MFM WRITE LOOPBACK TESTS

TEST 35 WRITE ZEROS UNTIL SECTOR PULSE WITH WPITE HEADER

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0. CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE INDEX PULSE AND 500 DATA BITS. MAKE SURE THAT ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE WRITE GATE RESETS.

TEST 36 WRITE LOOPBACK (PART 1)

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

177777
000000
177777

MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PUL CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION

TEST 37 WRITE LOOPBACK (PART 2)

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER

IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.

```
                        CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                        INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
                        CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:

                                000000
                                177777
                                000000

                        MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                        IS TRANSFERRED.  CHECK FOR CORRECT WRITE ENCODED DATA
                        AND PRECOMPENSATION.


TEST 40 WRITE LOOPBACK (PART 3)

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

                                125252
                                052525
                                125252

                        MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PUL
                        CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


TEST 41 WRITE LOOPBACK (PART 4)

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

                                044444
                                022222
                                111111

                        MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX MOD
                        CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


TEST 42 WRITE LOOPBACK (PART 5)

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

```
                                        052012
                                        100520
                                        052012

                MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PUL
                CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


TEST 43 WRITE LOOPBACK (PART 6)

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

                        155555
                        066666
                        155555

                MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
                CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


TEST 44 WRITE LOOPBACK (PART 7)

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

                        104210
                        104210
                        104210

                MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
                CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


TEST 45 WRITE TWO HEADERS

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

                        177777
                        000000
                        177777
```

FOLLOW THAT BY A SECTOR PULSE AND ONE THREE WORD
HEADER CONSISTING OF THE FOLLOWING DATA:

```
000000
177777
000000
```

SIMULATE AN INDEX PULSE AND MAKE SURE READY COMES UP.
CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMENSATION.

TEST 46 DATA FIELD FILLING ON WRITE HEADER

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, AND
SPECIFY TWO 3 WORD HEADERS CONSISTING OF THE
FOLLOWING DATA:

```
125252
052525
125252
052525
125252
052525
```

MAKE SURE THE DATA SYNCH ANY OTHER BITS OF DATA AND
ECC FIELD ARE WRITTEN CORRECTLY.

TEST 47 WRITE HEADER FOR 26 SECTORS

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, SPECIF
66 WORDS. MAKE SURE ALL 26 SECTORS ARE WRITTEN CORRECTL

TEST 50 WRITE HEADER IN 24 SECTOR FORMAT

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT
THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER
OF SIX WORDS IN 24 SECTOR FORMAT TO AN RK06, CYLINDER 0,
HEAD 0, DRIVE 0. CLOCK THROUGH THE SEEK AND DRIVE CLEAR
MESSAGES, SIMULATE INDEX PULSE, SECTOR PULSE, 3 HEADER
WORDS, SYNCH AND DATA, ANOTHER SECTOR PULSE, 3 HEADER
WORDS, AND AN INDEX PULSE. CHECK DATA WRITTEN TO MAKE
SURE ONLY LOW 16 BITS OF SILO ARE USED.

**TYPE B INSTRUCTION ERRORS

TEST 51 FORMAT ERROR (PART 1)

CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR. PUT TH CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO A RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0. CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6. TURN O MAINTENANCE MODE. MAKE SURE FORMAT ERROR, DRIVE AVAILABLE AND CONTROLLER ERROR SET.

TEST 52 FORMAT ERROR (PART 2)

CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR. PUT TH CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ HEADER TO A RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0. CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6. TURN O MAINTENANCE MODE. MAKE SURE FORMAT ERROR, DRIVE AVAILABLE AND CONTROLLER ERROR SET.

TEST 53 FAULT SETTING CONTROLLER ERROR

CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR. PUT TH CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0. CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6. TURN OFF MAINTENANCE MODE. MAKE SURE DRIVE AVAILABLE AND CONTROLLER ERROR SET.

6.0 ERROR REPORTING

THE GENERAL FORMAT OF ERROR REPORTS IS:

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

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

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

THESE FIELDS (ALL VALUES GIVEN IN OCTAL) ARE:

FIELD	BITS	WORDS
HEADER PREAMBLE	400	20

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

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

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

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

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

%

