RK611

DISKLESS CONT DIAG 3

MD-11-DZR6C-B

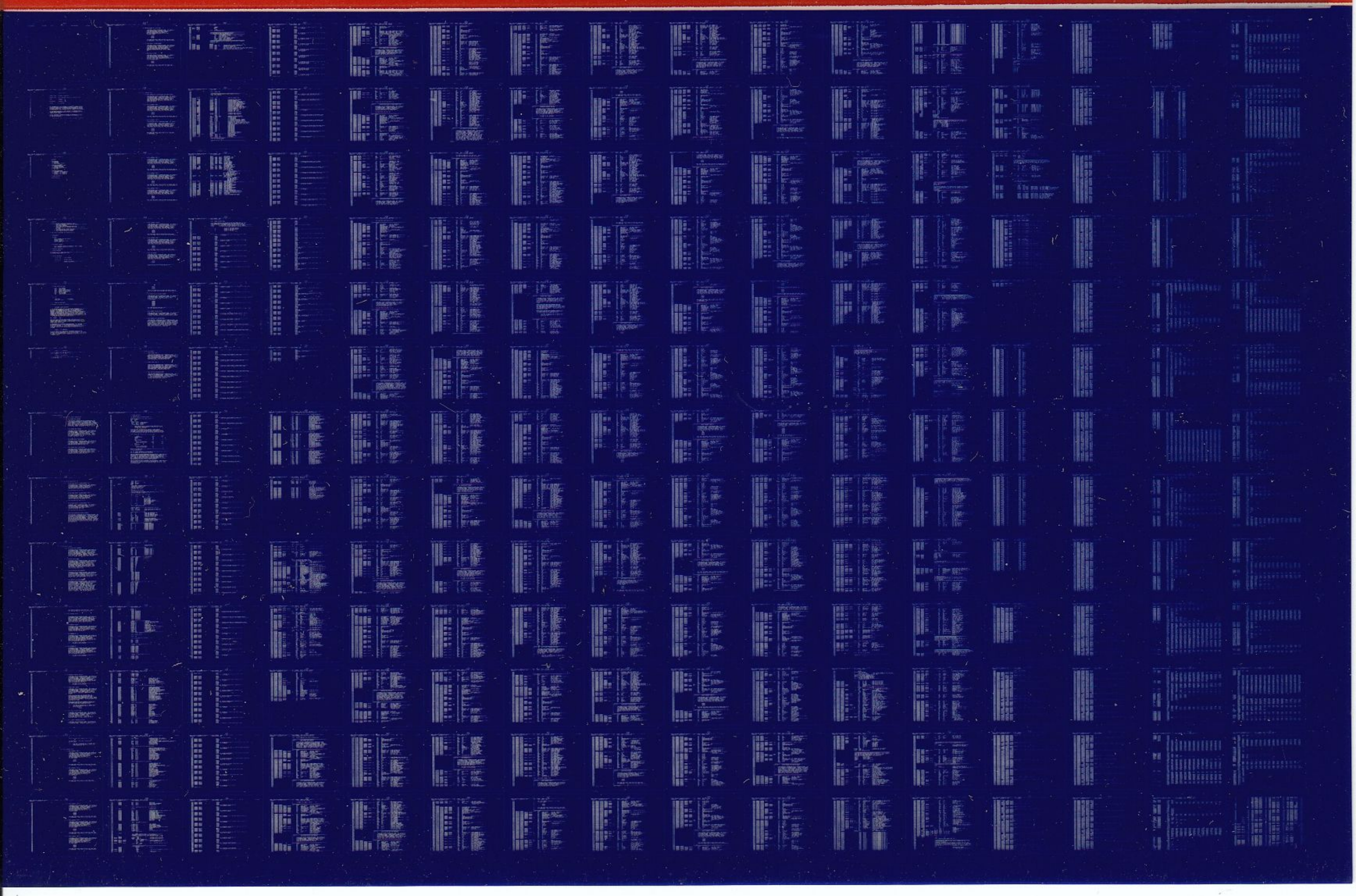
EP-DZR6C-B-DL-B

FICHE 1 OF 2

APR 1977

digital

MADE IN USA



RK611

DISKLESS CONT DIAG 3

MD-11-DZR6C-B

EP-DZR6C-B-DL-B APR 1977

FICHE 2 OF 2

digital

MADE IN U

B01

EOF1DZM9ACSEQ	00010000	770323	PDP10 411	=1HDR1DZR6CBSEQ	00010000	770323

```
                        .REM    %
                                IDENTIFICATION


                        PRODUCT CODE:   MAINDEC-11-DZR6C-B-D

                        PRODUCT NAME:   RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3

                        DATE:           FEBRUARY, 1977

                        MAINTAINER:     DIAGNOSTIC GROUP

                        AUTHOR:         ROY SPITZER
```

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 MPR 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 (DZR6A)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 2 (DZR6B)

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 PASSES       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 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 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 F, M SILO AND CHECK IT.  CLOCK IN NEXT WORD.
                                        CLOCK IN  EXT 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 3, 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.
```

```
531
532                                     TEST 32 READ HEADER IN 18 BIT MODE
533
534                                             CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
535                                             IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
536                                             CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
537                                             SIMULATE SECTOR PULSE, 255 ZEROES, A
538                                             ONE, AND A HEADER CONSISTING OF THE THREE
539                                             FOLLOWING WORDS:
540
541                                                     177777
542                                                     000000
543                                                     177777
544
545                                             MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
546                                             IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
547
548
549                                     TEST 33 SYNCH DETECT IN READ HEADER
550
551                                             CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
552                                             IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
553                                             IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
554                                             CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
555                                             SIMULATE SECTOR PULSE AND 350 ZEROES.  MAKE
556                                             SURE READY REMAINS RESET AND THE SILO REMAINS
557                                             EMPTY.
558
559
560                                     TEST 34 ZERO SYNCH ON READ
561
562                                             CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
563                                             IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
564                                             CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES,
565                                             SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF
566                                             BIT TIME, A ONE, AND A HEADER CONSISTING OF THE
567                                             THREE FOLLOWING WORDS:
568
569                                                     177777
570                                                     000000
571                                                     177777
572
573                                             MAKE SURE THAT READY COMES AFTER THE THIRD WORD
574                                             IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
575
576
```

```
577
578                                     **MFM WRITE LOOPBACK TESTS
579
580                                             TEST 35 WRITE ZEROS UNTIL SECTOR PULSE WITH WRITE HEADER
581
582                                                     CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
583                                                     IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
584                                                     IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
585                                                     CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
586                                                     INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
587                                                     ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
588                                                     WRITE GATE RESETS.
589
590
591                                             TEST 36 WRITE LOOPBACK (PART 1)
592
593                                                     CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
594                                                     IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
595                                                     IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
596                                                     CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
597                                                     INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
598                                                     CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
599
600                                                             177777
601                                                             000000
602                                                             177777
603
604                                                     MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PUL
605                                                     CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION
606
607
608                                             TEST 37 WRITE LOOPBACK (PART 2)
609
610                                                     CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
611
612                                                     IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
613                                                     IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
614                                                     CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
615                                                     INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
616                                                     CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
617
618                                                             000000
619                                                             177777
620                                                             000000
621
622                                                     MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
623                                                     IS TRANSFERRED.  CHECK FOR CORRECT WRITE ENCODED DATA
624                                                     AND PRECOMPENSATION.
625
626
```

```
                                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.
```

```
779
780                                     **TYPE 8 INSTRUCTION ERRORS
781
782                                             TEST 51 FORMAT ERROR (PART 1)
783
784                                                     CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT TH
785                                                     CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO A
786                                                     RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0.
787                                                     CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN O
788                                                     MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
789                                                     DRIVE AVAILABLE AND CONTROLLER ERROR SET.
790
791
792                                             TEST 52 FORMAT ERROR (PART 2)
793
794
795                                                     CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT TH
796                                                     CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO A
797                                                     RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0.
798                                                     CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN O
799                                                     MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
800                                                     DRIVE AVAILABLE AND CONTROLLER ERROR SET.
801
802
803                                             TEST 53 FAULT SETTING CONTROLLER ERROR
804
805                                                     CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT TH
806                                                     CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO
807                                                     AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE
808                                                     0.  CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.
809                                                     TURN OFF MAINTENANCE MODE.  MAKE SURE DRIVE
810                                                     AVAILABLE AND CONTROLLER ERROR SET.
811
812
```

6.0 ERROR REPORTING

THE GENERAL FORMAT OF ERROR REPORTS IS:

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

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

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

THESE FIELDS (ALL VALUES GIVEN IN OCTAL) ARE:

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

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

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

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

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

```
                                %
                        .NLIST  CND,MD,MC,TOC
                        .LIST   ME
                        .ENABL  ABS,AMA
167400                  $SWR=   167400
000001                  $TN=    1
                        .TITLE  RK611 DISKLESS CONTROLLER DIAGNOSTIC: P3 MD-11-DZR6CA
                        ;*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                  STAC.=  1100
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