```
                                ; *** REV 003 ***
                                .NLIST  CND,MD,MC
                                .LIST   ME
                                .ENABL  ABS,AMA
167400                          $SWR=   167400
000001                          $TN=    1
                                .TITLE  CZR6CC0 RK611 DSKLS CTRL PRT3
                                ;*COPYRIGHT (C) 1976,1977
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY ROY SPITZER
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                                ;*
                                .SBTTL  OPERATIONAL SWITCH SETTINGS
                                ;*
                                ;*      SWITCH                  USE
                                ;*      ------          --------------------
                                ;*        15            HALT ON ERROR
                                ;*        14            LOOP ON TEST
                                ;*        13            INHIBIT ERROR TYPEOUTS
                                ;*        12            ABORT PROGRAM AFTER 20 ERRORS
                                ;*        11            INHIBIT ITERATIONS
                                ;*        10            BELL ON ERROR
                                ;*         9            LOOP ON ERROR
                                ;*         8            LOOP ON TEST IN SWR<7:0>
                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                          STACK=  1100
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
000007                          R7=     %7              ;;GENERAL REGISTER
```

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

                        ;*PRIORITY LEVEL DEFINITIONS
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
                        .SBTTL  MEMORY MANAGEMENT DEFINITIONS

                        ;*KT11 VECTOR ADDRESS

000250                  MMVEC=  250

                        ;*KT11 STATUS REGISTER ADDRESSES

177572                  SR0=    177572
177574                  SR1=    177574
177576                  SR2=    177576
172516                  SR3=    172516

                        ;*KERNEL "I" PAGE DESCRIPTOR REGISTERS

172300                  KIPDR0= 172300
172302                  KIPDR1= 172302
172304                  KIPDR2= 172304
172306                  KIPDR3= 172306
172310                  KIPDR4= 172310
172312                  KIPDR5= 172312
172314                  KIPDR6= 172314
172316                  KIPDR7= 172316

                        ;*KERNEL "I" PAGE ADDRESS REGISTERS

172340                  KIPAR0= 172340
172342                  KIPAR1= 172342
172344                  KIPAR2= 172344
172346                  KIPAR3= 172346
```

```
1038            172350                  KIPAR4= 172350
1039            172352                  KIPAR5= 172352
1040            172354                  KIPAR6= 172354
1041            172356                  KIPAR7= 172356
1042
1043            000114                  MEMVEC= 114                     ;MEMORY PARITY VECTOR
1044            172100                  MEMBAS= 172100                  ;MEM PARITY OPTION
1045            000004                  WR.PAR= 4                       ;WRITE BAD PARITY
1046            000001                  PAR.EN= 1                       ;ENABLE PARITY ENABLE
1047            120210                  AVECT1= 120210                  ;DEFINE RK611 VECTOR ADDRESS
1048            000005                  APRIOR= 5                       ;DEFINE RK611 PRIORITY
1049            177440                  ABASE=  177440                  ;DEFINE BASE OF RK611 REGISTERS
1050
1051                                    .SBTTL  RK611 CONTROLLER REGISTER DEFINITION
1052
1053            000000                  RKCS1=  0                       ;CONTROL AND STATUS REGISTER 1
1054            000002                  RKWC=   2                       ;WORD COUNT REGISTER
1055            000004                  RKBA=   4                       ;BUS ADDRESS REGISTER
1056            000006                  RKDA=   6                       ;DESIRED TRACK SECTOR REGISTER
1057            000010                  RKCS2=  10                      ;CONTROL AND STATUS REGISTER 2
1058            000012                  RKDS=   12                      ;DRIVE STATUS REGISTER
1059            000014                  RKER=   14                      ;ERROR REGISTER
1060            000016                  RKASOF= 16                      ;ATTENTION SUMMARY AND OFFSET REGISTER
1061            000020                  RKDCYL= 20                      ;DESIRED CYLINDER REGISTER
1062            000024                  RKDB=   24                      ;DATA BUFFER
1063            000026                  RKMR1=  26                      ;MAINTENANCE REGISTER 1
1064            000034                  RKMR2=  34                      ;MAINTENANCE REGISTER 2
1065            000036                  RKMR3=  36                      ;MAINTENANCE REGISTER 3
1066            000030                  RKECPS= 30                      ;ECC POSITION INFORMATION
1067            000032                  RKECPT= 32                      ;ECC PATTERN INFORMATION
1068            000022                  RKSPAR= 22                      ;SPARE REGISTER
1069
1070                                    .SBTTL  DRIVE COMMANDS
1071
1072            000001                  SELDRV= 01                      ;SELECT DRIVE
1073            000003                  PACK=   03                      ;PACK ACKNOWLEDGE
1074            000005                  CLEAR=  05                      ;DRIVE CLEAR
1075            000007                  UNLOAD= 07                      ;UNLOAD
1076            000011                  SRTSPL= 11                      ;START SPINDLE
1077            000013                  RECAL=  13                      ;RECALIBRATE
1078            000015                  OFFSET= 15                      ;OFFSET
1079            000017                  SEEK=   17                      ;SEEK
1080            000021                  RDDATA= 21                      ;READ DATA
1081            000023                  WRDATA= 23                      ;WRITE DATA
1082            000025                  RDHEAD= 25                      ;READ HEADER
1083            000027                  WRHEAD= 27                      ;WRITE HEADER AND DATA
1084            000031                  WRTCHK= 31                      ;WRITE CHECK
1085            000300                  INTR=   300                     ;GENERATE INTERRUPT TO CPU
1086
1087                                    .SBTTL  CONTROL AND STATUS REGISTER 1 BITS
1088
1089            000001                  GO=     BIT0                    ;GO BIT
1090            000100                  IE=     BIT6                    ;INTERRUPT ENABLE
1091            000200                  RDY=    BIT7                    ;CONTROLLER READY
1092            000400                  BA16=   BIT8                    ;BUS ADDRESS BIT 16
1093            001000                  BA17=   BIT9                    ;BUS ADDRESS BIT 17
```

```
1094            002000                  CDT=    BIT10                   ;CONTROLLER DRIVE TYPE (0=RK06)
1095            004000                  CTO=    BIT11                   ;CONTROLLER TIMED OUT WAITING FOR
1096                                                                    ;  DRIVE RESPONSE
1097            010000                  CFMT=   BIT12                   ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
1098            020000                  SPAR=   BIT13                   ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
1099            040000                  DI=     BIT14                   ;DRIVE INTERRUPT
1100            100000                  CERR=   BIT15                   ;CONTROLLER ERROR
1101            100000                  CCLR=   BIT15                   ;CONTROLLER CLEAR
1102
1103                                    .SBTTL  CONTROL AND STATUS REGISTER 2 BITS
1104
1105            000007                  DRVMSK= 7                       ;MASK FOR DRIVE SELECTION CODE
1106            000010                  RLS=    BIT3                    ;DESELECT OR RELEASE DRIVE IN BITS 0-2
1107            000020                  BAI=    BIT4                    ;BUS ADDRESS INCREMENT INHIBIT
1108            000040                  SCLR=   BIT5                    ;CLEAR CONTROLLER AND ALL DRIVES
1109            000100                  IR=     BIT6                    ;INPUT READY
1110            000200                  OR=     BIT7                    ;OUTPUT READY
1111            000400                  UFE=    BIT8                    ;UNIT FIELD ERROR
1112            001000                  MDS=    BIT9                    ;MULTIPLE DRIVE SELECT
1113            002000                  PGE=    BIT10                   ;PROGRAMMING ERROR
1114            004000                  NEM=    BIT11                   ;NON-EXISTENT MEMORY
1115            010000                  NED=    BIT12                   ;NON-EXISTENT DRIVE
1116            020000                  UPE=    BIT13                   ;UNIBUS PARITY ERROR
1117            040000                  WCE=    BIT14                   ;WRITE CHECK ERROR
1118            100000                  DLT=    BIT15                   ;DATA LATE ERROR
1119
1120                                    .SBTTL  ERROR REGISTER BIT DEFINITION
1121
1122            000001                  ILF=    BIT0                    ;ILLEGAL FUNCTION CODE
1123            000002                  SKI=    BIT1                    ;SEEK INCOMPLETE
1124            000004                  NXF=    BIT2                    ;NON-EXECUTABLE DRIVE FUNCTION
1125            000010                  DRPAR=  BIT3                    ;DRIVE DETECTED DRIVE BUS PARITY ERROR
1126            000020                  FMTE=   BIT4                    ;FORMAT ERROR
1127            000040                  DTYE=   BIT5                    ;DRIVE TYPE ERROR
1128            000100                  ECH=    BIT6                    ;ECC HARD
1129            000200                  BSE=    BIT7                    ;BAD SECTOR ERROR
1130            000400                  HVRC=   BIT8                    ;HEADER VRC ERRROR
1131            001000                  COE=    BIT9                    ;CYLINDER ADDRESS OVERFLOW ERROR
1132            002000                  IDAE=   BIT10                   ;INVALID DISK ADDRESS ERROR
1133            004000                  WLE=    BIT11                   ;WRITE LOCK ERROR
1134            010000                  DTE=    BIT12                   ;DRIVE TIMING ERROR
1135            020000                  OPI=    BIT13                   ;OPERATION (SEARCH) INCOMPLETE
1136            040000                  UNS=    BIT14                   ;DRIVE UNSAFE
1137            100000                  DCK=    BIT15                   ;DATA CHECK
1138
1139                                    .SBTTL  STATUS REGISTER BIT DEFINITION
1140
1141            000001                  DRA=    BIT0                    ;DRIVE AVAILABLE (CONTROLLER IS SET IF
1142                                                                    ;  THIS BIT IS RESET)
1143            000004                  OFST=   BIT2                    ;DRIVE OFFSET
1144            000010                  ACLO=   BIT3                    ;AC LOW
1145            000020                  SPDLSS= BIT4                    ;SPEED LOSS
1146            000040                  DROT=   BIT5                    ;DRIVE OFF TRACK
1147            000100                  VV=     BIT6                    ;VOLUME VALID
1148            000200                  DRDY=   BIT7                    ;DRIVE READY
1149            000400                  DDT=    BIT8                    ;DRIVE TYPE (0=RK06)
```

```
                        STATUS REGISTER BIT DEFINITION

000000 004000           WRL=    BIT11                   ;WRITE LOCK
000000 020000           PIP=    BIT13                   ;POSITIONING IN PROGRESS
000000 040000           DSC=    BIT14                   ;DRIVE STATUS CHANGE
000000 100000           SVAL=   BIT15                   ;STATUS VALID

                        .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION

000000 000017           MESMSK= 17                      ;MESSAGE MASK

000000 000020           PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
000000 000040           DMD=    BIT5                    ;DIAGNOSTIC MODE
000000 000100           MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
000000 000200           MIND=   BIT7                    ;MAINTENANCE INDEX
000000 000400           MCLK=   BIT8                    ;MAINTENANCE CLOCK
000000 001000           MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
000000 002000           MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
000000 004000           PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
000000 010000           PCD=    BIT12                   ;PRECOMPENSATION DELAY
000000 020000           ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
000000 040000           WRTGAT= BIT14                   ;WRITE GATE
000000 100000           RDGATE= BIT15                   ;READ GATE

                        .SBTTL  TRANSMITTED MESSAGE A

000000 000020           S.SEEK= BIT4                    ;SEEK COMMAND
000000 000040           S.RECL= BIT5                    ;RECALIBRATE COMMAND
000000 000100           S.STSP= BIT6                    ;START SPINDLE COMMAND
000000 000200           S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
000000 000400           S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
000000 001000           S.FMT=  BIT9                    ;FORMAT
000000 002000           S.UNLD= BIT10                   ;UNLOAD
000000 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  003662          JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
000204  000137  003652          JMP     RESTRT          ;JUMP TO RESTART ROUTINE
000214                          .=214
000214  000137  003642          JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
                        .SBTTL  ACT11 HOOKS

                        ;;*****************************************************************
                        ;HOOKS REQUIRED BY ACT11
000220                          $SVPC=.                 ;SAVE PC
000046                          .=46
000046  044674                  $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
```

```
1206            000114                          .=MEMVEC
1207   000114   046274                          MEMERR
1208   000116   000340                          PR7
1209            001000                          .=1000
1210                                    .SBTTL  APT PARAMETER BLOCK
1211
1212
1213                                    ;;*****************************************************************
1214                                    ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1215            001000                  ;;*****************************************************************
1216            000024                          .$X=.   ;;SAVE CURRENT LOCATION
1217   000024   000200                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1218            000044                          200     ;;FOR APT START UP
1219   000044   001000                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1220            001000                          $APTHDR ;;POINT TO APT HEADER BLOCK
1221                                            .=.$X   ;;RESET LOCATION COUNTER
1222                                    ;;*****************************************************************
1223                                    ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1224                                    ;INTERFACE SPEC.
1225   001000                           $APTHD:
1226   001000   000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1227   001002   001214                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1228   001004   000000                 $TSTM:  .WORD           ;;RUN TIM OF LONGEST TEST
1229   001006   000000                 $PASTM: .WORD           ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1230   001010   000000                 $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1231   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
```

```
1288  001214                    $MAIL:
1289  001214  000000            $MSGTY: .WORD   AMSGTY  ;;APT MAILBOX
1290  001216  000000            $FATAL: .WORD   AFATAL  ;;MESSAGE TYPE CODE
1291  001220  000000            $TESTN: .WORD   ATESTN  ;;FATAL ERROR NUMBER
1292  001222  000000            $PASS:  .WORD   APASS   ;;TEST NUMBER
1293  001224  000000            $DEVCT: .WORD   ADEVCT  ;;PASS COUNT
1294  001226  000000            $UNIT:  .WORD   AUNIT   ;;DEVICE COUNT
1295  001230  000000            $MSGAD: .WORD   AMSGAD  ;;I/O UNIT NUMBER
1296  001232  000000            $MSGLG: .WORD   AMSGLG  ;;MESSAGE ADDRESS
1297  001234                    $ETABLE:                ;;MESSAGE LENGTH
1298  001234     000            $ENV:   .BYTE   AENV    ;;APT ENVIRONMENT TABLE
1299  001235     000            $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT BYTE
1300  001236  000000            $SWREG: .WORD   ASWREG  ;;ENVIRONMENT MODE BITS
1301  001240  000000            $USWR:  .WORD   AUSWR   ;;APT SWITCH REGISTER
1302  001242  000000            $CPUOP: .WORD   ACPUOP  ;;USER SWITCHES
1303                            ;*                      ;;CPU TYPE,OPTIONS
1304                            ;*                      BITS 15-11=CPU TYPE
1305                            ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1306                            ;*                              11/70=06,PDQ=07,Q=10
1307                            ;*                      BIT 10=REAL TIME CLOCK
1308                            ;*                      BIT  9=FLOATING POINT PROCESSOR
1309  001244     000            $MAMS1: .BYTE   AMAMS1  ;;BIT  8=MEMORY MANAGEMENT
1310  001245     000            $MTYP1: .BYTE   AMTYP1  ;;HIGH ADDRESS,M.S. BYTE
1311                            ;*                      ;;MEM. TYPE,BLK#1
1312                            ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
1313                            ;*                              900 NSEC CORE=001
1314                            ;*                              300 NSEC BIPOLAR=002
1315  001246  000000            $MADR1: .WORD   AMADR1  ;;      500 NSEC MOS=003
1316                            ;*                      ;;HIGH ADDRESS,BLK#1
1317  001250     000            $MAMS2: .BYTE   AMAMS2  ;;MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1318  001251     000            $MTYP2: .BYTE   AMTYP2  ;;HIGH ADDRESS,M.S. BYTE
1319  001252  000000            $MADR2: .WORD   AMADR2  ;;MEM.TYPE,BLK#2
1320  001254     000            $MAMS3: .BYTE   AMAMS3  ;;MEM.LAST ADDRESS,BLK#2
1321  001255     000            $MTYP3: .BYTE   AMTYP3  ;;HIGH ADDRESS,M.S.BYTE
1322  001256  000000            $MADR3: .WORD   AMADR3  ;;MEM.TYPE,BLK#3
1323  001260     000            $MAMS4: .BYTE   AMAMS4  ;;MEM.LAST ADDRESS,BLK#3
1324  001261     000            $MTYP4: .BYTE   AMTYP4  ;;HIGH ADDRESS,M.S.BYTE
1325  001262  000000            $MADR4: .WORD   AMADR4  ;;MEM.TYPE,BLK#4
1326  001264  120210            $VECT1: .WORD   AVECT1  ;;MEM.LAST ADDRESS,BLK#4
1327  001266  000000            $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1328  001270  177440            $BASE:  .WORD   ABASE   ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1329  001272  000000            $DEVM:  .WORD   ADEVM   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1330  001274  000000            $CDW1:  .WORD   ACDW1   ;;DEVICE MAP
1331  001276  000000            $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#1
1332  001300                    $ETEND:                 ;;CONTROLLER DESCRIPTION WORD#2
1333                            .MEXIT
```

```
                                .SBTTL  ERROR POINTER TABLE

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

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

001300                          $ERRTB:
                                ;       ERROR 1:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 CS1 INCORRECT.
001300  057755                          EM200
001302  064134                          EM3000
001304  053214                          DT001
001306  053656                          DF001
                                ;       ERROR 2:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE A INCORRECT.
001310  057755                          EM200
001312  064177                          EM3001
001314  053214                          DT001
001316  053656                          DF001
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE B INCORRECT.
001320  057755                          EM200
001322  064223                          EM3002
001324  053214                          DT001
001326  053656                          DF001
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 CS1 INCORRECT.
001330  060037                          EM201
001332  064134                          EM3000
001334  053214                          DT001
001336  053656                          DF001
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE A INCORRECT.
001340  060037                          EM201
001342  064177                          EM3001
001344  053214                          DT001
001346  053656                          DF001
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE IS INCORRECT.
001350  060037                          EM201
001352  064223                          EM3002
001354  053214                          DT001
001356  053656                          DF001
                                ;       ERROR 7:  ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
                                ;                 CS1 INCORRECT
001360  060122                          EM202
001362  064134                          EM3000
001364  053214                          DT001
```

```
1390  001366  053656                        DF001
1391                              ;         ERROR 10: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1392                              ;                   MESSAGE A INCORRECT.
1393  001370  060122                        EM202
1394  001372  064177                        EM3001
1395  001374  053214                        DT001
1396  001376  053656                        DF001
1397                              ;         ERROR 11: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1398                              ;                   MESSAGE B INCORRECT.
1399  001400  060122                        EM202
1400  001402  064223                        EM3002
1401  001404  053214                        DT001
1402  001406  053656                        DF001
1403                              ;         ERROR 12: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1404                              ;                   CS1 INCORRECT.
1405  001410  060213                        EM203
1406  001412  064134                        EM3000
1407  001414  053214                        DT001
1408  001416  053656                        DF001
1409                              ;         ERROR 13: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1410                              ;                   MESSAGE A INCORRECT.
1411  001420  060213                        EM203
1412  001422  064177                        EM3001
1413  001424  053214                        DT001
1414  001426  053656                        DF001
1415                              ;         ERROR 14: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1416                              ;                   MESSAGE B INCORRECT.
1417  001430  060213                        EM203
1418  001432  064223                        EM3002
1419  001434  053214                        DT001
1420  001436  053656                        DF001
1421                              ;         ERROR 15: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1422                              ;                   CS1 INCORRECT AFTER SENDING DRIVE CLEAR.
1423  001440  060305                        EM204
1424  001442  064247                        EM3003
1425  001444  053234                        DT015
1426  001446  053702                        DF015
1427                              ;         ERROR 16: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1428                              ;                   CS1 INCORRECT AFTER DATE SIMULATION.
1429  001450  060305                        EM204
1430  001452  064317                        EM3004
1431  001454  053234                        DT015
1432  001456  053702                        DF015
1433                              ;         ERROR 17: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1434                              ;                   MAINT REG. 1 INCORRECT DURING DATA SIMULATION (SECTOR PULSE)
1435  001460  060305                        EM204
1436  001462  064371                        EM3005
1437  001464  053244                        DT017
1438  001466  053726                        DF017
1439                              ;         ERROR 20: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1440                              ;                   MAINT REG. 1 INCORRECT DURING DATA SIMULATION (INDEX PULSE)
1441  001470  060305                        EM204
1442  001472  064473                        EM3006
1443  001474  053244                        DT017
1444  001476  053726                        DF017
1445                              ;         ERROR 21: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
```

```
1446                                    ;               MAINT REG. 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1447  001500  060305                            EM204
1448  001502  064574                            EM3007
1449  001504  053244                            DT017
1450  001506  053726                            DF017
1451                                    ;       ERROR 22: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1452                                    ;                 CS1 INCORRECT AFTER SENDING DRIVE CLEAR
1453  001510  060373                            EM205
1454  001512  064247                            EM3003
1455  001514  053262                            DT022
1456  001516  053752                            DF022
1457                                    ;       ERROR 23: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1458                                    ;                 BUS ADD INCORRECT AFTER SENDING DRIVE CLEAR.
1459  001520  060373                            EM205
1460  001522  064715                            EM3008
1461  001524  053262                            DT022
1462  001526  053752                            DF022
1463                                    ;       ERROR 24: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1464                                    ;                 WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR
1465  001530  060373                            EM205
1466  001532  064775                            EM3009
1467  001534  053262                            DT022
1468  001536  053752                            DF022
1469                                    ;       ERROR 25: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1470                                    ;                 MAINT REG 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1471  001540  060373                            EM205
1472  001542  065273                            EM3014
1473  001544  053302                            DT025
1474  001546  053776                            DF025
1475                                    ;       ERROR 26: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1476                                    ;                 CS1 CHANGED DURING COMMAND EXECUTION
1477  001550  060373                            EM205
1478  001552  065054                            EM3010
1479  001554  053262                            DT022
1480  001556  053752                            DF022
1481                                    ;       ERROR 27: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1482                                    ;                 BUS ADDRESS CHANGED BEFORE INDEX PULSE
1483  001560  060373                            EM205
1484  001562  065121                            EM3011
1485  001564  053262                            DT022
1486  001566  053752                            DF022
1487                                    ;       ERROR 30: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1488                                    ;                 WORD COUNT CHANGED BEFORE INDEX PULSE
1489  001570  060373                            EM205
1490  001572  065170                            EM3012
1491  001574  053262                            DT022
1492  001576  053752                            DF022
1493                                    ;       ERROR 31: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1494                                    ;                 CS1 CHANGED AFTER INDEX PULSE
1495  001600  060373                            EM205
1496  001602  065236                            EM3013
1497  001604  053314                            DT031
1498  001606  054022                            DF031
1499                                    ;       ERROR 32: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1500                                    ;                 BUS ADDRESS CHANGED AFTER INDEX PULSE.
1501  001610  060373                            EM205
```

```
1502  001612  065344                    EM3015
1503  001614  053314                    DT031
1504  001616  054022                    DF031
1505                          ;         ERROR 33: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1506                          ;                   WORD COUNT CHANGED AFTER INDEX PULSE
1507  001620  060373                    EM205
1508  001622  065412                    EM3016
1509  001624  053314                    DT031
1510  001626  054022                    DF031
1511                          ;         ERROR 34: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1512                          ;                   MAINT REG 1 INCORRECT AFTER SECTOR PULSE
1513  001630  060373                    EM205
1514  001632  065772                    EM3025
1515  001634  053314                    DT031
1516  001636  054022                    DF031
1517                          ;         ERROR 35:  ATTEMPTING AN NPR READ OF ONE WORD
1518                          ;                   CS1 INCORRECT
1519  001640  060461                    EM206
1520  001642  064134                    EM3000
1521  001644  053340                    DT035
1522  001646  054046                    DF035
1523                          ;         ERROR 36:  ATTEMPTING AN NPR READ OF ONE WORD
1524                          ;                   CS2 INCORRECT
1525  001650  060461                    EM206
1526  001652  065457                    EM3018
1527  001654  053340                    DT035
1528  001656  054046                    DF035
1529                          ;         ERROR 37:  ATTEMPTING AN NPR READ OF ONE WORD
1530                          ;                   BUS ADDRESS INCORRECT
1531  001660  060461                    EM206
1532  001662  065523                    EM3019
1533  001664  053340                    DT035
1534  001666  054046                    DF035
1535                          ;         ERROR 40:  ATTEMPTING AN NPR READ OF ONE WORD
1536                          ;                   WORD COUNT REG INCORRECT
1537  001670  060461                    EM206
1538  001672  065551                    EM3020
1539  001674  053340                    DT035
1540  001676  054046                    DF035
1541                          ;         ERROR 41:  ATTEMPTING AN NPR READ OF ONE WORD
1542                          ;                   WORD READ INCORRECT
1543  001700  060461                    EM206
1544  001702  065602                    EM3021
1545  001704  053364                    DT041
1546  001706  054072                    DF041
1547                          ;         ERROR 42:  ATTEMPTING AN NPR READ OF ONE WORD
1548                          ;                   CS1 INCORRECT AFTER READING DATA BUFFER
1549  001710  060461                    EM206
1550  001712  065626                    EM3022
1551  001714  053374                    DT042
1552  001716  054116                    DF042
1553                          ;         ERROR 43:  ATTEMPTING AN NPR READ OF ONE WORD
1554                          ;                   CS2 INCORRECT AFTER READING DATA BUFFER
1555  001720  060461                    EM206
1556  001722  065676                    EM3023
1557  001724  053374                    DT042
```

```
1558  001726  054116                        DF042
1559                                ;       ERROR 44:  ATTEMPTING AN NPR READ OF ONE WORD
1560                                ;                  CS1 INCORRECT
1561  001730  060524                        EM207
1562  001732  064134                        EM3000
1563  001734  053340                        DT035
1564  001736  054046                        DF035
1565                                ;       ERROR 45:  ATTEMPTING AN NPR READ
1566                                ;                  CS2 INCORRECT
1567  001740  060524                        EM207
1568  001742  065457                        EM3018
1569  001744  053340                        DT035
1570  001746  054046                        DF035
1571                                ;       ERROR 46:  ATTEMPTING AN NPR READ
1572                                ;                  BUS ADDRESS INCORRECT
1573  001750  060524                        EM207
1574  001752  065523                        EM3019
1575  001754  053340                        DT035
1576  001756  054046                        DF035
1577                                ;       ERROR 47:  ATTEMPTING AN NPR READ
1578                                ;                  WORD COUNT INCORRECT
1579  001760  060524                        EM207
1580  001762  065551                        EM3020
1581  001764  053340                        DT035
1582  001766  054046                        DF035
1583                                ;       ERROR 50:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1584                                ;                  CS1 INCORRECT
1585  001770  060553                        EM208
1586  001772  064134                        EM3000
1587  001774  053340                        DT035
1588  001776  054046                        DF035
1589                                ;       ERROR 51:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1590                                ;                  CS2 INCORRECT
1591  002000  060553                        EM208
1592  002002  065457                        EM3018
1593  002004  053340                        DT035
1594  002006  054046                        DF035
1595                                ;       ERROR 52:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1596                                ;                  BUS ADDRESS INCORRECT
1597  002010  060553                        EM208
1598  002012  065523                        EM3019
1599  002014  053340                        DT035
1600  002016  054046                        DF035
1601                                ;       ERROR 53:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1602                                ;                  WORD COUNT INCORRECT
1603  002020  060553                        EM208
1604  002022  065551                        EM3020
1605  002024  053340                        DT035
1606  002026  054046                        DF035
1607                                ;       ERROR 54:  ATTEMPTING NPR READ
1608                                ;                  DATA BUFFER INCORRECT
1609  002030  060524                        EM207
1610  002032  065602                        EM3021
1611  002034  053410                        DT054
1612  002036  054142                        DF054
1613                                ;       ERROR 55:  ATTEMPTING NPR READ
```

```
1614                                    ;                       CS1 INCORRECT AFTER READING DATA BUFFER
1615  002040  060524                            EM207
1616  002042  065626                            EM3022
1617  002044  053422                            DT055
1618  002046  054166                            DF055
1619                                    ;       ERROR 56:  ATTEMPTING NPR READ
1620                                    ;                  CS2 INCORRECT AFTER READING DATA BUFFER
1621  002050  060524                            EM207
1622  002052  065676                            EM3023
1623  002054  053422                            DT055
1624  002056  054166                            DF055
1625                                    ;       ERROR 57:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1626                                    ;                  INHIBIT CS1 INCORRECT
1627  002060  060624                            EM209
1628  002062  064134                            EM3000
1629  002064  053340                            DT035
1630  002066  054046                            DF035
1631                                    ;       ERROR 60:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1632                                    ;                  INHIBIT CS2 INCORRECT
1633  002070  060624                            EM209
1634  002072  065457                            EM3018
1635  002074  053340                            DT035
1636  002076  054046                            DF035
1637                                    ;       ERROR 61:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1638                                    ;                  INHIBIT BUS ADDRESS INCORRECT
1639  002100  060624                            EM209
1640  002102  065523                            EM3019
1641  002104  053340                            DT035
1642  002106  054046                            DF035
1643                                    ;       ERROR 62:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1644                                    ;                  INHIBIT WORD COUNT INCORRECT
1645  002110  060624                            EM209
1646  002112  065551                            EM3020
1647  002114  053340                            DT035
1648  002116  054046                            DF035
1649                                    ;       ERROR 63:  ATTEMPTING NPR READ WITH IBA TO CHECK ZERO
1650                                    ;                  DETECT-CS1 INCORRECT
1651  002120  060713                            EM210
1652  002122  064134                            EM3000
1653  002124  053340                            DT035
1654  002126  054046                            DF035
1655                                    ;       ERROR 64:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1656                                    ;                  DETECT-CS2 INCORRECT
1657  002130  060713                            EM210
1658  002132  065457                            EM3018
1659  002134  053340                            DT035
1660  002136  054046                            DF035
1661                                    ;       ERROR 65:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1662                                    ;                  DETECT-BUS ADDRESS INCORRECT
1663  002140  060713                            EM210
1664  002142  065523                            EM3019
1665  002144  053340                            DT035
1666  002146  054046                            DF035
1667                                    ;       ERROR 66:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1668                                    ;                  DETECT-WORD COUNT INCORRECT
1669  002150  060713                            EM210
```

```
1670  002152  065551                    EM3020
1671  002154  053340                    DT035
1672  002156  054046                    DF035
1673                          ;         ERROR 67:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1674                          ;                    INCREMENT-DATA BUFFER INCORRECT
1675  002160  060624                    EM209
1676  002162  065602                    EM3021
1677  002164  053410                    DT054
1678  002166  054142                    DF054
1679                          ;         ERROR 70:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1680                          ;                    INCREMENT-CS1 INCORRECT AFTER READING DATA BUFFER
1681  002170  060624                    EM209
1682  002172  065626                    EM3022
1683  002174  053422                    DT055
1684  002176  054166                    DF055
1685                          ;         ERROR 71:  ATTEMPTING NPR READ WITH ADDRESS BUFFER INHIBIT
1686                          ;                    INCREMENT-CS2 INCORRECT AFTER READING DATA BUFFER
1687  002200  060624                    EM209
1688  002202  065676                    EM3023
1689  002204  053422                    DT055
1690  002206  054166                    DF055
1691                          ;         ERROR 72:  ATTEMPTING TO FORCE NON-EXISTANT MEMORY
1692                          ;                    CS1 INCORRECT
1693  002210  061027                    EM211
1694  002212  064134                    EM3000
1695  002214  053440                    DT072
1696  002216  054212                    DF072
1697                          ;         ERROR 73:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1698                          ;                    CS2 INCORRECT
1699  002220  061027                    EM211
1700  002222  065457                    EM3018
1701  002224  053440                    DT072
1702  002226  054212                    DF072
1703                          ;         ERROR 74:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1704                          ;                    ERROR REG INCORRECT
1705  002230  061027                    EM211
1706  002232  065746                    EM3024
1707  002234  053440                    DT072
1708  002236  054212                    DF072
1709                          ;         ERROR 75:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1710                          ;                    BUS ADDRESS INCORRECT
1711  002240  061027                    EM211
1712  002242  065523                    EM3019
1713  002244  053440                    DT072
1714  002246  054212                    DF072
1715                          ;         ERROR 76:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1716                          ;                    WORD COUNT INCORRECT
1717  002250  061027                    EM211
1718  002252  065551                    EM3020
1719  002254  053440                    DT072
1720  002256  054212                    DF072
1721                          ;         ERROR 77:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1722                          ;                    CS1 INCORRECT
1723  002260  061077                    EM212
1724  002262  064134                    EM3000
1725  002264  053470                    DT077
```

```
1726  002266  054246                        DF077
1727                          ;             ERROR 100:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1728                          ;                         CS2 INCORRECT
1729  002270  061077                        EM212
1730  002272  065457                        EM3018
1731  002274  053470                        DT077
1732  002276  054246                        DF077
1733                          ;             ERROR 101: TESTING EXTENDED MEMORY ADDRESSING BITS
1734                          ;                 CS1 INCORRECT
1735  002300  061147                        EM213
1736  002302  064134                        EM3000
1737  002304  053340                        DT035
1738  002306  054046                        DF035
1739                          ;             ERROR 102: TESTING EXTENDED MEMORY ADDRESSING BITS
1740                          ;                 CS2 INCORRECT
1741  002310  061147                        EM213
1742  002312  065457                        EM3018
1743  002314  053340                        DT035
1744  002316  054046                        DF035
1745                          ;             ERROR 103: TESTING EXTENDED MEMORY ADDRESSING BITS
1746                          ;                 BUS ADDRESS INCORRECT
1747  002320  061147                        EM213
1748  002322  065523                        EM3019
1749  002324  053340                        DT035
1750  002326  054046                        DF035
1751                          ;             ERROR 104: TESTING EXTEND MEMORY ADDRESSING BITS
1752                          ;                 WORD COUNT INCORRECT
1753  002330  061147                        EM213
1754  002332  065551                        EM3020
1755  002334  053340                        DT035
1756  002336  054046                        DF035
1757                          ;             ERROR 105: TESTING EXTENDED MEMORY ADDRESSING BITS
1758                          ;                 DATA BUFFER INCORRECT
1759  002340  061147                        EM213
1760  002342  065602                        EM3021
1761  002344  053364                        DT041
1762  002346  054072                        DF041
1763                          ;             ERROR 106: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1764                          ;                 CS1 INCORRECT
1765  002350  061217                        EM214
1766  002352  064134                        EM3000
1767  002354  053440                        DT072
1768  002356  054212                        DF072
1769                          ;             ERROR 107: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1770                          ;                 CS2 INCORRECT
1771  002360  061217                        EM214
1772  002362  065457                        EM3018
1773  002364  053440                        DT072
1774  002366  054212                        DF072
1775                          ;             ERROR 110: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1776                          ;                 BUS ADDRESS INCORRECT
1777  002370  061217                        EM214
1778  002372  065523                        EM3019
1779  002374  053440                        DT072
1780  002376  054212                        DF072
1781                          ;             ERROR 111: ATEMPTING TO FORCE UNIBUS PARITY ERROR
```

```
1782                                    ;               WORD COUNT INCORRECT
1783  002400  061217                    ;       EM214
1784  002402  065551                    ;       EM3020
1785  002404  053440                    ;       DT072
1786  002406  054212                    ;       DF072
1787                                    ;       ERROR 112: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1788                                    ;               CS1 INCORRECT
1789  002410  061267                    ;       EM215
1790  002412  064134                    ;       EM3000
1791  002414  053340                    ;       DT035
1792  002416  054046                    ;       DF035
1793                                    ;       ERROR 113: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1794                                    ;               CS2 INCORRECT
1795  002420  061267                    ;       EM215
1796  002422  065457                    ;       EM3018
1797  002424  053340                    ;       DT035
1798  002426  054046                    ;       DF035
1799                                    ;       ERROR 114: ATTEMPTING NPR READ OR LOCATION PRIOR TO BAD PARITY
1800                                    ;               BUS ADDRESS INCORRECT
1801  002430  061267                    ;       EM215
1802  002432  065523                    ;       EM3019
1803  002434  053340                    ;       DT035
1804  002436  054046                    ;       DF035
1805                                    ;       ERROR 115: ATTEMPTING NPR READ  OF LOCATION PRIOR TO BAD PARITY
1806                                    ;               WORD COUNT INCORRECT
1807  002440  061267                    ;       EM215
1808  002442  065457                    ;       EM3018
1809  002444  053340                    ;       DT035
1810  002446  054046                    ;       DF035
1811                                    ;       ERROR 116: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1812                                    ;               ERROR REG INCORRECT
1813  002450  061217                    ;       EM214
1814  002452  065746                    ;       EM3024
1815  002454  053440                    ;       DT072
1816  002456  054212                    ;       DF072
1817                                    ;       ERROR 117: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1818                                    ;               CS1 INCORPECT
1819  002460  061353                    ;       EM216
1820  002462  064134                    ;       EM3000
1821  002464  053470                    ;       DT077
1822  002466  054246                    ;       DF077
1823                                    ;       ERROR 120: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1824                                    ;               CS2 INCORRECT
1825  002470  061353                    ;       EM216
1826  002472  065457                    ;       EM3018
1827  002474  053470                    ;       DT077
1828  002476  054246                    ;       DF077
1829                                    ;       ERROR 121: ATTEMPTING 18 BIT NPR READ
1830                                    ;               CS1 INCORRECT
1831  002500  061423                    ;       EM217
1832  002502  064134                    ;       EM3000
1833  002504  053340                    ;       DT035
1834  002506  054046                    ;       DF035
1835                                    ;       ERROR 122: ATTEMPTING 18 BIT NPR READ
1836                                    ;               CS2 INCORRECT
1837  002510  061423                    ;       EM217
```

```
1838  002512  065457                        EM3018
1839  002514  053340                        DT035
1840  002516  054046                        DF035
1841                              ;         ERROR 123: ATTEMPTING 18 BIT NPR READ
1842                              ;           BUS ADDRESS INCORRECT
1843  002520  061423                        EM217
1844  002522  065523                        EM3019
1845  002524  053340                        DT035
1846  002526  054046                        DF035
1847                              ;         ERROR 124: ATTEMPTING 18 BIT NPR READ
1848                              ;           WORD COUNT INCORRECT
1849  002530  061423                        EM217
1850  002532  065551                        EM3020
1851  002534  053340                        DT035
1852  002536  054046                        DF035
1853                              ;         ERROR 125: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1854                              ;           CS1 INCORRECT
1855  002540  061456                        EM218
1856  002542  064134                        EM3000
1857  002544  053340                        DT035
1858  002546  054046                        DF035
1859                              ;         ERROR 126: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1860                              ;           CS2 INCORRECT
1861  002550  061456                        EM218
1862  002552  065457                        EM3018
1863  002554  053340                        DT035
1864  002556  054046                        DF035
1865                              ;         ERROR 127: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1866                              ;           BUS ADDRESS INCORRECT
1867  002560  061456                        EM218
1868  002562  065523                        EM3019
1869  002564  053340                        DT035
1870  002566  054046                        DF035
1871                              ;         ERROR 130: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1872                              ;           WORD COUNT INCORRECT
1873  002570  061456                        EM218
1874  002572  065551                        EM3020
1875  002574  053340                        DT035
1876  002576  054046                        DF035
1877                              ;         ERROR 131: ATTEMPTING 18 BIT NPR READ
1878                              ;           DATA BUFFER INCORRECT
1879  002600  061423                        EM217
1880  002602  065602                        EM3021
1881  002604  053374                        DT042
1882  002606  054116                        DF042
1883                              ;         ERROR 132: ATTEMPTING 18 BIT NPR READ
1884                              ;           CS1 INCORRECT AFTER READING DATA BUFFER
1885  002610  061423                        EM217
1886  002612  065626                        EM3022
1887  002614  053422                        DT055
1888  002616  054166                        DF055
1889                              ;         ERROR 133: ATTEMPTING 18 BIT NPR READ
1890                              ;           CS2 INCORRECT AFTER READING DATA BUFFER
1891  002620  061423                        EM217
1892  002622  065676                        EM3023
1893  002624  053422                        DT055
```

```
1894  002626  054166                        DF055
1895                          ;             ERROR 134: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1896                          ;                CS1 INCORRECT
1897  002630  061536                        EM219
1898  002632  064134                        EM3000
1899  002634  053340                        DT035
1900  002636  054046                        DF035
1901                          ;             ERROR 135: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1902                          ;                CS2 INCORRECT
1903  002640  061536                        EM219
1904  002642  065457                        EM3018
1905  002644  053340                        DT035
1906  002646  054046                        DF035
1907                          ;             ERROR 136: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1908                          ;                BUS ADDRESS INCORRECT
1909  002650  061536                        EM219
1910  002652  065523                        EM3019
1911  002654  053340                        DT035
1912  002656  054046                        DF035
1913                          ;             ERROR 137: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1914                          ;                WORD COUNT INCORRECT
1915  002660  061536                        EM219
1916  002662  065551                        EM3020
1917  002664  053340                        DT035
1918  002666  054046                        DF035
1919                          ;             ERROR 140: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1920                          ;                CHECKING ZERO DETECT
1921                          ;                CS1 INCORRECT
1922  002670  061616                        EM220
1923  002672  064134                        EM3000
1924  002674  053340                        DT035
1925  002676  054046                        DF035
1926                          ;             ERROR 141  ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1927                          ;                CHECKING ZERO DETECT
1928                          ;                CS2 INCORRECT
1929  002700  061616                        EM220
1930  002702  065457                        EM3018
1931  002704  053340                        DT035
1932  002706  054046                        DF035
1933                          ;             ERROR 142: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1934                          ;                CHECKING ZERO DETECT
1935                          ;                BUS ADDRESS INCORRECT
1936  002710  061616                        EM220
1937  002712  065523                        EM3019
1938  002714  053340                        DT035
1939  002716  054046                        DF035
1940                          ;             ERROR 143: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1941                          ;                CHECKING ZERO DETECT
1942                          ;                WORD COUNT INCORRECT
1943  002720  061616                        EM220
1944  002722  065551                        EM3020
1945  002724  053340                        DT035
1946  002726  054046                        DF035
1947                          ;             ERROR 144: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1948                          ;                DATA BUFFER INCORRECT
1949  002730  061536                        EM219
```

```
 1950  002732  065602                    EM3021
 1951  002734  053364                    DT041
 1952  002736  054072                    DF041
 1953                            ;       ERROR 145: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
 1954                            ;                  CS1 INCORRECT AFTER READING DATA BUFFER
 1955  002740  061536                    EM219
 1956  002742  065626                    EM3022
 1957  002744  053470                    DT077
 1958  002746  054246                    DF077
 1959                            ;       ERROR 146: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
 1960                            ;                  CS2 INCORRECT AFTER READING DATA BUFFER
 1961  002750  061536                    EM219
 1962  002752  065676                    EM3023
 1963  002754  053470                    DT077
 1964  002756  054246                    DF077
 1965                            ;       ERROR 147:  UNEXPECTED MEMORY PARITY ENABLE TRAP
 1966  002760  057710                    EM000
 1967  002762  055070                    DH000C
 1968  002764  053210                    DT000
 1969  002766  053652                    DF000
 1970                            ;       ERROR 150: ATTEMPTING SIMULATION OF DATA IN READ HEADER
 1971                            ;                  CS1 INCORRECT
 1972  002770  061675                    EM221
 1973  002772  064134                    EM3000
 1974  002774  053504                    DT150
 1975  002776  054272                    DF150
 1976                            ;       ERROR 151: ATTEMPTING READ HEADER IN MAINTANENCE MODE
 1977                            ;                  CS1 INCORRECT AFTER COMPLETION OF COMMAND
 1978  003000  061752                    EM222
 1979  003002  066042                    EM3026
 1980  003004  053374                    DT042
 1981  003006  054116                    DF042
 1982                            ;       ERROR 152: ATTEMPTING READ HEADER IN MAINTANENCE MODE
 1983                            ;                  CS2 INCORRECT AFTER COMPLETION OF COMMAND
 1984  003010  061752                    EM222
 1985  003012  066111                    EM3027
 1986  003014  053374                    DT042
 1987  003016  054116                    DF042
 1988                            ;       ERROR 153: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 1989                            ;                  CS1 INCORRECT AFTER UNLOADING DATA BUFFER
 1990  003020  062025                    EM223
 1991  003022  065626                    EM3022
 1992  003024  053422                    DT055
 1993  003026  054166                    DF055
 1994                            ;       ERROR 154: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 1995                            ;                  CS2 INCORRECT AFTER UNLOADING DATA
 1996  003030  062025                    EM223
 1997  003032  065676                    EM3023
 1998  003034  053422                    DT055
 1999  003036  054166                    DF055
 2000                            ;       ERROR 155: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 2001                            ;                  DATA READ INCORRECT
 2002  003040  062025                    EM223
 2003  003042  065602                    EM3021
 2004  003044  053410                    DT054
 2005  003046  054142                    DF054
```

```
2006                                    ;       ERROR 156: ATTEMPTING SIMULATION OF DATA IN READ HEADER (20 BIT FORMAT)
2007                                    ;                  CS1 INCORRECT
2008  003050  062103                              EM224
2009  003052  064134                              EM3000
2010  003054  053504                              DT150
2011  003056  054272                              DF150
2012                                    ;       ERROR 157: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE/
2013                                    ;                  CS1 INCORRECT AFTER COMMAND COMPLETION
2014  003060  062200                              EM225
2015  003062  066042                              EM3026
2016  003064  053374                              DT042
2017  003066  054116                              DF042
2018                                    ;       ERROR 160: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE
2019                                    ;                  CS2 INCORRECT AFTER COMPLETION OF COMMAND
2020  003070  062200                              EM225
2021  003072  066111                              EM3027
2022  003074  053374                              DT042
2023  003076  054116                              DF042
2024                                    ;       ERROR 161: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2025                                    ;                  CS1 INCORRECT AFTER UNLOADING DATA BUFFER
2026  003100  062265                              EM226
2027  003102  065626                              EM3022
2028  003104  053422                              DT055
2029  003106  054166                              DF055
2030                                    ;       ERROR 162: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2031                                    ;                  CS2 INCORRECT AFTER UNLOADING DATA BUFFER
2032  003110  062265                              EM226
2033  003112  065676                              EM3023
2034  003114  053422                              DT055
2035  003116  054166                              DF055
2036                                    ;       ERROR 163: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2037                                    ;                  DATA BUFFER INCORRECT
2038  003120  062265                              EM226
2039  003122  065602                              EM3021
2040  003124  053410                              DT054
2041  003126  054142                              DF054
2042                                    ;       ERROR 164: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2043                                    ;                  CS1 INCORRECT
2044  003130  062365                              EM227
2045  003132  064134                              EM3000
2046  003134  053520                              DT164
2047  003136  054316                              DF164
2048                                    ;       ERROR 165: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2049                                    ;                  CS2 INCORRECT
2050  003140  062365                              EM227
2051  003142  065457                              EM3018
2052  003144  053520                              DT164
2053  003146  054316                              DF164
2054                                    ;       ERROR 166: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2055                                    ;                  CS1 INCORRECT READING EMPTY SILO
2056  003150  062365                              EM227
2057  003152  066160                              EM3028
2058  003154  053520                              DT164
2059  003156  054316                              DF164
2060                                    ;       ERROR 167: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2061                                    ;                  CS1 INCORRECT READING EMPTY SILO
```

```
2062  003160  062365                        EM227
2063  003162  066227                        EM3029
2064  003164  053520                        DT164
2065  003166  054316                        DF164
2066                              ;         ERROR 170:  WRITE BIT ERRORS
2067  003170  000000              EMW:      0
2068  003172  000000                        0
2069  003174  053536                        DT170
2070  003176  054342                        DF170
2071                              ;         ERROR 171:  WRITE GATE NOT RESET WITH SECTOR PULSE
2072  003200  062601                        EM231
2073  003202  066276                        EM3030
2074  003204  053562                        DT171
2075  003206  054366                        DF171
2076                              ;         ERROR 172:  WRITE GATE NOT SET WITH SECTOR PULSE RESET
2077  003210  062723                        EM232
2078  003212  066276                        EM3030
2079  003214  053562                        DT171
2080  003216  054366                        DF171
2081                              ;         ERROR 173:  WRITE GATE NOT RESET WITH SECOND INDEX PULSE
2082  003220  063151                        EM235
2083  003222  066276                        EM3030
2084  003224  053562                        DT171
2085  003226  054366                        DF171
2086                              ;         ERROR 174:  CS1 INCORRECT AT END OF WRITE HEADER
2087  003230  063261                        EM236
2088  003232  064134                        EM3000
2089  003234  053234                        DT015
2090  003236  053702                        DF015
2091                              ;         ERROR 175: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2092                              ;         CS1 INCORRECT
2093  003240  063631                        EM241
2094  003242  064134                        EM3000
2095  003244  053572                        DT175
2096  003246  054412                        DF175
2097                              ;         ERROR 176: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2098                              ;         CS2 INCORRECT
2099  003250  063631                        EM241
2100  003252  065457                        EM3018
2101  003254  053572                        DT175
2102  003256  054412                        DF175
2103                              ;         ERROR 177: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2104                              ;         DRIVE STATUS REG INCORRECT
2105  003260  063631                        EM241
2106  003262  066324                        EM3031
2107  003264  053572                        DT175
2108  003266  054412                        DF175
2109                              ;         ERROR 200: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2110                              ;         ERROR REG INCORRECT
2111  003270  063631                        EM241
2112  003272  066357                        EM3032
2113  003274  053572                        DT175
2114  003276  054412                        DF175
2115                              ;         ERROR 201: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2116                              ;         CS1 INCORRECT
2117  003300  063715                        EM242
```

```
2118  003302  064134                        EM3000
2119  003304  053572                        DT175
2120  003306  054412                        DF175
2121                              ;         ERROR 202: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2122                              ;         CS2 INCORRECT
2123  003310  063715                        EM242
2124  003312  065457                        EM3018
2125  003314  053572                        DT175
2126  003316  054412                        DF175
2127                              ;         ERROR 203: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2128                              ;         DRIVE STATUS REG INCORRECT
2129  003320  063715                        EM242
2130  003322  066324                        EM3031
2131  003324  053572                        DT175
2132  003326  054412                        DF175
2133                              ;         ERROR 204: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2134                              ;         ERROR REGISTER INCORRECT
2135  003330  063715                        EM242
2136  003332  066357                        EM3032
2137  003334  053572                        DT175
2138  003336  054412                        DF175
2139                              ;         ERROR 205:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2140                              ;         CS1 INCORRECT
2141  003340  064001                        EM243
2142  003342  064134                        EM3000
2143  003344  053572                        DT175
2144  003346  054412                        DF175
2145                              ;         ERROR 206:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2146                              ;         CS2 INCORRECT
2147  003350  064001                        EM243
2148  003352  065457                        EM3018
2149  003354  053572                        DT175
2150  003356  054412                        DF175
2151                              ;         ERROR 207:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2152                              ;         DRIVE STATUS REG INCORRECT
2153  003360  064001                        EM243
2154  003362  066324                        EM3031
2155  003364  053572                        DT175
2156  003366  054412                        DF175
2157                              ;         ERROR 210:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2158                              ;         ERROR REG INCORRECT
2159  003370  064001                        EM243
2160  003372  066357                        EM3032
2161  003374  053572                        DT175
2162  003376  054412                        DF175
2163                              ;         ERROR 211:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2164                              ;         CS1 INCORRECT
2165  003400  064102                        EM244
2166  003402  064134                        EM3000
2167  003404  053616                        DT211
2168  003406  054436                        DF211
2169                              ;         ERROR 212:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2170                              ;         CS2 INCORRECT
2171  003410  064102                        EM244
2172  003412  065457                        EM3018
2173  003414  053616                        DT211
```

```
2174  003416  054436                        DF211
2175                              ;         ERROR 213:  ATTEMPTING TO CLEAR CONTROLLER
2176                              ;         DRIVE STATUS REC INCORRECT
2177  003420  064102                        EM244
2178  003422  066324                        EM3031
2179  003424  053616                        DT211
2180  003426  054436                        DF211
2181                              ;         ERROR 214: ATTEMPTINT TO CLEAR CONTROLLER
2182                              ;         ERROR REG INCORRECT
2183  003430  064102                        EM244
2184  003432  066357                        EM3032
2185  003434  053616                        DT211
2186  003436  054436                        DF211
```

```
                                        .SBTTL  TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER

003440  000000                  T.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
003442  000000                  T.WC:   .WORD   0               ;WORD COUNT REGISTER
003444  000000                  T.BA:   .WORD   0               ;BUS ADDRESS REGISTER
003446  000000                  T.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
003450  000000                  T.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
003452  000000                  T.DS:   .WORD   0               ;DRIVE STATUS REGISTER
003454  000000                  T.ER:   .WORD   0               ;ERROR REGISTER
003456  000000                  T.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
003460  000000                  T.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
003462  000000                  T.DB:   .WORD   0               ;DATA BUFFER
003464  000000                  T.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
003466  000000                  T.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
003470  000000                  T.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
003472  000000                  T.ECPS: .WORD   0               ;ECC POSITION INFORMATION
003474  000000                  T.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
003476  000000                  T.SPAR: .WORD   0               ;SPARE REGISTER

                                        .SBTTL  EXPECTED RK611 CONTROLLER REGISTERS

003500  000000                  E.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
003502  000000                  E.WC:   .WORD   0               ;WORD COUNT REGISTER
003504  000000                  E.BA:   .WORD   0               ;BUS ADDRESS REGISTER
003506  000000                  E.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
003510  000000                  E.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
003512  000000                  E.DS:   .WORD   0               ;DRIVE STATUS REGISTER
003514  000000                  E.ER:   .WORD   0               ;ERROR REGISTER
003516  000000                  E.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
003520  000000                  E.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
003522  000000                  E.DB:   .WORD   0               ;DATA BUFFER
003524  000000                  E.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
003526  000000                  E.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
003530  000000                  E.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
003532  000000                  E.ECPS: .WORD   0               ;ECC POSITION INFORMATION
003534  000000                  E.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
003536  000000                  E.SPAR: .WORD   0               ;SPARE REGISTER

                                        .SBTTL  PREVIOUS RK611 CONTROLLER REGISTERS

003540  000000                  P.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
003542  000000                  P.WC:   .WORD   0               ;WORD COUNT REGISTER
003544  000000                  P.BA:   .WORD   0               ;BUS ADDRESS REGISTER
003546  000000                  P.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
003550  000000                  P.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
003552  000000                  P.DS:   .WORD   0               ;DRIVE STATUS REGISTER
003554  000000                  P.ER:   .WORD   0               ;ERROR REGISTER
003556  000000                  P.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
003560  000000                  P.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
003562  000000                  P.DB:   .WORD   0               ;DATA BUFFER
003564  000000                  P.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
003566  000000                  P.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
003570  000000                  P.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
003572  000000                  P.ECPS: .WORD   0               ;ECC POSITION INFORMATION
003574  000000                  P.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
003576  000000                  P.SPAR: .WORD   0               ;SPARE REGISTER
```

```
2243                                    .SBTTL  PROGRAM DEFINED VARIABLES
2244
2245  003600  000210                    RKVEC:  .WORD   210             ;RK611 VECTOR
2246  003602  000240                    RKPRI:  .WORD   PR5             ;RK611 PRIORITY
2247  003604  000000                    TRAPPC: .WORD   0               ;PC FOR MEMORY CHECK ENABLE TRAP
2248  003606  000000                    SRTFLG: .WORD   0               ;START FLAG
2249                                                                    ;   0 = 200
2250                                                                    ;   1 = 214
2251                                                                    ;  -1 = 204
2252  003610  000000                    ERRCNT: .WORD   0               ;ERROR COUNT FOR SWITCH 12 ABORT
2253  003612  000000                    P1.BIT: .WORD   0               ;NEXT BIT IN DATA SIMULATION
2254  003614  000000                    PR.BIT: .WORD   0               ;PRESENT BIT IN DATA SIMULATION
2255  003616  000000                    M1.BIT: .WORD   0               ;PREVIOUS BIT IN DATA SIMULATION
2256  003620  000000                    M2.BIT: .WORD   0               ;BIT BEFORE PREVIOUS BIT
2257  003622  000000                    BITCNT: .WORD   0               ;BIT POSITION
2258  003624  000000                    WRDCNT: .WORD   0               ;WORD COUNT FOR NPR TRANSFER
2259  003626  000000                    SECCNT: .WORD   0               ;SECTOR COUNT
2260  003630  000000                    MEMPAR: .WORD   0               ;MEMORY EMABLE ON FIRST 24K
2261  003632  000015                    WAITIM: .WORD   15              ;WAIT TIME FOR CONTROLLER READY
2262  003634  000000                    SAVSWR: .WORD   0               ;STORAGE FOR SWITCH REGISTER
2263  003636  000000                    PARPRE: .WORD   0               ;PARITY OPTION PRESENT FOR
2264                                                                    ;   LOCATION USED
2265  003640  000000                    CSRPTR: .WORD   0               ;POINTER TO CSR TO BE  USED
```

```
                                        .SBTTL  PROGRAM SETUP

003642  012737  000001  003606  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
003650  000406                          BR      START1

003652  012737  177777  003606  RESTRT: MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
003660  000402                          BR      START1

003662  005037  003606          START:  CLR     SRTFLG          ;CLEAR START FLAG
003666  000005                  START1: RESET                   ;RESET THE WHOLE SYSTEM
003670  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
003674  004737  051302                  JSR     PC,$TKINT       ;INIT KEYBOARD
003700  012746  000340                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
003704  012746  003712                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
003710  000002                          RTI                     ;LOAD PSW

003712                          1$:
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                        ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
003712  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
003716  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
003720  022706  001140                  CMP     #SWR,R6 ;;DONE?
003724  001374                          BNE     .-6             ;;LOOP BACK IF NO
003726  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER

                                        ;;INITIALIZE A FEW VECTORS
003732  012737  046644  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
003740  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
003746  012737  047576  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
003754  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
003762  012737  053120  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
003770  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
003776  012737  052764  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
004004  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
004012  013737  044540  044532          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
004020  005037  001200                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
004024  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
004030  112737  000001  001115          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
004036  012737  004036  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
004044  012737  004044  001110          MOV     #.,$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.
004052  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
004056  012737  004112  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
004064  012737  177570  001140          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
004072  012737  177570  001142          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
004100  022777  177777  175032          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
004106  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
004110  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
004112  012716  004120          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
004116  000002                          RTI
004120  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
004126  012737  000174  001142          MOV     #DISPREG,DISPLAY
004134  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

004140  005037  001222                  CLR     $PASS           ;;CLEAR PASS COUNT
```

```
2322  004144  132737  000200  001235          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
2323  004152  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
2324  004154  012737  001236  001140          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
2325  004162                          67$:
2326  004162  005037  003610                  CLR     ERRCNT          ;CLEAR ERROR COUNT FOR SWITCH 12 ABORT
2327                                  .SBTTL  TYPE PROGRAM NAME
2328                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
2329  004166  005227  177777                  INC     #-1             ;;FIRST TIME?
2330  004172  001056                          BNE     68$             ;;BRANCH IF NO
2331  004174  022737  044674  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
2332  004202  001452                          BEQ     68$             ;;BRANCH IF YES
2333  004204  104401  004252                  TYPE    ,69$            ;;TYPE ASCIZ STRING
2334                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
2335  004210  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
2336  004214  001012                          BNE     70$             ;;BRANCH IF YES
2337  004216  123727  001234  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
2338  004224  001406                          BEQ     70$             ;;BRANCH IF YES
2339  004226  023727  001140  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
2340  004234  001005                          BNE     71$             ;;BRANCH IF NO
2341  004236  104406                          GTSWR                   ;;GET SOFT-SWR SETTINGS
2342  004240  000403                          BR      71$
2343  004242  112737  000001  001134  70$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2344  004250                          71$:
2345  004250  000427                          BR      68$             ;;GET OVER THE ASCIZ
2346                                  ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 3  CZR6CC0/<CRLF>
2347  004330                          68$:
2348  004330  005227  177777                  INC     #-1             ;TEST IF FIRST PASS
2349  004334  001002                          BNE     6$              ;NO - SKIP
2350  004336  104401  054604                  TYPE    ,OPR006         ;TYPE RUN TIME MESSAGE
2351  004342  022737  000001  003606  6$:     CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2352  004350  001122                          BNE     15$             ;NO, CONTINUE SETUP
2353  004352  104401  054472          5$:     TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (   ) ="
2354  004356  013746  001270                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2355  004362  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2356  004364  104401  054524                  TYPE    ,OPR002
2357  004370  104412                          RDOCT                   ;GET VALUE
2358  004372  012637  001160                  MOV     (SP)+,$TMP0
2359  004376  001407                          BEQ     7$              ;CHECK IF <CR>
2360  004400  022737  160000  001160          CMP     #160000,$TMP0   ;CHECK IF IN I/O PAGE
2361  004406  101361                          BHI     5$
2362  004410  013737  001160  001270          MOV     $TMP0,$BASE     ;LOAD NEW BUS ADDRESS
2363  004416  104401  054532          7$:     TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (   ) ="
2364  004422  013746  001264                  MOV     $VECT1,-(SP)    ;TYPE OUT VECTOR ADDRESS
2365  004426  042716  160000                  BIC     #160000,(SP)
2366  004432  104402                          TYPOC
2367  004434  104401  054524                  TYPE    ,OPR002
2368  004440  104412                          RDOCT                   ;GET VALUE
2369  004442  012637  001160                  MOV     (SP)+,$TMP0
2370  004446  001412                          BEQ     10$             ;CHECK IF <CR>
2371  004450  022737  001000  001160          CMP     #1000,$TMP0     ;CHECK IF LEGAL
2372  004456  101757                          BLOS    7$
2373  004460  042737  017777  001264          BIC     #17777,$VECT1   ;LOAD NEW VECTOR ADDRESS
2374  004466  053737  001160  001264          BIS     $TMP0,$VECT1
2375  004474  104401  054562          10$:    TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (   ) ="
2376  004500  005046                          CLR     -(SP)
2377  004502  113716  001265                  MOVB    $VECT1+1,(SP)
```

```
2378  004506  006216                          ASR     (SP)              ;SHIFT 5 BITS RIGHT
2379  004510  006216                          ASR     (SP)
2380  004512  006216                          ASR     (SP)
2381  004514  006216                          ASR     (SP)
2382  004516  006216                          ASR     (SP)
2383  004520  104402                          TYPOC
2384  004522  104401  054524                  TYPE    ,OPR002
2385  004526  104412                          RDOCT                     ;GET VALUE
2386  004530  012637  001160                  MOV     (SP)+,$TMP0
2387  004534  001430                          BEQ     15$               ;CHECK FOR DEFAULT
2388  004536  022737  000007  001160          CMP     #7,$TMP0          ;CHECK IF LEGAL
2389  004544  103753                          BLO     10$
2390  004546  022737  000004  001160          CMP     #4,$TMP0
2391  004554  101347                          BHI     10$
2392  004556  006337  001160                  ASL     $TMP0             ;SHIFT 5 BITS LEFT
2393  004562  006337  001160                  ASL     $TMP0
2394  004566  006337  001160                  ASL     $TMP0
2395  004572  006337  001160                  ASL     $TMP0
2396  004576  006337  001160                  ASL     $TMP0
2397  004602  042737  160000  001264          BIC     #160000,$VECT1    ;STORE NEW PRIORITY
2398  004610  153737  001160  001265          BISB    $TMP0,$VECT1+1
2399  004616  013737  001264  003600  15$:     MOV     $VECT1,RKVEC      ;STORE RK611 VECTOR
2400  004624  042737  160000  003600          BIC     #160000,RKVEC
2401  004632  113737  001265  003602          MOVB    $VECT1+1,RKPRI    ;STORE PRIORITY
2402  004640  004737  046336                  JSR     PC,$SIZE          ;SIZE MEMORY
2403  004644  013702  001270                  MOV     $BASE,R2          ;SET RK611 BASE
2404  004650  005037  001202                  CLR     $ESCAPE           ;CLEAR ESCAPE
2405
2406  004654  004737  044740  NEWPAS: JSR     PC,PARCHK         ;CHECK OF MEMORY CHECK ENABLE
2407  004660  012746  000000                  MOV     #PR0,-(SP)        ;ALLOW ALL INTERRUPTS
2408  004664  012746  004672                  MOV     #TST1,-(SP)
2409  004670  000002                          RTI
```

```
                                .SBTTL  **DRIVE MESSAGES FOR CLASS B INSTRUCTIONS

                                ;;*****************************************************************
                                ;*TEST 1         READ HEADER SEEK MESSAGE
                                ;*
                                ;*       CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                ;*       PUT THE RK611 CONTROLLER IN DIAGNOSTIC MODE.  ISSUE
                                ;*       A READ HEADER TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0.
                                ;*       HEAD 0, DRIVE 0. CLOCK IN SEEK MESSAGE INTO SHIFT REGISTER.
                                ;*       VERIFY THAT A SEEK IS LOADED WITH THE PROPER BITS IN
                                ;*       MESSAGE SET.  REPEAT FOR A READ HEADER WITH CDT SET
                                ;*       IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
                                ;*
                                ;;*****************************************************************
004672  000004                  TST1:   SCOPE
004674  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
004702  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
004706  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004714  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004722  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004730  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
004736  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004744  012762  012025  000000          MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE RDHEAD WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004752  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004756  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004764  012762  000040  000026          MOV     #DMD,RKMR1(R2)
004772  005300                          DEC     R0
004774  001370                          BNE     1$
004776  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
005004  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
005012  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
005020  012737  012025  003500          MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
005026  012737  071027  003526          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
005034  012737  037760  003530          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
005042  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
005050  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
005052  104001                          ERROR   1               ;CS1 INCORRECT
005054  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005062  000412                          BR      TST2            ;GO TO NEXT TEST
005064  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005072  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
005074  104002                          ERROR   2               ;MESS A INCORRECT
005076  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005104  001401                          BEQ     TST2            ;YES, GO ON TO NEXT TEST
005106  104003                          ERROR   3               ;MESS B INCORRECT

                                ;;*****************************************************************
                                ;*TEST 2         WRITE HEADER SEEK MESSAGE
                                ;*
                                ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                ;*       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                ;*       CLOCK IN SEEK MESSAGE INTO SHIFT REGISTER.  VERIFY
                                ;*       THAT A SEEK IS LOADED WITH THE RTC BIT SET.  REPEAT
                                ;*       FOR A WRITE HEADER WITH CDT SET IN 24 SECTOR FORMAT,
```

```
2466                                        ;*      CYLINDER 1777, HEAD 7, DRIVE 7.
2467                                        ;*
2468                                        ;;*****************************************************************
2469  005110  000004                        TST2:   SCOPE
2470  005112  012737  000144  001200                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2471  005120  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
2472  005124  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2473  005132  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2474  005140  012762  001777  000020                MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2475  005146  012762  003400  000006                MOV     #3400,RKDA(R2)  ;LOAD TRACK
2476  005154  012762  000007  000010                MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
2477  005162  012762  012027  000000                MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE WRHEAD WITH CDT SET IN
2478                                                                        ;  24 SECTOR FORMAT
2479  005170  012700  000016                        MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
2480  005174  012762  000440  000026  1$:           MOV     #DMD!MCLK,RKMR1(R2)
2481  005202  012762  000040  000026                MOV     #DMD,RKMR1(R2)
2482  005210  005300                                DEC     R0
2483  005212  001370                                BNE     1$
2484  005214  016237  000000  003440                MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
2485  005222  016237  000034  003466                MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
2486  005230  016237  000036  003470                MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
2487  005236  012737  012027  003500                MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2488  005244  012737  071227  003526                MOV     #S.SEEK!S.RTC!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2489  005252  012737  037760  003530                MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
2490  005260  023737  003500  003440                CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2491  005266  001405                                BEQ     2$              ;YES, CHECK MESSAGE A
2492  005270  104004                                ERROR   4               ;CS1 INCORRECT
2493  005272  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2494  005300  000412                                BR      TST3            ;;GO TO NEXT TEST
2495  005302  023737  003526  003466  2$:           CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2496  005310  001401                                BEQ     3$              ;YES, CHECK MESSAGE B
2497  005312  104005                                ERROR   5               ;MESS A INCORRECT
2498  005314  023737  003530  003470  3$:           CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2499  005322  001401                                BEQ     TST3            ;;YES, GO ON TO NEXT TEST
2500  005324  104006                                ERROR   6               ;MESS B INCORRECT
2501
2502                                        ;;*****************************************************************
2503                                        ;*TEST 3        READ HEADER DRIVE CLEAR MESSAGE
2504                                        ;*
2505                                        ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2506                                        ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER WITH CDT SET
2507                                        ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2508                                        ;*      CLOCK SEEK MESSAGE AND MAKE SURE A DRIVE CLEAR IS
2509                                        ;*      GENERATED AND THE PROPER BITS ARE SET.
2510                                        ;*
2511                                        ;;*****************************************************************
2512  005326  000004                        TST3:   SCOPE
2513  005330  012737  000144  001200                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2514  005336  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
2515  005342  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2516  005350  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2517  005356  012762  001777  000020                MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2518  005364  012762  003400  000006                MOV     #3400,RKDA(R2)  ;LOAD TRACK
2519  005372  012762  000007  000010                MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2520  005400  012762  012025  000000                MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2521                                                                        ;  24 SECTOR FORMAT
```

```
2522  005406  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2523  005412  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2524  005420  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2525  005426  005300                          DEC     R0
2526  005430  001370                          BNE     1$
2527  005432  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2528  005440  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2529  005446  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2530  005454  012737  012025  003500          MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
2531  005462  012737  071407  003526          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2532  005470  005037  003530                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2533  005474  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2534  005502  001405                          BEQ     2$              ;YES, CHECK CS2
2535  005504  104007                          ERROR   7               ;CS1 INCORRECT
2536  005506  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2537  005514  000412                          BR      TST4            ;;GO TO NEXT TEST
2538  005516  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2539  005524  001401                          BEQ     3$              ;YES, CHECK MESS B
2540  005526  104010                          ERROR   10              ;MESS A INCORRECT
2541  005530  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2542  005536  001401                          BEQ     TST4            ;;YES, GO ON TO NEXT TEST
2543  005540  104011                          ERROR   11              ;MESS B INCORRECT
2544
2545                                  ;;*****************************************************************
2546                                  ;*TEST 4        WRITE HEADER DRIVE CLEAR MESSAGE
2547                                  ;*
2548                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
2549                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER WITH CDT SET
2550                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2551                                  ;*      CLOCK SEEK MESSAGE AND LOAD GENERATED DRIVE CLEAR
2552                                  ;*      INTO SHIFT REGISTER.  MAKE SURE THE DRIVE CLEAR IS
2553                                  ;*      GENERATED AND THE PROPER BITS ARE SET.
2554                                  ;*
2555                                  ;;*****************************************************************
2556  005542  000004          TST4:   SCOPE
2557  005544  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2558  005552  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2559  005556  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2560  005564  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2561  005572  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2562  005600  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2563  005606  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2564  005614  012762  012027  000000          MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2565                                                                  ;  24 SECTOR FORMAT
2566  005622  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2567  005626  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2568  005634  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2569  005642  005300                          DEC     R0
2570  005644  001370                          BNE     1$
2571  005646  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2572  005654  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2573  005662  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2574  005670  012737  012027  003500          MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2575  005676  012737  071407  003526          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2576  005704  005037  003530                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2577  005710  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
```

```
2578  005716  001405                          BEQ     2$              ;YES, CHECK CS2
2579  005720  104012                          ERROR   12              ;CS1 INCORRECT
2580  005722  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2581  005730  000412                          BR      TST5            ;;GO TO NEXT TEST
2582  005732  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2583  005740  001401                          BEQ     3$              ;YES, CHECK MESS B
2584  005742  104013                          ERROR   13              ;MESS A INCORRECT
2585  005744  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2586  005752  001401                          BEQ     TST5            ;;YES, GO ON TO NEXT TEST
2587  005754  104014                          ERROR   14              ;MESS B INCORRECT
2588
2589
2590                                  .SBTTL  **INDEX AND SECTOR PULSE DETECT ON
2591
2592                                  ;;*****************************************************************
2593                                  ;*TEST 5        SECTOR PULSE DETECT IN READ HEADER (PART 1)
2594                                  ;*
2595                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2596                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2597                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2598                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2599                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES AND A ONE.
2600                                  ;*
2601                                  ;*      MAKE SURE READ GATE DOES SET.
2602                                  ;*
2603                                  ;;*****************************************************************
2604  005756  000004                  TST5:   SCOPE
2605  005760  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2606  005766  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2607  005772  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2608  006000  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2609  006006  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2610  006014  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2611  006022  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2612  006030  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2613  006034  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2614  006042  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2615  006050  005300                          DEC     R0
2616  006052  001370                          BNE     1$
2617  006054  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2618  006062  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2619  006070  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2620  006076  001405                          BEQ     2$              ;YES, CLOCK ZEROES
2621  006100  104015                          ERROR   15              ;CS1 INCORRECT
2622  006102  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2623  006110  000553                          BR      TST6            ;;GO ON TO NEXT TEST
2624
2625  006112  012762  000140  000026  2$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
2626  006120  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2627  006126  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECT MAINT REG. 1
2628  006134  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2629  006140  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2630  006144  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROES
2631  006150  012700  000200                  MOV     #128.,R0        ;GENERATE 128 ZEROS UNTIL READ GATE
2632  006154  004737  046164          5$:     JSR     PC,RDBIT        ;READ A ZERO
2633  006160  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
```

```
2634  006166  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK MAINTENANCE REG. 1 CORRECT
2635  006174  001405                          BEQ     6$                  ;YES, SIMULATE NEXT BIT
2636  006176  104017                          ERROR   17                  ;MAINT REG. 1 INCORRECT
2637  006200  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
2638  006206  000514                          BR      TST6                ;;GO ON TO NEXT TEST
2639
2640  006210  005237  003622          6$:     INC     BITCNT              ;INCREMENT BIT COUNT
2641  006214  005300                          DEC     R0                  ;CHECK READY OF READ GATE
2642  006216  001356                          BNE     5$                  ;NO, CONTINUE
2643  006220  012737  122040  003524          MOV     #DMD!MEWD!ECCW!RDGATE,E.MR1  ;LOAD EXPECTED MR1
2644  006226  012700  000177                  MOV     #127.,R0            ;GENERATE 127 ZEROS
2645  006232  004737  046164          10$:    JSR     PC,RDBIT            ;READ A ZERO
2646  006236  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MAINT REG. 1
2647  006244  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK MAINT REG. 1 CORRECT
2648  006252  001405                          BEQ     11$                 ;YES, SIMULATE NEXT BIT
2649  006254  104017                          ERROR   17                  ;MAINT REG. 1 INCORRECT
2650  006256  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
2651  006264  000465                          BR      TST6                ;;GO ON TO NEXT TEST
2652
2653  006266  005237  003622          11$:    INC     BITCNT              ;INCREMENT BIT COUNT
2654  006272  005300                          DEC     R0                  ;CHECK IF ALL ZEROS ISSUED
2655  006274  001356                          BNE     10$                 ;NO, CONTINUE
2656  006276  012737  000001  003614          MOV     #1,PR.BIT           ;LOAD ONE FOR READING 1
2657  006304  004737  046164                  JSR     PC,RDBIT            ;READ A ONE
2658  006310  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MAINTENANCE REG.
2659  006316  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK MAINT REG. 1
2660  006324  001405                          BEQ     12$                 ;YES, CONTINUE
2661  006326  104017                          ERROR   17                  ;MAINTENANCE REG. 1 INCORRECT
2662  006330  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
2663  006336  000440                          BR      TST6                ;;GO ON TO NEXT TEST
2664  006340  005237  003622          12$:    INC     BITCNT              ;INCREMENT BIT COUNT
2665  006344  013737  003614  003616          MOV     PR.BIT,M1.BIT       ;LOAD ZERO FOR NEXT BIT
2666  006352  005037  003614                  CLR     PR.BIT
2667  006356  004737  046164                  JSR     PC,RDBIT            ;SIMULATE ZERO
2668  006362  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MAINTENANCE REG. 1
2669  006370  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK MAINT REG. 1 CORRECT
2670  006376  001405                          BEQ     13$                 ;CHECK CS1 CORRECT
2671  006400  104017                          ERROR   17                  ;MAINTENANCE REG. 1 INCORRECT
2672  006402  012762  100000  000000          MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
2673  006410  000413                          BR      TST6                ;;GO TO NEXT TEST
2674
2675  006412  016237  000000  003440  13$:    MOV     RKCS1(R2),T.CS1     ;STORE COMMAND AND STATUS REG. 1
2676  006420  012737  000025  003500          MOV     #RDHEAD,E.CS1       ;LOAD EXPECTED CS1
2677  006426  023737  003500  003440          CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
2678  006434  001401                          BEQ     TST6                ;;YES, GO TO NEXT TEST
2679  006436  104016                          ERROR   16                  ;CS1 INCORRECT
2680
2681                                  ;;*****************************************************************
2682                                  ;*TEST 6        SECTOR PULSE DETECT IN READ HEADER (PART 2)
2683                                  ;*
2684                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2685                                  ;*      IN DIPGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2686                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2687                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2688                                  ;*      SIMULATE INDEX PULSE, 255 ZEROES AND A ONE.
2689                                  ;*
```

```
                                        ;*      MAKE SURE READ GATE DOES NOT SET.
                                        ;*
                                        ;;*****************************************************************
006440  000004                          TST6:   SCOPE
006442  012737  000012  001200                  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
006450  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
006454  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006462  012762  000040  000000                  MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
006470  012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
006476  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
006504  012762  000025  000000                  MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
006512  012700  000312                          MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
006516  012762  000440  000026  1$:             MOV     #DMD!MCLK,RKMR1(R2)
006524  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
006532  005300                                  DEC     R0
006534  001370                                  BNE     1$
006536  016237  000000  003440                  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
006544  012737  000025  003500                  MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
006552  023737  003500  003440                  CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
006560  001405                                  BEQ     2$              ;YES, CLOCK IN ZEROS
006562  104015                                  ERROR   15
006564  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006572  000535                                  BR      TST7            ;;GO ON TO NEXT TEST
006574                                  2$:
006574  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDX PULSE
006602  012700  000004                          MOV     #4,R0
006606  012762  000640  000026  3$:             MOV     #DMD!MIND!MCLK,RKMR1(R2)
006614  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
006622  005300                                  DEC     R0
006624  001370                                  BNE     3$
006626  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
006634  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
006640  012737  022040  003524                  MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
006646  005037  003614                          CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
006652  005037  003616                          CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
006656  012700  000377                          MOV     #255.,R0        ;GENERATE 255 ZEROES
006662  004737  046164          5$:             JSR     PC,RDBIT        ;READ A ZERO
006666  016237  000026  003464                  MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006674  023737  003524  003464                  CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006702  001405                                  BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
006704  104020                                  ERROR   20              ;MAINT REG. 1 INCORRECT
006706  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006714  000464                                  BR      TST7            ;;GO ON TO NEXT TEST
                                        
006716  005237  003622          6$:             INC     BITCNT          ;INCREMENT BIT COUNT
006722  005300                                  DEC     R0              ;CHECK IF ALL ZEROES ISSUED
006724  001356                                  BNE     5$              ;NO, CONTINUE
006726  012737  000001  003614                  MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
006734  004737  046164                          JSR     PC,RDBIT        ;READ A ONE
006740  016237  000026  003464                  MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006746  023737  003524  003464                  CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006754  001405                                  BEQ     7$              ;YES, CONTINUE
006756  104020                                  ERROR   20              ;MAINT REG. 1 INCORRECT
006760  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006766  000437                                  BR      TST7            ;;GO ON TO NEXT TEST
```

```
2746  006770  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2747  006774  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2748  007002  005037  003614                  CLR     PR.BIT
2749  007006  004737  046164                  JSR     PC,RDBIT        ;SIMULATE ZERO
2750  007012  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2751  007020  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2752  007026  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2753  007030  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2754  007036  000413                          BR      TST7            ;;GO TO NEXT TEST
2755
2756  007040  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2757  007046  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2758  007054  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2759  007062  001401                          BEQ     TST7            ;;YES, GO TO NEXT TEST
2760  007064  104016                          ERROR   16              ;CS1 INCORRECT
2761
2762                                  ;;*****************************************************************
2763                                  ;*TEST 7        SECTOR PULSE DETECT IN READ HEADER (PART 3)
2764                                  ;*
2765                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2766                                  ;*      DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2767                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
2768                                  ;*      CLOCK BOTH SEEK AND DRIVE CHECK MESSAGES.
2769                                  ;*      SIMULATE 255 ZEROES AND A ONE.
2770                                  ;*
2771                                  ;*      MAKE SURE READ GATE DOES NOT SET.
2772                                  ;*
2773                                  ;*****************************************************************
2774  007066  000004                  TST7:   SCOPE
2775  007070  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2776  007076  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2777  007102  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2778  007110  012762  000040  000000          MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2779  007116  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2780  007124  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2781  007132  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2782  007140  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2783  007144  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2784  007152  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2785  007160  005300                          DEC     R0
2786  007162  001370                          BNE     1$
2787  007164  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2788  007172  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2789  007200  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2790  007206  001405                          BEQ     2$              ;YES, CLOCK IN ZEROS
2791  007210  104015                          ERROR   15
2792  007212  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2793  007220  000515                          BR      TST10           ;;GO ON TO NEXT TEST
2794  007222                          2$:
2795  007222  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2796  007226  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
2797  007234  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2798  007240  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
2799  007244  012700  000377                  MOV     #255.,R0        ;GENERATE 255 ZEROES
2800  007250  004737  046164          5$:     JSR     PC,RDBIT        ;READ A ZERO
2801  007254  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
```

```
2802  007262  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2803  007270  001405                          BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
2804  007272  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2805  007274  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2806  007302  000464                          BR      TST10           ;;GO ON TO NEXT TEST
2807
2808  007304  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2809  007310  005300                          DEC     R0              ;CHECK IF ALL ZEROES ISSUED
2810  007312  001356                          BNE     5$              ;NO, CONTINUE
2811  007314  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2812  007322  004737  046164                  JSR     PC,RDBIT        ;READ A ONE
2813  007326  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2814  007334  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2815  007342  001405                          BEQ     7$              ;YES, CONTINUE
2816  007344  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2817  007346  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2818  007354  000437                          BR      TST10           ;;GO ON TO NEXT TEST
2819
2820  007356  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2821  007362  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2822  007370  005037  003614                  CLR     PR.BIT
2823  007374  004737  046164                  JSR     PC,RDBIT        ;SIMULATE ZERO
2824  007400  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2825  007406  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2826  007414  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2827  007416  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2828  007424  000413                          BR      TST10           ;;GO TO NEXT TEST
2829
2830  007426  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2831  007434  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2832  007442  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2833  007450  001401                          BEQ     TST10           ;;YES, GO TO NEXT TEST
2834  007452  104016                          ERROR   16              ;CS1 INCORRECT
2835
2836                                  ;;*****************************************************************
2837                                  ;*TEST 10       INDEX PULSE DETECTION IN WRITE HEADER
2838                                  ;*
2839                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2840                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
2841                                  ;*      TO AN RK06, IN 26 SECTOR FORMAT, TO CYLINDER 0, HEAD 0,
2842                                  ;*      DRIVE 0, WITH A ONE WORD TRANSFER.  CLOCK THROUGH THE
2843                                  ;*      SEEK AND THE DRIVE CLEAR MESSAGES.  ISSUE 200 CONTROLLER
2844                                  ;*      CLOCKS AND MAKE SURE WRITE GATE DOES NOT SET.  SIMULATE
2845                                  ;*      SECTOR PULSE AND 200 CONTROLLER CLOCKS MAKING SURE WRITE
2846                                  ;*      GATE DOES NOT SET.  SIMULATE INDEX PULSE AND MAKE SURE
2847                                  ;*      WRITE GATE SETS.
2848                                  ;*
2849                                  ;*****************************************************************
2850  007454  000004          TST10:  SCOPE
2851  007456  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2852  007464  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2853  007470  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2854  007476  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2855  007504  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIAILZE ROM ADDRESS
2856  007512  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2857  007520  012762  067264  000004          MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
```

```
2858  007526  012762  177777  000002          MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
2859  007534  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
2860  007542  012700  000312                  MOV     #50.*4+2,R0      ;CLOCK UNTIL READY FOR INDEX PULSE
2861  007546  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2862  007554  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2863  007562  005300                          DEC     R0
2864  007564  001370                          BNE     1$
2865  007566  016237  000000  003440          MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
2866  007574  016237  000004  003444          MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS REG.
2867  007602  016237  000002  003442          MOV     RKWC(R2),T.WC    ;STORE WORD COUNT REG.
2868  007610  012737  000027  003500          MOV     #WRHEAD,E.CS1    ;LOAD EXPECTED CS1
2869  007616  012737  067264  003504          MOV     #WRBUFF,E.BA     ;LOAD EXPECTED BUS ADDRESS
2870  007624  012737  177777  003502          MOV     #-1,E.WC         ;LOAD EXPECTED WORD COUNT
2871  007632  023737  003500  003440          CMP     E.CS1,T.CS1      ;CHECK COMMAND AND STATUS REG.    CORRECT
2872  007640  001403                          BEQ     2$               ;YES, CONTINUE
2873  007642  104022                          ERROR   22               ;CS1 INCORRECT
2874  007644  000137  010572                  JMP     60$              ;CLEAR CONTROLLER
2875
2876  007650  023737  003504  003444  2$:     CMP     E.BA,T.BA        ;CHECK BUS ADDRESS CORRECT
2877  007656  001403                          BEQ     3$               ;YES, CONTINUE
2878  007660  104023                          ERROR   23               ;BUS ADDRESS INCORRECT
2879  007662  000137  010572                  JMP     60$              ;CLEAR RK611
2880
2881  007666  023737  003502  003442  3$:     CMP     E.WC,T.WC        ;CHECK WORD COUNT CORRECT
2882  007674  001403                          BEQ     4$               ;YES, CONTINUE
2883  007676  104024                          ERROR   24               ;WORD COUNT INCORRECT
2884  007700  000137  010572                  JMP     60$              ;CLEAR RK611
2885
2886  007704  012737  022040  003524  4$:     MOV     #ECCW!MEWD!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2887  007712  005037  003622                  CLR     BITCNT           ;INITIALIZE BIT COUNT
2888  007716  012700  000310                  MOV     #200.,R0         ;ISSUE 200 MAINT BITS
2889  007722  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2890  007730  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2891  007736  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2892  007744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2893  007752  016237  000026  003464          MOV     RKMR1(R2),T.MR1  ;STORE MAINT REG. 1
2894  007760  023737  003524  003464          CMP     E.MR1,T.MR1      ;CHECK MAINTENANCE REG. 1 CORRECT
2895  007766  001403                          BEQ     6$               ;YES, CONTINUE
2896  007770  104025                          ERROR   25               ;MAINT REG 1 INCORRECT
2897  007772  000137  010572                  JMP     60$              ;CLEAR RK611
2898
2899  007776  005300                  6$:     DEC     R0               ;CHECK IF READY FOR SECTOR PULSE
2900  010000  001350                          BNE     5$               ;NO, GET NEXT BIT
2901  010002  016237  000000  003440          MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
2902  010010  016237  000004  003444          MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS REG
2903  010016  016237  000002  003442          MOV     RKWC(R2),T.WC    ;STORE WORD COUNT REG
2904  010024  023737  003500  003440          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
2905  010032  001403                          BEQ     10$              ;YES, CONTINUE
2906  010034  104026                          ERROR   26               ;CS1 INCORRECT
2907  010036  000137  010572                  JMP     60$              ;CLEAR RK611
2908
2909  010042  023737  003504  003444  10$:    CMP     E.BA,T.BA        ;CHECK BUS ADDRESS CORRECT
2910  010050  001403                          BEQ     11$              ;YES, CONTINUE
2911  010052  104027                          ERROR   27               ;BUS ADDRESS INCORRECT
2912  010054  000137  010572                  JMP     60$              ;CLEAR RK611
2913
```

```
2914  010060  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
2915  010066  001403                          BEQ     12$             ;YES, CONTINUE
2916  010070  104030                          ERROR   30              ;WORD COUNT INCORRECT
2917  010072  000137  010572                  JMP     60$             ;CLEAR RK611
2918
2919  010076  012700  000004          12$:    MOV     #4,R0           ;SIMULATE SECTOR PULSE
2920  010102  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2921  010110  012762  000540  000026  13$:    MOV     #DMD!MSP!MCLK,RKMR1(R2)
2922  010116  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2923  010124  005300                          DEC     R0
2924  010126  001370                          BNE     13$
2925  010130  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2926  010136  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2927  010144  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS AND REG.
2928  010152  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2929  010160  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 INCORRECT
2930  010166  001402                          BEQ     15$             ;YES, CONTINUE
2931  010170  104026                          ERROR   26              ;CS1 INCORRECT
2932  010172  000577                          BR      60$             ;CLEAR RK611
2933
2934  010174  023737  003504  003444  15$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2935  010202  001402                          BEQ     16$             ;YES, CONTINUE
2936  010204  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2937  010206  000571                          BR      60$             ;CLEAR RK611
2938
2939  010210  023737  003502  003442  16$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2940  010216  001402                          BEQ     20$             ;YES, CONTINUE
2941  010220  104030                          ERROR   30              ;WORD COUNT INCORRECT
2942  010222  000563                          BR      60$             ;CLEAR RK611
2943
2944  010224  005037  003622          20$:    CLR     BITCNT          ;INITIALIZE BIT COUNT
2945  010230  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2946  010234  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2)
2947  010242  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2948  010250  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2949  010256  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2950  010264  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2951  010272  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2952  010300  001402                          BEQ     22$             ;YES, CONTINUE
2953  010302  104025                          ERROR   25              ;MAINT REG. 1 INCORRECT
2954  010304  000532                          BR      60$             ;CLEAR RK611
2955
2956  010306  005300          22$:    DEC     R0              ;CHECK IF READY FOR INDEX PULSE
2957  010310  001351                  BNE     21$             ;NO, GET NEXT BIT
2958  010312  016237  000000  003440  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2959  010320  016237  000004  003444  MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2960  010326  016237  000002  003442  MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2961  010334  023737  003500  003440  CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2962  010342  001402                  BEQ     23$             ;YES, CONTINUE
2963  010344  104026                  ERROR   26              ;CS1 INCORRECT
2964  010346  000511                  BR      60$             ;CLEAR RK611
2965
2966  010350  023737  003504  003444  23$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2967  010356  001402                          BEQ     24$             ;YES, CONTINUE
2968  010360  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2969  010362  000503                          BR      60$             ;CLEAR RK611
```

```
2970
2971  010364  023737  003502  003442  24$:    CMP     E.WC,T.WC          ;CHECK WORD COUNT CORRECT
2972  010372  001402                          BEQ     25$                ;YES, CONTINUE
2973  010374  104030                          ERROR   30                 ;WORD COUNT INCORRECT
2974  010376  000475                          BR      60$                ;CLEAR RK611
2975
2976  010400  012762  000240  000026  25$:    MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE PULSE
2977  010406  012700  000004                  MOV     #4,R0
2978  010412  012762  000640  000026  26$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
2979  010420  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
2980  010426  005300                          DEC     R0
2981  010430  001370                          BNE     26$
2982  010432  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2983  010440  012700  000002                  MOV     #2,R0              ;SIMULATE TWO CLOCK PULSES FOR WRITE
2984                                                                     ;  GATE TO COME UP
2985  010444  012762  000440  000026  27$:    MOV     #DMD!MCLK,RKMR1(R2)
2986  010452  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2987  010460  005300                          DEC     R0
2988  010462  001370                          BNE     27$
2989  010464  016237  000026  003464          MOV     RKMR1(R2),T.MR1    ;STORE MAINTENANCE REG.
2990  010472  016237  000000  003440          MOV     RKCS1(R2),T.CS1    ;STORE COMMAND AND STATUS REG 1
2991  010500  016237  000004  003444          MOV     RKBA(R2),T.BA      ;STORE BUS ADDRESS
2992  010506  016237  000002  003442          MOV     RKWC(R2),T.WC      ;STORE WORD COUNT
2993  010514  012737  062040  003524          MOV     #WRTGAT!MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2994  010522  023737  003500  003440          CMP     E.CS1,T.CS1        ;CHECK CS1 CORRECT
2995  010530  001401                          BEQ     28$                ;YES, CONTINUE
2996  010532  104031                          ERROR   31                 ;CS1 INCORRECT
2997  010534  023737  003504  003444  28$:    CMP     E.BA,T.BA          ;CHECK BUS ADDRESS CORRECT
2998  010542  001401                          BEQ     29$                ;YES, CONTINUE
2999  010544  104032                          ERROR   32                 ;BUS ADDRESS INCORRECT
3000  010546  023737  003502  003442  29$:    CMP     E.WC,T.WC          ;CHECK WORD COUNT CORRECT
3001  010554  001401                          BEQ     30$                ;YES, CONTINUE
3002  010556  104033                          ERROR   33                 ;WORD COUNT INCORRECT
3003  010560  023737  003524  003464  30$:    CMP     E.MR1,T.MR1        ;CHECK MAINT REG 1 CORRECT
3004  010566  001401                          BEQ     60$                ;YES, CLEAR RK611
3005  010570  104034                          ERROR   34                 ;MAINT REG. 1 INCORRECT
3006  010572  012762  100000  000000  60$:    MOV     #CCLR,RKCS1(R2)    ;CLEAR RK611
3007
3008                                  .SBTTL  **NPR READING OF MEMORY
3009
3010                                  ;;*****************************************************************
3011                                  ;*TEST 11       NPR OUTPUT DATA TRANSFER
3012                                  ;*
3013                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3014                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3015                                  ;*       IN 26 SECTOR FORMAT, CYLINDER 777, HEAD 7, DRIVE 7.
3016                                  ;*       SPECIFY A ONE WORD DATA TRANSFER.  CLOCK BOTH SEEK
3017                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE INDEX PULSE.
3018                                  ;*       CLOCK IN FIRST WORD OF NPR TRANSFER.  CHECK INPUT READY,
3019                                  ;*       OUTPUT READY, BUS  ADDRESS, WORD COUNT, AND CONTENTS OF
3020                                  ;*       THE SILO.  REPEAT FOR 8 DIFFERENT DATA PATTERNS.
3021                                  ;*
3022                                  ;;*****************************************************************
3023  010600  000004                  TST11:  SCOPE
3024  010602  012737  000144  001200          MOV     #100.,$TIMES       ;;DO 100. ITERATIONS
3025  010610  013702  001270                  MOV     $BASE,R2           ;LOAD RK611 BASE
```

```
 3026  010614  012703  066744                      MOV     #PATTERN,R3      ;LOAD PATTERN ADDRESS
 3027  010620  012704  000010                      MOV     #8.,R4           ;LOAD PATTERN COUNT
 3028  010624  012737  067266  003504              MOV     #WRBUFF+2,E.BA   ;LOAD EXPECTED BUS ADDRESS
 3029  010632  012737  000027  003500              MOV     #WRHEAD,E.CS1    ;LOAD EXPECTED CS1
 3030  010640  005037  003502                      CLR     E.WC             ;LOAD EXPECTED WORD COUNT
 3031  010644  012737  010652  001110              MOV     #1$,$LPERR       ;LOAD LOOP ON ERROR LOCATION FOR
 3032                                                                       ;  SUBTEST LOOP
 3033
 3034  010652                                  1$:
 3035  010652  012762  100000  000000              MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
 3036  010660  011337  067254                      MOV     (R3),WRBUFF      ;LOAD BUFFER FOR WRITE HEADER
 3037  010664  012762  000040  000026              MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN MAINT MODE
 3038  010672  012762  000777  000020              MOV     #777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS
 3039  010700  012762  003400  000006              MOV     #3400,RKDA(R2)   ;LOAD DISK ADDRESS
 3040  010706  012762  067264  000004              MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
 3041  010714  012762  000007  000010              MOV     #7,RKCS2(R2)     ;LOAD OTHER NUMBER
 3042  010722  012762  177777  000002              MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
 3043  010730  012762  000027  000000              MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
 3044  010736  012700  000312                      MOV     #50.*4+2,R0      ;ISSUE CLOCKS UNTIL READY FOR
 3045                                                                       ;  INDEX PULSE
 3046  010742  012762  000440  000026  2$:         MOV     #DMD!MCLK,RKMR1(R2)
 3047  010750  012762  000040  000026              MOV     #DMD,RKMR1(R2)
 3048  010756  005300                              DEC     R0
 3049  010760  001370                              BNE     2$
 3050  010762  012700  000004                      MOV     #4,R0            ;SIMULATE INDEX PULSE
 3051  010766  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)
 3052  010774  012762  000640  000026  3$:         MOV     #DMD!MIND!MCLK,RKMR1(R2)
 3053  011002  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)
 3054  011010  005300                              DEC     R0
 3055  011012  001370                              BNE     3$
 3056  011014  012762  000040  000026              MOV     #DMD,RKMR1(R2)
 3057  011022  012700  000045                      MOV     #37.,R0          ;SIMULATE 1 NPR TRANSFER
 3058  011026  012762  000440  000026  4$:         MOV     #DMD!MCLK,RKMR1(R2)
 3059  011034  012762  000040  000026              MOV     #DMD,RKMR1(R2)
 3060  011042  005300                              DEC     R0
 3061  011044  001370                              BNE     4$
 3062  011046  016237  000000  003440              MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
 3063  011054  016237  000004  003444              MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS REG
 3064  011062  016237  000002  003442              MOV     RKWC(R2),T.WC    ;STORE WORD COUNT
 3065  011070  012700  000024                      MOV     #20.,R0          ;WAIT FOR OUTPUT READY
 3066  011074  005300                          5$:         DEC     R0
 3067  011076  001376                              BNE     5$
 3068  011100  016237  000010  003450              MOV     RKCS2(R2),T.CS2  ;STORE COMMAND AND STATUS REG. 2
 3069  011106  012737  000307  003510              MOV     #OR!IR!7,E.CS2   ;LOAD EXPECTED CS2
 3070  011114  023737  003500  003440              CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
 3071  011122  001401                              BEQ     6$               ;YES, CHECK CS2
 3072  011124  104035                              ERROR   35               ;CS1 INCORRECT
 3073  011126  023737  003510  003450  6$:         CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
 3074  011134  001401                              BEQ     7$               ;YES, CONTINUE
 3075  011136  104036                              ERROR   36               ;CS2 INCORRECT
 3076  011140  023737  003504  003444  7$:         CMP     E.BA,T.BA        ;CHECK IF BUS ADDRESS INCREMENT OCCURRED
 3077  011146  001401                              BEQ     8$               ;YES, CONTINUE
 3078  011150  104037                              ERROR   37               ;BUS ADDRESS INCORRECT
 3079  011152  023737  003502  003442  8$:         CMP     E.WC,T.WC        ;CHECK WORD COUNT REG CORRECT
 3080  011160  001401                              BEQ     9$               ;YES, CONTINUE
 3081  011162  104040                              ERROR   40               ;WORD COUNT INCORRECT
```

```
3082  011164  016237  000024  003462  9$:     MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3083  011172  011337  003522                  MOV     (R3),E.DB       ;LOAD EXPECTED DATA BUFFER
3084  011176  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3085  011204  001401                          BEQ     15$             ;YES,CONTINUE
3086  011206  104041                          ERROR   41              ;DATA BUFFER INCORRECT
3087  011210  016237  000000  003440  15$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3088  011216  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3089  011224  012737  000107  003510          MOV     #IR!7,E.CS2     ;LOAD EXPECTED CS2
3090  011232  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3091  011240  001401                          BEQ     17$             ;YES, CONTINUE
3092  011242  104042                          ERROR   42              ;CS1 INCORRECT
3093  011244  023737  003510  003450  17$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3094  011252  001401                          BEQ     20$             ;YES, CONTINUE
3095  011254  104043                          ERROR   43              ;CS2 INCORRECT
3096  011256  104415                  20$:    SCOPE                   ;CHECK IF LOOP ON ERROR
3097  011260  005723                          TST     (R3)+           ;GENERATE ADDRESS OF NEXT CONFIG
3098  011262  005304                          DEC     R4              ;CHECK IF ALL 8 CONFIGS TRIED
3099  011264  001000                          BNE     TST12           ;;NO, TRY NEXT DATA PATTERN
3100
3101                                  ;;*****************************************************************
3102                                  ;*TEST 12       PARTIAL SILO FILLING
3103                                  ;*
3104                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3105                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3106                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3107                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK IN ALL
3108                                  ;*      SPECIFIED WORDS INTO THE SILO.  CHECK WORD COUNT,
3109                                  ;*      BUS ADDRESS, INPUT READY, AND OUTPUT READY.  MAKE
3110                                  ;*      SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
3111                                  ;*      INTO THE SILO.  CHECK THE SILO FOR CORRECT DATA.
3112                                  ;*      REPEAT FOR WORD COUNTS 2-65.
3113                                  ;*
3114                                  ;*****************************************************************
3115  011266  000004                  TST12:  SCOPE
3116  011270  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3117  011276  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3118  011302  012737  000001  001160          MOV     #1,$TMPO        ;LOAD NUMBER OF WORDS FOR DATA TRANSFER
3119  011310  012704  000065                  MOV     #65,R4          ;LOAD ITERATION COUNT
3120  011314  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3121  011322  012737  011330  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3122                                                                  ;  SUBTEST LOOP
3123
3124  011330                          1$:
3125  011330  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3126  011336  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3127  011344  012762  067042  000004          MOV     #NPRBUF,RKBA(R2)  ;LOAD BUS ADDRESS
3128  011352  012737  067042  003504          MOV     #NPRBUF,E.BA
3129  011360  013737  001160  003502          MOV     $TMPO,E.WC      ;LOAD WORD COUNT
3130  011366  005437  003502                  NEG     E.WC
3131  011372  013762  003502  000002          MOV     E.WC,RKWC(R2)
3132  011400  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3133  011406  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3134                                                                  ;  INDEX PULSE
3135  011412  012762  000440  000026  2$:     MOV     #DMD!MCLK,RKMR1(R2)
3136  011420  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3137  011426  005300                          DEC     R0
```

```
3138  011430  001370                        BNE     2$
3139  011432  012700  000004                MOV     #4,R0           ;SIMULATE INDEX PULSE
3140  011436  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3141  011444  012762  000640  000026  3$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
3142  011452  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3143  011460  005300                        DEC     R0
3144  011462  001370                        BNE     3$
3145  011464  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3146  011472  012737  000300  003510        MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3147  011500  012700  000045          4$:   MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3148  011504  012762  000440  000026  5$:   MOV     #DMD!MCLK,RKMR1(R2)
3149  011512  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3150  011520  005300                        DEC     R0
3151  011522  001370                        BNE     5$
3152  011524  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3153  011532  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3154  011540  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3155  011546  022737  067042  003504        CMP     #NPRBUF,E.BA    ;CHECK IF FIRST WORD
3156  011554  001004                        BNE     7$              ;NO, STORE CS2
3157  011556  012700  000024                MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3158  011562  005300                  6$:   DEC     R0
3159  011564  001376                        BNE     6$
3160  011566  016237  000010  003450  7$:   MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3161  011574  062737  000002  003504        ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADD
3162  011602  005237  003502                INC     E.WC
3163  011606  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3164  011614  001401                        BEQ     8$              ;YES, CHECK CS2
3165  011616  104044                        ERROR   44              ;CS1 INCORRECT
3166  011620  023737  003510  003450  8$:   CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3167  011626  001401                        BEQ     9$              ;YES, CHECK BUSS ADDRESS REG.
3168  011630  104045                        ERROR   45              ;CS2 INCORRECT
3169  011632  023737  003504  003444  9$:   CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3170  011640  001401                        BEQ     10$             ;YES, CHECK WORD COUNT
3171  011642  104046                        ERROR   46              ;BUS ADDRESS INCORRECT
3172  011644  023737  003502  003442  10$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3173  011652  001401                        BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3174  011654  104047                        ERROR   47              ;WORD COUNT INCORRECT
3175  011656  005737  003502          11$:  TST     E.WC            ;CHECK IF FINISHED
3176  011662  001306                        BNE     4$              ;NO, TRANSFER NEXT WORD
3177  011664  012700  000112                MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3178  011670  012762  000440  000026  15$:  MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3179  011676  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3180  011704  005300                        DEC     R0
3181  011706  001370                        BNE     15$
3182  011710  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3183  011716  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3184  011724  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3185  011732  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3186  011740  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3187  011746  001401                        BEQ     16$             ;YES, CHECK CS2
3188  011750  104050                        ERROR   50              ;CS1 INCORRECT
3189  011752  023737  003510  003450  16$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3190  011760  001401                        BEQ     17$             ;YES, CHECK BUS ADDRESS
3191  011762  104051                        ERROR   51              ;CS2 INCORRECT
3192  011764  023737  003504  003444  17$:  CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3193  011772  001401                        BEQ     18$             ;YES, CHECK WORD COUNT
```

```
3194  011774  104052                        ERROR   52              ;BUS ADDRESS INCORRECT
3195  011776  023737  003502  003442  18$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3196  012004  001401                        BEQ     19$             ;YES, CONTINUE
3197  012006  104053                        ERROR   53              ;WORD COUNT INCORRECT
3198  012010  013701  001160          19$:  MOV     $TMPO,R1        ;LOAD NUMBER OF WORDS LOADED
3199  012014  012703  067042                MOV     #NPRBUFF,R3     ;LOAD START ADDRESS
3200  012020  005037  003624                CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINTOUT
3201  012024  016237  000024  003462  25$:  MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3202  012032  012337  003522                MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3203  012036  023737  003522  003462        CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3204  012044  001401                        BEQ     26$             ;YES, CONTINUE
3205  012046  104054                        ERROR   54              ;DATA BUFFER INCORRECT
3206  012050  016237  000000  003440  26$:  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3207  012056  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3208  012064  022701  000001                CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3209  012070  001003                        BNE     27$             ;NO, CONTINUE
3210  012072  012737  000100  003510        MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3211  012100  023737  003500  003440  27$:  CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3212  012106  001401                        BEQ     28$             ;YES, CONTINUE
3213  012110  104055                        ERROR   55              ;CS1 INCORRECT
3214  012112  023737  003510  003450  28$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3215  012120  001401                        BEQ     29$             ;YES, CONTINUE
3216  012122  104056                        ERROR   56              ;CS2 INCORRECT
3217  012124  005237  003624          29$:  INC     WRDCNT          ;INCREMENT WORD COUNT
3218  012130  005301                        DEC     R1              ;DECREMENT WORDS READ
3219  012132  001334                        BNE     25$             ;CHECK IF ALL WORDS READ
3220  012134  104415                        SCOP1                   ;CHECK IF LOOP ON ERROR
3221  012136  005237  001160                INC     $TMPO           ;INCREMENT WORDS READ FROM MEM
3222  012142  005304                        DEC     R4              ;CHECK IF FINISHED
3223  012144  001402                        BEQ     TST13           ;YES, GO ON TO NEXT TEST
3224  012146  000137  011330                JMP     1$              ;TRY NEXT WORD COUNT
3225
3226                                  ;;*****************************************************************
3227                                  ;*TEST 13       SILO FILLING WITH NPR TRANSFERS
3228                                  ;*
3229                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3230                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3231                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3232                                  ;*      SPECIFY A 66 WORD DATA TRANSFER, CLOCK IN ALL 66 WORDS
3233                                  ;*      INTO THE SILO.  CHECK INPUT READY, OUTPUT READY, BUS
3234                                  ;*      ADDRESS, WORD COUNT, AND CONTENTS OF THE SILO.
3235                                  ;*
3236                                  ;*****************************************************************
3237  012152  000004                TST13:  SCOPE
3238  012154  012737  000144  001200        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3239  012162  013702  001270                MOV     $BASE,R2        ;LOAD RK611 BASE
3240  012166  012737  000027  003500        MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3241  012174  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3242  012202  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3243  012210  012737  067044  003504        MOV     #NPRBUF+2,E.BA  ;LOAD BUS ADDRESS
3244  012216  012762  067042  000004        MOV     #NPRBUF,RKBA(R2)
3245  012224  012737  177677  003502        MOV     #-65.,E.WC      ;LOAD WORD COUNT
3246  012232  012762  177676  000002        MOV     #-66.,RKWC(R2)
3247  012240  012762  000027  000000        MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3248  012246  012700  000312                MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3249                                                                ;  INDEX PULSE
```

```
3250  012252  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3251  012260  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3252  012266  005300                          DEC     R0
3253  012270  001370                          BNE     1$
3254  012272  012700  000004                  MOV     #4,R0               ;SIMULATE INDEX PULSE
3255  012276  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3256  012304  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3257  012312  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3258  012320  005300                          DEC     R0
3259  012322  001370                          BNE     2$
3260  012324  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3261  012332  012737  000300  003510          MOV     #IR!OR,E.CS2        ;LOAD EXPECTED CS2
3262  012340  012700  000045          4$:     MOV     #37.,R0             ;SIMULATE 1 NPR TRANSFER
3263  012344  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3264  012352  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3265  012360  005300                          DEC     R0
3266  012362  001370                          BNE     5$
3267  012364  016237  000000  003440          MOV     RKCS1(R2),T.CS1     ;STORE COMMAND AND STATUS REG. 1
3268  012372  016237  000004  003444          MOV     RKBA(R2),T.BA       ;STORE BUS ADDRESS
3269  012400  016237  000002  003442          MOV     RKWC(R2),T.WC       ;STORE WORD COUNT
3270  012406  022737  067044  003504          CMP     #NPRBUF+2,E.BA      ;CHECK IF FIRST WORD
3271  012414  001004                          BNE     7$                  ;NO, STORE CS2
3272  012416  012700  000024                  MOV     #20.,R0             ;WAIT FOR OUTPUT READY
3273  012422  005300                  6$:     DEC     R0
3274  012424  001376                          BNE     6$
3275  012426  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2     ;STORE COMMAND AND STATUS REG. 2
3276  012434  023737  003500  003440          CMP     E.CS1,T.CS1         ;CHECK COMMAND STATUS REG. 1 CORRECT
3277  012442  001401                          BEQ     8$                  ;YES, CHECK CS2
3278  012444  104044                          ERROR   44                  ;CS1 INCORRECT
3279  012446  023737  003510  003450  8$:     CMP     E.CS2,T.CS2         ;CHECK COMMAND STATUS REG. 2 CORRECT
3280  012454  001401                          BEQ     9$                  ;YES, CHECK BUS ADDRESS
3281  012456  104045                          ERROR   45                  ;CS2 INCORRECT
3282  012460  023737  003504  003444  9$:     CMP     E.BA,T.BA           ;CHECK BUS ADDRESS CORRECT
3283  012466  001401                          BEQ     10$                 ;YES, CHECK WORD COUNT
3284  012470  104046                          ERROR   46                  ;BUS ADDRESS INCORRECT
3285  012472  023737  003502  003442  10$:    CMP     E.WC,T.WC           ;CHECK WORD COUNT CORRECT
3286  012500  001401                          BEQ     11$                 ;YES, CHECK IF ALL WORDS TRANSFERRED
3287  012502  104047                          ERROR   47                  ;WORD COUNT INCORRECT
3288  012504  062737  000002  003504  11$:    ADD     #2,E.BA             ;INCREMENT WORD COUNT AND BUS ADDRESS
3289  012512  005237  003502                  INC     E.WC                ;
3290  012516  100710                          BMI     4$                  ;CHECK IF FINISHED (NO, BRANCH)
3291  012520  001004                          BNE     12$                 ;CHECK IF LAST WORD
3292  012522  012737  000200  003510          MOV     #OR,E.CS2           ;LOAD EXPECTED CS2
3293  012530  000703                          BR      4$                  ;PROCESS LAST WORD
3294
3295  012532  005037  003502          12$:    CLR     E.WC                ;ADJUST EXPECTED WORD COUNT
3296  012536  162737  000002  003504          SUB     #2,E.BA             ;   AND BUS ADDRESS
3297  012544  012700  000112                  MOV     #2*37.,R0           ;ISSUE ENOUGH CLOCKS FOR
3298  012550  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3299  012556  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3300  012564  005300                          DEC     R0
3301  012566  001370                          BNE     15$
3302  012570  016237  000000  003440          MOV     RKCS1(R2),T.CS1     ;STORE COMMAND AND STATUS REG. 1
3303  012576  016237  000010  003450          MOV     RKCS2(R2),T.CS2     ;STORE COMMAND AND STATUS REG. 2
3304  012604  016237  000004  003444          MOV     RKBA(R2),T.BA       ;STORE BUS ADDRESS REG
3305  012612  016237  000002  003442          MOV     RKWC(R2),T.WC       ;STORE WORD COUNT
```

```
3306  012620  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3307  012626  001401                          BEQ     16$             ;YES, CHECK CS2
3308  012630  104050                          ERROR   50              ;CS1 INCORRECT
3309  012632  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3310  012640  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3311  012642  104051                          ERROR   51              ;CS2 INCORRECT
3312  012644  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3313  012652  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3314  012654  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3315  012656  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3316  012664  001401                          BEQ     19$             ;YES, CHECK DATA
3317  012666  104053                          ERROR   53              ;WORD COUNT INCORRECT
3318  012670  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBER OF WORDS LOADED
3319  012674  012703  067042                  MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3320  012700  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR  PRINT OUT
3321  012704  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3322  012712  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3323  012720  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3324  012724  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3325  012732  001401                          BEQ     26$             ;YES, CONTINUE
3326  012734  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3327  012736  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
3328  012744  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3329  012750  001015                          BNE     28$             ;NO, GET CS2
3330  012752  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3331  012756  005300                  27$:    DEC     R0
3332  012760  001376                          BNE     27$
3333  012762  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3334  012770  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3335  012774  001003                          BNE     28$             ;NO, CONTINUE
3336  012776  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3337  013004  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3338  013012  001401                          BEQ     29$             ;YES, CHECK CS2
3339  013014  104055                          ERROR   55              ;CS1 INCORRECT
3340  013016  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3341  013024  001401                          BEQ     30$             ;YES, GET NEXT WORD
3342  013026  104056                          ERROR   56              ;CS2 INCORRECT
3343  013030  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3344  013034  005301                          DEC     R1              ;DECREMENT WORDS READ
3345  013036  001325                          BNE     25$             ;CHECK IF ALL WORDS READ
3346
3347                                  ;;*****************************************************************
3348                                  ;*TEST 14        SILO CAPICITY WITH NPR TRANSFERS
3349                                  ;*
3350                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3351                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3352                                  ;*       IN 26 SECTOR FORMAT, CYLINDER 0. HEAD 0, DRIVE 0.
3353                                  ;*       SPECIFY A 68 WORD DATA TRANSFER.  CLOCK IN 66
3354                                  ;*       WORDS INTO THE SILO.  MAKE SURE THAT SILO WILL STOP
3355                                  ;*       FILLING AT 66 WORDS.  TAKE ONE WORD FROM SILO AND
3356                                  ;*       CHECK IT.  CLOCK IN NEXT WORD.  MAKE SURE NO MORE
3357                                  ;*       THAN  ONE WORD IS CLOCKED IN THE SILO.  TAKE ONE
3358                                  ;*       WORD FROM SILO AND CHECK IT.  CLOCK IN NEXT WORD.
3359                                  ;*       CLOCK IN NEXT WORD   MAKE SURE NO MORE THAN ONE WORD IS
3360                                  ;*       CLOCKED IN THE SILO.  TAKE ONE WORD FROM SILO AND
3361                                  ;*       CHECK IT. ATTEMPT TO CLOCK IN NEXT WORD AND
```

```
3362                                    ;*      MAKE SURE NO WORDS ARE CLOCK INTO SILO.  UNLOAD THE
3363                                    ;*      SILO AND MAKE SURE ALL THE WORDS ARE CORRECT.
3364                                    ;*
3365                                    ;.*****************************************************************
3366  013040  000004                    ↑ST14:  SCOPE
3367  013042  012737  000144  001200           MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3368  013050  013702  001270                   MOV     $BASE,R2        ;LOAD RK611 BASE
3369  013054  012737  000027  003500           MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3370  013062  012762  100000  000000           MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3371  013070  012762  000040  000026           MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3372  013076  012737  067044  003504           MOV     #NPRBUFF+2,E.BA ;LOAD BUS ADDRESS
3373  013104  012762  067042  000004           MOV     #NPRBUF,RKBA(R2)
3374  013112  012737  177675  003502           MOV     #-67.,E.WC      ;LOAD WORD COUNT
3375  013120  012762  177674  000002           MOV     #-68.,RKWC(R2)
3376  013126  012762  000027  000000           MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3377  013134  012700  000312                   MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3378                                                                    ;  INDEX PULSE
3379  013140  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3380  013146  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3381  013154  005300                           DEC     R0
3382  013156  001370                           BNE     1$
3383  013160  012700  000004                   MOV     #4,R0           ;SIMULATE INDEX PULSE
3384  013164  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3385  013172  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3386  013200  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3387  013206  005300                           DEC     R0
3388  013210  001370                           BNE     2$
3389  013212  012737  000040  000026           MOV     #DMD,RKMR1
3390  013220  012737  000300  003510           MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3391  013226  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3392  013232  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3393  013240  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3394  013246  005300                           DEC     R0
3395  013250  001370                           BNE     5$
3396  013252  016237  000000  003440           MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND REG. 1
3397  013260  016237  000004  003444           MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3398  013266  016237  000002  003442           MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3399  013274  022737  067044  003504           CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
3400  013302  001004                           BNE     7$              ;NO, STORE CS2
3401  013304  012700  000024                   MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3402  013310  005300                   6$:     DEC     R0
3403  013312  001376                           BNE     6$
3404  013314  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3405  013322  023737  003500  003440           CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3406  013330  001401                           BEQ     8$              ;YES, CHECK CS2
3407  013332  104044                           ERROR   44              ;CS1 INCORRECT
3408  013334  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3409  013342  001401                           BEQ     9$              ;YES, CHECK BUS ADDRESS
3410  013344  104045                           ERROR   45              ;CS2 INCORRECT
3411  013346  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3412  013354  001401                           BEQ     10$             ;YES, CHECK WORD COUNT
3413  013356  104046                           ERROR   46              ;BUS ADDRESS INCORRECT
3414  013360  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3415  013366  001401                           BEQ     11$             ;YES, CHECK IF 1ST 65 WORDS TRANSFERRED
3416  013370  104047                           ERROR   47              ;WORD COUNT INCORRECT
3417  013372  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
```

```
3418  013400  005237  003502                      INC     E.WC
3419  013404  022737  177776  003502              CMP     #-2,E.WC        ;CHECK IF 65 WORDS IN SILO
3420  013412  101305                              BHI     4$              ;NO, GET NEXT WORD
3421  013414  001004                              BNE     12$             ;CHECK IF ALL 65 WORDS IN SILO
3422  013416  012737  000200  003510              MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3423  013424  000700                              BR      4$              ;PROCESS 66TH WORD
3424
3425  013426  005337  003502          12$:        DEC     E.WC            ;ADJUST WORD COUNT AND
3426  013432  162737  000002  003504              SUB     #2,E.BA         ;  BUS ADDRESS
3427  013440  012701  000003                      MOV     #3,R1
3428  013444  005037  003624                      CLR     WRDCNT
3429  013450  012703  067042                      MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3430  013454  012700  000112          13$:        MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3431  013460  012762  000440  000026  15$:        MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3432  013466  012762  000040  000026              MOV     #DMD,RKMR1(R2)
3433  013474  005300                              DEC     R0
3434  013476  001370                              BNE     15$
3435  013500  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3436  013506  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3437  013514  016237  000004  003444              MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3438  013522  016237  000002  003442              MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3439  013530  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1
3440  013536  001401                              BEQ     16$             ;YES, CHECK CS2
3441  013540  104050                              ERROR   50              ;CS1 INCORRECT
3442  013542  023737  003510  003450  16$:        CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3443  013550  001401                              BEQ     17$             ;YES,CHECK BUS ADDRESS
3444  013552  104051                              ERROR   51              ;CS2 INCORRECT
3445  013554  023737  003504  003444  17$:        CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3446  013562  001401                              BEQ     18$             ;YES, CHECK WORD COUNT
3447  013564  104052                              ERROR   52              ;BUS ADDRESS INCORRECT
3448  013566  023737  003502  003442  18$:        CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3449  013574  001401                              BEQ     19$             ;YES, READ 1 WORD FROM SILO
3450  013576  104053                              ERROR   53              ;WORD COUNT INCORRECT
3451  013600  012737  000300  003510  19$:        MOV     #IR!OR,E.CS2    ;LOAD EXPECT CS2
3452  013606  016237  000024  003462              MOV     RKDB(R2),T.DB   ;STORE DATA BUFFER
3453  013614  012337  003522                      MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3454  013620  023737  003522  003462              CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3455  013626  001401                              BEQ     25$             ;YES, CONTINUE
3456  013630  104054                              ERROR   54              ;DATA BUFFER INCORRECT
3457  013632  016237  000000  003440  25$:        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3458  013640  012700  000024                      MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3459  013644  005300                  26$:        DEC     R0
3460  013646  001376                              BNE     26$
3461  013650  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3462  013656  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK IF COMMAND STATUS REG. 1 CORRECT
3463  013664  001401                              BEQ     27$             ;YES, CHECK CS2
3464  013666  104055                              ERROR   55              ;CS1 INCORRECT
3465  013670  023737  003510  003450  27$:        CMP     E.CS2,T.CS2     ;CHECK IF COMMAND STATUS REG. 2 CORRECT
3466  013676  001401                              BEQ     30$             ;YES, DO NPR TRANSFER
3467  013700  104056                              ERROR   56              ;CS2 INCORRECT
3468  013702  012700  000045          30$:        MOV     #37.,R0         ;CLOCK IN ONE WORD (NPR TRANSFER)
3469  013706  012762  000440  000026  31$:        MOV     #DMD!MCLK,RKMR1(R2)
3470  013714  012762  000040  000026              MOV     #DMD,RKMR1(R2)
3471  013722  005300                              DEC     R0
3472  013724  001370                              BNE     31$
3473  013726  022701  000001                      CMP     #1,R1           ;CHECK IF 68TH WORD READ
```

```
3474  013732  001410                          BEQ     32$             ;YES, NO NPR WILL TAKE PLACE
3475  013734  062737  000002  003504          ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
3476  013742  005237  003502                  INC     E.WC
3477  013746  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3478  013754  016237  000000  003440  32$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3479  013762  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3480  013770  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3481  013776  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3482  014004  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3483  014012  001401                          BEQ     33$             ;YES, CHECK CS2
3484  014014  104044                          ERROR   44              ;CS1 INCORRECT
3485  014016  023737  003510  003450  33$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3486  014024  001401                          BEQ     34$             ;YES, CHECK BUS ADD
3487  014026  104045                          ERROR   45              ;CS2 INCORRECT
3488  014030  023737  003504  003444  34$:    CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3489  014036  001401                          BEQ     35$             ;YES, CHECK WORD COUNT
3490  014040  104046                          ERROR   46              ;BUS ADD INCORRECT
3491  014042  023737  003502  003442  35$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3492  014050  001401                          BEQ     36$             ;YES, CONTINUE
3493  014052  104047                          ERROR   47              ;WORD COUNT INCORRECT
3494  014054  005237  003624          36$:    INC     WRDCNT
3495  014060  005301                          DEC     R1              ;CHECK IF READ TO UNLOAD SILO
3496  014062  001402                          BEQ     39$             ;YES, READ DATA; BUFFER
3497  014064  000137  013454                  JMP     13$             ;NO, INPUT NEXT WORD
3498
3499  014070  162737  000002  003504  39$:    SUB     #2,E.BA         ;ADJUST WORD COUNT AND BUS ADDRESS
3500  014076  005037  003502                  CLR     E.WC
3501  014102  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3502  014110  012701  000101                  MOV     #65.,R1         ;LOAD NUMBER OF WORDS LEFT
3503  014114  016237  000024  003462  40$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3504  014122  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3505  014126  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3506  014134  001401                          BEQ     41$             ;YES, CHECK CS1
3507  014136  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3508  014140  016237  000000  003440  41$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3509  014146  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF FIRST WORDS
3510  014154  001004                          BNE     43$             ;NO, DO NOT WAIT FOR INPUT READY
3511  014156  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY
3512  014162  005300                  42$:    DEC     R0
3513  014164  001376                          BNE     42$
3514  014166  016237  000010  003450  43$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3515  014174  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3516  014200  001003                          BNE     44$             ;NO, CONTINUE
3517  014202  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3518  014210  023737  003500  003440  44$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3519  014216  001401                          BEQ     45$             ;YES,CHECK CS2
3520  014220  104055                          ERROR   55              ;CS1 INCORRECT
3521  014222  023737  003510  003450  45$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3522  014230  001401                          BEQ     46$             ;YES, READ NEXT WORD ON SILO
3523  014232  104056                          ERROR   56              ;CS2 INCORRECT
3524  014234  005237  003624          46$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3525  014240  005301                          DEC     R1              ;CHECK IF ALL WORDS READ
3526  014242  001324                          BNE     40$             ;NO, READ NEXT WORD
3527
3528                                  ;;*****************************************************************
3529                                  ;*TEST 15        BUS ADDRESS INHIBIT
```

```
                                        ;*
                                        ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN
                                        ;*      RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      SPECIFY A 66 WORD DATA TRANSFER WITH BUS ADDRESS
                                        ;*      INHIBIT INCREMENT.  CHECK WORD COUNT, BUS ADDRESS,
                                        ;*      INPUT READY, OUTPUT READY, AND MAKE SURE ALL THE
                                        ;*      WORDS IN THE SILO ARE THE CORRECT SAME WORD.
                                        ;*
                                        ;;**********************************************************************
014244  000004                  T15:    SCOPE
014246  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
014254  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
014260  012737  000027  003500          MOV     #WRHEAD!E.CS1   ;LOAD EXPECTED CS1
014266  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
014274  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
014302  012737  067042  003504          MOV     #NPRBUF,E.BA    ;LOAD BUS ADDRESS
014310  012762  067042  000004          MOV     #NPRBUF,RKBA(R2)
014316  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
014324  012762  177676  000002          MOV     #-66.,RKWC(R2)
014332  012762  000020  000010          MOV     #BAI,RKCS2(R2)  ;SET BUS ADDRESS INCREMENT INHIBIT
014340  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
014346  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
014352  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
014360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014366  005300                          DEC     R0
014370  001370                          BNE     1$
014372  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
014376  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014404  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
014412  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014420  005300                          DEC     R0
014422  001370                          BNE     2$
014424  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014432  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
014440  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
014444  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
014452  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014460  005300                          DEC     R0
014462  001370                          BNE     5$
014464  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
014472  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
014500  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
014506  022737  000101  003502          CMP     #65.,E.WC       ;CHECK IF FIRST WORD
014514  001004                          BNE     7$              ;NO, STORE CS2
014516  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
014522  005300                  6$:     DEC     R0
014524  001376                          BNE     6$
014526  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
014534  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
014542  001401                          BEQ     8$              ;YES, CHECK CS2
014544  104057                          ERROR   57              ;CS1 INCORRECT
014546  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
014554  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
014556  104060                          ERROR   60              ;CS2 INCORRECT
```

```
3586  014560  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
3587  014566  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3588  014570  104061                          ERROR   61              ;BUS ADDRESS INCORRECT
3589  014572  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3590  014600  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3591  014602  104062                          ERROR   62              ;WORD COUNT INCORRECT
3592  014604  005237  003502          11$:    INC     E.WC            ;INCREMENT WORD COUNT
3593  014610  100713                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3594  014612  001004                          BNE     12$             ;CHECK IF LAST WORD
3595  014614  012737  000220  003510          MOV     #OR!BAI,E.CS2   ;LOAD EXPECTED COMMAND STATUS REG. 2
3596  014622  000706                          BR      4$              ;PROCESS THE LAST WORD
3597
3598  014624  005037  003502          12$:    CLR     E.WC            ;ADJUST WORD COUNT
3599  014630  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3600  014634  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3601  014642  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3602  014650  005300                          DEC     R0
3603  014652  001370                          BNE     15$
3604  014654  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3605  014662  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3606  014670  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3607  014676  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
3608  014704  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3609  014712  001401                          BEQ     16$             ;YES, CHECK CS2
3610  014714  104063                          ERROR   63              ;CS1 INCORRECT
3611  014716  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3612  014724  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3613  014726  104064                          ERROR   64              ;CS2 INCORRECT
3614  014730  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3615  014736  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3616  014740  104065                          ERROR   65              ;BUS ADDRESS INCORRECT
3617  014742  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3618  014750  001401                          BEQ     19$             ;YES, CHECK DATA
3619  014752  104066                          ERROR   66              ;WORD COUNT INCORRECT
3620  014754  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBERS OF WORDS LOADED
3621  014760  013737  067042  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3622  014766  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINT OUT
3623  014772  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3624  015000  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
3625  015006  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3626  015014  001401                          BEQ     26$             ;YES, CONTINUE
3627  015016  104067                          ERROR   67              ;DATA BUFFER INCORRECT
3628  015020  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3629  015026  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3630  015032  001015                          BNE     28$             ;NO, GET CS2
3631  015034  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3632  015040  005300                  27$:    DEC     R0
3633  015042  001376                          BNE     27$
3634  015044  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3635  015052  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3636  015056  001003                          BNE     28$             ;NO, CONTINUE
3637  015060  012737  000120  003510          MOV     #IR!BAI,E.CS2   ;LOAD EXPECTED CS2
3638  015066  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3639  015074  001401                          BEQ     29$             ;YES, CHECK CS2
3640  015076  104070                          ERROR   70              ;CS1 INCORRECT
3641  015100  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
```

```
3642  015106  001401                          BEQ     30$             ;YES, GET NEXT WORD
3643  015110  104071                          ERROR   71              ;CS2 INCORRECT
3644  015112  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3645  015116  005301                          DEC     R1              ;DECREMENT WORDS READ
3646  015120  001324                          BNE     25$             ;CHECK IF ALL WORDS READ
3647
3648                                  ;;*****************************************************************
3649                                  ;*TEST 16       NON-EXISTENT MEMORY
3650                                  ;*
3651                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR,  PUT CONTROLLER
3652                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3653                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3654                                  ;*      SPECIFY A ONE WORD DATA TO A NON-EXISTENT ADDRESS
3655                                  ;*      (760000) AND MAKE SURE THE NON-EXISTENT  MEMORY ERROR
3656                                  ;*      OCCURS IN THE RK611 CONTROLLER.
3657                                  ;*
3658                                  ;*****************************************************************
3659  015122  000004                  T$T16:  SCOPE
3660  015124  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3661  015132  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3662  015136  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3663  015144  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3664  015152  012737  160002  003504          MOV     #160002,E.BA    ;LOAD BUS ADDRESS
3665  015160  012762  160000  000004          MOV     #160000,RKBA(R2)
3666  015166  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
3667  015174  012762  177676  000002          MOV     #-66.,RKWC(R2)
3668  015202  012737  101626  003500          MOV     #CERR!RDY!BA16!BA17!WRHEAD&<^C<GO>>,E.CS1
3669  015210  012762  001427  000000          MOV     #BA17!BA16!WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3670  015216  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3671                                                                  ;  INDEX PULSE
3672  015222  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3673  015230  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3674  015236  005300                          DEC     R0
3675  015240  001370                          BNE     1$
3676  015242  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3677  015246  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3678  015254  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3679  015262  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3680  015270  005300                          DEC     R0
3681  015272  001370                          BNE     2$
3682  015274  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3683  015302  012700  000045                  MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3684  015306  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3685  015314  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3686  015322  005300                          DEC     R0
3687  015324  001370                          BNE     5$
3688  015326  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3689  015334  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3690  015342  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3691  015350  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3692  015356  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG.
3693  015364  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG.
3694  015370  012737  004100  003510          MOV     #IR!NEM,E.CS2   ;LOAD EXPECTED CS2
3695  015376  032737  000200  003450          BIT     #OR,T.CS2
3696  015404  001403                          BEQ     7$
3697  015406  052737  000200  003510          BIS     #OR,E.CS2
```

```
 3698  015414  023737  003500  003440  7$:     CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
 3699  015422  001401                          BEQ     8$              ;YES, CHECK CS2
 3700  015424  104072                          ERROR   72              ;CS1 INCORRECT
 3701  015426  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
 3702  015434  001401                          BEQ     9$              ;YES, CHECK ERROR REG.
 3703  015436  104073                          ERROR   73              ;CS2 INCORRECT
 3704  015440  023737  003514  003454  9$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 3705  015446  001401                          BEQ     10$             ;CHECK BUS ADDRESS
 3706  015450  104074                          ERROR   74              ;ERROR REG INCORRECT
 3707  015452  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 3708  015460  001401                          BEQ     11$             ;YES, CHECK WORD COUNT
 3709  015462  104075                          ERROR   75              ;BUS ADDRESS INCORRECT
 3710  015464  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG.
 3711  015472  001401                          BEQ     12$             ;YES, CLEAR RK611
 3712  015474  104076                          ERROR   76              ;WORD COUNT INCORRECT
 3713  015476  012762  100000  000000  12$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3714  015504  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3715  015512  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 3716  015520  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 3717  015526  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 3718  015534  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1
 3719  015542  001401                          BEQ     15$             ;YES, CHECK CS2
 3720  015544  104077                          ERROR   77              ;CS1 INCORRECT
 3721  015546  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF NEM CLEARED
 3722  015554  001401                          BEQ     TST17           ;YES, GO ON TO NEXT TEST
 3723  015556  104100                          ERROR   100             ;CS2 INCORRECT
 3724
 3725                                  ;;*****************************************************************
 3726                                  ;*TEST 17       BUS ADDRESS BIT 16
 3727                                  ;*
 3728                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 3729                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO  AN RK06
 3730                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 3731                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 200000.
 3732                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
 3733                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 177776.
 3734                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
 3735                                  ;*
 3736                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 32K
 3737                                  ;*             OF MEMORY IS ON THE SYSTEM.
 3738                                  ;*
 3739                                  ;;*********************** ***************************************
 3740  015560  000004                  TST17:  SCOPE
 3741  015562  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 3742  015570  005737  046374                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
 3743  015574  100004                          BPL     1$              ;NO, BYPASS TEST
 3744  015576  022737  002000  046642          CMP     #2000,$LSTBK    ;CHECK IF ENOUGH MEMORY
 3745  015604  103417                          BLO     2$              ;YES, DO TEST
 3746  015606                          1$:
 3747  015606  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
 3748  015614  005227  177777                  INC     #-1             ;ONLY DO ONCE
 3749  015620  001007                          BNE     64$             ;NO, GO TO NEXT TEST
 3750  015622  104401  055013                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
 3751  015626  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
 3752  015632  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 3753  015634  104401  055023                  TYPE    ,TSTBY2
```

```
3754  015640  000137  016674          64$:    JMP     TST20           ;GO TO NEXT TEST
3755
3756  015644  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3757  015650  012737  002000  172354          MOV     #2000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3758  015656  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3759  015662  013737  067042  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3760  015670  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3761  015674  012737  015702  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3762                                                                  ;  SUBTEST LOOP
3763
3764  015702                          3$:
3765  015702  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3766  015710  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3767  015716  012762  177777  000002          MOV     #-1,RKWC(R2)
3768  015724  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3769  015732  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3770  015740  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3771  015744  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3772  015752  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3773  015760  005300                          DEC     R0
3774  015762  001370                          BNE     5$
3775  015764  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3776  015770  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3777  015776  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3778  016004  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3779  016012  005300                          DEC     R0
3780  016014  001370                          BNE     6$
3781  016016  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3782  016024  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3783  016030  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3784  016036  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3785  016044  005300                          DEC     R0
3786  016046  001370                          BNE     7$
3787  016050  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3788  016056  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3789  016064  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3790  016072  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3791  016076  005300                  8$:     DEC     R0
3792  016100  001376                          BNE     8$
3793  016102  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3794  016110  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3795  016116  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3796  016124  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3797  016130  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3798  016136  001401                          BEQ     10$             ;YES, CHECK CS2
3799  016140  104101                          ERROR   101             ;CS1 INCORRECT
3800  016142  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3801  016150  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3802  016152  104102                          ERROR   102             ;CS2 INCORRECT
3803  016154  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3804  016162  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3805  016164  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3806  016166  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3807  016174  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3808  016176  104104                          ERROR   104             ;WORD COUNT INCORRECT
3809  016200  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
```

```
3810  016206  013737  067042  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3811  016214  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3812  016222  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3813  016224  104105                          ERROR   105             ;DATA INCORRECT
3814  016226  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3815  016230  012737  001777  172354          MOV     #2000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
3816  016236  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3817  016242  013737  067042  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
3818  016250  013737  067044  140100          MOV     NPRBUF+2,140100
3819  016256  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3820  016262  012737  016270  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
3821                                                                  ;  SUBTEST LOOP
3822
3823  016270                          20$:
3824  016270  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3825  016276  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3826  016304  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
3827  016312  012762  177776  000002          MOV     #-2,RKWC(R2)
3828  016320  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
3829  016324  012762  177776  000004          MOV     #177776,RKBA(R2)
3830  016332  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3831  016340  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
3832  016346  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3833  016352  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
3834  016360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3835  016366  005300                          DEC     R0
3836  016370  001370                          BNE     21$
3837  016372  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3838  016376  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3839  016404  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
3840  016412  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3841  016420  005300                          DEC     R0
3842  016422  001370                          BNE     22$
3843  016424  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3844  016432  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
3845  016436  012700  000045          23$:    MOV     #37.,R0
3846  016442  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
3847  016450  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3848  016456  005300                          DEC     R0
3849  016460  001370                          BNE     24$
3850  016462  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3851  016470  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3852  016476  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3853  016504  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
3854  016510  001404                          BEQ     26$             ;NO, GET CS2
3855  016512  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3856  016516  005300                  25$:    DEC     R0
3857  016520  001376                          BNE     25$
3858  016522  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
3859  016530  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3860  016536  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
3861  016544  001401                          BEQ     28$             ;YES, CHECK CS2
3862  016546  104101                          ERROR   101             ;CS1 INCORRECT
3863  016550  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
3864  016556  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
3865  016560  1041C2                          ERROR   102             ;CS2 INCORRECT
```

```
3866  016562  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3867  016570  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
3868  016572  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3869  016574  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3870  016602  001401                          BEQ     31$             ;YES, GET TEXT WORD
3871  016604  104104                          ERROR   104             ;WORD COUNT INCORRECT
3872  016606  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
3873  016614  005237  003502                  INC     E.WC            ;  WORD COUNT
3874  016620  005301                          DEC     R1              ;CHECK IF FINISHED
3875  016622  001305                          BNE     23$             ;NO, GET SECOND WORD
3876  016624  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
3877  016630  012703  067042                  MOV     #NPRBUF,R3      ;  DATA COMPARE
3878  016634  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3879  016642  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
3880  016646  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
3881  016654  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
3882  016656  104105                          ERROR   105             ;DATA BUFFER INCORRECT
3883  016660  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
3884  016662  001364                          BNE     35$             ;NO READ SECOND WORD
3885  016664  104415                          SCOP1                   ;CHECK IF LOOP ON ERROR
3886  016666  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3887
3888                                  ;;*****************************************************************
3889                                  ;*TEST 20       BUS ADDRESS BIT 17
3890                                  ;*
3891                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3892                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3893                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
3894                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 400000.
3895                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
3896                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 377776.
3897                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
3898                                  ;*
3899                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
3900                                  ;*             OF MEMORY IS ON THE SYSTEM.
3901                                  ;*
3902                                  ;;*****************************************************************
3903  016674  000004          ↑ST20:  SCOPE
3904  016676  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3905  016704  005737  046374                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
3906  016710  100004                          BPL     1$              ;NO, BYPASS TEST
3907  016712  022737  004000  046642          CMP     #4000,$LSTBK    ;CHECK IF ENOUGH MEMORY
3908  016720  103417                          BLO     2$              ;YES, DO TEST
3909  016722                          1$:
3910  016722  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
3911  016730  005227  177777                  INC     #-1             ;ONLY DO ONCE
3912  016734  001007                          BNE     64$             ;NO, GO TO NEXT TEST
3913  016736  104401  055013                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
3914  016742  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
3915  016746  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3916  016750  104401  055023                  TYPE    ,TSTBY2
3917  016754  000137  020010          64$:    JMP     ↑ST21           ;GO TO NEXT TEST
3918
3919  016760  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3920  016764  012737  004000  172354          MOV     #4000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3921  016772  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
```

```
3922  016776  013737  067042  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3923  017004  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3924  017010  012737  017016  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3925                                                                  ;  SUBTEST LOOP
3926
3927  017016                          3$:
3928  017016  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3929  017024  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3930  017032  012762  177777  000002          MOV     #-1,RKWC(R2)
3931  017040  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
3932  017046  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
3933  017[    012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3934  017     012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3935  017     012762  000040  000026          MOV     #DMD,RKMR1(R2)
3936  017074  005300                          DEC     R0
3937  017076  001370                          BNE     5$
3938  017100  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3939  017104  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3940  017112  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3941  017120  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3942  017126  005300                          DEC     R0
3943  017130  001370                          BNE     6$
3944  017132  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3945  017140  012700  000045                  MOV     #37.,R0         ;ISSUE 1 PR TRANSFER
3946  017144  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3947  017152  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3948  017160  005300                          DEC     R0
3949  017162  001370                          BNE     7$
3950  017164  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3951  017172  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3952  017200  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3953  017206  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3954  017212  005300                  8$:     DEC     R0
3955  017214  001376                          BNE     8$
3956  017216  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3957  017224  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3958  017232  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3959  017240  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3960  017244  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3961  017252  001401                          BEQ     10$             ;YES, CHECK CS2
3962  017254  104101                          ERROR   101             ;CS1 INCORRECT
3963  017256  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3964  017264  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3965  017266  104102                          ERROR   102             ;CS2 INCORRECT
3966  017270  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3967  017276  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3968  017300  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3969  017302  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3970  017310  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3971  017312  104104                          ERROR   104             ;WORD COUNT INCORRECT
3972  017314  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3973  017322  013737  067042  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3974  017330  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3975  017336  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3976  017340  104105                          ERROR   105             ;DATA INCORRECT
3977  017342  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
```

```
 3978  017344  012737  003777  172354          MOV     #4000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
 3979  017352  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
 3980  017356  013737  067042  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
 3981  017364  013737  067044  140100          MOV     NPRBUF+2,140100
 3982  017372  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
 3983  017376  012737  017404  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 3984                                                                  ;  SUBTEST LOOP
 3985
 3986  017404                          20$:
 3987  017404  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3988  017412  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 3989  017420  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
 3990  017426  012762  177776  000002          MOV     #-2,RKWC(R2)
 3991  017434  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
 3992  017440  012762  177776  000004          MOV     #177776,RKBA(R2)
 3993  017446  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
 3994  017454  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
 3995  017462  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 3996  017466  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
 3997  017474  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3998  017502  005300                          DEC     R0
 3999  017504  001370                          BNE     21$
 4000  017506  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4001  017512  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4002  017520  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4003  017526  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4004  017534  005300                          DEC     R0
 4005  017536  001370                          BNE     22$
 4006  017540  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4007  017546  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
 4008  017552  012700  000045          23$:    MOV     #37.,R0
 4009  017556  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
 4010  017564  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4011  017572  005300                          DEC     R0
 4012  017574  001370                          BNE     24$
 4013  017576  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4014  017604  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
 4015  017612  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4016  017620  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
 4017  017624  001404                          BEQ     26$             ;NO, GET CS2
 4018  017626  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4019  017632  005300                  25$:    DEC     R0
 4020  017634  001376                          BNE     25$
 4021  017636  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 4022  017644  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4023  017652  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
 4024  017660  001401                          BEQ     28$             ;YES, CHECK CS2
 4025  017662  104101                          ERROR   101             ;CS1 INCORRECT
 4026  017664  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
 4027  017672  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
 4028  017674  104102                          ERROR   102             ;CS2 INCORRECT
 4029  017676  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4030  017704  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
 4031  017706  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
 4032  017710  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4033  017716  001401                          BEQ     31$             ;YES, GET TEXT WORD
```

```
4034  017720  104104                          ERROR   104             ;WORD COUNT INCORRECT
4035  017722  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4036  017730  005237  003502                  INC     E.WC            ;  WORD COUNT
4037  017734  005301                          DEC     R1              ;CHECK IF FINISHED
4038  017736  001305                          BNE     23$             ;NO, GET SECOND WORD
4039  017740  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
4040  017744  012703  067042                  MOV     #NPRBUF,R3      ;  DATA COMPARE
4041  017750  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4042  017756  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4043  017762  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
4044  017770  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
4045  017772  104105                          ERROR   105             ;DATA BUFFER INCORRECT
4046  017774  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
4047  017776  001364                          BNE     35$             ;NO READ SECOND WORD
4048  020000  104415                          SCOPE                   ;CHECK IF LOOP ON ERROR
4049  020002  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4050
4051                                  ;;*****************************************************************
4052                                  ;*TEST 21       ADDRESSING GREATER THAN 96K
4053                                  ;*
4054                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4055                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4056                                  ;*       IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
4057                                  ;*       SPECIFY A ONE WORD DATA TRANSFER FROM 600000.
4058                                  ;*       READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
4059                                  ;*       REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 577776.
4060                                  ;*       CHECK BUS ADDRESS AND WORD COUNT.
4061                                  ;*
4062                                  ;*       NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 96K
4063                                  ;*              OF MEMORY IS ON THE SYSTEM.
4064                                  ;*
4065                                  ;;*****************************************************************
4066  020010  000004                  TST21:  SCOPE
4067  020012  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4068  020020  005737  046374                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
4069  020024  100004                          BPL     1$              ;NO, BYPASS TEST
4070  020026  022737  006000  046642          CMP     #6000,$LSTBK    ;CHECK IF ENOUGH MEMORY
4071  020034  103417                          BLO     2$              ;YES, DO TEST
4072  020036                          1$:
4073  020036  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4074  020044  005227  177777                  INC     #-1             ;ONLY DO ONCE
4075  020050  001007                          BNE     64$             ;NO, GO TO NEXT TEST
4076  020052  104401  055013                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4077  020056  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4078  020062  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4079  020064  104401  055023                  TYPE    ,TSTBY2
4080  020070  000137  021124          64$:    JMP     TST22           ;GO TO NEXT TEST
4081
4082  020074  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
4083  020100  012737  006000  172354          MOV     #6000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
4084  020106  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
4085  020112  013737  067042  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
4086  020120  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
4087  020124  012737  020132  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
4088                                                                  ;  SUBTEST LOOP
4089
```

```
4090  020132                                  3$:
4091  020132  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4092  020140  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4093  020146  012762  177777  000002            MOV     #-1,RKWC(R2)
4094  020154  012737  001427  003500            MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
4095  020162  012762  001427  000000            MOV     #BA16!BA17!WRHEAD,RKCS1(R2)
4096  020170  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4097  020174  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4098  020202  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4099  020210  005300                            DEC     R0
4100  020212  001370                            BNE     5$
4101  020214  012700  000004                    MOV     #4,R0           ;SIMULATE INDEX PULSE
4102  020220  012762  0C0240  000026            MOV     #DMD!MIND,RKMR1(R2)
4103  020226  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
4104  020234  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4105  020242  005300                            DEC     R0
4106  020244  001370                            BNE     6$
4107  020246  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4108  020254  012700  000045                    MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4109  020260  012762  000440  000026  7$:       MOV     #DMD!MCLK,RKMR1(R2)
4110  020266  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4111  020274  005300                            DEC     R0
4112  020276  001370                            BNE     7$
4113  020300  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4114  020306  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4115  020314  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WOR
4116  020322  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4117  020326  005300                      8$:   DEC     R0
4118  020330  001376                            BNE     8$
4119  020332  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4120  020340  012737  000300  003510            MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4121  020346  012737  000002  003504            MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
4122  020354  005037  003502                    CLR     E.WC            ;LOAD EXPECTED WORD COUNT
4123  020360  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
4124  020366  001401                            BEQ     10$             ;YES, CHECK CS2
4125  020370  104101                            ERROR   101             ;CS1 INCORRECT
4126  020372  023737  003510  003450  10$:      CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
4127  020400  001401                            BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
4128  020402  104102                            ERROR   102             ;CS2 INCORRECT
4129  020404  023737  003504  003444  11$:      CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
4130  020412  001401                            BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
4131  020414  104103                            ERROR   103             ;BUS ADDRESS INCORRECT
4132  020416  023737  003502  003442  12$:      CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
4133  020424  001401                            BEQ     13$             ;YES, CHECK DATA BUFFER
4134  020426  104104                            ERROR   104             ;WORD COUNT INCORRECT
4135  020430  016237  000024  003462  13$:      MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4136  020436  013737  067042  003522            MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
4137  020444  023737  003522  003462            CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4138  020452  001401                            BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
4139  020454  104105                            ERROR   105             ;DATA INCORRECT
4140  020456  104415                      15$:  SCOP1                   ;CHECK IF LOOP ON ERROR
4141  020460  012737  005777  172354            MOV     #6000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
4142  020466  005237  177572                    INC     SR0             ;TURN ON MEMORY MANAGEMENT
4143  020472  013737  067042  140076            MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
4144  020500  013737  067044  140100            MOV     NPRBUF+2,140100
4145  020506  005037  177572                    CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
```

```
4146  020512  012737  020520  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
4147                                                                  ;  SUBTEST LOOP
4148
4149  020520                          20$:
4150  020520  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4151  020526  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4152  020534  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
4153  020542  012762  177776  000002          MOV     #-2,RKWC(R2)
4154  020550  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
4155  020554  012762  177776  000004          MOV     #177776,RKBA(R2)
4156  020562  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
4157  020570  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
4158  020576  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4159  020602  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
4160  020610  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4161  020616  005300                          DEC     R0
4162  020620  001370                          BNE     21$
4163  020622  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4164  020626  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4165  020634  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
4166  020642  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4167  020650  005300                          DEC     R0
4168  020652  001370                          BNE     22$
4169  020654  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4170  020662  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
4171  020666  012700  000045          23$:    MOV     #37.,R0
4172  020672  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
4173  020700  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4174  020706  005300                          DEC     R0
4175  020710  001370                          BNE     24$
4176  020712  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4177  020720  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4178  020726  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4179  020734  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
4180  020740  001404                          BEQ     26$             ;NO, GET CS2
4181  020742  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4182  020746  005300                  25$:    DEC     R0
4183  020750  001376                          BNE     25$
4184  020752  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4185  020760  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4186  020766  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
4187  020774  001401                          BEQ     28$             ;YES, CHECK CS2
4188  020776  104101                          ERROR   101             ;CS1 INCORRECT
4189  021000  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
4190  021006  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
4191  021010  104102                          ERROR   102             ;CS2 INCORRECT
4192  021012  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4193  021020  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
4194  021022  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
4195  021024  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4196  021032  001401                          BEQ     31$             ;YES, GET TEXT WORD
4197  021034  104104                          ERROR   104             ;WORD COUNT INCORRECT
4198  021036  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4199  021044  005237  003502                  INC     E.WC            ;  WORD COUNT
4200  021050  005301                          DEC     R1              ;CHECK IF FINISHED
4201  021052  001305                          BNE     23$             ;NO, GET SECOND WORD
```

```
4202  021054  012700  000002                    MOV     #2,R0              ;LOAD COUNT AND ADDRESS WORD
4203  021060  012703  067042                    MOV     #DPRBUF,R3         ;  DATA COMPARE
4204  021064  016237  000024  003462  35$:      MOV     RKDB(R2),T.DB      ;READ DATA BUFFER
4205  021072  012337  003522                    MOV     (R3)+,E.DB         ;GET EXPECTED DATA
4206  021076  023737  003522  003462            CMP     E.DB,T.DB          ;CHECK IF CORRECT
4207  021104  001401                            BEQ     36$                ;YES, CHECK IF FINISHED
4208  021106  104105                            ERROR   105                ;DATA BUFFER INCORRECT
4209  021110  005300                  36$:      DEC     R0                 ;CHECK IF FINISHED
4210  021112  001364                            BNE     35$                ;NO READ SECOND WORD
4211  021114  104415                            SCOP1                      ;CHECK IF LOOP ON ERROR
4212  021116  012762  100000  000000            MOV     #CCLR,RKCS1(R2)    ;CLEAR RK611
4213
4214                                    ;;*****************************************************************
4215                                    ;TEST 22        UNIBUS PARITY ERROR
4216                                    ;*
4217                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4218                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4219                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4220                                    ;*      SPECIFY A ONE WORD DATA TRANSFER FROM A LOCATION
4221                                    ;*      WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY ERROR
4222                                    ;*      OCCURS.
4223                                    ;*
4224                                    ;*      REPEAT FOR A ONE WORD DATA TRANSFER FROM THE
4225                                    ;*      LOCATION PRIOR TO THE LOCATION WITH BAD PARITY.
4226                                    ;*      MAKE SURE UNIBUS PARITY ERROR DOES NOT OCCUR.  REPEAT
4227                                    ;*      FOR A ONE WORD DATA TRANSFER FROM THE LOCATION AFTER
4228                                    ;*      THE LOCATION WITH BAD PARITY.  MAKE SURE UNIBUS PARITY
4229                                    ;*      ERROR DOES NOT OCCUR.
4230                                    ;*
4231                                    ;*      REPEAT FOR A TWO WORD DATA TRANSFER STARTING WITH
4232                                    ;*      THE ADDRESS PRIOR TO THE LOCATION WITH BAD PARITY.
4233                                    ;*      MAKE SURE UNIBUS PARITY ERROR DOES OCCUR.
4234                                    ;*
4235                                    ;*      NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
4236                                    ;*              EXISTS FOR SPECIFIED LOCATION AND IS NOT
4237                                    ;*              RUN ON AN 11/70.
4238
4239                                    ;*
4240                                    ;*****************************************************************
4241  021124  000004                    TST22:  SCOPE
4242  021126  012737  000144  001200            MOV     #100.,$TIMES       ;;DO 100. ITERATIONS
4243  021134  005737  003636                    TST     PARPRE             ;CHECK IF MEMORY PARITY AVAILABLE
4244  021140  001017                            BNE     1$                 ;YES, DO TEST
4245  021142  012737  000001  001200            MOV     #1,$TIMES          ;FORCE INTERATION COUNT TO 1
4246  021150  005227  177777                    INC     #-1                ;ONLY DO ONCE
4247  021154  001007                            BNE     64$                ;NO, GO TO NEXT TEST
4248  021156  104401  055013                    TYPE    ,TSTBY1            ;TYPE TEST N BYPASSED
4249  021162  013746  001220                    MOV     $TESTN,-(SP)       ;;SAVE $TESTN FOR TYPEOUT
4250  021166  104402                            TYPOC                      ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4251  021170  104401  055023                    TYPE    ,TSTBY2
4252  021174  000137  022372          64$:      JMP     @#ST23             ;GO TO NEXT TEST
4253
4254  021200  013702  001270          1$:       MOV     $BASE,R2           ;LOAD RK611 BASE
4255  021204  004737  044714                    JSR     PC,WRTPAR          ;GENERATE BAD PARITY
4256  021210  012737  021216  001110            MOV     #2$,$LPERR         ;LOAD LOOP ON ERROR LOCATION FOR
4257                                                                       ;  SUBTEST LOOP
```

```
4258
4259  021216                                  2$:
4260  021216  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4261  021224  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4262  021232  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT NEG
4263  021240  005037  003502                    CLR     E.WC
4264  021244  012762  067300  000004            MOV     #BADPAR,RKBA(R2);LOAD BUS ADDRESS
4265  021252  012737  067302  003504            MOV     #BADPAR+2,E.BA
4266  021260  012737  100226  003500            MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4267  021266  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
4268  021274  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4269  021300  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4270  021306  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4271  021314  005300                            DEC     R0
4272  021316  001370                            BNE     5$
4273  021320  012700  000004                    MOV     #4,R0           ;SIMULATE INDEX PULSE
4274  021324  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4275  021332  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
4276  021340  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4277  021346  005300                            DEC     R0
4278  021350  001370                            BNE     6$
4279  021352  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4280  021360  012700  000045                    MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4281  021364  012762  000440  000026  7$:       MOV     #DMD!MCLK,RKMR1(R2)
4282  021372  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4283  021400  005300                            DEC     R0
4284  021402  001370                            BNE     7$
4285  021404  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG.1
4286  021412  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4287  021420  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4288  021426  016237  000014  003454            MOV     RKER(R2),T.ER   ;STORE ERROR REG
4289  021434  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4290  021440  005300                    8$:     DEC     R0
4291  021442  001376                            BNE     8$
4292  021444  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG.2
4293  021452  012737  020300  003510            MOV     #IR!OR!UPE,E.CS2 ;LOAD EXPECTED CS2
4294  021460  005037  003514                    CLR     E.ER            ;LOAD EXPECTED ERROR REG
4295  021464  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4296  021472  001401                            BEQ     10$             ;YES CHECK CS2
4297  021474  104106                            ERROR   106             ;CS1 INCORRECT
4298  021476  023737  003510  003450  10$:      CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4299  021504  001401                            BEQ     11$             ;YES, CHECK BUS ADDRESS
4300  021506  104107                            ERROR   107             ;CS2 INCORRECT
4301  021510  023737  003504  003444  11$:      CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4302  021516  001401                            BEQ     12$             ;YES, CHECK WORD COUNT
4303  021520  104110                            ERROR   110             ;BUS ADDRESS INCORRECT
4304  021522  023737  003502  003442  12$:      CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4305  021530  001401                            BEQ     13$             ;YES,CHECK ERROR REG.
4306  021532  104111                            ERROR   111             ;WORD COUNT INCORRECT
4307  021534  023737  003514  003454  13$:      CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4308  021542  001401                            BEQ     14$             ;YES,CLEAR ERROR
4309  021544  104116                            ERROR   116             ;ERROR REG CORRECT
4310  021546  012762  100000  000000  14$:      MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4311  021554  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
4312  021562  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND STATUS REG. 2
4313  021570  012737  000200  003500            MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
```

```
4314  021576  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4315  021604  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4316  021612  001401                          BEQ     15$             ;YES, CHECK CS2
4317  021614  104117                          ERROR   117             ;CS1 INCORRECT
4318  021616  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
4319  021624  001401                          BEQ     16$             ;YES, CONTINUE
4320  021626  104120                          ERROR   120             ;CS2 INCORRECT
4321  021630  104415                  16$:    SCOP1                   ;CHECK IF LOOP ON ERROR
4322  021632  012737  021640  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
4323                                                                  ;  SUBTEST LOOP
4324
4325  021640                          20$:
4326  021640  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4327  021646  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611-IN-DIAGNOSTIC MODE
4328  021654  012762  177776  000002          MOV     #-2,RKWC(R2)    ;LOAD WORD COUNT REG
4329  021662  012737  177777  003502          MOV     #-1,E.WC
4330  021670  012762  067276  000004          MOV     #BADPAR-2,RKBA(R2) ;LOAD BUS ADDRESS REG
4331  021676  012737  067300  003504          MOV     #BADPAR,E.BA
4332  021704  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
4333  021712  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
4334  021720  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4335  021724  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4336  021732  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4337  021740  005300                          DEC     R0
4338  021742  001370                          BNE     21$
4339  021744  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4340  021750  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4341  021756  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
4342  021764  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4343  021772  005300                          DEC     R0
4344  021774  001370                          BNE     22$
4345  021776  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4346  022004  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4347  022010  012762  000440  000026  23$:    MOV     #DMD!MCLK,RKMR1(R2)
4348  022016  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4349  022024  005300                          DEC     R0
4350  022026  001370                          BNE     23$
4351  022030  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4352  022036  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4353  022044  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4354  022052  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4355  022056  005300                  24$:    DEC     R0
4356  022060  001376                          BNE     24$
4357  022062  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4358  022070  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4359  022076  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4360  022104  001401                          BEQ     25$             ;YES,CHECK CS2
4361  022106  104112                          ERROR   112             ;CS1 INCORRECT
4362  022110  023737  003510  003450  25$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4363  022116  001401                          BEQ     26$             ;YES, CHECK BUS ADDRESS
4364  022120  104113                          ERROR   113             ;CS2 INCORRECT
4365  022122  023737  003504  003444  26$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4366  022130  001401                          BEQ     27$             ;YES, CHECK WORD COUNT
4367  022132  104114                          ERROR   114             ;BUS ADDRESS INCORRECT
4368  022134  023737  003502  003442  27$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4369  022142  001401                          BEQ     28$             ;YES, DO NEXT NPR TRANSFER
```

```
4370  022144  104115                          ERROR   115                 ;WORD COUNT INCORRECT
4371  022146  012700  000045                28$:    MOV     #37.,R0             ;ISSUE 1 NPR TRANSFER
4372  022152  012762  000440  000026  30$:    MOV     #DMD!MCLK,RKMR1(R2)
4373  022160  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4374  022166  005300                          DEC     R0
4375  022170  001370                          BNE     30$
4376  022172  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4377  022200  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4378  022206  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4379  022214  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4380  022222  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
4381  022230  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
4382  022236  012737  020300  003510          MOV     #OR!IR!UPE,E.CS2;LOAD EXPECTED CS2
4383  022244  005237  003502                  INC     E.WC            ;LOAD EXPECTED WORD COUNT
4384  022250  062737  000002  003504          ADD     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
4385  022256  005037  003514                  CLR     E.ER            ;LOAD EXPECTED WORD COUNT
4386  022262  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4387  022270  001401                          BEQ     31$             ;YES, CHECK CS2
4388  022272  104106                          ERROR   106             ;CS1 INCORRECT
4389  022274  023737  003510  003450  31$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4390  022302  001401                          BEQ     32$             ;YES, CHECK BUS ADDRESS
4391  022304  104107                          ERROR   107             ;CS2 INCORRECT
4392  022306  023737  003504  003444  32$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4393  022314  001401                          BEQ     33$             ;YES, CHECK WORD COUNT
4394  022316  104110                          ERROR   110             ;BUS ADDRESS INCORRECT
4395  022320  023737  003502  003442  33$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4396  022326  001401                          BEQ     34$             ;YES, CHECK ERROR REG
4397  022330  104111                          ERROR   111             ;WORD COUNT INCORRECT
4398  022332  023737  003514  003454  34$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4399  022340  001401                          BEQ     35$             ;YES, CONTINUE
4400  022342  104116                          ERROR   116             ;WORD COUNT INCORRECT
4401  022344  104415                  35$:    SCOP1                   ;CHECK IF WORD ON ERROR
4402  022346  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4403  022354  013703  003640                  MOV     CSRPTR,R3       ;RESET THE PARITY BIT
4404  022360  042713  000007                  BIC     #7,(R3)         ;24-OCT-77 THE ABOVE TWO LINES
4405  022364  012737  000000  067300          MOV     #0,BADPAR       ;WRITE GOOD PARITY
4406
4407                                  ;;*****************************************************************
4408                                  ;*TEST 23       SILO FILL IN 18 BIT MODE
4409                                  ;*
4410                                  ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
4411                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4412                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0. DRIVE 0,
4413                                  ;*      SPECIFY 66  WORD DATA TRANSFER.  CLOCK
4414                                  ;*      ALL 66 WORD INTO THE SILO.   CHECK THAT ALL 66
4415                                  ;*      WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).
4416                                  ;*
4417                                  ;*****************************************************************
4418  022372  000004                  TST23:  SCOPE
4419  022374  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4420  022402  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4421  022406  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4422  022414  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
4423  022422  012762  177676  000002          MOV     #-66.,RKWC(R2)  ;LOAD WORD COUNT
4424  022430  012737  177677  003502          MOV     #-65.,E.WC
4425  022436  012762  067042  000004          MOV     #NPRBUF,RKBA(R2);LOAD BUS ADDRESS
```

```
4426  022444  012737  067044  003504          MOV     #NPRBUF+2,E.BA
4427  022452  012737  010027  003500          MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
4428  022460  012762  010027  000000          MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
4429  022466  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS DATA
4430                                                                  ;  INDEX PULSE
4431  022472  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
4432  022500  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4433  022506  005300                          DEC     R0
4434  022510  001370                          BNE     5$
4435  022512  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4436  022516  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4437  022524  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
4438  022532  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4439  022540  005300                          DEC     R0
4440  022542  001370                          BNE     6$
4441  022544  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4442  022552  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4443  022560  012701  000102                  MOV     #66.,R1         ;ISSUE 66 NPR TRANSFERS
4444  022564  012700  000050          7$:     MOV     #40.,R0
4445  022570  012762  000440  000026  8$:     MOV     #DMD!MCLK,RKMR1(R2)
4446  022576  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4447  022604  005300                          DEC     R0
4448  022606  001370                          BNE     8$
4449  022610  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4450  022616  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG. 2
4451  022624  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4452  022632  022737  067044  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
4453  022640  001004                          BNE     10$             ;NO, CONTINUE
4454  022642  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4455  022646  005300                  9$:     DEC     R0
4456  022650  001376                          BNE     9$
4457  022652  016237  000010  003450  10$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4458  022660  005737  003502                  TST     E.WC            ;CHECK IF LAST WORD
4459  022664  001003                          BNE     11$             ;NO, CONTINUE
4460  022666  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
4461  022674  023737  003500  003440  11$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4462  022702  001401                          BEQ     12$             ;YES, CONTINUE
4463  022704  104121                          ERROR   121             ;CS1 INCORRECT
4464  022706  023737  003510  003450  12$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4465  022714  001401                          BEQ     13$             ;YES, CONTINUE
4466  022716  104122                          ERROR   122             ;CS2 INCORRECT
4467  022720  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4468  022726  001401                          BEQ     14$             ;YES, CONTINUE
4469  022730  104123                          ERROR   123             ;BUS ADDRESS INCORRECT
4470  022732  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG CORRECT
4471  022740  001401                          BEQ     15$             ;YES, CONTINUE
4472  022742  104124                          ERROR   124             ;WORD COUNT INCORRECT
4473  022744  062737  000002  003504  15$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4474  022752  005237  003502                  INC     E.WC            ;  WORD COUNT
4475  022756  005301                          DEC     R1              ;CHECK IF SILO FULL
4476  022760  001301                          BNE     7$              ;NO, GET NEXT WORD
4477  022762  012700  000120                  MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
4478  022766  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
4479  022774  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4480  023002  005300                          DEC     R0
4481  023004  001370                          BNE     20$
```

```
4482  023006  162737  000002  003504          SUB     #2,E.BA          ;ADJUST BUS ADDRESS AND WORD COUNT
4483  023014  005037  003502                  CLR     E.WC
4484  023020  016237  000000  003440          MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
4485  023026  016237  000010  003450          MOV     RKCS2(R2),T.CS2  ;STORE COMMAND AND STATUS REG. 2
4486  023034  016237  000004  003444          MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS
4487  023042  016237  000002  003442          MOV     RKWC(R2),T.WC    ;STORE WORD COUNT
4488  023050  023737  003500  003440          CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
4489  023056  001401                          BEQ     21$              ;YES, CONTINUE
4490  023060  104125                          ERROR   125              ;CS1 INCORRECT
4491  023062  023737  003510  003450  21$:    CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
4492  023070  001401                          BEQ     22$              ;YES, CONTINUE
4493  023072  104126                          ERROR   126              ;CS2 INCORRECT
4494  023074  023737  003504  003444  22$:    CMP     E.BA,T.BA        ;CHECK BUS ADDRESS INCORRECT
4495  023102  001401                          BEQ     23$              ;YES, CONTINUE
4496  023104  104127                          ERROR   127              ;BUS ADDRESS INCORRECT
4497  023106  023737  003502  003442  23$:    CMP     E.WC,T.WC        ;CHECK WORD COUNT CORRECT
4498  023114  001401                          BEQ     24$              ;YES, CONTINUE
4499  023116  104130                          ERROR   130              ;WORD COUNT INCORRECT
4500  023120  012703  067042          24$:    MOV     #NPRBUF,R3       ;LOAD BUFFER ADDRESS FOR COMPARE
4501  023124  012737  000300  003510          MOV     #IR!OR,E.CS2     ;LOAD EXPECTED CS2
4502  023132  012701  000102                  MOV     #66.,R1          ;LOAD COUNT
4503  023136  005037  003624                  CLR     WRDCNT           ;INITIALIZE WORD COUNT
4504  023142  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB    ;GET DATA BUFFER
4505  023150  012337  003522                  MOV     (R3)+,E.DB       ;GET EXPECTED DATA
4506  023154  023737  003522  003462          CMP     E.DB,T.DB        ;CHECK IF DATA CORRECT
4507  023162  001401                          BEQ     26$              ;YES, CONTINUE
4508  023164  104131                          ERROR   131              ;DATA READ INCORRECT
4509  023166  012700  000050          26$:    MOV     #40.,R0          ;SET STALL
4510  023172  005300                  27$:    DEC     R0               ;RUN STALL TO ZERO
4511  023174  001376                          BNE     27$
4512  023176  016237  000000  003440          MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG 1
4513  023204  016237  000010  003450          MOV     RKCS2(R2),T.CS2  ;STORE COMMAND AND STATUS REG 2
4514  023212  022701  000001                  CMP     #1,R1            ;CHECK IF LAST WORD
4515  023216  001003                          BNE     28$              ;NO, CONTINUE