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

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

```
                        ;
                        ;SP=     %6             ;;STACK POINTER
                        ;PC=     %7             ;;PROGRAM COUNTER
                        ;
                        ;*PRIORITY LEVEL DEFINITIONS
                        ;PR0=    0              ;;PRIORITY LEVEL 0
                        ;PR1=    40             ;;PRIORITY LEVEL 1
                        ;PR2=    100            ;;PRIORITY LEVEL 2
                        ;PR3=    140            ;;PRIORITY LEVEL 3
                        ;PR4=    200            ;;PRIORITY LEVEL 4
                        ;PR5=    240            ;;PRIORITY LEVEL 5
                        ;PR6=    300            ;;PRIORITY LEVEL 6
                        ;PR7=    340            ;;PRIORITY LEVEL 7
                        ;
                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
                        ;SW15=   100000
                        ;SW14=   40000
                        ;SW13=   20000
                        ;SW12=   10000
                        ;SW11=   4000
                        ;SW10=   2000
                        ;SW09=   1000
                        ;SW08=   400
                        ;SW07=   200
                        ;SW06=   100
                        ;SW05=   40
                        ;SW04=   20
                        ;SW03=   10
                        ;SW02=   4
                        ;SW01=   2
                        ;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)
                        ;BIT15=  100000
                        ;BIT14=  40000
                        ;BIT13=  20000
                        ;BIT12=  10000
                        ;BIT11=  4000
                        ;BIT10=  2000
                        ;BIT09=  1000
                        ;BIT08=  400
                        ;BIT07=  200
                        ;BIT06=  100
                        ;BIT05=  40
                        ;BIT04=  20
                        ;BIT03=  10
                        ;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
```

```
                172350          KIPAR4= 172350
                172352          KIPAR5= 172352
                172354          KIPAR6= 172354
                172356          KIPAR7= 172356

                000114          MEMVEC= 114             ;MEMORY PARITY VECTOR
                172100          MEMBAS= 172100          ;MEM PARITY OPTION
                000004          WR.PAR= 4               ;WRITE BAD PARITY
                000001          PAR.EN= 1               ;ENABLE PARITY ENABLE
                120210          AVECT1= 120210          ;DEFINE RK611 VECTOR ADDRESS
                000005          APRIOR= 5               ;DEFINE RK611 PRIORITY
                177440          ABASE=  177440          ;DEFINE BASE OF RK611 REGISTERS

                                .SBTTL  RK611 CONTROLLER REGISTER DEFINITION

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

                                .SBTTL  DRIVE COMMANDS

                000001          SELDRV= 01              ;SELECT DRIVE
                000003          PACK=   03              ;PACK ACKNOWLEDGE
                000005          CLEAR=  05              ;DRIVE CLEAR
                000007          UNLOAD= 07              ;UNLOAD
                000011          SRTSPL= 11              ;START SPINDLE
                000013          RECAL=  13              ;RECALIBRATE
                000015          OFFSET= 15              ;OFFSET
                000017          SEEK=   17              ;SEEK
                000021          RDDATA= 21              ;READ DATA
                000023          WRDATA= 23              ;WRITE DATA
                000025          RDHEAD= 25              ;READ HEADER
                000027          WRHEAD= 27              ;WRITE HEADER AND DATA
                000031          WRTCHK= 31              ;WRITE CHECK
                000300          INTR=   300             ;GENERATE INTERRUPT TO CPU

                                .SBTTL  CONTROL AND STATUS REGISTER 1 BITS

                000001          GO=     BIT0            ;GO BIT
                000100          IE=     BIT6            ;INTERRUPT ENABLE
                000200          RDY=    BIT7            ;CONTROLLER READY
                000400          BA16=   BIT8            ;BUS ADDRESS BIT 16
                001000          BA17=   BIT9            ;BUS ADDRESS BIT 17
```

```
                                CDT=    BIT10           ;CONTROLLER DRIVE TYPE (0=RK06)
                                CTO=    BIT11           ;CONTROLLER TIMED OUT WAITING FOR
                                                        ;  DRIVE RESPONSE
                                CFMT=   BIT12           ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
                                SPAR=   BIT13           ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
                                DI=     BIT14           ;DRIVE INTERRUPT
                                CERR=   BIT15           ;CONTROLLER ERROR
                                CCLR=   BIT15           ;CONTROLLER CLEAR

                        .SBTTL  CONTROL AND STATUS REGISTER 2 BITS

000007                  DRVMSK= 7               ;MASK FOR DRIVE SELECTION CODE
000010                  RLS=    BIT3            ;DESELECT OR RELEASE DRIVE IN BITS 0-2
000020                  BAI=    BIT4            ;BUS ADDRESS INCREMENT INHIBIT
000040                  SCLR=   BIT5            ;CLEAR CONTROLLER AND ALL DRIVES
000100                  IR=     BIT6            ;INPUT READY
000200                  OR=     BIT7            ;OUTPUT READY
000400                  UFE=    BIT8            ;UNIT FIELD ERROR
001000                  MDS=    BIT9            ;MULTIPLE DRIVE SELECT
002000                  PGE=    BIT10           ;PROGRAMMING ERROR
004000                  NEM=    BIT11           ;NON-EXISTENT MEMORY
010000                  NED=    BIT12           ;NON-EXISTENT DRIVE
020000                  UPE=    BIT13           ;UNIBUS PARITY ERROR
040000                  WCE=    BIT14           ;WRITE CHECK ERROR
100000                  DLT=    BIT15           ;DATA LATE ERROR

                        .SBTTL  ERROR REGISTER BIT DEFINITION

000001                  ILF=    BIT0            ;ILLEGAL FUNCTION CODE
000002                  SKI=    BIT1            ;SEEK INCOMPLETE
000004                  NXF=    BIT2            ;NON-EXECUTABLE DRIVE FUNCTION
000010                  DRPAR=  BIT3            ;DRIVE DETECTED DRIVE BUS PARITY ERROR
000020                  FMTE=   BIT4            ;FORMAT ERROR
000040                  DTYE=   BIT5            ;DRIVE TYPE ERROR
000100                  ECH=    BIT6            ;ECC HARD
000200                  BSE=    BIT7            ;BAD SECTOR ERROR
000400                  HVRC=   BIT8            ;HEADER VRC ERRROR
001000                  COE=    BIT9            ;CYLINDER ADDRESS OVERFLOW ERROR
002000                  IDAE=   BIT10           ;INVALID DISK ADDRESS ERROR
004000                  WLE=    BIT11           ;WRITE LOCK ERROR
010000                  DTE=    BIT12           ;DRIVE TIMING ERROR
020000                  OPI=    BIT13           ;OPERATION (SEARCH) INCOMPLETE
040000                  UNS=    BIT14           ;DRIVE UNSAFE
100000                  DCK=    BIT15           ;DATA CHECK

                        .SBTTL  STATUS REGISTER BIT DEFINITION

000001                  DRA=    BIT0            ;DRIVE AVAILABLE (CONTROLLER IS SET IF
                                                ;  THIS BIT IS RESET)
000004                  OFST=   BIT2            ;DRIVE OFFSET
000010                  ACLO=   BIT3            ;AC LOW
000020                  SPDLSS= BIT4            ;SPEED LOSS
000040                  DROT=   BIT5            ;DRIVE OFF TRACK
000100                  VV=     BIT6            ;VOLUME VALID
000200                  DRDY=   BIT7            ;DRIVE READY
000400                  DDT=    BIT8            ;DRIVE TYPE (0=RK06)
```

```
                                WRL=    BIT11                   ;WRITE LOCK
                                PIP=    BIT13                   ;POSITIONING IN PROGRESS
                                DSC=    BIT14                   ;DRIVE STATUS CHANGE
                                SVAL=   BIT15                   ;STATUS VALID

                                .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION

                                MESMSK= 17                      ;MESSAGE MASK

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

                                .SBTTL  TRANSMITTED MESSAGE A

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

                                        .=0
                                ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                                        .=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
                                        .=214
000214  000137  003642                  JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
                                .SBTTL  ACT11 HOOKS

                                ;;**************************************************************
                                ;HOOKS REQUIRED BY ACT11
                                        $SVPC=.                 ;SAVE PC
                                        .=46
000046  044666                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                                        .=52
000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
                                        .=$SVPC                 ;; RESTORE PC
```

```
1203            000114                          .=MEMVEC
1204   000114   046266                          MEMERR
1205   000116   000340                          PR7
1206            001000                          .=1000
1207                                    .SBTTL  APT PARAMETER BLOCK
1208
1209                                    ;;*****************************************************************
1210                                    ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1211                                    ;;*****************************************************************
1212            001000                          .$X=.   ;;SAVE CURRENT LOCATION
1213            000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1214   000024   000200                          200     ;;FOR APT START UP
1215            000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1216   000044   001000                          $APTHDR ;;POINT TO APT HEADER BLOCK
1217            001000                          .=.$X   ;;RESET LOCATION COUNTER
1218                                    ;;*****************************************************************
1219                                    ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1220                                    ;INTERFACE SPEC.
1221
1222   001000                           $APTHD:
1223   001000   000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1224   001002   001214                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1225   001004   000000                 $TSTM:  .WORD           ;;RUN TIM OF LONGEST TEST
1226   001006   000000                 $PASTM: .WORD           ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1227   001010   000000                 $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1228   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
```

```
1285  001214                  $MAIL:                          ;;APT MAILBOX
1286  001214  000000          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
1287  001216  000000          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
1288  001220  000000          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
1289  001222  000000          $PASS:  .WORD   APASS           ;;PASS COUNT
1290  001224  000000          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
1291  001226  000000          $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
1292  001230  000000          $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
1293  001232  000000          $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
1294  001234                  $ETABLE:                        ;;APT ENVIRONMENT TABLE
1295  001234      000         $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
1296  001235      000         $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
1297  001236  000000          $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
1298  001240  000000          $USWR:  .WORD   AUSWR           ;;USER SWITCHES
1299  001242  000000          $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
1300                          ;*                              BITS 15-11=CPU TYPE
1301                          ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1302                          ;*                                      11/70=06,PDQ=07,Q=10
1303                          ;*                              BIT 10=REAL TIME CLOCK
1304                          ;*                              BIT  9=FLOATING POINT PROCESSOR
1305                          ;*                              BIT  8=MEMORY MANAGEMENT
1306  001244      000         $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
1307  001245      000         $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
1308                          ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
1309                          ;*                                      900 NSEC CORE=001
1310                          ;*                                      300 NSEC BIPOLAR=002
1311                          ;*                                      500 NSEC MOS=003
1312  001246  000000          $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
1313                          ;*                               MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1314  001250      000         $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
1315  001251      000         $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
1316  001252  000000          $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
1317  001254      000         $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
1318  001255      000         $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
1319  001256  000000          $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
1320  001260      000         $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
1321  001261      000         $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
1322  001262  000000          $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
1323  001264  120210          $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1324  001266  000000          $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1325  001270  177440          $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1326  001272  000000          $DEVM:  .WORD   ADEVM           ;;DEVICE MAP
1327  001274  000000          $CDW1:  .WORD   ACDW1           ;;CONTROLLER DESCRIPTION WORD#1
1328  001276  000000          $CDW2:  .WORD   ACDW2           ;;CONTROLLER DESCRIPTION WORD#2
1329  001300                  $ETEND:
1330                          .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  057746                          EM200
001302  064125                          EM3000
001304  053206                          DT001
001306  053650                          DF001
                                ;       ERROR 2:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE A INCORRECT.
001310  057746                          EM200
001312  064170                          EM3001
001314  053206                          DT001
001316  053650                          DF001
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE B INCORRECT.
001320  057746                          EM200
001322  064214                          EM3002
001324  053206                          DT001
001326  053650                          DF001
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 CS1 INCORRECT.
001330  060030                          EM201
001332  064125                          EM3000
001334  053206                          DT001
001336  053650                          DF001
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE A INCORRECT.
001340  060030                          EM201
001342  064170                          EM3001
001344  053206                          DT001
001346  053650                          DF001
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE IS INCORRECT.
001350  060030                          EM201
001352  064214                          EM3002
001354  053206                          DT001
001356  053650                          DF001
                                ;       ERROR 7:  ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
                                ;                 CS1 INCORRECT
001360  060113                          EM202
001362  064125                          EM3000
001364  053206                          DT001
```

```
1387  001366  053650                        DF001
1388                              ;         ERROR 10: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1389                              ;                   MESSAGE A INCORRECT.
1390  001370  060113                        EM202
1391  001372  064170                        EM3001
1392  001374  053206                        DT001
1393  001376  053650                        DF001
1394                              ;         ERROR 11: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1395                              ;                   MESSAGE B INCORRECT.
1396  001400  060113                        EM202
1397  001402  064214                        EM3002
1398  001404  053206                        DT001
1399  001406  053650                        DF001
1400                              ;         ERROR 12: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1401                              ;                   CS1 INCORRECT.
1402  001410  060204                        EM203
1403  001412  064125                        EM3000
1404  001414  053206                        DT001
1405  001416  053650                        DF001
1406                              ;         ERROR 13: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1407                              ;                   MESSAGE A INCORRECT.
1408  001420  060204                        EM203
1409  001422  064170                        EM3001
1410  001424  053206                        DT001
1411  001426  053650                        DF001
1412                              ;         ERROR 14: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1413                              ;                   MESSAGE B INCORRECT.
1414  001430  060204                        EM203
1415  001432  064214                        EM3002
1416  001434  053206                        DT001
1417  001436  053650                        DF001
1418                              ;         ERROR 15: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1419                              ;                   CS1 INCORRECT AFTER SENDING DRIVE CLEAR.
1420  001440  060276                        EM204
1421  001442  064240                        EM3003
1422  001444  053226                        DT015
1423  001446  053674                        DF015
1424                              ;         ERROR 16: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1425                              ;                   CS1 INCORRECT AFTER DATE SIMULATION.
1426  001450  060276                        EM204
1427  001452  064310                        EM3004
1428  001454  053226                        DT015
1429  001456  053674                        DF015
1430                              ;         ERROR 17: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1431                              ;                   MAINT REG. 1 INCORRECT DURING DATA SIMULATION (SECTOR PULSE)
1432  001460  060276                        EM204
1433  001462  064362                        EM3005
1434  001464  053236                        DT017
1435  001466  053720                        DF017
1436                              ;         ERROR 20: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1437                              ;                   MAINT REG. 1 INCORRECT DURING DATA SIMULATION (INDEX PULSE)
1438  001470  060276                        EM204
1439  001472  064464                        EM3006
1440  001474  053236                        DT017
1441  001476  053720                        DF017
1442                              ;         ERROR 21: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
```

```
1443                                    ;               MAINT REG. 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1444  001500  060276                            EM204
1445  001502  064565                            EM3007
1446  001504  053236                            DT017
1447  001506  053720                            DF017
1448                                    ;       ERROR 22: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1449                                    ;               CS1 INCORRECT AFTER SENDING DRIVE CLEAR
1450  001510  060364                            EM205
1451  001512  064240                            EM3003
1452  001514  053254                            DT022
1453  001516  053744                            DF022
1454                                    ;       ERROR 23: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1455                                    ;               BUS ADD INCORRECT AFTER SENDING DRIVE CLEAR.
1456  001520  060364                            EM205
1457  001522  064706                            EM3008
1458  001524  053254                            DT022
1459  001526  053744                            DF022
1460                                    ;       ERROR 24: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1461                                    ;               WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR
1462  001530  060364                            EM205
1463  001532  064766                            EM3009
1464  001534  053254                            DT022
1465  001536  053744                            DF022
1466                                    ;       ERROR 25: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1467                                    ;               MAINT REG 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1468  001540  060364                            EM205
1469  001542  065264                            EM3014
1470  001544  053274                            DT025
1471  001546  053770                            DF025
1472                                    ;       ERROR 26: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1473                                    ;               CS1 CHANGED DURING COMMAND EXECUTION
1474  001550  060364                            EM205
1475  001552  065045                            EM3010
1476  001554  053254                            DT022
1477  001556  053744                            DF022
1478                                    ;       ERROR 27: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1479                                    ;               BUS ADDRESS CHANGED BEFORE INDEX PULSE
1480  001560  060364                            EM205
1481  001562  065112                            EM3011
1482  001564  053254                            DT022
1483  001566  053744                            DF022
1484                                    ;       ERROR 30: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1485                                    ;               WORD COUNT CHANGED BEFORE INDEX PULSE
1486  001570  060364                            EM205
1487  001572  065161                            EM3012
1488  001574  053254                            DT022
1489  001576  053744                            DF022
1490                                    ;       ERROR 31: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1491                                    ;               CS1 CHANGED AFTER INDEX PULSE
1492  001600  060364                            EM205
1493  001602  065227                            EM3013
1494  001604  053306                            DT031
1495  001606  054014                            DF031
1496                                    ;       ERROR 32: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1497                                    ;               BUS ADDRESS CHANGED AFTER INDEX PULSE.
1498  001610  060364                            EM205
```

```
1499  001612  065335                  EM3015
1500  001614  053306                  DT031
1501  001616  054014                  DF031
1502                          ;       ERROR 33: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1503                          ;                 WORD COUNT CHANGED AFTER INDEX PULSE
1504  001620  060364                  EM205
1505  001622  065403                  EM3016
1506  001624  053306                  DT031
1507  001626  054014                  DF031
1508                          ;       ERROR 34: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1509                          ;                 MAINT REG 1 INCORRECT AFTER SECTOR PULSE
1510  001630  060364                  EM205
1511  001632  065763                  EM3025
1512  001634  053306                  DT031
1513  001636  054014                  DF031
1514                          ;       ERROR 35:  ATTEMPTING AN NPR READ OF ONE WORD
1515                          ;                  CS1 INCORRECT
1516  001640  060452                  EM206
1517  001642  064125                  EM3000
1518  001644  053332                  DT035
1519  001646  054040                  DF035
1520                          ;       ERROR 36:  ATTEMPTING AN NPR READ OF ONE WORD
1521                          ;                  CS2 INCORRECT
1522  001650  060452                  EM206
1523  001652  065450                  EM3018
1524  001654  053332                  DT035
1525  001656  054040                  DF035
1526                          ;       ERROR 37:  ATTEMPTING AN NPR READ OF ONE WORD
1527                          ;                  BUS ADDRESS INCORRECT
1528  001660  060452                  EM206
1529  001662  065514                  EM3019
1530  001664  053332                  DT035
1531  001666  054040                  DF035
1532                          ;       ERROR 40:  ATTEMPTING AN NPR READ OF ONE WORD
1533                          ;                  WORD COUNT REG INCORRECT
1534  001670  060452                  EM206
1535  001672  065542                  EM3020
1536  001674  053332                  DT035
1537  001676  054040                  DF035
1538                          ;       ERROR 41:  ATTEMPTING AN NPR READ OF ONE WORD
1539                          ;                  WORD READ INCORRECT
1540  001700  060452                  EM206
1541  001702  065573                  EM3021
1542  001704  053356                  DT041
1543  001706  054064                  DF041
1544                          ;       ERROR 42:  ATTEMPTING AN NPR READ OF ONE WORD
1545                          ;                  CS1 INCORRECT AFTER READING DATA BUFFER
1546  001710  060452                  EM206
1547  001712  065617                  EM3022
1548  001714  053366                  DT042
1549  001716  054110                  DF042
1550                          ;       ERROR 43:  ATTEMPTING AN NPR READ OF ONE WORD
1551                          ;                  CS2 INCORRECT AFTER READING DATA BUFFER
1552  001720  060452                  EM206
1553  001722  065667                  EM3023
1554  001724  053366                  DT042
```

```
1555  001726  054110                    DF042
1556                              ;       ERROR 44:  ATTEMPTING AN NPR READ OF ONE WORD
1557                              ;                  CS1 INCORRECT
1558  001730  060515                    EM207
1559  001732  064125                    EM3000
1560  001734  053332                    DT035
1561  001736  054040                    DF035
1562                              ;       ERROR 45:  ATTEMPTING AN NPR READ
1563                              ;                  CS2 INCORRECT
1564  001740  060515                    EM207
1565  001742  065450                    EM3018
1566  001744  053332                    DT035
1567  001746  054040                    DF035
1568                              ;       ERROR 46:  ATTEMPTING AN NPR READ
1569                              ;                  BUS ADDRESS INCORRECT
1570  001750  060515                    EM207
1571  001752  065514                    EM3019
1572  001754  053332                    DT035
1573  001756  054040                    DF035
1574                              ;       ERROR 47:  ATTEMPTING AN NPR READ
1575                              ;                  WORD COUNT INCORRECT
1576  001760  060515                    EM207
1577  001762  065542                    EM3020
1578  001764  053332                    DT035
1579  001766  054040                    DF035
1580                              ;       ERROR 50:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1581                              ;                  CS1 INCORRECT
1582  001770  060544                    EM208
1583  001772  064125                    EM3000
1584  001774  053332                    DT035
1585  001776  054040                    DF035
1586                              ;       ERROR 51:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1587                              ;                  CS2 INCORRECT
1588  002000  060544                    EM208
1589  002002  065450                    EM3018
1590  002004  053332                    DT035
1591  002006  054040                    DF035
1592                              ;       ERROR 52:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1593                              ;                  BUS ADDRESS INCORRECT
1594  002010  060544                    EM208
1595  002012  065514                    EM3019
1596  002014  053332                    DT035
1597  002016  054040                    DF035
1598                              ;       ERROR 53:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1599                              ;                  WORD COUNT INCORRECT
1600  002020  060544                    EM208
1601  002022  065542                    EM3020
1602  002024  053332                    DT035
1603  002026  054040                    DF035
1604                              ;       ERROR 54:  ATTEMPTING NPR READ
1605                              ;                  DATA BUFFER INCORRECT
1606  002030  060515                    EM207
1607  002032  065573                    EM3021
1608  002034  053402                    DT054
1609  002036  054134                    DF054
1610                              ;       ERROR 55:  ATTEMPTING NPR READ
```

```
1611                                    ;                       CS1 INCORRECT AFTER READING DATA BUFFER
1612  002040  060515                    ;       EM207
1613  002042  065617                    ;       EM3022
1614  002044  053414                    ;       DTO55
1615  002046  054160                    ;       DFO55
1616                                    ;       ERROR 56:  ATTEMPTING NPR READ
1617                                    ;                  CS2 INCORRECT AFTER READING DATA BUFFER
1618  002050  060515                    ;       EM207
1619  002052  065667                    ;       EM3023
1620  002054  053414                    ;       DTO55
1621  002056  054160                    ;       DFO55
1622                                    ;       ERROR 57:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1623                                    ;                  INHIBIT CS1 INCORRECT
1624  002060  060615                    ;       EM209
1625  002062  064125                    ;       EM3000
1626  002064  053332                    ;       DTO35
1627  002066  054040                    ;       DFO35
1628                                    ;       ERROR 60:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1629                                    ;                  INHIBIT CS2 INCORRECT
1630  002070  060615                    ;       EM209
1631  002072  065450                    ;       EM3018
1632  002074  053332                    ;       DTO35
1633  002076  054040                    ;       DFO35
1634                                    ;       ERROR 61:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1635                                    ;                  INHIBIT BUS ADDRESS INCORRECT
1636  002100  060615                    ;       EM209
1637  002102  065514                    ;       EM3019
1638  002104  053332                    ;       DTO35
1639  002106  054040                    ;       DFO35
1640                                    ;       ERROR 62:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1641                                    ;                  INHIBIT WORD COUNT INCORRECT
1642  002110  060615                    ;       EM209
1643  002112  065542                    ;       EM3020
1644  002114  053332                    ;       DTO35
1645  002116  054040                    ;       DFO35
1646                                    ;       ERROR 63:  ATTEMPTING NPR READ WITH IBA TO CHECK ZERO
1647                                    ;                  DETECT-CS1 INCORRECT
1648  002120  060704                    ;       EM210
1649  002122  064125                    ;       EM3000
1650  002124  053332                    ;       DTO35
1651  002126  054040                    ;       DFO35
1652                                    ;       ERROR 64:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1653                                    ;                  DETECT-CS2 INCORRECT
1654  002130  060704                    ;       EM210
1655  002132  065450                    ;       EM3018
1656  002134  053332                    ;       DTO35
1657  002136  054040                    ;       DFO35
1658                                    ;       ERROR 65:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1659                                    ;                  DETECT-BUS ADDRESS INCORRECT
1660  002140  060704                    ;       EM210
1661  002142  065514                    ;       EM3019
1662  002144  053332                    ;       DTO35
1663  002146  054040                    ;       DFO35
1664                                    ;       ERROR 66:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1665                                    ;                  DETECT-WORD COUNT INCORRECT
1666  002150  060704                    ;       EM210
```

```
1667  002152  065542                    EM3020
1668  002154  053332                    DT035
1669  002156  054040                    DF035
1670                          ;         ERROR 67:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1671                          ;                    INCREMENT-DATA BUFFER INCORRECT
1672  002160  060615                    EM209
1673  002162  065573                    EM3021
1674  002164  053402                    DT054
1675  002166  054134                    DF054
1676                          ;         ERROR 70:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1677                          ;                    INCREMENT-CS1 INCORRECT AFTER READING DATA BUFFER
1678  002170  060615                    EM209
1679  002172  065617                    EM3022
1680  002174  053414                    DT055
1681  002176  054160                    DF055
1682                          ;         ERROR 71:  ATTEMPTING NPR READ WITH ADDRESS BUFFER INHIBIT
1683                          ;                    INCREMENT-CS2 INCORRECT AFTER READING DATA BUFFER
1684  002200  060615                    EM209
1685  002202  065667                    EM3023
1686  002204  053414                    DT055
1687  002206  054160                    DF055
1688                          ;         ERROR 72:  ATTEMPTING TO FORCE NON-EXISTANT MEMORY
1689                          ;                    CS1 INCORRECT
1690  002210  061020                    EM211
1691  002212  064125                    EM3000
1692  002214  053432                    DT072
1693  002216  054204                    DF072
1694                          ;         ERROR 73:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1695                          ;                    CS2 INCORRECT
1696  002220  061020                    EM211
1697  002222  065450                    EM3018
1698  002224  053432                    DT072
1699  002226  054204                    DF072
1700                          ;         ERROR 74:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1701                          ;                    ERROR REG INCORRECT
1702  002230  061020                    EM211
1703  002232  065737                    EM3024
1704  002234  053432                    DT072
1705  002236  054204                    DF072
1706                          ;         ERROR 75:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1707                          ;                    BUS ADDRESS INCORRECT
1708  002240  061020                    EM211
1709  002242  065514                    EM3019
1710  002244  053432                    DT072
1711  002246  054204                    DF072
1712                          ;         ERROR 76:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1713                          ;                    WORD COUNT INCORRECT