4516  023220  012737  000100  003510          MOV     #IR,E.CS2        ;LOAD EXPECTED CS2
4517  023226  023737  003500  003440  28$:    CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
4518  023234  001401                          BEQ     29$              ;YES, CONTINUE
4519  023236  104132                          ERROR   132              ;CS1 INCORRECT
4520  023240  023737  003510  003450  29$:    CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
4521  023246  001401                          BEQ     30$              ;YES, CONTINUE
4522  023250  104133                          ERROR   133              ;CS2 INCORRECT
4523  023252  005237  003624          30$:    INC     WRDCNT           ;INCREMENT WORD COUNT
4524  023256  005301                          DEC     R1               ;CHECK IF FINISHED
4525  023260  001330                          BNE     25$              ;NO, CONTINUE
4526
4527                                  ;;*****************************************************************
4528                                  ;*TEST 24       BIT 16 AND 17 READING WITH NPR
4529                                  ;*
4530                                  ;*       CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
4531                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4532                                  ;*       IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4533                                  ;*       SPECIFY ONE WORD DATA TRANSFER FROM A LOCATION
4534                                  ;*       WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY
4535                                  ;*       DOES NOT OCCUR.
4536                                  ;*
4537                                  ;*       NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
```

```
4538                                    ;*              ENABLE EXISTS FOR SPECIFIED LOCATION AND IS
4539                                    ;*              NOT RUN ON AN 11/70.
4540
4541                                    ;*
4542                                    ;.*****************************************************************
4543  023262  000004                    †ST24:  SCOPE
4544  023264  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4545  023272  005737  003636                    TST     PARPRE          ;CHECK IF MEMORY PARITY AVAILABLE
4546  023276  001017                            BNE     1$              ;YES, DO TEST
4547  023300  012737  000001  001200            MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4548  023306  005227  177777                    INC     #-1             ;ONLY DO ONCE
4549  023312  001007                            BNE     64$             ;NO, GO TO NEXT TEST
4550  023314  104401  055013                    TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4551  023320  013746  001220                    MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4552  023324  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4553  023326  104401  055023                    TYPE    ,TSTBY2
4554  023332  000137  024116          64$:      JMP     †ST25           ;GO TO NEXT TEST
4555
4556  023336  013702  001270          1$:       MOV     $BASE,R2        ;LOAD RK611 BASE
4557  023342  004737  044714                    JSR     PC,WRTPAR       ;GENERATE BAD PARITY
4558  023346  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4559  023354  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
4560  023362  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
4561  023370  005037  003502                    CLR     E.WC
4562  023374  012762  067300  000004            MOV     #BADPAR,RKBA(R2) ;LOAD BUS ADDRESS
4563  023402  012737  067302  003504            MOV     #BADPAR+2,E.BA
4564  023410  012737  010027  003500            MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
4565  023416  012762  010027  000000            MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
4566  023424  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4567                                                                    ;  INDEX PULSE
4568  023430  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2)
4569  023436  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4570  023444  005300                            DEC     R0
4571  023446  001370                            BNE     5$
4572  023450  012700  000004                    MOV     #4,R0           ;SIMULATE INDEX PULSE
4573  023454  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4574  023462  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
4575  023470  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4576  023476  005300                            DEC     R0
4577  023500  001370                            BNE     6$
4578  023502  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4579  023510  012737  000300  003510            MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4580  023516  012700  000050                    MOV     #40.,R0         ;ISSUE NPR TRANSFER
4581  023522  012762  000440  000026  8$:       MOV     #DMD!MCLK,RKMR1(R2)
4582  023530  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4583  023536  005300                            DEC     R0
4584  023540  001370                            BNE     8$
4585  023542  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4586  023550  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4587  023556  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4588  023564  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4589  023570  005300                9$:       DEC     R0
4590  023572  001376                            BNE     9$
4591  023574  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4592  023602  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4593  023610  001401                            BEQ     12$             ;YES, CHECK CS2
```

```
4594  023612  104134                          ERROR   134             ;CS1 INCORRECT
4595  023614  023737  003510  003450  12$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4596  023622  001401                          BEQ     13$             ;YES, CHECK BUS ADDRESS
4597  023624  104135                          ERROR   135             ;CS2 INCORRECT
4598  023626  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4599  023634  001401                          BEQ     14$             ;YES, CHECK WORD COUNT
4600  023636  104136                          ERROR   136             ;BUS ADDRESS INCORRECT
4601  023640  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4602  023646  001401                          BEQ     15$             ;YES, CONTINUE
4603  023650  104137                          ERROR   137             ;WORD COUNT INCORRECT
4604  023652  012700  000120          15$:    MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
4605  023656  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
4606  023664  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4607  023672  005300                          DEC     R0
4608  023674  001370                          BNE     20$
4609  023676  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
4610  023704  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4611  023712  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4612  023720  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4613  023726  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4614  023734  001401                          BEQ     21$             ;YES, CHECK CS2
4615  023736  104140                          ERROR   140             ;CS1 INCORRECT
4616  023740  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4617  023746  001401                          BEQ     22$             ;YES, CHECK BUS ADDRESS
4618  023750  104141                          ERROR   141             ;CS2 INCORRECT
4619  023752  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4620  023760  001401                          BEQ     23$             ;YES, CHECK WORD COUNT
4621  023762  104142                          ERROR   142             ;BUS ADDRESS INCORRECT
4622  023764  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
4623  023772  001401                          BEQ     24$             ;YES, CHECK DATA
4624  023774  104143                          ERROR   143             ;WORD COUNT INCORRECT
4625  023776  016237  000024  003462  24$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4626  024004  012737  000157  003522          MOV     #157,E.DB       ;LOAD EXPECT DATA
4627  024012  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK TO MAKE SURE CORRECT
4628  024020  001401                          BEQ     26$             ;YES, CONTINUE
4629  024022  104144                          ERROR   144             ;DATA INCORRECT
4630  024024  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4631  024032  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4632  024040  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4633  024046  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4634  024054  001401                          BEQ     29$             ;YES, CHECK SC2
4635  024056  104145                          ERROR   145             ;CS1 INCORRECT
4636  024060  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS1 CORRECT
4637  024066  001401                          BEQ     30$             ;YES, CONTINUE
4638  024070  104146                          ERROR   146             ;CS2 INCORRECT
4639  024072                          30$:
4640  024072  013703  003640                  MOV     CSRPTR,R3       ;RESET THE PARITY BIT
4641  024076  042713  000007                  BIC     #7,(R3)         ;PARITY BIT FOR THE WRONG MEM IS DISABLED
4642  024102  012737  000000  067300          MOV     #0,BADPAR       ;WRITE GOOD PARITY
4643  024110  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4644
4645                                  .SBTTL  **MFM READ LOOPBACK TESTS
4646
4647                                  ;;*****************************************************************
4648                                  ;*TEST 25        READ LOOPBACK (PART 1)
4649                                  ;*
```

```
                                        ;*      CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
                                        ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
                                        ;*      ONE, AND A HEADER CONSISTING OF THE THREE
                                        ;*      FOLLOWING WORDS:
                                        ;*
                                        ;*              177777
                                        ;*              000000
                                        ;*              177777
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;**************************************************************
024116  000004                  TST25:  SCOPE
024120  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
024126  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
024132  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024140  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
024146  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
024154  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
024160  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
024166  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024174  005300                          DEC     R0
024176  001370                          BNE     1$
024200  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
024206  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024214  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
024220  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
024224  012700  000341                  MOV     #225.,R0
024230  004737  046164          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
024234  005300                          DEC     R0
024236  001374                          BNE     2$
024240  012737  000001  003614          MOV     #1,PR.BIT
024246  004737  046164                  JSR     PC,RDBIT
024252  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
024256  012703  066762                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
024262  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
024270  012304          5$:     MOV     (R3)+,R4        ;GET DATA
024272  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
024276  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
024304  006004                          ROR     R4              ;GET NEXT BIT
024306  103403                          BCS     7$              ;CHECK IF 1
024310  005037  003614                  CLR     PR.BIT          ;NO, ZERO
024314  000403                          BR      8$              ;SIMULATE READ DATA

024316  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
024324  004737  046164          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
024330  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
024336  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
024344  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
024346  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
024354  160137  003624                  SUB     R1,WRDCNT
024360  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
```

```
4706  024366  160037  003622                    SUB     R0,BITCNT
4707  024372  104150                            ERROR   150             ;CS1 INCORRECT DURING HEADER
4708  024374  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4709  024402  000522                            BR      TST26           ;;GO ON TO NEXT TEST
4710
4711  024404  005300                    9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
4712  024406  001333                            BNE     6$              ;NO, GET NEXT BIT
4713  024410  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
4714  024412  001326                            BNE     5$              ;NO, GET NEXT WORD
4715  024414  012700  000004                    MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4716  024420  013737  003614  003616    15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4717  024426  005037  003614                    CLR     PR.BIT          ;LOAD NEXT BIT
4718  024432  004737  046164                    JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4719  024436  005300                            DEC     R0              ;CHECK IF TIME FOR READY
4720  024440  001367                            BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4721  024442  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4722  024450  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4723  024456  012737  000224  003500            MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4724  024464  012737  000300  003510            MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4725  024472  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4726  024500  001401                            BEQ     16$             ;YES  CHECK CS2
4727  024502  104151                            ERROR   151             ;CS1 INCORRECT
4728  024504  023737  003510  003450    16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4729  024512  001401                            BEQ     17$             ;YES, CHECK DATA
4730  024514  104152                            ERROR   152             ;CS2 INCORRECT
4731  024516  005037  003624            17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
4732  024522  012703  066762                    MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
4733  024526  012337  003522            20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4734  024532  016237  000024  003462            MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4735  024540  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4736  024546  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4737  024554  022737  000002  003624            CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4738  024562  001003                            BNE     21$             ;NO, CHECK CS1
4739  024564  012737  000100  003510            MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4740  024572  023737  003500  003440    21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4741  024600  001402                            BEQ     22$             ;YES, CHECK CS2
4742  024602  104153                            ERROR   153             ;CS1 INCORRECT
4743  024604  000421                            BR      TST26           ;;GO ON TO NEXT TEST
4744
4745  024606  023737  003510  003450    22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4746  024614  001402                            BEQ     23$             ;YES, CHECK DATA
4747  024616  104154                            ERROR   154             ;CS2 INCORRECT
4748  024620  000413                            BR      TST26           ;;GO ON TO NEXT TEST
4749
4750  024622  023737  003522  003462    23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4751  024630  001401                            BEQ     24$             ;YES, GET NEXT HEADER WORD
4752  024632  104155                            ERROR   155             ;DATA INCORRECT
4753  024634  005237  003624            24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4754  024640  022737  000003  003624            CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4755  024646  001327                            BNE     20$             ;NO, GET NEXT WORD
4756
4757                                    ;;*****************************************************************
4758                                    ;*TEST 26        READ LOOPBACK (PART 2)
4759                                    ;*
4760                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4761                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
```

```
                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
                                ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A ONE,
                                ;*      AND A HEADER CONSISTING OF THE THREE
                                ;*      FOLLOWING WORDS:
                                ;*
                                ;*              000000
                                ;*              177777
                                ;*              000000
                                ;*
                                ;*      MAKE SURE THAT READY COMES UP AFTER THIRD WORD
                                ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                ;*
                                ;;*****************************************************************
024650  000004                  TST26:  SCOPE
024652  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
024660  013702  001270          MOV     $BASE,R2        ;LOAD RK611 BASE
024664  012762  000000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024672  012762  070040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
024700  012762  007025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
024706  012700  000312          MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
024712  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
024720  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024726  005300                  DEC     R0
024730  001370                  BNE     1$
024732  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
024740  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024746  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
024752  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
024756  012700  000341          MOV     #225.,R0
024762  004737  046164  2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
024766  005300                  DEC     R0
024770  001374                  BNE     2$
024772  012737  000001  003614          MOV     #1,PR.BIT
025000  004737  046164          JSR     PC,RDBIT
025004  012701  000003          MOV     #3,R1           ;LOAD NUMBER OF WORDS
025010  012703  066770          MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
025014  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
025022  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
025024  012700  000020          MOV     #16.,R0         ;LOAD BIT COUNT
025030  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
025036  006004                  ROR     R4              ;GET NEXT BIT
025040  103403                  BCS     7$              ;CHECK IF 1
025042  005037  003614          CLR     PR.BIT          ;NO, ZERO
025046  000403                  BR      8$              ;SIMULATE READ DATA

025050  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
025056  004737  046164  8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
025062  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
025070  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
025076  001417                  BEQ     9$              ;YES, SIMULATE NEXT BIT
025100  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
025106  160137  003624          SUB     R1,WRDCNT
025112  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
025120  160037  003622          SUB     R0,BITCNT
025124  104150                  ERROR   150             ;CS1 INCORRECT DURING HEADER
```

```
4818  025126  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4819  025134  000522                          BR      TST27           ;;GO ON TO NEXT TEST
4820
4821  025136  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
4822  025140  001333                          BNE     6$              ;NO, GET NEXT BIT
4823  025142  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
4824  025144  001326                          BNE     5$              ;NO, GET NEXT WORD
4825  025146  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4826  025152  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4827  025160  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
4828  025164  004737  046164                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4829  025170  005300                          DEC     R0              ;CHECK IF TIME FOR READY
4830  025172  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4831  025174  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4832  025202  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4833  025210  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4834  025216  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4835  025224  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4836  025232  001401                          BEQ     16$             ;YES, CHECK CS2
4837  025234  104151                          ERROR   151             ;CS1 INCORRECT
4838  025236  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4839  025244  001401                          BEQ     17$             ;YES, CHECK DATA
4840  025246  104152                          ERROR   152             ;CS2 INCORRECT
4841  025250  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
4842  025254  012703  066770                  MOV     #HEAD2,R3       ;GET ADDRESS OF DATA
4843  025260  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4844  025264  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4845  025272  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4846  025300  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4847  025306  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4848  025314  001003                          BNE     21$             ;NO, CHECK CS1
4849  025316  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4850  025324  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4851  025332  001402                          BEQ     22$             ;YES, CHECK CS2
4852  025334  104153                          ERROR   153             ;CS1 INCORRECT
4853  025336  000421                          BR      TST27           ;;GO ON TO NEXT TEST
4854
4855  025340  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4856  025346  001402                          BEQ     23$             ;YES, CHECK DATA
4857  025350  104154                          ERROR   154             ;CS2 INCORRECT
4858  025352  000413                          BR      TST27           ;;GO ON TO NEXT TEST
4859
4860  025354  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4861  025362  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4862  025364  104155                          ERROR   155             ;DATA INCORRECT
4863  025366  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4864  025372  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4865  025400  001327                          BNE     20$             ;NO, GET NEXT WORD
4866
4867                          ;;*****************************************************************
4868                          ;*TEST 27        READ LOOPBACK (PART 3)
4869                          ;*
4870                          ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4871                          ;*      IN DIAGNOSTIC MOVE.  ISSUE A READ HEADER TO AN RK06
4872                          ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4873                          ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
```

```
                                        ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
                                        ;*      ONE, AND A HEADER CONSISTING OF THE THREE
                                        ;*      FOLLOWING WORDS:
                                        ;*
                                        ;*              125252
                                        ;*              052525
                                        ;*              125252
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;**************************************************************
025402  000004                  TST27:  SCOPE
025404  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
025412  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
025416  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
025424  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
025432  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
025440  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
025444  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
025452  012762  000040  000026          MOV     #DMD,RKMR1(R2)
025460  005300                          DEC     R0
025462  001370                          BNE     1$
025464  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
025472  012762  000040  000026          MOV     #DMD,RKMR1(R2)
025500  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
025504  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
025510  012700  000341                  MOV     #225.,R0
025514  004737  046164          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
025520  005300                          DEC     R0
025522  001374                          BNE     2$
025524  012737  000001  003614          MOV     #1,PR.BIT
025532  004737  046164                  JSR     PC,RDBIT
025536  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
025542  012703  066776                  MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
025546  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
025554  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
025556  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
025562  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
025570  006004                          ROR     R4              ;GET NEXT BIT
025572  103403                          BCS     7$              ;CHECK IF 1
025574  005037  003614                  CLR     PR.BIT          ;NO, ZERO
025600  000403                          BR      8$              ;SIMULATE READ DATA

025602  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
025610  004737  046164          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
025614  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
025622  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
025630  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
025632  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
025640  160137  003624                  SUB     R1,WRDCNT
025644  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
025652  160037  003622                  SUB     R0,BITCNT
025656  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
025660  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
025666  000522                          BR      TST30           ;;GO ON TO NEXT TEST
```

```
4930
4931  025670  005300                    9$:   DEC     R0              ;CHECK IF READY FOR NEXT WORD
4932  025672  001333                          BNE     6$              ;NO, GET NEXT BIT
4933  025674  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
4934  025676  001326                          BNE     5$              ;NO, GET NEXT WORD
4935  025700  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4936  025704  013737  003614  003616   15$:   MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4937  025712  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
4938  025716  004737  046164                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4939  025722  005300                          DEC     R0              ;CHECK IF TIME FOR READY
4940  025724  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4941  025726  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4942  025734  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4943  025742  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4944  025750  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4945  025756  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4946  025764  001401                          BEQ     16$             ;YES, CHECK CS2
4947  025766  104151                          ERROR   151             ;CS1 INCORRECT
4948  025770  023737  003510  003450   16$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4949  025776  001401                          BEQ     17$             ;YES, CHECK DATA
4950  026000  104152                          ERROR   152             ;CS2 INCORRECT
4951  026002  005037  003624          17$:   CLR     WRDCNT          ;INITIALIZE WORD COUNT
4952  026006  012703  066776                  MOV     #HEAD3,R3       ;GET ADDRESS OF DATA
4953  026012  012337  003522          20$:   MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4954  026016  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4955  026024  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4956  026032  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4957  026040  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4958  026046  001003                          BNE     21$             ;NO, CHECK CS1
4959  026050  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4960  026056  023737  003500  003440   21$:   CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4961  026064  001402                          BEQ     22$             ;YES, CHECK CS2
4962  026066  104153                          ERROR   153             ;CS1 INCORRECT
4963  026070  000421                          BR      TST30           ;;GO ON TO NEXT TEST
4964
4965  026072  023737  003510  003450   22$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4966  026100  001402                          BEQ     23$             ;YES, CHECK DATA
4967  026102  104154                          ERROR   154             ;CS2 INCORRECT
4968  026104  000413                          BR      TST30           ;;GO ON TO NEXT TEST
4969
4970  026106  023737  003522  003462   23$:   CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4971  026114  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4972  026116  104155                          ERROR   155             ;DATA INCORRECT
4973  026120  005237  003624          24$:   INC     WRDCNT          ;INCREMENT WORD COUNT
4974  026124  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4975  026132  001327                          BNE     20$             ;NO, GET NEXT WORD
4976
4977                                  ;;*****************************************************************
4978                                  ;*TEST 30       READ LOOPBACK (PART 4)
4979                                  ;*
4980                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4981                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4982                                  ;*       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4983                                  ;*       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4984                                  ;*       SIMULATE SECTOR PULSE, 225 ZEROES, A
4985                                  ;*       ONE, AND A HEADER CONSISTING OF THE THREE
```

```
                                        ;*      FOLLOWING WORDS:
                                        ;*
                                        ;*              044444
                                        ;*              022222
                                        ;*              111111
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;**************************************************************
026134  000004                  TST30:  SCOPE
026136  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
026144  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
026150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
026156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
026164  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
026172  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
026176  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
026204  012762  000040  000026          MOV     #DMD,RKMR1(R2)
026212  005300                          DEC     R0
026214  001370                          BNE     1$
026216  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
026224  012762  000040  000026          MOV     #DMD,RKMR1(R2)
026232  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
026236  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
026242  012700  000341                  MOV     #225.,R0
026246  004737  046164          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
026252  005300                          DEC     R0
026254  001374                          BNE     2$
026256  012737  000001  003614          MOV     #1,PR.BIT
026264  004737  046164                  JSR     PC,RDBIT
026270  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
026274  012703  067012                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
026300  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
026306  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
026310  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
026314  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
026322  006004                          ROR     R4              ;GET NEXT BIT
026324  103403                          BCS     7$              ;CHECK IF 1
026326  005037  003614                  CLR     PR.BIT          ;NO, ZERO
026332  000403                          BR      8$              ;SIMULATE READ DATA

026334  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
026342  004737  046164          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
026346  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
026354  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
026362  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
026364  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
026372  160137  003624                  SUB     R1,WRDCNT
026376  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
026404  160037  003622                  SUB     R0,BITCNT
026410  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
026412  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
026420  000522                          BR      TST31           ;;GO ON TO NEXT TEST

026422  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
```

```
5042  026424  001333                          BNE     6$              ;NO, GET NEXT BIT
5043  026426  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
5044  026430  001326                          BNE     5$              ;NO, GET NEXT WORD
5045  026432  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5046  026436  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5047  026444  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
5048  026450  004737  046164                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
5049  026454  005300                          DEC     R0              ;CHECK IF TIME FOR READY
5050  026456  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5051  026460  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5052  026466  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5053  026474  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5054  026502  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5055  026510  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5056  026516  001401                          BEQ     16$             ;YES, CHECK CS2
5057  026520  104151                          ERROR   151             ;CS1 INCORRECT
5058  026522  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5059  026530  001401                          BEQ     17$             ;YES, CHECK DATA
5060  026532  104152                          ERROR   152             ;CS2 INCORRECT
5061  026534  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5062  026540  012703  067012                  MOV     #HEAD4,R3       ;GET ADDRESS OF DATA
5063  026544  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5064  026550  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5065  026556  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5066  026564  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5067  026572  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5068  026600  001003                          BNE     21$             ;NO, CHECK CS1
5069  026602  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5070  026610  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5071  026616  001402                          BEQ     22$             ;YES, CHECK CS2
5072  026620  104153                          ERROR   153             ;CS1 INCORRECT
5073  026622  000421                          BR      TST31           ;;GO ON TO NEXT TEST
5074
5075  026624  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5076  026632  001402                          BEQ     23$             ;YES, CHECK DATA
5077  026634  104154                          ERROR   154             ;CS2 INCORRECT
5078  026636  000413                          BR      TST31           ;;GO ON TO NEXT TEST
5079
5080  026640  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5081  026646  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5082  026650  104155                          ERROR   155             ;DATA INCORRECT
5083  026652  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5084  026656  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5085  026664  001327                          BNE     20$             ;NO, GET NEXT WORD
5086
5087                                  ;;*****************************************************************
5088                                  ;*TEST 31        READ LOOPBACK (PART 5)
5089                                  ;*
5090                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5091                                  ;*       IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5092                                  ;*       26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5093                                  ;*       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5094                                  ;*       SIMULATE SECTOR PULSE, 255 ZEROES, A
5095                                  ;*       ONE, AND A HEADER CONSISTING OF THE THREE
5096                                  ;*       FOLLOWING WORDS.
5097                                  ;*
```

```
                                        ;*              052012
                                        ;*              100520
                                        ;*              052012
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSRERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;;*****************************************************************
026666  000004                    TST31:  SCOPE
026670  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
026676  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
026702  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
026710  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
026716  012762  000025  000000            MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
026724  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
026730  012762  000440  000026    1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
026736  012762  000040  000026            MOV     #DMD,RKMR1(R2)
026744  005300                            DEC     R0
026746  001370                            BNE     1$
026750  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
026756  012762  000040  000026            MOV     #DMD,RKMR1(R2)
026764  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
026770  005037  003616                    CLR     M1.BIT          ;  PREVIOUS BIT
026774  012700  000341                    MOV     #225.,R0
027000  004737  046164            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
027004  005300                            DEC     R0
027006  001374                            BNE     2$
027010  012737  000001  003614            MOV     #1,PR.BIT
027016  004737  046164                    JSR     PC,RDBIT
027022  012701  000003                    MOV     #3,R1           ;LOAD NUMBER OF WORDS
027026  012703  067020                    MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
027032  012737  000025  003500            MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
027040  012304            5$:     MOV     (R3)+,R4        ;GET DATA
027042  012700  000020                    MOV     #16.,R0         ;LOAD BIT COUNT
027046  013737  003614  003616    6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
027054  006004                            ROR     R4              ;GET NEXT BIT
027056  103403                            BCS     7$              ;CHECK IF 1
027060  005037  003614                    CLR     PR.BIT          ;NO, ZERO
027064  000403                            BR      8$              ;SIMULATE READ DATA
027066  012737  000001  003614    7$:     MOV     #1,PR.BIT       ;ONE
027074  004737  046164            8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
027100  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
027106  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
027114  001417                            BEQ     9$              ;YES, SIMULATE NEXT BIT
027116  012737  000003  003624            MOV     #3,WRDCNT       ;LOAD WORD COUNT
027124  160137  003624                    SUB     R1,WRDCNT
027130  012737  000020  003622            MOV     #16.,BITCNT     ;LOAD BIT COUNT
027136  160037  003622                    SUB     R0,BITCNT
027142  104150                            ERROR   150             ;CS1 INCORRECT DURING HEADER
027144  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
027152  000522                            BR      TST32           ;;GO ON TO NEXT TEST
027154  005300                    9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
027156  001333                            BNE     6$              ;NO, GET NEXT BIT
027160  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
```

```
5154  027162  001326                          BNE     5$              ;NO, GET NEXT WORD
5155  027164  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5156  027170  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5157  027176  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
5158  027202  004737  046164                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
5159  027206  005300                          DEC     R0              ;CHECK IF TIME FOR READY
5160  027210  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5161  027212  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5162  027220  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5163  027226  012737  000224  003500          MOV     #RDY!RDHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
5164  027234  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5165  027242  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5166  027250  001401                          BEQ     16$             ;YES, CHECK CS2
5167  027252  104151                          ERROR   151             ;CS1 INCORRECT
5168  027254  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5169  027262  001401                          BEQ     17$             ;YES, CHECK DATA
5170  027264  104152                          ERROR   152             ;CS2 INCORRECT
5171  027266  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5172  027272  012703  067020                  MOV     #HEAD5,R3       ;GET ADDRESS OF DATA
5173  027276  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5174  027302  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5175  027310  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5176  027316  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5177  027324  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5178  027332  001003                          BNE     21$             ;NO, CHECK CS1
5179  027334  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5180  027342  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5181  027350  001402                          BEQ     22$             ;YES, CHECK CS2
5182  027352  104153                          ERROR   153             ;CS1 INCORRECT
5183  027354  000421                          BR      TST32           ;;GO ON TO NEXT TEST
5184
5185  027356  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5186  027364  001402                          BEQ     23$             ;YES, CHECK DATA
5187  027366  104154                          ERROR   154             ;CS2 INCORRECT
5188  027370  000413                          BR      TST32           ;;GO ON TO NEXT TEST
5189
5190  027372  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5191  027400  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5192  027402  104155                          ERROR   155             ;DATA INCORRECT
5193  027404  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5194  027410  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5195  027416  001327                          BNE     20$             ;NO, GET NEXT WORD
5196
5197                                  ;;*****************************************************************
5198                                  ;*TEST 32       READ HEADER IN 18 BIT MODE
5199                                  ;*
5200                                  ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5201                                  ;*       IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5202                                  ;*       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5203                                  ;*       SIMULATE SECTOR PULSE, 255 ZEROES, A
5204                                  ;*       ONE, AND A HEADER CONSISTING OF THE THREE
5205                                  ;*       FOLLOWING WORDS:
5206                                  ;*
5207                                  ;*               177777
5208                                  ;*               000000
5209                                  ;*               177777
```

```
5210                                    ;*
5211                                    ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
5212                                    ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5213                                    ;*
5214                                    ;;*****************************************************************
5215  027420  000004                    TST32:  SCOPE
5216  027422  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5217  027430  013702  001270                    MOV     $BASE,R2        ;LOAD RK611
5218  027434  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5219  027442  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5220  027450  012762  010025  000000            MOV     #CFMT!RDHEAD,RKCS1(R2) ;ISSUE READ HEADER (24 SECTOR FORMAT)
5221  027456  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5222  027462  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5223  027470  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5224  027476  005300                            DEC     R0
5225  027500  001370                            BNE     1$
5226  027502  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5227  027510  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5228  027516  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
5229  027522  005037  003616                    CLR     M1.BIT          ;  PREVIOUS BIT
5230  027526  012700  000377                    MOV     #255.,R0
5231  027532  004737  046164            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
5232  027536  005300                            DEC     R0
5233  027540  001374                            BNE     2$
5234  027542  012737  000001  003614            MOV     #1,PR.BIT
5235  027550  004737  046164                    JSR     PC,RDBIT
5236  027554  012701  000003                    MOV     #3,R1           ;LOAD NUMBER OF WORDS
5237  027560  012703  066762                    MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5238  027564  012737  010025  003500            MOV     #CFMT!RDHEAD,E.CS1 ;LOAD EXPECTED CS1
5239  027572  012304                    5$:     MOV     (R3)+,R4        ;GET DATA
5240  027574  012700  000020                    MOV     #16.,R0         ;LOAD BIT COUNT
5241  027600  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PRESENT BIT
5242  027606  006004                            ROR     R4              ;GET NEXT BIT
5243  027610  103403                            BCS     7$              ;CHECK IF 1
5244  027612  005037  003614                    CLR     PR.BIT          ;NO, ZERO
5245  027616  000403                            BR      8$              ;SIMULATE READ DATA
5246
5247  027620  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
5248  027626  004737  046164          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
5249  027632  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5250  027640  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5251  027646  001417                            BEQ     9$              ;YES, SIMULATE NEXT BIT
5252  027650  012737  000003  003624            MOV     #3,WRDCNT       ;LOAD WORD COUNT
5253  027656  160137  003624                    SUB     R1,WRDCNT
5254  027662  012737  000020  003622            MOV     #16.,BITCNT     ;LOAD BIT COUNT
5255  027670  160037  003622                    SUB     R0,BITCNT
5256  027674  104156                            ERROR   156             ;CS1 INCORRECT DURING HEADER
5257  027676  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5258  027704  000522                            BR      TST33           ;;GO ON TO NEXT TEST
5259
5260  027706  005300                    9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5261  027710  001333                            BNE     6$              ;NO, GET NEXT BIT
5262  027712  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
5263  027714  001326                            BNE     5$              ;NO, GET NEXT WORD
5264  027716  012700  000004                    MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5265  027722  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
```

```
5266  027730  005037  003614                      CLR     PR.BIT              ;LOAD NEXT BIT
5267  027734  004737  046164                      JSR     PC,RDBIT            ;READ BIT
5268  027740  005300                              DEC     R0                  ;CHECK IF TIME FOR READY
5269  027742  001367                              BNE     15$                 ;NO, CONTINUE WITH POSTAMBLE
5270  027744  016237  000000  003440              MOV     RKCS1(R2),T.CS1     ;GET CURRENT CS1
5271  027752  016237  000010  003450              MOV     RKCS2(R2),T.CS2     ;GET CURRENT CS2
5272  027760  012737  010224  003500              MOV     #CFMT!RDY!RDHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
5273  027766  012737  000300  003510              MOV     #OR!IR,E.CS2        ;LOAD EXPECTED CS2
5274  027774  023737  003500  003440              CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
5275  030002  001401                              BEQ     16$                 ;YES, CHECK CS2
5276  030004  104157                              ERROR   157                 ;CS1 INCORRECT
5277  030006  023737  003510  003450  16$:       CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
5278  030014  001401                              BEQ     17$                 ;YES, CHECK DATA
5279  030016  104160                              ERROR   160                 ;CS2 INCORRECT
5280  030020  005037  003624          17$:       CLR     WRDCNT              ;INITIALIZE WORD COUNT
5281  030024  012703  066762                      MOV     #HEAD1,R3           ;GET ADDRESS OF DATA
5282  030030  012337  003522          20$:       MOV     (R3)+,E.DB          ;GET EXPECTED DATA
5283  030034  016237  000024  003462              MOV     RKDB(R2),T.DB       ;GET ACTUAL DATA
5284  030042  016237  000000  003440              MOV     RKCS1(R2),T.CS1     ;STORE COMMAND AND STATUS REG. 1
5285  030050  016237  000010  003450              MOV     RKCS2(R2),T.CS2     ;STORE COMMAND AND STATUS REG. 2
5286  030056  022737  000002  003624              CMP     #2,WRDCNT           ;CHECK IF LAST WORD IN DATA BUFFER
5287  030064  001003                              BNE     21$                 ;NO, CHECK CS1
5288  030066  012737  000100  003510              MOV     #IR,E.CS2           ;LOAD EXPECTED CS2
5289  030074  023737  003500  003440  21$:       CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
5290  030102  001402                              BEQ     22$                 ;YES, CHECK CS2
5291  030104  104161                              ERROR   161                 ;CS1 INCORRECT
5292  030106  000421                              BR      TST33               ;;GO ON TO NEXT TEST
5293
5294  030110  023737  003510  003450  22$:       CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
5295  030116  001402                              BEQ     23$                 ;YES, CHECK DATA BUFFER
5296  030120  104162                              ERROR   162                 ;CS2 INCORRECT
5297  030122  000413                              BR      TST33               ;;GO ON TO NEXT TEST
5298
5299  030124  023737  003522  003462  23$:       CMP     E.DB,T.DB           ;CHECK DATA BUFFER CORRECT
5300  030132  001401                              BEQ     24$                 ;YES, GET NEXT WORD
5301  030134  104163                              ERROR   163                 ;DATA BUFFER INCORRECT
5302  030136  005237  003624          24$:       INC     WRDCNT              ;INCREMENT WORD COUNT
5303  030142  022737  000003  003624              CMP     #3,WRDCNT           ;CHECK IF FINISHED
5304  030150  001327                              BNE     20$                 ;NO READ NEXT WORD
5305
5306                                              ;;*****************************************************************
5307                                              ;*TEST 33       SYNCH DETECT IN READ HEADER
5308                                              ;*
5309                                              ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5310                                              ;*       IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5311                                              ;*       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5312                                              ;*       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5313                                              ;*       SIMULATE SECTOR PULSE AND 350 ZEROES.  MAKE
5314                                              ;*       SURE READY REMAINS RESET AND THE SILO REMAINS
5315                                              ;*       EMPTY.
5316                                              ;*
5317                                              ;*****************************************************************
5318  030152  000004                              TST33:  SCOPE
5319  030154  012737  000144  001200              MOV     #100.,$TIMES        ;;DO 100. ITERATIONS
5320  030162  013702  001270                      MOV     $BASE,R2            ;LOAD RK611 BASE
5321  030166  012762  100000  000000              MOV     #CCLR,RKCS1(R2)     ;CLEAR RK611
```

```
5322  030174  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
5323  030202  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEAD
5324  030210  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5325  030214  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5326  030222  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5327  030230  005300                          DEC     R0
5328  030232  001370                          BNE     1$
5329  030234  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE TO SECTOR PULSE
5330  030242  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5331  030250  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND
5332  030254  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
5333  030260  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
5334  030266  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
5335  030274  005037  003622                  CLR     BITCNT          ;SIMULATE 350 ZEROES
5336  030300  004737  046164          2$:     JSR     PC,RDBIT
5337  030304  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE CS1
5338  030312  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE CS2
5339  030320  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5340  030326  001402                          BEQ     3$              ;YES, CHECK CS2
5341  030330  104164                          ERROR   164                     ;CS1 INCORRECT
5342  030332  000447                          BR      TST34           ;;GO ON TO NEXT TEST
5343
5344  030334  023737  003510  003450  3$:     CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
5345  030342  001402                          BEQ     4$              ;YES, CHECK IF SILO EMPTY
5346  030344  104165                          ERROR   165             ;CS2 INCORRECT
5347  030346  000441                          BR      TST34           ;;GO ON TO NEXT TEST
5348  030350  005237  003622          4$:     INC     BITCNT          ;INCREMENT BIT COUNT
5349  030354  022737  000536  003622          CMP     #350.,BITCNT    ;CHECK IF FINISHED
5350  030362  001346                          BNE     2$              ;NO, SIMULATE NEXT ZERO
5351  030364  005762  000024                  TST     RKDB(R2)        ;READ DATA BUFFER
5352  030370  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE CS1 AND CS2
5353  030376  016237  000010  003450          MOV     RKCS2(R2),T.CS2
5354  030404  012737  100224  003500          MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECT CS1
5355  030412  012737  100100  003510          MOV     #DCK!IR,E.CS2   ;LOAD EXPECTED CS2
5356  030420  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK FOR CONTROLLER ERROR
5357  030426  001401                          BEQ     5$              ;YES, CHECK FOR DATA LATE
5358  030430  104166                          ERROR   166             ;CS1 INCORRECT
5359  030432  023737  003510  003450  5$:     CMP     E.CS2,T.CS2     ;CHECK FOR DATA LATE
5360  030440  001401                          BEQ     6$              ;YES, CHECK RK611
5361  030442  104167                          ERROR   167             ;CS2 INCORRECT
5362  030444  012762  100000  000000  6$:     MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5363
5364                                  ;;*****************************************************************
5365                                  ;*TEST 34       ZERO SYNCH ON READ
5366                                  ;*
5367                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5368                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5369                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES,
5370                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF
5371                                  ;*      BIT TIME, A ONE, AND A HEADER CONSISTING OF THE
5372                                  ;*      THREE FOLLOWING WORDS:
5373                                  ;*
5374                                  ;*              177777
5375                                  ;*              000000
5376                                  ;*              177777
5377                                  ;*
```

```
5378                                    ;*      MAKE SURE THAT READY COMES AFTER THE THIRD WORD
5379                                    ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5380                                    ;*
5381                                    ;;*********************************************************************
5382  030452  000004                    T$T34:  SCOPE
5383  030454  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5384  030462  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
5385  030466  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5386  030474  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5387  030502  012762  000025  000000            MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
5388  030510  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5389  030514  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
5390  030522  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5391  030530  005300                            DEC     R0
5392  030532  001370                            BNE     1$
5393  030534  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5394  030542  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5395  030550  012762  000440  000026            MOV     #DMD!MCLK,RKMR1(R2)  ;SHIFT DATA ONE HALF BIT TIME
5396  030556  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5397  030564  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
5398  030570  005037  003616                    CLR     M1.BIT          ;  PREVIOUS BIT
5399  030574  012700  000341                    MOV     #225.,R0
5400  030600  004737  046164            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
5401  030604  005300                            DEC     R0
5402  030606  001374                            BNE     2$
5403  030610  012737  000001  003614            MOV     #1,PR.BIT
5404  030616  004737  046164                    JSR     PC,RDBIT
5405  030622  012701  000003                    MOV     #3,R1           ;LOAD NUMBER OF WORDS
5406  030626  012703  066762                    MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5407  030632  012737  000025  003500            MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
5408  030640  012304            5$:     MOV     (R3)+,R4        ;GET DATA
5409  030642  012700  000020                    MOV     #16.,R0         ;LOAD BIT COUNT
5410  030646  013737  003614  003616  6$:       MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5411  030654  006004                            ROR     R4              ;GET NEXT BIT
5412  030656  103403                            BCS     7$              ;CHECK IF 1
5413  030660  005037  003614                    CLR     PR.BIT          ;NO, ZERO
5414  030664  000403                            BR      8$              ;SIMULATE READ DATA
5415
5416  030666  012737  000001  003614  7$:       MOV     #1,PR.BIT       ;ONE
5417  030674  004737  046164            8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
5418  030700  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5419  030706  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5420  030714  001417                            BEQ     9$              ;YES, SIMULATE NEXT BIT
5421  030716  012737  000003  003624            MOV     #3,WRDCNT       ;LOAD WORD COUNT
5422  030724  160137  003624                    SUB     R1,WRDCNT
5423  030730  012737  000020  003622            MOV     #16.,BITCNT     ;LOAD BIT COUNT
5424  030736  160037  003622                    SUB     R0,BITCNT
5425  030742  104150                            ERROR   150             ;CS1 INCORRECT DURING HEADER
5426  030744  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5427  030752  000522                            BR      T$T35           ;;GO ON TO NEXT TEST
5428
5429  030754  005300            9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5430  030756  001333                            BNE     6$              ;NO, GET NEXT BIT
5431  030760  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
5432  030762  001326                            BNE     5$              ;NO, GET NEXT WORD
5433  030764  012700  000004                    MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
```

```
5434  030770  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5435  030776  005037  003614          CLR     PR.BIT          ;LOAD NEXT BIT
5436  031002  004737  046164          JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
5437  031006  005300                  DEC     R0              ;CHECK IF TIME FOR READY
5438  031010  001367                  BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5439  031012  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5440  031020  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5441  031026  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5442  031034  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5443  031042  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5444  031050  001401                  BEQ     16$             ;YES, CHECK CS2
5445  031052  104151                  ERROR   151             ;CS1 INCORRECT
5446  031054  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5447  031062  001401                  BEQ     17$             ;YES, CHECK DATA
5448  031064  104152                  ERROR   152             ;CS2 INCORRECT
5449  031066  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5450  031072  012703  066762                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
5451  031076  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5452  031102  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5453  031110  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5454  031116  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5455  031124  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5456  031132  001003                  BNE     21$             ;NO, CHECK CS1
5457  031134  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5458  031142  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5459  031150  001402                  BEQ     22$             ;YES, CHECK CS2
5460  031152  104153                  ERROR   153             ;CS1 INCORRECT
5461  031154  000421                  BR      TST35           ;;GO ON TO NEXT TEST
5462
5463  031156  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5464  031164  001402                  BEQ     23$             ;YES, CHECK DATA
5465  031166  104154                  ERROR   154             ;CS2 INCORRECT
5466  031170  000413                  BR      TST35           ;;GO ON TO NEXT TEST
5467
5468  031172  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5469  031200  001401                  BEQ     24$             ;YES, GET NEXT HEADER WORD
5470  031202  104155                  ERROR   155             ;DATA INCORRECT
5471  031204  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5472  031210  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5473  031216  001327                  BNE     20$             ;NO, GET NEXT WORD
5474
5475                                  .SBTTL  **MFM WRITE LOOPBACK TESTS
5476
5477                                  ;;*****************************************************************
5478                                  ;*TEST 35       WRITE ZEROS UNTIL SECTOR PULSE WITH WRITE HEADER
5479                                  ;*
5480                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5481                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5482                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5483                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
5484                                  ;*      INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
5485                                  ;*      ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
5486                                  ;*      WRITE GATE RESETS.
5487                                  ;*
5488                                  ;;*****************************************************************
5489  031220  000004                  TST35:  SCOPE
```

```
5490  031222  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5491  031230  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5492  031234  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5493  031242  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5494  031250  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;INITIALIZE ROM
5495  031256  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5496  031264  012762  067264  000004          MOV     #WRBUFF,RKBA(R2) ;ISSUE WRITE HEADER
5497  031272  012762  177777  000002          MOV     #-1,RKWC(R2)
5498  031300  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5499  031306  012700  002364                  MOV     #<256.+48.+64.+256.+10.>*2,R0 ;ISSUE ENOUGH CLOCKS
5500                                                  ;  UNTIL READY FOR INDEX PULSE
5501  031312  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5502  031320  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5503  031326  005300                          DEC     R0
5504  031330  001370                          BNE     1$
5505  031332  012700  000004                  MOV     #4.,R0          ;SIMULATE INDEX PULSE
5506  031336  012762  000240  000026          MOV     #MIND!DMD,RKMR1(R2)
5507  031344  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5508  031352  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5509  031360  005300                          DEC     R0
5510  031362  001370                          BNE     2$
5511  031364  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5512  031372  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5513                                                  ;  MAINT. REG
5514  031400  012700  000002                  MOV     #2,R0           ;WAIT FOR WRITE GATE
5515  031404  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5516  031412  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5517  031420  005300                          DEC     R0
5518  031422  001370                          BNE     3$
5519  031424  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
5520  031430  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5521  031434  005037  003614                  CLR     PR.BIT
5522  031440  005037  003616                  CLR     M1.BIT
5523  031444  005037  003620                  CLR     M2.BIT
5524  031450  012700  000764                  MOV     #500.,R0        ;LOAD COUNT FOR 500 BITS
5525  031454  012737  062473  003170          MOV     #EM230,EMW      ;LOAD ERROR MESSAGE
5526  031462  005037  003622                  CLR     BITCNT          ;CLEAR BIT COUNT
5527  031466  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5528  031472  104170                          ERROR   170             ;ERROR IN WRITE
5529  031474  005237  003622                  INC     BITCNT          ;INCREMENT NUMBER OF BITS WRITTEN
5530  031500  005300                          DEC     R0              ;CHECK IF FINISHED
5531  031502  001371                          BNE     5$              ;NO, CONTINUE
5532  031504  042737  040000  003524          BIC     #WRTGAT,E.MR1   ;GENERATE EXPECTED MR1
5533  031512  052737  000100  003524          BIS     #MSP,E.MR1
5534  031520  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;RAISE SECTOR PULSE
5535  031526  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
5536  031534  023737  003524  003464          CMP     E.MR1,T.MR1     ;STORE MAINT REG 1
5537  031542  001401                          BEQ     10$             ;YES, LOWER SECTOR PULSE
5538  031544  104171                          ERROR   171             ;WRITE GATE DID NOT RESET
5539  031546  042737  000100  003524  10$:    BIC     #MSP,E.MR1      ;GENERATE EXPECTED MR1
5540  031554  052737  040000  003524          BIS     #WRTGAT,E.MR1
5541  031562  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;RESET SECTOR PULSE
5542  031570  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
5543  031576  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT
5544  031604  001401                          BEQ     TST36           ;;YES, GO ON TO NEXT TEST
5545  031606  104172                          ERROR   172             ;WRITE GATE DID NOT SET
```

```
                                        ;;*****************************************************************
                                        ;*TEST 36       WRITE LOOPBACK (PART 1)
                                        ;*
                                        ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                                        ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
                                        ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
                                        ;*
                                        ;*              177777
                                        ;*              000000
                                        ;*              177777
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
                                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
                                        ;*
                                        ;;*****************************************************************
031610  000004                  TST36:  SCOPE
031612  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
031620  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
031624  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
031632  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
031640  012762  066762  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
031646  012762  177775  000002          MOV     #-3,RKWC(R2)
031654  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
031662  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR INDEX PULSE
031666  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
031674  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031702  005300                          DEC     R0
031704  001370                          BNE     1$
031706  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
031712  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
031720  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
031726  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
031734  005300                          DEC     R0
031736  001370                          BNE     2$
031740  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031746  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
031752  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
031760  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031766  005300                          DEC     R0
031770  001370                          BNE     3$
031772  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
032000  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032006  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
032012  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
032020  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
032026  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
032032  005037  003614                  CLR     PR.BIT
032036  005037  003616                  CLR     M1.BIT
032042  005037  003620                  CLR     M2.BIT
032046  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
```

```
5602  032052  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5603  032056  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5604  032062  104170                          ERROR   170             ;DATA INCORRECT
5605  032064  005237  003622                  INC     BITCNT
5606  032070  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5607  032072  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5608  032074  012737  000001  003612          MOV     #1,F1.BIT       ;PUT IN SYNCH BIT
5609  032102  004737  045214                  JSR     PC,WRTBIT
5610  032106  104170                          ERROR   170             ;DATA INCORRECT
5611  032110  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5612  032114  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5613  032122  012703  066762                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5614  032126  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5615  032132  012304          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5616  032134  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5617  032140  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5618  032146  013737  003614  003616          MOV     PR.BIT,M1.BIT
5619  032154  013737  003612  003614          MOV     P1.BIT,PR.BIT
5620  032162  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5621  032164  103403                          BCS     14$             ;CHECK IF ONE
5622  032166  005037  003612                  CLR     P1.BIT          ;ZERO
5623  032172  000403                          BR      15$             ;CLOCK IN BIT
5624
5625  032174  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5626  032202  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5627  032206  104170                          ERROR   170             ;BIT INCORRECT
5628  032210  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5629  032214  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5630  032216  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5631  032220  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5632  032222  001343                          BNE     10$             ;NO, GET NEXT WORD
5633  032224  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5634  032230  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5635  032236  013737  003614  003616          MOV     PR.BIT,M1.BIT
5636  032244  013737  003612  003614          MOV     P1.BIT,PR.BIT
5637  032252  005037  003612                  CLR     P1.BIT
5638  032256  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
5639  032262  104170                          ERROR   170             ;BIT INCORRECT
5640  032264  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5641  032270  005301                          DEC     R1              ;CHECK IF FINISHED
5642  032272  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5643  032274  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5644  032302  012700  000004                  MOV     #4,R0
5645  032306  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5646  032314  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5647  032322  005300                          DEC     R0
5648  032324  001370                          BNE     20$
5649  032326  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5650  032334  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5651  032342  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5652  032350  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5653  032356  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5654  032360  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5655  032362  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5656  032366  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5657  032374  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
5658  032402  005300                          DEC     R0
5659  032404  001370                          BNE     26$
5660  032406  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5661  032414  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5662  032422  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5663  032430  001401                          BEQ     TST37           ;;YES, GO ON TO NEXT TEST
5664  032432  104174                          ERROR   174             ;CS1 INCORRECT
5665
5666                                  ;;*****************************************************************
5667                                  ;*TEST 37        WRITE LOOPBACK (PART 2)
5668                                  ;*
5669                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5670                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5671                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5672                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5673                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5674                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
5675                                  ;*
5676                                  ;*              000000
5677                                  ;*              177777
5678                                  ;*              000000
5679                                  ;*
5680                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
5681                                  ;*      IS TRANSFERRED.  CHECK FOR CORRECT WRITE ENCODED DATA
5682                                  ;*      AND PRECOMPENSATION.
5683                                  ;*
5684                                  ;*****************************************************************
5685  032434  000004                  TST37:  SCOPE
5686  032436  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5687  032444  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5688  032450  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5689  032456  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5690  032464  012762  066770  000004          MOV     #HEAD2,RKBA(R2) ;ISSUE WRITE HEADER
5691  032472  012762  177775  000002          MOV     #-3,RKWC(R2)
5692  032500  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5693  032506  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5694                                                                  ;  READY FOR INDEX PULSE
5695  032512  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5696  032520  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5697  032526  005300                          DEC     R0
5698  032530  001370                          BNE     1$
5699  032532  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5700  032536  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5701  032544  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5702  032552  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5703  032560  005300                          DEC     R0
5704  032562  001370                          BNE     2$
5705  032564  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5706  032572  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5707  032576  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5708  032604  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5709  032612  005300                          DEC     R0
5710  032614  001370                          BNE     3$
5711  032616  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5712  032624  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5713  032632  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
```

```
5714  032636  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5715  032644  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5716                                                                  ;  MAINT REG 1
5717  032652  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5718  032656  005037  003614                  CLR     PR.BIT
5719  032662  005037  003616                  CLR     M1.BIT
5720  032666  005037  003620                  CLR     M2.BIT
5721  032672  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5722  032676  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5723  032702  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5724  032706  104170                  ERROR   170                     ;DATA INCORRECT
5725  032710  005237  003622                  INC     BITCNT
5726  032714  005300                  DEC     R0                      ;CHECK IF READY FOR DATA
5727  032716  001371                  BNE     5$                      ;NO, GENERATE NEXT BIT
5728  032720  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5729  032726  004737  045214                  JSR     PC,WRTBIT
5730  032732  104170                  ERROR   170                     ;DATA INCORRECT
5731  032734  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5732  032740  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5733  032746  012703  066770                  MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
5734  032752  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5735  032756  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5736  032760  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5737  032764  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5738  032772  013737  003614  003616          MOV     PR.BIT,M1.BIT
5739  033000  013737  003612  003614          MOV     P1.BIT,PR.BIT
5740  033006  006004                  ROR     R4                      ;SHIFT IN NEXT BIT
5741  033010  103403                  BCS     14$                     ;CHECK IF ONE
5742  033012  005037  003612                  CLR     P1.BIT          ;ZERO
5743  033016  000403                  BR      15$                     ;CLOCK IN BIT
5744
5745  033020  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5746  033026  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5747  033032  104170                  ERROR   170                     ;BIT INCORRECT
5748  033034  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5749  033040  005301                  DEC     R1                      ;CHECK IF WORD FINISHED
5750  033042  001350                  BNE     12$                     ;NO, CONTINUE WITH NEXT BIT
5751  033044  005300                  DEC     R0                      ;CHECK IF HEADER COMPLETE
5752  033046  001343                  BNE     10$                     ;NO, GET NEXT WORD
5753  033050  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5754  033054  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5755  033062  013737  003614  003616          MOV     PR.BIT,M1.BIT
5756  033070  013737  003612  003614          MOV     P1.BIT,PR.BIT
5757  033076  005037  003612                  CLR     P1.BIT
5758  033102  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
5759  033106  104170                  ERROR   170                     ;BIT INCORRECT
5760  033110  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5761  033114  005301                  DEC     R1                      ;CHECK IF FINISHED
5762  033116  001356                  BNE     18$                     ;NO, CLOCK NEXT BIT
5763  033120  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5764  033126  012700  000004                  MOV     #4,R0
5765  033132  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5766  033140  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5767  033146  005300                  DEC     R0
5768  033150  001370                  BNE     20$
5769  033152  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
5770  033160  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5771  033166  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5772  033174  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5773  033202  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5774  033204  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5775  033206  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5776  033212  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5777  033220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5778  033226  005300                          DEC     R0
5779  033230  001370                          BNE     26$
5780  033232  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5781  033240  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5782  033246  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5783  033254  001401                          BEQ     TST40           ;;YES, GO ON TO NEXT TEST
5784  033256  104174                          ERROR   174             ;CS1 INCORRECT
5785
5786                                  ;;*****************************************************************
5787                                  ;*TEST 40       WRITE LOOPBACK (PART 3)
5788                                  ;*
5789                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5790                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5791                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5792                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  STIMULATE
5793                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5794                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE.
5795                                  ;*
5796                                  ;*              125252
5797                                  ;*              052525
5798                                  ;*              125252
5799                                  ;*
5800                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
5801                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5802                                  ;*
5803                                  ;;*****************************************************************
5804  033260  000004                  TST40:  SCOPE
5805  033262  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5806  033270  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5807  033274  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5808  033302  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5809  033310  012762  066776  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE WRITE HEADER
5810  033316  012762  177775  000002          MOV     #-3,RKWC(R2)
5811  033324  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5812  033332  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5813                                                                  ;  READY FOR INDEX PULSE
5814  033336  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5815  033344  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5816  033352  005300                          DEC     R0
5817  033354  001370                          BNE     1$
5818  033356  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5819  033362  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5820  033370  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5821  033376  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5822  033404  005300                          DEC     R0
5823  033406  001370                          BNE     2$
5824  033410  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5825  033416  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
```

```
5826  033422  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5827  033430  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5828  033436  005300                          DEC     R0
5829  033440  001370                          BNE     3$
5830  033442  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5831  033450  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5832  033456  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5833  033462  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5834  033470  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5835                                                                  ;  MAINT REG 1
5836  033476  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5837  033502  005037  003614                  CLR     PR.BIT
5838  033506  005037  003616                  CLR     M1.BIT
5839  033512  005037  003620                  CLR     M2.BIT
5840  033516  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5841  033522  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5842  033526  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5843  033532  104170                          ERROR   170             ;DATA INCORRECT
5844  033534  005237  003622                  INC     BITCNT
5845  033540  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5846  033542  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5847  033544  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5848  033552  004737  045214                  JSR     PC,WRTBIT
5849  033556  104170                          ERROR   170             ;DATA INCORRECT
5850  033560  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5851  033564  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5852  033572  012703  066776                  MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
5853  033576  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5854  033602  012304          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5855  033604  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5856  033610  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5857  033616  013737  003614  003616          MOV     PR.BIT,M1.BIT
5858  033624  013737  003612  003614          MOV     P1.BIT,PR.BIT
5859  033632  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5860  033634  103403                          BCS     14$             ;CHECK IF ONE
5861  033636  005037  003612                  CLR     P1.BIT          ;ZERO
5862  033642  000403                          BR      15$             ;CLOCK IN BIT
5863
5864  033644  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5865  033652  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5866  033656  104170                          ERROR   170             ;BIT INCORRECT
5867  033660  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5868  033664  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5869  033666  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5870  033670  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5871  033672  001343                          BNE     10$             ;NO, GET NEXT WORD
5872  033674  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5873  033700  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5874  033706  013737  003614  003616          MOV     PR.BIT,M1.BIT
5875  033714  013737  003612  003614          MOV     P1.BIT,PR.BIT
5876  033722  005037  003612                  CLR     P1.BIT
5877  033726  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
5878  033732  104170                          ERROR   170             ;BIT INCORRECT
5879  033734  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5880  033740  005301                          DEC     R1              ;CHECK IF FINISHED
5881  033742  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
```

```
5882   033744  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5883   033752  012700  000004                  MOV     #4,R0
5884   033756  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5885   033764  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5886   033772  005300                          DEC     R0
5887   033774  001370                          BNE     20$
5888   033776  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5889   034004  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5890   034012  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5891   034020  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5892   034026  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5893   034030  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5894   034032  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5895   034036  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5896   034044  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5897   034052  005300                          DEC     R0
5898   034054  001370                          BNE     26$
5899   034056  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5900   034064  012737  000226  003500          MOV     #RDY!WRHEAD&^C<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5901   034072  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5902   034100  001401                          BEQ     TST41           ;YES, GO ON TO NEXT TEST
5903   034102  104174                          ERROR   174             ;CS1 INCORRECT
5904
5905                                  ;;*****************************************************************
5906                                  ;*TEST 41       WRITE LOOPBACK (PART 4)
5907                                  ;*
5908                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5909                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5910                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5911                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5912                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5913                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AND INDEX PULSE:
5914                                  ;*
5915                                  ;*              044444
5916                                  ;*              022222
5917                                  ;*              111111
5918                                  ;*
5919                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX MODE.
5920                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5921                                  ;*
5922                                  ;*****************************************************************
5923   034104  000004                  TST41:  SCOPE
5924   034106  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5925   034114  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5926   034120  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5927   034126  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5928   034134  012762  067012  000004          MOV     #HEAD4,RKBA(R2) ;ISSUE WRITE HEADER
5929   034142  012762  177775  000002          MOV     #-3,RKWC(R2)
5930   034150  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5931   034156  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5932                                                                  ;  READY FOR INDEX PULSE
5933   034162  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5934   034170  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5935   034176  005300                          DEC     R0
5936   034200  001370                          BNE     1$
5937   034202  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
```

```
5938  034206  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5939  034214  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5940  034222  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5941  034230  005300                          DEC     R0
5942  034232  001370                          BNE     2$
5943  034234  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5944  034242  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5945  034246  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5946  034254  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5947  034262  005300                          DEC     R0
5948  034264  001370                          BNE     3$
5949  034266  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5950  034274  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5951  034302  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5952  034306  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5953  034314  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5954                                                                  ;  MAINT REG 1
5955  034322  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5956  034326  005037  003614                  CLR     PR.BIT
5957  034332  005037  003616                  CLR     M1.BIT
5958  034336  005037  003620                  CLR     M2.BIT
5959  034342  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5960  034346  005037  003632                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5961  034352  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5962  034356  104170                          ERROR   170             ;DATA INCORRECT
5963  034360  005237  003622                  INC     BITCNT
5964  034364  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5965  034366  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5966  034370  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5967  034376  004737  045214                  JSR     PC,WRTBIT
5968  034402  104170                          ERROR   170             ;DATA INCORRECT
5969  034404  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5970  034410  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5971  034416  012703  067012                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
5972  034422  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5973  034426  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5974  034430  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5975  034434  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5976  0344    013737  003614  003616          MOV     PR.BIT,M1.BIT
5977  034450  013737  003612  003614          MOV     P1.BIT,PR.BIT
5978  034456  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5979  034460  103403                          BCS     14$             ;CHECK IF ONE
5980  034462  005037  003612                  CLR     P1.BIT          ;ZERO
5981  034466  000403                          BR      15$             ;CLOCK IN BIT
5982
5983  034470  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5984  034476  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5985  034502  104170                          ERROR   170             ;BIT INCORRECT
5986  034504  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5987  034510  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5988  034512  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5989  034514  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5990  034516  001343                          BNE     10$             ;NO, GET NEXT WORD
5991  034520  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5992  034524  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5993  034532  013737  003614  003616          MOV     PR.BIT,M1.BIT
```

```
 5994  034540  013737  003612  003614          MOV     P1.BIT,PR.BIT
 5995  034546  005037  003612                  CLR     P1.BIT
 5996  034552  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
 5997  034556  104170                          ERROR   170             ;BIT INCORRECT
 5998  034560  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 5999  034564  005301                          DEC     R1              ;CHECK IF FINISHED
 6000  034566  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
 6001  034570  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
 6002  034576  012700  000004                  MOV     #4,R0
 6003  034602  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6004  034610  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6005  034616  005300                          DEC     R0
 6006  034620  001370                          BNE     20$
 6007  034622  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6008  034630  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6009  034636  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 6010  034644  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 6011  034652  001401                          BEQ     25$             ;YES, CHECK IF READY SET
 6012  034654  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
 6013  034656  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
 6014  034662  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 6015  034670  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6016  034676  005300                          DEC     R0
 6017  034700  001370                          BNE     26$
 6018  034702  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6019  034710  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
 6020  034716  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6021  034724  001401                          BEQ     TST42           ;YES, GO ON TO NEXT TEST
 6022  034726  104174                          ERROR   174             ;CS1 INCORRECT
 6023
 6024                                  ;;*****************************************************************
 6025                                  ;*TEST 42        WRITE LOOPBACK (PART 5)
 6026                                  ;*
 6027                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6028                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6029                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 6030                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 6031                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
 6032                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
 6033                                  ;*
 6034                                  ;*              052012
 6035                                  ;*              100520
 6036                                  ;*              052012
 6037                                  ;*
 6038                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
 6039                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
 6040                                  ;*
 6041                                  ;*****************************************************************
 6042  034730  000004                  TST42:  SCOPE
 6043  034732  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6044  034740  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6045  034744  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6046  034752  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 6047  034760  012762  067020  000004          MOV     #HEAD5,RKBA(R2) ;ISSUE WRITE HEADER
 6048  034766  012762  177775  000002          MOV     #-3,RKWC(R2)
 6049  034774  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
```

```
 6050  035002  012700  000312              MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6051                                                              ;  READY FOR INDEX PULSE
 6052  035006  012762  000440  000026  1$: MOV     #DMD!MCLK,RKMR1(R2)
 6053  035014  012762  000040  000026      MOV     #DMD,RKMR1(R2)
 6054  035022  005300                      DEC     R0
 6055  035024  001370                      BNE     1$
 6056  035026  012700  000004              MOV     #4,R0           ;ISSUE INDEX PULSE
 6057  035032  012762  000240  000026      MOV     #DMD!MIND,RKMR1(R2)
 6058  035040  012762  000640  000026  2$: MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6059  035046  012762  000240  000026      MOV     #DMD!MIND,RKMR1(R2)
 6060  035054  005300                      DEC     R0
 6061  035056  001370                      BNE     2$
 6062  035060  012762  000040  000026      MOV     #DMD,RKMR1(R2)
 6063  035066  012700  000010              MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6064  035072  012762  000440  000026  3$: MOV     #DMD!MCLK,RKMR1(R2)
 6065  035100  012762  000040  000026      MOV     #DMD,RKMR1(R2)
 6066  035106  005300                      DEC     R0
 6067  035110  001370                      BNE     3$
 6068  035112  012762  000140  000026      MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6069  035120  012762  000040  000026      MOV     #DMD,RKMR1(R2)
 6070  035126  005037  003626              CLR     SECCNT          ;INITIALIZE SECTOR COUNT
 6071  035132  012737  063045  003170      MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 6072  035140  012737  062040  003524      MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6073                                                              ;  MAINT REG 1
 6074  035146  005037  003612              CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 6075  035152  005037  003614              CLR     PR.BIT
 6076  035156  005037  003616              CLR     M1.BIT
 6077  035162  005037  003620              CLR     M2.BIT
 6078  035166  012700  000400              MOV     #256.,R0        ;SIMULATE SYNCH
 6079  035172  005037  003622              CLR     BITCNT          ;INITIALIZE BIT COUNT
 6080  035176  004737  045214          5$: JSR     PC,WRTBIT       ;WRITE ONE BIT
 6081  035202  104170                      ERROR   170             ;DATA INCORRECT
 6082  035204  005237  003622              INC     BITCNT
 6083  035210  005300                      DEC     R0              ;CHECK IF READY FOR DATA
 6084  035212  001371                      BNE     5$              ;NO, GENERATE NEXT BIT
 6085  035214  012737  000001  003612      MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6086  035222  004737  045214              JSR     PC,WRTBIT
 6087  035226  104170                      ERROR   170             ;DATA INCORRECT
 6088  035230  005037  003622              CLR     BITCNT          ;INITIALIZE BIT COUNT
 6089  035234  012737  063111  003170      MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 6090  035242  012703  067020              MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
 6091  035246  012700  000003              MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 6092  035252  012304              10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 6093  035254  012701  000020              MOV     #16.,R1         ;LOAD BIT COUNT
 6094  035260  013737  003616  003620  12$: MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6095  035266  013737  003614  003616      MOV     PR.BIT,M1.BIT
 6096  035274  013737  003612  003614      MOV     P1.BIT,PR.BIT
 6097  035302  006004                      ROR     R4              ;SHIFT IN NEXT BIT
 6098  035304  103403                      BCS     14$             ;CHECK IF ONE
 6099  035306  005037  003612              CLR     P1.BIT          ;ZERO
 6100  035312  000403                      BR      15$             ;CLOCK IN BIT
 6101
 6102  035314  012737  000001  003612  14$: MOV     #1,P1.BIT       ;ONE
 6103  035322  004737  045214          15$: JSR     PC,WRTBIT       ;WRITE BIT
 6104  035326  104170                      ERROR   170             ;BIT INCORRECT
 6105  035330  005237  003622              INC     BITCNT          ;INCREMENT BIT COUNT
```

```
6106  035334  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6107  035336  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6108  035340  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6109  035342  001343                          BNE     10$             ;NO, GET NEXT WORD
6110  035344  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6111  035350  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6112  035356  013737  003614  003616          MOV     PR.BIT,M1.BIT
6113  035364  013737  003612  003614          MOV     P1.BIT,PR.BIT
6114  035372  005037  003612                  CLR     P1.BIT
6115  035376  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
6116  035402  104170                          ERROR   170             ;BIT INCORRECT
6117  035404  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6118  035410  005301                          DEC     R1              ;CHECK IF FINISHED
6119  035412  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6120  035414  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6121  035422  012700  000004                  MOV     #4,R0
6122  035426  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6123  035434  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6124  035442  005300                          DEC     R0
6125  035444  001370                          BNE     20$
6126  035446  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6127  035454  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6128  035462  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6129  035470  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6130  035476  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6131  035500  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6132  035502  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6133  035506  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6134  035514  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6135  035522  005300                          DEC     R0
6136  035524  001370                          BNE     26$
6137  035526  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6138  035534  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6139  035542  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6140  035550  001401                          BEQ     TST43           ;YES, GO ON TO NEXT TEST
6141  035552  104174                          ERROR   174             ;CS1 INCORRECT
6142
6143                                  ;*****************************************************************
6144                                  ;*TEST 43       WRITE LOOPBACK (PART 6)
6145                                  ;*
6146                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6147                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6148                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6149                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6150                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6151                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6152                                  ;*
6153                                  ;*              155555
6154                                  ;*              066666
6155                                  ;*              155555
6156                                  ;*
6157                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
6158                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
6159                                  ;*
6160                                  ;*****************************************************************
6161  035554  000004                  TST43:  SCOPE
```

```
6162  035556  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6163  035564  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6164  035570  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6165  035576  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6166  035604  012762  067026  000004          MOV     #HEAD6,RKBA(R2) ;ISSUE WRITE HEADER
6167  035612  012762  177775  000002          MOV     #-3,RKWC(R2)
6168  035620  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
6169  035626  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6170                                                                  ;  READY FOR INDEX PULSE
6171  035632  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6172  035640  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6173  035646  005300                          DEC     R0
6174  035650  001370                          BNE     1$
6175  035652  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6176  035656  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6177  035664  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6178  035672  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6179  035700  005300                          DEC     R0
6180  035702  001370                          BNE     2$
6181  035704  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6182  035712  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6183  035716  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6184  035724  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6185  035732  005300                          DEC     R0
6186  035734  001370                          BNE     3$
6187  035736  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6188  035744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6189  035752  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6190  035756  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6191  035764  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6192                                                                  ;  MAINT REG 1
6193  035772  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6194  035776  005037  003614                  CLR     PR.BIT
6195  036002  005037  003616                  CLR     M1.BIT
6196  036006  005037  003620                  CLR     M2.BIT
6197  036012  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6198  036016  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6199  036022  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6200  036026  104170                          ERROR   170             ;DATA INCORRECT
6201  036030  005237  003622                  INC     BITCNT
6202  036034  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6203  036036  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6204  036040  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6205  036046  004737  045214                  JSR     PC,WRTBIT
6206  036052  104170                          ERROR   170             ;DATA INCORRECT
6207  036054  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6208  036060  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6209  036066  012703  067026                  MOV     #HEAD6,R3       ;LOAD ADDRESS OF DATA
6210  036072  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6211  036076  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6212  036100  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6213  036104  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6214  036112  013737  003614  003616          MOV     PR.BIT,M1.BIT
6215  036120  013737  003612  003614          MOV     P1.BIT,PR.BIT
6216  036126  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6217  036130  103403                          BCS     14$             ;CHECK IF ONE
```

```
6218  036132  005037  003612                  CLR     P1.BIT          ;ZERO
6219  036136  000403                          BR      15$             ;CLOCK IN BIT
6220
6221  036140  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6222  036146  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6223  036152  104170                          ERROR   170             ;BIT INCORRECT
6224  036154  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6225  036160  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6226  036162  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6227  036164  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6228  036166  001343                          BNE     10$             ;NO, GET NEXT WORD
6229  036170  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6230  036174  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6231  036202  013737  003614  003616          MOV     PR.BIT,M1.BIT
6232  036210  013737  003612  003614          MOV     P1.BIT,PR.BIT
6233  036216  005037  003612                  CLR     P1.BIT
6234  036222  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
6235  036226  104170                          ERROR   170             ;BIT INCORRECT
6236  036230  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6237  036234  005301                          DEC     R1              ;CHECK IF FINISHED
6238  036236  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6239  036240  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6240  036246  012700  000004                  MOV     #4,R0
6241  036252  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6242  036260  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6243  036266  005300                          DEC     R0
6244  036270  001370                          BNE     20$
6245  036272  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6246  036300  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6247  036306  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6248  036314  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6249  036322  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6250  036324  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6251  036326  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6252  036332  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6253  036340  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6254  036346  005300                          DEC     R0
6255  036350  001370                          BNE     26$
6256  036352  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6257  036360  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6258  036366  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6259  036374  001401                          BEQ     TST44           ;;YES, GO ON TO NEXT TEST
6260  036376  104174                          ERROR   174             ;CS1 INCORRECT
6261
6262                                  ;;**********************************************************
6263                                  ;*TEST 44        WRITE LOOPBACK (PART 7)
6264                                  ;*
6265                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6266                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6267                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6268                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6269                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6270                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6271                                  ;*
6272                                  ;*              104210
6273                                  ;*              104210
```

```
                                        ;*              104210
                                        ;*
                                        ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
                                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
                                        ;*
                                        ;.*****************************************************************
036400  000004                  TST44:  SCOPE
036402  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
036410  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
036414  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
036422  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
036430  012762  067034  000004          MOV     #HEAD7,RKBA(R2) ;ISSUE WRITE HEADER
036436  012762  177775  000002          MOV     #-3,RKWC(R2)
036444  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
036452  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR INDEX PULSE
036456  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
036464  012762  000040  000026          MOV     #DMD,RKMR1(R2)
036472  005300                          DEC     R0
036474  001370                          BNE     1$
036476  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
036502  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
036510  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
036516  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
036524  005300                          DEC     R0
036526  001370                          BNE     2$
036530  012762  000040  000026          MOV     #DMD,RKMR1(R2)
036536  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
036542  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
036550  012762  000040  000026          MOV     #DMD,RKMR1(R2)
036556  005300                          DEC     R0
036560  001370                          BNE     3$
036562  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
036570  012762  000040  000026          MOV     #DMD,RKMR1(R2)
036576  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
036602  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
036610  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
036616  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
036622  005037  003614                  CLR     PR.BIT
036626  005037  003616                  CLR     M1.BIT
036632  005037  003620                  CLR     M2.BIT
036636  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
036642  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
036646  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
036652  104170                          ERROR   170             ;DATA INCORRECT
036654  005237  003622                  INC     BITCNT
036660  005300                          DEC     R0              ;CHECK IF READY FOR DATA
036662  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
036664  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
036672  004737  045214                  JSR     PC,WRTBIT
036676  104170                          ERROR   170             ;DATA INCORRECT
036700  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
036704  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
036712  012703  067034                  MOV     #HEAD7,R3       ;LOAD ADDRESS OF DATA
036716  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
```

```
6330  036722  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6331  036724  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6332  036730  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6333  036736  013737  003614  003616          MOV     PR.BIT,M1.BIT
6334  036744  013737  003612  003614          MOV     P1.BIT,PR.BIT
6335  036752  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6336  036754  103403                          BCS     14$             ;CHECK IF ONE
6337  036756  005037  003612                  CLR     P1.BIT          ;ZERO
6338  036762  000403                          BR      15$             ;CLOCK IN BIT
6339
6340  036764  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6341  036772  004737  045214  15$:    JSR     PC,WRTBIT       ;WRITE BIT
6342  036776  104170                          ERROR   170             ;BIT INCORRECT
6343  037000  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6344  037004  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6345  037006  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6346  037010  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6347  037012  001343                          BNE     10$             ;NO, GET NEXT WORD
6348  037014  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6349  037020  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6350  037026  013737  003614  003616          MOV     PR.BIT,M1.BIT
6351  037034  013737  003612  003614          MOV     P1.BIT,PR.BIT
6352  037042  005037  003612                  CLR     P1.BIT
6353  037046  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
6354  037052  104170                          ERROR   170             ;BIT INCORRECT
6355  037054  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6356  037060  005301                          DEC     R1              ;CHECK IF FINISHED
6357  037062  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6358  037064  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6359  037072  012700  000004                  MOV     #4,R0
6360  037076  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6361  037104  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6362  037112  005300                          DEC     R0
6363  037114  001370                          BNE     20$
6364  037116  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6365  037124  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6366  037132  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6367  037140  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6368  037146  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6369  037150  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6370  037152  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6371  037156  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6372  037164  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6373  037172  005300                          DEC     R0
6374  037174  001370                          BNE     26$
6375  037176  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6376  037204  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6377  037212  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6378  037220  001401                          BEQ     TST45           ;;YES, GO ON TO NEST TEST
6379  037222  104174                          ERROR   174             ;CS1 INCORRECT
6380
6381                                  ;;*****************************************************************
6382                                  ;*TEST 45       WRITE TWO HEADERS
6383                                  ;*
6384                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6385                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
```

```
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                                        ;*      INDEX PULSE, SECTOR PULSE, THREE WORD HEADER
                                        ;*      CONSISTING OF THE FOLLOWING DATA:
                                        ;*
                                        ;*              177777
                                        ;*              000000
                                        ;*              177777
                                        ;*
                                        ;*      FOLLOW THAT BY A SECTOR PULSE AND ONE THREE WORD
                                        ;*      HEADER CONSISTING OF THE FOLLOWING DATA:
                                        ;*
                                        ;*              000000
                                        ;*              177777
                                        ;*              000000
                                        ;*
                                        ;*      SIMULATE AN INDEX PULSE AND MAKE SURE READY COMES UP.
                                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMENSATION.
                                        ;*
                                        ;;*****************************************************************
037224  000004                  1$T45:  SCOPE
037226  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
037234  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
037240  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
037246  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
037254  012762  066762  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
037262  012703  066762                  MOV     #HEAD1,R3
037266  012762  177772  000002          MOV     #-6,RKWC(R2)
037274  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
037302  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                        ;                       READY FOR INDEX PULSE
037306  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
037314  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037322  005300                          DEC     R0
037324  001370                          BNE     1$
037326  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
037332  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037340  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
037346  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037354  005300                          DEC     R0
037356  001370                          BNE     2$
037360  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
037364  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037372  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
037376  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
037402  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
037410  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037416  005300                          DEC     R0
037420  001370                          BNE     3$
037422  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
037430  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037436  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
037444  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                        ;                       MAINT REG 1
037452  005037  003612                  CLR     P1.BIT
037456  005037  003614                  CLR     PR.BIT
```

```
6442  037462  005037  003616                        CLR     M1.BIT
6443  037466  005037  003620                        CLR     M2.BIT
6444  037472  012700  000400                        MOV     #256.,R0        ;SIMULATE SYNCH
6445  037476  005037  003622                        CLR     BITCNT          ;INITIALIZE BIT COUNT
6446  037502  004737  045214            5$:         JSR     PC,WRTBIT       ;WRITE ONE BIT
6447  037506  104170                              ERROR   170             ;DATA INCORRECT
6448  037510  005237  003622                        INC     BITCNT
6449  037514  005300                              DEC     R0              ;CHECK IF READY FOR DATA
6450  037516  001371                              BNE     5$              ;NO,GENERATE NEXT BIT
6451  037520  012737  000001  003612              MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6452  037526  004737  045214                        JSR     PC,WRTBIT
6453  037532  104170                              ERROR   170             ;DATA INCORRECT
6454  037534  005037  003622                        CLR     BITCNT          ;INITIALIZE BIT COUNT
6455  037540  012737  063111  003170              MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6456  037546  012700  000003                        MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6457  037552  012304            10$:        MOV     (R3)+,R4        ;GET NEXT WORD
6458  037554  012701  000020                        MOV     #16.,R1         ;LOAD BIT COUNT
6459  037560  013737  003616  003620    12$:        MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6460  037566  013737  003614  003616              MOV     PR.BIT,M1.BIT
6461  037574  013737  003612  003614              MOV     P1.BIT,PR.BIT
6462  037602  006004                              ROR     R4              ;SHIFT IN NEXT BIT
6463  037604  103403                              BCS     14$             ;CHECK IF ONE
6464  037606  005037  003612                        CLR     P1.BIT          ;ZERO
6465  037612  000403                              BR      15$             ;CLOCK IN BIT
6466
6467  037614  012737  000001  003612    14$:        MOV     #1,P1.BIT       ;ONE
6468  037622  004737  045214            15$:        JSR     PC,WRTBIT       ;WRITE BIT
6469  037626  104170                              ERROR   170             ;BIT INCORRECT
6470  037630  005237  003622                        INC     BITCNT          ;INCREMENT BIT COUNT
6471  037634  005301                              DEC     R1              ;CHECK IF WORD FINISHED
6472  037636  001350                              BNE     12$             ;NO, CONTINUE
6473  037640  005300                              DEC     R0              ;CHECK IF HEADER COMPLETE
6474  037642  001343                              BNE     10$             ;NO, GET NEXT WORD
6475  037644  012701  000020                        MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6476  037650  013737  003616  003620    18$:        MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6477  037656  013737  003614  003616              MOV     PR.BIT,M1.BIT
6478  037664  013737  003612  003614              MOV     P1.BIT,PR.BIT
6479  037672  005037  003612                        CLR     P1.BIT
6480  037676  004737  045214                        JSR     PC,WRTBIT       ;WRITE ZERO
6481  037702  104170                              ERROR   170             ;BIT INCORRECT
6482  037704  005237  003622                        INC     BITCNT          ;INCREMENT
6483  037710  005301                              DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6484  037712  001356                              BNE     18$             ;NO, CONTINUE
6485  037714  005237  003626                        INC     SECCNT          ;INCREMENT
6486  037720  005305                              DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
6487  037722  001237                              BNE     4$              ;NO, DO SECOND HEADER
6488  037724  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6489  037732  012700  000004                        MOV     #4,R0
6490  037736  012762  000640  000026    20$:        MOV     #DMD!MIND!MCLK,RKMR1(R2)
6491  037744  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)
6492  037752  005300                              DEC     R0
6493  037754  001370                              BNE     20$
6494  037756  012762  000040  000026              MOV     #DMD,RKMR1(R2)
6495  037764  016237  000026  003464              MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6496  037772  012737  022040  003524              MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
6497  040000  023737  003524  003464              CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
```

```
6498  040006  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6499  040010  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6500  040012  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6501  040016  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6502  040024  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6503  040032  005300                          DEC     R0
6504  040034  001370                          BNE     26$
6505  040036  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6506  040044  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
6507  040052  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6508  040060  001401                          BEQ     TST46           ;;YES, GO ON TO NEXT TEST
6509  040062  104174                          ERROR   174
6510
6511                                  ;;*****************************************************************
6512                                  ;*TEST 46       DATA FIELD FILLING ON WRITE HEADER
6513                                  ;*
6514                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6515                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6516                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, AND
6517                                  ;*      SPECIFY TWO 3 WORD HEADERS CONSISTING OF THE
6518                                  ;*      FOLLOWING DATA:
6519                                  ;*
6520                                  ;*              125252
6521                                  ;*              052525
6522                                  ;*              125252
6523                                  ;*              052525
6524                                  ;*              125252
6525                                  ;*              052525
6526                                  ;*
6527                                  ;*      MAKE SURE THE DATA SYNCH ANY OTHER BITS OF DATA AND
6528                                  ;*      ECC FIELD ARE WRITTEN CORRECTLY.
6529                                  ;*
6530                                  ;*****************************************************************
6531  040064  000004                  TST46:  SCOPE
6532  040066  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6533  040074  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6534  040100  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6535  040106  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6536  040114  012762  066776  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE READ HEADER
6537  040122  012703  066776                  MOV     #HEAD3,R3
6538  040126  012762  177772  000002          MOV     #-2*3,RKWC(R2)
6539  040134  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
6540  040142  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
6541                                                                  ;  FOR INDEX PULSE
6542  040146  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6543  040154  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6544  040162  005300                          DEC     R0
6545  040164  001370                          BNE     1$
6546  040166  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6547  040172  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6548  040200  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6549  040206  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6550  040214  005300                          DEC     R0
6551  040216  001370                          BNE     2$
6552  040220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6553  040226  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
```

```
6554  040232  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6555  040240  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6556  040246  005300                          DEC     R0
6557  040250  001370                          BNE     3$
6558  040252  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
6559  040256  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
6560  040262  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6561  040270  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6562  040276  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6563  040304  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6564                                                                  ;  MAINT REG 1
6565  040312  005037  003612                  CLR     P1.BIT
6566  040316  005037  003614                  CLR     PR.BIT
6567  040322  005037  003616                  CLR     M1.BIT
6568  040326  005037  003620                  CLR     M2.BIT
6569  040332  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6570  040336  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6571  040342  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6572  040346  104170                          ERROR   170             ;DATA INCORRECT
6573  040350  005237  003622                  INC     BITCNT
6574  040354  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6575  040356  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6576  040360  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6577  040366  004737  045214                  JSR     PC,WRTBIT
6578  040372  104170                          ERROR   170             ;DATA INCORRECT
6579  040374  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6580  040400  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6581  040406  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6582  040412  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
6583  040414  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6584  040420  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6585  040426  013737  003614  003616          MOV     PR.BIT,M1.BIT
6586  040434  013737  003612  003614          MOV     P1.BIT,PR.BIT
6587  040442  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6588  040444  103403                          BCS     14$             ;CHECK IF ONE
6589  040446  005037  003612                  CLR     P1.BIT          ;ZERO
6590  040452  000403                          BR      15$             ;CLOCK IN BIT
6591
6592  040454  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
6593  040462  004737  045214          15$:     JSR     PC,WRTBIT       ;WRITE BIT
6594  040466  104170                          ERROR   170             ;BIT INCORRECT
6595  040470  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6596  040474  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6597  040476  001350                          BNE     12$             ;NO, CONTINUE
6598  040500  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6599  040502  001343                          BNE     10$             ;NO, GET NEXT WORD
6600  040504  012737  063343  003170          MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
6601  040512  012701  000477                  MOV     #64.+255.,R1    ;LOAD COUNT
6602  040516  013737  003616  003620  18$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6603  040524  013737  003614  003616          MOV     PR.BIT,M1.BIT
6604  040532  013737  003612  003614          MOV     P1.BIT,PR.BIT
6605  040540  005037  003612                  CLR     P1.BIT
6606  040544  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
6607  040550  104170                          ERROR   170             ;BIT INCORRECT
6608  040552  005301                          DEC     R1              ;CHECK IF READY FOR DATA
6609  040554  001360                          BNE     18$             ;NO, CONTINUE
```

```
6610  040556  012737  000001  003612          MOV     #1,P1.BIT          ;SET SYNCH BIT
6611  040564  004737  045214                  JSR     PC,WRTBIT          ;WRITE SYNCH BIT
6612  040570  104170                          ERROR   170                ;SYNCH BIT INCORRECT
6613  040572  012737  063411  003170          MOV     #EM238,EMW         ;LOAD ERROR MESSAGE
6614  040600  005037  003622                  CLR     BITCNT             ;CLEAR BIT COUNT
6615  040604  012701  007777                  MOV     #256.*16.-1,R1     ;LOAD COUNT
6616  040610  013737  003616  003620  20$:    MOV     M1.BIT,M2.BIT      ;SHIFT BITS
6617  040616  013737  003614  003616          MOV     PR.BIT,M1.BIT
6618  040624  013737  003612  003614          MOV     P1.BIT,PR.BIT
6619  040632  005037  003612                  CLR     P1.BIT
6620  040636  004737  045214                  JSR     PC,WRTBIT          ;WRITE ZEROS
6621  040642  104170                          ERROR   170                ;BIT INCORRECT
6622  040644  005237  003622                  INC     BITCNT             ;INCREMENT BIT COUNT
6623  040650  005301                          DEC     R1                 ;CHECK IF READY FOR ECC
6624  040652  001356                          BNE     20$                ;NO, CONTINUE
6625  040654  012701  000040                  MOV     #32.,R1            ;LOAD COUNT
6626  040660  042737  020000  003524          BIC     #ECCW,E.MR1        ;RESET ECCW BIT
6627  040666  004737  045214          21$:    JSR     PC,WRTBIT          ;WRITE ECC FIELD
6628  040672  104170                          ERROR   170                ;BIT INCORRECT
6629  040674  005237  003622                  INC     BITCNT             ;INCREMENT COUNT
6630  040700  005301                          DEC     R1                 ;CHECK IF READY FOR POST AMBLE
6631  040702  001371                          BNE     21$                ;NO CONTINUE
6632  040704  052737  020000  003524          BIS     #ECCW,E.MR1        ;SET ECCW
6633  040712  012701  000012                  MOV     #10.,R1            ;CHECK IF READY FOR NEXT HEADER
6634  040716  004737  045214          22$:    JSR     PC,WRTBIT          ;WRITE POSTAMBLE
6635  040722  104170                          ERROR   170                ;BIT INCORRECT
6636  040724  005237  003622                  INC     BITCNT             ;INCREMENT COUNT
6637  040730  005301                          DEC     R1                 ;CHECK IF READY FOR NEXT HEADER
6638  040732  001371                          BNE     22$                ;NO, COMPLETE POSTAMBLE
6639  040734  005237  003626                  INC     SECCNT             ;INCREMENT COUNT
6640  040740  005305                          DEC     R5                 ;CHECK IF ALL HEADERS RECEIVED
6641  040742  001402                          BEQ     23$                ;YES, SIMULATE INDEX
6642  040744  000137  040262                  JMP     4$                 ;NO GET NEXT HEADER
6643
6644  040750  012762  000240  000026  23$:    MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6645  040756  012700  000004                  MOV     #4,R0
6646  040762  012762  000640  000026  25$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6647  040770  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6648  040776  005300                          DEC     R0
6649  041000  001370                          BNE     25$
6650  041002  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6651  041010  016237  000026  003464          MOV     RKMR1(R2),T.MR1    ;GET MAINT REG 1
6652  041016  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6653  041024  023737  003524  003464          CMP     E.MR1,T.MR1        ;CHECK IF MR1 CORRECT
6654                                                                     ;   (WRITE GATE RESET)
6655  041032  001401                          BEQ     28$                ;YES, CHECK IF READY SET
6656  041034  104173                          ERROR   173                ;MAINTENANCE REG 1 INCORRECT
6657  041036  012700  000010          28$:    MOV     #8.,R0             ;FINISH COMMAND
6658  041042  012762  000440  000026  29$:    MOV     #DMD!MCLK,RKMR1(R2)
6659  041050  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6660  041056  005300                          DEC     R0
6661  041060  001370                          BNE     29$
6662  041062  016237  000000  003440          MOV     RKCS1(R2),T.CS1    ;GET COMMAND AND STATUS REG 1
6663  041070  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6664  041076  023737  003500  003440          CMP     E.CS1,T.CS1        ;CHECK IF CS1 CORRECT
6665  041104  001401                          BEQ     TST47              ;;YES, GO TO NEXT TEST
```

```
 6666  041106  104174                          ERROR   174             ;CS1 INCORRECT
 6667
 6668                                  ;;*****************************************************************
 6669                                  ;*TEST 47       WRITE HEADER FOR 26 SECTORS
 6670                                  ;*
 6671                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6672                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6673                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, SPECIFYING
 6674                                  ;*      66 WORDS.  MAKE SURE ALL 26 SECTORS ARE WRITTEN CORRECTLY.
 6675                                  ;*
 6676                                  ;*****************************************************************
 6677  041110  000004                  ↑ST47:  SCOPE
 6678  041112  012737  000010  001200          MOV     #10.$TIMES      ;;DO 10 ITERATIONS
 6679  041120  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6680  041124  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6681  041132  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 6682  041140  012762  067042  000004          MOV     #NPRBUF,RKBA(R2)        ;ISSUE READ HEADER
 6683  041146  012703  067042                  MOV     #NPRBUF,R3
 6684  041152  012762  177676  000002          MOV     #-22.*3,RKWC(R2)
 6685  041160  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
 6686  041166  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
 6687                                                                  ;  FOR INDEX PULSE
 6688  041172  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6689  041200  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6690  041206  005300                          DEC     R0
 6691  041210  001370                          BNE     1$
 6692  041212  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
 6693  041216  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6694  041224  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6695  041232  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6696  041240  005300                          DEC     R0
 6697  041242  001370                          BNE     2$
 6698  041244  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6699  041252  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6700  041256  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 6701  041264  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6702  041272  005300                          DEC     R0
 6703  041274  001370                          BNE     3$
 6704  041276  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
 6705  041302  012705  000026                  MOV     #22.,R5         ;LOAD NUMBER OF HEADERS
 6706  041306  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6707  041314  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6708  041322  012737  063045  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 6709  041330  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6710                                                                  ;  MAINT REG 1
 6711  041336  005037  003612                  CLR     P1.BIT
 6712  041342  005037  003614                  CLR     PR.BIT
 6713  041346  005037  003616                  CLR     M1.BIT
 6714  041352  005037  003620                  CLR     M2.BIT
 6715  041356  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 6716  041362  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6717  041366  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 6718  041372  104170                          ERROR   170             ;DATA INCORRECT
 6719  041374  005237  003622                  INC     BITCNT
 6720  041400  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 6721  041402  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
```

```
6722  041404  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6723  041412  004737  045214                  JSR     PC,WRTBIT
6724  041416  104170                          ERROR   170             ;DATA INCORRECT
6725  041420  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6726  041424  012737  063111  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6727  041432  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6728  041436  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6729  041440  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6730  041444  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6731  041452  013737  003614  003616          MOV     PR.BIT,M1.BIT
6732  041460  013737  003612  003614          MOV     P1.BIT,PR.BIT
6733  041466  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6734  041470  103403                          BCS     14$             ;CHECK IF ONE
6735  041472  005037  003612                  CLR     P1.BIT          ;ZERO
6736  041476  000403                          BR      15$             ;CLOCK IN BIT
6737
6738  041500  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6739  041506  004737  045214          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6740  041512  104170                          ERROR   170             ;BIT INCORRECT
6741  041514  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6742  041520  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6743  041522  001350                          BNE     12$             ;NO, CONTINUE
6744  041524  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6745  041526  001343                          BNE     10$             ;NO, GET NEXT WORD
6746  041530  012737  063343  003170          MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
6747  041536  012701  000477                  MOV     #64.+255.,R1    ;LOAD COUNT
6748  041542  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6749  041550  013737  003614  003616          MOV     PR.BIT,M1.BIT
6750  041556  013737  003612  003614          MOV     P1.BIT,PR.BIT
6751  041564  005037  003612                  CLR     P1.BIT
6752  041570  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZERO
6753  041574  104170                          ERROR   170             ;BIT INCORRECT
6754  041576  005301                          DEC     R1              ;CHECK IF READY FOR DATA
6755  041600  001360                          BNE     18$             ;NO, CONTINUE
6756  041602  012737  000001  003612          MOV     #1,P1.BIT       ;SET SYNCH BIT
6757  041610  004737  045214                  JSR     PC,WRTBIT       ;WRITE SYNCH BIT
6758  041614  104170                          ERROR   170             ;SYNCH BIT INCORRECT
6759  041616  012737  063411  003170          MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
6760  041624  005037  003622                  CLR     BITCNT          ;CLEAR BIT COUNT
6761  041630  012701  007777                  MOV     #256.*16.-1,R1  ;LOAD COUNT
6762  041634  013737  003616  003620  20$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6763  041642  013737  003614  003616          MOV     PR.BIT,M1.BIT
6764  041650  013737  003612  003614          MOV     P1.BIT,PR.BIT
6765  041656  005037  003612                  CLR     P1.BIT
6766  041662  004737  045214                  JSR     PC,WRTBIT       ;WRITE ZEROS
6767  041666  104170                          ERROR   170             ;BIT INCORRECT
6768  041670  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6769  041674  005301                          DEC     R1              ;CHECK IF READY FOR ECC
6770  041676  001356                          BNE     20$             ;NO, CONTINUE
6771  041700  012701  000040                  MOV     #32.,R1         ;LOAD COUNT
6772  041704  042737  020000  003524          BIC     #ECCW,E.MR1     ;RESET ECCW BIT
6773  041712  004737  045214          21$:    JSR     PC,WRTBIT       ;WRITE ECC FIELD
6774  041716  104170                          ERROR   170             ;BIT INCORRECT
6775  041720  005237  003622                  INC     BITCNT          ;INCREMENT COUNT
6776  041724  005301                          DEC     R1              ;CHECK IF READY FOR POST AMBLE
6777  041726  001371                          BNE     21$             ;NO CONTINUE
```

```
6778  041730  052737  020000  003524          BIS     #ECCW,E.MR1     ;SET ECCW
6779  041736  012701  000012                  MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
6780  041742  004737  045214          22$:    JSR     PC,WRTBIT       ;WRITE POSTAMBLE
6781  041746  104170                          ERROR   170             ;BIT INCORRECT
6782  041750  005237  003622                  INC     BITCNT          ;INCREMENT COUNT
6783  041754  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6784  041756  001371                          BNE     22$             ;NO, COMPLETE POSTAMBLE
6785  041760  005237  003626                  INC     SECCNT          ;INCREMENT COUNT
6786  041764  005305                          DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
6787  041766  001402                          BEQ     23$             ;YES, SIMULATE INDEX
6788  041770  000137  041306                  JMP     4$              ;NO GET NEXT HEADER
6789
6790  041774  012762  000240  000026  23$:    MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6791  042002  012700  000004                  MOV     #4,R0
6792  042006  012762  000640  000026  25$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6793  042014  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6794  042022  005300                          DEC     R0
6795  042024  001370                          BNE     25$
6796  042026  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6797  042034  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6798  042042  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6799  042050  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6800                                                                  ;  (WRITE GATE RESET)
6801  042056  001401                          BEQ     28$             ;YES, CHECK IF READY SET
6802  042060  104173                          ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6803  042062  012700  000010          28$:    MOV     #8.,R0          ;FINISH COMMAND
6804  042066  012762  000440  000026  29$:    MOV     #DMD!MCLK,RKMR1(R2)
6805  042074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6806  042102  005300                          DEC     R0
6807  042104  001370                          BNE     29$
6808  042106  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6809  042114  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6810  042122  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6811  042130  001401                          BEQ     TST50           ;YES, GO TO NEXT TEST
6812  042132  104174                          ERROR   174             ;CS1 INCORRECT
6813
6814                                  ;;*****************************************************************
6815                                  ;*TEST 50       WRITE HEADER IN 24 SECTOR FORMAT
6816                                  ;*
6817                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
6818                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
6819                                  ;*      OF SIX WORDS IN 24 SECTOR FORMAT TO AN RK06, CYLINDER 0,
6820                                  ;*      HEAD 0, DRIVE 0.  CLOCK THROUGH THE SEEK AND DRIVE CLEAR
6821                                  ;*      MESSAGES, SIMULATE INDEX PULSE, SECTOR PULSE, 3 HEADER
6822                                  ;*      WORDS, SYNCH AND DATA, ANOTHER SECTOR PULSE, 3 HEADER
6823                                  ;*      WORDS, AND AN INDEX PULSE.  CHECK DATA WRITTEN TO MAKE
6824                                  ;*      SURE ONLY LOW 16 BITS OF SILO ARE USED.
6825                                  ;*
6826                                  ;*****************************************************************
6827  042134  000004                  TST50:  SCOPE
6828  042136  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6829  042144  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6830  042150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6831  042156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
6832  042164  012762  066762  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
6833  042172  012703  066762                  MOV     #HEAD1,R3
```

```
 6834  042176  012762  177772  000002          MOV     #-6,RKWC(R2)
 6835  042204  012762  010027  000000          MOV     #CFMT!WRHEAD,RKCS1(R2)
 6836  042212  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6837                                                                  ;  READY FOR INDEX PULSE
 6838  042216  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6839  042224  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6840  042232  005300                          DEC     R0
 6841  042234  001370                          BNE     1$
 6842  042236  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
 6843  042242  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6844  042250  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6845  042256  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6846  042264  005300                          DEC     R0
 6847  042266  001370                          BNE     2$
 6848  042270  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
 6849  042274  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6850  042302  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
 6851  042306  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6852  042312  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 6853  042320  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6854  042326  005300                          DEC     R0
 6855  042330  001370                          BNE     3$
 6856  042332  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6857  042340  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6858  042346  012737  063450  003170          MOV     #EM239,EMW      ;LOAD ERROR MESSAGE
 6859  042354  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6860                                                                  ;  MAINT REG 1
 6861  042362  005037  003612                  CLR     P1.BIT
 6862  042366  005037  003614                  CLR     PR.BIT
 6863  042372  005037  003616                  CLR     M1.BIT
 6864  042376  005037  003620                  CLR     M2.BIT
 6865  042402  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 6866  042406  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6867  042412  004737  045214          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 6868  042416  104170                          ERROR   170             ;DATA INCORRECT
 6869  042420  005237  003622                  INC     BITCNT
 6870  042424  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 6871  042426  001371                          BNE     5$              ;NO,GENERATE NEXT BIT
 6872  042430  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6873  042436  004737  045214                  JSR     PC,WRTBIT
 6874  042442  104170                          ERROR   170             ;DATA INCORRECT
 6875  042444  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6876  042450  012737  063542  003170          MOV     #EM240,EMW      ;LOAD ERROR MESSAGE
 6877  042456  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6878  042462  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
 6879  042464  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 6880  042470  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6881  042476  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6882  042504  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6883  042512  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 6884  042514  103403                          BCS     14$             ;CHECK IF ONE
 6885  042516  005037  003612                  CLR     P1.BIT          ;ZERO
 6886  042522  000403                          BR      15$             ;CLOCK IN BIT
 6887
 6888  042524  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
 6889  042532  004737  045214          15$:     JSR     PC,WRTBIT       ;WRITE BIT
```

```
 6890  042536  104170                          ERROR   170                 ;BIT INCORRECT
 6891  042540  005237  003622                  INC     BITCNT              ;INCREMENT BIT COUNT
 6892  042544  005301                          DEC     R1                  ;CHECK IF WORD FINISHED
 6893  042546  001350                          BNE     12$                 ;NO, CONTINUE
 6894  042550  005300                          DEC     R0                  ;CHECK IF HEADER COMPLETE
 6895  042552  001343                          BNE     10$                 ;NO, GET NEXT WORD
 6896  042554  012701  000020                  MOV     #16.,R1             ;LOAD BIT COUNT FOR NEXT WORD
 6897  042560  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT       ;SHIFT BITS
 6898  042566  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6899  042574  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6900  042602  005037  003612                  CLR     P1.BIT
 6901  042606  004737  045214                  JSR     PC,WRTBIT           ;WRITE ZERO
 6902  042612  104170                          ERROR   170                 ;BIT INCORRECT
 6903  042614  005237  003622                  INC     BITCNT              ;INCREMENT
 6904  042620  005301                          DEC     R1                  ;CHECK IF READY FOR NEXT HEADER
 6905  042622  001356                          BNE     18$                 ;NO, CONTINUE
 6906  042624  005237  003626                  INC     SECCNT              ;INCREMENT
 6907  042630  005305                          DEC     R5                  ;CHECK IF SECOND HEADER WRITTEN
 6908  042632  001237                          BNE     4$                  ;NO, DO SECOND HEADER
 6909  042634  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
 6910  042642  012700  000004                  MOV     #4,R0
 6911  042646  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6912  042654  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6913  042662  005300                          DEC     R0
 6914  042664  001370                          BNE     20$
 6915  042666  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6916  042674  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;GET MAINT REG 1
 6917  042702  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 6918  042710  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK MR1 CORRECT (WRITE GATE RESET
 6919  042716  001401                          BEQ     25$                 ;YES, CHECK IF READY SET
 6920  042720  104173                          ERROR   173                 ;MAINT REG 1 INCORRECT
 6921  042722  012700  000010          25$:    MOV     #8.,R0              ;FINISH COMMAND
 6922  042726  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 6923  042734  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6924  042742  005300                          DEC     R0
 6925  042744  001370                          BNE     26$
 6926  042746  016237  000000  003440          MOV     RKCS1(R2),T.CS1     ;GET COMMAND AND STATUS REG 1
 6927  042754  012737  010226  003500          MOV     #RDY!CFMT!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6928  042762  023737  003500  003440          CMP     E.CS1,T.CS1         ;CHECK IF CS1 CORRECT
 6929  042770  001401                          BEQ     TST51               ;;YES, GO ON TO NEXT TEST
 6930  042772  104174                          ERROR   174
 6931
 6932                                  .SBTTL  **TYPE B INSTRUCTION ERRORS
 6933
 6934                                  ;;*****************************************************************
 6935                                  ;*TEST 51        FORMAT ERROR (PART 1)
 6936                                  ;*
 6937                                  ;*       CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
 6938                                  ;*       CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
 6939                                  ;*       RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0.
 6940                                  ;*       CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
 6941                                  ;*       MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
 6942                                  ;*       DRIVE AVAILABLE AND CONTROLLER ERROR SET.
 6943                                  ;*
 6944                                  ;;*****************************************************************
 6945  042774  000004                  TST51:  SCOPE
```

```
 6946  043776  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6947  044004  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6948  044010  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
 6949  044016  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
 6950  044024  012762  000043  000020          MOV     #43,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
 6951  044032  012762  000025  000000          MOV     #PDHEAD,RKCS1(R2) ;ISSUE READ HEADER
 6952  044040  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
 6953  044044  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6954  044052  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6955  044060  005300                          DEC     R0
 6956  044062  001370                          BNE     1$
 6957  044064  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
 6958  044070  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
 6959  044074  105762  000000          2$:     TSTB    RKCS1(R2)
 6960  044100  100402                          BMI     3$
 6961  044102  005300                          DEC     R0
 6962  044104  001373                          BNE     2$
 6963  044106  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6964  044114  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6965  044122  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6966  044130  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6967  044136  012737  100224  003500          MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6968  044144  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6969  044152  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
 6970  044160  012737  000020  003514          MOV     #FMTE,E.ER      ;LOAD EXPECTED ERROR REG
 6971  044166  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
 6972  044174  001401                          BEQ     4$              ;YES, CONTINUE
 6973  044176  104175                          ERROR   175
 6974  044200  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
 6975  044206  001401                          BEQ     5$              ;YES, CONTINUE
 6976  044210  104176                          ERROR   176
 6977  044212  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
 6978  044220  001401                          BEQ     6$              ;YES, CONTINUE
 6979  044222  104177                          ERROR   177
 6980  044224  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
 6981  044232  001401                          BEQ     7$              ;YES, CONTINUE
 6982  044234  104200                          ERROR   200
 6983  044236  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
 6984  044244  013737  003450  003550          MOV     T.CS2,P.CS2     ;   COMMAND AND STATUS REG 1
 6985  044252  013737  003452  003552          MOV     T.DS,P.DS       ;   COMMAND AND STATUS REG 2
 6986  044260  013737  003454  003554          MOV     T.ER,P.ER       ;   DRIVE STATUS REG
 6987                                          ;   AND ERROR REG
 6988  044266  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6989  044274  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6990  044302  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6991  044310  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6992  044316  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6993  044324  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 6994  044332  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6995  044340  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
 6996  044344  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
 6997  044350  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 6998  044356  001401                          BEQ     11$             ;YES, CONTINUE
 6999  044360  104211                          ERROR   211             ;CS1 INCORRECT
 7000  044362  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 7001  044370  001401                          BEQ     12$             ;YES. CONTINUE
```

```
7002  043372  104212                          ERROR   212             ;CS2 INCORRECT
7003  043374  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7004  043402  001401                          BEQ     13$             ;YES, CONTINUE
7005  043404  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7006  043406  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7007  043414  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7008  043416  104214                          ERROR   214             ;ERROR REG INCORRECT
7009  043420                          14$:
7010
7011                                  ;;*****************************************************************
7012                                  ;*TEST 52       FORMAT ERROR (PART 2)
7013                                  ;*
7014                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
7015                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
7016                                  ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0.
7017                                  ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
7018                                  ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
7019                                  ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
7020                                  ;*
7021                                  ;;*****************************************************************
7022  043420  000004                  TST52:  SCOPE
7023  043422  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
7024  043430  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
7025  043434  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
7026  043442  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
7027  043450  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
7028  043456  012762  010025  000000          MOV     #RDHEAD!CFMT,RKCS1(R2) ;ISSUE READ HEADER
7029  043464  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
7030  043470  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
7031  043476  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7032  043504  005300                          DEC     R0
7033  043506  001370                          BNE     1$
7034  043510  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
7035  043514  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
7036  043520  105762  000000          2$:     TSTB    RKCS1(R2)
7037  043524  100402                          BMI     3$
7038  043526  005300                          DEC     R0
7039  043530  001373                          BNE     2$
7040  043532  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7041  043540  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7042  043546  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7043  043554  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7044  043562  012737  110224  003500          MOV     #CERR!RDY!RDHEAD!CFMT&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
7045  043570  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7046  043576  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
7047  043604  012737  000030  003514          MOV     #FMTE!DRPAR,E.ER        ;LOAD EXPECTED ERROR REG
7048  043612  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
7049  043620  001401                          BEQ     4$              ;YES, CONTINUE
7050  043622  104201                          ERROR   201
7051  043624  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
7052  043632  001401                          BEQ     5$              ;YES, CONTINUE
7053  043634  104202                          ERROR   202
7054  043636  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
7055  043644  001401                          BEQ     6$              ;YES, CONTINUE
7056  043646  104203                          ERROR   203
7057  043650  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
```

```
7058  043656  001401                          BEQ     7$              ;YES, CONTINUE
7059  043660  104204                          ERROR   204
7060  043662  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
7061  043670  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
7062  043676  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
7063  043704  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
7064                                                                  ;  AND ERROR REG
7065  043712  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
7066  043720  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7067  043726  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7068  043734  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7069  043742  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7070  043750  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7071  043756  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7072  043764  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7073  043770  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
7074  043774  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7075  044002  001401                          BEQ     11$             ;YES, CONTINUE
7076  044004  104211                          ERROR   211             ;CS1 INCORRECT
7077  044006  023737  003510  003450  11$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
7078  044014  001401                          BEQ     12$             ;YES, CONTINUE
7079  044016  104212                          ERROR   212             ;CS2 INCORRECT
7080  044020  023737  003512  003452  12$:     CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7081  044026  001401                          BEQ     13$             ;YES, CONTINUE
7082  044030  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7083  044032  023737  003514  003454  13$:     CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7084  044040  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7085  044042  104214                          ERROR   214             ;ERROR REG INCORRECT
7086  044044                          14$:
7087
7088                                  ;;*****************************************************************
7089                                  ;*TEST 53       FAULT SETTING CONTROLLER ERROR
7090                                  ;*
7091                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
7092                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO
7093                                  ;*      AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE
7094                                  ;*      0.  CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.
7095                                  ;*      TURN OFF MAINTENANCE MODE.  MAKE SURE DRIVE
7096                                  ;*      AVAILABLE AND CONTROLLER ERROR SET.
7097                                  ;*
7098                                  ;*****************************************************************
7099  044044  000004                  TST53:  SCOPE
7100  044046  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
7101  044054  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
7102  044060  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
7103  044066  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
7104  044074  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
7105  044102  012762  177775  000002          MOV     #-3,RKWC(R2)    ;LOAD WORD COUNT
7106  044110  012762  067264  000004          MOV     #WRBUFF,RKBA(R2) ;LOAD BUS ADDRESS
7107  044116  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;ISSUE WRITE HEADER
7108  044124  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
7109  044130  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
7110  044136  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7111  044144  005300                          DEC     R0
7112  044146  001370                          BNE     1$
7113  044150  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
```

```
7114  044154  013700  003632              MOV     WAITIM,R0       ;WAIT FOR READY
7115  044160  105762  000000      2$:     TSTB    RKCS1(R2)
7116  044164  100402                      BMI     3$
7117  044166  005300                      DEC     R0
7118  044170  001373                      BNE     2$
7119  044172  016237  000000  003440  3$: MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7120  044200  016237  000010  003450      MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7121  044206  016237  000012  003452      MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7122  044214  016237  000014  003454      MOV     RKER(R2),T.ER   ;STORE ERROR REG
7123  044222  012737  100226  003500      MOV     #CERR!RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
7124  044230  012737  000100  003510      MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7125  044236  012737  100001  003512      MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
7126  044244  012737  000000  003514      MOV     #0,E.ER ;LOAD EXPECTED ERROR REG
7127  044252  023737  003500  003440      CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
7128  044260  001401                      BEQ     4$              ;YES, CONTINUE
7129  044262  104205                      ERROR   205
7130  044264  023737  003510  003450  4$: CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
7131  044272  001401                      BEQ     5$              ;YES, CONTINUE
7132  044274  104206                      ERROR   206
7133  044276  023737  003512  003452  5$: CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
7134  044304  001401                      BEQ     6$              ;YES, CONTINUE
7135  044306  104207                      ERROR   207
7136  044310  023737  003514  003454  6$: CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
7137  044316  001401                      BEQ     7$              ;YES, CONTINUE
7138  044320  104210                      ERROR   210
7139  044322  013737  003440  003540  7$: MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
7140  044330  013737  003450  003550      MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
7141  044336  013737  003452  003552      MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
7142  044344  013737  003454  003554      MOV     T.ER,P.ER       ;  DRIVE STATUS REG
7143                                                              ;  AND ERROR REG
7144  044352  012762  100000  000000      MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
7145  044360  016237  000000  003440      MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7146  044366  016237  000010  003450      MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7147  044374  016237  000012  003452      MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7148  044402  016237  000014  003454      MOV     RKER(R2),T.ER   ;STORE ERROR REG
7149  044410  012737  000200  003500      MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7150  044416  012737  000100  003510      MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7151  044424  005037  003512              CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7152  044430  005037  003514              CLR     E.ER            ;LOAD EXPECTED ERROR REG
7153  044434  023737  003500  003440      CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7154  044442  001401                      BEQ     11$             ;YES, CONTINUE
7155  044444  104211                      ERROR   211             ;CS1 INCORRECT
7156  044446  023737  003510  003450  11$: CMP    E.CS2,T.CS2     ;CHECK CS2 CORRECT
7157  044454  001401                      BEQ     12$             ;YES, CONTINUE
7158  044456  104212                      ERROR   212             ;CS2 INCORRECT
7159  044460  023737  003512  003452  12$: CMP    E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7160  044466  001401                      BEQ     13$             ;YES, CONTINUE
7161  044470  104213                      ERROR   213             ;DRIVE STATUS REG INCORRECT
7162  044472  023737  003514  003454  13$: CMP    E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7163  044500  001401                      BEQ     14$             ;YES, GO ON TO NEXT TEST
7164  044502  104214                      ERROR   214             ;ERROR REG INCORRECT
7165  044504                          14$:
7166
```

```
                                        .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 NEWPAS

044504                                  $EOP:
044504  000004                                SCOPE
044506  005037  001102                        CLR     $TSTNM          ;;ZERO THE TEST NUMBER
044512  005037  001200                        CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
044516  005237  001222                        INC     $PASS           ;;INCREMENT THE PASS NUMBER
044522  042737  100000  001222                BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
044530  005327                                DEC     (PC)+           ;;LOOP?
044532  000001                          $EOPCT: .WORD   1
044534  003063                                BGT     $DOAGN          ;;YES
044536  012737                                MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
044540  000001                          $ENDCT: .WORD   1
044542  044532                                  $EOPCT
044544  104401  044552                        TYPE    ,65$            ;;TYPE ASCIZ STRING
044550  000407                                BR      64$             ;;GET OVER THE ASCIZ
                                        ;;65$:  .ASCIZ  <12><15>/END PASS #/
044570                                  64$:
044570  013746  001222                        MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                        ;;TYPE PASS NUMBER
044574  104405                                TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044576  104401  044604                        TYPE    ,67$            ;;TYPE ASCIZ STRING
044602  000421                                BR      66$             ;;GET OVER THE ASCIZ
                                        ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
044646                                  66$:
044646  013746  001112                        MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                        ;;TOTAL NUMBER OF ERRORS
044652  104405                                TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044654  104401  001211                        TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
044660  005037  001112                        CLR     $ERTTL          ;;CLEAR ERROR TOTAL
044664  013700  000042                $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
044670  001405                                BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
044672  000005                                RESET                   ;;CLEAR THE WORLD
044674  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
044676  000240                                NOP                     ;;SAVE ROOM
044700  000240                                NOP                     ;;FOR
044702  000240                                NOP                     ;;ACT11
044704                                  $DOAGN:
044704  000137                                JMP     @(PC)+          ;;RETURN
044706  004654                          $RTNAD: .WORD   NEWPAS
044710      377       377       000     $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
044714                                          .EVEN

                                        .SBTTL  GENERATE BAD PARITY IN MEMORY

044714  013703  003640                WRTPAR: MOV     CSRPTR,R3       ;GET ADDRESS OF CSR TO BE USED
044720  012713  000004                        MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
044724  012737  000157  067300                MOV     #157,BADPAR     ;WRITE BAD PARITY
044732  012713  000001                        MOV     #PAR.EN,(R3)    ;ALLOW PARITY DETECTION
```

```
7223  044736  000207                          RTS     PC              ;RETURN
7224
7225                                  .SBTTL  CHECK FOR MEMORY CHECK ENABLE
7226
7227  044740  012737  045074  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
7228  044746  012737  000340  000006          MOV     #PR7,ERRVEC+2
7229                                  ;       MOV     #0,BADPAR       ;LOAD GOOD PARITY
7230  044754  005037  003630                  CLR     MEMPAR          ;CLEAR FLAG
7231  044760  005037  003636                  CLR     PARPRE          ;CLEAR PARITY PRESENT FLAG
7232  044764  012703  172100                  MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
7233                                                                  ;  MEMORY CHECK ENABLE AVAILIBLE
7234  044770  042713  000007                  BIC     #7,(R3)         ;DISABLE IN ORDER NOT GET INTERR
7235  044774  012737  000000  067300          MOV     #0,BADPAR       ;WRITE GOOD PARITY
7236  045002  012704  000001                  MOV     #1,R4           ;INITIALIZE MASK
7237  045006  012713  000001          16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
7238  045012  005713                          TST     (R3)
7239                                  ;       BIS     R4,MEMPAR       ;SET PARITY PRESENT BIT
7240                                  ;       TST     PARPRE          ;TEST IF PARITY PRESENT ALREADY SET
7241                                  ;       BNE     10$             ;YES - SKIP
7242  045014  012737  045100  000114          MOV     #30$,MEMVEC     ;SET UP PARITY TRAP VECTOR
7243  045022  012737  000340  000116          MOV     #PR7,MEMVEC+2
7244  045030  012713  000004                  MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
7245  045034  012737  177777  067300          MOV     #-1,BADPAR      ;TRY SET BAD PARITY IN BADPAR
7246  045042  012713  000001                  MOV     #PAR.EN,(R3)    ;SET TO TRAP ON PARITY ERROR
7247  045046  005737  067300                  TST     BADPAR          ;CAUSE TRAP IF BAD PARITY
7248
7249  045052  005037  003636                  CLR     PARPRE          ;COME TO THIS POINT IF NO TRAP
7250  045056  000424                          BR      35$             ;TO BYPASS T22,24 IF ANY MEM NOT TRX PARITY
7251                                                                  ;CHECK BIT
7252  045060  062703  000002          10$:    ADD     #2,R3           ;BUMP TO NEXT CSR
7253  045064  000241                          CLC
7254  045066  006104                          ROL     R4              ;ROTATE MASK
7255  045070  001346                          BNE     16$             ;SKIP IF MASK 0
7256  045072  000416                          BR      35$             ;ELSE GO TO EXIT
7257  045074  022626          20$:    CMP     (SP)+,(SP)+     ;CLEAN STACK
7258  045076  000770                          BR      10$
7259
7260  045100  022626          30$:    CMP     (SP)+,(SP)+     ;CLEAR STACK
7261  045102  005013                  CLR     (R3)            ;CLEAR CSR REGISTER
7262  045104  005037  067300          CLR     BADPAR          ;CLEAN UP BAD PARITY
7263  045110  012713  000001          MOV     #PAR.EN,(R3)    ;SET TO DETECT PARITY ERROR
7264  045114  010337  003640          MOV     R3,CSRPTR       ;STORE CSR TO BE USED IN TESTS
7265  045120  012737  177777  003636  MOV     #-1,PARPRE      ;SET PARITY PRESENT FLAG
7266  045126  000754                  BR      10$             ;TEST NEXT CSR
7267
7268  045130  012737  000006  000004  35$:    MOV     #ERRVEC+2,ERRVEC        ;RESTORE TRAP CATCHER
7269  045136  005037  000006                  CLR     ERRVEC+2
7270  045142  005737  003630                  TST     MEMPAR          ;TEST IF ANY PARITY AVAILABLE
7271  045146  001006                          BNE     37$             ;YES - SKIP
7272  045150  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC        ;ELSE RESTORE TRAP CATCHER
7273  045156  005037  000116                  CLR     MEMVEC+2
7274  045162  000413                          BR      40$             ;SKIP
7275  045164  012737  046274  000114  37$:    MOV     #MEMERR,MEMVEC  ;ELSE SET FOR PARITY TRAPS
7276  045172  012737  000340  000116          MOV     #PR7,MEMVEC+2
7277  045200  012746  000000                  MOV     #PR0,-(SP)      ;SET PRIORITY 0
7278  045204  012746  045212                  MOV     #40$,-(SP)
```

```
7279  045210  000002                          RTI
7280  045212  000207                  40$:    RTS     PC                  ;RETURN
7281
7282                                  .SBTTL  SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE
7283
7284  045214  052737  002400  003524  WRTBIT: BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT. REG. 1
7285  045222  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIED 1ST UPWARD TRANSITION
7286  045230  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
7287  045236  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
7288  045244  001416                          BEQ     3$              ;YES, PROVIDE DOWNWARD TRANSISTION
7289  045246  012737  045266  001202          MOV     #1$,$ESCAPE     ;LOAD ESCAPE FOR LOOP ON ERROR
7290  045254  012737  066403  003172          MOV     #EMW1,EMW+2     ;LOAD ERROR MESSAGE
7291  045262  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7292  045264  000207                          RTS     PC              ;MR1 INCORRECT ON UPWARD TRANSITION
7293
7294  045266  032777  001000  133644  1$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7295  045274  001402                          BEQ     3$              ;NO, CONTINUE
7296  045276  000137  046150                  JMP     63$             ;YES, LOOP ON ERROR
7297
7298  045302  042737  014400  003524  3$:     BIC     #MCLK!PCA!PCD,E.MR1 ;INITIALIZE MAINTENANCE REG. 1
7299  045310  052737  042000  003524          BIS     #MEWD!WRTGAT,E.MR1
7300  045316  005737  003614                  TST     PR.BIT          ;CHECK IF ONE
7301  045322  001152                          BNE     20$             ;YES, SIMULATE ONE
7302  045324  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7303  045330  001023                          BNE     10$             ;YES, NO TRANSISTION
7304  045332  042737  002000  003524          BIC     #MEWD,E.MR1     ;INDICATE TRANSISTION
7305  045340  005737  003612                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
7306  045344  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
7307  045346  005737  003620                  TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7308  045352  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
7309  045354  052737  010000  003524          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
7310  045362  000406                          BR      10$             ;CLOCK IN ZERO
7311
7312  045364  005737  003620          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7313  045370  001003                          BNE     10$             ;CLOCK IN ZERO
7314  045372  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
7315  045400  012762  000040  000026  10$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
7316  045406  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7317  045414  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7318  045422  001416                          BEQ     12$             ;YES, CONTINUE
7319  045424  012737  045444  001202          MOV     #11$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7320  045432  012737  066472  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
7321  045440  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7322  045442  000207                          RTS     PC              ;MR1 INCORRECT
7323
7324  045444  032777  001000  133466  11$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7325  045452  001402                          BEQ     12$             ;NO, CONTINUE
7326  045454  000137  046150                  JMP     63$             ;YES, LOOP ON ERROR
7327
7328  045460  052737  002400  003524  12$:    BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT REG 1
7329  045466  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSISITION
7330  045474  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
7331  045502  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG. 1 CORRECT
7332  045510  001416                          BEQ     15$             ;YES, CONTINUE
7333  045512  012737  045532  001202          MOV     #13$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7334  045520  012737  066563  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
```

```
7335  045526  011646                          MOV     (SP),-(SP)          ;SAVE RETURN
7336  045530  000207                          RTS     PC                  ;MR1 INCORRECT
7337
7338  045532  032777  001000  133400  13$:    BIT     #SW9,@SWR           ;CHECK IF LOOP ON ERROR
7339  045540  001402                          BEQ     15$                 ;NO, CONTINUE
7340  045542  000137  046150                  JMP     63$                 ;YES, LOOP ON ERROR
7341
7342  045546  052737  002000  003524  15$:    BIS     #MEWD,E.MR1         ;RESET TRANSITION INDICATION
7343  045554  042737  000400  003524          BIC     #MCLK,E.MR1
7344  045562  012762  000040  000026          MOV     #DMD,RKMR1(R2)      ;SUPPLY LAST PART OF DATA
7345  045570  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MR1
7346  045576  023737  003464  003524          CMP     T.MR1,E.MR1         ;CHECK IF MR1 CORRECT
7347  045604  001414                          BEQ     18$                 ;YES, RETURN
7348  045606  012737  045626  001202          MOV     #17$,$ESCAPE        ;LOAD ESCAPE FOR LOOP ON ERROR
7349  045614  012737  066652  003172          MOV     #EMW4,EMW+2         ;LOAD ERROR MESSAGE
7350  045622  011646                          MOV     (SP),-(SP)          ;SAVE RETURN
7351  045624  000207                          RTS     PC                  ;MR1 INCORRECT
7352
7353  045626  032777  001000  133304  17$:    BIT     #SW9,@SWR           ;CHECK IF LOOP ON ERROR
7354  045634  001145                          BNE     63$                 ;YES, LOOP ON ERROR
7355  045636  005037  001202          18$:    CLR     $ESCAPE             ;CLEAR ESCAPE
7356  045642  062716  000002                  ADD     #2,(SP)             ;ADJUST RETURN
7357  045646  000207                          RTS     PC                  ;RETURN
7358
7359  045650  005737  003612          20$:    TST     P1.BIT              ;CHECK IN NEXT BIT A ONE
7360  045654  001007                          BNE     30$                 ;YES, CHECK IF PRECOMP DELAY
7361  045656  005737  003616                  TST     M1.BIT              ;CHECK FOR PRECOMP ADVANCE
7362  045662  001415                          BEQ     40$                 ;NO, CLOCK IN DATA BIT
7363  045664  052737  004000  003524          BIS     #PCA,E.MR1          ;SET PRECOMP. ADVANCE
7364  045672  000411                          BR      40$                 ;CHECK MR1
7365
7366  045674  042737  000400  003524  30$:    BIC     #MCLK,E.MR1         ;RESET MAINT CLOCK IN EXPECTED MR1
7367  045702  005737  003616                  TST     M1.BIT              ;CHECK FOR PRECOMP DELAY
7368  045706  001003                          BNE     40$                 ;NO, CHECK MR1
7369  045710  052737  010000  003524          BIS     #PCD,E.MR1          ;SET SET PRECOMP DELAY
7370  045716  012762  000040  000026  40$:    MOV     #DMD,RKMR1(R2)      ;CLOCK IN DATA BIT
7371  045724  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MR1
7372  045732  023737  003464  003524          CMP     T.MR1,E.MR1         ;CHECK MR1 CORRECT
7373  045740  001414                          BEQ     42$                 ;YES, CLOCK IN REST OF BIT
7374  045742  012737  045762  001202          MOV     #41$,$ESCAPE        ;LOAD ESCAPE FOR LOOP ON ERROR
7375  045750  012737  066472  003172          MOV     #EMW2,EMW+2         ;LOAD ERROR MESSAGE
7376  045756  011646                          MOV     (SP),-(SP)          ;SAVE RETURN
7377  045760  000207                          RTS     PC                  ;MR1 INCORRECT
7378
7379  045762  032777  001000  133150  41$:    BIT     #SW9,@SWR           CHECK IF LOOP ON ERROR
7380  045770  001067                          BNE     63$                 ,._S, LOOP ON ERROR
7381  045772  052737  000400  003524  42$:    BIS     #MCLK,E.MR1         ;CHREATE EXPECTED MAINT. REG. 1
7382  046000  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSITION
7383  046006  016237  000026  003464          MOV     RKMR1(R2),T.MR1     ;STORE MAINT REG 1
7384  046014  023737  003524  003464          CMP     E.MR1,T.MR1         ;CHECK IF MAINT REG 1 CORRECT
7385  046022  001414                          BEQ     45$                 ;YES, CONTINUE
7386  046024  012737  046044  001202          MOV     #43$,$ESCAPE        ;LOAD ESCAPE
7387  046032  012737  066563  003172          MOV     #EMW3,EMW+2         ;LOAD ERROR MESSAGE
7388  046040  011646                          MOV     (SP),-(SP)          ;SAVE RETURN
7389  046042  000207                          RTS     PC                  ;MR1 INCORRECT
7390
```

```
7391  046044  032777  001000  133066  43$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7392  046052  001036                          BNE     63$             ;YES, LOOP ON ERROR
7393  046054  042737  002400  003524  45$:    BIC     #MEWD!MCLK,E.MR1 ;SET TRANSISTION
7394  046062  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLOCK TRANSISTION
7395  046070  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7396  046076  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7397  046104  001414                          BEQ     50$             ;YES, RETURN
7398  046106  012737  046126  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7399  046114  012737  066652  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
7400  046122  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7401  046124  000207                          RTS     PC              ;MR1 INCORRECT
7402
7403  046126  032777  001000  133004  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7404  046134  001005                          BNE     63$             ;YES, LOOP ON ERROR
7405  046136  005037  001202          50$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7406  046142  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
7407  046146  000207                          RTS     PC              ;RETURN
7408
7409  046150  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7410  046154  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
7411  046160  000177  132724                  JMP     @$LPERR         ;LOOP ON ERROR
7412
7413                                  .SBTTL  SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
7414
7415  046164  005737  003614          RDBIT:  TST     PR.BIT          ;CHECK IF ONE
7416  046170  001024                          BNE     10$             ;YES, SIMULATE ONE
7417  046172  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7418  046176  001404                          BEQ     4$              ;NO, INSERT TRANSITION
7419  046200  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;YES, DO NOT INSERT TRANSITION
7420  046206  000403                          BR      5$              ;CLOCK IN ZERO
7421
7422  046210  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2)  ;INSERT TRANSITION
7423  046216  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
7424  046224  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
7425  046232  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7426  046240  000207                          RTS     PC              ;RETURN
7427
7428  046242  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2)  ;CLOCK IN ONE
7429  046250  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7430  046256  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
7431  046264  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7432  046272  000207                          RTS     PC              ;RETURN
7433
7434                                  .SBTTL  MEMORY CHECK ENABLE TRAP
7435
7436  046274  012737  046310  001202  MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
7437  046302  011637  003604                  MOV     (SP),TRAPPC     ;STORE PC
7438  046306  104147                          ERROR   147             ;REPORT MEM PARITY ERROR
7439  046310  005037  001202          10$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7440  046314  032777  001000  132616          BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7441  046322  001001                          BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
7442  046324  000002                          RTI                     ;NO, RETURN
7443
7444  046326  012706  001100          15$:    MOV     #STACK,SP       ;INITIALIZE STACK
7445  046332  000177  132552                  JMP     @$LPERR         ;LOOP ON ERROR
7446
```

```
                                        .SBTTL  ROUTINE TO SIZE MEMORY

                                        ;;**********************************************************************
                                        ;*CALL:
                                        ;*      JSR     PC,$SIZE
                                        ;*      RETURN
                                        ;*$LSTAD WILL CONTAIN:
                                        ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
                                        ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
                                        ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
                                        ;*$KT11 IS THE MEMORY MANAGEMENT KEY
                                        ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
                                        ;*      MUST BE SETUP BEFORE THE CALL
                                        ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
                                        ;*      DETERMINED BY ROUTINE

046336  010046                 $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
046340  010146                         MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
046342  010246                         MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
046344  010346                         MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
046346  013746  000004                 MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
046352  013746  000006                 MOV     @#ERRVEC+2,-(SP)
046356  010600                         MOV     SP,R0           ;;SAVE THE STACK POINTER
                                ;;SET THE ERRVEC PS TO THE PRESENT PS
046360  104400                         TRAP                    ;;PUSH OLD PSW AND PC ON STACK
046362  012637  000006                 MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
046366  012701  003776                 MOV     #3776,R1        ;;SETUP ADDRESS
046372  105727                         TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
046374  000200                 $KT11:  .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
046376  100062                         BPL     $CORE           ;;BR IF NO
046400  012737  046536  000004         MOV     #$KTNEX,@#ERRVEC        ;;SET FOR TIMEOUT
046406  005737  177572                 TST     @#SR0           ;;KT11 ARE YOU THERE?
046412  052737  100000  046374         BIS     #100000,$KT11   ;;YES--SET KT11 KEY
046420  005046                         CLR     -(SP)           ;;INITIALIZE FOR "PAR" LOADING
046422  012702  172340                 MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
046426  012703  000010                 MOV     #^D8,R3         ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
046432  012762  077406  177740  1$:    MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
046440  011622                         MOV     (SP),(R2)+      ;;LOAD "PAR"
046442  062716  000200                 ADD     #200,(SP)       ;;UPDATE FOR NEXT "PAR"
046446  077307                         SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
046450  012742  177600                 MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
046454  005042                         CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
046456  012737  046474  000004         MOV     #2$,@#ERRVEC    ;;CATCH TIMEOUT IF NO SR3
046464  012737  000020  172516         MOV     #20,@#SR3       ;;ENABLE 22 BIT MODE
046472  000401                         BR      3$              ;;THIS PDP-11 HAS A SR3 REGISTER
046474  022626                 2$:     CMP     (SP)+,(SP)+     ;;CLEAN OFF THE STACK--NO SR3
046476  005237  177572         3$:     INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
046502  012737  046526  000004         MOV     #$KTOUT,@#ERRVEC        ;;SET FOR TIME OUT
046510  005737  143776         4$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
046514  062712  000040                 ADD     #40,(R2)        ;;MAKE A 1K STEP
046520  023712  172356                 CMP     @#KIPAR7,(R2)   ;;LAST ONE?
046524  101371                         BHI     4$              ;;NO--TRY IT
046526  011202                 $KTOUT: MOV     (R2),R2         ;;GET LAST BANK+1
046530  005037  177572                 CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
046534  000421                         BR      $SIZEX
046536  042737  100000  046374 $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
```

```
7503  046544  012737  046574  000004  $CORE:  MOV     #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
7504  046552  005002                  CLR     R2               ;;SET UP BANK
7505  046554  062701  004000          1$:     ADD     #4000,R1         ;;INCREMENT BY 1K
7506  046560  062702  000040                  ADD     #40,R2           ;;1K STEP
7507  046564  005711                  TST     (R1)             ;;TRAP ON TIME OUT
7508  046566  022701  177776                  CMP     #177776,R1       ;;LAST ONE
7509  046572  001370                  BNE     1$               ;;NO--TRY AGAIN
7510  046574  162701  004000          $CROUT: SUB     #4000,R1
7511  046600  162702  000040          $SIZEX: SUB     #40,R2           ;;DROP BACK
7512  046604  010006                  MOV     R0,SP            ;;RESTORE THE STACK
7513  046606  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
7514  046612  012637  000004                  MOV     (SP)+,@#ERRVEC
7515  046616  010137  046640                  MOV     R1,$LSTAD        ;;LAST ADDRESS
7516  046622  010237  046642                  MOV     R2,$LSTBK        ;;LAST BANK
7517  046626  012603                  MOV     (SP)+,R3         ;;RESTORE R3
7518  046630  012602                  MOV     (SP)+,R2         ;;RESTORE R2
7519  046632  012601                  MOV     (SP)+,R1         ;;RESTORE R1
7520  046634  012600                  MOV     (SP)+,R0         ;;RESTORE R0
7521  046636  000207                  RTS     PC
7522  046640  000000          $LSTAD: .WORD   0                ;;CONTAINS THE LAST ADDRESS
7523  046642  000000          $LSTBK: .WORD   0                ;;CONTAINS THE LAST BANK
7524                          .SBTTL  SCOPE HANDLER ROUTINE
7525
7526                          ;;**************************************************************
7527                          ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
7528                          ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
7529                          ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
7530                          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
7531                          ;*SW14=1         LOOP ON TEST
7532                          ;*SW11=1         INHIBIT ITERATIONS
7533                          ;*SW09=1         LOOP ON ERROR
7534                          ;*SW08=1         LOOP ON TEST IN SWR<7:0>
7535                          ;*CALL
7536                          ;*      SCOPE            ;;SCOPE=IOT
7537
7538  046644                  $SCOPE:
7539  046644  104407                  CKSWR                    ;;TEST  FOR CHANGE IN SOFT-SWR
7540  046646  032777  040000  132264  1$:     BIT     #BIT14,@SWR      ;;LOOP ON PRESENT TEST?
7541  046654  001131                  BNE     $OVER            ;;YES IF SW14=1
7542                          ;#####START OF CODE FOR THE XOR TESTER#####
7543  046656  000416          $XTSTR: BR      6$               ;;IF RUNNING ON THE "XOR" TESTER CHANGE
7544                                                           ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
7545  046660  013746  000004                  MOV     @#ERRVEC,-(SP)   ;;SAVE THE CONTENTS OF THE ERROR VECTOR
7546  046664  012737  046704  000004          MOV     #5$,@#ERRVEC     ;;SET FOR TIMEOUT
7547  046672  005737  177060                  TST     @#177060         ;;TIME OUT ON XOR?
7548  046676  012637  000004                  MOV     (SP)+,@#ERRVEC   ;;RESTORE THE ERROR VECTOR
7549  046702  000500                  BR      $SVLAD           ;;GO TO THE NEXT TEST
7550  046704  022626                  5$:     CMP     (SP)+,(SP)+      ;;CLEAR THE STACK AFTER A TIME OUT
7551  046706  012637  000004                  MOV     (SP)+,@#ERRVEC   ;;RESTORE THE ERROR VECTOR
7552  046712  000440                  BR      7$               ;;LOOP ON THE PRESENT TEST
7553  046714                  6$:;#####END OF CODE FOR THE XOR TESTER#####
7554  046714  032777  000400  132216          BIT     #BIT08,@SWR      ;;LOOP ON SPEC. TEST?
7555  046722  001421                  BEQ     2$               ;;BR IF NO
7556  046724  005046                  CLR     -(SP)            ;;CLEAR A TEMP. LOCATION
7557  046726  117716  132206                  MOVB    @SWR,(SP)        ;;PICKUP THE DESIRED TEST NUMBER
7558  046732  001414                  BEQ     8$               ;;BRANCH IF BAD TEST NUMBER IN SWR
```

```
7559  046734  022716  000053                    CMP     #53,(SP)          ;;CHECK THE NUMBER IN THE SWR
7560  046740  002411                            BLT     8$                ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
7561  046742  011637  001102                    MOV     (SP),$TSTNM       ;;UPDATE THE TEST NUMBER
7562  046746  005316                            DEC     (SP)              ;;BACKUP BY ONE
7563  046750  006316                            ASL     (SP)              ;;SCALE THE TEST NUMBER AS AN INDEX
7564  046752  062716  047156                    ADD     #$SW08TBL,(SP)    ;;FORM THE ADDRESS OF TEST POINTER
7565  046756  013637  001106                    MOV     @(SP)+,$LPADR     ;;SET LOOP ADDRESS TO DESIRED TEST
7566  046762  000466                            BR      $OVER             ;;GO LOOP ON THE TEST
7567  046764  005726                    8$:     TST     (SP)+             ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
7568  046766  105737  001103            2$:     TSTB    $ERFLG            ;;HAS AN ERROR OCCURRED?
7569  046772  001421                            BEQ     3$                ;;BR IF NO
7570  046774  123737  001115  001103            CMPB    $ERMAX,$ERFLG     ;;MAX. ERRORS FOR THIS TEST OCCURRED?
7571  047002  101015                            BHI     3$                ;;BR IF NO
7572  047004  032777  001000  132126            BIT     #BIT09,@SWR       ;;LOOP ON ERROR?
7573  047012  001404                            BEQ     4$                ;;BR IF NO
7574  047014  013737  001110  001106    7$:     MOV     $LPERR,$LPADR     ;;SET LOOP ADDRESS TO LAST SCOPE
7575  047022  000446                            BR      $OVER
7576  047024  105037  001103            4$:     CLRB    $ERFLG            ;;ZERO THE ERROR FLAG
7577  047030  005037  001200                    CLR     $TIMES            ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
7578  047034  000415                            BR      1$                ;;ESCAPE TO THE NEXT TEST
7579  047036  032777  004000  132074    3$:     BIT     #BIT11,@SWR       ;;INHIBIT ITERATIONS?
7580  047044  001011                            BNE     1$                ;;BR IF YES
7581  047046  005737  001222                    TST     $PASS             ;;IF FIRST PASS OF PROGRAM
7582  047052  001406                            BEQ     1$                ;;      INHIBIT ITERATIONS
7583  047054  005237  001104                    INC     $ICNT             ;;INCREMENT ITERATION COUNT
7584  047060  023737  001200  001104            CMP     $TIMES,$ICNT      ;;CHECK THE NUMBER OF ITERATIONS MADE
7585  047066  002024                            BGE     $OVER             ;;BR IF MORE ITERATION REQUIRED
7586  047070  012737  000001  001104    1$:     MOV     #1,$ICNT          ;;REINITIALIZE THE ITERATION COUNTER
7587  047076  013737  047154  001200            MOV     $MXCNT,$TIMES     ;;SET NUMBER OF ITERATIONS TO DO
7588  047104  105237  001102            $SVLAD: INCB    $TSTNM            ;;COUNT TEST NUMBERS
7589  047110  113737  001102  001220            MOVB    $TSTNM,$TESTN     ;;SET TEST NUMBER IN APT MAILBOX
7590  047116  011637  001106                    MOV     (SP),$LPADR       ;;SAVE SCOPE LOOP ADDRESS
7591  047122  011637  001110                    MOV     (SP),$LPERR       ;;SAVE ERROR LOOP ADDRESS
7592  047126  005037  001202                    CLR     $ESCAPE           ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
7593  047132  112737  000001  001115            MOVB    #1,$ERMAX         ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
7594  047140  013777  001102  131774    $OVER:  MOV     $TSTNM,@DISPLAY   ;;DISPLAY TEST NUMBER
7595  047146  013716  001106                    MOV     $LPADR,(SP)       ;;FUDGE RETURN ADDRESS
7596  047152  000002                            RTI                       ;;FIXES PS
7597  047154  003720                    $MXCNT: 2000.                     ;;MAX. NUMBER OF ITERATIONS
7598  047156                            $SW08TBL:
7599  047156  004674                            .WORD   TST1+2            ;;STARTING ADDRESS OF TEST 1
7600  047160  005112                            .WORD   TST2+2            ;;STARTING ADDRESS OF TEST 2
7601  047162  005330                            .WORD   TST3+2            ;;STARTING ADDRESS OF TEST 3
7602  047164  005544                            .WORD   TST4+2            ;;STARTING ADDRESS OF TEST 4
7603  047166  005760                            .WORD   TST5+2            ;;STARTING ADDRESS OF TEST 5
7604  047170  006442                            .WORD   TST6+2            ;;STARTING ADDRESS OF TEST 6
7605  047172  007070                            .WORD   TST7+2            ;;STARTING ADDRESS OF TEST 7
7606  047174  007456                            .WORD   TST10+2           ;;STARTING ADDRESS OF TEST 10
7607  047176  010602                            .WORD   TST11+2           ;;STARTING ADDRESS OF TEST 11
7608  047200  011270                            .WORD   TST12+2           ;;STARTING ADDRESS OF TEST 12
7609  047202  012154                            .WORD   TST13+2           ;;STARTING ADDRESS OF TEST 13
7610  047204  013042                            .WORD   TST14+2           ;;STARTING ADDRESS OF TEST 14
7611  047206  014246                            .WORD   TST15+2           ;;STARTING ADDRESS OF TEST 15
7612  047210  015124                            .WORD   TST16+2           ;;STARTING ADDRESS OF TEST 16
7613  047212  015562                            .WORD   TST17+2           ;;STARTING ADDRESS OF TEST 17
7614  047214  016676                            .WORD   TST20+2           ;;STARTING ADDRESS OF TEST 20
```

```
 7615  047216  020012                          .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
 7616  047220  021126                          .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
 7617  047222  022374                          .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
 7618  047224  023264                          .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
 7619  047226  024120                          .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
 7620  047230  024652                          .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
 7621  047232  025404                          .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
 7622  047234  026136                          .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
 7623  047236  026670                          .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
 7624  047240  027422                          .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
 7625  047242  030154                          .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
 7626  047244  030454                          .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
 7627  047246  031222                          .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
 7628  047250  031612                          .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
 7629  047252  032436                          .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
 7630  047254  033262                          .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
 7631  047256  034106                          .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
 7632  047260  034732                          .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
 7633  047262  035556                          .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
 7634  047264  036402                          .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
 7635  047266  037226                          .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
 7636  047270  040066                          .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
 7637  047272  041112                          .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
 7638  047274  042136                          .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
 7639  047276  042776                          .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
 7640  047300  043422                          .WORD   TST52+2         ;;STARTING ADDRESS OF TEST 52
 7641  047302  044046                          .WORD   TST53+2         ;;STARTING ADDRESS OF TEST 53
 7642                          ;;*****************************************************************
 7643                          .SBTTL  LOOP ON INTERNAL ERROR
 7644
 7645  047304  032777  001000  131626  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 7646  047312  001405                          BEQ     5$              ;NO RETURN
 7647  047314  105737  001103                  TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
 7648  047320  001402                          BEQ     5$              ;NO, RETURN
 7649  047322  013716  001110                  MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
 7650  047326  000002                  5$:     RTI                     ;RETURN
 7651                          .SBTTL  APT COMMUNICATIONS ROUTINE
 7652
 7653                          ;;*****************************************************************
 7654  047330  112737  000001  047574  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
 7655  047336  112737  000001  047572  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
 7656  047344  000403                          BR      $ATYC
 7657  047346  112737  000001  047574  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
 7658  047354                          $ATYC:
 7659  047354  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7660  047356  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 7661  047360  105737  047572                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
 7662  047364  001450                          BEQ     5$              ;;IF NOT:  BR
 7663  047366  122737  000001  001234          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
 7664  047374  001031                          BNE     3$              ;;IF NOT:  BR
 7665  047376  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
 7666  047404  001425                          BEQ     3$              ;;IF NOT:  BR
 7667  047406  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
 7668  047412  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7669  047420  005737  001214          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
 7670  047424  001375                          BNE     1$              ;;IF NOT:  WAIT
```

```
 7671  047426  010037  001230          MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
 7672  047432  105720          2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
 7673  047434  001376                  BNE     2$
 7674  047436  163700  001230          SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
 7675  047442  006200                  ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
 7676  047444  010037  001232          MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
 7577  047450  012737  000004  001214  MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
 7678  047456  000413                  BR      5$
 7679  047460  017637  000004  047504  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
 7680  047466  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
 7681  047474  013746  177776          MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
 7682  047500  004737  050336          JSR     PC,$TYPE        ;;CALL TYPE MACRO
 7683  047504  000000          4$:     .WORD   0
 7684  047506                  5$:
 7685  047506  105737  047574  10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
 7686  047512  001416                  BEQ     12$             ;;IF NOT:  BR
 7687  047514  005737  001234          TST     $ENV            ;;RUNNING UNDER APT?
 7688  047520  001413                  BEQ     12$             ;;IF NOT:  BR
 7689  047522  005737  001214  11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
 7690  047526  001375                  BNE     11$             ;;IF NOT:  WAIT
 7691  047530  017637  000004  001216  MOV     @4(SP),$FATAL   ;;GET ERROR #
 7692  047536  062766  000002  000004  .       ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7693  047544  005237  001214          INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
 7694  047550  105037  047574  12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
 7695  047554  105037  047573          CLRB    $LFLG           ;;CLEAR LOG FLAG
 7696  047560  105037  047572          CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
 7697  047564  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
 7698  047566  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
 7699  047570  000207                  RTS     PC              ;;RETURN
 7700  047572     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
 7701  047573     000          $LFLG:  .BYTE   0               ;;LOG FLAG
 7702  047574     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
 7703          047576                  .EVEN
 7704          000200          APTSIZE=200
 7705          000001          APTENV=001
 7706          000100          APTSPOOL=100
 7707          000040          APTCSUP=040
 7708                          .SBTTL  ERROR HANDLER ROUTINE
 7709
 7710                          ;;**************************************************************
 7711                          ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 7712                          ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 7713                          ;*AND GO TO TYPERR ON ERROR
 7714                          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 7715                          ;*SW15=1        HALT ON ERROR
 7716                          ;*SW13=1        INHIBIT ERROR TYPEOUTS
 7717                          ;*SW10=1        BELL ON ERROR
 7718                          ;*SW09=1        LOOP ON ERROR
 7719                          ;*CALL
 7720                          ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 7721
 7722  047576                  $ERROR:
 7723  047576  104407                  CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 7724  047600  105237  001103  7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 7725  047604  001775                  BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 7726  047606  013777  001102  131326  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
```

```
7727  047614  032777  002000  131316          BIT     #BIT10,@SWR     ;;BELL ON ERROR?
7728  047622  001402                          BEQ     1$              ;;NO - SKIP
7729  047624  104401  001204                  TYPE    ,$BELL          ;;RING BELL
7730  047630  005237  001112          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
7731  047634  011637  001116                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
7732  047640  162737  000002  001116          SUB     #2,$ERRPC
7733  047646  117737  131244  001114          MOVB    @$ERRPC,$ITLMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
7734  047654  032777  020000  131256          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
7735  047662  001004                          BNE     20$             ;;SKIP TYPEOUTS
7736  047664  004737  047776                  JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
7737  047670  104401  001211                  TYPE    ,$CRLF
7738  047674                          20$:
7739  047674  122737  000001  001234          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7740  047702  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
7741  047704  113737  001114  047716          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
7742  047712  004737  047346                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
7743  047716     000          21$:    .BYTE   0
7744  047717     000                  .BYTE   0
7745  047720  000777          22$:    BR      22$             ;;APT ERROR LOOP
7746  047722  005777  131212          2$:     TST     @SWR            ;;HALT ON ERROR
7747  047726  100002                          BPL     3$              ;;SKIP IF CONTINUE
7748  047730  000000                          HALT                    ;;HALT ON ERROR!
7749  047732  104407                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
7750  047734  032777  001000  131176  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
7751  047742  001402                          BEQ     4$              ;;BR IF NO
7752  047744  013716  001110                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
7753  047750  005737  001202          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
7754  047754  001402                          BEQ     5$              ;;BR IF NONE
7755  047756  013716  001202                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
7756  047762                          5$:
7757  047762  022737  044674  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
7758  047770  001001                          BNE     6$              ;;BRANCH IF NO
7759  047772  000000                          HALT                    ;;YES
7760  047774                          6$:
7761  047774  000002                          RTI                     .;RETURN
7762
7763                                  ;;*****************************************************************
7764                                  .SBTTL  TYPE ERROR ROUTINE
7765                                  ;*ENTRY JSR PC,TYPERR
7766                                  ;*RETURN RTS PC
7767                                  ;*
7768                                  ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
7769                                  ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
7770                                  ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
7771                                  ;*THE ERROR.
7772                                  ;;*****************************************************************
7773  047776  104413          TYPERR: SAVREG
7774  050000  113700  001114          MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
7775  050004  042700  177400          BIC     #177400,R0      ;CLEAR UNUSED BITS
7776  050010  005300                  DEC     R0              ;FORM INDEX FOR ERROR TABLE
7777  050012  006300                  ASL     R0
7778  050014  006300                  ASL     R0
7779  050016  006300                  ASL     R0
7780  050020  062700  001300  1$:     ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
7781  050024  012037  050040          MOV     (R0)+,2$        ;GET EM POINTER
7782  050030  001404                  BEQ     3$              ;BRANCH IF THERE ISN'T ONE
```

```
7783  050032  104401  001211            TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
7784  050036  104401                    TYPE                    ;TYPE ERROR MESSAGE (EM)
7785  050040  000000            2$:     .WORD   0               ;EM POINTER GOES HERE
7786  050042  012037  050056    3$:     MOV     (R0)+,4$        ;GET DH POINTER
7787  050046  001404                    BEQ     5$              ;BRANCH IF THERE ISN'T ONE
7788  050050  104401  001211            TYPE    ,$CRLF          ;TYPE CR-LF
7789  050054  104401                    TYPE                    ;TYPE DATA HEADER
7790  050056  000000            4$:     .WORD   0               ;DH POINTER GOES HERE
7791  050060  012001            5$:     MOV     (R0)+,R1        ;GET DT POINTER
7792  050062  001445                    BEQ     20$             ;BRANCH IF THERE ARE NONE
7793  050064  005004                    CLR     R4              ;RESET INDENT SWITCH
7794  050066  012000                    MOV     (R0)+,R0        ;GET DF POINTER
7795  050070  012002                    MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
7796  050072  104401  001211            TYPE    ,$CRLF
7797  050076  112003            10$:    MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
7798  050100  105720                    TSTB    (R0)+           ;BUMP PAST FORMAT WORD
7799  050102  005703                    TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
7800  050104  001416                    BEQ     14$             ;NO - SKIP DATA PRINT
7801  050106  005704                    TST     R4              ;CHECK IF INDENT WORDS
7802  050110  001004                    BNE     12$             ;YES, GO INDENT
7803  050112  013146            11$:    MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
7804  050114  104402                    TYPOC                   ;TYPE IT
7805  050116  005303                    DEC     R3              ;MORE DATA WORDS
7806  050120  001403                    BEQ     13$             ;NO-BRANCH
7807  050122  104401  054723    12$:    TYPE    ,SPACE2         ;TYPE SEPARATORS
7808  050126  000771                    BR      11$             ;LOOP
7809  050130  104401  001211    13$:    TYPE    ,$CRLF          ;TYPE <CR><LF>
7810  050134  005710                    TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
7811  050136  001401                    BEQ     14$             ;NO, DO NOT CHANGE INDENT
7812  050140  005104                    COM     R4              ;CHANGE INDENT
7813  050142  005302            14$:    DEC     R2              ;MORE DH'S?
7814  050144  003414                    BLE     20$             ;NO-BRANCH
7815  050146  012037  050166    15$:    MOV     (R0)+,18$       ;GET NEXT DH POINTER
7816  050152  001751                    BEQ     10$             ;IF NO HEADER GET DATA
7817  050154  005704                    TST     R4              ;INDENT?
7818  050156  001402                    BEQ     17$             ;NO-BRANCH
7819  050160  104401  054723            TYPE    ,SPACE2         ;INDENT
7820  050164  104401            17$:    TYPE                    ;TYPE DH
7821  050166  000000            18$:    .WORD   0               ;DH POINTER GOES HERE
7822  050170  104401  001211            TYPE    ,$CRLF
7823  050174  000740                    BR      10$             ;LOOP
7824  050176  104414            20$:    RESREG
7825  050200  005237  003610            INC     ERRCNT          ;INCREMENT ERROR COUNT
7826  050204  032777  010000  130726    BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
7827  050212  001421                    BEQ     25$             ;NO, RETURN
7828  050214  022737  000024  003610    CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
7829  050222  103015                    BHIS    25$             ;NO, RETURN
7830  050224  104401  054726            TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
7831                                                            ;  ERROR THRESHOLD EXCEEDED"
7832  050230  005737  000042            TST     42              ;CHECK IF IN CHAIN MODE
7833  050234  001407                    BEQ     30$             ;NO, HALT
7834  050236  012737  000001  044532    MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
7835  050244  012706  001100            MOV     #STACK,SP       ;INITIALIZE STACK
7836  050250  000137  044504            JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
7837  050254  000000            30$:    HALT
7838  050256  000207            25$:    RTS     PC
```

```
7839
7840                                        .SBTTL  CONTROLLED PROGRAM HALT
7841  050260  013702  001270          CTRHLT: MOV     $BASE,R2        ;SET '611 BASE
7842  050264  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
7843  050272  012706  001100                  MOV     #STACK,SP       ;CLEAR STACK
7844  050276  104401  054657                  TYPE    ,OPROO7         ;TYPE HALT MESSAGE
7845  050302  005737  000042                  TST     42              ;TEST IF MONITOR PRESENT
7846  050306  001410                          BEQ     5$              ;NO - SKIP
7847  050310  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
7848  050314  005037  001202                  CLR     $ESCAPE         ;CLEAR ESCAPE
7849  050320  005037  044532                  CLR     $EOPCT          ;SET PASS COUNT TO 0
7850  050324  000137  044504                  JMP     $EOP            ;GO TO END OF PASS
7851
7852  050330  000000                  5$:     HALT                    ;HALT PROGRAM
7853  050332  000137  003666                  JMP     START1          ;DO RESTART IF CONTINUE
7854
7855                                        .SBTTL  TYPE ROUTINE
7856
7857                                        ;;*****************************************************************
7858                                        ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
7859                                        ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
7860                                        ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
7861                                        ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
7862                                        ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
7863                                        ;*
7864                                        ;*CALL:
7865                                        ;*1) USING A TRAP INSTRUCTION
7866                                        ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
7867                                        ;*OR
7868                                        ;*      TYPE
7869                                        ;*      MESADR
7870                                        ;*
7871
7872  050336  105737  001157          $TYPE: TSTB    $TPFLG          ;;IS THERE A TERMINAL?
7873  050342  100002                         BPL     1$              ;;BR IF YES
7874  050344  000000                         HALT                    ;;HALT HERE IF NO TERMINAL
7875  050346  000430                         BR      3$              ;;LEAVE
7876  050350  010046                  1$:    MOV     R0,-(SP)        ;;SAVE R0
7877  050352  017600  000002                 MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
7878  050356  122737  000001  001234         CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7879  050364  001011                         BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
7880  050366  132737  000100  001235         BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
7881  050374  001405                         BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
7882  050376  010037  050406                 MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
7883  050402  004737  047336                 JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
7884  050406  000000                  61$:   .WORD   0               ;;MESSAGE ADDRESS
7885  050410  132737  000040  001235  62$:   BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
7886  050416  001003                         BNE     60$             ;;YES,SKIP TYPE OUT
7887  050420  112046                  2$:    MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
7888  050422  001005                         BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
7889  050424  005726                         TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
7890  050426  012600                  60$:   MOV     (SP)+,R0        ;;RESTORE R0
7891  050430  062716  000002          3$:    ADD     #2,(SP)         ;;ADJUST RETURN PC
7892  050434  000002                         RTI                     ;;RETURN
7893  050436  122716  000011          4$:    CMPB    #HT,(SP)        ;;BRANCH IF <HT>
7894  050442  001430                         BEQ     8$
```

```
7895  050444  122716  000200            CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
7896  050450  001006                    BNE     5$
7897  050452  005726                    TST     (SP)+           ;;POP  <CR><LF> EQUIV
7898  050454  104401                    TYPE                    ;;TYPE A CR AND LF
7899  050456  001211                    $CRLF
7900  050460  105037  050614            CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
7901  050464  000755                    BR      2$              ;;GET NEXT CHARACTER
7902  050466  004737  050550    5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
7903  050472  123726  001156    6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
7904  050476  001350                    BNE     2$              ;;IF NO GO GET NEXT CHAR.
7905  050500  013746  001154            MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
7906                                                            ;;AND THE NULL CHAR,
7907  050504  105366  000001    7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
7908  050510  002770                    BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
7909  050512  004737  050550            JSR     PC,$TYPEC       ;;GO TYPE A NULL
7910  050516  105337  050614            DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
7911  050522  000770                    BR      7$              ;;LOOP
7912
7913                                    ;HORIZONTAL TAB PROCESSOR
7914
7915  050524  112716  000040    8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
7916  050530  004737  050550    9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
7917  050534  132737  000007  050614    BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
7918  050542  001372                    BNE     9$              ;;TAB STOP
7919  050544  005726                    TST     (SP)+           ;;POP SPACE OFF STACK
7920  050546  000724                    BR      2$              ;;GET NEXT CHARACTER
7921  050550  105777  130374    $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
7922  050554  100375                    BPL     $TYPEC
7923  050556  116677  000002  130366    MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
7924  050564  122766  000015  000002    CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
7925  050572  001003                    BNE     1$              ;;BRANCH IF NO
7926  050574  105037  050614            CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
7927  050600  000406                    BR      $TYPEX          ;;EXIT
7928  050602  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
7929  050610  001402                    BEQ     $TYPEX          ;;BRANCH IF YES
7930  050612  105227                    INCB    (PC)+           ;;COUNT THE CHARACTER
7931  050614  000000            $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
7932  050616  000207            $TYPEX: RTS     PC
7933
7934                                    .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
7935
7936                                    ;;**************************************************************
7937                                    ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
7938                                    ;*OCTAL (ASCII) NUMBER AND TYPE IT.
7939                                    ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
7940                                    ;*CALL:
7941                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7942                                    ;*      TYPOS                   ;;CALL FOR TYPEOUT
7943                                    ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
7944                                    ;*      .BYTE   M               ;;M=1 OR 0
7945                                    ;*                                      ;;1=TYPE LEADING ZEROS
7946                                    ;*                                      ;;0=SUPPRESS LEADING ZEROS
7947                                    ;*
7948                                    ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
7949                                    ;*$TYPOS OR $TYPOC
7950                                    ;*CALL:
```

```
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPON                   ;;CALL FOR TYPEOUT