1714  002250  061020                    EM211
1715  002252  065542                    EM3020
1716  002254  053432                    DT072
1717  002256  054204                    DF072
1718                          ;         ERROR 77:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1719                          ;                    CS1 INCORRECT
1720  002260  061070                    EM212
1721  002262  064125                    EM3000
1722  002264  053462                    DT077
```

```
1723  002266  054240                        DF077
1724                                ;       ERROR 100:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1725                                ;                   CS2 INCORRECT
1726  002270  061070                        EM212
1727  002272  065450                        EM3C18
1728  002274  053462                        DT077
1729  002276  054240                        DF077
1730                                ;       ERROR 101: TESTING EXTENDED MEMORY ADDRESSING BITS
1731                                ;                   CS1 INCORRECT
1732  002300  061140                        EM213
1733  002302  064125                        EM3000
1734  002304  053332                        DT035
1735  002306  054040                        DF035
1736                                ;       ERROR 102: TESTING EXTENDED MEMORY ADDRESSING BITS
1737                                ;                   CS2 INCORRECT
1738  002310  061140                        EM213
1739  002312  065450                        EM3018
1740  002314  053332                        DT035
1741  002316  054040                        DF035
1742                                ;       ERROR 103: TESTING EXTENDED MEMORY ADDRESSING BITS
1743                                ;                   BUS ADDRESS INCORRECT
1744  002320  061140                        EM213
1745  002322  065514                        EM3019
1746  002324  053332                        DT035
1747  002326  054040                        DF035
1748                                ;       ERROR 104: TESTING EXTEND MEMORY ADDRESSING BITS
1749                                ;                   WORD COUNT INCORRECT
1750  002330  061140                        EM213
1751  002332  065542                        EM3020
1752  002334  053332                        DT035
1753  002336  054040                        DF035
1754                                ;       ERROR 105: TESTING EXTENDED MEMORY ADDRESSING BITS
1755                                ;                   DATA BUFFER INCORRECT
1756  002340  061140                        EM213
1757  002342  065573                        EM3021
1758  002344  053356                        DT041
1759  002346  054064                        DF041
1760                                ;       ERROR 106: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1761                                ;                   CS1 INCORRECT
1762  002350  061210                        EM214
1763  002352  064125                        EM3000
1764  002354  053432                        DT072
1765  002356  054204                        DF072
1766                                ;       ERROR 107: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1767                                ;                   CS2 INCORRECT
1768  002360  061210                        EM214
1769  002362  065450                        EM3018
1770  002364  053432                        DT072
1771  002366  054204                        DF072
1772                                ;       ERROR 110: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1773                                ;                   BUS ADDRESS INCORRECT
1774  002370  061210                        EM214
1775  002372  065514                        EM3019
1776  002374  053432                        DT072
1777  002376  054204                        DF072
1778                                ;       ERROR 111: ATEMPTING TO FORCE UNIBUS PARITY ERROR
```

```
1779                                    ;               WORD COUNT INCORRECT
1780  002400  061210                    EM214
1781  002402  065542                    EM3020
1782  002404  053432                    DT072
1783  002406  054204                    DF072
1784                                    ;       ERROR 112: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1785                                    ;               CS1 INCORRECT
1786  002410  061260                    EM215
1787  002412  064125                    EM3000
1788  002414  053332                    DT035
1789  002416  054040                    DF035
1790                                    ;       ERROR 113: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1791                                    ;               CS2 INCORRECT
1792  002420  061260                    EM215
1793  002422  065450                    EM3018
1794  002424  053332                    DT035
1795  002426  054040                    DF035
1796                                    ;       ERROR 114: ATTEMPTING NPR READ OR LOCATION PRIOR TO BAD PARITY
1797                                    ;               BUS ADDRESS INCORRECT
1798  002430  061260                    EM215
1799  002432  065514                    EM3019
1800  002434  053332                    DT035
1801  002436  054040                    DF035
1802                                    ;       ERROR 115: ATTEMPTING NPR READ  OF LOCATION PRIOR TO BAD PARITY
1803                                    ;               WORD COUNT INCORRECT
1804  002440  061260                    EM215
1805  002442  065450                    EM3018
1806  002444  053332                    DT035
1807  002446  054040                    DF035
1808                                    ;       ERROR 116: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1809                                    ;               ERROR REG INCORRECT
1810  002450  061210                    EM214
1811  002452  065737                    EM3024
1812  002454  053432                    DT072
1813  002456  054204                    DF072
1814                                    ;       ERROR 117: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1815                                    ;               CS1 INCORRECT
1816  002460  061344                    EM216
1817  002462  064125                    EM3000
1818  002464  053462                    DT077
1819  002466  054240                    DF077
1820                                    ;       ERROR 120: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1821                                    ;               CS2 INCORRECT
1822  002470  061344                    EM216
1823  002472  065450                    EM3018
1824  002474  053462                    DT077
1825  002476  054240                    DF077
1826                                    ;       ERROR 121: ATTEMPTING 18 BIT NPR READ
1827                                    ;               CS1 INCORRECT
1828  002500  061414                    EM217
1829  002502  064125                    EM3000
1830  002504  053332                    DT035
1831  002506  054040                    DF035
1832                                    ;       ERROR 122: ATTEMPTING 18 BIT NPR READ
1833                                    ;               CS2 INCORRECT
1834  002510  061414                    EM217
```

```
1835  002512  065450                    EM3018
1836  002514  053332                    DT035
1837  002516  054040                    DF035
1838                          ;         ERROR 123: ATTEMPTING 18 BIT NPR READ
1839                          ;           BUS ADDRESS INCORRECT
1840  002520  061414                    EM217
1841  002522  065514                    EM3019
1842  002524  053332                    DT035
1843  002526  054040                    DF035
1844                          ;         ERROR 124: ATTEMPTING 18 BIT NPR READ
1845                          ;           WORD COUNT INCORRECT
1846  002530  061414                    EM217
1847  002532  065542                    EM3020
1848  002534  053332                    DT035
1849  002536  054040                    DF035
1850                          ;         ERROR 125: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1851                          ;           CS1 INCORRECT
1852  002540  061447                    EM218
1853  002542  064125                    EM3000
1854  002544  053332                    DT035
1855  002546  054040                    DF035
1856                          ;         ERROR 126: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1857                          ;           CS2 INCORRECT
1858  002550  061447                    EM218
1859  002552  065450                    EM3018
1860  002554  053332                    DT035
1861  002556  054040                    DF035
1862                          ;         ERROR 127: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1863                          ;           BUS ADDRESS INCORRECT
1864  002560  061447                    EM218
1865  002562  065514                    EM3019
1866  002564  053332                    DT035
1867  002566  054040                    DF035
1868                          ;         ERROR 130: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1869                          ;           WORD COUNT INCORRECT
1870  002570  061447                    EM218
1871  002572  065542                    EM3020
1872  002574  053332                    DT035
1873  002576  054040                    DF035
1874                          ;         ERROR 131: ATTEMPTING 18 BIT NPR READ
1875                          ;           DATA BUFFER INCORRECT
1876  002600  061414                    EM217
1877  002602  065573                    EM3021
1878  002604  053366                    DT042
1879  002606  054110                    DF042
1880                          ;         ERROR 132: ATTEMPTING 18 BIT NPR READ
1881                          ;           CS1 INCORRECT AFTER READING DATA BUFFER
1882  002610  061414                    EM217
1883  002612  065617                    EM3022
1884  002614  053414                    DT055
1885  002616  054160                    DF055
1886                          ;         ERROR 133: ATTEMPTING 18 BIT NPR READ
1887                          ;           CS2 INCORRECT AFTER READING DATA BUFFER
1888  002620  061414                    EM217
1889  002622  065667                    EM3023
1890  002624  053414                    DT055
```

```
1891  002626  054160                          DF055
1892                                ;         ERROR 134: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1893                                ;                    CS1 INCORRECT
1894  002630  061527                          EM219
1895  002632  064125                          EM3000
1896  002634  053332                          DT035
1897  002636  054040                          DF035
1898                                ;         ERROR 135: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1899                                ;                    CS2 INCORRECT
1900  002640  061527                          EM219
1901  002642  065450                          EM3018
1902  002644  053332                          DT035
1903  002646  054040                          DF035
1904                                ;         ERROR 136: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1905                                ;                    BUS ADDRESS INCORRECT
1906  002650  061527                          EM219
1907  002652  065514                          EM3019
1908  002654  053332                          DT035
1909  002656  054040                          DF035
1910                                ;         ERROR 137: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1911                                ;                    WORD COUNT INCORRECT
1912  002660  061527                          EM219
1913  002662  065542                          EM3020
1914  002664  053332                          DT035
1915  002666  054040                          DF035
1916                                ;         ERROR 140: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1917                                ;                    CHECKING ZERO DETECT
1918                                ;                    CS1 INCORRECT
1919  002670  061607                          EM220
1920  002672  064125                          EM3000
1921  002674  053332                          DT035
1922  002676  054040                          DF035
1923                                ;         ERROR 141: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1924                                ;                    CHECKING ZERO DETECT
1925                                ;                    CS2 INCORRECT
1926  002700  061607                          EM220
1927  002702  065450                          EM3018
1928  002704  053332                          DT035
1929  002706  054040                          DF035
1930                                ;         ERROR 142: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1931                                ;                    CHECKING ZERO DETECT
1932                                ;                    BUS ADDRESS INCORRECT
1933  002710  061607                          EM220
1934  002712  065514                          EM3019
1935  002714  053332                          DT035
1936  002716  054040                          DF035
1937                                ;         ERROR 143: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1938                                ;                    CHECKING ZERO DETECT
1939                                ;                    WORD COUNT INCORRECT
1940  002720  061607                          EM220
1941  002722  065542                          EM3020
1942  002724  053332                          DT035
1943  002726  054040                          DF035
1944                                ;         ERROR 144: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1945                                ;                    DATA BUFFER INCORRECT
1946  002730  061527                          EM219
```

```
1947  002732  065573                          EM3021
1948  002734  053356                          DT041
1949  002736  054064                          DF041
1950                              ;           ERROR 145: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1951                              ;                      CS1 INCORRECT AFTER READING DATA BUFFER
1952  002740  061527                          EM219
1953  002742  065617                          EM3022
1954  002744  053462                          DT077
1955  002746  054240                          DF077
1956                              ;           ERROR 146: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1957                              ;                      CS2 INCORRECT AFTER READING DATA BUFFER
1958  002750  061527                          EM219
1959  002752  065667                          EM3023
1960  002754  053462                          DT077
1961  002756  054240                          DF077
1962                              ;           ERROR 147:  UNEXPECTED MEMORY PARITY ENABLE TRAP
1963  002760  057701                          EM000
1964  002762  055061                          DH000C
1965  002764  053202                          DT000
1966  002766  053644                          DF000
1967                              ;           ERROR 150: ATTEMPTING SIMULATION OF DATA IN READ HEADER
1968                              ;                      CS1 INCORRECT
1969  002770  061666                          EM221
1970  002772  064125                          EM3000
1971  002774  053476                          DT150
1972  002776  054264                          DF150
1973                              ;           ERROR 151: ATTEMPTING READ HEADER IN MAINTANENCE MODE
1974                              ;                      CS1 INCORRECT AFTER COMPLETION OF COMMAND
1975  003000  061743                          EM222
1976  003002  066033                          EM3026
1977  003004  053366                          DT042
1978  003006  054110                          DF042
1979                              ;           ERROR 152: ATTEMPTING READ HEADER IN MAINTANENCE MODE
1980                              ;                      CS2 INCORRECT AFTER COMPLETION OF COMMAND
1981  003010  061743                          EM222
1982  003012  066102                          EM3027
1983  003014  053366                          DT042
1984  003016  054110                          DF042
1985                              ;           ERROR 153: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1986                              ;                      CS1 INCORRECT AFTER UNLOADING DATA BUFFER
1987  003020  062016                          EM223
1988  003022  065617                          EM3022
1989  003024  053414                          DT055
1990  003026  054160                          DF055
1991                              ;           ERROR 154: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1992                              ;                      CS2 INCORRECT AFTER UNLOADING DATA
1993  003030  062016                          EM223
1994  003032  065667                          EM3023
1995  003034  053414                          DT055
1996  003036  054160                          DF055
1997                              ;           ERROR 155: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1998                              ;                      DATA READ INCORRECT
1999  003040  062016                          EM223
2000  003042  065573                          EM3021
2001  003044  053402                          DT054
2002  003046  054134                          DF054
```

```
2003                                    ;       ERROR 156: ATTEMPTING SIMULATION OF DATA IN READ HEADER (20 BIT FORMAT)
2004                                    ;                  CS1 INCORRECT
2005  003050  062074                            EM224
2006  003052  064125                            EM3000
2007  003054  053476                            DT150
2008  003056  054264                            DF150
2009                                    ;       ERROR 157: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE/
2010                                    ;                  CS1 INCORRECT AFTER COMMAND COMPLETION
2011  003060  062171                            EM225
2012  003062  066033                            EM3026
2013  003064  053366                            DT042
2014  003066  054110                            DF042
2015                                    ;       ERROR 160: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE
2016                                    ;                  CS2 INCORRECT AFTER COMPLETION OF COMMAND
2017  003070  062171                            EM225
2018  003072  066102                            EM3027
2019  003074  053366                            DT042
2020  003076  054110                            DF042
2021                                    ;       ERROR 161: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2022                                    ;                  CS1 INCORRECT AFTER UNLOADING DATA BUFFER
2023  003100  062256                            EM226
2024  003102  065617                            EM3022
2025  003104  053414                            DT055
2026  003106  054160                            DF055
2027                                    ;       ERROR 162: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2028                                    ;                  CS2 INCORRECT AFTER UNLOADING DATA BUFFER
2029  003110  062256                            EM226
2030  003112  065667                            EM3023
2031  003114  053414                            DT055
2032  003116  054160                            DF055
2033                                    ;       ERROR 163: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2034                                    ;                  DATA BUFFER INCORRECT
2035  003120  062256                            EM226
2036  003122  065573                            EM3021
2037  003124  053402                            DT054
2038  003126  054134                            DF054
2039                                    ;       ERROR 164: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2040                                    ;                  CS1 INCORRECT
2041  003130  062356                            EM227
2042  003132  064125                            EM3000
2043  003134  053512                            DT164
2044  003136  054310                            DF164
2045                                    ;       ERROR 165: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2046                                    ;                  CS2 INCORRECT
2047  003140  062356                            EM227
2048  003142  065450                            EM3018
2049  003144  053512                            DT164
2050  003146  054310                            DF164
2051                                    ;       ERROR 166: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2052                                    ;                  CS1 INCORRECT READING EMPTY SILO
2053  003150  062356                            EM227
2054  003152  066151                            EM3028
2055  003154  053512                            DT164
2056  003156  054310                            DF164
2057                                    ;       ERROR 167: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2058                                    ;                  CS1 INCORRECT READING EMPTY SILO
```

```
2059  003160  062356                      EM227
2060  003162  066220                      EM3029
2061  003164  053512                      DT164
2062  003166  054310                      DF164
2063                              ;       ERROR 170:  WRITE BIT ERRORS
2064  003170  000000              EMW:    0
2065  003172  000000                      0
2066  003174  053530                      DT170
2067  003176  054334                      DF170
2068                              ;       ERROR 171:  WRITE GATE NOT RESET WITH SECTOR PULSE
2069  003200  062572                      EM231
2070  003202  066267                      EM3030
2071  003204  053554                      DT171
2072  003206  054360                      DF171
2073                              ;       ERROR 172:  WRITE GATE NOT SET WITH SECTOR PULSE RESET
2074  003210  062714                      EM232
2075  003212  066267                      EM3030
2076  003214  053554                      DT171
2077  003216  054360                      DF171
2078                              ;       ERROR 173:  WRITE GATE NOT RESET WITH SECOND INDEX PULSE
2079  003220  063142                      EM235
2080  003222  066267                      EM3030
2081  003224  053554                      DT171
2082  003226  054360                      DF171
2083                              ;       ERROR 174:  CS1 INCORRECT AT END OF WRITE HEADER
2084  003230  063252                      EM236
2085  003232  064125                      EM3000
2086  003234  053226                      DT015
2087  003236  053674                      DF015
2088                              ;       ERROR 175: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2089                              ;       CS1 INCORRECT
2090  003240  063622                      EM241
2091  003242  064125                      EM3000
2092  003244  053564                      DT175
2093  003246  054404                      DF175
2094                              ;       ERROR 176: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2095                              ;       CS2 INCORRECT
2096  003250  063622                      EM241
2097  003252  065450                      EM3018
2098  003254  053564                      DT175
2099  003256  054404                      DF175
2100                              ;       ERROR 177: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2101                              ;       DRIVE STATUS REG INCORRECT
2102  003260  063622                      EM241
2103  003262  066315                      EM3031
2104  003264  053564                      DT175
2105  003266  054404                      DF175
2106                              ;       ERROR 200: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2107                              ;       ERROR REG INCORRECT
2108  003270  063622                      EM241
2109  003272  066350                      EM3032
2110  003274  053564                      DT175
2111  003276  054404                      DF175
2112                              ;       ERROR 201: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2113                              ;       CS1 INCORRECT
2114  003300  063706                      EM242
```

```
2115  003302  064125                  EM3000
2116  003304  053564                  DT175
2117  003306  054404                  DF175
2118                          ;       ERROR 202: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2119                          ;       CS2 INCORRECT
2120  003310  063706                  EM242
2121  003312  065450                  EM3018
2122  003314  053564                  DT175
2123  003316  054404                  DF175
2124                          ;       ERROR 203: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2125                          ;       DRIVE STATUS REG INCORRECT
2126  003320  063706                  EM242
2127  003322  066315                  EM3031
2128  003324  053564                  DT175
2129  003326  054404                  DF175
2130                          ;       ERROR 204: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2131                          ;       ERROR REGISTER INCORRECT
2132  003330  063706                  EM242
2133  003332  066350                  EM3032
2134  003334  053564                  DT175
2135  003336  054404                  DF175
2136                          ;       ERROR 205:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2137                          ;       CS1 INCORRECT
2138  003340  063772                  EM243
2139  003342  064125                  EM3000
2140  003344  053564                  DT175
2141  003346  054404                  DF175
2142                          ;       ERROR 206:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2143                          ;       CS2 INCORRECT
2144  003350  063772                  EM243
2145  003352  065450                  EM3018
2146  003354  053564                  DT175
2147  003356  054404                  DF175
2148                          ;       ERROR 207:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2149                          ;       DRIVE STATUS REG INCORRECT
2150  003360  063772                  EM243
2151  003362  066315                  EM3031
2152  003364  053564                  DT175
2153  003366  054404                  DF175
2154                          ;       ERROR 210:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2155                          ;       ERROR REG INCORRECT
2156  003370  063772                  EM243
2157  003372  066350                  EM3032
2158  003374  053564                  DT175
2159  003376  054404                  DF175
2160                          ;       ERROR 211:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2161                          ;       CS1 INCORRECT
2162  003400  064073                  EM244
2163  003402  064125                  EM3000
2164  003404  053610                  DT211
2165  003406  054430                  DF211
2166                          ;       ERROR 212:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2167                          ;       CS2 INCORRECT
2168  003410  064073                  EM244
2169  003412  065450                  EM3018
2170  003414  053610                  DT211
```

```
2171  003416  054430                        DF211
2172                                ;       ERROR 213:  ATTEMPTING TO CLEAR CONTROLLER
2173                                ;       DRIVE STATUS REG INCORRECT
2174  003420  064073                        EM244
2175  003422  066315                        EM3031
2176  003424  053610                        DT211
2177  003426  054430                        DF211
2178                                ;       ERROR 214: ATTEMPTINT TO CLEAR CONTROLLER
2179                                ;       ERROR REG INCORRECT
2180  003430  064073                        EM244
2181  003432  066350                        EM3032
2182  003434  053610                        DT211
2183  003436  054430                        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
```

```
2240                                    .SBTTL  PROGRAM DEFINED VARIABLES
2241
2242  003600  000210                    RKVEC:  .WORD   210              ;RK611 VECTOR
2243  003602  000240                    RKPRI:  .WORD   PR5              ;RK611 PRIORITY
2244  003604  000000                    TRAPPC: .WORD   0                ;PC FOR MEMORY CHECK ENABLE TRAP
2245  003606  000000                    SRTFLG: .WORD   0                ;START FLAG
2246                                                                     ;  0 = 200
2247                                                                     ;  1 = 214
2248                                                                     ; -1 = 204
2249  003610  000000                    ERRCNT: .WORD   0                ;ERROR COUNT FOR SWITCH 12 ABORT
2250  003612  000000                    P1.BIT: .WORD   0                ;NEXT BIT IN DATA SIMULATION
2251  003614  000000                    PR.BIT: .WORD   0                ;PRESENT BIT IN DATA SIMULATION
2252  003616  000000                    M1.BIT: .WORD   0                ;PREVIOUS BIT IN DATA SIMULATION
2253  003620  000000                    M2.BIT: .WORD   0                ;BIT BEFORE PREVIOUS BIT
2254  003622  000000                    BITCNT: .WORD   0                ;BIT POSITION
2255  003624  000000                    WRDCNT: .WORD   0                ;WORD COUNT FOR NPR TRANSFER
2256  003626  000000                    SECCNT: .WORD   0                ;SECTOR COUNT
2257  003630  000000                    MEMPAR: .WORD   0                ;MEMORY ENABLE ON FIRST 24K
2258  003632  000015                    WAITIM: .WORD   15               ;WAIT TIME FOR CONTROLLER READY
2259  003634  000000                    SAVSWR: .WORD   0                ;STORAGE FOR SWITCH REGISTER
2260  003636  000000                    PARPRE: .WORD   0                ;PARITY OPTION PRESENT FOR
2261                                                                     ;  LOCATION USED
2262  003640  000000                    CSRPTR: .WORD   0                ;POINTER TO CSR TO BE  USED
```

```
2263                                    .SBTTL  PROGRAM SETUP
2264
2265  003642  012737  000001  003606  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
2266  003650  000406                          BR      START1
2267
2268  003652  012737  177777  003606  RESTRT: MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
2269  003660  000402                          BR      START1
2270
2271  003662  005037  003606          START:  CLR     SRTFLG          ;CLEAR START FLAG
2272  003666  000005                  START1: RESET                   ;RESET THE WHOLE SYSTEM
2273  003670  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
2274  003674  004737  051274                  JSR     PC,$TKINT       ;INIT KEYBOARD
2275  003700  012746  000340                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
2276  003704  012746  003712                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
2277  003710  000002                          RTI                     ;LOAD PSW
2278
2279  003712                          1$:
2280                                  .SBTTL  INITIALIZE THE COMMON TAGS
2281                                  ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
2282  003712  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
2283  003716  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
2284  003720  022706  001140                  CMP     #SWR,R6 ;;DONE?
2285  003724  001374                          BNE     .-6             ;;LOOP BACK IF NO
2286  003726  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
2287                                  ;;INITIALIZE A FEW VECTORS
2288  003732  012737  046636  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
2289  003740  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
2290  003746  012737  047570  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
2291  003754  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
2292  003762  012737  053112  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
2293  003770  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
2294  003776  012737  052756  000024          MOV     #$PWRON,@#PWRVEC ;;POWER FAILURE VECTOR
2295  004004  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
2296  004012  012737  044532  044524          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
2297  004020  005037  001200                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
2298  004024  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
2299  004030  112737  000001  001115          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
2300  004036  012737  004036  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
2301  004044  012737  004044  001110          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
2302                                  ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
2303                                  ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
2304  004052  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
2305  004056  012737  004112  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
2306  004064  012737  177570  001140          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
2307  004072  012737  177570  001142          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
2308  004100  022777  177777  175032          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
2309  004106  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
2310                                                                  ;;AND  THE HARDWARE SWR IS NOT = -1
2311  004110  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
2312  004112  012716  004120          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
2313  004116  000002                          RTI
2314  004120  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
2315  004126  012737  000174  001142          MOV     #DISPREG,DISPLAY
2316  004134  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
2317
2318  004140  005037  001222                  CLR     $PASS           ;;CLEAR PASS COUNT
```

```
2319  004144  132737  000200  001235          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
2320  004152  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
2321  004154  012737  001236  001140          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
2322  004162                          67$:
2323  004162  005037  003610                  CLR     ERRCNT          ;CLEAR ERROR COUNT FOR SWITCH 12 ABORT
2324                                  .SBTTL  TYPE PROGRAM NAME
2325                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
2326  004166  005227  177777                  INC     #-1             ;;FIRST TIME?
2327  004172  001063                          BNE     68$             ;;BRANCH IF NO
2328  004174  022737  044666  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
2329  004202  001457                          BEQ     68$             ;;BRANCH IF YES
2330  004204  104401  004252                  TYPE    ,69$            ;;TYPE ASCIZ STRING
2331                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
2332  004210  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
2333  004214  001012                          BNE     70$             ;;BRANCH IF YES
2334  004216  123727  001234  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
2335  004224  001406                          BEQ     70$             ;;BRANCH IF YES
2336  004226  023727  001140  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
2337  004234  001005                          BNE     71$             ;;BRANCH IF NO
2338  004236  104406                          GTSWR                   ;;GET SOFT-SWR SETTINGS
2339  004240  000403                          BR      71$
2340  004242  112737  000001  001134  70$:     MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2341  004250                          71$:
2342  004250  000434                          BR      68$             ;;GET OVER THE ASCIZ
2343                                  ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 3  MAINDEC-11-DZR6C-B/<CRLF>
2344  004342                          68$:
2345  004342  005227  177777                  INC     #-1             ;TEST IF FIRST PASS
2346  004346  001002                          BNE     6$              ;NO - SKIP
2347  004350  104401  054576                  TYPE    ,OPR006         ;TYPE RUN TIME MESSAGE
2348  004354  022737  000001  003606  6$:      CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2349  004362  001122                          BNE     15$             ;NO, CONTINUE SETUP
2350  004364  104401  054464          5$:     TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (   ) ="