                                        ;*
                                        ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT
050620  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
050624  116637  000001  051043          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
050632  112637  051045                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
050636  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
050642  000406                          BR      $TYPON
050644  112737  000001  051043  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
050652  112737  000006  051045          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
050660  112737  000005  051042  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
050666  010346                          MOV     R3,-(SP)        ;;SAVE R3
050670  010446                          MOV     R4,-(SP)        ;;SAVE R4
050672  010546                          MOV     R5,-(SP)        ;;SAVE R5
050674  113704  051045                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
050700  005404                          NEG     R4
050702  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
050706  110437  051044                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
050712  113704  051043                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
050716  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
050722  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
050724  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
050726  000404                          BR      3$              ;;GO DO MSB
050730  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
050732  006105                          ROL     R5
050734  006105                          ROL     R5
050736  010503                          MOV     R5,R3
050740  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
050742  105337  051044                  DECB    $OMODE          ;;TYPE THIS DIGIT?
050746  100016                          BPL     7$              ;;BR IF NO
050750  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
050754  001002                          BNE     4$              ;;TEST FOR 0
050756  005704                          TST     R4              ;;SUPPRESS THIS 0?
050760  001403                          BEQ     5$              ;;BR IF YES
050762  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
050764  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
050770  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
050774  110337  051040                  MOVB    R3,8$           ;;SAVE FOR TYPING
051000  104401  051040                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
051004  105337  051042          7$:     DECB    $OCNT           ;;COUNT BY 1
051010  003347                          BGT     2$              ;;BR IF MORE TO DO
051012  002402                          BLT     6$              ;;BR IF DONE
051014  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
051016  000744                          BR      2$              ;;GO DO THE LAST DIGIT
051020  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
051022  012604                          MOV     (SP)+,R4        ;;RESTORE R4
051024  012603                          MOV     (SP)+,R3        ;;RESTORE R3
051026  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
051034  012616                          MOV     (SP)+,(SP)
051036  000002                          RTI                     ;;RETURN
051040     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
```

```
 8007  051041  000                       $OCNT:  .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 8008  051042  000                       $OFILL: .BYTE   0               ;;OCTAL DIGIT COUNTER
 8009  051043  000                       $OMODE: .WORD   0               ;;ZERO FILL SWITCH
 8010  051044  000000                    .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE ;;NUMBER OF DIGITS TO TYPE
 8011
 8012
 8013                                    ;;*****************************************************************
 8014                                    ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
 8015                                    ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
 8016                                    ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
 8017                                    ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
 8018                                    ;*REPLACED WITH SPACES.
 8019                                    ;*CALL:
 8020                                    ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
 8021                                    ;*      TYPDS                   ;;GO TO THE ROUTINE
 8022
 8023  051046                            $TYPDS:
 8024  051046  010046                           MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 8025  051050  010146                           MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 8026  051052  010246                           MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 8027  051054  010346                           MOV     R3,-(SP)        ;;PUSH R3 ON STACK
 8028  051056  010546                           MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 8029  051060  012746  020200                   MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
 8030  051064  016605  000020                   MOV     20(SP),R5       ;;GET THE INPUT NUMBER
 8031  051070  100004                           BPL     1$              ;;BR IF INPUT IS POS.
 8032  051072  005405                           NEG     R5              ;;MAKE THE BINARY NUMBER POS.
 8033  051074  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
 8034  051102  005000                    1$:    CLR     R0              ;;ZERO THE CONSTANTS INDEX
 8035  051104  012703  051262                   MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
 8036  051110  112723  000040                   MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
 8037  051114  005002                    2$:    CLR     R2              ;;CLEAR THE BCD NUMBER
 8038  051116  016001  051252                   MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
 8039  051122  160105                    3$:    SUB     R1,R5           ;;FORM THIS BCD DIGIT
 8040  051124  002402                           BLT     4$              ;;BR IF DONE
 8041  051126  005202                           INC     R2              ;;INCREASE THE BCD DIGIT BY 1
 8042  051130  000774                           BR      3$
 8043  051132  060105                    4$:    ADD     R1,R5           ;;ADD BACK THE CONSTANT
 8044  051134  005702                           TST     R2              ;;CHECK IF BCD DIGIT=0
 8045  051136  001002                           BNE     5$              ;;FALL THROUGH IF 0
 8046  051140  105716                           TSTB    (SP)            ;;STILL DOING LEADING 0'S?
 8047  051142  100407                           BMI     7$              ;;BR IF YES
 8048  051144  106316                    5$:    ASLB    (SP)            ;;MSD?
 8049  051146  103003                           BCC     6$              ;;BR IF NO
 8050  051150  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
 8051  051156  052702  000060            6$:   BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
 8052  051162  052702  000040            7$:   BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
 8053  051166  110223                           MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
 8054  051170  005720                           TST     (R0)+           ;;JUST INCREMENTING
 8055  051172  020027  000010                   CMP     R0,#10          ;;CHECK THE TABLE INDEX
 8056  051176  002746                           BLT     2$              ;;GO DO THE NEXT DIGIT
 8057  051200  003002                           BGT     8$              ;;GO TO EXIT
 8058  051202  010502                           MOV     R5,R2           ;;GET THE LSD
 8059  051204  000764                           BR      6$              ;;GO CHANGE TO ASCII
 8060  051206  105726                    8$:    TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
 8061  051210  100003                           BPL     9$              ;;BR IF NO
 8062  051212  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
```

```
 8063  051220  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
 8064  051222  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
 8065  051224  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
 8066  051226  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 8067  051230  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 8068  051232  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 8069  051234  104401  051262                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
 8070  051240  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
 8071  051246  012616                          MOV     (SP)+,(SP)
 8072  051250  000002                          RTI                     ;;RETURN TO USER
 8073  051252  023420                  $DTBL:  10000.
 8074  051254  001750                          1000.
 8075  051256  000144                          100.
 8076  051260  000012                          10.
 8077  051262  000004                  $DBLK:  .BLKW   4
 8078                                  .SBTTL  TTY INPUT ROUTINE
 8079
 8080                                  ;;**************************************************************************
 8081                                  .ENABL  LSB
 8082  051272  000000                  $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
 8083  051274  000000                  $TKQIN: .WORD   0               ;;INPUT POINTER
 8084  051276  000000                  $TKQOUT: .WORD  0               ;;OUTPUT POINTER
 8085  051300  000001                  $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
 8086          051301                  $TKQEND=.
 8087          051302                  .EVEN
 8088
 8089                                  ;*TK INITIALIZE ROUTINE
 8090                                  ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
 8091                                  ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
 8092                                  ;
 8093                                  ;*CALL:
 8094                                  ;*      JSR     PC,$TKINT
 8095                                  ;*      RETURN
 8096                                  ;
 8097  051302  005037  051272          $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
 8098  051306  012737  051300  051274          MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
 8099  051314  013737  051274  051276          MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
 8100  051322  012737  051352  000060          MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
 8101  051330  012737  000200  000062          MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
 8102  051336  005777  127604                  TST     @$TKB           ;;CLEAR DONE FLAG
 8103  051342  012777  000100  127574          MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
 8104  051350  000207                          RTS     PC              ;;RETURN TO CALLER
 8105
 8106                                  ;*TK SERVICE ROUTINE
 8107                                  ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
 8108                                  ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
 8109                                  ;*IT IN THE QUEUE.
 8110                                  ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
 8111                                  ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
 8112                                  ;
 8113  051352  117746  127570          $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
 8114  051356  042716  177600                  BIC     #↑C177,(SP)     ;;STRIP THE JUNK
 8115  051362  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL C?
 8116  051366  001007                          BNE     1$              ;;BRANCH IF NO
 8117  051370  104401  052466                  TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (↑C)
 8118  051374  004737  051302                  JSR     PC,$TKINT       ;;INIT THE KEYBOARD
```

```
8119  051400  005726                        TST     (SP)+           ;;CLEAN UP STACK
8120  051402  000137  050260                JMP     CTRHLT          ;;CONTROL C RESTART
8121  051406  021627  000007        1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
8122  051412  001004                        BNE     2$              ;;BRANCH IF NO
8123  051414  022737  000176  001140        CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
8124  051422  001500                        BEQ     6$              ;;GO TO SWR CHANGE
8125
8126  051424                          2$:
8127  051424  022737  000001  051272        CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
8128  051432  001004                        BNE     3$              ;;BRANCH IF NO
8129  051434  104401  001204                TYPE    $BELL           ;;RING THE TTY BELL
8130  051440  005726                        TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
8131  051442  000451                        BR      5$              ;;EXIT
8132  051444  021627  000023        3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
8133  051450  001021                        BNE     32$             ;;BRANCH IF NO
8134  051452  005077  127466                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
8135  051456  005726                        TST     (SP)+           ;;CLEAN CHAR OFF STACK
8136  051460  105777  127460        31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
8137  051464  100375                        BPL     31$             ;;LOOP UNTIL ITS THERE
8138  051466  117746  127454                MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
8139  051472  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
8140  051476  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
8141  051502  001366                        BNE     31$             ;;BRANCH IF NO
8142  051504  012777  000100  127432        MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
8143  051512  000002                        RTI                     ;;RETURN
8144  051514  005237  051272        32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
8145  051520  021627  000140                CMP     (SP),#140       ;;IS IT UPPER CASE?
8146  051524  002405                        BLT     4$              ;;BRANCH IF YES
8147  051526  021627  000175                CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
8148  051532  003002                        BGT     4$              ;;BRANCH IF YES
8149  051534  042716  000040                BIC     #40,(SP)        ;;MAKE IT UPPER CASE
8150  051540  112677  177530        4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
8151  051544  005237  051274                INC     $TKQIN          ;;UPDATE THE POINTER
8152  051550  023727  051274  051301        CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
8153  051556  001003                        BNE     5$              ;;BRANCH IF NO
8154  051560  012737  051300  051274        MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
8155  051566  000002                5$:     RTI                     ;;RETURN
8156
8157                                  ;;**********************************************************************
8158                                  ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
8159                                  ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
8160                                  ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
8161                                  ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
8162  051570  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
8163  051576  001124                        BNE     15$             ;;EXIT IF NOT
8164  051600  105777  127340                TSTB    @$TKS           ;;IS A CHAR WAITING?
8165  051604  100121                        BPL     15$             ;;IF NOT, EXIT
8166  051606  117746  127334                MOVB    @$TKB,-(SP)     ;;YES
8167  051612  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
8168  051616  021627  000007                CMP     (SP),#7         ;;IS IT A CONTROL-G?
8169  051622  001300                        BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
8170                                                                ;;AND EXIT
8171
8172                                  ;;**********************************************************************
8173                                  ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
8174                                  ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL. AS A RESULT OF A
```

```
                                        ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
051624  123727  001134  000001  6$:   CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
051632  001674                        BEQ     2$              ;;BRANCH IF YES
051634  005726                        TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
051636  004737  051302                JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
051642  005077  127276                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
051646  112737  000001  001135        MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR

051654  104401  052500                TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (↑G)
051660  104401  052505        $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
051664  013746  000176                MOV     $WREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
051670  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
051672  104401  052516                TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
051676  005046                19$:    CLR     -(SP)           ;;CLEAR COUNTER
051700  005046                        CLR     -(SP)           ;;THE NEW SWR
051702  105777  127236          7$:   TSTB    @$TKS           ;;CHAR THERE?
051706  100375                        BPL     7$              ;;IF NOT TRY AGAIN

051710  117746  127232                MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
051714  042716  177600                BIC     #↑C177,(SP)     ;;MAKE IT 7-BIT ASCII

051720  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL-C?
051724  001015                        BNE     9$              ;;BRANCH IF NOT
051726  104401  052466                TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (↑C)
051732  062706  000006                ADD     #6,SP           ;;CLEAN UP STACK
051736  123727  001135  000001        CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
051744  001003                        BNE     8$              ;;BRANCH IF NO
051746  012777  000100  127170        MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
051754  000137  050260          8$:   JMP     CTRHLT          ;;CONTROL-C RESTART


051760  021627  000025          9$:   CMP     (SP),#25        ;;IS IT A CONTROL-U?
051764  001005                        BNE     10$             ;;BRANCH IF NOT
051766  104401  052473                TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (↑U)
051772  062706  000006          20$:  ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
051776  000737                        BR      19$             ;;LET'S TRY IT AGAIN


052000  021627  000015          10$:  CMP     (SP),#15        ;;IS IT A <CR>?
052004  001022                        BNE     16$             ;;BRANCH IF NO
052006  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
052012  001403                        BEQ     11$             ;;BRANCH IF YES
052014  016677  000002  127116        MOV     2(SP),@SWR      ;;SAVE NEW SWR
052022  062706  000006          11$:  ADD     #6,SP           ;;CLEAR UP STACK
052026  104401  001211          14$:  TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
052032  123727  001135  000001        CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
052040  001003                        BNE     15$             ;;BRANCH IF NOT
052042  012777  000100  127074        MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
052050  000002                15$:    RTI                     ;;RETURN
052052  004737  050550          16$:  JSR     PC,$TYPEC       ;;ECHO CHAR
052056  021627  000060                CMP     (SP),#60        ;;CHAR < 0?
052062  002420                        BLT     18$             ;;BRANCH IF YES
052064  021627  000067                CMP     (SP),#67        ;;CHAR > 7?
052070  003015                        BGT     18$             ;;BRANCH IF YES
052072  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
052076  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
```

```
8231  052102  001403                        BEQ     17$             ;;BRANCH IF YES
8232  052104  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
8233  052106  006316                        ASL     (SP)            ;;    CHAR OVER TO MAKE
8234  052110  006316                        ASL     (SP)            ;;    ROOM FOR NEW ONE.
8235  052112  005266  000002        17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
8236  052116  056616  177776              BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
8237  052122  000667                        BR      7$              ;;GET THE NEXT ONE
8238  052124  104401  001210        18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
8239  052130  000720                        BR      20$             ;;SIMULATE CONTROL-U
8240                                .DSABL  LSB
8241
8242
8243                                ;;*****************************************************************
8244                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
8245                                ;*CALL:
8246                                ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
8247                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
8248                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
8249                                ;
8250
8251  052132  011646                $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
8252  052134  016666  000004  000002        MOV     4(SP),2(SP)     ;;THE PS
8253  052142  005066  000004              CLR     4(SP)           ;;GET READY FOR A CHARACTER
8254  052146  005046                      CLR     -(SP)           ;;PUT NEW PS ON STACK
8255  052150  012746  052156              MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
8256  052154  000002                      RTI                     ;;POP NEW PC AND PS
8257  052156                        64$:
8258  052156  005737  051272        1$:     TST     $TKCNT          ;;WAIT ON A CHARACTER
8259  052162  001775                      BEQ     1$
8260  052164  005337  051272              DEC     $TKCNT          ;;DECREMENT THE COUNTER
8261  052170  117766  177102  000004      MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
8262  052176  005237  051276              INC     $TKQOUT         ;;UPDATE THE POINTER
8263  052202  027727  051276  051301      CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
8264  052210  001003                      BNE     2$              ;;BRANCH IF NO
8265  052212  012737  051300  051276      MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
8266  052220  000002                2$:     RTI                     ;;RETURN
8267                                ;;*****************************************************************
8268                                ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
8269                                ;*CALL:
8270                                ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
8271                                ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
8272                                ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
8273
8274  052222  010346                $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
8275  052224  005046                      CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
8276  052226  012703  052456        1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
8277  052232  022703  052466        2$:     CMP     #$TTYIN+80.,R3  ;;BUFFER FULL?
8278  052236  101456                      BLOS    4$              ;;BR IF YES
8279  052240  104410                      RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
8280  052242  112613                      MOVB    (SP)+,(R3)      ;;GET CHARACTER
8281  052244  122713  000177        10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
8282  052250  001022                      BNE     5$              ;;BR IF NO
8283  052252  005716                      TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
8284  052254  001007                      BNE     6$              ;;BR IF NO
8285  052256  112737  000134  052454      MOVB    #'\,9$          ;;TYPE A BACK SLASH
8286  052264  104401  052454              TYPE    ,9$
```

```
8287  052270  012716  177777            MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
8288  052274  005303            6$:     DEC     R3              ;;BACKUP BY ONE
8289  052276  020327  052456            CMP     R3,#$TTYIN      ;;STACK EMPTY?
8290  052302  103434                     BLO     4$              ;;BR IF YES
8291  052304  111337  052454            MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
8292  052310  104401  052454            TYPE    ,9$             ;;GO TYPE
8293  052314  000746                     BR      2$              ;;GO READ ANOTHER CHAR.
8294  052316  005716            5$:     TST     (SP)            ;;RUBOUT KEY SET?
8295  052320  001406                     BEQ     7$              ;;BR IF NO
8296  052322  112737  000134  052454    MOVB    #'\,9$          ;;TYPE A BACK SLASH
8297  052330  104401  052454            TYPE    ,9$
8298  052334  005016                     CLR     (SP)            ;;CLEAR THE RUBOUT KEY
8299  052336  122713  000025    7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
8300  052342  001003                     BNE     8$              ;;BR IF NO
8301  052344  104401  052473            TYPE    ,$CNTLU         ;;TYPE A CONTROL "U"
8302  052350  000726                     BR      1$              ;;GO START OVER
8303  052352  122713  000022    8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
8304  052356  00 ?11                    BNE     3$              ;;BRANCH IF NO
8305  052360  105013                     CLRB    (R3)            ;;CLEAR THE CHARACTER
8306  052362  104401  001211            TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
8307  052366  104401  052456            TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
8308  052372  000717                     BR      2$              ;;GO PICKUP ANOTHER CHACTER
8309  052374  104401  001210    4$:     TYPE    ,$QUES          ;;TYPE A '?'
8310  052400  000712                     BR      1$              ;;CLEAR THE BUFFER AND LOOP
8311  052402  111337  052454    3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
8312  052406  104401  052454            TYPE    ,9$
8313  052412  122723  000015            CMPB    #15,(R3)+       ;;CHECK FOR RETURN
8314  052416  001305                     BNE     2$              ;;LOOP IF NOT RETURN
8315  052420  105063  177777            CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
8316  052424  104401  001212            TYPE    ,$LF            ;;TYPE A LINE FEED
8317  052430  005726                     TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
8318  052432  012603                     MOV     (SP)+,R3        ;;RESTORE R3
8319  052434  011646                     MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
8320  052436  016666  000004  000002    MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
8321  052444  012766  052456  000004    MOV     #$TTYIN,4(SP)
8322  052452  000002                     RTI                     ;;RETURN
8323  052454     000            9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
8324  052455     000                     .BYTE   0               ;;TERMINATOR
8325  052456  000010            $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
8326  052466  041536  005015     000    $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
8327  052473     136  006525  000012    $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
8328  052500  043536  005015     000    $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
8329  052505     015  051412  051127    $MSWR:  .ASCIZ  <15><12>/SWR = /
8330  052512  036440  000040
8331  052516  020040  042516  020127    $MNEW:  .ASCIZ  /  NEW = /
8332  052524  020075     000
8333          052530                    .EVEN
8334                                    .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
8335
8336                                    ;;*****************************************************************
8337                                    ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
8338                                    ;*CHANGE IT TO BINARY.
8339                                    ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
8340                                    ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
8341                                    ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
8342                                    ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
```

```
8343                                    ;*CALL:
8344                                    ;*      RDOCT                   ;;READ AN OCTAL NUMBER
8345                                    ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
8346                                    ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
8347
8348  052530  011646                    $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
8349  052532  016666  000004  000002            MOV     4(SP),2(SP)     ;;INPUT NUMBER
8350  052540  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
8351  052542  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
8352  052544  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
8353  052546  104411                    1$:     RDLIN                   ;;READ AN ASCIZ LINE
8354  052550  012600                            MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
8355  052552  010037  052656                    MOV     R0,5$           ;;AND SAVE IT
8356  052556  005001                            CLR     R1              ;;CLEAR DATA WORD
8357  052560  005002                            CLR     R2
8358  052562  112046                    2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
8359  052564  001420                            BEQ     3$              ;;IF ZERO GET OUT
8360  052566  122716  000060                    CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
8361  052572  003026                            BGT     4$              ;;IS AN OCTAL DIGIT
8362  052574  122716  000067                    CMPB    #'7,(SP)
8363  052600  002423                            BLT     4$
8364  052602  006301                            ASL     R1              ;;*2
8365  052604  006102                            ROL     R2
8366  052606  006301                            ASL     R1              ;;*4
8367  052610  006102                            ROL     R2
8368  052612  006301                            ASL     R1              ;;*8
8369  052614  006102                            ROL     R2
8370  052616  042716  177770                    BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
8371  052622  062601                            ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
8372  052624  000756                            BR      2$              ;;LOOP
8373  052626  005726                    3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
8374  052630  010166  000012                    MOV     R1,12(SP)       ;;SAVE THE RESULT
8375  052634  010237  052666                    MOV     R2,$HIOCT
8376  052640  012602                            MOV     (SP)+,R2        ;;POP STACK INTO R2
8377  052642  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
8378  052644  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
8379  052646  000002                            RTI                     ;;RETURN
8380  052650  005726                    4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
8381  052652  105010                            CLRB    (R0)            ;;SET A TERMINATOR
8382  052654  104401                            TYPE                    ;;TYPE UP THRU THE BAD CHAR.
8383  052656  000000                    5$:     .WORD   0
8384  052660  104401  001210                    TYPE    ,$QUES          ;;"?" "CR" & "LF"
8385  052664  000730                            BR      1$              ;;TRY AGAIN
8386  052666  000000                    $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
8387                                    .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
8388
8389                                    ;;******************************************************************
8390                                    ;*SAVE R0-R5
8391                                    ;*CALL:
8392                                    ;*      SAVREG
8393                                    ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
8394                                    ;*
8395                                    ;*TOP---(+16)
8396                                    ;* +2---(+18)
8397                                    ;* +4---R5
8398                                    ;* +6---R4
```

```
8399                                    ;* +8---R3
8400                                    ;*+10---R2
8401                                    ;*+12---R1
8402                                    ;*+14---R0
8403
8404  052670                            $SAVREG:
8405  052670  010046                           MOV     R0,-(SP)        ;;PUSH R0 ON STACK
8406  052672  010146                           MOV     R1,-(SP)        ;;PUSH R1 ON STACK
8407  052674  010246                           MOV     R2,-(SP)        ;;PUSH R2 ON STACK
8408  052676  010346                           MOV     R3,-(SP)        ;;PUSH R3 ON STACK
8409  052700  010446                           MOV     R4,-(SP)        ;;PUSH R4 ON STACK
8410  052702  010546                           MOV     R5,-(SP)        ;;PUSH R5 ON STACK
8411  052704  016646  000022                   MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
8412  052710  016646  000022                   MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
8413  052714  016646  000022                   MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
8414  052720  016646  000022                   MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
8415  052724  000002                           RTI
8416
8417                                    ;*RESTORE R0-R5
8418                                    ;*CALL:
8419                                    ;*      RESREG
8420  052726                            $RESREG:
8421  052726  012666  000022                   MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
8422  052732  012666  000022                   MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
8423  052736  012666  000022                   MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
8424  052742  012666  000022                   MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
8425  052746  012605                           MOV     (SP)+,R5        ;;POP STACK INTO R5
8426  052750  012604                           MOV     (SP)+,R4        ;;POP STACK INTO R4
8427  052752  012603                           MOV     (SP)+,R3        ;;POP STACK INTO R3
8428  052754  012602                           MOV     (SP)+,R2        ;;POP STACK INTO R2
8429  052756  012601                           MOV     (SP)+,R1        ;;POP STACK INTO R1
8430  052760  012600                           MOV     (SP)+,R0        ;;POP STACK INTO R0
8431  052762  000002                           RTI
8432
8433                                    .SBTTL  POWER DOWN AND UP ROUTINE
8434
8435                                    ;;*****************************************************************
8436
8437                                    ;POWER DOWN ROUTINE
8438  052764  017737  126150  003634    $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
8439  052772  012737  053012  000024            MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
8440  053000  012737  000340  000026            MOV     #PR7,PWRVEC+2
8441  053006  000000                           HALT
8442  053010  000776                           BR      .-2     ;HANG UP
8443
8444                                    ;;*****************************************************************
8445
8446                                    ;POWER UP ROUTINE
8447  053012  005037  053106            $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
8448  053016  012737  000144  053110            MOV     #100.,$PWRCT+2
8449  053024  005237  053106            1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
8450  053030  001375                           BNE     1$
8451  053032  005337  053110                   DEC     $PWRCT+2
8452  053036  001372                           BNE     1$
8453  053040  012737  052764  000024            MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
8454  053046  012737  000340  000026            MOV     #PR7,PWRVEC+2
```

```
8455  053054  012706  001100            MOV     #STACK,SP       ;FORCE STACK
8456  053060  104401  053112            TYPE    $POWER          ;TYPE POWER
8457  053064  004737  044740            JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
8458  053070  013777  003634  126042    MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
8459  053076  013702  001270            MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
8460  053102  000177  126000            JMP     @$LPADR ;GO BACK TO LAST TEST
8461
8462  053106  000000  000000  $PWRCT:  .WORD   0,0              ;TELETYPE TIME OUT
8463  053112  047520  042527  000122  $POWER: .ASCIZ  /POWER/
8464                                    .EVEN
8465                            .SBTTL  TRAP DECODER
8466
8467                            ;;**************************************************************
8468                            ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
8469                            ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
8470                            ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
8471                            ;*GO TO THAT ROUTINE.
8472
8473  053120  010046          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
8474  053122  016600  000002          MOV     2(SP),R0        ;;GET TRAP ADDRESS
8475  053126  005740                  TST     -(R0)           ;;BACKUP BY 2
8476  053130  111000                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
8477  053132  006300                  ASL     R0              ;;POSITION FOR INDEXING
8478  053134  016000  053154          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
8479  053140  000200                  RTS     R0              ;;GO TO ROUTINE
8480
8481
8482                            ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
8483
8484  053142  011646          $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
8485  053144  016666  000004  000002  MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
8486  053152  000002                  RTI                     ;;RESTORE THE PSW
8487
8488                            .SBTTL  TRAP TABLE
8489
8490                            ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
8491                            ;*BY THE "TRAP" INSTRUCTION.
8492
8493                            ;       ROUTINE
8494                            ;       -------
8495  053154  053142          $TRPAD: .WORD   $TRAP2
8496  053156  050336                  $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
8497  053160  050644                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
8498  053162  050620                  $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
8499  053164  050660                  $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
8500  053166  051046                  $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
8501
8502  053170  051660                  $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
8503
8504  053172  051570                  $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
8505  053174  052132                  $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
8506  053176  052222                  $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
8507  053200  052530                  $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
8508  053202  052670                  $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
8509  053204  052726                  $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
8510  053206  047304                  SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
8511                                            .SBTTL  DATA TABLE FOR PRINT OUT
8512
8513  053210  001220  003604                    DTO00:  .WORD   $TESTN,TRAPPC
8514  053214  001220  001116  003500            DTO01:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MR3
8515  053222  003440  003526  003466
8516  053230  003530  003470
8517  053234  001220  001116  003500            DTO15:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1
8518  053242  003440
8519  053244  001220  001116  003524            DTO17:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,PR.BIT,M1.BIT,BITCNT
8520  053252  003464  003614  003616
8521  053260  003622
8522  053262  001220  001116  003500            DTO22:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC
8523  053270  003440  003504  003444
8524  053276  003502  003442
8525  053302  001220  001116  003524            DTO25:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,BITCNT
8526  053310  003464  003622
8527  053314  001220  001116  003500            DTO31:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC,E.MR1,T.MR1
8528  053322  003440  003504  003444
8529  053330  003502  003442  003524
8530  053336  003464
8531  053340  001220  001116  003500            DTO35:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.BA,T.BA
8532  053346  003440  003510  003450
8533  053354  003504  003444
8534  053360  003502  003442                            .WORD   E.WC,T.WC
8535  053364  001220  001116  003522            DTO41:  .WORD   $TESTN,$ERRPC,E.DB,T.DB
8536  053372  003462
8537  053374  001220  001116  003500            DTO42:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
8538  053402  003440  003510  003450
8539  053410  001220  001116  003522            DTO54:  .WORD   $TESTN,$ERRPC,E.DB,T.DB,WRDCNT
8540  053416  003462  003624
8541  053422  001220  001116  003500            DTO55:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,WRDCNT
8542  053430  003440  003510  003450
8543  053436  003624
8544  053440  001220  001116  003500            DTO72:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
8545  053446  003440  003510  003450
8546  053454  003514  003454
8547  053460  003504  003444  003502                    .WORD   E.BA,T.BA,E.WC,T.WC
8548  053466  003442
8549  053470  001220  001116  003500            DTO77:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
8550  053476  003440  003510  003450
8551  053504  001220  001116  003500            DT150:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,WRDCNT,BITCNT
8552  053512  003440  003624  003622
8553  053520  001220  001116  003500            DT164:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS1,BITCNT
8554  053526  003440  003510  003440
8555  053534  003622
8556  053536  001220  001116  003524            DT170:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT,SECCNT
8557  053544  003464  003612  003614
8558  053552  003616  003620  003622
8559  053560  003626
8560  053562  001220  001116  003524            DT171:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
8561  053570  003464
8562  053572  001220  001116  003500            DT175:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
8563  053600  003440  003510  003450
8564  053606  003512  003452  003514
8565  053614  003454
8566  053616  001220  001116  003500            DT211:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
```

```
 8567  053624  003440  003510  003450
 8568  053632  003512  003452  003514
 8569  053640  003454
 8570  053642  003540  003550  003552          .WORD   P.CS1,P.CS2,P.DS,P.ER
 8571  053650  003554
```

```
                                        .SBTTL  DATA FORMAT FOR PRINT OUT
                                        
                                DF000:  .WORD   1
                                        .BYTE   2,0
                                DF001:  .WORD   5               ;ERRORS 1-14
                                        .BYTE   0,0
                                        .WORD   DH0C0A
                                        .BYTE   0,0
                                        .WORD   DH000B
                                        .BYTE   2,0
                                        .WORD   DH001A
                                        .BYTE   0,0
                                        .WORD   DH001B
                                        .BYTE   6,0
                                DF015:  .WORD   5               ;ERRORS 15-16
                                        .BYTE   0,0
                                        .WORD   DH000A
                                        .BYTE   0,0
                                        .WORD   DH000B
                                        .BYTE   2,0
                                        .WORD   DH015A
                                        .BYTE   0,0
                                        .WORD   DH015B
                                        .BYTE   2,0
                                DF017:  .WORD   5               ;ERROR 17-21
                                        .BYTE   0,0
                                        .WORD   DH000A
                                        .BYTE   0,0
                                        .WORD   DH000B
                                        .BYTE   2,0
                                        .WORD   DH017A
                                        .BYTE   0,0
                                        .WORD   DH017B
                                        .BYTE   5,0
                                DF022:  .WORD   5               ;ERROR 22-24
                                        .BYTE   0,0
                                        .WORD   DH000A
                                        .BYTE   0,0
                                        .WORD   DH000B
                                        .BYTE   2,0
                                        .WORD   DH022A
                                        .BYTE   0,0
                                        .WORD   DH022B
                                        .BYTE   6,0
                                DF025:  .WORD   5               ;ERROR 25
                                        .BYTE   0,0
                                        .WORD   DH000A
                                        .BYTE   0,0
                                        .WORD   DH000B
                                        .BYTE   2,0
                                        .WORD   DH025A
                                        .BYTE   0,0
                                        .WORD   DH025B
                                        .BYTE   3,0
                                DF031:  .WORD   5               ;ERROR 31-34
                                        .BYTE   0,0
```

```
8628  054026  055037                        .WORD   DH000A
8629  054030     000  000                   .BYTE   0,0
8630  054032  055055                        .WORD   DH000B
8631  054034     002  000                   .BYTE   2,0
8632  054036  055634                        .WORD   DH031A
8633  054040     000  000                   .BYTE   0,0
8634  054042  055733                        .WORD   DH031B
8635  054044     010  000                   .BYTE   8.,0
8636  054046  000005              DF035:    .WORD   5               ;ERRORS 35-40
8637  054050     000  000                   .BYTE   0,0
8638  054052  055037                        .WORD   DH000A
8639  054054     000  000                   .BYTE   0,0
8640  054056  055055                        .WORD   DH000B
8641  054060     002  000                   .BYTE   2,0
8642  054062  056031                        .WORD   DH035A
8643  054064     000  000                   .BYTE   0,0
8644  054066  056130                        .WORD   DH035B
8645  054070     010  000                   .BYTE   8.,0
8646  054072  000005              DF041:    .WORD   5               ;ERROR 41
8647  054074     000  000                   .BYTE   0,0
8648  054076  055037                        .WORD   DH000A
8649  054100     000  000                   .BYTE   0,0
8650  054102  055055                        .WORD   DH000B
8651  054104     002  000                   .BYTE   2,0
8652  054106  056225                        .WORD   DH041A
8653  054110     000  000                   .BYTE   0,0
8654  054112  056242                        .WORD   DH041B
8655  054114     002  000                   .BYTE   2,0
8656  054116  000005              DF042:    .WORD   5               ;ERRORS 42-43
8657  054120     000  000                   .BYTE   0,0
8658  054122  055037                        .WORD   DH000A
8659  054124     000  000                   .BYTE   0,0
8660  054126  055055                        .WORD   DH000B
8661  054130     002  000                   .BYTE   2,0
8662  054132  056257                        .WORD   DH042A
8663  054134     000  000                   .BYTE   0,0
8664  054136  056316                        .WORD   DH042B
8665  054140     004  000                   .BYTE   4,0
8666  054142  000005              DF054:    .WORD   5               ;ERROR 54
8667  054144     000  000                   .BYTE   0,0
8668  054146  055037                        .WORD   DH000A
8669  054150     000  000                   .BYTE   0,0
8670  054152  055055                        .WORD   DH000B
8671  054154     002  000                   .BYTE   2,0
8672  054156  056354                        .WORD   DH054A
8673  054160     000  000                   .BYTE   0,0
8674  054162  056401                        .WORD   DH054B
8675  054164     003  000                   .BYTE   3,0
8676  054166  000005              DF055:    .WORD   5               ;ERROR 55
8677  054170     000  000                   .BYTE   0,0
8678  054172  055037                        .WORD   DH000A
8679  054174     000  000                   .BYTE   0,0
8680  054176  055055                        .WORD   DH000B
8681  054200     002  000                   .BYTE   2,0
8682  054202  056427                        .WORD   DH055A
8683  054204     000  000                   .BYTE   0,0
```

```
 8684  054206  056474                        .WORD   DH055B
 8685  054210     005      000                .BYTE   5,0
 8686  054212  000007              DF072:    .WORD   7
 8687  054214     000      000               .BYTE   0,0
 8688  054216  055037                        .WORD   DH000A
 8689  054220     000      000               .BYTE   0,0
 8690  054222  055055                        .WORD   DH000B
 8691  054224     002      000               .BYTE   2,0
 8692  054226  056542                        .WORD   DH072A
 8693  054230     000      000               .BYTE   0,0
 8694  054232  056601                        .WORD   DH072B
 8695  054234     004      000               .BYTE   4,0
 8696  054236  056637                        .WORD   DH072C
 8697  054240     000      000               .BYTE   0,0
 8698  054242  056716                        .WORD   DH072D
 8699  054244     006      000               .BYTE   6,0
 8700  054246  000007              DF077:    .WORD   7
 8701  054250     000      000               .BYTE   0,0
 8702  054252  055037                        .WORD   DH000A
 8703  054254     000      000               .BYTE   0,0
 8704  054256  055055                        .WORD   DH000B
 8705  054260     002      000               .BYTE   2,0
 8706  054262  056542                        .WORD   DH072A
 8707  054264     000      000               .BYTE   0,0
 8708  054266  056601                        .WORD   DH072B
 8709  054270     004      000               .BYTE   4,0
 8710  054272  000005              DF150:    .WORD   5               ;ERROR 150
 8711  054274     000      000               .BYTE   0,0
 8712  054276  055037                        .WORD   DH000A
 8713  054300     000      000               .BYTE   0,0
 8714  054302  055055                        .WORD   DH000B
 8715  054304     002      000               .BYTE   2,0
 8716  054306  056773                        .WORD   DH150A
 8717  054310     000      000               .BYTE   0,0
 8718  054312  057027                        .WORD   DH150B
 8719  054314     004      000               .BYTE   4,0
 8720  054316  000005              DF164:    .WORD   5               ;ERROR 164
 8721  054320     000      000               .BYTE   0,0
 8722  054322  055037                        .WORD   DH000A
 8723  054324     000      000               .BYTE   0,0
 8724  054326  055055                        .WORD   DH000B
 8725  054330     002      000               .BYTE   2,0
 8726  054332  057065                        .WORD   DH164A
 8727  054334     000      000               .BYTE   0,0
 8728  054336  057131                        .WORD   DH164B
 8729  054340     005      000               .BYTE   5,0
 8730  054342  000005              DF170:    .WORD   5       ;ERROR 170
 8731  054344     000      000               .BYTE   0,0
 8732  054346  055037                        .WORD   DH000A
 8733  054350     000      000               .BYTE   0,0
 8734  054352  055055                        .WORD   DH000B
 8735  0543       002      000               .BYTE   2,0
 8736  054356  057177                        .WORD   DH170A
 8737  054360     000      000               .BYTE   0,0
 8738  054362  057276                        .WORD   DH170B
 8739  054364     010      000               .BYTE   8.,0
```

```
8740  054366  000005          DF171:  .WORD   5               ;ERRORS 171-174
8741  054370     000  000             .BYTE   0,0
8742  054372  055037                  .WORD   DH000A
8743  054374     000  000             .BYTE   0,0
8744  054376  055055                  .WORD   DH000B
8745  054400     002  000             .BYTE   2,0
8746  054402  057374                  .WORD   DH171A
8747  054404     000  000             .BYTE   0,0
8748  054406  057413                  .WORD   DH171B
8749  054410     002  000             .BYTE   2,0
8750  054412  000005          DF175:  .WORD   5               ;ERRORS 175-210
8751  054414     000  000             .BYTE   0,0
8752  054416  055037                  .WORD   DH000A
8753  054420     000  000             .BYTE   0,0
8754  054422  055055                  .WORD   DH000B
8755  054424     002  000             .BYTE   2,0
8756  054426  057431                  .WORD   DH175A
8757  054430     000  000             .BYTE   0,0
8758  054432  057530                  .WORD   DH175B
8759  054434     010  000             .BYTE   8.,0
8760  054436  000007          DF211:  .WORD   7               ;ERRORS 211-214
8761  054440     000  000             .BYTE   0,0
8762  054442  055037                  .WORD   DH000A
8763  054444     000  000             .BYTE   0,0
8764  054446  055055                  .WORD   DH000B
8765  054450     002  000             .BYTE   2,0
8766  054452  057431                  .WORD   DH175A
8767  054454     000  000             .BYTE   0,0
8768  054456  057530                  .WORD   DH175B
8769  054460     010  000             .BYTE   8.,0
8770  054462  057625                  .WORD   DH211A
8771  054464     000  000             .BYTE   0,0
8772  054466  057653                  .WORD   DH211B
8773  054470     004  000             .BYTE   4,0
```

```
                                        .SBTTL  ASCII MESSAGES

054472  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 VECTOR ADDRESS ( /
054500  020061  042526  052103
054506  051117  040440  042104
054514  042522  051523  024040
054522  000040
054524  024440  036440  000040  OPR002: .ASCIZ  / ) = /
054532  045522  030466  020061  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
054540  042526  052103  051117
054546  040440  042104  042522
054554  051523  024040  000040
054562  045522  030466  020061  OPR004: .ASCIZ  /RK611 PRIORITY ( /
054570  051120  047511  044522
054576  054524  024040  000040
054604  005015  047062  020104  OPR006: .ASCIZ  <15><12>/2ND PASS RUN TIME IS APPROX 13 MINUTES/<15><12>
054612  040520  051523  051040
054620  047125  052040  046511
054626  020105  051511  040440
054634  050120  047522  020130
054642  031461  046440  047111
054650  052125  051505  005015
054656     000
054657     015  025012  025052  OPR007: .ASCIZ  <15><12>/*****   PROGRAM HALTED   ******/<15><12>
054664  025052  020040  050040
054672  047522  051107  046501
054700  044040  046101  042524
054706  020104  020040  025052
054714  025052  025052  005015
054722     000
054723     040  000040          SPACE2: .ASCIZ  /  /
054726  005015  051120  043517  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
054734  040522  020115  041101
054742  051117  042524  020104
054750  042502  040503  051525
054756  020105  051105  047522
054764  020122  044124  042522
054772  044123  046117  020104
055000  054105  042503  042105
055006  042105  005015     000
055013     015  052012  051505  TSTBY1: .ASCIZ  <15><12>/TEST /
055020  020124     000
055023     040  054502  040520  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
055030  051523  042105  005015
055036     000
```

```
                                                .SBTTL  DATA HEADERS

 8819
 8820
 8821  055037     124  051505  020124  DH000A: .ASCIZ  /TEST    ERROR/
 8822  055044  020040  042440  051122
 8823  055052  051117     000
 8824  055055     116  046525  020040  DH000B: .ASCIZ  /NUM     PC/
 8825  055062  020040  050040  000103
 8826  055070  042524  052123  020040  DH000C: .ASCII  /TEST    TRAP/<15><12>
 8827  055076  020040  051124  050101
 8828  055104  005015
 8829  055106  052516  020115  020040          .ASCIZ  /NUM     PC/
 8830  055114  020040  041520     000
 8831  055121     105  050130  041505  DH001A: .ASCIZ  /EXPECT  ACUTAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8832  055126  020124  040440  052503
 8833  055134  040524  020114  042440
 8834  055142  050130  041505  020124
 8835  055150  040440  052103  040525
 8836  055156  020114  042440  050130
 8837  055164  041505  020124  040440
 8838  055172  052103  040525  000114
 8839  055200  045522  051503  020061  DH001B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
 8840  055206  020040  045522  051503
 8841  055214  020061  020040  042515
 8842  055222  051523  040440  020040
 8843  055230  042515  051523  040440
 8844  055236  020040  042515  051523
 8845  055244  041040  020040  042515
 8846  055252  051523  041040     000
 8847  055257     105  050130  041505  DH015A: .ASCIZ  /EXPECT  ACTUAL/
 8848  055264  020124  040440  052103
 8849  055272  040525  000114
 8850  055276  045522  051503  020061  DH015B: .ASCIZ  /RKCS1   RKCS1/
 8851  055304  020040  045522  051503
 8852  055312  000061
 8853  055314  054105  042520  052103  DH017A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PREVOUS BIT/
 8854  055322  020040  041501  052524
 8855  055330  046101  020040  051120
 8856  055336  051505  047105  020124
 8857  055344  051120  053105  052517
 8858  055352  020123  044502  000124
 8859  055360  045522  051115  020061  DH017B: .ASCIZ  /RKMR1   RKMR1   BIT     BIT     COUNT/
 8860  055366  020040  045522  051115
 8861  055374  020061  020040  044502
 8862  055402  020124  020040  020040
 8863  055410  044502  020124  020040
 8864  055416  020040  047503  047125
 8865  055424  000124
 8866  055426  054105  042520  052103  DH022A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8867  055434  020040  041501  052524
 8868  055442  046101  020040  054105
 8869  055450  042520  052103  020040
 8870  055456  041501  052524  046101
 8871  055464  020040  054105  042520
 8872  055472  052103  020040  041501
 8873  055500  052524  046101     000
 8874  055505     122  041513  030523  DH022B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC/
```

```
8875  055512  020040  051040  041513
8876  055520  030523  020040  051040
8877  055526  041113  020101  020040
8878  055534  051040  041113  020101
8879  055542  020040  051040  053513
8880  055550  020103  020040  051040
8881  055556  053513  000103
8882  055562  054105  042520  052103  DH025A: .ASCIZ  /EXPECT  ACTUAL  BIT/
8883  055570  020040  041501  052524
8884  055576  046101  020040  044502
8885  055604  000124
8886  055606  045522  051115  020061  DH025B: .ASCIZ  /RKMR1   RKMR1   COUNT/
8887  055614  020040  045522  051115
8888  055622  020061  020040  047503
8889  055630  047125  000124
8890  055634  054105  042520  052103  DH031A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8891  055642  020040  041501  052524
8892  055650  046101  020040  054105
8893  055656  042520  052103  020040
8894  055664  041501  052524  046101
8895  055672  020040  054105  042520
8896  055700  052103  020040  041501
8897  055706  052524  046101  020040
8898  055714  054105  042520  052103
8899  055722  020040  041501  052524
8900  055730  046101     000
8901  055733     122  041513  030523  DH031B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC    RKMR1   RKMR1/
8902  055740  020040  051040  041513
8903  055746  030523  020040  051040
8904  055754  041113  020101  020040
8905  055762  051040  041113  020101
8906  055770  020040  051040  053513
8907  055776  020103  020040  051040
8908  056004  053513  020103  020040
8909  056012  051040  046513  030522
8910  056020  020040  051040  046513
8911  056026  030522     000
8912  056031     105  050130  041505  DH035A: .ASCII  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8913  056036  020124  040440  052103
8914  056044  040525  020114  042440
8915  056052  050130  041505  020124
8916  056060  040440  052103  040525
8917  056066  020114  042440  050130
8918  056074  041505  020124  040440
8919  056102  052103  040525     114
8920  056107     040  042440  050130          .ASCIZ  /  EXPECT  ACTUAL/
8921  056114  041505  020124  040440
8922  056122  052103  040525  000114
8923  056130  045522  051503  020061  DH035B: .ASCII  /RKCS1   RKCS1   RKCS2   RKCS2   RKBA    RKBA/
8924  056136  020040  045522  051503
8925  056144  020061  020040  045522
8926  056152  051503  020062  020040
8927  056160  045522  051503  020062
8928  056166  020040  045522  040502
8929  056174  020040  020040  045522
8930  056202  040502
```

```
 8931  056204  020040  020040  045522          .ASCIZ  /    RKWC    RKWC/
 8932  056212  041527  020040  020040
 8933  056220  045522  041527     000
 8934  056225     105  050130  041505  DH041A: .ASCIZ  /EXPECT  WORD/
 8935  056232  020124  053440  051117
 8936  056240  000104
 8937  056242  047527  042122  020040  DH041B: .ASCIZ  /WORD    READ/
 8938  056250  020040  042522  042101
 8939  056256     000
 8940  056257     105  050130  041505  DH042A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 8941  056264  020124  040440  052103
 8942  056272  040525  020114  042440
 8943  056300  050130  041505  020124
 8944  056306  040440  052103  040525
 8945  056314  000114
 8946  056316  045522  051503  020061  DH042B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
 8947  056324  020040  045522  051503
 8948  056332  020061  020040  045522
 8949  056340  051503  020062  020040
 8950  056346  045522  051503  000062
 8951  056354  054105  042520  052103  DH054A: .ASCIZ  /EXPECT  WORD    WORD/
 895_  056362  020040  047527  042122
 8953  056370  020040  020040  047527
 8954  056376  042122     000
 8955  056401     127  051117  020104  DH054B: .ASCIZ  /WORD    READ    COUNT/
 8956  056406  020040  051040  040505
 8957  056414  020104  020040  041440
 8958  056422  052517  052116     000
 8959  056427     105  050130  041505  DH055A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  WORD/
 8960  056434  020124  040440  052103
 8961  056442  040525  020114  042440
 8962  056450  050130  041505  020124
 8963  056456  040440  052103  040525
 8964  056464  020114  053440  051117
 8965  056472  000104
 8966  056474  045522  051503  020061  DH055B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
 8967  056502  020040  045522  051503
 8968  056510  020061  020040  045522
 8969  056516  051503  020062  020040
 8970  056524  045522  051503  020062
 8971  056532  020040  047503  047125
 8972  056540  000124
 8973  056542  054105  042520  052103  DH072A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 8974  056550  020040  041501  052524
 8975  056556  046101  020040  054105
 8976  056564  042520  052103  020040
 8977  056572  041501  052524  046101
 8978  056600     000
 8979  056601     122  041513  030523  DH072B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
 8980  056606  020040  051040  041513
 8981  056614  030523  020040  051040
 8982  056622  041513  031123  020040
 8983  056630  051040  041513  031123
 8984  056636     000
 8985  056637     105  050130  041505  DH072C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8986  056644  020124  040440  052103
```

```
 8987  056652  040525  020114  042440
 8988  056660  050130  041505  020124
 8989  056666  040440  052103  040525
 8990  056674  020114  042440  050130
 8991  056702  041505  020124  040440
 8992  056710  052103  040525  000114
 8993  056716  045522  051105  020040  DH072D: .ASCIZ  /RKER    RKER    RKBA    RKBA    RKWC    RKWC/
 8994  056724  020040  045522  051105
 8995  056732  020040  020040  045522
 8996  056740  040502  020040  020040
 8997  056746  045522  040502  020040
 8998  056754  020040  045522  041527
 8999  056762  020040  020040  045522
 9000  056770  041527     000
 9001  056773     105  050130  041505  DH150A: .ASCIZ  /EXPECT  ACTUAL  WORD    BIT/
 9002  057000  020124  040440  052103
 9003  057006  040525  020114  053440
 9004  057014  051117  020104  020040
 9005  057022  041040  052111     000
 9006  057027     122  041513  030523  DH150B: .ASCIZ  /RKCS1   RKCS1   COUNT   COUNT/
 9007  057034  020040  051040  041513
 9008  057042  030523  020040  041440
 9009  057050  052517  052116  020040
 9010  057056  041440  052517  052116
 9011  057064     000
 9012  057065     105  050130  041505  DH164A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  BIT/
 9013  057072  020124  040440  052103
 9014  057100  040525  020114  042440
 9015  057106  050130  041505  020124
 9016  057114  040440  052103  040525
 9017  057122  020114  041040  052111
 9018  057130     000
 9019  057131     122  041513  030523  DH164B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
 9020  057136  020040  051040  041513
 9021  057144  030523  020040  051040
 9022  057152  041513  031123  020040
 9023  057160  051040  041513  031123
 9024  057166  020040  041440  052517
 9025  057174  052116     000
 9026  057177     105  050130  041505  DH170A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT     SECTOR/
 9027  057204  020124  040440  052103
 9028  057212  040525  020114  050040
 9029  057220  042522  042523  052116
 9030  057226  050040  042522  042523
 9031  057234  052116  050040  042522
 9032  057242  042523  052116  050040
 9033  057250  042522  042523  052116
 9034  057256  041040  052111  020040
 9035  057264  020040  051440  041505
 9036  057272  047524  000122
 9037  057276  045522  051115  020061  DH170B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT   COUNT/
 9038  057304  020040  045522  051115
 9039  057312  020061  020040  044502
 9040  057320  025524  020061  020040
 9041  057326  044502  020124  020040
 9042  057334  020040  044502  026524
```

```
9043  057342  020061  020040  044502
9044  057350  026524  020062  020040
9045  057356  047503  047125  020124
9046  057364  020040  047503  047125
9047  057372  000124
9048  057374  054105  042520  052103  DH171A: .ASCIZ  /EXPECT  ACTUAL/
9049  057402  020040  041501  052524
9050  057410  046101     000
9051  057413     122  046513  030522  DH171B: .ASCIZ  /RKMR1   RKMR1/
9052  057420  020040  051040  046513
9053  057426  030522     000
9054  057431     105  050130  041505  DH175A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
9055  057436  020124  040440  052103
9056  057444  040525  020114  042440
9057  057452  050130  041505  020124
9058  057460  040440  052103  040525
9059  057466  020114  042440  050130
9060  057474  041505  020124  040440
9061  057502  052103  040525  020114
9062  057510  042440  050130  041505
9063  057516  020124  040440  052103
9064  057524  040525  000114
9065  057530  045522  051503  020061  DH175B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKDS    RKDS    RkER    RKER/
9066  057536  020040  045522  051503
9067  057544  020061  020040  045522
9068  057552  051503  020062  020040
9069  057560  045522  051503  020062
9070  057566  020040  045522  051504
9071  057574  020040  020040  045522
9072  057602  051504  020040  020040
9073  057610  045522  051105  020040
9074  057616  020040  045522  051105
9075  057624     000
9076  057625     120  042522  044526  DH211A: .ASCIZ  /PREVIOUS REG CONTENTS/
9077  057632  052517  020123  042522
9078  057640  020107  047503  052116
9079  057646  047105  051524     000
9080  057653     122  041513  030523  DH211B: .ASCIZ  /RKCS1   RKCS2   RKDS    RKER/
9081  057660  020040  051040  041513
9082  057666  031123  020040  051040
9083  057674  042113  020123  020040
9084  057702  051040  042513  000122
```

```
 9085                                          .SBTTL  ERROR MESSAGES
 9086
 9087  057710  047125  054105  042520  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
 9088  057716  052103  042105  046440
 9089  057724  046505  051117  020131
 9090  057732  040520  044522  054524
 9091  057740  042440  040516  046102
 9092  057746  020105  051124  050101
 9093  057754     000
 9094  057755     101  052124  046505  EM200:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER/
 9095  057762  052120  047111  020107
 9096  057770  047524  041440  042510
 9097  057776  045503  051440  042505
 9098  060004  020113  042515  051523
 9099  060012  043501  020105  051106
 9100  060020  046517  051040  040505
 9101  060026  020104  042510  042101
 9102  060034  051105     000
 9103  060037     101  052124  046505  EM201:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER/
 9104  060044  052120  047111  020107
 9105  060052  047524  041440  042510
 9106  060060  045503  051440  042505
 9107  060066  020113  042515  051523
 9108  060074  043501  020105  051106
 9109  060102  046517  053440  044522
 9110  060110  042524  044040  040505
 9111  060116  042504  000122
 9112  060122  052101  042524  050115  EM202:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM READ HEADER/
 9113  060130  044524  043516  052040
 9114  060136  020117  044103  041505
 9115  060144  020113  046103  040505
 9116  060152  020122  051104  053111
 9117  060160  020105  042515  051523
 9118  060166  043501  020105  051106
 9119  060174  046517  051040  040505
 9120  060202  020104  042510  042101
 9121  060210  051105     000
 9122  060213     101  052124  046505  EM203:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM WRITE HEADER/
 9123  060220  052120  047111  020107
 9124  060226  047524  041440  042510
 9125  060234  045503  041440  042514
 9126  060242  051101  042040  044522
 9127  060250  042526  046440  051505
 9128  060256  040523  042507  043040
 9129  060264  047522  020115  051127
 9130  060272  052111  020105  042510
 9131  060300  042101  05.105     000
 9132  060305     101  052124  046505  EM204:  .ASCIZ  /ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT/
 9133  060312  052120  047111  020107
 9134  060320  020101  042522  042101
 9135  060326  044040  040505  042504
 9136  060334  020122  047524  041440
 9137  060342  042510  045503  051440
 9138  060350  041505  047524  020122
 9139  060356  052520  051514  020105
 9140  060364  042504  042524  052103
```

```
9141  060372      000
9142  060373      101  052124  046505  EM205:  .ASCIZ  /ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT/
9143  060400  052120  047111  020107
9144  060406  020101  051127  052111
9145  060414  020105  042510  042101
9146  060422  051105  052040  020117
9147  060430  044103  041505  020113
9148  060436  047111  042504  020130
9149  060444  052520  051514  020105
9150  060452  042504  042524  052103
9151  060460      000
9152  060461      101  052124  046505  EM206:  .ASCIZ  /ATTEMPTING AN NPR READ OF ONE WORD/
9153  060466  052120  047111  020107
9154  060474  047101  047040  051120
9155  060502  051040  040505  020104
9156  060510  043117  047440  042516
9157  060516  053440  051117  000104
9158  060524  052101  042524  050115  EM207:  .ASCIZ  /ATTEMPTING AN NPR READ/
9159  060532  044524  043516  040440
9160  060540  020116  050116  020122
9161  060546  042522  042101      000
9162  060553      101  052124  046505  EM208:  .ASCIZ  /ATTEMPTING NPR READ CHECKING ZERO DETECT/
9163  060560  052120  047111  020107
9164  060566  050116  020122  042522
9165  060574  042101  041440  042510
9166  060602  045503  047111  020107
9167  060610  042532  047522  042040
9168  060616  052105  041505  000124
9169  060624  052101  042524  050115  EM209:  .ASCIZ  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
9170  060632  044524  043516  047040
9171  060640  051120  051040  040505
9172  060646  020104  044527  044124
9173  060654  041040  051525  040440
9174  060662  042104  042522  051523
9175  060670  044440  041516  042522
9176  060676  042515  052116  044440
9177  060704  044116  041111  052111
9178  060712      000
9179  060713      101  052124  046505  EM210:  .ASCII  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
9180  060720  052120  047111  020107
9181  060726  050116  020122  042522
9182  060734  042101  053440  052111
9183  060742  020110  052502  020123
9184  060750  042101  051104  051505
9185  060756  020123  047111  051103
9186  060764  046505  047105  020124
9187  060772  047111  044510  044502
9188  061000      124
9189  061001      040  044103  041505          .ASCIZ  / CHECKING ZERO DETECT/
9190  061006  044513  043516  055040
9191  061014  051105  020117  042504
9192  061022  042524  052103      000
9193  061027      101  052124  046505  EM211:  .ASCIZ  /ATTEMPTING TO FORCE NON-EXISTENT MEMORY/
9194  061034  052120  047111  020107
9195  061042  047524  043040  051117
9196  061050  042503  047040  047117
```

```
 9197  061056  042455  044530  052123
 9198  061064  047105  020124  042515
 9199  061072  047515  054522     000
 9200  061077     101  052124  046505  EM212:  .ASCIZ  /ATTEMPTING TO CLEAR NON-EXISTENT MEMORY/
 9201  061104  052120  047111  020107
 9202  061112  047524  041440  042514
 9203  061120  051101  047040  047117
 9204  061126  042455  044530  052123
 9205  061134  047105  020124  042515
 9206  061142  047515  054522     000
 9207  061147     124  051505  044524  EM213:  .ASCIZ  /TESTING EXTENDED MEMORY ADDRESSING BITS/
 9208  061154  043516  042440  052130
 9209  061162  047105  042504  020104
 9210  061170  042515  047515  054522
 9211  061176  040440  042104  042522
 9212  061204  051523  047111  020107
 9213  061212  044502  051524     000
 9214  061217     101  052124  046505  EM214:  .ASCIZ  /ATTEMPTING TO FORCE UNIBUS PARITY ERROR/
 9215  061224  052120  047111  020107
 9216  061232  047524  043040  051117
 9217  061240  042503  052440  044516
 9218  061246  052502  020123  040520
 9219  061254  044522  054524  042440
 9220  061262  051122  051117     000
 9221  061267     101  052124  046505  EM215:  .ASCIZ  /ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY/
 9222  061274  052120  047111  020107
 9223  061302  050116  020122  042522
 9224  061310  042101  047440  020106
 9225  061316  047514  040503  044524
 9226  061324  047117  050040  044522
 9227  061332  051117  052040  020117
 9228  061340  040502  020104  040520
 9229  061346  044522  054524     000
 9230  061353     101  052124  046505  EM216:  .ASCIZ  /ATTEMPTING TO CLEAR UNIBUS PARITY ERROR/
 9231  061360  052120  047111  020107
 9232  061366  047524  041440  042514
 9233  061374  051101  052440  044516
 9234  061402  052502  020123  040520
 9235  061410  044522  054524  042440
 9236  061416  051122  051117     000
 9237  061423     101  052124  046505  EM217:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ/
 9238  061430  052120  047111  020107
 9239  061436  034061  041040  052111
 9240  061444  047040  051120  051040
 9241  061452  040505  000104
 9242  061456  052101  042524  050115  EM218:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT/
 9243  061464  044524  043516  030440
 9244  061472  020070  044502  020124
 9245  061500  052116  020122  042522
 9246  061506  042101  041440  042510
 9247  061514  045503  047111  020107
 9248  061522  042532  047522  042040
 9249  061530  052105  041505  000124
 9250  061536  052101  042524  050115  EM219:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
 9251  061544  044524  043516  030440
 9252  061552  020070  044502  020124
```

```
9253  061560  050116  020122  042522
9254  061566  042101  053440  052111
9255  061574  020110  044502  020124
9256  061602  033061  024040  040520
9257  061610  020051  042523  000124
9258  061616  052101  042524  050115  EM220:  .ASCII  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
9259  061624  044524  043516  030440
9260  061632  020070  044502  020124
9261  061640  050116  020122  042522
9262  061646  042101  053440  052111
9263  061654  020110  044502  020124
9264  061662  033061  024040  040520
9265  061670  020051  042523      124
9266  061675      101  052124  046505  EM221:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER/
9267  061702  052120  047111  020107
9268  061710  044523  052515  040514
9269  061716  044524  047117  047440
9270  061724  020106  040504  040524
9271  061732  044440  020116  042522
9272  061740  042101  044040  040505
9273  061746  042504  000122
9274  061752  052101  042524  050115  EM222:  .ASCIZ  /ATTEMPTING READ HEADER IN MAINTANENCE MODE/
9275  061760  044524  043516  051040
9276  061766  040505  020104  042510
9277  061774  042101  051105  044440
9278  062002  020116  040515  047111
9279  062010  040524  042516  041516
9280  062016  020105  047515  042504
9281  062024      000
9282  062025      101  052124  046505  EM223:  .ASCIZ  /ATTEMPTING DATA BUFFER READ AFTER READ HEADER/
9283  062032  052120  047111  020107
9284  062040  040504  040524  041040
9285  062046  043125  042506  020122
9286  062054  042522  042101  040440
9287  062062  052106  051105  051040
9288  062070  040505  020104  042510
9289  062076  042101  051105      000
9290  062103      101  052124  046505  EM224:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER (18 BIT FORMAT)/
9291  062110  052120  047111  020107
9292  062116  044523  052515  040514
9293  062124  044524  047117  047440
9294  062132  020106  040504  040524
9295  062140  044440  020116  042522
9296  062146  042101  044040  040505
9297  062154  042504  020122  030450
9298  062162  020070  044502  020124
9299  062170  047506  046522  052101
9300  062176  000051
9301  062200  052101  042524  050115  EM225:  .ASCIZ  /ATTEMPTING READ HEADER (18 BIT FORMAT) IN MAINT MODE/
9302  062206  044524  043516  051040
9303  062214  040505  020104  042510
9304  062222  042101  051105  024040
9305  062230  034061  041040  052111
9306  062236  043040  051117  040515
9307  062244  024524  044440  020116
9308  062252  040515  047111  020124
```

```
9309  062260  047515  042504     000
9310  062265     101  052124  046505  EM226:  .ASCII  /ATTEMPTING DATA BUFFER READ AFTER/<12><15>
9311  062272  052120  047111  020107
9312  062300  040504  040524  041040
9313  062306  043125  042506  020122
9314  062314  042522  042101  040440
9315  062322  052106  051105  006412
9316  062330  042522  042101  044040          .ASCIZ  /READ HEADER IN 18 BIT FORMAT/
9317  062336  040505  042504  020122
9318  062344  047111  030440  020070
9319  062352  044502  020124  047506
9320  062360  046522  052101     000
9321  062365     101  052124  046505  EM227:  .ASCII  /ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER/<15><12>
9322  062372  052120  047111  020107
9323  062400  047524  041440  042510
9324  062406  045503  051440  047131
9325  062414  044103  042040  052105
9326  062422  041505  020124  047117
9327  062430  051040  040505  020104
9328  062436  042510  042101  051105
9329  062444  005015
9330  062446  044103  041505  044513          .ASCIZ  /CHECKING ZERO DETECT/
9331  062454  043516  055040  051105
9332  062462  020117  042504  042524
9333  062470  052103     000
9334  062473     101  052124  046505  EM230:  .ASCII  /ATTEMPTING TO CHECK WRITING OF ZEROES BETWEEN INDEX/<15><12>
9335  062500  052120  047111  020107
9336  062506  047524  041440  042510
9337  062514  045503  053440  044522
9338  062522  044524  043516  047440
9339  062530  020106  042532  047522
9340  062536  051505  041040  052105
9341  062544  042527  047105  044440
9342  062552  042116  054105  005015
9343  062560  047101  020104  042523          .ASCIZ  /AND SECTOR PULSE/
9344  062566  052103  051117  050040
9345  062574  046125  042523     000
9346  062601     101  052124  046505  EM231:  .ASCII  /ATTEMPTING TO RESET WRITE GATE BY SETTING/<15><12>
9347  062606  052120  047111  020107
9348  062614  047524  051040  051505
9349  062622  052105  053440  044522
9350  062630  042524  043440  052101
9351  062636  020105  054502  051440
9352  062644  052105  044524  043516
9353  062652  005015
9354  062654  042523  052103  051117          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
9355  062662  050040  046125  042523
9356  062670  044440  020116  020101
9357  062676  051127  052111  020105
9358  062704  042510  042101  051105
9359  062712  041440  046517  040515
9360  062720  042116     000
9361  062723     101  052124  046505  EM232:  .ASCII  /ATTEMPTING TO SET WRITE GATE BY RESETTING/<15><12>
9362  062730  052120  047111  020107
9363  062736  047524  051440  052105
9364  062744  053440  044522  042524
```

```
 9365  062752  043440  052101  020105
 9366  062760  054502  051040  051505
 9367  062766  052105  044524  043516
 9368  062774  005015
 9369  062776  042523  052103  051117          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 9370  063004  050040  046125  042523
 9371  063012  044440  020116  020101
 9372  063020  051127  052111  020105
 9373  063026  042510  042101  051105
 9374  063034  041440  046517  040515
 9375  063042  042116     000
 9376  063045     101  052124  046505  EM233:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH OF HEADER/
 9377  063052  052120  047111  020107
 9378  063060  047524  053440  044522
 9379  063066  042524  051440  047131
 9380  063074  044103  047440  020106
 9381  063102  042510  042101  051105
 9382  063110     000
 9383  063111     101  052124  046505  EM234:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA/
 9384  063116  052120  047111  020107
 9385  063124  047524  053440  044522
 9386  063132  042524  044040  040505
 9387  063140  042504  020122  040504
 9388  063146  040524     000
 9389  063151     101  052124  046505  EM235:  .ASCII  /ATTEMPTING TO RESET WRITE GATE WITH SECOND/<15><12>
 9390  063156  052120  047111  020107
 9391  063164  047524  051040  051505
 9392  063172  052105  053440  044522
 9393  063200  042524  043440  052101
 9394  063206  020105  044527  044124
 9395  063214  051440  041505  047117
 9396  063222  006504     012
 9397  063225     111  042116  054105           ASCIZ  /INDEX PULSE OF WRITE HEADER/
 9398  063232  050040  046125  042523
 9399  063240  047440  020106  051127
 9400  063246  052111  020105  042510
 9401  063254  042101  051105     000
 9402  063261     101  052124  046505  EM236:  .ASCIZ  /ATTEMPTING TO COMPLETE WRITE HEADER IN MAINT MODE/
 9403  063266  052120  047111  020107
 9404  063274  047524  041440  046517
 9405  063302  046120  052105  020105
 9406  063310  051127  052111  020105
 9407  063316  042510  042101  051105
 9408  063324  044440  020116  040515
 9409  063332  047111  020124  047515
 9410  063340  042504     000
 9411  063343     101  052124  046505  EM237:  .ASCIZ  /ATTEMPTING TO WRITE GAP OR DATA SYNCH/
 9412  063350  052120  047111  020107
 9413  063356  047524  053440  044522
 9414  063364  042524  043440  050101
 9415  063372  047440  020122  040504
 9416  063400  040524  051440  047131
 9417  063406  044103     000
 9418  063411     101  052124  046505  EM238:  .ASCIZ /ATTEMPTING TO WRITE DATA FIELD/
 9419  063416  052120  047111  020107
 9420  063424  047524  053440  044522
```

```
9421  063432  042524  042040  052101
9422  063440  020101  044506  046105
9423  063446  000104
9424  063450  052101  042524  050115  EM239:  .ASCIZ  /ATTEMPING TO WRITE SYNCH OF HEADER USING 24 SECTOR FORMAT/
9425  063456  047111  020107  047524
9426  063464  053440  044522  042524
9427  063472  051440  047131  044103
9428  063500  047440  020106  042510
9429  063506  042101  051105  052440
9430  063514  044523  043516  031040
9431  063522  020064  042523  052103
9432  063530  051117  043040  051117
9433  063536  040515  000124
9434  063542  052101  042524  050115  EM240:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA USING 24 SECTOR FORMAT/
9435  063550  044524  043516  052040
9436  063556  020117  051127  052111
9437  063564  020105  042510  042101
9438  063572  051105  042040  052101
9439  063600  020101  051525  047111
9440  063606  020107  032062  051440
9441  063614  041505  047524  020122
9442  063622  047506  046522  052101
9443  063630     000
9444  063631     101  052124  046505  EM241:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26 SECTOR)/
9445  063636  052120  047111  020107
9446  063644  047524  043040  051117
9447  063652  042503  043040  051117
9448  063660  040515  020124  051105
9449  063666  047522  020122  041450
9450  063674  046506  020124  020075
9451  063702  033062  051440  041505
9452  063710  047524  024522     000
9453  063715     101  052124  046505  EM242:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24 SECTOR)/
9454  063722  052120  047111  020107
9455  063730  047524  043040  051117
9456  063736  042503  043040  051117
9457  063744  040515  020124  051105
9458  063752  047522  020122  041450
9459  063760  046506  020124  020075
9460  063766  032062  051440  041505
9461  063774  047524  024522     000
9462  064001     101  052124  046505  EM243:  .ASCIZ  /ATTEMPING TO FORCE CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS/
9463  064006  044520  043516  052040
9464  064014  020117  047506  041522
9465  064022  020105  047503  052116
9466  064030  047522  046114  051105
9467  064036  042440  051122  051117
9468  064044  053440  052111  020110
9469  064052  040506  046125  020124
9470  064060  044502  020124  047111
9471  064066  042040  044522  042526
9472  064074  046440  051505  000123
9473  064102  052101  042524  050115  EM244:  .ASCIZ  /ATTEMPTING TO CLEAR ERROR/
9474  064110  044524  043516  052040
9475  064116  020117  046103  040505
9476  064124  020122  051105  047522
```

```
9477  064132  000122
9478  064134  047503  046515  047101  EM3000: .ASCIZ  /COMMAND AND STATUS REG 1 INCORRECT/
9479  064142  020104  047101  020104
9480  064150  052123  052101  051525
9481  064156  051040  043505  030440
9482  064164  044440  041516  051117
9483  064172  042522  052103     000
9484  064177     115  051505  040523  EM3001: .ASCIZ  /MESSAGE A INCORRECT/
9485  064204  042507  040440  044440
9486  064212  041516  051117  042522
9487  064220  052103     000
9488  064223     115  051505  040523  EM3002: .ASCIZ  /MESSAGE B INCORRECT/
9489  064230  042507  041040  044440
9490  064236  041516  051117  042522
9491  064244  052103     000
9492  064247     103  030523  044440  EM3003: .ASCIZ  /CS1 INCORRECT AFTER SENDING DRIVE CLEAR/
9493  064254  041516  051117  042522
9494  064262  052103  040440  052106
9495  064270  051105  051440  047105
9496  064276  044504  043516  042040
9497  064304  044522  042526  041440
9498  064312  042514  051101     000
9499  064317     103  030523  044440  EM3004: .ASCIZ  /CS1 INCORRECT AFTER AFTER DATA SIMULATION/
9500  064324  041516  051117  042522
9501  064332  052103  040440  052106
9502  064340  051105  040440  052106
9503  064346  051105  042040  052101
9504  064354  020101  044523  052515
9505  064362  040514  044524  047117
9506  064370     000
9507  064371     115  044501  052116  EM3005: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
9508  064376  051040  043505  020056
9509  064404  020061  047111  047503
9510  064412  051122  041505  020124
9511  064420  052504  044522  043516
9512  064426  042040  052101  020101
9513  064434  044523  052515  040514
9514  064442  044524  047117
9515  064446  005015  043101  042524          .ASCIZ  <15><12>/AFTER SECTOR PULSE/
9516  064454  020122  042523  052103
9517  064462  051117  050040  046125
9518  064470  042523     000
9519  064473     115  044501  052116  EM3006: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
9520  064500  051040  043505  020056
9521  064506  020061  047111  047503
9522  064514  051122  041505  020124
9523  064522  052504  044522  043516
9524  064530  042040  052101  020101
9525  064536  044523  052515  040514
9526  064544  044524  047117
9527  064550  005015  043101  042524          .ASCIZ  <15><12>/AFTER INDEX PULSE/
9528  064556  020122  047111  042504
9529  064564  020130  052520  051514
9530  064572  000105
9531  064574  040515  047111  020124  EM3007: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
9532  064602  042522  027107  030440
```

```
 9533  064610  044440  041516  051117
 9534  064616  042522  052103  042040
 9535  064624  051125  047111  020107
 9536  064632  040504  040524  051440
 9537  064640  046511  046125  052101
 9538  064646  047511     116
 9539  064651     015  047012  020117          .ASCIZ  <15,<12>/NO SECTOR OR INDEX PULSE SUPPLIED/
 9540  064656  042523  052103  051117
 9541  064664  047440  020122  047111
 9542  064672  042504  020130  052520
 9543  064700  051514  020105  052523
 9544  064706  050120  044514  042105
 9545  064714     000
 9546  064715     102  051525  040440  EM3008: .ASCIZ  /BUS ADDRESS INCORRECT AFTER SENDING DRIVE CLEAR/
 9547  064722  042104  042522  051523
 9548  064730  044440  041516  051117
 9549  064736  042522  052103  040440
 9550  064744  052106  051105  051440
 9551  064752  047105  044504  043516
 9552  064760  042040  044522  042526
 9553  064766  041440  042514  051101
 9554  064774     000
 9555  064775     127  051117  020104  EM3009: .ASCIZ  /WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR/
 9556  065002  047503  047125  020124
 9557  065010  047111  047503  051122
 9558  065016  041505  020124  043101
 9559  065024  042524  020122  042523
 9560  065032  042116  047111  020107
 9561  065040  051104  053111  020105
 9562  065046  046103  040505  000122
 9563  065054  051503  020061  044103  EM3010: .ASCIZ  /CS1 CHANGED DURING COMMAND EXECUTION/
 9564  065062  047101  042507  020104
 9565  065070  052504  044522  043516
 9566  065076  041440  046517  040515
 9567  065104  042116  042440  042530
 9568  065112  052503  044524  047117
 9569  065120     000
 9570  065121     102  051525  040440  EM3011: .ASCIZ  /BUS ADDRESS CHANGED BEFORE INDEX PULSE/
 9571  065126  042104  042522  051523
 9572  065134  041440  040510  043516
 9573  065142  042105  041040  043105
 9574  065150  051117  020105  047111
 9575  065156  042504  020130  052520
 9576  065164  051514  000105
 9577  065170  047527  042122  041440  EM3012: .ASCIZ  /WORD COUNT CHANGED BEFORE INDEX PULSE/
 9578  065176  052517  052116  041440
 9579  065204  040510  043516  042105
 9580  065212  041040  043105  051117
 9581  065220  020105  047111  042504
 9582  065226  020130  052520  051514
 9583  065234  000105
 9584  065236  051503  020061  044103  EM3013: .ASCIZ  /CS1 CHANGE AFTER INDEX PULSE/
 9585  065244  047101  042507  040440
 9586  065252  052106  051105  044440
 9587  065260  042116  054105  050040
 9588  065266  046125  042523     000
```

```
 9589  065273     115  044501  052116  EM3014: .ASCIZ  /MAINT REG 1 INCORRECT BEFORE INDEX PULSE/
 9590  065300  051040  043505  030440
 9591  065306  044440  041516  051117
 9592  065314  042522  052103  041040
 9593  065322  043105  051117  020105
 9594  065330  047111  042504  020130
 9595  065336  052520  051514  000105
 9596  065344  052502  020123  042101  EM3015: .ASCIZ  /BUS ADDRESS CHANGED AFTER INDEX PULSE/
 9597  065352  051104  051505  020123
 9598  065360  044103  047101  042507
 9599  065366  020104  043101  042524
 9600  065374  020122  047111  042504
 9601  065402  020130  052520  051514
 9602  065410  000105
 9603  065412  047527  042122  041440  EM3016: .ASCIZ  /WORD COUNT CHANGED AFTER INDEX PULSE/
 9604  065420  052517  052116  041440
 9605  065426  040510  043516  042105
 9606  065434  040440  052106  051105
 9607  065442  044440  042116  054105
 9608  065450  050040  046125  042523
 9609  065456     000
 9610  065457     103  046517  040515  EM3018: .ASCIZ  /COMMAND AND STATUS REG. 2 INCORRECT/
 9611  065464  042116  040440  042116
 9612  065472  051440  040524  052524
 9613  065500  020123  042522  027107
 9614  065506  031040  044440  041516
 9615  065514  051117  042522  052103
 9616  065522     000
 9617  065523     102  051525  040440  EM3019: .ASCIZ  /BUS ADD REG INCORRECT/
 9618  065530  042104  051040  043505
 9619  065536  044440  041516  051117
 9620  065544  042522  052103     000
 9621  065551     127  051117  020104  EM3020: .ASCIZ  /WORD COUNT REG INCORRECT/
 9622  065556  047503  047125  020124
 9623  065564  042522  020107  047111
 9624  065572  047503  051122  041505
 9625  065600  000124
 9626  065602  040504  040524  051040  EM3021: .ASCIZ  /DATA READ INCORRECT/
 9627  065610  040505  020104  047111
 9628  065616  047503  051122  041505
 9629  065624  000124
 9630  065626  051503  020061  047111  EM3022: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
 9631  065634  047503  051122  041505
 9632  065642  020124  043101  042524
 9633  065650  020122  042522  042101
 9634  065656  047111  020107  040504
 9635  065664  040524  041040  043125
 9636  065672  042506  000122
 9637  065676  051503  020062  047111  EM3023: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
 9638  065704  047503  051122  041505
 9639  065712  020124  043101  042524
 9640  065720  020122  042522  042101
 9641  065726  047111  020107  040504
 9642  065734  040524  041040  043125
 9643  065742  042506  000122
 9644  065746  051105  047522  020122  EM3024: .ASCIZ  /ERROR REG INCORRECT/
```

```
9645  065754  042522  020107  047111
9646  065762  047503  051122  041505
9647  065770  000124
9648  065772  040515  047111  020124  EM3025: .ASCIZ  /MAINT REG 1 INCORRECT AFTER INDEX PULSE/
9649  066000  042522  020107  020061
9650  066006  047111  047503  051122
9651  066014  041505  020124  043101
9652  066022  042524  020122  047111
9653  066030  042504  020130  052520
9654  066036  051514  000105
9655  066042  051503  020061  047111  EM3026: .ASCIZ  /CS1 INCORRECT AFTER COMMAND COMPLETION/
9656  066050  047503  051122  041505
9657  066056  020124  043101  042524
9658  066064  020122  047503  046515
9659  066072  047101  020104  047503
9660  066100  050115  042514  044524
9661  066106  047117     000
9662  066111     103  031123  044440  EM3027: .ASCIZ  /CS2 INCORRECT AFTER COMMAND COMPLETION/
9663  066116  041516  051117  042522
9664  066124  052103  040440  052106
9665  066132  051105  041440  046517
9666  066140  040515  042116  041440
9667  066146  046517  046120  052105
9668  066154  047511  000116
9669  066160  051503  020061  047111  EM3028: .ASCIZ  /CS1 INCORRECT AFTER READING EMPTY SILO/
9670  066166  047503  051122  041505
9671  066174  020124  043101  042524
9672  066202  020122  042522  042101
9673  066210  047111  020107  046505
9674  066216  052120  020131  044523
9675  066224  047514     000
9676  066227     103  031123  044440  EM3029: .ASCIZ  /CS2 INCORRECT AFTER READING EMPTY SILO/
9677  066234  041516  051117  042522
9678  066242  052103  040440  052106
9679  066250  051105  051040  040505
9680  066256  044504  043516  042440
9681  066264  050115  054524  051440
9682  066272  046111  000117
9683  066276  040515  047111  020124  EM3030: .ASCIZ  /MAINT REG 1 INCORRECT/
9684  066304  042522  020107  020061
9685  066312  047111  047503  051122
9686  066320  041505  000124
9687  066324  051104  053111  020105  EM3031: .ASCIZ  /DRIVE STATUS REG INCORRECT/
9688  066332  052123  052101  051525
9689  066340  051040  043505  044440
9690  066346  041516  051117  042522
9691  066354  052103     000
9692  066357     105  051122  051117  EM3032: .ASCIZ  /ERROR REG INCORRECT/
9693  066364  051040  043505  044440
9694  066372  041516  051117  042522
9695  066400  052103     000
9696  066403     115  030522  044440  EMW1:   .ASCIZ  /MR1 INCORRECT ON 1ST UPWARD TRANSISTION OF MAINT CLOCK/
9697  066410  041516  051117  042522
9698  066416  052103  047440  020116
9699  066424  051461  020124  050125
9700  066432  040527  042122  052040
```

```
9701  066440  040522  051516  051511
9702  066446  044524  047117  047440
9703  066454  020106  040515  047111
9704  066462  020124  046103  041517
9705  066470  000113
9706  066472  051115  020061  047111  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISTION OF MAINT CLOCK/
9707  066500  047503  051122  041505
9708  066506  020124  047117  030440
9709  066514  052123  042040  053517
9710  066522  053516  051101  020104
9711  066530  051124  047101  044523
9712  066536  052123  047511  020116
9713  066544  043117  046440  044501
9714  066552  052116  041440  047514
9715  066560  045503     000
9716  066563     115  030522  044440  EMW3:   .ASCIZ  /MR1 INCORRECT ON 2ND UPWARD TRANSISTION OF MAINT CLOCK/
9717  066570  041516  051117  042522
9718  066576  052103  047440  020116
9719  066604  047062  020104  050125
9720  066612  040527  042122  052040
9721  066620  040522  051516  051511
9722  066626  044524  047127  047440
9723  066634  020106  040515  047111
9724  066642  020124  046103  041517
9725  066650  000113
9726  066652  051115  020061  047111  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSISTION OF MAINT CLOCK/
9727  066660  047503  051122  041505
9728  066666  020124  047117  031040
9729  066674  042116  042040  053517
9730  066702  053516  051101  020104
9731  066710  051124  047101  044523
9732  066716  052123  047511  020116
9733  066724  043117  046440  044501
9734  066732  052116  041440  047514
9735  066740  045503     000
```

```
9736
9737
9738                    066744          .SBTTL  DATA PATTERNS
9739    066744  000000                  .EVEN
9740    066744  000000          PATTERN: .WORD  000000
9741    066746  177777                   .WORD  177777
9742    066750  125252                   .WORD  125252
9743    066752  052515                   .WORD  052515
9744    066754  101706                   .WORD  101706
9745    066756  060422                   .WORD  060422
9746    066760  130715                   .WORD  130715
9747    066762  177777          HEAD1:   .WORD  177777
9748    066764  000000                   .WORD  000000
9749    066766  177777                   .WORD  177777
9750    066770  000000          HEAD2:   .WORD  000000
9751    066772  177777                   .WORD  177777
9752    066774  000000                   .WORD  000000
9753    066776  125252          HEAD3:   .WORD  125252
9754    067000  052525                   .WORD  052525
9755    067002  125252                   .WORD  125252
9756    067004  052525                   .WORD  052525
9757    067006  125252                   .WORD  125252
9758    067010  052525                   .WORD  052525
9759    067012  044444          HEAD4:   .WORD  044444
9760    067014  022222                   .WORD  022222
9761    067016  111111                   .WORD  111111
9762    067020  052012          HEAD5:   .WORD  052012
9763    067022  100520                   .WORD  100520
9764    067024  052012                   .WORD  052012
9765    067026  155555          HEAD6:   .WORD  155555
9766    067030  066666                   .WORD  066666
9767    067032  155555                   .WORD  155555
9768    067034  104210          HEAD7:   .WORD  104210
9769    067036  104210                   .WORD  104210
9770    067040  104210                   .WORD  104210
9771    067042     100     100  NPRBUF:  .BYTE  100,100
9772    067044     101     101           .BYTE  101,101
9773    067046     102     102           .BYTE  102,102
9774    067050     103     103           .BYTE  103,103
9775    067052     104     104           .BYTE  104,104
9776    067054     105     105           .BYTE  105,105
9777    067056     106     106           .BYTE  106,106
9778    067060     107     107           .BYTE  107,107
9779    067062     110     110           .BYTE  110,110
9780    067064     111     111           .BYTE  111,111
9781    067066     112     112           .BYTE  112,112
9782    067070     113     113           .BYTE  113,113
9783    067072     114     114           .BYTE  114,114
9784    067074     115     115           .BYTE  115,115
9785    067076     116     116           .BYTE  116,116
9786    067100     117     117           .BYTE  117,117
9787    067102     120     120           .BYTE  120,120
9788    067104     121     121           .BYTE  121,121
9789    067106     122     122           .BYTE  122,122
9790    067110     123     123           .BYTE  123,123
9791    067112     124     124           .BYTE  124,124
9792    067114     125     125           .BYTE  125,125
```

```
 9792  067116      126      126                    .BYTE   126,126
 9793  067120      127      127                    .BYTE   127,127
 9794  067122      130      130                    .BYTE   130,130
 9795  067124      131      131                    .BYTE   131,131
 9796  067126      132      132                    .BYTE   132,132
 9797  067130      133      133                    .BYTE   133,133
 9798  067132      134      134                    .BYTE   134,134
 9799  067134      135      135                    .BYTE   135,135
 9800  067136      136      136                    .BYTE   136,136
 9801  067140      137      137                    .BYTE   137,137
 9802  067142      140      140                    .BYTE   140,140
 9803  067144      141      141                    .BYTE   141,141
 9804  067146      142      142                    .BYTE   142,142
 9805  067150      143      143                    .BYTE   143,143
 9806  067152      144      144                    .BYTE   144,144
 9807  067154      145      145                    .BYTE   145,145
 9808  067156      146      146                    .BYTE   146,146
 9809  067160      147      147                    .BYTE   147,147
 9810  067162      150      150                    .BYTE   150,150
 9811  067164      151      151                    .BYTE   151,151
 9812  067166      152      152                    .BYTE   152,152
 9813  067170      153      153                    .BYTE   153,153
 9814  067172      154      154                    .BYTE   154,154
 9815  067174      155      155                    .BYTE   155,155
 9816  067176      156      156                    .BYTE   156,156
 9817  067200      157      157                    .BYTE   157,157
 9818  067202      160      160                    .BYTE   160,160
 9819  067204      161      161                    .BYTE   161,161
 9820  067206      162      162                    .BYTE   162,162
 9821  067210      163      163                    .BYTE   163,163
 9822  067212      164      164                    .BYTE   164,164
 9823  067214      165      165                    .BYTE   165,165
 9824  067216      166      166                    .BYTE   166,166
 9825  067220      167      167                    .BYTE   167,167
 9826  067222      170      170                    .BYTE   170,170
 9827  067224      171      171                    .BYTE   171,171
 9828  067226      172      172                    .BYTE   172,172
 9829  067230      173      173                    .BYTE   173,173
 9830  067232      174      174                    .BYTE   174,174
 9831  067234      175      175                    .BYTE   175,175
 9832  067236      176      176                    .BYTE   176,176
 9833  067240      177      177                    .BYTE   177,177
 9834  067242      200      200                    .BYTE   200,200
 9835  067244      201      201                    .BYTE   201,201
 9836  067246      202      202                    .BYTE   202,202
 9837  067250      203      203                    .BYTE   203,203
 9838  067252      204      204                    .BYTE   204,204
 9839  067254      205      205                    .BYTE   205,205
 9840  067256      206      206                    .BYTE   205,206
 9841  067260      207      207                    .BYTE   207,207
 9842  067262      210      210                    .BYTE   210,210
 9843  067264   000102                 WRBUFF:  .BLKW   66.
 9844           067300                 BADPAR=  WRBUFF+14
 9845           000001                 .END
```

```
ABASE = 177440           1049*   1287    1328
ABORT   054726           7830    8805*
ACDW1 = 000000           1287    1330
ACDW2 = 000000           1287    1331
ACLO  = 000010           1144*
ACPUOP= 000000           1287    1302
ADDW0 = 000000           1287
ADDW1 = 000000           1287
ADDW10= 000000           1287
ADDW11= 000000           1287
ADDW12= 000000           1287
ADDW13= 000000           1287
ADDW14= 000000           1287
ADDW15= 000000           1287
ADDW2 = 000000           1287
ADDW3 = 000000           1287
ADDW4 = 000000           1287
ADDW5 = 000000           1287
ADDW6 = 000000           1287
ADDW7 = 000000           1287
ADDW8 = 000000           1287
ADDW9 = 000000           1287
ADEVCT= 000000           1287    1293
ADEVM = 000000           1287    1329
AENV  = 000000           1287    1298
AENVM = 000000           1287    1299
AFATAL= 000000           1287    1290
AMADR1= 000000           1287    1315
AMADR2= 000000           1287    1319
AMADR3= 000000           1287    1322
AMADR4= 000000           1287    1325
AMAMS1= 000000           1287    1309
AMAMS2= 000000           1287    1317
AMAMS3= 000000           1287    1320
AMAMS4= 000000           1287    1323
AMSGAD= 000000           1287    1295
AMSGLG= 000000           1287    1296
AMSGTY= 000000           1287    1289
AMTYP1= 000000           1287    1310
AMTYP2= 000000           1287    1318
AMTYP3= 000000           1287    1321
AMTYP4= 000000           1287    1324
APASS = 000000           1287    1292
APRIOR= 000005           1048*   1287
APTCSU= 000040           7707*   7885
APTENV= 000001           7663    7705*   7739    7878
APTSIZ= 000200           2322    7704*
APTSPO= 000100           7665    7706*   7880
ASWREG= 000000           1287    1300
ATESTN= 000000           1287    1291
AUNIT = 000000           1287    1294
AUSWR = 000000           1287    1301
AVECT1= 120210           1047*   1287    1326
AVECT2= 000000           1287    1327
BADPAR= 067300           4264    4265    4330    4331    4405*   4562    4563    4642*   7221*   7235*   7245*   7247    7262*
                         9844*
```

```
BAI    = 000020          1107*  3550
BA16   = 000400          1092*  3668   3669   3768   3769   3830   3994   4094   4095   4156
BA17   = 001000          1093*  3668   3669   3931   3932   3993   4094   4095   4156   4157
BITCNT  003622           2257*  2628*  2640*  2653*  2664*  2721*  2734*  2746*  2795*  2808*  2820*  2887*  2944*
                         4705*  4706*  4815*  4816*  4925*  4926*  5035*  5036*  5145*  5146*  5254*  5255*  5335*
                         5348*  5349   5423*  5424*  5526*  5529*  5602*  5605*  5611*  5628*  5640*  5722*  5725*
                         5731*  5748*  5760*  5841*  5844*  5850*  5867*  5879*  5960*  5963*  5969*  5986*  5998*
                         6079*  6082*  6088*  6105*  6117*  6198*  6201*  6207*  6224*  6236*  6317*  6320*  6326*
                         6343*  6355*  6445*  6448*  6454*  6470*  6482*  6570*  6573*  6579*  6595*  6614*  6622*
                         6629*  6636*  6716*  6719*  6725*  6741*  6760*  6768*  6775*  6782*  6866*  6869*  6875*
                         6891*  6903*  8519   8525   8551   8553   8556
BIT0   = 000001           993*  1089   1122   1141
BIT00  = 000001           983*   993
BIT01  = 000002           982*   992
BIT02  = 000004           981*   991
BIT03  = 000010           980*   990
BIT04  = 000020           979*   989
BIT05  = 000040           978*   988
BIT06  = 000100           977*   987
BIT07  = 000200           976*   986
BIT08  = 000400           975*   985   7554
BIT09  = 001000           974*   984   7572   7750
BIT1   = 000002           992*  1123
BIT10  = 002000           973*  1094   1113   1132   1165   1180   7727
BIT11  = 004000           972*  1095   1114   1133   1150   1166   1181   7579
BIT12  = 010000           971*  1097   1115   1134   1167
BIT13  = 020000           970*  1098   1116   1135   1151   1168   7734
BIT14  = 040000           969*  1099   1117   1136   1152   1169   7540
BIT15  = 100000           968*  1100   1101   1118   1137   1153   1170
BIT2   = 000004           991*  1124   1143
BIT3   = 000010           990*  1106   1125   1144
BIT4   = 000020           989*  1107   1126   1145   1159   1174
BIT5   = 000040           988*  1108   1127   1146   1160   1175
BIT6   = 000100           987*  1090   1109   1128   1147   1161   1176
BIT7   = 000200           986*  1091   1110   1129   1148   1162   1177
BIT8   = 000400           985*  1092   1111   1130   1149   1163   1178
BIT9   = 001000           984*  1093   1112   1131   1164   1179
BPTVEC= 000014           1000*
BSE    = 000200          1129*
CCLR   = 100000          1101*  2427   2448   2472   2493   2515   2536   2559   2580   2607   2622   2637   2650
                         2662   2672   2696   2711   2731   2743   2753   2777   2792   2805   2817   2827   2853
                         3006   3035   3125   3241   3370   3544   3662   3713   3765   3824   3886   3928   3987
                         4049   4091   4150   4212   4260   4310   4326   4402   4421   4558   4643   4669   4708
                         4779   4818   4889   4928   4999   5038   5109   5148   5218   5257   5321   5362   5385
                         5426   5492   5568   5688   5807   5926   6045   6164   6283   6409   6534   6680   6830
                         6988   7065   7144   7842
CDT    = 002000          1094*  2432   2442   2477   2487   2520   2530   2564   2574
CERR   = 100000          1100*  3668   4266   4381   5354   6967   7044   7123
CFMT   = 010000          1097*  2432   2442   2477   2487   2520   2530   2564   2574   4427   4428   4564   4565
                         5220   5238   5272   6835   6927   7028   7044
CKSWR  = 104407          7539   7723   7749   8504*
CLEAR  = 000005          1074*
COE    = 001000          1131*
CR     = 000015           908*  7924   7934
CRLF   = 000200           909*  2347   7895   7934
CSRPTR  003640           2265*  4403   4640   7219   7264*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
CTO    = 004000            1095#
CTRHLT   050260            7841#  8120   8203
DCK    = 100000            1137#  5355
DDISP  = 177570             915#  1260   2310
DDT    = 000400            1149#
DF000    053652            1969   8574#
DF001    053656            1354   1360   1366   1372   1378   1384   1390   1396   1402   1408   1414   1420   8576#
DF015    053702            1426   1432   2090   8586#
DF017    053726            1438   1444   1450   8596#
DF022    053752            1456   1462   1468   1480   1486   1492   8606#
DF025    053776            1474   8616#
DF031    054022            1498   1504   1510   1516   8626#
DF035    054046            1522   1528   1534   1540   1564   1570   1576   1582   1588   1594   1600   1606   1630
                           1636   1642   1648   1654   1660   1666   1672   1738   1744   1750   1756   1792   1798
                           1804   1810   1834   1840   1846   1852   1858   1864   1870   1876   1900   1906   1912
                           1918   1925   1932   1939   1946   8636#
DF041    054072            1546   1762   1952   8646#
DF042    054116            1552   1558   1882   1981   1987   2017   2023   8656#
DF054    054142            1612   1678   2005   2041   8666#
DF055    054166            1618   1624   1684   1690   1888   1894   1993   1999   2029   2035   8676#
DF072    054212            1696   1702   1708   1714   1720   1768   1774   1780   1786   1816   8686#
DF077    054246            1726   1732   1822   1828   1958   1964   8700#
DF150    054272            1975   2011   8710#
DF164    054316            2047   2053   2059   2065   8720#
DF170    054342            2070   8730#
DF171    054366            2075   2080   2085   8740#
DF175    054412            2096   2102   2108   2114   2120   2126   2132   2138   2144   2150   2156   2162   8750#
DF211    054436            2168   2174   2180   2186   8760#
DH000A   055037            8578   8588   8598   8608   8618   8628   8638   8648   8658   8668   8678   8688   8702
                           8712   8722   8732   8742   8752   8762   8821#
DH000B   055055            8580   8590   8600   8610   8620   8630   8640   8650   8660   8670   8680   8690   8704
                           8714   8724   8734   8744   8754   8764   8824#
DH000C   055070            1967   8826#
DH001A   055121            8582   8831#
DH001B   055200            8584   8839#
DH015A   055257            8592   8847#
DH015B   055276            8594   8850#
DH017A   055314            8602   8853#
DH017B   055360            8604   8859#
DH022A   055426            8612   8866#
DH022B   055505            8614   8874#
DH025A   055562            8622   8882#
DH025B   055606            8624   8886#
DH031A   055634            8632   8890#
DH031B   055733            8634   8901#
DH035A   056031            8642   8912#
DH035B   056130            8644   8923#
DH041A   056225            8652   8934#
DH041B   056242            8654   8937#
DH042A   056257            8662   8940#
DH042B   056316            8664   8946#
DH054A   056354            8672   8951#
DH054B   056401            8674   8955#
DH055A   056427            8682   8959#
DH055B   056474            8684   8966#
DH072A   056542            8692   8706   8973#
```

```
DH072B  056601            8694    8708    8979#
DH072C  056637            8696    8985#
DH072D  056716            8698    8993#
DH150A  056773            8716    9001#
DH1508  057027            8718    9006#
DH164A  057065            8726    9012#
DH1648  057131            8728    9019#
DH170A  057177            8736    9026#
DH1708  057276            8738    9037#
DH171A  057374            8746    9048#
DH1718  057413            8748    9051#
DH175A  057431            8756    8766    9054#
DH1758  057530            8758    8768    9065#
DH211A  057625            8770    9076#
DH211B  057653            8772    9080#
DI    = 040000            1093#
DISPLA  001142            1260#   2310#   2318#   7594#   7726#
DISPRE  000174            1189#   2318
DLT   = 100000            1118#
DMD   = 000040            1160#   2428    2435    2436    2473    2480    2481    2516    2523    2524    2560    2567    2568
                          2608    2609    2610    2613    2614    2625    2626    2627    2643    2697    2698    2699    2702
                          2703    2714    2716    2717    2720    2722    2778    2779    2780    2783    2784    2796    2854
                          2855    2856    2861    2862    2886    2889    2890    2891    2892    2920    2921    2922    2925
                          2946    2947    2948    2949    2976    2978    2979    2982    2985    2986    2993    3037    3046
                          3047    3051    3052    3053    3056    3058    3059    3126    3135    3136    3140    3141    3142
                          3145    3148    3149    3178    3179    3242    3250    3251    3255    3256    3257    3260    3263
                          3264    3298    3299    3371    3379    3380    3384    3385    3386    3389    3392    3393    3431
                          3432    3469    3470    3545    3554    3555    3559    3560    3561    3564    3567    3568    3600
                          3601    3663    3672    3673    3677    3678    3679    3682    3684    3685    3766    3771    3772
                          3776    3777    3778    3781    3783    3784    3825    3833    3834    3838    3839    3840    3843
                          3846    3847    3929    3934    3935    3939    3940    3941    3944    3946    3947    3988    3996
                          3997    4001    4002    4003    4006    4009    4010    4092    4097    4098    4102    4103    4104
                          4107    4109    4110    4151    4159    4160    4164    4165    4166    4169    4172    4173    4261
                          4269    4270    4274    4275    4276    4279    4281    4282    4327    4335    4336    4340    4341
                          4342    4345    4347    4348    4372    4373    4422    4431    4432    4436    4437    4438    4441
                          4445    4446    4478    4479    4559    4568    4569    4573    4574    4575    4578    4581    4582
                          4605    4606    4670    4673    4674    4677    4678    4780    4783    4784    4787    4788    4890
                          4893    4894    4897    4898    5000    5003    5004    5007    5008    5110    5113    5114    5117
                          5118    5219    5222    5223    5226    5227    5322    5325    5326    5329    5330    5386    5389
                          5390    5393    5394    5395    5396    5493    5494    5495    5501    5502    5506    5507    5508
                          5511    5512    5515    5516    5534    5541    5569    5575    5576    5580    5581    5582    5585
                          5587    5588    5591    5592    5595    5643    5645    5646    5649    5651    5656    5657    5689
                          5695    5696    5700    5701    5702    5705    5707    5708    5711    5712    5715    5763    5765
                          5766    5769    5771    5776    5777    5808    5814    5815    5819    5820    5821    5824    5826
                          5827    5830    5831    5834    5882    5884    5885    5888    5890    5895    5896    5927    5933
                          5934    5938    5939    5940    5943    5945    5946    5949    5950    5953    6001    6003    6004
                          6007    6009    6014    6015    6046    6052    6053    6057    6058    6059    6062    6064    6065
                          6068    6069    6072    6120    6122    6123    6126    6128    6133    6134    6165    6171    6172
                          6176    6177    6178    6181    6183    6184    6187    6188    6191    6239    6241    6242    6245
                          6247    6252    6253    6284    6290    6291    6295    6296    6297    6300    6302    6303    6306
                          6307    6310    6358    6360    6361    6364    6366    6371    6372    6410    6417    6418    6422
                          6423    6424    6428    6431    6432    6435    6436    6438    6488    6490    6491    6494    6496
                          6501    6502    6535    6542    6543    6547    6548    6549    6552    6554    6555    6560    6561
                          6563    6644    6646    6647    6650    6652    6658    6659    6681    6688    6689    6693    6694
                          6695    6698    6700    6701    6706    6707    6709    6790    6792    6793    6796    6798    6804
                          6805    6831    6838    6839    6843    6844    6845    6849    6852    6853    6856    6857    6859
```

```
                        6909    6911    6912    6915    6917    6922    6923    6949    6953    6954    7026    7030    7031
                        7103    7109    7110    7285    7315    7329    7344    7370    7382    7394    7419    7422    7423
                        7424    7425    7428    7429    7430    7431
DRA    = 000001         1141#   6969    7046    7125
DRDY   = 000200         1148#
DROT   = 000040         1146#
DRPAR  = 000010         1125#   7047
DRVMSK= 000007          1105#
DSC    = 040000         1152#
DSWR   = 177570          914#   1259    2309
DTE    = 010000         1134#
DTYE   = 000040         1127#
DT000    053210         1968    8513#
DT001    053214         1353    1359    1365    1371    1377    1383    1389    1395    1401    1407    1413    1419    8514#
DT015    053234         1425    1431    2089    8517#
DT017    053244         1437    1443    1449    8519#
DT022    053262         1455    1461    1467    1479    1485    1491    8522#
DT025    053302         1473    8525#
DT031    053314         1497    1503    1509    1515    8527#
DT035    053340         1521    1527    1533    1539    1563    1569    1575    1581    1587    1593    1599    1605    1629
                        1635    1641    1647    1653    1659    1665    1671    1737    1743    1749    1755    1791    1797
                        1803    1809    1833    1839    1845    1851    1857    1863    1869    1875    1899    1905    1911
                        1917    1924    1931    1938    1945    8531#
DT041    053364         1545    1761    1951    8535#
DT042    053374         1551    1557    1881    1980    1986    2016    2022    8537#
DT054    053410         1611    1677    2004    2040    8539#
DT055    053422         1617    1623    1683    1689    1887    1893    1992    1998    2028    2034    8541#
DT072    053440         1695    1701    1707    1713    1719    1767    1773    1779    1785    1815    8544#
DT077    053470         1725    1731    1821    1827    1957    1963    8549#
DT150    053504         1974    2010    8551#
DT164    053520         2046    2052    2058    2064    8553#
DT170    053536         2069    8556#
DT171    053562         2074    2079    2084    8560#
DT175    053572         2095    2101    2107    2113    2119    2125    2131    2137    2143    2149    2155    2161    8562#
DT211    053616         2167    2173    2179    2185    8566#
ECCW   = 020000         1168#   2627    2643    2722    2796    2886    2993    5512    5595    5651    5715    5771    5834
                        5890    5953    6009    6072    6128    6191    6247    6310    6366    6438    6496    6563    6626
                        6632    6652    6709    6772    6778    6798    6859    6917
ECH    = 000100         1128#
EMTVEC= 000030          1003#   2293*   2294*
EMW     003170          2067#   5525*   5594*   5612*   5714*   5732*   5833*   5851*   5952*   5970*   6071*   6089*   6190*
                        6208#   6309*   6327*   6437*   6455*   6562*   6580*   6600*   6613*   6708*   6726*   6746*   6759*
                        6858*   6876*   7290*   7320*   7334*   7349*   7375*   7387*   7399*
EMW1    066403          7290    9696#
EMW2    066472          7320    7375    9706#
EMW3    066563          7334    7387    9716#
EMW4    066652          7349    7399    9726#
EM000   057710          1966    9087#
EM200   057755          1351    1357    1363    9094#
EM201   060037          1369    1375    1381    9103#
EM202   060122          1387    1393    1399    9112#
EM203   060213          1405    1411    1417    9122#
EM204   060305          1423    1429    1435    1441    1447    9132#
EM205   060373          1453    1459    1465    1471    1477    1483    1489    1495    1501    1507    1513    9142#
EM206   060461          1519    1525    1531    1537    1543    1549    1555    9152#
EM207   060524          1561    1567    1573    1579    1609    1615    1621    9158#
```

EM208	060553	1585	1591	1597	1603	9162#							
EM209	060624	1627	1633	1639	1645	1675	1681	1687	9169#				
EM210	060713	1651	1657	1663	1669	9179#							
EM211	061027	1693	1699	1705	1711	1717	9193#						
EM212	061077	1723	1729	9200#									
EM213	061147	1735	1741	1747	1753	1759	9207#						
EM214	061217	1765	1771	1777	1783	1813	9214#						
EM215	061267	1789	1795	1801	1807	9221#							
EM216	061353	1819	1825	9230#									
EM217	061423	1831	1837	1843	1849	1879	1885	1891	9237#				
EM218	061456	1855	1861	1867	1873	9242#							
EM219	061536	1697	1903	1909	1915	1949	1955	1961	9250#				
EM220	061616	1922	1929	1936	1943	9258#							
EM221	061675	1972	9266#										
EM222	061752	1978	1984	9274#									
EM223	062025	1990	1996	2002	9282#								
EM224	062103	2008	9290#										
EM225	062200	2014	2020	9301#									
EM226	062265	2026	2032	2038	9310#								
EM227	062365	2044	2050	2056	2062	9321#							
EM230	062473	5525	9334#										
EM231	062601	2072	9346#										
EM232	062723	2077	9361#										
EM233	063045	5594	5714	5833	5952	6071	6190	6309	6437	6562	6708	9376#	
EM234	063111	5612	5732	5851	5970	6089	6208	6327	6455	6580	6726	9383#	
EM235	063151	2082	9389#										
EM236	063261	2087	9402#										
EM237	063343	6600	6746	9411#									
EM238	063411	6613	6759	9418#									
EM239	063450	6858	9424#										
EM240	063542	6876	9434#										
EM241	063631	2093	2099	2105	2111	9444#							
EM242	063715	2117	2123	2129	2135	9453#							
EM243	064001	2141	2147	2153	2159	9462#							
EM244	064102	2165	2171	2177	2183	9473#							
EM3000	064134	1352	1370	1388	1406	1520	1562	1586	1628	1652	1694	1724	1736	1766
		1790	1820	1832	1856	1898	1923	1973	2009	2045	2088	2094	2118	2142
		2166	9478#											
EM3001	064177	1358	1376	1394	1412	9484#								
EM3002	064223	1364	1382	1400	1418	9488#								
EM3003	064247	1424	1454	9492#										
EM3004	064317	1430	9499#											
EM3005	064371	1436	9507#											
EM3006	064473	1442	9519#											
EM3007	064574	1448	9531#											
EM3008	064715	1460	9546#											
EM3009	064775	1466	9555#											
EM3010	065054	1478	9563#											
EM3011	065121	1484	9570#											
EM3012	065170	1490	9577#											
EM3013	065236	1496	9584#											
EM3014	065273	1472	9589#											
EM3015	065344	1502	9596#											
EM3016	065412	1508	9603#											
EM3018	065457	1526	1568	1592	1634	1658	1700	1730	1742	1772	1796	1808	1826	1838
		1862	1904	1930	2051	2100	2124	2148	2172	9610#				

```
EM3019  065523  1532  1574  1598  1640  1664  1712  1748  1778  1802  1844  1868  1910  1937
                9617#
EM3020  065551  1538  1580  1604  1646  1670  1718  1754  1784  1850  1874  1916  1944  9621#
EM3021  065602  1544  1610  1676  1760  1880  1950  2003  2039  9626#
EM3022  065626  1550  1616  1682  1886  1956  1991  2027  9630#
EM3023  065676  1556  1622  1688  1892  1962  1997  2033  9637#
EM3024  065746  1706  1814  9644#
EM3025  065772  1514  9648#
EM3026  066042  1979  2015  9655#
EM3027  066111  1985  2021  9662#
EM3028  066160  2057  9669#
EM3029  066227  2063  9676#
EM3030  066276  2073  2078  2083  9683#
EM3031  066324  2106  2130  2154  2178  9687#
EM3032  066357  2112  2136  2160  2184  9692#
ERRCNT  003610  2252#  2326*  7825*  7828
ERRVEC= 000004   996#  2307  2308*  2319*  7227*  7228*  7268*  7269*  7467  7468  7472*  7477*  7489*
                7494*  7503*  7513*  7514*  7545  7546*  7548*  7551*
E.ASOF  003516  2215#
E.BA    003504  2210#  2869*  2876  2909  2934  2966  2997  3028*  3076  3128*  3155  3161*  3169
                3192  3243*  3270  3282  3288*  3296*  3312  3372*  3399  3411  3417*  3426*  3445
                3475*  3488  3499*  3546*  3586  3614  3664*  3707  3795*  3803  3828*  3866  3872*
                3958*  3966  3991*  4029  4035*  4121*  4129  4154*  4192  4198*  4265*  4301  4331*
                4365  4384*  4392  4426*  4452  4467  4473*  4482*  4494  4563*  4598  4619  8522
                8527  8531  8547
E.CS1   003500  2208#  2442*  2445  2487*  2490  2530*  2533  2574*  2577  2618*  2619  2676*  2677
                2707*  2708  2757*  2758  2788*  2789  2831*  2832  2868*  2871  2904  2929  2961
                2994  3029*  3070  3090  3120*  3163  3186  3211  3240*  3276  3306  3337  3369*
                3405  3439  3462  3482  3518  3543*  3580  3608  3638  3668*  3698  3716*  3718
                3768*  3797  3830*  3860  3931*  3960  3993*  4023  4094*  4123  4156*  4186  4266*
                4295  4313*  4315  4332*  4359  4381*  4386  4427*  4461  4488  4517  4564*  4592
                4613  4633  4689*  4701  4723*  4725  4740  4799*  4811  4833*  4835  4850  4909*
                4921  4943*  4945  4960  5019*  5031  5053*  5055  5070  5129*  5141  5163*  5165
                5180  5238*  5250  5272*  5274  5289  5333*  5339  5354*  5356  5407*  5419  5441*
                5443  5458  5661*  5662  5781*  5782  5900*  5901  6019*  6020  6138*  6139  6257*
                6258  6376*  6377  6506*  6507  6663*  6664  6809*  6810  6927*  6928  6967*  6971
                6993*  6997  7044*  7048  7070*  7074  7123*  7127  7149*  7153  8514  8517  8522
                8527  8531  8537  8541  8544  8549  8551  8553  8562  8566
E.CS2   003510  2212#  3069*  3073  3089*  3093  3146*  3166  3189  3210*  3214  3261*  3279  3292*
                3309  3321*  3336*  3340  3390*  3408  3422*  3442  3451*  3465  3477*  3485  3501*
                3517*  3521  3565*  3583  3595*  3611  3624*  3637*  3641  3694*  3697*  3701  3717*
                3721  3794*  3800  3859*  3863  3957*  3963  4022*  4026  4120*  4126  4185*  4189
                4293*  4298  4314*  4318  4358*  4362  4382*  4389  4442*  4460*  4464  4491  4501*
                4516*  4520  4579*  4595  4616  4632*  4636  4724*  4728  4739*  4745  4834*  4838
                4849*  4855  4944*  4948  4959*  4965  5054*  5058  5069*  5075  5164*  5168  5179*
                5185  5273*  5277  5288*  5294  5334*  5344  5355*  5359  5442*  5446  5457*  5463
                6968*  6974  6994*  7000  7045*  7051  7071*  7077  7124*  7130  7150*  7156  8531
                8537  8541  8544  8549  8553  8562  8566
E.DA    003506  2211#
E.DB    003522  2217#  3083*  3084  3202*  3203  3323*  3324  3453*  3454  3504*  3505  3621*  3625
                3810*  3811  3879*  3880  3973*  3974  4042*  4043  4136*  4137  4205*  4206  4505*
                4506  4626*  4627  4733*  4750  4843*  4860  4953*  4970  5063*  5080  5173*  5190
                5282*  5299  5451*  5468  8535  8539
E.DCYL  003520  2216#
E.DS    003512  2213#  6969*  6977  6995*  7003  7046*  7054  7072*  7080  7125*  7133  7151*  7159
                8562  8566
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
E.ECPS  003532          2221#
E.ECPT  003534          2222#
E.ER    003514          2214#  3693*  3704   4294*  4307   4385*  4398   6970*  6980   6996*  7006   7047*  7057
                        7073*  7083   7126*  7136   7152*  7162   8544   8562   8566
E.MR1   003524          2218#  2627*  2634   2643*  2647   2659   2669   2722*  2728   2740   2751   2796*  2802
                        2814   2825   2886*  2894   2951   2993*  3003   5512*  5532*  5533*  5536   5539*  5540*
                        5543   5595*  5651*  5652   5715*  5771*  5772   5834*  5890*  5891   5953*  6009*  6010
                        6072*  6128*  6129   6191*  6247*  6248   6310*  6366*  6367   6438*  6496*  6497   6563*
                        6626*  6632*  6652*  6653   6709*  6772*  6778*  6798*  6799   6859*  6917*  6918   7284*
                        7287   7298*  7299*  7304*  7309*  7314*  7317   7328*  7331   7342*  7343*  7346   7363*
                        7366*  7369*  7372   7381*  7384   7393*  7396   8519   8525   8527   8556   8560
E.MR2   003526          2219#  2443*  2450   2488*  2495   2531*  2538   2575*  2582   8514
E.MR3   003530          2220#  2444*  2453   2489*  2498   2532*  2541   2576*  2585   8514
E.SPAR  003536          2223#
E.WC    003502          2209#  2870*  2881   2914   2939   2971   3000   3030*  3079   3129*  3130*  3131   3162*
                        3172   3175   3195   3245*  3285   3289*  3295*  3315   3374*  3414   3418*  3419   3425*
                        3448   3476*  3491   3500*  3548*  3574   3589   3592*  3598*  3617   3666*  3710   3796*
                        3806   3826*  3853   3869   3873*  3959*  3969   3989*  4016   4032   4036*  4122*  4132
                        4152*  4179   4195   4199*  4263*  4304   4329*  4368   4383*  4395   4424*  4458   4470
                        4474*  4483*  4497   4561*  4601   4622   8522   8527   8534   8547
FMTE    = 000020        1126#  6970   7047
GNS     = ****** U      1188   2346   7190   7197   8496   8497   8498   8499   8500   8502   8504   8505   8506
                        8507   8508   8509   8510
GO      = 000001        1089#  3668   4266   4381   4723   4833   4943   5053   5163   5272   5354   5441   5661
                        5781   5900   6019   6138   6257   6376   6506   6663   6909   6927   6967   7044   7123
GTSWR   = 104406        2341   8502#
HEAD1   066762          4688   4732   5237   5281   5406   5450   5570   5613   6411   6412   6832   6833   9746#
HEAD2   066770          4798   4842   5690   5733   9749#
HEAD3   066776          4908   4952   5809   5852   6536   6537   9752#
HEAD4   067012          5018   5062   5928   5971   9758#
HEAD5   067020          5128   5172   6047   6090   9761#
HEAD6   067026          6166   6209   9764#
HEAD7   067034          6285   6328   9767#
HT      = 000011         906#  7893   7934
HVRC    = 000400        1130#
IDAE    = 002000        1132#
IE      = 000100        1090#
ILF     = 000001        1122#
INTR    = 000300        1085#
IOTVEC= 000020          1001#  2291*  2292*
IR      = 000100        1109#  3069   3089   3146   3210   3261   3321   3336   3390   3451   3501   3517   3565
                        3624   3637   3694   3717   3794   3859   3957   4022   4120   4185   4293   4314   4358
                        4382   4442   4501   4516   4579   4632   4724   4739   4834   4849   4944   4959   5054
                        5069   5164   5179   5273   5288   5334   5355   5442   5457   6968   6994   7045   7071
                        7124   7150
KIPAR0= 172340          1034#  7453   7481
KIPAR1= 172342          1035#
KIPAR2= 172344          1036#
KIPAR3= 172346          1037#
KIPAR4= 172350          1038#
KIPAR5= 172352          1039#
KIPAR6= 172354          1040#  3757*  3815*  3920*  3978*  4083*  4141*
KIPAR7= 172356          1041#  7497
KIPDR0= 172300          1023#
KIPDR1= 172302          1024#
KIPDR2= 172304          1025#
```

```
KIPDR3= 172306          1026#
KIPDR4= 172310          1027#
KIPDR5= 172312          1028#
KIPDR6= 172314          1029#
KIPDR7= 172316          1030#
LF    = 000012           907#  7928  7934
MCLK  = 000400          1163#  2435  2480  2523  2567  2613  2702  2716  2783  2861  2889  2891  2921
                        2946   2948  2978  2985  3046  3052  3058  3135  3141  3148  3178  3250  3256
                        3263   3298  3379  3385  3392  3431  3469  3554  3560  3567  3600  3672  3678
                        3684   3771  3777  3783  3833  3839  3846  3934  3940  3946  3996  4002  4009
                        4097   4103  4109  4159  4165  4172  4269  4275  4281  4335  4341  4347  4372
                        4431   4437  4445  4478  4568  4574  4581  4605  4673  4783  4893  5003  5113
                        5222   5325  5389  5395  5501  5507  5515  5575  5581  5587  5645  5656  5695
                        5701   5707  5765  5776  5814  5820  5826  5884  5895  5933  5939  5945  6003
                        6014   6052  6058  6064  6122  6133  6171  6177  6183  6241  6252  6290  6296
                        6302   6360  6371  6417  6423  6431  6490  6501  6542  6548  6554  6646  6658
                        6688   6694  6700  6792  6804  6838  6844  6852  6911  6922  6953  7030  7109
                        7284   7285  7298  7328  7329  7343  7366  7381  7382  7393  7419  7422  7424
                        7428   7430
MDS   = 001000          1112#
MEMBAS= 172100          1044#  7232
MEMERR  046274          1207   7275  7436#
MEMPAR  003630          2260#  7230* 7270
MEMVEC= 000114          1043#  1206  7242*  7243*  7272*  7273*  7275*  7276*
MERD  = 001000          1164#  7422  7430
MESMSK= 000017          1157#
MEWD  = 002000          1165#  2627  2643  2722  2796  2886  2993  5512  5595  5651  5715  5771  5834
                        5890   5953  6009  6072  6128  6191  6247  6310  6366  6438  6496  6563  6652
                        6709   6798  6859  6917  7284  7299  7304  7328  7342  7393
MIND  = 000200          1162#  2714  2716  2717  2976  2978  2979  3051  3052  3053  3140  3141  3142
                        3255   3256  3257  3384  3385  3386  3559  3560  3561  3677  3678  3679  3776
                        3777   3778  3838  3839  3840  3939  3940  3941  4001  4002  4003  4102  4103
                        4104   4164  4165  4166  4274  4275  4276  4340  4341  4342  4436  4437  4438
                        4573   4574  4575  5506  5507  5508  5580  5581  5582  5643  5645  5646  5700
                        5701   5702  5763  5765  5766  5819  5820  5821  5882  5884  5885  5938  5939
                        5940   6001  6003  6004  6057  6058  6059  6120  6122  6123  6176  6177  6178
                        6239   6241  6242  6295  6296  6297  6358  6360  6361  6422  6423  6424  6488
                        6490   6491  6547  6548  6549  6644  6646  6647  6693  6694  6695  6790  6792
                        6793   6843  6844  6845  6909  6911  6912
MMVEC = 000250          1012#
MSP   = 000100          1161#  2609  2625  2698  2779  2855  2920  2921  2922  4677  4787  4897  5007
                        5117   5226  5329  5393  5494  5533  5534  5539  5591  5711  5830  5949  6068
                        6187   6306  6435  6560  6706  6856
M1.BIT  003616          2255#  2630* 2665* 2724* 2747* 2798* 2821* 4680* 4692* 4716* 4790* 4802* 4826*
                        4900*  4912* 4936* 5010* 5022* 5046* 5120* 5132* 5156* 5229* 5241* 5265* 5332*
                        5398*  5410* 5434* 5522* 5599* 5617  5618* 5634  5635* 5719* 5737  5738* 5754
                        5755*  5838* 5856  5857* 5873  5874* 5957* 5975  5976* 5992  5993* 6076* 6094
                        6095*  6111  6112* 6195* 6213  6214* 6230  6231* 6314* 6332  6333* 6349  6350*
                        6442*  6459  6460* 6476  6477* 6567* 6584  6585* 6602  6603* 6616  6617* 6713*
                        6730   6731* 6748  6749* 6762  6763* 6863* 6880  6881* 6897  6898* 7302  7361
                        7367   7417  8519  8556
M2.BIT  003620          2256#  5523* 5600* 5617* 5634* 5720* 5737* 5754* 5839* 5856* 5873* 5958* 5975*
                        5992*  6077* 6094* 6111* 6196* 6213* 6230* 6315* 6332* 6349* 6443* 6459* 6476*
                        6568*  6584* 6602* 6616* 6714* 6730* 6748* 6762* 6864* 6880* 6897* 7307  7312
                        8556
NED   = 010000          1115#
```

```
NEM    = 004000          1114#  3694
NEWPAS  004654           2406#  7213
NPRBUF  067042           3127   3128   3155   3199   3243   3244   3270   3319   3372   3373   3399   3429   3546
                         3547   3621   3759   3810   3817   3818   3877   3922   3973   3980   3981   4040   4085
                         4136   4143   4144   4203   4425   4426   4452   4500   6682   6683   9770#
NXF    = 000004          1124#
OFFSET= 000015           1078#
OFST   = 000004          1143#
OPI    = 020000          1135#
OPR001  054472           2353   8776#
OPR002  054524           2356   2367   2384   8781#
OPR003  054532           2363   8782#
OPR004  054562           2375   8786#
OPR006  054604           2350   8789#
OPR007  054657           7844   8797#
OR     = 000200          1110#  3069   3146   3261   3292   3321   3390   3422   3451   3477   3501   3565   3595
                         3624   3695   3697   3794   3859   3957   4022   4120   4185   4293   4358   4382   4442
                         4460   4501   4579   4724   4834   4944   5054   5164   5273   5442
PACK   = 000003          1073#
PARCHK  044740           2406   7227#  8457
PARM    003642           1195   2268#
PARPRE  003636           2263#  4243   4545   7231#  7249#  7265#
PAR.EN= 000001           1046#  7222   7237   7246   7263
PAT    = 000020          1159#
PATTER  066744           3026   9739#
PCA    = 004000          1166#  7298   7314   7363
PCD    = 010000          1167#  7298   7309   7369
PGE    = 002000          1113#
PIP    = 020000          1151#
PIRQ   = 177772           913#
PIRQVE= 000240           1007#
PR.BIT  003614           2254#  2629#  2656#  2665   2666#  2723#  2737#  2747   2748#  2797#  2811#  2821   2822#
                         4679#  4685#  4692   4695#  4698#  4716   4717#  4789#  4795#  4802   4805#  4808#  4826
                         4827#  4899#  4905#  4912   4915#  4918#  4936   4937#  5009#  5015#  5022   5025#  5028#
                         5046   5047#  5119#  5125#  5132   5135#  5138#  5156   5157#  5228#  5234#  5241   5244#
                         5247#  5265   5266#  5331#  5397#  5403#  5410   5413#  5416#  5434   5435#  5521#  5598#
                         5618   5619#  5635   5636#  5718#  5738   5739#  5755   5756#  5837#  5857   5858#  5874
                         5875#  5956#  5976   5977#  5993   5994#  6075#  6095   6096#  6112   6113#  6194#  6214
                         6215#  6231   6232#  6313#  6333   6334#  6350   6351#  6441#  6460   6461#  6477   6478#
                         6566#  6585   6586#  6603   6604#  6617   6618#  6712#  6731   6732#  6749   6750#  6763
                         6764#  6862#  6881   6882#  6898   6899#  7300   7415   8519   8556
PR0    = 000000           930#  2407   7277
PR1    = 000040           931#
PR2    = 000100           932#
PR3    = 000140           933#
PR4    = 000200           934#
PR5    = 000240           935#  2246
PR6    = 000300           936#
PR7    = 000340           937#  1208   2278   7228   7243   7276   8440   8454
PS     = 177776           910#   911
PSW    = 177776           911#
PWRVEC= 000024           1002#  2297#  2298#  8439#  8440#  8453#  8454#
P.ASOF  003556           2234#
P.BA    003544           2229#
P.CS1   003540           2227#  6983#  7060#  7139#  8570
P.CS2   003550           2231#  6984#  7061#  7140#  8570
```

```
P.DA    003546  2230*
P.DB    003562  2236*
P.DCYL  003560  2235*
P.DS    003552  2232*  6985*  7062*  7141*  8570
P.ECPS  003572  2240*
P.ECPT  003574  2241*
P.ER    003554  2233*  6986*  7063*  7142*  8570
P.MR1   003564  2237*
P.MR2   003566  2238*
P.MR3   003570  2239*
P.SPAR  003576  2242*
P.WC    003542  2228*
P1.BIT  003612  2253*  5520*  5597*  5608*  5619  5622*  5625*  5636  5637*  5717*  5728*  5739  5742*
                5745*  5756  5757*  5836*  5847*  5858  5861*  5864*  5875  5876*  5955*  5966*  5977
                5980*  5983*  5994  5995*  6074*  6085*  6096  6099*  6102*  6113  6114*  6193*  6204*
                6215  6218*  6221*  6232  6233*  6312*  6323*  6334  6337*  6340*  6351  6352*  6440*
                6451*  6461  6464*  6467*  6478  6479*  6565*  6576*  6586  6589*  6592*  6604  6605*
                6610*  6618  6619*  6711*  6722*  6732  6735*  6738*  6750  6751*  6756*  6764  6765*
                6861*  6872*  6882  6885*  6888*  6899  6900*  7305  7359  8556
RDBIT   046164  2632  2645  2657  2667  2726  2738  2749  2800  2812  2823  4682  4686  4699
                4718  4792  4796  4809  4828  4902  4906  4919  4938  5012  5016  5029  5048
                5122  5126  5139  5158  5231  5235  5248  5267  5336  5400  5404  5417  5436
                7415*
RDCHR = 104410  8279  8505*
RDDATA= 000021  1080*
RDGATE= 100000  1170*  2643
RDHEAD= 000025  1082*  2432  2442  2520  2530  2611  2618  2676  2700  2707  2757  2781  2788
                2831  4671  4689  4723  4781  4799  4833  4891  4909  4943  5001  5019  5053
                5111  5129  5163  5220  5238  5272  5323  5333  5354  5387  5407  5441  6951
                6967  7028  7044
RDLIN = 104411  8353  8506*
RDOCT = 104412  2357  2368  2385  8507*
RDY   = 000200  1091*  3668  3716  4266  4313  4381  4723  4833  4943  5053  5163  5272  5354
                5441  5661  5781  5900  6019  6138  6257  6376  6506  6663  6809  6927  6967
                6993  7044  7070  7123  7149
RECAL = 000013  1077*
RESREG= 104414  7824  8509*
RESTRT  003652  1193  2271*
RESVEC= 000010  997*
RKASOF= 000016  1060*
RKBA  = 000004  1055*  2857*  2866  2902  2927  2959  2991  3040*  3063  3127*  3153  3184  3244*
                3268  3304  3373*  3397  3437  3480  3547*  3572  3606  3665*  3690  3788  3829*
                3851  3951  3992*  4014  4114  4155*  4177  4264*  4286  4330*  4352  4378  4425*
                4450  4486  4562*  4586  4611  5496*  5570*  5690*  5809*  5928*  6047*  6166*  6285*
                6411*  6536*  6682*  6832*  7106*
RKCS1 = 000000  1053*  2427*  2432*  2439  2448*  2472*  2477*  2484  2493*  2515*  2520*  2527  2536*
                2559*  2564*  2571  2580*  2607*  2611*  2617  2622*  2637*  2650*  2662*  2672*  2675
                2696*  2697*  2700*  2706  2711*  2731*  2743*  2753*  2756  2777*  2778*  2781*  2787
                2792*  2805*  2817*  2827*  2830  2853*  2859*  2865  2901  2926  2958  2990  3006*
                3035*  3043*  3062  3087  3125*  3132*  3152  3182  3206  3241*  3247*  3267  3302
                3327  3370*  3376*  3396  3435  3457  3478  3508  3544*  3551*  3571  3604  3628
                3662*  3669*  3688  3713*  3714  3765*  3769*  3787  3824*  3831*  3850  3886*  3928*
                3932*  3950  3987*  3994*  4013  4049*  4091*  4095*  4113  4150*  4157*  4176  4212*
                4260*  4267*  4285  4310*  4311  4326*  4333*  4351  4376  4402*  4421*  4428*  4449
                4484  4512  4558*  4565*  4585  4609  4630  4643*  4669*  4671*  4700  4708*  4721
                4735  4779*  4781*  4810  4818*  4831  4845  4889*  4891*  4920  4928*  4941  4955
```

```
                    4999* 5001* 5030  5038* 5051  5065  5109* 5111* 5140  5148* 5161  5175  5218*
                    5220* 5249  5257* 5270  5284  5321* 5323* 5337  5352  5362* 5385* 5387* 5418
                    5426* 5439  5453  5492* 5498* 5568* 5572* 5660  5688* 5692* 5780  5807* 5811*
                    5899  5926* 5930* 6018  6045* 6049* 6137  6164* 6168* 6256  6283* 6287* 6375
                    6409* 6414* 6505  6534* 6539* 6662  6680* 6685* 6808  6830* 6835* 6926  6951*
                    6959  6963  6988* 6989  7028* 7036  7040  7065* 7066  7107* 7115  7119  7144*
                    7145  7842*
RKCS2  = 000010     1057* 2431* 2476* 2519* 2563* 3041* 3068  3088  3160  3183  3207  3275  3303
                    3333  3404  3436  3461  3479  3514  3550* 3579  3605  3634  3689  3715  3793
                    3858  3956  4021  4119  4184  4292  4312  4357  4377  4457  4485  4513  4591
                    4610  4631  4722  4736  4832  4846  4942  4956  5052  5066  5162  5176  5271
                    5285  5338  5353  5440  5454  6948* 6964  6990  7025* 7041  7067  7102* 7120
                    7146
RKDA   = 000006     1056* 2430* 2475* 2518* 2562* 3039*
RKDB   = 000024     1062* 3082  3201  3322  3452  3503  3623  3809  3878  3972  4041  4135  4204
                    4504  4625  4734  4844  4954  5064  5174  5283  5351  5452
RKDCYL= 000020      1061* 2429* 2474* 2517* 2561* 3038* 6950* 7027* 7104*
RKDS   = 000012     1058* 6965  6991  7042  7068  7121  7147
RKECPS= 000030      1066*
RKECPT= 000032      1067*
RKER   = 000014     10    3692  4288  4380  6966  6992  7043  7069  7122  7148
RKMR1  = 000026     106   2428* 2435* 2436* 2473* 2480* 2481* 2516* 2523* 2524* 2560* 2567* 2568*
                    2606  2609* 2610* 2613* 2614* 2625* 2626* 2633  2646  2658  2668  2698* 2699*
                    2702* 2703* 2714* 2716* 2717* 2720* 2727  2739  2750  2779* 2780* 2783* 2784*
                    2801  2813  2824  2854* 2855* 2856* 2861* 2862* 2889* 2890* 2891* 2892* 2893
                    2920* 2921* 2922* 2925* 2946* 2947* 2948* 2949* 2950  2976* 2978* 2979* 2982*
                    2985* 2986* 2989  3037* 3046* 3047* 3051* 3052* 3053* 3056* 3058* 3059* 3126*
                    3135* 3136* 3140* 3141* 3142* 3145* 3148* 3149* 3178* 3179* 3242* 3250* 3251*
                    3255* 3256* 3257* 3260* 3263* 3264* 3298* 3299* 3371* 3379* 3380* 3384* 3385*
                    3386* 3389* 3392* 3393* 3431* 3432* 3469* 3470* 3545* 3554* 3555* 3559* 3560*
                    3561* 3564* 3567* 3568* 3600* 3601* 3663* 3672* 3673* 3677* 3678* 3679* 3682*
                    3684* 3685* 3766* 3771* 3772* 3776* 3777* 3778* 3781* 3783* 3784* 3825* 3833*
                    3834* 3838* 3839* 3840* 3843* 3846* 3847* 3929* 3934* 3935* 3939* 3940* 3941*
                    3944* 3946* 3947* 3988* 3996* 3997* 4001* 4002* 4003* 4006* 4009* 4010* 4092*
                    4097* 4098* 4102* 4103* 4104* 4107* 4109* 4110* 4151* 4159* 4160* 4164* 4165*
                    4166* 4169* 4172* 4173* 4261* 4269* 4270* 4274* 4275* 4276* 4279* 4281* 4282*
                    4327* 4335* 4336* 4340* 4341* 4342* 4345* 4347* 4348* 4372* 4373* 4422* 4431*
                    4432* 4436* 4437* 4438* 4441* 4445* 4446* 4478* 4479* 4559* 4568* 4569* 4573*
                    4574* 4575* 4578* 4581* 4582* 4605* 4606* 4670* 4673* 4674* 4677* 4678* 4780*
                    4783* 4784* 4787* 4788* 4890* 4893* 4894* 4897* 4898* 5000* 5003* 5004* 5007*
                    5008* 5110* 5113* 5114* 5117* 5118* 5219* 5222* 5223* 5226* 5227* 5322* 5325*
                    5326* 5329* 5330* 5386* 5389* 5390* 5393* 5394* 5395* 5396* 5493* 5494* 5495*
                    5501* 5502* 5506* 5507* 5508* 5511* 5515* 5516* 5534* 5535  5541* 5542  5569*
                    5575* 5576* 5580* 5581* 5582* 5585* 5587* 5588* 5591* 5592* 5643* 5645* 5646*
                    5649* 5650  5656* 5657* 5689* 5695* 5696* 5700* 5701* 5702* 5705* 5707* 5708*
                    5711* 5712* 5763* 5765* 5766* 5769* 5770  5776* 5777* 5808* 5814* 5815* 5819*
                    5820* 5821* 5824* 5826* 5827* 5830* 5831* 5882* 5884* 5885* 5888* 5889  5895*
                    5896* 5927* 5933* 5934* 5938* 5939* 5940* 5943* 5945* 5946* 5949* 5950* 6001*
                    6003* 6004* 6007* 6008  6014* 6015* 6046* 6052* 6053* 6057* 6058* 6059* 6062*
                    6064* 6065* 6068* 6069* 6120* 6122* 6123* 6126* 6127  6133* 6134* 6165* 6171*
                    6172* 6176* 6177* 6178* 6181* 6183* 6184* 6187* 6188* 6239* 6241* 6242* 6245*
                    6246  6252* 6253* 6284* 6290* 6291* 6295* 6296* 6297* 6300* 6302* 6303* 6306*
                    6307* 6358* 6360* 6361* 6364* 6365  6371* 6372* 6410* 6417* 6418* 6422* 6423*
                    6424* 6428* 6431* 6432* 6435* 6436* 6488* 6490* 6491* 6494* 6495  6501* 6502*
                    6535* 6542* 6543* 6547* 6548* 6549* 6552* 6554* 6555* 6560* 6561* 6644* 6646*
                    6647* 6650* 6651  6658* 6659* 6681* 6688* 6689* 6693* 6694* 6695* 6698* 6700*
```

```
                    6701* 6706* 6707* 6790* 6792* 6793* 6796* 6797  6804* 6805* 6831* 6838* 6839*
                    6843* 6844* 6845* 6849* 6852* 6853* 6856* 6857* 6909* 6911* 6912* 6915* 6916
                    6922* 6923* 6949* 6953* 6954* 6957* 7026* 7030* 7031* 7034* 7103* 7109* 7110*
                    7113* 7285* 7286  7315* 7316  7329* 7330  7344* 7345  7370* 7371  7382* 7383
                    7394* 7395  7419* 7422* 7423* 7424* 7425* 7428* 7429* 7430* 7431*
RKMR2 = 000034      1064* 2440  2485  2528  2572
RKMR3 = 000036      1065* 2441  2486  2529  2573
RKPRI   003602      2246* 2401*
RKSPAR= 000022      1068*
RKVEC   003600      2245* 2399* 2400*
RKWC  = 000002      1054* 2858* 2867  2903  2928  2960  2992  3042* 3064  3131* 3154  3185  3246*
                    3269  3305  3375* 3398  3438  3481  3549* 3573  3607  3667* 3691  3767* 3789
                    3827* 3852  3930* 3952  3990* 4015  4093* 4115  4153* 4178  4262* 4287  4328*
                    4353  4379  4423* 4451  4487  4560* 4587  4612  5497* 5571* 5691* 5810* 5929*
                    6048* 6167* 6286* 6413* 6538* 6684* 6834* 7105*
RLS   = 000010      1106*
SP''REG= 104413     7773  8508*
SA\ ^JR 003634      2262* 8438* 8458
SCLR  = 000040      1108* 6948  7025  7102
SCOP1 = 104415      3096  3220  3814  3885  3977  4048  4140  4211  4321  4401  8510*
SCOP1$  047304      7645* 8510
SECCNT  003626      2259* 5519* 5593* 5713* 5832* 5951* 6070* 6189* 6308* 6427* 6485* 6558* 6639*
                    6704* 6785* 6848* 6906* 8556
SEEK  = 000017      1079*
SELDRV= 000001      1072*
SKI   = 000002      1123*
SPACE2  054723      7807  7819  8804*
SPAR  = 020000      1098*
SPDLSS= 000020      1145*
SRTFLG  003606      2248* 2268* 2271* 2274* 2351
SRTSPL= 000011      1076*
SR0   = 177572      1016* 3758* 3760* 3816* 3819* 3921* 3923* 3979* 3982* 4084* 4086* 4142* 4145*
                    7478  7493* 7500*
SR1   = 177574      1017*
SR2   = 177576      1018*
SR3   = 172516      1019* 7490*
STACK = 001100       901* 2276  2289  7410  7444  7835  7843  8455
START   003662      1192  2274*
START1  003666      2269  2272  2275* 7853
STKLMT= 177774       912*
SVAL  = 100000      1153* 6969  7046  7125
SWR     001140      1259* 2287  2309* 2311  2317* 2324* 2339  7294  7324  7338  7353  7379  7391
                    7403  7440  7540  7554  7557  7572  7579  7645  7727  7734  7746  7750  7826
                    8123  8162  8217* 8438  8458*
SWRE3   000176      1190* 2317  2339  8123  8162  8185
SW0   = 000001       965*
SW00  = 000001       955*  965
SW01  = 000002       954*  964
SW02  = 000004       953*  963
SW03  = 000010       952*  962
SW04  = 000020       951*  961
SW05  = 000040       950*  960
SW06  = 000100       949*  959
SW07  = 000200       948*  958
SW08  = 000400       947*  957
SW09  = 001000       946*  956
```

```
SW1    = 000002            964#
SW10   = 002000            945#
SW11   = 004000            944#
SW12   = 010000            943#  7826
SW13   = 020000            942#
SW14   = 040000            941#
SW15   = 100000            940#
SW2    = 000004            963#
SW3    = 000010            962#
SW4    = 000020            961#
SW5    = 000040            960#
SW6    = 000100            959#
SW7    = 000200            958#
SW8    = 000400            957#
SW9    = 001000            956#  7294  7324  7338  7353  7379  7391  7403  7440  7645
S.CLR  = 000400           1178#  2531  2575
S.FMT  = 001000           1179#  2443  2488  2531  2575
S.PACK= 004000            1181#
S.RECL= 000040            1175#
S.RTC  = 000200           1177#  2488
S.SEEK= 000020            1174#  2443  2488
S.STSP= 000100            1176#
S.UNLD= 002000            1180#
TBITVE= 000014             998#
TKVEC  = 000060           1005#  8100*  8101*
TPVEC  = 000064           1006#
TRAPPC  003604            2247#  7437*  8513
TRAPVE= 000034            1004#  2295*  2296*
TRTVEC= 000014             999#
TSTBY1  055013            3750   3913   4076   4248   4550   8814#
TSTBY2  055023            3753   3916   4079   4251   4553   8816#
TST1    004672            2408   2424#  7599
TST10   007454            2793   2806   2818   2828   2833   2850#  7606
TST11   010600            3023#  7607
TST12   011266            3099   3115#  7608
TST13   012152            3223   3237#  7609
TST14   013040            3366#  7610
TST15   014244            3540#  7611
TST16   015122            3659#  7612
TST17   015560            3722   3740#  7613
TST2    005110            2449   2454   2469#  7600
TST20   016674            3754   3903#  7614
TST21   020010            3917   4066#  7615
TST22   021124            4080   4241#  7616
TST23   022372            4252   4418#  7617
TST24   023262            4543#  7618
TST25   024116            4554   4666#  7619
TST26   024650            4709   4743   4748   4776#  7620
TST27   025402            4819   4853   4858   4886#  7621
TST3    005326            2494   2499   2512#  7601
TST30   026134            4929   4963   4968   4996#  7622
TST31   026666            5039   5073   5078   5106#  7623
TST32   027420            5149   5183   5188   5215#  7624
TST33   030152            5258   5292   5297   5318#  7625
TST34   030452            5342   5347   5382#  7626
TST35   031220            5427   5461   5466   5489#  7627
```

```
TST36   031610          5544    5565*   7628
TST37   032434          5663    5685*   7629
TST4    005542          2537    2542    2556*   7602
TST40   033260          5783    5804*   7630
TST41   034104          5902    5923*   7631
TST42   034730          6021    6042*   7632
TST43   035554          6140    6161*   7633
TST44   036400          6259    6280*   7634
TST45   037224          6378    6406*   7635
TST46   040064          6508    6531*   7636
TST47   041110          6665    6677*   7637
TST5    005756          2581    2586    2604*   7603
TST50   042134          6811    6827*   7638
TST51   042774          6929    6945*   7639
TST52   043420          7022*   7640
TST53   044044          7099*   7641
TST6    006440          2623    2638    2651    2663    2673    2678    2693*   7604
TST7    007066          2712    2732    2744    2754    2759    2774*   7605
TYPOS = 104405          7194    7201    8500*
TYPE  = 104401          2333    2350    2353    2356    2363    2367    2375    2384    3750    3753    3913    3916    4076
                        4079    4248    4251    4550    4553    7188    7195    7202    7729    7737    7783    7784    7788
                        7789    7796    7807    7809    7819    7820    7822    7830    7844    7898    7994    8069    8117
                        8129    8183    8184    8187    8198    8208    8219    8238    8286    8292    8297    8301    8306
                        8307    8309    8312    8316    8382    8384    8456    8496*
TYPERR  047776          7736    7773*
TYPOC = 104402          2355    2366    2383    3752    3915    4078    4250    4552    7804    8186    8497*
TYPON = 104404          8499*
TYPOS = 104403          8498*
T.ASOF  003456          2196*
T.BA    003444          2191*   2866*   2876    2902*   2909    2927*   2934    2959*   2966    2991*   2997    3063*   3076
                        3153*   3169    3184*   3192    3268*   3282    3304*   3312    3397*   3411    3437*   3445    3480*
                        3488    3572*   3586    3606*   3614    3690*   3707    3788*   3803    3851*   3866    3951*   3966
                        4014*   4029    4114*   4129    4177*   4192    4286*   4301    4352*   4365    4378*   4392    4450*
                        4467    4486*   4494    4586*   4598    4611*   4619    8522    8527    8531    8547
T.CS1   003440          2189*   2439*   2445    2484*   2490    2527*   2533    2571*   2577    2617*   2619    2675*   2677
                        2706*   2708    2756*   2758    2787*   2789    2830*   2832    2865*   2871    2901*   2904    2926*
                        2929    2958*   2961    2990*   2994    3062*   3070    3087*   3090    3152*   3163    3182*   3186
                        3206*   3211    3267*   3276    3302*   3306    3327*   3337    3396*   3405    3435*   3439    3457*
                        3462    3478*   3482    3508*   3518    3571*   3580    3604*   3608    3628*   3638    3688*   3698
                        3714*   3718    3787*   3797    3850*   3860    3950*   3960    4013*   4023    4113*   4123    4176*
                        4186    4285*   4295    4311*   4315    4351*   4359    4376*   4386    4449*   4461    4484*   4488
                        4512*   4517    4585*   4592    4609*   4613    4630*   4633    4700*   4701    4721*   4725    4735*
                        4740    4810*   4811    4831*   4835    4845*   4850    4920*   4921    4941*   4945    4955*   4960
                        5030*   5031    5051*   5055    5065*   5070    5140*   5141    5161*   5165    5175*   5180    5249*
                        5250    5270*   5274    5284*   5289    5337*   5339    5352*   5356    5418*   5419    5439*   5443
                        5453*   5458    5660*   5662    5780*   5782    5899*   5901    6018*   6020    6137*   6139    6256*
                        6258    6375*   6377    6505*   6507    6662*   6664    6808*   6810    6926*   6928    6963*   6971
                        6983    6989*   6997    7040*   7048    7060    7066*   7074    7119*   7127    7139    7145*   7153
                        8514    8517    8522    8527    8531    8537    8541    8544    8549    8551    8553    8562    8566
T.CS2   003450          2193*   3068*   3073    3088*   3093    3160*   3166    3183*   3189    3207*   3214    3275*   3279
                        3303*   3309    3333*   3340    3404*   3408    3436*   3442    3461*   3465    3479*   3485    3514*
                        3521    3579*   3583    3605*   3611    3634*   3641    3689*   3695    3701    3715*   3721    3793*
                        3800    3858*   3863    3956*   3963    4021*   4026    4119*   4126    4184*   4189    4292*   4298
                        4312*   4318    4357*   4362    4377*   4389    4457*   4464    4485*   4491    4513*   4520    4591*
                        4595    4610*   4616    4631*   4636    4722*   4728    4736*   4745    4832*   4838    4846*   4855
                        4942*   4948    4956*   4965    5052*   5058    5066*   5075    5162*   5168    5176*   5185    5271*
```

```
T.DA     003446
T.DB     003462
T.DCYL   003460
T.DS     003452
T.ECPS   003472
T.ECPT   003474
T.ER     003454
T.MR1    003464
T.MR2    003466
T.MR3    003470
T.SPAR   003476
T.WC     003442

UFE    = 000400
UNLOAD= 000007
UNS    = 040000
UPE    = 020000
VV     = 000100
WAITIM  003632
WCE    = 040000
WLE    = 004000
WRBUFF  067264
WRDATA= 000023
WRDCNT  003624
WRHEAD= 000027
WRL    = 004000
WRTBIT  045214
WRTCHK= 000031

5277  5285*  5294  5338*  5344  5353*  5359  5440*  5446  5454*  5463  6964*  6974
6984  6990*  7000  7041*  7051  7061  7067*  7077  7120*  7130  7140  7146*  7156
8531  8537  8541  8544  8549  8562  8566
2192*
2198*  3082*  3084  3201*  3203  3222*  332  3452*  3454  3503*  3505  3623*  3625
3809*  3811  3878*  3880  3972*  3974  4041*  4043  4135*  4137  4204*  4206  4504*
4506  4625*  4627  4734*  4750  4844*  4860  4954*  4970  5064*  5080  5174*  5190
5283*  5299  5452*  5468  8535  8539
2197*
2194*  6965*  6977  6985  6991*  7003  7042*  7054  7062  7068*  7080  7121*  7133
7141  7147*  7159  8562  8566
2202*
2203*
2195*  3692*  3704  4288*  4307  4380*  4398  6966*  6980  6986  6992*  7006  7043*
7057  7063  7069*  7083  7122*  7136  7142  7148*  7162  8544  8562  8566
2199*  2633*  2634  2646*  2647  2658*  2659  2668*  2669  2727*  2728  2739*  2740
2750*  2751  2801*  2802  2813*  2814  2824*  2825  2893*  2894  2950*  2951  2989*
3003  5535*  5536  5542*  5543  5650*  5652  5770*  5772  5889*  5691  6008*  6010
6127*  6129  6246*  6248  6365*  6367  6495*  6497  6651*  6653  6797*  6799  6916*
6918  7286*  7287  7316*  7317  7330*  7331  7345*  7346  7371*  7372  7383*  7384
7395*  7396  8519  8525  8527  8556  8560
2200*  2440*  2450  2485*  2495  2528*  2538  2572*  2582  8514
2201*  2441*  2453  2486*  2498  2529*  2541  2573*  2585  8514
2204*
2190*  2867*  2881  2903*  2914  2928*  2939  2960*  2971  2992*  3000  3064*  3079
3154*  3172  3185*  3195  3269*  3285  3305*  3315  3398*  3414  3438*  3448  3481*
3491  3573*  3589  3607*  3617  3691*  3710  3789*  3806  3852*  3869  3952*  3969
4015*  4032  4115*  4132  4178*  4195  4287*  4304  4353*  4368  4379*  4395  4451*
4470  4487*  4497  4587*  4601  4612*  4622  8522  8527  8534  8547
1111*
1075*
1136*
1116*  4293  4382
1147*
2261*  6958  7035  7114
1117*
1133*
2857  2869  3028  3036*  3040  5496  7106  9843#  9844
1081*
2258*  3200*  3217*  3320*  3328  3343*  3428*  3494*  3509  3524*  3622*  3629  3644*
4503*  4523*  4703*  4704*  4731*  4737  4753*  4754  4813*  4814*  4841*  4847  4863*
4864  4923*  4924*  4951*  4957  4973*  4974  5033*  5034*  5061*  5067  5083*  5084
5143*  5144*  5171*  5177  5193*  5194  5252*  5253*  5280*  5286  5302*  5303  5421*
5422*  5449*  5455  5471*  5472  8539  8541  8551
1083*  2477  2487  2564  2574  2859  2868  3029  3043  3120  3132  3240  3247
3369  3376  3543  3551  3668  3669  3768  3769  3830  3831  3931  3932  3993
3994  4094  4095  4156  4157  4266  4267  4332  4333  4381  4427  4428  4564
4565  5498  5572  5661  5692  5781  5811  5900  5930  6019  6049  6138  6168
6257  6287  6376  6414  6506  6539  6663  6685  6809  6835  6927  7107  7123
1150*
5527  5603  5609  5626  5638  5723  5729  5746  5758  5842  5848  5865  5877
5961  5967  5984  5996  6080  6086  6103  6115  6199  6205  6222  6234  6318
6324  6341  6353  6446  6452  6468  6480  6571  6577  6593  6606  6611  6620
6627  6634  6717  6723  6739  6752  6757  6766  6773  6780  6867  6873  6889
6901  7284*
1084*
```

```
WRTGAT= 040000          1169* 2993  5512  5532  5540  5595  5715  5834  5953  6072  6191  6310  6438
                        6563  6709  6859  7299
WRTPAR  044714          4255  4557  7219*
WR.PAR= 000004          1045* 7220  7244
$APTHD  001000          1219  1225*
$ASTAT= ****** U        7685  7700
$ATYC   047354          7656  7658*
$ATY1   047330          7654*
$ATY3   047336          7655* 7883
$ATY4   047346          7657* 7742
$AUTOB  001134          1256* 2343* 8176  8333
$BASE   001270          1328* 2354  2362* 2403  2426  2471  2514  2558  2606  2695  2776  2852  3025
                        3117  3239  3368  3542  3661  3756  3919  4082  4254  4420  4556  4668  4778
                        4888  4998  5108  5217  5320  5384  5491  5567  5687  5806  5925  6044  6163
                        6282  6408  6533  6679  6829  6947  7024  7101  7841  8459
$BDADR  001122          1251*
$BDDAT  001126          1253*
$BELL   001204          1279* 7729  7762  8129  8326
$CDW1   001274          1330*
$CDW2   001276          1331*
$CHARC  050614          7900* 7910* 7917  7926* 7931*
$CKSWR  051570          8162* 8504
$CMTAG  001100          1239* 2284  2285  2293  2299  2300  2301
$CM3  = 000000          1269*
$CM4  = 000010          1269* 1270* 1271* 1272* 1273* 1274* 1275* 1276* 1277*
$CNTLC  052466          8117  8198  8326*
$CNTLG  052500          8183  8328*
$CNTLU  052473          8208  8301  8327*
$CORE   046544          7476  7503*
$CPUOP  001242          1302*
$CRLF   001211          1281* 7202  7737  7762  7783  7788  7796  7809  7822  7899  7934  8219  8306
                        8326  8387
$CROUT  046574          7503  7510*
$DBLK   051262          8035  8069  8077*
$DEVCT  001224          1293*
$DEVM   001272          1329*
$DOAGN  044704          7184  7205  7211*
$DTBL   051252          8038  8073*
$ENDAD  044674          1202  2331  7207* 7757
$ENDCT  044540          2299  7186*
$ENULL  044710          7214*
$ENV    001234          1298* 2337  7663  7687  7739  7878
$ENVM   001235          1299* 2322  7665  7880  7885
$EOP    044504          7176* 7836  7850
$EOPCT  044532          2299* 7183* 7187  7834* 7849*
$ERFLG  001103          1242* 7529  7568  7570  7576* 7598  7647  7724* 7762  7847*
$ERMAX  001115          1248* 2302* 7570  7593* 7598
$ERROR  047576          2293  7722*
$ERRPC  001116          1249* 7731* 7732* 7733  7762  8514  8517  8519  8522  8525  8527  8531  8535
                        8537  8539  8541  8544  8549  8551  8553  8556  8560  8562  8566
$ERRTB  001300          1348* 7780
$ERTTL  001112          1246* 7199  7203* 7730* 7762
$ESCAP  001202          1278* 2301* 2404* 7289* 7319* 7333* 7348* 7355* 7374* 7386* 7398* 7405* 7409*
                        7436* 7439* 7592* 7753  7755  7762  7848*
$ETABL  001234          1297*
$ETEND  001300          1231  1332*
```