2351  004370  013746  001270                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2352  004374  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2353  004376  104401  054516                  TYPE    ,OPR002
2354  004402  104412                          RDOCT                   ;GET VALUE
2355  004404  012637  001160                  MOV     (SP)+,$TMPO
2356  004410  001407                          BEQ     7$              ;CHECK IF <CR>
2357  004412  022737  160000  001160          CMP     #160000,$TMPO   ;CHECK IF IN I/O PAGE
2358  004420  101361                          BHI     5$
2359  004422  013737  001160  001270          MOV     $TMPO,$BASE     ;LOAD NEW BUS ADDRESS
2360  004430  104401  054524          7$:     TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (   ) ="
2361  004434  013746  001264                  MOV     $VECT1,-(SP)    ;TYPE OUT VECTOR ADDRESS
2362  004440  042716  160000                  BIC     #160000,(SP)
2363  004444  104402                          TYPOC
2364  004446  104401  054516                  TYPE    ,OPR002
2365  004452  104412                          RDOCT                   ;GET VALUE
2366  004454  012637  001160                  MOV     (SP)+,$TMPO
2367  004460  001412                          BEQ     10$             ;CHECK IF <CR>
2368  004462  022737  001000  001160          CMP     #1000,$TMPO     ;CHECK IF LEGAL
2369  004470  101757                          BLOS    7$
2370  004472  042737  017777  001264          BIC     #17777,$VECT1   ;LOAD NEW VECTOR ADDRESS
2371  004500  053737  001160  001264          BIS     $TMPO,$VECT1
2372  004506  104401  054554          10$:    TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (   ) ="
2373  004512  005046                          CLR     -(SP)
2374  004514  113716  001265                  MOVB    $VECT1+1,(SP)
```

```
2375  004520  006216                        ASR     (SP)            ;SHIFT 5 BITS RIGHT
2376  004522  006216                        ASR     (SP)
2377  004524  006216                        ASR     (SP)
2378  004526  006216                        ASR     (SP)
2379  004530  006216                        ASR     (SP)
2380  004532  104402                        TYPOC
2381  004534  104401  054516                TYPE    ,OPR002
2382  004540  104412                        RDOCT                   ;GET VALUE
2383  004542  012637  001160                MOV     (SP)+,$TMPO
2384  004546  001430                        BEQ     15$             ;CHECK FOR DEFAULT
2385  004550  022737  000007  001160        CMP     #7,$TMPO        ;CHECK IF LEGAL
2386  004556  103753                        BLO     10$
2387  004560  022737  000004  001160        CMP     #4,$TMPO
2388  004566  101347                        BHI     10$
2389  004570  006337  001160                ASL     $TMPO           ;SHIFT 5 BITS LEFT
2390  004574  006337  001160                ASL     $TMPO
2391  004600  006337  001160                ASL     $TMPO
2392  004604  006337  001160                ASL     $TMPO
2393  004610  006337  001160                ASL     $TMPO
2394  004614  042737  160000  001264        BIC     #160000,$VECT1  ;STORE NEW PRIORITY
2395  004622  153737  001160  001265        BISB    $TMPO,$VECT1+1
2396  004630  013737  001264  003600  15$:  MOV     $VECT1,RKVEC    ;STORE RK611 VECTOR
2397  004636  042737  160000  003600        BIC     #160000,RKVEC
2398  004644  113737  001265  003602        MOVB    $VECT1+1,RKPRI  ;STORE PRIORITY
2399  004652  004737  046330                JSR     PC,$SIZE        ;SIZE MEMORY
2400  004656  013702  001270                MOV     $BASE,R2        ;SET RK611 BASE
2401  004662  005037  001202                CLR     $ESCAPE         ;CLEAR ESCAPE
2402
2403  004666  004737  044732  NEWPAS: JSR     PC,PARCHK       ;CHECK OF MEMORY CHECK ENABLE
2404  004672  012746  000000                MOV     #PRO,-(SP)      ;ALLOW ALL INTERRUPTS
2405  004676  012746  004704                MOV     #TST1,-(SP)
2406  004702  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.
                                ;*
                                ;;*****************************************************************
004704  000004                  TST1:   SCOPE
004706  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
004714  013702  001270          1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
004720  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004726  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004734  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004742  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
004750  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004756  012762  012025  000000          MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE RDHEAD WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004764  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004770  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004776  012762  000040  000026          MCV     #DMD,RKMR1(R2)
005004  005300                          DEC     R0
005006  001370                          BNE     1$
005010  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
005016  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
005024  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
005032  012737  012025  003500          MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
005040  012737  071027  003526          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
005046  012737  037760  003530          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
005054  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
005062  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
005064  104001                          ERROR   1               ;CS1 INCORRECT
005066  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005074  000412                          BR      TST2            ;;GO TO NEXT TEST
005076  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005104  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
005106  104002                          ERROR   2               ;MESS A INCORRECT
005110  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005116  001401                          BEQ     TST2            ;;YES, GO ON TO NEXT TEST
005120  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,
```

```
2463                                    ;*      CYLINDER 1777, HEAD 7, DRIVE 7.
2464                                    ;*
2465                                    ;;**********************************************************************
2466  005122  000004                    TST2:   SCOPE
2467  005124  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2468  005132  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2469  005136  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2470  005144  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2471  005152  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2472  005160  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2473  005166  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
2474  005174  012762  012027  000000            MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE WRHEAD WITH CDT SET IN
2475                                                                    ;  24 SECTOR FORMAT
2476  005202  012700  000016                    MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
2477  005206  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)
2478  005214  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2479  005222  005300                            DEC     R0
2480  005224  001370                            BNE     1$
2481  005226  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
2482  005234  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
2483  005242  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
2484  005250  012737  012027  003500            MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2485  005256  012737  071227  003526            MOV     #S.SEEK!S.RTC!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2486  005264  012737  037760  003530            MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
2487  005272  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2488  005300  001405                            BEQ     2$              ;YES, CHECK MESSAGE A
2489  005302  104004                            ERROR   4               ;CS1 INCORRECT
2490  005304  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2491  005312  000412                            BR      TST3            ;;GO TO NEXT TEST
2492  005314  023737  003526  003466  2$:       CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2493  005322  001401                            BEQ     3$              ;YES, CHECK MESSAGE B
2494  005324  104005                            ERROR   5               ;MESS A INCORRECT
2495  005326  023737  003530  003470  3$:       CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2496  005334  001401                            BEQ     TST3            ;;YES, GO ON TO NEXT TEST
2497  005336  104006                            ERROR   6               ;MESS B INCORRECT
2498
2499                                    ;;**********************************************************************
2500                                    ;*TEST 3        READ HEADER DRIVE CLEAR MESSAGE
2501                                    ;*
2502                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2503                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER WITH CDT SET
2504                                    ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2505                                    ;*      CLOCK SEEK MESSAGE AND MAKE SURE A DRIVE CLEAR IS
2506                                    ;*      GENERATED AND THE PROPER BITS ARE SET.
2507                                    ;*
2508                                    ;;**********************************************************************
2509  005340  000004                    TST3:   SCOPE
2510  005342  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2511  005350  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2512  005354  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2513  005362  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2514  005370  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2515  005376  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2516  005404  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2517  005412  012762  012025  000000            MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2518                                                                    ;  24 SECTOR FORMAT
```

```
2519  005420  012700  000156                    MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2520  005424  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
2521  005432  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2522  005440  005300                            DEC     R0
2523  005442  001370                            BNE     1$
2524  005444  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2525  005452  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2526  005460  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2527  005466  012737  012025  003500            MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
2528  005474  012737  071407  003526            MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2529  005502  005037  003530                    CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2530  005506  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2531  005514  001405                            BEQ     2$              ;YES, CHECK CS2
2532  005516  104007                            ERROR   7               ;CS1 INCORRECT
2533  005520  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2534  005526  000412                            BR      TST4            ;GO TO NEXT TEST
2535  005530  023737  003526  003466  2$:       CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2536  005536  001401                            BEQ     3$              ;YES, CHECK MESS B
2537  005540  104010                            ERROR   10              ;MESS A INCORRECT
2538  005542  023737  003530  003470  3$:       CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2539  005550  001401                            BEQ     TST4            ;YES, GO ON TO NEXT TEST
2540  005552  104011                            ERROR   11              ;MESS B INCORRECT
2541
2542                                    ;;*****************************************************************
2543                                    ;*TEST 4        WRITE HEADER DRIVE CLEAR MESSAGE
2544                                    ;*
2545                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
2546                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER WITH CDT SET
2547                                    ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2548                                    ;*      CLOCK SEEK MESSAGE AND LOAD GENERATED DRIVE CLEAR
2549                                    ;*      INTO SHIFT REGISTER.  MAKE SURE THE DRIVE CLEAR IS
2550                                    ;*      GENERATED AND THE PROPER BITS ARE SET.
2551                                    ;*
2552                                    ;*****************************************************************
2553  005554  000004                    TST4:   SCOPE
2554  005556  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2555  005564  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2556  005570  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2557  005576  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2558  005604  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2559  005612  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2560  005620  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2561  005626  012762  012027  000000            MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2562                                                                    ;  24 SECTOR FORMAT
2563  005634  012700  000156                    MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2564  005640  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
2565  005646  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2566  005654  005300                            DEC     R0
2567  005656  001370                            BNE     1$
2568  005660  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2569  005666  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2570  005674  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2571  005702  012737  012027  003500            MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2572  005710  012737  071407  003526            MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2573  005716  005037  003530                    CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2574  005722  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
```

```
2575  005730  001405                          BEQ     2$              ;YES, CHECK CS2
2576  005732  104012                          ERROR   12              ;CS1 INCORRECT
2577  005734  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2578  005742  000412                          BR      TST5            ;;GO TO NEXT TEST
2579  005744  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2580  005752  001401                          BEQ     3$              ;YES, CHECK MESS B
2581  005754  104013                          ERROR   13              ;MESS A INCORRECT
2582  005756  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2583  005764  001401                          BEQ     TST5            ;;YES, GO ON TO NEXT TEST
2584  005766  104014                          ERROR   14              ;MESS B INCORRECT
2585
2586
2587                                  .SBTTL  **INDEX AND SECTOR PULSE DETECT ON
2588
2589                                  ;;*****************************************************************
2590                                  ;*TEST 5        SECTOR PULSE DETECT IN READ HEADER (PART 1)
2591                                  ;*
2592                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2593                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2594                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2595                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2596                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES AND A ONE.
2597                                  ;*
2598                                  ;*      MAKE SURE READ GATE DOES SET.
2599                                  ;*
2600                                  ;;*****************************************************************
2601  005770  000004                  TST5:   SCOPE
2602  005772  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2603  006000  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2604  006004  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2605  006012  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2606  006020  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2607  006026  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2608  006034  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2609  006042  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2610  006046  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2611  006054  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2612  006062  005300                          DEC     R0
2613  006064  001370                          BNE     1$
2614  006066  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2615  006074  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2616  006102  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2617  006110  001405                          BEQ     2$              ;YES, CLOCK ZEROES
2618  006112  104015                          ERROR   15              ;CS1 INCORRECT
2619  006114  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2620  006122  000553                          BR      TST6            ;;GO ON TO NEXT TEST
2621
2622  006124  012762  000140  000026  2$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
2623  006132  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2624  006140  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECT MAINT REG. 1
2625  006146  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2626  006152  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2627  006156  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROES
2628  006162  012700  000200                  MOV     #128.,R0        ;GENERATE 128 ZEROS UNTIL READ GATE
2629  006166  004737  046156          5$:     JSR     PC,RDBIT        ;READ A ZERO
2630  006172  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
```

```
2631  006200  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2632  006206  001405                          BEQ     6$              ;YES, SIMULATE NEXT BIT
2633  006210  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2634  006212  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2635  006220  000514                          BR      TST6            ;;GO ON TO NEXT TEST
2636
2637  006222  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2638  006226  005300                          DEC     R0              ;CHECK READY OF READ GATE
2639  006230  001356                          BNE     5$              ;NO, CONTINUE
2640  006232  012737  122040  003524          MOV     #DMD!MEMD!ECCW!RDGATE,E.MR1  ;LOAD EXPECTED MR1
2641  006240  012700  000177                  MOV     #127.,R0        ;GENERATE 127 ZEROS
2642  006244  004737  046156          10$:    JSR     PC,RDBIT        ;READ A ZERO
2643  006250  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2644  006256  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2645  006264  001405                          BEQ     11$             ;YES, SIMULATE NEXT BIT
2646  006266  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2647  006270  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2648  006276  000465                          BR      TST6            ;;GO ON TO NEXT TEST
2649
2650  006300  005237  003622          11$:    INC     BITCNT          ;INCREMENT BIT COUNT
2651  006304  005300                          DEC     R0              ;CHECK IF ALL ZEROS ISSUED
2652  006306  001356                          BNE     10$             ;NO, CONTINUE
2653  006310  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2654  006316  004737  046156                  JSR     PC,RDBIT        ;READ A ONE
2655  006322  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2656  006330  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1
2657  006336  001405                          BEQ     12$             ;YES, CONTINUE
2658  006340  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2659  006342  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2660  006350  000440                          BR      TST6            ;;GO ON TO NEXT TEST
2661  006352  005237  003622          12$:    INC     BITCNT          ;INCREMENT BIT COUNT
2662  006356  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2663  006364  005037  003614                  CLR     PR.BIT
2664  006370  004737  046156                  JSR     PC,RDBIT        ;SIMULATE ZERO
2665  006374  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2666  006402  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2667  006410  001405                          BEQ     13$             ;CHECK CS1 CORRECT
2668  006412  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2669  006414  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2670  006422  000413                          BR      TST6            ;;GO TO NEXT TEST
2671
2672  006424  016237  000000  003440  13$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2673  006432  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2674  006440  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2675  006446  001401                          BEQ     TST6            ;;YES, GO TO NEXT TEST
2676  006450  104016                          ERROR   16              ;CS1 INCORRECT
2677
2678                                  ;;*****************************************************************
2679                                  ;*TEST 6        SECTOR PULSE DETECT IN READ HEADER (PART 2)
2680                                  ;*
2681                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2682                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2683                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2684                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2685                                  ;*      SIMULATE INDEX PULSE, 255 ZEROES AND A ONE.
2686                                  ;*
```

```
2687                                    ;*      MAKE SURE READ GATE DOES NOT SET.
2688                                    ;*
2689                                    ;;*****************************************************************
2690  006452  000004                    TST6:   SCOPE
2691  006454  012737  000012  001200            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2692  006462  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
2693  006466  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2694  006474  012762  000040  000000            MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2695  006502  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2696  006510  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2697  006516  012762  000025  000000            MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2698  006524  012700  000312                    MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2699  006530  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
2700  006536  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2701  006544  005300                            DEC     R0
2702  006546  001370                            BNE     1$
2703  006550  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2704  006556  012737  000025  003500            MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2705  006564  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2706  006572  001405                            BEQ     2$              ;YES, CLOCK IN ZEROS
2707  006574  104015                            ERROR   15
2708  006576  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2709  006604  000535                            BR      TST7            ;;GO ON TO NEXT TEST
2710  006606                            2$:
2711  006606  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDX PULSE
2712  006614  012700  000004                    MOV     #4,R0
2713  006620  012762  000640  000026  3$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
2714  006626  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
2715  006634  005300                            DEC     R0
2716  006636  001370                            BNE     3$
2717  006640  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2718  006646  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
2719  006652  012737  022040  003524            MOV     #DMD!MEMD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
2720  006660  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2721  006664  005037  003616                    CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
2722  006670  012700  000377                    MOV     #255.,R0        ;GENERATE 255 ZEROES
2723  006674  004737  046156            5$:     JSR     PC,RDBIT        ;READ A ZERO
2724  006700  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2725  006706  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2726  006714  001405                            BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
2727  006716  104020                            ERROR   20              ;MAINT REG. 1 INCORRECT
2728  006720  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2729  006726  000464                            BR      TST7            ;;GO ON TO NEXT TEST
2730
2731  006730  005237  003622            6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2732  006734  005300                            DEC     R0              ;CHECK IF ALL ZEROES ISSUED
2733  006736  001356                            BNE     5$              ;NO, CONTINUE
2734  006740  012737  000001  003614            MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2735  006746  004737  046156                    JSR     PC,RDBIT        ;READ A ONE
2736  006752  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2737  006760  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2738  006766  001405                            BEQ     7$              ;YES, CONTINUE
2739  006770  104020                            ERROR   20              ;MAINT REG. 1 INCORRECT
2740  006772  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2741  007000  000437                            BR      TST7            ;;GO ON TO NEXT TEST
2742
```

```
2743  007002  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2744  007006  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2745  007014  005037  003614                  CLR     PR.BIT
2746  007020  004737  046156                  JSR     PC,RDBIT        ;SIMULATE ZERO
2747  007024  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2748  007032  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2749  007040  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2750  007042  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2751  007050  000413                          BR      TST7            ;;GO TO NEXT TEST
2752
2753  007052  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2754  007060  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2755  007066  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2756  007074  001401                          BEQ     TST7            ;;YES, GO TO NEXT TEST
2757  007076  104016                          ERROR   16              ;CS1 INCORRECT
2758
2759                                  ;;*****************************************************************
2760                                  ;*TEST 7        SECTOR PULSE DETECT IN READ HEADER (PART 3)
2761                                  ;*
2762                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2763                                  ;*      DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2764                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
2765                                  ;*      CLOCK BOTH SEEK AND DRIVE CHECK MESSAGES.
2766                                  ;*      SIMULATE 255 ZEROES AND A ONE.
2767                                  ;*
2768                                  ;*      MAKE SURE READ GATE DOES NOT SET.
2769                                  ;*
2770                                  ;;*****************************************************************
2771  007100  000004                  TST7:   SCOPE
2772  007102  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2773  007110  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2774  007114  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2775  007122  012762  000040  000000          MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2776  007130  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2777  007136  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2778  007144  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2779  007152  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2780  007156  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2781  007164  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2782  007172  005300                          DEC     R0
2783  007174  001370                          BNE     1$
2784  007176  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2785  007204  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2786  007212  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2787  007220  001405                          BEQ     2$              ;YES, CLOCK IN ZEROS
2788  007222  104015                          ERROR   15
2789  007224  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2790  007232  000515                          BR      TST10           ;;GO ON TO NEXT TEST
2791  007234                          2$:
2792  007234  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2793  007240  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
2794  007246  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2795  007252  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
2796  007256  012700  000377                  MOV     #255.,R0        ;GENERATE 255 ZEROES
2797  007262  004737  046156          5$:     JSR     PC,RDBIT        ;READ A ZERO
2798  007266  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
```

```
2799  007274  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2800  007302  001405                          BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
2801  007304  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2802  007306  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2803  007314  000464                          BR      TST10           ;;GO ON TO NEXT TEST
2804
2805  007316  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2806  007322  005300                          DEC     R0              ;CHECK IF ALL ZEROES ISSUED
2807  007324  001356                          BNE     5$              ;NO, CONTINUE
2808  007326  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2809  007334  004737  046156                  JSR     PC,RDBIT        ;READ A ONE
2810  007340  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2811  007346  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2812  007354  001405                          BEQ     7$              ;YES, CONTINUE
2813  007356  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2814  007360  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2815  007366  000437                          BR      TST10           ;;GO ON TO NEXT TEST
2816
2817  007370  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2818  007374  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2819  007402  005037  003614                  CLR     PR.BIT
2820  007406  004737  046156                  JSR     PC,RDBIT        ;SIMULATE ZERO
2821  007412  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2822  007420  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 COPRECT
2823  007426  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2824  007430  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2825  007436  000413                          BR      TST10           ;;GO TO NEXT TEST
2826
2827  007440  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2828  007446  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2829  007454  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2830  007462  001401                          BEQ     TST10           ;;YES, GO TO NEXT TEST
2831  007464  104016                          ERROR   16              ;CS1 INCORRECT
2832
2833                                  ;;*****************************************************************
2834                                  ;*TEST 10       INDEX PULSE DETECTION IN WRITE HEADER
2835                                  ;*
2836                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2837                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
2838                                  ;*      TO AN RKD6, IN 26 SECTOR FORMAT, TO CYLINDER 0, HEAD 0,
2839                                  ;*      DRIVE 0, WITH A ONE WORD TRANSFER.  CLOCK THROUGH THE
2840                                  ;*      SEEK AND THE DRIVE CLEAR MESSAGES.  ISSUE 200 CONTROLLER
2841                                  ;*      CLOCKS AND MAKE SURE WRITE GATE DOES NOT SET.  SIMULATE
2842                                  ;*      SECTOR PULSE AND 200 CONTROLLER CLOCKS MAKING SURE WRITE
2843                                  ;*      GATE DOES NOT SET.  SIMULATE INDEX PULSE AND MAKE SURE
2844                                  ;*      WRITE GATE SETS.
2845                                  ;*
2846                                  ;*****************************************************************
2847  007466  000004                  TST10:  SCOPE
2848  007470  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2849  007476  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2850  007502  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2851  007510  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2852  007516  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIAILZE ROM ADDRESS
2853  007524  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2854  007532  012762  067254  000004          MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
```

```
2855  007540  012762  177777  000002          MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
2856  007546  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
2857  007554  012700  000312                  MOV     #50.*4+2,R0      ;CLOCK UNTIL READY FOR INDEX PULSE
2858  007560  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2859  007566  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2860  007574  005300                          DEC     R0
2861  007576  001370                          BNE     1$
2862  007600  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2863  007606  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
2864  007614  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2865  007622  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
2866  007630  012737  067254  003504          MOV     #WRBUFF,E.BA    ;LOAD EXPECTED BUS ADDRESS
2867  007636  012737  177777  003502          MOV     #-1,E.WC        ;LOAD EXPECTED WORD COUNT
2868  007644  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2869  007652  001403                          BEQ     2$              ;YES, CONTINUE
2870  007654  104022                          ERROR   22              ;CS1 INCORRECT
2871  007656  000137  010604                  JMP     60$             ;CLEAR CONTROLLER
2872
2873  007662  023737  003504  003444  2$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2874  007670  001403                          BEQ     3$              ;YES, CONTINUE
2875  007672  104023                          ERROR   23              ;BUS ADDRESS INCORRECT
2876  007674  000137  010604                  JMP     60$             ;CLEAR RK611
2877
2878  007700  023737  003502  003442  3$:     CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2879  007706  001403                          BEQ     4$              ;YES, CONTINUE
2880  007710  104024                          ERROR   24              ;WORD COUNT INCORRECT
2881  007712  000137  010604                  JMP     60$             ;CLEAR RK611
2882
2883  007716  012737  022040  003524  4$:     MOV     #ECCW!MEWD!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2884  007724  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2885  007730  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2886  007734  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2887  007742  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2888  007750  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2889  007756  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2890  007764  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2891  007772  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2892  010000  001403                          BEQ     6$              ;YES, CONTINUE
2893  010002  104025                          ERROR   25              ;MAINT REG 1 INCORRECT
2894  010004  000137  010604                  JMP     60$             ;CLEAR RK611
2895
2896  010010  005300                  6$:     DEC     R0              ;CHECK IF READY FOR SECTOR PULSE
2897  010012  001350                          BNE     5$              ;NO, GET NEXT BIT
2898  010014  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2899  010022  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
2900  010030  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG
2901  010036  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2902  010044  001403                          BEQ     10$             ;YES, CONTINUE
2903  010046  104026                          ERROR   26              ;CS1 INCORRECT
2904  010050  000137  010604                  JMP     60$             ;CLEAR RK611
2905
2906  010054  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2907  010062  001403                          BEQ     11$             ;YES, CONTINUE
2908  010064  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2909  010066  000137  010604                  JMP     60$             ;CLEAR RK611
2910
```

```
2911  010072  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
2912  010100  001403                          BEQ     12$             ;YES, CONTINUE
2913  010102  104030                          ERROR   30              ;WORD COUNT INCORRECT
2914  010104  000137  010604                  JMP     60$             ;CLEAR RK611
2915
2916  010110  012700  000004          12$:    MOV     #4,R0           ;SIMULATE SECTOR PULSE
2917  010114  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2918  010122  012762  000540  000026  13$:    MOV     #DMD!MSP!MCLK,RKMR1(R2)
2919  010130  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2920  010136  005300                          DEC     R0
2921  010140  001370                          BNE     13$
2922  010142  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2923  010150  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2924  010156  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS AND REG.
2925  010164  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2926  010172  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 INCORRECT
2927  010200  001402                          BEQ     15$             ;YES, CONTINUE
2928  010202  104026                          ERROR   26              ;CS1 INCORRECT
2929  010204  000577                          BR      60$             ;CLEAR RK611
2930
2931  010206  023737  003504  003444  15$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2932  010214  001402                          BEQ     16$             ;YES, CONTINUE
2933  010216  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2934  010220  000571                          BR      60$             ;CLEAR RK611
2935
2936  010222  023737  003502  003442  16$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2937  010230  001402                          BEQ     20$             ;YES, CONTINUE
2938  010232  104030                          ERROR   30              ;WORD COUNT INCORRECT
2939  010234  000563                          BR      60$             ;CLEAR RK611
2940
2941  010236  005037  003622          20$:    CLR     BITCNT          ;INITIALIZE BIT COUNT
2942  010242  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2943  010246  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2)
2944  010254  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2945  010262  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2946  010270  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2947  010276  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2948  010304  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2949  010312  001402                          BEQ     22$             ;YES, CONTINUE
2950  010314  104025                          ERROR   25              ;MAINT REG. 1 INCORRECT
2951  010316  000532                          BR      60$             ;CLEAR RK611
2952
2953  010320  005300                  22$:    DEC     R0              ;CHECK IF READY FOR INDEX PULSE
2954  010322  001351                          BNE     21$             ;NO, GET NEXT BIT
2955  010324  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2956  010332  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2957  010340  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2958  010346  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2959  010354  001402                          BEQ     23$             ;YES, CONTINUE
2960  010356  104026                          ERROR   26              ;CS1 INCORRECT
2961  010360  000511                          BR      60$             ;CLEAR RK611
2962
2963  010362  023737  003504  003444  23$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2964  010370  001402                          BEQ     24$             ;YES, CONTINUE
2965  010372  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2966  010374  000503                          BR      60$             ;CLEAR RK611
```

```
2967
2968  010376  023737  003502  003442  24$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2969  010404  001402                          BEQ     25$             ;YES, CONTINUE
2970  010406  104030                          ERROR   30              ;WORD COUNT INCORRECT
2971  010410  000475                          BR      60$             ;CLEAR RK611
2972
2973  010412  012762  000240  000026  25$:    MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE PULSE
2974  010420  012700  000004                  MOV     #4,R0
2975  010424  012762  000640  000026  26$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
2976  010432  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
2977  010440  005300                          DEC     R0
2978  010442  001370                          BNE     26$
2979  010444  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2980  010452  012700  000002                  MOV     #2,R0           ;SIMULATE TWO CLOCK PULSES FOR WRITE
2981                                                                  ;  GATE TO COME UP
2982  010456  012762  000440  000026  27$:    MOV     #DMD!MCLK,RKMR1(R2)
2983  010464  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2984  010472  005300                          DEC     R0
2985  010474  001370                          BNE     27$
2986  010476  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2987  010504  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2988  010512  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2989  010520  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2990  010526  012737  062040  003524          MOV     #WRTGAT!MEMD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2991  010534  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2992  010542  001401                          BEQ     28$             ;YES, CONTINUE
2993  010544  104031                          ERROR   31              ;CS1 INCORRECT
2994  010546  023737  003504  003444  28$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2995  010554  001401                          BEQ     29$             ;YES, CONTINUE
2996  010556  104032                          ERROR   32              ;BUS ADDRESS INCORRECT
2997  010560  023737  003502  003442  29$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2998  010566  001401                          BEQ     30$             ;YES, CONTINUE
2999  010570  104033                          ERROR   33              ;WORD COUNT INCORRECT
3000  010572  023737  003524  003464  30$:    CMP     E.MR1,T.MR1     ;CHECK MAINT REG 1 CORRECT
3001  010600  001401                          BEQ     60$             ;YES, CLEAR RK611
3002  010602  104034                          ERROR   34              ;MAINT REG. 1 INCORRECT
3003  010604  012762  100000  000000  60$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3004
3005                                  .SBTTL  **NPR READING OF MEMORY
3006
3007                                  ;;*****************************************************************
3008                                  ;*TEST 11        NPR OUTPUT DATA TRANSFER
3009                                  ;*
3010                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3011                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3012                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 777, HEAD 7, DRIVE 7.
3013                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK BOTH SEEK
3014                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE INDEX PULSE.
3015                                  ;*      CLOCK IN FIRST WORD OF NPR TRANSFER.  CHECK INPUT READY,
3016                                  ;*      OUTPUT READY, BUS ADDRESS, WORD COUNT, AND CONTENTS OF
3017                                  ;*      THE SILO.  REPEAT FOR 8 DIFFERENT DATA PATTERNS.
3018                                  ;*
3019                                  ;;*****************************************************************
3020  010612  000004                  TST11:  SCOPE
3021  010614  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3022  010622  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
```

```
3023  010626  012703  066734                    MOV     #PATTERN,R3      ;LOAD PATTERN ADDRESS
3024  010632  012704  000010                    MOV     #8.,R4           ;LOAD PATTERN COUNT
3025  010636  012737  067256  003504           MOV     #WRBUFF+2,E.BA   ;LOAD EXPECTED BUS ADDRESS
3026  010644  012737  000027  003500           MOV     #WRHEAD,E.CS1    ;LOAD EXPECTED CS1
3027  010652  005037  003502                    CLR     E.WC             ;LOAD EXPECTED WORD COUNT
3028  010656  012737  010664  001110           MOV     #1$,$LPERR       ;LOAD LOOP ON ERROR LOCATION FOR
3029                                                                     ;  SUBTEST LOOP
3030
3031  010664                          1$:
3032  010664  012762  100000  000000           MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3033  010672  011337  067254                    MOV     (R3),WRBUFF      ;LOAD BUFFER FOR WRITE HEADER
3034  010676  012762  000040  000026           MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN MAINT MODE
3035  010704  012762  000777  000020           MOV     #777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS
3036  010712  012762  003400  000006           MOV     #3400,RKDA(R2)   ;LOAD DISK ADDRESS
3037  010720  012762  067254  000004           MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
3038  010726  012762  000007  000010           MOV     #7,RKCS2(R2)     ;LOAD OTHER NUMBER
3039  010734  012762  177777  000002           MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
3040  010742  012762  000027  000000           MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3041  010750  012700  000312                    MOV     #50.*4+2,R0      ;ISSUE CLOCKS UNTIL READY FOR
3042                                                                     ;  INDEX PULSE
3043  010754  012762  000440  000026  2$:      MOV     #DMD!MCLK,RKMR1(R2)
3044  010762  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3045  010770  005300                           DEC     R0
3046  010772  001370                           BNE     2$
3047  010774  012700  000004                    MOV     #4,R0            ;SIMULATE INDEX PULSE
3048  011000  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3049  011006  012762  000640  000026  3$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
3050  011014  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3051  011022  005300                           DEC     R0
3052  011024  001370                           BNE     3$
3053  011026  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3054  011034  012700  000045                    MOV     #37.,R0          ;SIMULATE 1 NPR TRANSFER
3055  011040  012762  000440  000026  4$:      MOV     #DMD!MCLK,RKMR1(R2)
3056  011046  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3057  011054  005300                           DEC     R0
3058  011056  001370                           BNE     4$
3059  011060  016237  000000  003440           MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
3060  011066  016237  000004  003444           MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS REG
3061  011074  016237  000002  003442           MOV     RKWC(R2),T.WC    ;STORE WORD COUNT
3062  011102  012700  000024                    MOV     #20.,R0          ;WAIT FOR OUTPUT READY
3063  011106  005300                  5$:      DEC     R0
3064  011110  001376                           BNE     5$
3065  011112  016237  000010  003450           MOV     RKCS2(R2),T.CS2  ;STORE COMMAND AND STATUS REG. 2
3066  011120  012737  000307  003510           MOV     #OR!IR!7,E.CS2   ;LOAD EXPECTED CS2
3067  011126  023737  003500  003440           CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
3068  011134  001401                           BEQ     6$               ;YES, CHECK CS2
3069  011136  104035                           ERROR   35               ;CS1 INCORRECT
3070  011140  023737  003510  003450  6$:      CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
3071  011146  001401                           BEQ     7$               ;YES, CONTINUE
3072  011150  104036                           ERROR   36               ;CS2 INCORRECT
3073  011152  023737  003504  003444  7$:      CMP     E.BA,T.BA        ;CHECK IF BUS ADDRESS INCREMENT OCCURRED
3074  011160  001401                           BEQ     8$               ;YES, CONTINUE
3075  011162  104037                           ERROR   37               ;BUS ADDRESS INCORRECT
3076  011164  023737  003502  003442  8$:      CMP     E.WC,T.WC        ;CHECK WORD COUNT REG CORRECT
3077  011172  001401                           BEQ     9$               ;YES, CONTINUE
3078  011174  104040                           ERROR   40               ;WORD COUNT INCORRECT
```

```
3079  011176  016237  000024  003462  9$:     MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3080  011204  011337  003522          9$:     MOV     (R3),E.DB       ;LOAD EXPECTED DATA BUFFER
3081  011210  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3082  011216  001401                          BEQ     15$             ;YES,CONTINUE
3083  011220  104041                          ERROR   41              ;DATA BUFFER INCORRECT
3084  011222  016237  000000  003440  15$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3085  011230  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3086  011236  012737  000107  003510          MOV     #IR!7,E.CS2     ;LOAD EXPECTED CS2
3087  011244  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3088  011252  001401                          BEQ     17$             ;YES, CONTINUE
3089  011254  104042                          ERROR   42              ;CS1 INCORRECT
3090  011256  023737  003510  003450  17$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3091  011264  001401                          BEQ     20$             ;YES, CONTINUE
3092  011266  104043                          ERROR   43              ;CS2 INCORRECT
3093  011270  104415                  20$:    SCOPE                   ;CHECK IF LOOP ON ERROR
3094  011272  005723                          TST     (R3)+           ;GENERATE ADDRESS OF NEXT CONFIG
3095  011274  005304                          DEC     R4              ;CHECK IF ALL 8 CONFIGS TRIED
3096  011276  001000                          BNE     TST12           ;;NO, TRY NEXT DATA PATTERN
3097
3098                                  ;;*****************************************************************
3099                                  ;*TEST 12       PARTIAL SILO FILLING
3100                                  ;*
3101                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3102                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3103                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3104                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK IN ALL
3105                                  ;*      SPECIFIED WORDS INTO THE SILO.  CHECK WORD COUNT,
3106                                  ;*      BUS ADDRESS, INPUT READY, AND OUTPUT READY.  MAKE
3107                                  ;*      SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
3108                                  ;*      INTO THE SILO.  CHECK THE SILO FOR CORRECT DATA.
3109                                  ;*      REPEAT FOR WORD COUNTS 2-65.
3110                                  ;*
3111                                  ;*****************************************************************
3112  011300  000004                  TST12:  SCOPE
3113  011302  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3114  011310  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3115  011314  012737  000001  001160          MOV     #1,$TMP0        ;LOAD NUMBER OF WORDS FOR DATA TRANSFER
3116  011322  012704  000065                  MOV     #65,R4          ;LOAD ITERATION COUNT
3117  011326  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3118  011334  012737  011342  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3119                                                                  ;  SUBTEST LOOP
3120
3121  011342                          1$:
3122  011342  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3123  011350  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3124  011356  012762  067032  000004          MOV     #NPRBUF,RKBA(R2)  ;LOAD BUS ADDRESS
3125  011364  012737  067032  003504          MOV     #NPRBUF,E.BA
3126  011372  013737  001160  003502          MOV     $TMP0,E.WC      ;LOAD WORD COUNT
3127  011400  005437  003502                  NEG     E.WC
3128  011404  013762  003502  000002          MOV     E.WC,RKWC(R2)
3129  011412  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3130  011420  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3131                                                                  ;  INDEX PULSE
3132  011424  012762  000440  000026  2$:     MOV     #DMD!MCLK,RKMR1(R2)
3133  011432  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3134  011440  005300                          DEC     R0
```

```
3135  011442  001370                          BNE     2$
3136  011444  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3137  011450  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3138  011456  012762  000640  000026  3$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3139  011464  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3140  011472  005300                          DEC     R0
3141  011474  001370                          BNE     3$
3142  011476  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3143  011504  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3144  011512  012700  000045          4$:     MOV     #37,R0          ;SIMULATE 1 NPR TRANSFER
3145  011516  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3146  011524  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3147  011532  005300                          DEC     R0
3148  011534  001370                          BNE     5$
3149  011536  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3150  011544  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3151  011552  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3152  011560  022737  067032  003504          CMP     #NPRBUF,E.BA    ;CHECK IF FIRST WORD
3153  011566  001004                          BNE     7$              ;NO, STORE CS2
3154  011570  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3155  011574  005300                  6$:     DEC     R0
3156  011576  001376                          BNE     6$
3157  011600  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3158  011606  062737  000002  003504          ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADD
3159  011614  005237  003502                  INC     E.W
3160  011620  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3161  011626  001401                          BEQ     8$              ;YES, CHECK CS2
3162  011630  104044                          ERROR   44              ;CS1 INCORRECT
3163  011632  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3164  011640  001401                          BEQ     9$              ;YES, CHECK BUSS ADDRESS REG.
3165  011642  104045                          ERROR   45              ;CS2 INCORRECT
3166  011644  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3167  011652  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3168  011654  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
3169  011656  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3170  011664  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3171  011666  104047                          ERROR   47              ;WORD COUNT INCORRECT
3172  011670  005737  003502          11$:    TST     E.WC            ;CHECK IF FINISHED
3173  011674  001306                          BNE     4$              ;NO, TRANSFER NEXT WORD
3174  011676  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3175  011702  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3176  011710  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3177  011716  005300                          DEC     R0
3178  011720  001370                          BNE     15$
3179  011722  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3180  011730  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3181  011736  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3182  011744  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3183  011752  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3184  011760  001401                          BEQ     16$             ;YES, CHECK CS2
3185  011762  104050                          ERROR   50              ;CS1 INCORRECT
3186  011764  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3187  011772  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3188  011774  104051                          ERROR   51              ;CS2 INCORRECT
3189  011776  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3190  012004  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
```

```
3191  012006  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3192  012010  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3193  012016  001401                          BEQ     19$             ;YES, CONTINUE
3194  012020  104053                          ERROR   53              ;WORD COUNT INCORRECT
3195  012022  013701  001160          19$:    MOV     $TMPO,R1        ;LOAD NUMBER OF WORDS LOADED
3196  012026  012703  067032                  MOV     #NPRBUFF,R3     ;LOAD START ADDRESS
3197  012032  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINTOUT
3198  012036  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3199  012044  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3200  012050  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3201  012056  001401                          BEQ     26$             ;YES, CONTINUE
3202  012060  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3203  012062  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3204  012070  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3205  012076  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3206  012102  001003                          BNE     27$             ;NO, CONTINUE
3207  012104  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3208  012112  023737  003500  003440  27$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3209  012120  001401                          BEQ     28$             ;YES, CONTINUE
3210  012122  104055                          ERROR   55              ;CS1 INCORRECT
3211  012124  023737  003610  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3212  012132  001401                          BEQ     29$             ;YES, CONTINUE
3213  012134  104056                          ERROR   56              ;CS2 INCORRECT
3214  012136  005237  003624          29$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3215  012142  005301                          DEC     R1              ;DECREMENT WORDS READ
3216  012144  001334                          BNE     25$             ;CHECK IF ALL WORDS READ
3217  012146  104415                          SCOP1                   ;CHECK IF LOOP ON ERROR
3218  012150  005237  001160                  INC     $TMPO           ;INCREMENT WORDS READ FROM MEM
3219  012154  005304                          DEC     R4              ;CHECK IF FINISHED
3220  012156  001402                          BEQ     TST13           ;;YES, GO ON TO NEXT TEST
3221  012160  000137  011342                  JMP     1$              ;TRY NEXT WORD COUNT
3222
3223                                  ;;*****************************************************************
3224                                  ;*TEST 13       SILO FILLING WITH NPR TRANSFERS
3225                                  ;*
3226                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3227                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3228                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3229                                  ;*      SPECIFY A 66 WORD DATA TRANSFER, CLOCK IN ALL 66 WORDS
3230                                  ;*      INTO THE SILO.  CHECK INPUT READY, OUTPUT READY, BUS
3231                                  ;*      ADDRESS, WORD COUNT, AND CONTENTS OF THE SILO.
3232                                  ;*
3233                                  ;*****************************************************************
3234  012164  000004                  TST13:  SCOPE
3235  012166  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3236  012174  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3237  012200  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3238  012206  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3239  012214  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3240  012222  012737  067034  003504          MOV     #NPRBUF+2,E.BA  ;LOAD BUS ADDRESS
3241  012230  012762  067032  000004          MOV     #NPRBUF,RKBA(R2)
3242  012236  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
3243  012244  012762  177676  000002          MOV     #-66.,RKWC(R2)
3244  012252  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3245  012260  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3246                                                                  ;  INDEX PULSE
```

```
3247  012264  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3248  012272  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3249  012300  005300                          DEC     R0
3250  012302  001370                          BNE     1$
3251  012304  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3252  012310  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3253  012316  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3254  012324  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3255  012332  005300                          DEC     R0
3256  012334  001370                          BNE     2$
3257  012336  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3258  012344  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3259  012352  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3260  012356  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3261  012364  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3262  012372  005300                          DEC     R0
3263  012374  001370                          BNE     5$
3264  012376  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3265  012404  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3266  012412  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3267  012420  022737  067034  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
3268  012426  001004                          BNE     7$              ;NO, STORE CS2
3269  012430  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3270  012434  005300                  6$:     DEC     R0
3271  012436  001376                          BNE     6$
3272  012440  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3273  012446  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3274  012454  001401                          BEQ     8$              ;YES, CHECK CS2
3275  012456  104044                          ERROR   44              ;CS1 INCORRECT
3276  012460  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3277  012466  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
3278  012470  104045                          ERROR   45              ;CS2 INCORRECT
3279  012472  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3280  012500  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3281  012502  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
3282  012504  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHEC  WORD COUNT CORRECT
3283  012512  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3284  012514  104047                          ERROR   47              ;WORD COUNT INCORRECT
3285  012516  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADDRESS
3286  012524  005237  003502                  INC     E.WC            ;
3287  012530  100710                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3288  012532  001004                          BNE     12$             ;CHECK IF LAST WORD
3289  012534  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3290  012542  000703                          BR      4$              ;PROCESS LAST WORD
3291
3292  012544  005037  003502          12$:    CLR     E.WC            ;ADJUST EXPECTED WORD COUNT
3293  012550  162737  000002  003504          SUB     #2,E.BA         ;  AND BUS ADDRESS
3294  012556  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3295  012562  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3296  012570  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3297  012576  005300                          DEC     R0
3298  012600  001370                          BNE     15$
3299  012602  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3300  012610  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3301  012616  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3302  012624  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
```

```
3303  012632  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3304  012640  001401                          BEQ     16$             ;YES, CHECK CS2
3305  012642  104050                          ERROR   50              ;CS1 INCORRECT
3306  012644  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3307  012652  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3308  012654  104051                          ERROR   51              ;CS2 INCORRECT
3309  012656  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3310  012664  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3311  012666  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3312  012670  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3313  012676  001401                          BEQ     19$             ;YES, CHECK DATA
3314  012700  104053                          ERROR   53              ;WORD COUNT INCORRECT
3315  012702  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBER OF WORDS LOADED
3316  012706  012703  067032                  MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3317  012712  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR  PRINT OUT
3318  012716  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3319  012724  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3320  012732  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3321  012736  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3322  012744  001401                          BEQ     26$             ;YES, CONTINUE
3323  012746  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3324  012750  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
3325  012756  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3326  012762  001015                          BNE     28$             ;NO, GET CS2
3327  012764  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3328  012770  005300                  27$:    DEC     R0
3329  012772  001376                          BNE     27$
3330  012774  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3331  013002  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3332  013006  001003                          BNE     28$             ;NO, CONTINUE
3333  013010  012737  000100  00?510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3334  013016  023737  003500  00?   28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3335  013024  001401                          BEQ     29$             ;YES, CHECK CS2
3336  013026  104055                          ERROR   55              ;CS1 INCORRECT
3337  013030  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3338  013036  001401                          BEQ     30$             ;YES, GET NEXT WORD
3339  013040  104056                          ERROR   56              ;CS2 INCORRECT
3340  013042  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3341  013046  005301                          DEC     R1              ;DECREMENT WORDS READ
3342  013050  001325                          BNE     25$             ;CHECK IF ALL WORDS READ
3343
3344                                  ;*****************************************************************
3345                                  ;*TEST 14       SILO CAPICITY WITH NPR TRANSFERS
3346                                  ;*
3347                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3348                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3349                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0. HEAD 0, DRIVE 0.
3350                                  ;*      SPECIFY A 68 WORD DATA TRANSFER.  CLOCK IN 66
3351                                  ;*      WORDS INTO THE SILO.  MAKE SURE THAT SILO WILL STOP
3352                                  ;*      FILLING AT 66 WORDS.  TAKE ONE WORD FROM SILO AND
3353                                  ;*      CHECK IT.  CLOCK IN NEXT WORD.  MAKE SURE NO MORE
3354                                  ;*      THAN  ONE WORD IS CLOCKED IN THE SILO.  TAKE ONE
3355                                  ;*      WORD FROM SILO AND CHECK IT.  CLOCK IN NEXT WORD.
3356                                  ;*      CLOCK IN NEXT WORD.  MAKE SURE NO MORE THAN ONE WORD IS
3357                                  ;*      CLOCKED IN THE SILO.  TAKE ONE WORD FROM SILO AND
3358                                  ;*      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.
                                        ;*
                                        ;*************************************************************************
013052  000004                  TST14:  SCOPE
013054  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
013062  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
013066  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
013074  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
013102  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
013110  012737  067034  003504          MOV     #NPRBUFF+2,E.BA ;LOAD BUS ADDRESS
013116  012762  067032  000004          MOV     #NPRBUF,RKBA(R2)
013124  012737  177675  003502          MOV     #-67.,E.WC      ;LOAD WORD COUNT
013132  012762  177674  000002          MOV     #-68.,RKWC(R2)
013140  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
013146  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
013152  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
013160  012762  000040  000026          MOV     #DMD,RKMR1(R2)
013166  005300                          DEC     R0
013170  001370                          BNE     1$
013172  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
013176  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
013204  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
013212  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
013220  005300                          DEC     R0
013222  001370                          BNE     2$
013224  012737  000040  000026          MOV     #DMD,RKMR1
013232  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
013240  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
013244  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
013252  012762  000040  000026          MOV     #DMD,RKMR1(R2)
013260  005300                          DEC     R0
013262  001370                          BNE     5$
013264  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND REG. 1
013272  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
013300  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
013306  022737  067034  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
013314  001004                          BNE     7$              ;NO, STORE CS2
013316  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
013322  005300                  6$:     DEC     R0
013324  001376                          BNE     6$
013326  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
013334  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
013342  001401                          BEQ     8$              ;YES, CHECK CS2
013344  104044                          ERROR   44              ;CS1 INCORRECT
013346  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
013354  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
013356  104045                          ERROR   45              ;CS2 INCORRECT
013360  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
013366  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
013370  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
013372  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