F16


```
$FATAL  001216            1290#  7691*
$FFLG   047574            7654*  7657*  7685   7694*  7702#
$FILLC  001156            1267#  7903   7934
$FILLS  001155            1266#  7934
$GDADR  001120            1250#
$GDDAT  001124            1252#
$GET42  044664            7204#
$GTSWR  051660            8184#  8502
$HD     =  000000          886
$HIBTS  001000            1226#
$HIOCT  052666            8375*  8386#
$ICNT   001104            1243#  7583*  7584   7586*  7597
$INTAG  001135            1257#  8181*  8200   8220   8333
$ITEMB  001114            1247#  7733*  7741   7762   7774
$KTNEX  046536            7477   7502#
$KTOUT  046526            7494   7499#
$KT11   046374            3742   3905   4068   7475*  7479*  7502*
$LF     001212            1282#  7762   7934   8316   8326   8387
$LFLG   047573            7695*  7701#
$LPADR  001106            1244#  2303*  7565*  7574*  7590*  7595   7597   8460
$LPERR  001110            1245#  2304*  3031*  3121*  3761*  3820*  3924*  3983*  4087*  4146*  4256*  4322*  7411
                          7445   7574   7591*  7597   7649   7752
$LSTAD  046640            7515*  7522#
$LSTBK  046642            3744   3907   4070   7516*  7523#
$MADR1  001246            1315#
$MADR2  001252            1319#
$MADR3  001256            1322#
$MADR4  001262            1325#
$MAIL   001214            1227   1231   1288#  2321   2337   7589   7739   7878
$MAMS1  001244            1309#
$MAMS2  001250            1317#
$MAMS3  001254            1320#
$MAMS4  001260            1323#
$MBADR  001002            1227#
$MFLG   047572            7655*  7661   7696*  7700#
$MNEW   052516            8187   8331#
$MSGAD  001230            1295#  7671*  7674
$MSGLG  001232            1296#  7676*
$MSGTY  001214            1289#  7669   7677*  7689   7693*
$MSWR   052505            8184   8329#
$MTYP1  001245            1310#
$MTYP2  001251            1318#
$MTYP3  001255            1321#
$MTYP4  001261            1324#
$MXCNT  047154            7587   7597#
$NULL   001154            1265#  7905   7934
$NWTST= 000001            2412#  2414   2457#  2459   2502#  2504   2545#  2547   2592#  2594   2681#  2683   2762#
                          2764   2836#  2838   3010#  3012   3101#  3103   3226#  3228   3347#  3349   3528#  3530
                          3648#  3650   3725#  3727   3888#  3890   4051#  4053   4214#  4216   4407#  4409   4527#
                          4529   4647#  4649   4757#  4759   4867#  4869   4977#  4979   5087#  5089   5197#  5199
                          5306#  5308   5364#  5366   5477#  5479   5547#  5549   5666#  5668   5786#  5788   5905#
                          5907   6024#  6026   6143#  6145   6262#  6264   6381#  6383   6511#  6513   6668#  6670
                          6814#  6816   6934#  6936   7011#  7013   7088#  7090
$OCNT   051042            7966*  7995*  8008#
$OMODE  051044            7961*  7965*  7970   7973*  7984*  8010#
$OVER   047140            7541   7566   7575   7585   7594#
```

```
$PASS   001222          1292#  2321*  7180*  7181*  7192   7214   7581   7598
$PASTM  001006          1229#
$POWER  053112          8456   8463#
$PWRCT  053106          8447*  8448*  8449*  8451*  8462#
$PWRDN  052764          2297   8438#  8453
$PWRUP  053012          8439   8447#
$QUES   001210          1280#  7762   7934   8238   8309   8326   8384   8387
$RDCHR  052132          8251#  8505
$RDDEC= ****** U        8508
$RDLIN  052222          8274#  8506
$RDOCT  052530          8348#  8507
$RDSZ = 000010          8267#
$RESRE  052726          8420#  8509
$RTNAD  044706          7213#
$R2A  = ****** U        8510
$SAVRE  052670          8404#  8508
$SCOPE  046644          2291   7538#
$SETUP= 000137          2268#  2290   2291   2293   2295   2297   2299   2300   2301   2303   2331   2334   7178
                        7539   7723   7749   7757   8121   8126   8127   8157   8333
$SIZE   046336          2402   7463#
$SIZEX  046600          7501   7511#
$STUP = 177777          2268#
$SVLAD  047104          7549   7588#
$SVPC = 000220          1200#  1205
$SWR  = 167400           874#   886    890    891    892    893    894    895    896    897   1277   1278   1279
                        2300   2301   2303   2304   2425   2470   2513   2557   2605   2694   2775   2851   3024
                        3116   3238   3367   3541   3660   3741   3904   4067   4242   4419   4544   4667   4777
                        4887   4997   5107   5216   5319   5383   5490   5566   5686   5805   5924   6043   6162
                        6281   6407   6532   6678   6828   6946   7023   7100   7173   7179   7206   7212   7214
                        7530   7531   7532   7533   7534   7540   7552   7554   7555   7568   7569   7570   7577
                        7578   7579   7591   7594   7597   7714   7715   7716   7717   7718   7727   7734   7746
                        7750   7762
$SWREG  001236          1300#  2324
$SWRMK= 000000           897    898   7534   7535   7558
$SWO8T  047156          7564   7598#
$TESTN  001220          1291#  3751   3914   4077   4249   4551   7589*  8513   8514   8517   8519   8522   8525
                        8527   8531   8535   8537   8539   8541   8544   8549   8551   8553   8556   8560   8562
                        8566
$TIMES  001200          1277#  2300*  2425*  2470*  2513*  2557*  2605*  2694*  2775*  2851*  3024*  3116*  3238*
                        3367*  3541*  3660*  3741*  3747*  3904*  3910*  4067*  4073*  4242*  4245*  4419*  4544*
                        4547*  4667*  4777*  4887*  4997*  5107*  5216*  5319*  5383*  5490*  5566*  5686*  5805*
                        5924*  6043*  6162*  6281*  6407*  6532*  6678*  6828*  6946*  7023*  7100*  7179*  7577*
                        7584   7587*  7597
$TKB    001146          1262#  8081   8102   8113   8138   8166   8193
$TKCNT  051272          8082#  8097*  8127   8144*  8258   8260*
$TKINT  051302          2277   8097#  8118   8179
$TKQEN= 051301          8086#  8152   8263
$TKQIN  051274          8083#  8098*  8099   8150*  8151*  8152   8154*
$TKQOU  051276          8084#  8099*  8261   8262*  8263   8265*
$TKQSR  051300          8085#  8098   8154   8265
$TKS    001144          1261#  8081   8103*  8134*  8136   8142*  8164   8180*  8190   8202*  8222*
$TKSRV  051352          8100   8113#
$TMP0   001160          1269#  2358*  2360   2362   2369*  2371   2374   2386*  2388   2390   2392*  2393*  2394*
                        2395*  2396*  2398   3118*  3129   3198   3221*
$TMP1   001162          1270#
$TMP2   001164          1271#
```

```
$TMP3   001166          1272#
$TMP4   001170          1273#
$TMP5   001172          1274#
$TMP6   001174          1275#
$TMP7   001176          1276#
$TN   = 000054           875#   886   2412  2425#  2449  2454  2457  2470#  2494  2499  2502  2513#  2537
                        2542  2545  2557#  2581  2566  2592  2605#  2623  2638  2651  2663  2673  2678
                        2681  2694#  2712  2732  2744  2754  2759  2762  2775#  2793  2806  2818  2828
                        2833  2836  2851#  3010  3024#  3099  3101  3116#  3223  3226  3238#  3347  3367#
                        3528  3541#  3648  3660#  3722  3725  3741#  3746  3888  3904#  3909  4051  4067#
                        4072  4214  4242#  4245  4407  4419#  4527  4544#  4547  4647  4667#  4709  4743
                        4748  4757  4777#  4819  4853  4858  4867  4887#  4929  4963  4968  4977  4997#
                        5039  5073  5078  5087  5107#  5149  5183  5188  5197  5216#  5258  5292  5297
                        5306  5319#  5342  5347  5364  5383#  5427  5461  5466  5477  5490#  5544  5547
                        5566#  5663  5666  5686#  5783  5786  5805#  5902  5905  5924#  6021  6024  6043#
                        6140  6143  6162#  6259  6262  6281#  6378  6381  6407#  6508  6511  6532#  6665
                        6668  6678#  6811  6814  6828#  6929  6934  6946#  7011  7023#  7088  7100#  7559
                        7599
$TPB    001152          1264#  7923#  7934
$TPFLG  001157          1268#  7872   7934
$TPS    001150          1263#  7921   7934
$TRAP   053120          2295   8473#
$TRAP2  053142          8484#  8495
$TRP  = 000016          8488#  8497#  8498#  8499#  8500#  8501#  8502  8503#  8504  8505#  8506#  8507#  8508#
                        8509#  8510#  8511#
$TRPAD  053154          8478   8495#
$TSTM   001004          1228#
$TSTNM  001102          1241#  7178#  7529  7561#  7588#  7589  7594  7598  7726  7762
$TTYIN  052456          8276   8277   8289  8307  8321  8325#
$TYPBN= ****** U        8501
$TYPDS  051046          8023#  8500
$TYPE   050336          7682   7872#  8488  8496
$TYPEC  050550          7902   7909   7916  7921#  7922  8224
$TYPEX  050616          7927   7929   7932#
$TYPOC  050644          7964#  8497
$TYPON  050660          7963   7966#  8499
$TYPOS  050620          7959#  8498
$UNIT   001226          1294#
$UNITM  001010          1230#
$USWR   001240          1301#
$VECT1  001264          1326#  2364  2373#  2374#  2377  2397#  2398#  2399  2401
$VECT2  001266          1327#
$XTSTR  046656          7543#
$$GET4= 000000          7206#
$$SW08= 000054          7598#  7599  7600#  7601#  7602#  7603#  7604#  7605#  7606#  7607#  7608#  7609#  7610#
                        7611#  7612#  7613#  7614#  7615#  7616#  7617#  7618#  7619#  7620#  7621#  7622#  7623#
                        7624#  7625#  7626#  7627#  7628#  7629#  7630#  7631#  7632#  7633#  7634#  7635#  7636#
                        7637#  7638#  7639#  7640#  7641#  7642#
$OFILL  051043          7960#  7964#  7974  8009#
$40CAT= ****** U        7540   7736
.     = 067470          1184#  1188#  1194#  1200  1201#  1203#  1205#  1206#  1209#  1215  1216#  1218#  1220#
                        1238#  1283  2288  2303  2304  2347#  7191#  7214  7215#  7597  7598  7703#  7762
                        7934  8077#  8081  8085#  8086  8087#  8325#  8326  8333#  8387  8442  9738#  9843#
.$ASTA= ****** U        7655   7658
.$X   = 001000          1215#  1220
```

```
BYPASS  1232#  3746  3909  4072  4245  4547
CLRMSG  1232#  2514  2558
CLRPSW  1232#
COMMEN  1008#
ENDCOM  1008#
ERROR    902#  2447  2452  2455  2492  2497  2500  2535  2540  2543  2579  2584  2587  2621  2636
        2649  2661  2671  2679  2710  2730  2742  2760  2791  2804  2816  2834  2873  2878  2883
        2896  2906  2911  2916  2931  2936  2941  2953  2963  2968  2973  2996  2999  3002  3005
        3072  3075  3078  3081  3086  3092  3095  3165  3168  3171  3174  3188  3191  3194  3197
        3205  3213  3216  3278  3281  3284  3287  3308  3311  3314  3317  3326  3339  3342  3407
        3410  3413  3416  3441  3444  3447  3450  3456  3464  3467  3484  3487  3490  3493  3507
        3520  3523  3582  3585  3588  3591  3610  3613  3616  3619  3627  3640  3643  3700  3703
        3706  3709  3712  3720  3723  3799  3802  3805  3808  3813  3862  3865  3868  3871  3882
        3962  3965  3968  3971  3976  4025  4028  4031  4034  4045  4125  4128  4131  4134  4139
        4188  4191  4194  4197  4208  4297  4300  4303  4306  4309  4317  4320  4361  4364  4367
        4370  4388  4391  4394  4397  4400  4463  4466  4469  4472  4490  4493  4496  4499  4508
        4519  4522  4594  4597  4600  4603  4615  4618  4621  4624  4629  4635  4638  4707  4727
        4730  4742  4747  4752  4817  4837  4840  4852  4857  4862  4927  4947  4950  4962  4967
        4972  5037  5057  5060  5072  5077  5082  5147  5167  5170  5182  5187  5192  5256  5276
        5279  5291  5296  5301  5341  5346  5358  5361  5425  5445  5448  5460  5465  5470  5528
        5538  5545  5604  5610  5627  5639  5654  5664  5724  5730  5747  5759  5774  5784  5843
        5849  5866  5878  5893  5903  5962  5968  5985  5997  6012  6022  6081  6087  6104  6116
        6131  6141  6200  6206  6223  6235  6250  6260  6319  6325  6342  6354  6369  6379  6447
        6453  6469  6481  6499  6509  6572  6578  6594  6607  6612  6621  6628  6635  6656  6666
        6718  6724  6740  6753  6758  6767  6774  6781  6802  6812  6868  6874  6890  6902  6920
        6930  6973  6976  6979  6982  6999  7002  7005  7008  7050  7053  7056  7059  7076  7079
        7082  7085  7129  7132  7135  7138  7155  7158  7161  7164  7438
ESCAPE  1008#
FORERR  1232#  6947  7024  7101
GETPRI  1008#  7471
GETSWR  1008#  2334#
LDLPER  1232#  3031  3121  3761  3820  3924  3983  4087  4146  4256  4322
MSG     2412#  2414  2457#  2459  2502#  2504  2545#  2547  2592#  2594  2681#  2683  2762#  2764  2836#
        2838  3010#  3012  3101#  3103  3226#  3228  3347#  3349  3528#  3530  3648#  3650  3725#  3727
        3888#  3890  4051#  4053  4214#  4216  4407#  4409  4527#  4529  4647#  4649  4757#  4759  4867#
        4869  4977#  4979  5087#  5089  5197#  5199  5306#  5308  5364#  5366  5477#  5479  5547#  5549
        5666#  5668  5786#  5788  5905#  5907  6024#  6026  6143#  6145  6262#  6264  6381#  6383  6511#
        6513  6668#  6670  6814#  6816  6934#  6936  7011#  7013  7088#  7090
MULT    1008#
NEWTST  1008#  2412  2457  2502  2545  2592  2681  2762  2836  3010  3101  3226  3347  3528  3648
        3725  3888  4051  4214  4407  4527  4647  4757  4867  4977  5087  5197  5306  5364  5477
        5547  5666  5786  5905  6024  6143  6262  6381  6511  6668  6814  6934  7011  7088
POP     1008#  7697  7698  8064  8376  8425
PUSH    1008#  7658  7660  7681  8023  8350  8405
RDLOOP  1232#  4668  4778  4888  4998  5108  5384
REPORT  1008#
SCOPE    903#  2424  2469  2512  2556  2604  2693  2774  2850  3023  3115  3237  3366  3540  3659
        3740  3903  4066  4241  4418  4543  4666  4776  4886  4996  5106  5215  5318  5382  5489
        5565  5685  5804  5923  6042  6161  6280  6406  6531  6677  6827  6945  7022  7099  7177
SEKMSG  1232#  2426  2471
SETPRI  1008#  8254
SETTRA  8488#  8497  8498  8499  8500  8502  8504  8505  8506  8507  8508  8509  8510
SETUP   1008#  2282
SKIP    1008#  2449  2454  2494  2499  2537  2542  2581  2586  2623  2638  2651  2663  2673  2678
        2712  2732  2744  2754  2759  2793  2806  2818  2828  2833  3099  3223  3722  4709  4743
        4748  4819  4853  4858  4929  4963  4968  5039  5073  5078  5149  5183  5188  5258  5292
```

```
            5297    5342    5347    5427    5461    5466    5544    5663    5783    5902    6021    6140    6259    6378    6508
            6665    6811    6929
SLASH       1008#
SPACE       1008#
SPREAD      1232#   2695    2776
STARS       1008#   1198    1212    1214    1221    1234    1283    1286    2412    2423    2457    2468    2502    2511    2545
            2555    2592    2603    2681    2692    2762    2773    2836    2849    3010    3022    3101    3114    3226    3236
            3347    3365    3528    3539    3648    3658    3725    3739    3888    3902    4051    4065    4214    4240    4407
            4417    4527    4542    4647    4665    4757    4775    4867    4885    4977    4995    5087    5105    5197    5214
            5306    5317    5364    5381    5477    5488    5547    5564    5666    5684    5786    5803    5905    5922    6024
            6041    6143    6160    6262    6279    6381    6405    6511    6530    6668    6676    6814    6826    6934    6944
            7011    7021    7088    7098    7169    7449    7526    7642    7653    7710    7763    7772    7857    7936    8013
            8080    8157    8172    8243    8267    8336    8389    8435    8444    8467
SWRSU       1008#   2305#
TRMTRP      8488#
TSTMEM      1232#   3742    3905    4068
TYPBIN      1008#
TYPDEC      1008#   7192    7199
TYPNAM      1008#   2327
TYPNUM      1008#
TYPOCS      1008#
TYPOCT      1008#   2354    3751    3914    4077    4249    4551    8185
TYPTXT      1008#   7188    7195
WRLOOP      1232#   5567    5687    5806    5925    6044    6163    6282
WRTRK       1232#   6533    6679
WRTRK1      1232#   6408    6829
$$CMRE      1232#
$$CMTM      1232#   1269    1270    1271    1272    1273    1274    1275    1276
$$ESCA      1008#
$$NEWT      1008#   2412    2457    2502    2545    2592    2681    2762    2836    3010    3101    3226    3347    3528    3648
            3725    3888    4051    4214    4407    4527    4647    4757    4867    4977    5087    5197    5306    5364    5477
            5547    5666    5786    5905    6024    6143    6262    6381    6511    6668    6814    6934    7011    7088
$$SET       8488#   8497    8498    8499    8500    8502    8504    8505    8506    8507    8508    8509    8510
$$SETM      2321#
$$SKIP      1008#   2449    2454    2494    2499    2537    2542    2581    2586    2623    2638    2651    2663    2673    2678
            2712    2732    2744    2754    2759    2793    2806    2818    2828    2833    3099    3223    3722    4709    4743
            4748    4819    4853    4858    4929    4963    4968    5039    5073    5078    5149    5183    5188    5258    5292
            5297    5342    5347    5427    5461    5466    5544    5663    5783    5902    6021    6140    6259    6378    6508
            6665    6811    6929
.EQUAT       874#    898
.HEADE       874#    876
.KT11        874#   1008
.SETUP       874#   2268
.SWRHI       874#    886
.SWRLO       874#    898#
.$ACT1       874#   1196
.$APTB      1284#
.$APTH       874#   1210
.$APTY       874#   7651
.$CATC       874#   1182
.$CMTA       874#   1232
.$EOP        874#   7167
.$ERRO       874#   7708
.$ERRT       874#
.$POWE       874#
.$RDOC       874#   8334
```

```
.$READ    874#   8078
.$SAVE    874#   8387
.$SCOP    874#   7524
.$SIZE    874#   7447
.$TRAP    874#   8465
.$TYPD    874#   8011
.$TYPE    874#   7855
.$TYPO    874#   7934


. ABS.  067470     000


 ERRORS DETECTED:  0

 RM03:CZR6CC,RM03:CZR6CC.SEQ/SOL/CRF/NL:TOC/DOC=RM03:CZR6CC.P11
 RUN-TIME:  32 29 3 SECONDS
 RUN-TIME RATIO: 1341/65=20.5
 CORE USED:  35K  (69 PAGES)

 DOCUMENT PAGES:  205
```