013400  001401                          BEQ     11$             ;YES, CHECK IF 1ST 65 WORDS TRANSFERRED
013402  104047                          ERROR   47              ;WORD COUNT INCORRECT
013404  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
```

```
3415  013412  005237  003502                    INC     E.WC
3416  013416  022737  177776  003502            CMP     #-2,E.WC        ;CHECK IF 65 WORDS IN SILO
3417  013424  101305                            BHI     4$              ;NO, GET NEXT WORD
3418  013426  001004                            BNE     12$             ;CHECK IF ALL 65 WORDS IN SILO
3419  013430  012737  000200  003510            MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3420  013436  000700                            BR      4$              ;PROCESS 66TH WORD
3421
3422  013440  005337  003502          12$:      DEC     E.WC            ;ADJUST WORD COUNT AND
3423  013444  162737  000002  003504            SUB     #2,E.BA         ;  BUS ADDRESS
3424  013452  012701  000003                    MOV     #3,R1
3425  013456  005037  003624                    CLR     WRDCNT
3426  013462  012703  067032                    MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3427  013466  012700  000112          13$:      MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3428  013472  012762  000440  000026  15$:      MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3429  013500  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3430  013506  005300                            DEC     R0
3431  013510  001370                            BNE     15$
3432  013512  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3433  013520  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3434  013526  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3435  013534  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3436  013542  123737  003500  003440            CMPB    E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1
3437  013550  001401                            BEQ     16$             ;YES, CHECK CS2
3438  013552  104050                            ERROR   50              ;CS1 INCORRECT
3439  013554  023737  003510  003450  16$:      CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3440  013562  001401                            BEQ     17$             ;YES,CHECK BUS ADDRESS
3441  013564  104051                            ERROR   51              ;CS2 INCORRECT
3442  013566  023737  003504  003444  17$:      CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3443  013574  001401                            BEQ     18$             ;YES, CHECK WORD COUNT
3444  013576  104052                            ERROR   52              ;BUS ADDRESS INCORRECT
3445  013600  023737  003502  003442  18$:      CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3446  013606  001401                            BEQ     19$             ;YES, READ 1 WORD FROM SILO
3447  013610  104053                            ERROR   53              ;WORD COUNT INCORRECT
3448  013612  012737  000300  003510  19$:      MOV     #IR!OR,E.CS2    ;LOAD EXPECT CS2
3449  013620  016237  000024  003462            MOV     RKDB(R2),T.DB   ;STORE DATA BUFFER
3450  013626  012337  003522                    MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3451  013632  023737  003522  003462            CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3452  013640  001401                            BEQ     25$             ;YES, CONTINUE
3453  013642  104054                            ERROR   54              ;DATA BUFFER INCORRECT
3454  013644  016237  000000  003440  25$:      MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3455  013652  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3456  013656  005300                    26$:    DEC     R0
3457  013660  001376                            BNE     26$
3458  013662  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3459  013670  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF COMMAND STATUS REG. 1 CORRECT
3460  013676  001401                            BEQ     27$             ;YES, CHECK CS2
3461  013700  104055                            ERROR   55              ;CS1 INCORRECT
3462  013702  023737  003510  003450  27$:      CMP     E.CS2,T.CS2     ;CHECK IF COMMAND STATUS REG. 2 CORRECT
3463  013710  001401                            BEQ     30$             ;YES, DO NPR TRANSFER
3464  013712  104056                            ERROR   56              ;CS2 INCORRECT
3465  013714  012700  000045          30$:      MOV     #37.,R0         ;CLOCK IN ONE WORD (NPR TRANSFER)
3466  013720  012762  000440  000026  31$:      MOV     #DMD!MCLK,RKMR1(R2)
3467  013726  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3468  013734  005300                            DEC     R0
3469  013736  001370                            BNE     31$
3470  013740  022701  000001                    CMP     #1,R1           ;CHECK IF 68TH WORD READ
```

```
3471  013744  001410                          BEQ     32$             ;YES, NO NPR WILL TAKE PLACE
3472  013746  062737  000002  003504          ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
3473  013754  005237  003502                  INC     E.WC
3474  013760  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3475  013766  016237  000000  003440  32$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3476  013774  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3477  014002  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3478  014010  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3479  014016  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3480  014024  001401                          BEQ     33$             ;YES, CHECK CS2
3481  014026  104044                          ERROR   44              ;CS1 INCORRECT
3482  014030  023737  003510  003450  33$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3483  014036  001401                          BEQ     34$             ;YES, CHECK BUS ADD
3484  014040  104045                          ERROR   45              ;CS2 INCORRECT
3485  014042  023737  003504  003444  34$:    CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3486  014050  001401                          BEQ     35$             ;YES, CHECK WORD COUNT
3487  014052  104046                          ERROR   46              ;BUS ADD INCORRECT
3488  014054  023737  003502  003442  35$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3489  014062  001401                          BEQ     36$             ;YES, CONTINUE
3490  014064  104047                          ERROR   47              ;WORD COUNT INCORRECT
3491  014066  005237  003624          36$:    INC     WRDCNT
3492  014072  005301                          DEC     R1              ;CHECK IF READ TO UNLOAD SILO
3493  014074  001402                          BEQ     39$             ;YES, READ DATA; BUFFER
3494  014076  000137  013466                  JMP     13$             ;NO, INPUT NEXT WORD
3495
3496  014102  162737  000002  003504  39$:    SUB     #2,E.BA         ;ADJUST WORD COUNT AND BUS ADDRESS
3497  014110  005037  003502                  CLR     E.WC
3498  014114  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3499  014122  012701  000101                  MOV     #65.,R1         ;LOAD NUMBER OF WORDS LEFT
3500  014126  016237  000024  003462  40$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3501  014134  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3502  014140  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3503  014146  001401                          BEQ     41$             ;YES, CHECK CS1
3504  014150  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3505  014152  016237  000000  003440  41$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3506  014160  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF FIRST WORDS
3507  014166  001004                          BNE     43$             ;NO, DO NOT WAIT FOR INPUT READY
3508  014170  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY
3509  014174  005300                  42$:    DEC     R0
3510  014176  001376                          BNE     42$
3511  014200  016237  000010  003450  43$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3512  014206  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3513  014212  001003                          BNE     44$             ;NO, CONTINUE
3514  014214  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3515  014222  023737  003500  003440  44$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3516  014230  001401                          BEQ     45$             ;YES,CHECK CS2
3517  014232  104055                          ERROR   55              ;CS1 INCORRECT
3518  014234  023737  003510  003450  45$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3519  014242  001401                          BEQ     46$             ;YES, READ NEXT WORD ON SILO
3520  014244  104056                          ERROR   56              ;CS2 INCORRECT
3521  014246  005237  003624          46$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3522  014252  005301                          DEC     R1              ;CHECK IF ALL WORDS READ
3523  014254  001324                          BNE     40$             ;NO, READ NEXT WORD
3524
3525                                  ;;*****************************************************************
3526                                  ;*TEST 15        BUS ADDRESS INHIBIT
```

```
3527                                            ;*
3528                                            ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3529                                            ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN
3530                                            ;*      RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3531                                            ;*      SPECIFY A 66 WORD DATA TRANSFER WITH BUS ADDRESS
3532                                            ;*      INHIBIT INCREMENT.  CHECK WORD COUNT, BUS ADDRESS,
3533                                            ;*      INPUT READY, OUTPUT READY, AND MAKE SURE ALL THE
3534                                            ;*      WORDS IN THE SILO ARE THE CORRECT SAME WORD.
3535                                            ;*
3536                                            ;;*****************************************************************
3537  014256  000004                            ↑ST15:  SCOPE
3538  014260  012737  000144  001200                    MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3539  014266  013702  001270                            MOV     $BASE,R2        ;LOAD RK611 BASE
3540  014272  012737  000027  003500                    MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3541  014300  012762  100000  000000                    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3542  014306  012762  000040  000026                    MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3543  014314  012737  067032  003504                    MOV     #NPRBUF,E.BA    ;LOAD BUS ADDRESS
3544  014322  012762  067032  000004                    MOV     #NPRBUF,RKBA(R2)
3545  014330  012737  177677  003502                    MOV     #-65.,E.WC      ;LOAD WORD COUNT
3546  014336  012762  177676  000002                    MOV     #-66.,RKWC(R2)
3547  014344  012762  000020  000010                    MOV     #BAI,RKCS2(R2)  ;SET BUS ADDRESS INCREMENT INHIBIT
3548  014352  012762  000027  000000                    MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3549  014360  012700  000312                            MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3550                                                                            ;  INDEX PULSE
3551  014364  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
3552  014372  012762  000040  000026                    MOV     #DMD,RKMR1(R2)
3553  014400  005300                                    DEC     R0
3554  014402  001370                                    BNE     1$
3555  014404  012700  000004                            MOV     #4,R0           ;SIMULATE INDEX PULSE
3556  014410  012762  000240  000026                    MOV     #DMD!MIND,RKMR1(R2)
3557  014416  012762  000640  000026  2$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
3558  014424  012762  000240  000026                    MOV     #DMD!MIND,RKMR1(R2)
3559  014432  005300                                    DEC     R0
3560  014434  001370                                    BNE     2$
3561  014436  012762  000040  000026                    MOV     #DMD,RKMR1(R2)
3562  014444  012737  000320  003510                    MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
3563  014452  012700  000045              4$:       MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3564  014456  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2)
3565  014464  012762  000040  000026                    MOV     #DMD,RKMR1(R2)
3566  014472  005300                                    DEC     R0
3567  014474  001370                                    BNE     5$
3568  014476  016237  000000  003440                    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3569  014504  016237  000004  003444                    MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3570  014512  016237  000002  003442                    MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3571  014520  022737  000101  003502                    CMP     #65.,E.WC       ;CHECK IF FIRST WORD
3572  014526  001004                                    BNE     7$              ;NO, STORE CS2
3573  014530  012700  000024                            MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3574  014534  005300                      6$:       DEC     R0
3575  014536  001376                                    BNE     6$
3576  014540  016237  000010  003450  7$:       MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3577  014546  023737  003500  003440                    CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3578  014554  001401                                    BEQ     8$              ;YES, CHECK CS2
3579  014556  104057                                    ERROR   57              ;CS1 INCORRECT
3580  014560  023737  003510  003450  8$:       CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORREC
3581  014566  001401                                    BEQ     9$              ;YES, CHECK BUS ADDRESS
3582  014570  104060                                    ERROR   60              ;CS2 INCORRECT
```

```
3583  014572  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
3584  014600  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3585  014602  104061                          ERROR   61              ;BUS ADDRESS INCORRECT
3586  014604  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3587  014612  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3588  014614  104062                          ERROR   62              ;WORD COUNT INCORRECT
3589  014616  005237  003502          11$:    INC     E.WC            ;INCREMENT WORD COUNT
3590  014622  100713                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3591  014624  001004                          BNE     12$             ;CHECK IF LAST WORD
3592  014626  012737  000220  003510          MOV     #OR!BAI,E.CS2   ;LOAD EXPECTED COMMAND STATUS REG. 2
3593  014634  000706                          BR      4$              ;PROCESS THE LAST WORD
3594
3595  014636  005037  003502          12$:    CLR     E.WC            ;ADJUST WORD COUNT
3596  014642  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3597  014646  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3598  014654  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3599  014662  005300                          DEC     R0
3600  014664  001370                          BNE     15$
3601  014666  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3602  014674  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3603  014702  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3604  014710  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
3605  014716  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3606  014724  001401                          BEQ     16$             ;YES, CHECK CS2
3607  014726  104063                          ERROR   63              ;CS1 INCORRECT
3608  014730  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3609  014736  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3610  014740  104064                          ERROR   64              ;CS2 INCORRECT
3611  014742  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3612  014750  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3613  014752  104065                          ERROR   65              ;BUS ADDRESS INCORRECT
3614  014754  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3615  014762  001401                          BEQ     19$             ;YES, CHECK DATA
3616  014764  104066                          ERROR   66              ;WORD COUNT INCORRECT
3617  014766  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBERS OF WORDS LOADED
3618  014772  013737  067032  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3619  015000  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINT OUT
3620  015004  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3621  015012  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
3622  015020  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3623  015026  001401                          BEQ     26$             ;YES, CONTINUE
3624  015030  104067                          ERROR   67              ;DATA BUFFER INCORRECT
3625  015032  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3626  015040  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3627  015044  001015                          BNE     28$             ;NO, GET CS2
3628  015046  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3629  015052  005300                  27$:    DEC     R0
3630  015054  001376                          BNE     27$
3631  015056  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3632  015064  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3633  015070  001003                          BNE     28$             ;NO, CONTINUE
3634  015072  012737  000120  003510          MOV     #IR!BAI,E.CS2   ;LOAD EXPECTED CS2
3635  015100  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3636  015106  001401                          BEQ     29$             ;YES, CHECK CS2
3637  015110  104070                          ERROR   70              ;CS1 INCORRECT
3638  015112  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
```

```
3639  015120  001401                          BEQ     30$             ;YES, GET NEXT WORD
3640  015122  104071                          ERROR   71              ;CS2 INCORRECT
3641  015124  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3642  015130  005301                          DEC     R1              ;DECREMENT WORDS READ
3643  015132  001324                          BNE     25$             ;CHECK IF ALL WORDS READ
3644
3645                                  ;;*****************************************************************
3646                                  ;*TEST 16       NON-EXISTENT MEMORY
3647                                  ;*
3648                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR,  PUT CONTROLLER
3649                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3650                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3651                                  ;*      SPECIFY A ONE WORD DATA TO A NON-EXISTENT ADDRESS
3652                                  ;*      (760000) AND MAKE SURE THE NON-EXISTENT  MEMORY ERROR
3653                                  ;*      OCCURS IN THE RK611 CONTROLLER.
3654                                  ;*
3655                                  ;;*****************************************************************
3656  015134  000004                  TST16:  SCOPE
3657  015136  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3658  015144  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3659  015150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3660  015156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3661  015164  012737  160002  003504          MOV     #160002,E.BA    ;LOAD BUS ADDRESS
3662  015172  012762  160000  000004          MOV     #160000,RKBA(R2)
3663  015200  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
3664  015206  012762  177676  000002          MOV     #-66.,RKWC(R2)
3665  015214  012737  101626  003500          MOV     #CERR!RDY!BA16!BA17!WRHEAD&^C<GO>,E.CS1
3666  015222  012762  001427  000000          MOV     #BA17!BA16!WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3667  015230  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3668                                                                  ;  INDEX PULSE
3669  015234  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3670  015242  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3671  015250  005300                          DEC     R0
3672  015252  001370                          BNE     1$
3673  015254  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3674  015260  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3675  015266  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3676  015274  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3677  015302  005300                          DEC     R0
3678  015304  001370                          BNE     2$
3679  015306  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3680  015314  012700  000045                  MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3681  015320  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3682  015326  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3683  015334  005300                          DEC     R0
3684  015336  001370                          BNE     5$
3685  015340  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3686  015346  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3687  015354  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3688  015362  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3689  015370  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG.
3690  015376  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG.
3691  015402  012737  004100  003510          MOV     #IR!NEM,E.CS2   ;LOAD EXPECTED CS2
3692  015410  032737  000200  003450          BIT     #OR,T.CS2
3693  015416  001403                          BEQ     7$
3694  015420  052737  000200  003510          BIS     #OR,E.CS2
```

```
3695  015426  023737  003500  003440  7$:     CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3696  015434  001401                          BEQ     8$              ;YES, CHECK CS2
3697  015436  104072                          ERROR   72              ;CS1 INCORRECT
3698  015440  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3699  015446  001401                          BEQ     9$              ;YES, CHECK ERROR REG.
3700  015450  104073                          ERROR   73              ;CS2 INCORRECT
3701  015452  023737  003514  003454  9$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3702  015460  001401                          BEQ     10$             ;CHECK BUS ADDRESS
3703  015462  104074                          ERROR   74              ;ERROR REG INCORRECT
3704  015464  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3705  015472  001401                          BEQ     11$             ;YES, CHECK WORD COUNT
3706  015474  104075                          ERROR   75              ;BUS ADDRESS INCORRECT
3707  015476  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG.
3708  015504  001401                          BEQ     12$             ;YES, CLEAR RK611
3709  015506  104076                          ERROR   76              ;WORD COUNT INCORRECT
3710  015510  012762  100000  000000  12$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3711  015516  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3712  015524  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3713  015532  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
3714  015540  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3715  015546  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1
3716  015554  001401                          BEQ     15$             ;YES, CHECK CS2
3717  015556  104077                          ERROR   77              ;CS1 INCORRECT
3718  015560  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF MEM CLEARED
3719  015566  001401                          BEQ     TST17           ;YES, GO ON TO NEXT TEST
3720  015570  104100                          ERROR   100             ;CS2 INCORRECT
3721
3722                                          ;;*****************************************************************
3723                                          ;*TEST 17       BUS ADDRESS BIT 16
3724                                          ;*
3725                                          ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3726                                          ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO  AN RK06
3727                                          ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3728                                          ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 200000.
3729                                          ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
3730                                          ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 177776.
3731                                          ;*      CHECK BUS ADDRESS AND WORD COUNT.
3732                                          ;*
3733                                          ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 32K
3734                                          ;*             OF MEMORY IS ON THE SYSTEM.
3735                                          ;*
3736                                          ;*****************************************************************
3737  015572  000004                  TST17:  SCOPE
3738  015574  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3739  015602  005737  046366                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
3740  015606  100004                          BPL     1$              ;NO, BYPASS TEST
3741  015610  022737  002000  046634          CMP     #2000,$LSTBK    ;CHECK IF ENOUGH MEMORY
3742  015616  103417                          BLO     2$              ;YES, DO TEST
3743  015620                          1$:
3744  015620  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
3745  015626  005227  177777                  INC     #-1             ;ONLY DO ONCE
3746  015632  001007                          BNE     64$             ;NO, GO TO NEXT TEST
3747  015634  104401  055004                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
3748  015640  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
3749  015644  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3750  015646  104401  055014                  TYPE    ,TSTBY2
```

```
3751  015652  000137  016706          64$:    JMP     TST20           ;GO TO NEXT TEST
3752
3753  015656  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3754  015662  012737  002000  172354          MOV     #2000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3755  015670  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3756  015674  013737  067032  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3757  015702  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3758  015706  012737  015714  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3759                                                                  ;  SUBTEST LOOP
3760
3761  015714                          3$:
3762  015714  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3763  015722  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3764  015730  012762  177777  000002          MOV     #-1,RKWC(R2)
3765  015736  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3766  015744  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3767  015752  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3768  015756  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3769  015764  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3770  015772  005300                          DEC     R0
3771  015774  001370                          BNE     5$
3772  015776  012700  000                     MOV     #4,R0           ;SIMULATE INDEX PULSE
3773  016002  012762  000040  000026          MOV     #DMD!MIND,RKMR1(R2)
3774  016010  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3775  016016  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3776  016024  005300                          DEC     R0
3777  016026  001370                          BNE     6$
3778  016030  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3779  016036  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3780  016042  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3781  016050  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3782  016056  005300                          DEC     R0
3783  016060  001370                          BNE     7$
3784  016062  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3785  016070  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3786  016076  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3787  016104  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3788  016110  005300                  8$:     DEC     R0
3789  016112  001376                          BNE     8$
3790  016114  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3791  016122  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3792  016130  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3793  016136  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3794  016142  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3795  016150  001401                          BEQ     10$             ;YES, CHECK CS2
3796  016152  104101                          ERROR   101             ;CS1 INCORRECT
3797  016154  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3798  016162  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3799  016164  104102                          ERROR   102             ;CS2 INCORRECT
3800  016166  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3801  016174  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3802  016176  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3803  016200  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3804  016206  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3805  016210  104104                          ERROR   104             ;WORD COUNT INCORRECT
3806  016212  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
```

```
3807  016220  013737  067032  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3808  016226  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3809  016234  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3810  016236  104105                          ERROR   105             ;DATA INCORRECT
3811  016240  104415                  15$:    SCOPI                   ;CHECK IF LOOP ON ERROR
3812  016242  012737  001777  172354          MOV     #2000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
3813  016250  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3814  016254  013737  067032  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
3815  016262  013737  067034  140100          MOV     NPRBUF+2,140100
3816  016270  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3817  016274  012737  016302  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
3818                                                                  ;  SUBTEST LOOP
3819
3820  016302                          20$:
3821  016302  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3822  016310  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3823  016316  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
3824  016324  012762  177776  000002          MOV     #-2,RKWC(R2)
3825  016332  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
3826  016336  012762  177776  000004          MOV     #177776,RKBA(R2)
3827  016344  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3828  016352  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
3829  016360  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3830  016364  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
3831  016372  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3832  016400  005300                          DEC     R0
3833  016402  001370                          BNE     21$
3834  016404  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3835  016410  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3836  016416  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
3837  016424  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3838  016432  005300                          DEC     R0
3839  016434  001370                          BNE     22$
3840  016436  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3841  016444  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
3842  016450  012700  000045          23$:    MOV     #37.,R0
3843  016454  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
3844  016462  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3845  016470  005300                          DEC     R0
3846  016472  001370                          BNE     24$
3847  016474  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3848  016502  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3849  016510  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3850  016516  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
3851  016522  001404                          BEQ     26$             ;NO, GET CS2
3852  016524  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3853  016530  005300                  25$:    DEC     R0
3854  016532  001376                          BNE     25$
3855  016534  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
3856  016542  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3857  016550  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
3858  016556  001401                          BEQ     28$             ;YES, CHECK CS2
3859  016560  104101                          ERROR   101             ;CS1 INCORRECT
3860  016562  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
3861  016570  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
3862  016572  104102                          ERROR   102             ;CS2 INCORRECT
```

```
  3863  016574  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
  3864  016602  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
  3865  016604  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
  3866  016606  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
  3867  016614  001401                          BEQ     31$             ;YES, GET TEXT WORD
  3868  016616  104104                          ERROR   104             ;WORD COUNT INCORRECT
  3869  016620  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
  3870  016626  005237  003502                  INC     E.WC            ;  WORD COUNT
  3871  016632  005301                          DEC     R1              ;CHECK IF FINISHED
  3872  016634  001305                          BNE     23$             ;NO, GET SECOND WORD
  3873  016636  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
  3874  016642  012703  067032                  MOV     #NPRBUF,R3      ;  DATA COMPARE
  3875  016646  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
  3876  016654  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
  3877  016660  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
  3878  016666  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
  3879  016670  104105                          ERROR   105             ;DATA BUFFER INCORRECT
  3880  016672  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
  3881  016674  001364                          BNE     35$             ;NO READ SECOND WORD
  3882  016676  104415                          SCOPE1                  ;CHECK IF LOOP ON ERROR
  3883  016700  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
  3884
  3885                                  ;;*****************************************************************
  3886                                  ;*TEST 20       BUS ADDRESS BIT 17
  3887                                  ;*
  3888                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
  3889                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
  3890                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
  3891                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 400000.
  3892                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
  3893                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 377776.
  3894                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
  3895                                  ;*
  3896                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
  3897                                  ;*             OF MEMORY IS ON THE SYSTEM.
  3898                                  ;*
  3899                                  ;;*****************************************************************
  3900  016706  000004                  TST20:  SCOPE
  3901  016710  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
  3902  016716  005737  046366                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
  3903  016722  100004                          BPL     1$              ;NO, BYPASS TEST
  3904  016724  022737  004000  046634          CMP     #4000,$LSTBK    ;CHECK IF ENOUGH MEMORY
  3905  016732  103417                          BLO     2$              ;YES, DO TEST
  3906  016734                          1$:
  3907  016734  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
  3908  016742  005227  177777                  INC     #-1             ;ONLY DO ONCE
  3909  016746  001007                          BNE     64$             ;NO, GO TO NEXT TEST
  3910  016750  104401  055004                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
  3911  016754  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
  3912  016760  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
  3913  016762  104401  055014                  TYPE    ,TSTBY2
  3914  016766  000137  020022          64$:    JMP     TST21           ;GO TO NEXT TEST
  3915
  3916  016772  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
  3917  016776  012737  004000  172354          MOV     #4000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
  3918  017004  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
```

```
3919  017010  013737  067032  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3920  017016  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3921  017022  012737  017030  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3922                                                                  ;  SUBTEST LOOP
3923
3924  017030                          3$:
3925  017030  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3926  017036  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3927  017044  012762  177777  000002          MOV     #-1,RKWC(R2)
3928  017052  012737  001027  003500          MOV     #BA17!RHEAD,E.CS1 ;LOAD COMMAND
3929  017060  012762  001027  000000          MOV     #BA17!RHEAD,RKCS1(R2)
3930  017066  012700  000312                  MOV     #50,#4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3931  017072  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3932  017100  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3933  017106  005300                          DEC     R0
3934  017110  001370                          BNE     5$
3935  017112  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3936  017116  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3937  017124  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3938  017132  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3939  017140  005300                          DEC     R0
3940  017142  001370                          BNE     6$
3941  017144  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3942  017152  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3943  017156  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3944  017164  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3945  017172  005300                          DEC     R0
3946  017174  001370                          BNE     7$
3947  017176  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3948  017204  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3949  017212  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3950  017220  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3951  017224  005300                  8$:     DEC     R0
3952  017226  001376                          BNE     8$
3953  017230  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3954  017236  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3955  017244  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3956  017252  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3957  017256  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3958  017264  001401                          BEQ     10$             ;YES, CHECK CS2
3959  017266  104101                          ERROR   101             ;CS1 INCORRECT
3960  017270  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3961  017276  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3962  017300  104102                          ERROR   102             ;CS2 INCORRECT
3963  017302  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3964  017310  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3965  017312  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3966  017314  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3967  017322  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3968  017324  104104                          ERROR   104             ;WORD COUNT INCORRECT
3969  017326  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3970  017334  013737  067032  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3971  017342  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3972  017350  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3973  017352  104105                          ERROR   105             ;DATA INCORRECT
3974  017354  104415                  15$:    SCOPE                   ;CHECK IF LOOP ON ERROR
```

```
3975  017356  012737  003777  172354          MOV     #4000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
3976  017364  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3977  017370  013737  067032  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
3978  017376  013737  067034  140100          MOV     NPRBUF+2,140100
3979  017404  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3980  017410  012737  017416  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
3981                                                                  ;  SUBTEST LOOP
3982
3983  017416                          20$:
3984  017416  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3985  017424  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3986  017432  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
3987  017440  012762  177776  000002          MOV     #-2,RKWC(R2)
3988  017446  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
3989  017452  012762  177776  000004          MOV     #177776,RKBA(R2)
3990  017460  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
3991  017466  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3992  017474  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3993  017500  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
3994  017506  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3995  017514  005300                          DEC     R0
3996  017516  001370                          BNE     21$
3997  017520  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3998  017524  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3999  017532  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
4000  017540  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4001  017546  005300                          DEC     R0
4002  017550  001370                          BNE     22$
4003  017552  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4004  017560  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
4005  017564  012700  000045          23$:    MOV     #37.,R0
4006  017570  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
4007  017576  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4008  017604  005300                          DEC     R0
4009  017606  001370                          BNE     24$
4010  017610  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4011  017616  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4012  017624  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4013  017632  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
4014  017636  001404                          BEQ     26$             ;NO, GET CS2
4015  017640  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4016  017644  005300                  25$:    DEC     R0
4017  017646  001376                          BNE     25$
4018  017650  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4019  017656  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4020  017664  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
4021  017672  001401                          BEQ     28$             ;YES, CHECK CS2
4022  017674  104101                          ERROR   101             ;CS1 INCORRECT
4023  017676  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
4024  017704  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
4025  017706  104102                          ERROR   102             ;CS2 INCORRECT
4026  017710  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4027  017716  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
4028  017720  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
4029  017722  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4030  017730  001401                          BEQ     31$             ;YES, GET TEXT WORD
```

```
4031  017732  104104                          ERROR   104             ;WORD COUNT INCORRECT
4032  017734  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4033  017742  005237  003502                  INC     E.WC            ;  WORD COUNT
4034  017746  005301                          DEC     R1              ;CHECK IF FINISHED
4035  017750  001305                          BNE     23$             ;NO, GET SECOND WORD
4036  017752  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
4037  017756  012703  067032                  MOV     #NPRBUF,R3      ;  DATA COMPARE
4038  017762  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4039  017770  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4040  017774  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
4041  020002  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
4042  020004  104105                          ERROR   105             ;DATA BUFFER INCORRECT
4043  020006  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
4044  020010  001364                          BNE     35$             ;NO READ SECOND WORD
4045  020012  104415                          SCOPE1                  ;CHECK IF LOOP ON ERROR
4046  020014  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4047
4048                                  ;;*****************************************************************
4049                                  ;TEST 21        ADDRESSING GREATER THAN 96K
4050                                  ;*
4051                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4052                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4053                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
4054                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 600000.
4055                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
4056                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 577776.
4057                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
4058                                  ;*
4059                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 96K
4060                                  ;*             OF MEMORY IS ON THE SYSTEM.
4061                                  ;*
4062                                  ;;*****************************************************************
4063  020022  000004                  TST21:  SCOPE
4064  020024  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4065  020032  005737  046366                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
4066  020036  100004                          BPL     1$              ;NO, BYPASS TEST
4067  020040  022737  006000  046634          CMP     #6000,$LSTBK    ;CHECK IF ENOUGH MEMORY
4068  020046  103417                          BLO     2$              ;YES, DO TEST
4069  020050                          1$:
4070  020050  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4071  020056  005227  177777                  INC     #-1             ;ONLY DO ONCE
4072  020062  001007                          BNE     64$             ;NO, GO TO NEXT TEST
4073  020064  104401  055004                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4074  020070  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4075  020074  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4076  020076  104401  055014                  TYPE    ,TSTBY2
4077  020102  000137  021136          64$:    JMP     †ST22           ;GO TO NEXT TEST
4078
4079  020106  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
4080  020112  012737  006000  172354          MOV     #6000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
4081  020120  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
4082  020124  013737  067032  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
4083  020132  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
4084  020136  012737  020144  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
4085                                                                  ;  SUBTEST LOOP
4086
```

```
4087  020144                                  3$:
4088  020144  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4089  020152  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4090  020160  012762  177777  000002                MOV     #-1,RKWC(R2)
4091  020166  012737  001427  003500                MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
4092  020174  012762  001427  000000                MOV     #BA16!BA17!WRHEAD,RKCS1(R2)
4093  020202  012700  000312                      MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4094  020206  012762  000440  000026  5$:         MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4095  020214  012762  000040  000026                MOV     #DMD,RKMR1(R2)
4096  020222  005300                                DEC     R0
4097  020224  001370                                BNE     5$
4098  020226  012700  000004                      MOV     #4,R0           ;SIMULATE INDEX PULSE
4099  020232  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
4100  020240  012762  000640  000026  6$:         MOV     #DMD!MIND!MCLK,RKMR1(R2)
4101  020246  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
4102  020254  005300                                DEC     R0
4103  020256  001370                                BNE     6$
4104  020260  012762  000040  000026                MOV     #DMD,RKMR1(R2)
4105  020266  012700  000045                      MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4106  020272  012762  000440  000026  7$:         MOV     #DMD!MCLK,RKMR1(R2)
4107  020300  012762  000040  000026                MOV     #DMD,RKMR1(R2)
4108  020306  005300                                DEC     R0
4109  020310  001370                                BNE     7$
4110  020312  016237  000000  003440                MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4111  020320  016237  000004  003444                MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4112  020326  016237  000002  003442                MOV     RKWC(R2),T.WC   ;STORE WOR
4113  020334  012700  000024                      MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4114  020340  005300                          8$:   DEC     R0
4115  020342  001376                                BNE     8$
4116  020344  016237  000010  003450                MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4117  020352  012737  000300  003510                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4118  020360  012737  000002  003504                MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
4119  020366  005037  003502                       CLR     E.WC            ;LOAD EXPECTED WORD COUNT
4120  020372  023737  003500  003440                CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
4121  020400  001401                                BEQ     10$             ;YES, CHECK CS2
4122  020402  104101                                ERROR   101             ;CS1 INCORRECT
4123  020404  023737  003510  003450  10$:         CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
4124  020412  001401                                BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
4125  020414  104102                                ERROR   102             ;CS2 INCORRECT
4126  020416  023737  003504  003444  11$:         CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
4127  020424  001401                                BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
4128  020426  104103                                ERROR   103             ;BUS ADDRESS INCORRECT
4129  020430  023737  003502  003442  12$:         CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
4130  020436  001401                                BEQ     13$             ;YES, CHECK DATA BUFFER
4131  020440  104104                                ERROR   104             ;WORD COUNT INCORRECT
4132  020442  016237  000024  003462  13$:         MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4133  020450  013737  067032  003522                MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
4134  020456  023737  003522  003462                CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4135  020464  001401                                BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
4136  020466  104105                                ERROR   105             ;DATA INCORRECT
4137  020470  104415                          15$:  SCOP1                   ;CHECK IF LOOP ON ERROR
4138  020472  012737  005777  172354                MOV     #6000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
4139  020500  005237  177572                       INC     SR0             ;TURN ON MEMORY MANAGEMENT
4140  020504  013737  067032  140076                MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
4141  020512  013737  067034  140100                MOV     NPRBUF+2,140100
4142  020520  005037  177572                       CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
```

```
4143  020524  012737  020532  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
4144                                                                  ;  SUBTEST LOOP
4145
4146  020532                          20$:
4147  020532  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4148  020540  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4149  020546  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
4150  020554  012762  177776  000002          MOV     #-2,RKWC(R2)
4151  020562  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
4152  020566  012762  177776  000004          MOV     #177776,RKBA(R2)
4153  020574  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
4154  020602  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
4155  020610  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4156  020614  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
4157  020622  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4158  020630  005300                          DEC     R0
4159  020632  001370                          BNE     21$
4160  020634  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4161  020640  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4162  020646  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
4163  020654  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4164  020662  005300                          DEC     R0
4165  020664  001370                          BNE     22$
4166  020666  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4167  020674  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
4168  020700  012700  000045          23$:    MOV     #37.,R0
4169  020704  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
4170  020712  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4171  020720  005300                          DEC     R0
4172  020722  001370                          BNE     24$
4173  020724  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4174  020732  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4175  020740  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4176  020746  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
4177  020752  001404                          BEQ     26$             ;NO, GET CS2
4178  020754  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4179  020760  005300                  25$:    DEC     R0
4180  020762  001376                          BNE     25$
4181  020764  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4182  020772  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4183  021000  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
4184  021006  001401                          BEQ     28$             ;YES, CHECK CS2
4185  021010  104101                          ERROR   101             ;CS1 INCORRECT
4186  021012  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
4187  021020  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
4188  021022  104102                          ERROR   102             ;CS2 INCORRECT
4189  021024  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4190  021032  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
4191  021034  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
4192  021036  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4193  021044  001401                          BEQ     31$             ;YES, GET TEXT WORD
4194  021046  104104                          ERROR   104             ;WORD COUNT INCORRECT
4195  021050  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4196  021056  005237  003502                  INC     E.WC            ;  WORD COUNT
4197  021062  005301                          DEC     R1              ;CHECK IF FINISHED
4198  021064  001305                          BNE     23$             ;NO, GET SECOND WORD
```

```
4199  021066  012700  000002                    MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
4200  021072  012703  067032                    MOV     #NPRBUF,R3      ;  DATA COMPARE
4201  021076  016237  000024  003462  35$:      MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4202  021104  012337  003522                    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4203  021110  023737  003522  003462            CMP     E.DB,T.DB       ;CHECK IF CORRECT
4204  021116  001401                            BEQ     36$             ;YES, CHECK IF FINISHED
4205  021120  104105                            ERROR   105             ;DATA BUFFER INCORRECT
4206  021122  005300                    36$:     DEC     R0              ;CHECK IF FINISHED
4207  021124  001364                            BNE     35$             ;NO READ SECOND WORD
4208  021126  104415                            SCOP1                   ;CHECK IF LOOP ON ERROR
4209  021130  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4210
4211                                    ;;**********************************************************************
4212                                    ;*TEST 22       UNIBUS PARITY ERROR
4213                                    ;*
4214                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4215                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4216                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4217                                    ;*      SPECIFY A ONE WORD DATA TRANSFER FROM A LOCATION
4218                                    ;*      WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY ERROR
4219                                    ;*      OCCURS.
4220                                    ;*
4221                                    ;*      REPEAT FOR A ONE WORD DATA TRANSFER FROM THE
4222                                    ;*      LOCATION PRIOR TO THE LOCATION WITH BAD PARITY.
4223                                    ;*      MAKE SURE UNIBUS PARITY ERROR DOES NOT OCCUR.  REPEAT
4224                                    ;*      FOR A ONE WORD DATA TRANSFER FROM THE LOCATION AFTER
4225                                    ;*      THE LOCATION WITH BAD PARITY.  MAKE SURE UNIBUS PARITY
4226                                    ;*      ERROR DOES NOT OCCUR.
4227                                    ;*
4228                                    ;*      REPEAT FOR A TWO WORD DATA TRANSFER STARTING WITH
4229                                    ;*      THE ADDRESS PRIOR TO THE LOCATION WITH BAD PARITY.
4230                                    ;*      MAKE SURE UNIBUS PARITY ERROR DOES OCCUR.
4231                                    ;*
4232                                    ;*      NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
4233                                    ;*              EXISTS FOR SPECIFIED LOCATION AND IS NOT
4234                                    ;*              RUN ON AN 11/70.
4235                                    ;*
4236                                    ;**********************************************************************
4237
4238  021136  000004                    T$T22:  SCOPE
4239  021140  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4240  021146  005737  003636                    TST     PARPRE          ;CHECK IF MEMORY PARITY AVAILABLE
4241  021152  001017                            BNE     1$              ;YES, DO TEST
4242  021154  012737  000001  001200            MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4243  021162  005227  177777                    INC     #-1             ;ONLY DO ONCE
4244  021166  001007                            BNE     64$             ;NO, GO TO NEXT TEST
4245  021170  104401  055004                    TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4246  021174  013746  001220                    MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4247  021200  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4248  021202  104401  055014                    TYPE    ,TSTBY2
4249  021206  000137  022374            64$:    JMP     T$T23           ;GO TO NEXT TEST
4250
4251  021212  013702  001270            1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
4252  021216  004737  044706                    JSR     PC,WRTPAR       ;GENERATE BAD PARITY
4253  021222  012737  021230  001110            MOV     #2$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
4254                                                                    ;  SUBTEST LOOP
```

```
4255
4256  021230                                  2$:
4257  021230  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4258  021236  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4259  021244  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT NEG
4260  021252  005037  003502                    CLR     E.WC
4261  021256  012762  067270  000004            MOV     #BAOPAR,RKBA(R2);LOAD BUS ADDRESS
4262  021264  012737  067272  003504            MOV     #BAOPAR+2,E.BA
4263  021272  012737  100226  003500            MOV     #CERR!RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
4264  021300  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
4265  021306  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4266  021312  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4267  021320  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4268  021326  005300                            DEC     R0
4269  021330  001370                            BNE     5$
4270  021332  012700  000004                    MOV     #4,R0           ;SIMULATE INDEX PULSE
4271  021336  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4272  021344  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
4273  021352  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4274  021360  005300                            DEC     R0
4275  021362  001370                            BNE     6$
4276  021364  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4277  021372  012700  000045                    MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4278  021376  012762  000440  000026  7$:       MOV     #DMD!MCLK,RKMR1(R2)
4279  021404  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4280  021412  005300                            DEC     R0
4281  021414  001370                            BNE     7$
4282  021416  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG.1
4283  021424  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4284  021432  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4285  021440  016237  000014  003454            MOV     RKER(R2),T.ER   ;STORE ERROR REG
4286  021446  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4287  021452  005300                    8$:     DEC     R0
4288  021454  001376                            BNE     8$
4289  021456  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG.2
4290  021464  012737  020300  003510            MOV     #IR!OR!UPE,E.CS2 ;LOAD EXPECTED CS2
4291  021472  005037  003514                    CLR     E.ER            ;LOAD EXPECTED ERROR REG
4292  021476  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4293  021504  001401                            BEQ     .0$             ;YES CHECK CS2
4294  021506  104106                            ERROR   .06             ;CS1 INCORRECT
4295  021510  023737  003510  003450  10$:      CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4296  021516  001401                            BEQ     11$             ;YES, CHECK BUS ADDRESS
4297  021520  104107                            ERROR   107             ;CS2 INCORRECT
4298  021522  023737  003504  003444  11$:      CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4299  021530  001401                            BEQ     12$             ;YES, CHECK WORD COUNT
4300  021532  104110                            ERROR   110             ;BUS ADDRESS INCORRECT
4301  021534  023737  003502  003442  12$:      CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4302  021542  001401                            BEQ     13$             ;YES,CHECK ERROR REG.
4303  021544  104111                            ERROR   111             ;WORD COUNT INCORRECT
4304  021546  023737  003514  003454  13$:      CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4305  021554  001401                            BEQ     14$             ;YES,CLEAR ERROR
4306  021556  104116                            ERROR   116             ;ERROR REG CORRECT
4307  021560  012762  100000  000000  14$:      MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4308  021566  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
4309  021574  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND STATUS REG. 2
4310  021602  012737  000200  003500            MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
```

```
 4311  021610  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 4312  021616  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4313  021624  001401                          BEQ     15$             ;YES, CHECK CS2
 4314  021626  104117                          ERROR   117             ;CS1 INCORRECT
 4315  021630  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
 4316  021636  001401                          BEQ     16$             ;YES, CONTINUE
 4317  021640  104120                          ERROR   120             ;CS2 INCORRECT
 4318  021642  104415                  16$:    SCOP1                   ;CHECK IF LOOP ON ERROR
 4319  021644  012737  021652  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 4320                                                                  ;  SUBTEST LOOP
 4321
 4322  021652                          20$:
 4323  021652  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4324  021660  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611-IN-DIAGNOSTIC MODE
 4325  021666  012762  177776  000002          MOV     #-2,RKWC(R2)    ;LOAD WORD COUNT REG
 4326  021674  012737  177777  003502          MOV     #-1,E.WC
 4327  021702  012762  067266  000004          MOV     #BADPAR-2,RKBA(R2) ;LOAD BUS ADDRESS REG
 4328  021710  012737  067270  003504          MOV     #BADPAR,E.BA
 4329  021716  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
 4330  021724  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
 4331  021732  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4332  021736  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
 4333  021744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4334  021752  005300                          DEC     R0
 4335  021754  001370                          BNE     21$
 4336  021756  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4337  021762  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4338  021770  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4339  021776  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4340  022004  005300                          DEC     R0
 4341  022006  001370                          BNE     22$
 4342  022010  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4343  022016  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
 4344  022022  012762  000440  000026  23$:    MOV     #DMD!MCLK,RKMR1(R2)
 4345  022030  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4346  022036  005300                          DEC     R0
 4347  022040  001370                          BNE     23$
 4348  022042  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4349  022050  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
 4350  022056  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4351  022064  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4352  022070  005300                  24$:    DEC     R0
 4353  022072  001376                          BNE     24$
 4354  022074  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4355  022102  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4356  022110  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4357  022116  001401                          BEQ     25$             ;YES,CHECK CS2
 4358  022120  104112                          ERROR   112             ;CS1 INCORRECT
 4359  022122  023737  003510  003450  25$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4360  022130  001401                          BEQ     26$             ;YES, CHECK BUS ADDRESS
 4361  022132  104113                          ERROR   113             ;CS2 INCORRECT
 4362  022134  023737  003504  003444  26$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4363  022142  001401                          BEQ     27$             ;YES, CHECK WORD COUNT
 4364  022144  104114                          ERROR   114             ;BUS ADDRESS INCORRECT
 4365  022146  023737  003502  003442  27$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4366  022154  001401                          BEQ     28$             ;YES, DO NEXT NPR TRANSFER
```

```
4367  022156  104115                          ERROR   115             ;WORD COUNT INCORRECT
4368  022160  012700  000045          28$:    MOV     #37,R0          ;ISSUE 1 NPR TRANSFER
4369  022164  012762  000440  000026  30$:    MOV     #DMD!MCLK,RKMR1(R2)
4370  022172  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4371  022200  005300                          DEC     R0
4372  022202  001370                          BNE     30$
4373  022204  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4374  022212  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4375  022220  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4376  022226  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4377  022234  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
4378  022242  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4379  022250  012737  020300  003510          MOV     #OR!IR!UPE,E.CS2;LOAD EXPECTED CS2
4380  022256  005237  003502                  INC     E.WC            ;LOAD EXPECTED WORD COUNT
4381  022262  062737  000002  003504          ADD     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
4382  022270  005037  003514                  CLR     E.ER            ;LOAD EXPECTED WORD COUNT
4383  022274  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4384  022302  001401                          BEQ     31$             ;YES, CHECK CS2
4385  022304  104106                          ERROR   106             ;CS1 INCORRECT
4386  022306  023737  003510  003450  31$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4387  022314  001401                          BEQ     32$             ;YES, CHECK BUS ADDRESS
4388  022316  104107                          ERRCP   107             ;CS2 INCORRECT
4389  022320  023737  003504  003444  32$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4390  022326  001401                          BEQ     33$             ;YES, CHECK WORD COUNT
4391  022330  104110                          ERROR   110             ;BUS ADDRESS INCORRECT
4392  022332  023737  003502  003442  33$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4393  022340  001401                          BEQ     34$             ;YES, CHECK ERROR REG
4394  022342  104111                          ERROR   111             ;WORD COUNT INCORRECT
4395  022344  023737  003514  003454  34$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
4396  022352  001401                          BEQ     35$             ;YES, CONTINUE
4397  022354  104116                          ERROR   116             ;WORD COUNT INCORRECT
4398  022356  104415                  35$:    SCOP1                   ;CHECK IF WORD ON ERROR
4399  022360  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4400  022366  012737  000000  067270          MOV     #0,BADPAR       ;WRITE GOOD PARITY
4401
4402                                  ;;*****************************************************************
4403                                  ;*TEST 23       SILO FILL IN 18 BIT MODE
4404                                  ;*
4405                                  ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
4406                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4407                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0. DRIVE 0,
4408                                  ;*      SPECIFY 66  WORD DATA TRANSFER.  CLOCK
4409                                  ;*      ALL 66 WORD INTO THE SILO.   CHECK THAT ALL 66
4410                                  ;*      WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).
4411                                  ;*
4412                                  ;*****************************************************************
4413  022374  000004                  ST23:   SCOPE
4414  022376  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4415  022404  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4416  022410  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4417  022416  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
4418  022424  012762  177676  000002          MOV     #-66.,RKWC(R2)  ;LOAD WORD COUNT
4419  022432  012737  177677  003502          MOV     #-65.,E.WC
4420  022440  012762  067032  000004          MOV     #NPRBUF,RKBA(R2);LOAD BUS ADDRESS
4421  022446  012737  067034  003504          MOV     #NPRBUF+2,E.BA
4422  022454  012737  010027  003500          MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
```

```
 4423  022462  012762  010027  000000          MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
 4424  022470  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS DATA
 4425                                                                  ;  INDEX PULSE
 4426  022474  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
 4427  022502  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4428  022510  005300                          DEC     R0
 4429  022512  001370                          BNE     5$
 4430  022514  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4431  022520  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4432  022526  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4433  022534  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4434  022542  005300                          DEC     R0
 4435  022544  001370                          BNE     6$
 4436  022546  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4437  022554  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4438  022562  012701  000102                  MOV     #66.,R1         ;ISSUE 66 NPR TRANSFERS
 4439  022566  012700  000050          7$:     MOV     #40.,R0
 4440  022572  012762  000440  000026  8$:     MOV     #DMD!MCLK,RKMR1(R2)
 4441  022600  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4442  022606  005300                          DEC     R0
 4443  022610  001370                          BNE     8$
 4444  022612  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4445  022620  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG. 2
 4446  022626  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4447  022634  022737  067034  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
 4448  022642  001004                          BNE     10$             ;NO, CONTINUE
 4449  022644  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4450  022650  005300                  9$:     DEC     R0
 4451  022652  001376                          BNE     9$
 4452  022654  016237  000010  003450  10$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4453  022662  005737  003502                  TST     E.WC            ;CHECK IF LAST WORD
 4454  022666  001003                          BNE     11$             ;NO, CONTINUE
 4455  022670  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
 4456  022676  023737  003500  003440  11$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4457  022704  001401                          BEQ     12$             ;YES, CONTINUE
 4458  022706  104121                          ERROR   121             ;CS1 INCORRECT
 4459  022710  023737  003510  003450  12$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4460  022716  001401                          BEQ     13$             ;YES, CONTINUE
 4461  022720  104122                          ERROR   122             ;CS2 INCORRECT
 4462  022722  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4463  022730  001401                          BEQ     14$             ;YES, CONTINUE
 4464  022732  104123                          ERROR   123             ;BUS ADDRESS INCORRECT
 4465  022734  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG CORRECT
 4466  022742  001401                          BEQ     15$             ;YES, CONTINUE
 4467  022744  104124                          ERROR   124             ;WORD COUNT INCORRECT
 4468  022746  062737  000002  003504  15$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
 4469  022754  005237  003502                  INC     E.WC            ;  WORD COUNT
 4470  022760  005301                          DEC     R1              ;CHECK IF SILO FULL
 4471  022762  001301                          BNE     7$              ;NO, GET NEXT WORD
 4472  022764  012700  000120                  MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
 4473  022770  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
 4474  022776  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4475  023004  005300                          DEC     R0
 4476  023006  001370                          BNE     20$
 4477  023010  162737  000002  003504          SUB     #2,E.BA         ;ADJUST BUS ADDRESS AND WORD COUNT
 4478  023016  005037  003502                  CLR     E.WC
```

```
4479  023032  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4480  023036  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4481  023044  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4482  023052  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4483  023060  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4484  023066  001401                          BEQ     21$             ;YES, CONTINUE
4485  023070  104125                          ERROR   125             ;CS1 INCORRECT
4486  023072  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4487  023100  001401                          BEQ     22$             ;YES, CONTINUE
4488  023102  104126                          ERROR   126             ;CS2 INCORRECT
4489  023104  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS INCORRECT
4490  023112  001401                          BEQ     23$             ;YES, CONTINUE
4491  023114  104127                          ERROR   127             ;BUS ADDRESS INCORRECT
4492  023116  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4493  023124  001401                          BEQ     24$             ;YES, CONTINUE
4494  023126  104130                          ERROR   130             ;WORD COUNT INCORRECT
4495  023130  012703  067032          24$:    MOV     #NPRBUF,R3      ;LOAD BUFFER ADDRESS FOR COMPARE
4496  023134  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4497  023142  012701  000102                  MOV     #66.,R1         ;LOAD COUNT
4498  023146  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT
4499  023152  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;GET DATA BUFFER
4500  023160  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4501  023164  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4502  023172  001401                          BEQ     26$             ;YES, CONTINUE
4503  023174  104131                          ERROR   131             ;DATA READ INCORRECT
4504  023176  012700  000050          26$:    MOV     #40.,R0         ;SET STALL
4505  023202  005300                  27$:    DEC     R0              ;RUN STALL TO ZERO
4506  023204  001376                          BNE     27$
4507  023206  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4508  023214  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4509  023222  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
4510  023226  001003                          BNE     28$             ;NO, CONTINUE
4511  023230  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4512  023236  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4513  023244  001401                          BEQ     29$             ;YES, CONTINUE
4514  023246  104132                          ERROR   132             ;CS1 INCORRECT
4515  023250  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4516  023256  001401                          BEQ     30$             ;YES, CONTINUE
4517  023260  104133                          ERROR   133             ;CS2 INCORRECT
4518  023262  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4519  023266  005301                          DEC     R1              ;CHECK IF FINISHED
4520  023270  001330                          BNE     25$             ;NO, CONTINUE
4521
4522                                  ;*****************************************************************
4523                                  ;*TEST 24       BIT 16 AND 17 READING WITH NPR
4524                                  ;*
4525                                  ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
4526                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4527                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4528                                  ;*      SPECIFY ONE WORD DATA TRANSFER FROM A LOCATION
4529                                  ;*      WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY
4530                                  ;*      DOES NOT OCCUR.
4531                                  ;*
4532                                  ;*      NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
4533                                  ;*              ENABLE EXISTS FOR SPECIFIED LOCATION AND IS
4534                                  ;*              NOT RUN ON AN 11/70.
```

```
4535
4536                                    ;*
4537                                    ;;*****************************************************************
4538  023264  000004                    TST24:  SCOPE
4539  023266  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4540  023274  005737  003636                    TST     PARPRE          ;CHECK IF MEMORY PARITY AVAILABLE
4541  023300  001017                            BNE     1$              ;YES, DO TEST
4542  023302  012737  000001  001200            MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4543  023310  005227  177777                    INC     #-1             ;ONLY DO ONCE
4544  023314  001007                            BNE     64$             ;NO, GO TO NEXT TEST
4545  023316  104401  055004                    TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4546  023322  013746  001220                    MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4547  023326  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4548  023330  104401  055014                    TYPE    ,TSTBY2
4549  023334  000137  024110          64$:      JMP     TST25           ;GO TO NEXT TEST
4550
4551  023340  013702  001270          1$:       MOV     $BASE,R2        ;LOAD RK611 BASE
4552  023344  004737  044706                    JSR     PC,WRTPAR       ;GENERATE BAD PARITY
4553  023350  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4554  023356  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
4555  023364  012762  177777  000002            MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
4556  023372  005037  003502                    CLR     E.WC
4557  023376  012762  067270  000004            MOV     #BADPAR,RKBA(R2) ;LOAD BUS ADDRESS
4558  023404  012737  067272  003504            MOV     #BADPAR+2,E.BA
4559  023412  012737  010027  003500            MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
4560  023420  012762  010027  000000            MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
4561  023426  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4562                                                                    ;  INDEX PULSE
4563  023432  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2)
4564  023440  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4565  023446  005300                            DEC     R0
4566  023450  001370                            BNE     5$
4567  023452  012700  000004                    MOV     #4,R0           ;SIMULATE INDEX PULSE
4568  023456  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4569  023464  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
4570  023472  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
4571  023500  005300                            DEC     R0
4572  023502  001370                            BNE     6$
4573  023504  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4574  023512  012737  000300  003510            MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4575  023520  012700  000050                    MOV     #40.,R0         ;ISSUE NPR TRANSFER
4576  023524  012762  000440  000026  8$:       MOV     #DMD!MCLK,RKMR1(R2)
4577  023532  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4578  023540  005300                            DEC     R0
4579  023542  001370                            BNE     8$
4580  023544  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4581  023552  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4582  023560  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4583  023566  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4584  023572  005300                    9$:     DEC     R0
4585  023574  001376                            BNE     9$
4586  023576  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4587  023604  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4588  023612  001401                            BEQ     12$             ;YES, CHECK CS2
4589  023614  104134                            ERROR   134             ;CS1 INCORRECT
4590  023616  023737  003510  003450  12$:      CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
```

```
4591  023624  001401                                BEQ     13$             ;YES, CHECK BUS ADDRESS
4592  023626  104135                                ERROR   135             ;CS2 INCORRECT
4593  023630  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4594  023636  001401                                BEQ     14$             ;YES, CHECK WORD COUNT
4595  023640  104136                                ERROR   136             ;BUS ADDRESS INCORRECT
4596  023642  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4597  023650  001401                                BEQ     15$             ;YES, CONTINUE
4598  023652  104137                                ERROR   137             ;WORD COUNT INCORRECT
4599  023654  012700  000120          15$:    MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
4600  023660  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
4601  023666  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4602  023674  005300                            DEC     R0
4603  023676  001370                            BNE     20$
4604  023700  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
4605  023706  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4606  023714  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4607  023722  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4608  023730  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4609  023736  001401                            BEQ     21$             ;YES, CHECK CS2
4610  023740  104140                            ERROR   140             ;CS1 INCORRECT
4611  023742  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4612  023750  001401                            BEQ     22$             ;YES, CHECK BUS ADDRESS
4613  023752  104141                            ERROR   141             ;CS2 INCORRECT
4614  023754  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4615  023762  001401                            BEQ     23$             ;YES, CHECK WORD COUNT
4616  023764  104142                            ERROR   142             ;BUS ADDRESS INCORRECT
4617  023766  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
4618  023774  001401                            BEQ     24$             ;YES, CHECK DATA
4619  023776  104143                            ERROR   143             ;WORD COUNT INCORRECT
4620  024000  016237  000024  003462  24$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4621  024006  012737  000157  003522          MOV     #157,E.DB       ;LOAD EXPECT DATA
4622  024014  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK TO MAKE SURE CORRECT
4623  024022  001401                            BEQ     26$             ;YES, CONTINUE
4624  024024  104144                            ERROR   144             ;DATA INCORRECT
4625  024026  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4626  024034  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4627  024042  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4628  024050  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4629  024056  001401                            BEQ     29$             ;YES, CHECK SC2
4630  024060  104145                            ERROR   145             ;CS1 INCORRECT
4631  024062  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS1 CORRECT
4632  024070  001401                            BEQ     30$             ;YES, CONTINUE
4633  024072  104146                            ERROR   146             ;CS2 INCORRECT
4634  024074  012737  000000  067270  30$:    MOV     #0,BADPAR       ;WRITE GOOD PARITY
4635  024102  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4636
4637                                    .SBTTL  **MFM READ LOOPBACK TESTS
4638
4639                                    ;;*****************************************************************
4640                                    ;*TEST 25       READ LOOPBACK (PART 1)
4641                                    ;*
4642                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
4643                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4644                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4645                                    ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4646                                    ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
```

```
4647                                    ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4648                                    ;*      FOLLOWING WORDS:
4649                                    ;*
4650                                    ;*              177777
4651                                    ;*              000000
4652                                    ;*              177777
4653                                    ;*
4654                                    ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4655                                    ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4656                                    ;*
4657                                    ;;*****************************************************************
4658  024110  000004                    TST25:  SCOPE
4659  024112  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4660  024120  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
4661  024124  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4662  024132  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4663  024140  012762  000025  000000            MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
4664  024146  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4665  024152  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
4666  024160  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4667  024166  005300                            DEC     R0
4668  024170  001370                            BNE     1$
4669  024172  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4670  024200  012762  000040  000026            MOV     #DMD,RKMR1(R2)
4671  024206  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
4672  024212  005037  003616                    CLR     M1.BIT          ;  PREVIOUS BIT
4673  024216  012700  000341                    MOV     #225.,R0
4674  024222  004737  046156            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
4675  024226  005300                            DEC     R0
4676  024230  001374                            BNE     2$
4677  024232  012737  000001  003614            MOV     #1,PR.BIT
4678  024240  004737  046156                    JSR     PC,RDBIT
4679  024244  012701  000003                    MOV     #3,R1           ;LOAD NUMBER OF WORDS
4680  024250  012703  066752                    MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
4681  024254  012737  000025  003500            MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
4682  024262  012304                    5$:     MOV     (R3)+,R4        ;GET DATA
4683  024264  012700  000020                    MOV     #16.,R0         ;LOAD BIT COUNT
4684  024270  013737  003614  003616  6$:       MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4685  024276  006004                            ROR     R4              ;GET NEXT BIT
4686  024300  103403                            BCS     7$              ;CHECK IF 1
4687  024302  005037  003614                    CLR     PR.BIT          ;NO, ZERO
4688  024306  000403                            BR      8$              ;SIMULATE READ DATA
4689
4690  024310  012737  000001  003614  7$:       MOV     #1,PR.BIT       ;ONE
4691  024316  004737  046156            8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
4692  024322  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
4693  024330  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
4694  024336  001417                            BEQ     9$              ;YES, SIMULATE NEXT BIT
4695  024340  012737  000003  003624            MOV     #3,WRDCNT       ;LOAD WORD COUNT
4696  024346  160137  003624                    SUB     R1,WRDCNT
4697  024352  012737  000020  003622            MOV     #16.,BITCNT     ;LOAD BIT COUNT
4698  024360  160037  003622                    SUB     R0,BITCNT
4699  024364  104150                            ERROR   150             ;CS1 INCORRECT DURING HEADER
4700  024366  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4701  024374  000522                            BR      TST26           ;;GO ON TO NEXT TEST
4702
```

```
4703  024376  005300                    9$:   DEC   R0              ;CHECK IF READY FOR NEXT WORD
4704  024400  001333                          BNE   6$              ;NO, GET NEXT BIT
4705  024402  005301                          DEC   R1              ;CHECK IF HEADER FINISHED
4706  024404  001326                          BNE   5$              ;NO, GET NEXT WORD
4707  024406  012700  000004                  MOV   #4,R0           ;LOAD COUNT FOR POSTAMBLE
4708  024412  013737  003614  003616   15$:   MOV   PR.BIT,M1.BIT   ;STORE LAST BIT
4709  024420  005037  003614                  CLR   PR.BIT          ;LOAD NEXT BIT
4710  024424  004737  046156                  JSR   PC,RDBIT        ;SIMULATE 1 BIT READ
4711  024430  005300                          DEC   R0              ;CHECK IF TIME FOR READY
4712  024432  001367                          BNE   15$             ;NO, CONTINUE WITH POSTAMBLE
4713  024434  016237  000000  003440          MOV   RKCS1(R2),T.CS1 ;GET CURRENT CS1
4714  024442  016237  000010  003450          MOV   RKCS2(R2),T.CS2 ;GET CURRENT CS2
4715  024450  012737  000224  003500          MOV   #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4716  024456  012737  000300  003510          MOV   #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4717  024464  023737  003500  003440          CMP   E.CS1,T.CS1     ;CHECK CS1 CORRECT
4718  024472  001401                          BEQ   16$             ;YES, CHECK CS2
4719  024474  104151                          ERROR 151             ;CS1 INCORRECT
4720  024476  023737  00?~10  003450   16$:   CMP   E.CS2,T.CS2     ;CHECK CS2 CORRECT
4721  024504  001401                          BEQ   17$             ;YES, CHECK DATA
4722  024506  104152                          ERROR 152             ;CS2 INCORRECT
4723  024510  005037  003624           17$:   CLR   WRDCNT          ;INITIALIZE WORD COUNT
4724  024514  012703  066752                  MOV   #HEAD1,R3       ;GET ADDRESS OF DATA
4725  024520  012337  003522           20$:   MOV   (R3)+,E.DB      ;GET EXPECTED DATA
4726  024524  016237  000024  003462          MOV   RKDB(R2),T.DB   ;GET ACTUAL DATA
4727  024532  016237  000000  003440          MOV   RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4728  024540  016237  000010  003450          MOV   RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4729  024546  022737  000002  003624          CMP   #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4730  024554  001003                          BNE   21$             ;NO, CHECK CS1
4731  024556  012737  000100  003510          MOV   #IR,E.CS2       ;STORE EXPECTED CS2
4732  024564  023737  003500  003440   21$:   CMP   E.CS1,T.CS1     ;CHECK CS1 CORRECT
4733  024572  001402                          BEQ   22$             ;YES, CHECK CS2
4734  024574  104153                          ERROR 153             ;CS1 INCORRECT
4735  024576  000421                          BR    TST26           ;;GO ON TO NEXT TEST
4736
4737  024600  023737  003510  003450   22$:   CMP   E.CS2,T.CS2     ;CHECK CS2 CORRECT
4738  024606  001402                          BEQ   23$             ;YES, CHECK DATA
4739  024610  104154                          ERROR 154             ;CS2 INCORRECT
4740  024612  000413                          BR    TST26           ;;GO ON TO NEXT TEST
4741
4742  024614  023737  003522  003462   23$:   CMP   E.DB,T.DB       ;CHECK IF DATA CORRECT
4743  024622  001401                          BEQ   24$             ;YES, GET NEXT HEADER WORD
4744  024624  104155                          ERROR 155             ;DATA INCORRECT
4745  024626  005237  003624           24$:   INC   WRDCNT          ;INCREMENT WORD COUNT
4746  024632  022737  000003  003624          CMP   #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4747  024640  001327                          BNE   20$             ;NO, GET NEXT WORD
4748
4749                                ;;*****************************************************************
4750                                ;*TEST 26       READ LOOPBACK (PART 2)
4751                                ;*
4752                                ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4753                                ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4754                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4755                                ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4756                                ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A ONE,
4757                                ;*      AND A HEADER CONSISTING OF THE THREE
4758                                ;*      FOLLOWING WORDS:
```

```
                                        ;*
                                        ;*              000000
                                        ;*              177777
                                        ;*              000000
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;;*****************************************************************
024642  000004                          TST26:  SCOPE
024644  012737  000144  001200                 MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
024652  013702  001270                 1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
024656  012762  100000  000000                 MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024664  012762  000040  000026                 MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
024672  012762  000025  000000                 MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
024700  012700  000312                 2$:     MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
024704  012762  000440  000026                 MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
024712  012762  000040  000026                 MOV     #DMD,RKMR1(R2)
024720  005300                          3$:     DEC     R0
024722  001370                                  BNE     1$
024724  012762  000140  000026                 MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
024732  012762  000040  000026                 MOV     #DMD,RKMR1(R2)
024740  005037  003614                 4$:     CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
024744  005037  003616                         CLR     M1.BIT          ;  PREVIOUS BIT
024750  012700  000341                         MOV     #<25.*4>,R0
024754  004737  046156                 5$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
024760  005300                                  DEC     R0
024762  001374                                  BNE     5$
024764  012737  000001  003614                 MOV     #1,PR.BIT
024772  004737  046156                         JSR     PC,RDBIT
024776  012701  000003                 6$:     MOV     #3,R1           ;LOAD NUMBER OF WORDS
025002  012703  066760                         MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
025006  012737  000025  003500                 MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
025014  012304                          7$:     MOV     (R3)+,R4        ;GET DATA
025016  012700  000020                         MOV     #16.,R0         ;LOAD BIT COUNT
025022  013737  003614  003616         8$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
025030  006004                                  ROR     R4              ;GET NEXT BIT
025032  103403                                  BCS     9$              ;CHECK IF 1
025034  005037  003614                         CLR     PR.BIT          ;NO, ZERO
025040  000403                                  BR      10$             ;SIMULATE READ DATA
                                        
025042  012737  000001  003614         9$:     MOV     #1,PR.BIT       ;ONE
025050  004737  046156                 10$:    JSR     PC,RDBIT        ;SIMULATE READ DATA
025054  016237  000000  003440                 MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
025062  023737  003500  003440                 CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
025070  001417                                  BEQ     11$             ;YES, SIMULATE NEXT BIT
025072  012737  000003  003624                 MOV     #3,WRDCNT       ;LOAD WORD COUNT
025100  160137  003624                         SUB     R1,WRDCNT
025104  012737  000020  003622                 MOV     #16.,BITCNT     ;LOAD BIT COUNT
025112  160037  003622                         SUB     R0,BITCNT
025116  104150                                  ERROR   150             ;CS1 INCORRECT DURING HEADER
025120  012762  100000  000000                 MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
025126  000522                                  BR      TST27           ;;GO ON TO NEXT TEST
                                        
025130  005300                          11$:    DEC     R0              ;CHECK IF READY FOR NEXT WORD
025132  001333                                  BNE     8$              ;NO, GET NEXT BIT
```

```
4815  025134  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
4816  025136  001326                          BNE     5$              ;NO, GET NEXT WORD
4817  025140  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4818  025144  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4819  025152  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
4820  025156  004737  046156                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4821  025162  005300                          DEC     R0              ;CHECK IF TIME FOR READY
4822  025164  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4823  025166  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4824  025174  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4825  025202  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4826  025210  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4827  025216  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4828  025224  001401                          BEQ     16$             ;YES, CHECK CS2
4829  025226  104151                          ERROR   151             ;CS1 INCORRECT
4830  025230  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4831  025236  001401                          BEQ     17$             ;YES, CHECK DATA
4832  025240  104152                          ERROR   152             ;CS2 INCORRECT
4833  025242  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
4834  025246  012703  066760                  MOV     #HEAD2,R3       ;GET ADDRESS OF DATA
4835  025252  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4836  025256  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4837  025264  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4838  025272  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4839  025300  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4840  025306  001003                          BNE     21$             ;NO, CHECK CS1
4841  025310  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4842  025316  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4843  025324  001402                          BEQ     22$             ;YES, CHECK CS2
4844  025326  104153                          ERROR   153             ;CS1 INCORRECT
4845  025330  000421                          BR      TST27           ;;GO ON TO NEXT TEST
4846
4847  025332  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4848  025340  001402                          BEQ     23$             ;YES, CHECK DATA
4849  025342  104154                          ERROR   154             ;CS2 INCORRECT
4850  025344  000413                          BR      TST27           ;;GO ON TO NEXT TEST
4851
4852  025346  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4853  025354  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4854  025356  104155                          ERROR   155             ;DATA INCORRECT
4855  025360  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4856  025364  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4857  025372  001327                          BNE     20$             ;NO, GET NEXT WORD
4858
4859                                  ;;*****************************************************************
4860                                  ;*TEST 27       READ LOOPBACK (PART 3)
4861                                  ;*
4862                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4863                                  ;*      IN DIAGNOSTIC MOVE.  ISSUE A READ HEADER TO AN RK06
4864                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4865                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
4866                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
4867                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4868                                  ;*      FOLLOWING WORDS:
4869                                  ;*
4870                                  ;*              125252
```

```
4871                                        ;*              052525
4872                                        ;*              125252
4873                                        ;*
4874                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4875                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4876                                        ;*
4877                                        ;;*****************************************************************
4878  025374  000004                       TST27:  SCOPE
4879  025376  012737  000144  001200               MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4880  025404  013702  001270               MOV     $BASE,R2        ;LOAD RK611 BASE
4881  025410  012762  100000  000000       MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4882  025416  012762  000040  000026       MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4883  025424  012762  000025  000000       MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
4884  025432  012700  000312               MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4885  025436  012762  000440  000026  1$:  MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
4886  025444  012762  000040  000026       MOV     #DMD,RKMR1(R2)
4887  025452  005300                       DEC     R0
4888  025454  001370                       BNE     1$
4889  025456  012762  000140  000026       MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4890  025464  012762  000040  000026       MOV     #DMD,RKMR1(R2)
4891  025472  005037  003614               CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
4892  025476  005037  003616               CLR     M1.BIT          ;  PREVIOUS BIT
4893  025502  012700  000341               MOV     #225.,R0
4894  025506  004737  046156          2$:  JSR     PC,RDBIT        ;SIMULATE SYNCH
4895  025512  005300                       DEC     R0
4896  025514  001374                       BNE     2$
4897  025516  012737  000001  003614       MOV     #1,PR.BIT
4898  025524  004737  046156               JSR     PC,RDBIT
4899  025530  012701  000003               MOV     #3,R1           ;LOAD NUMBER OF WORDS
4900  025534  012703  066766               MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
4901  025540  012737  000025  003500       MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
4902  025546  012304                  5$:  MOV     (R3)+,R4        ;GET DATA
4903  025550  012700  000020               MOV     #16.,R0         ;LOAD BIT COUNT
4904  025554  013737  003614  003616  6$:  MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4905  025562  006004                       ROR     R4              ;GET NEXT BIT
4906  025564  103403                       BCS     7$              ;CHECK IF 1
4907  025566  005037  003614               CLR     PR.BIT          ;NO, ZERO
4908  025572  000403                       BR      8$              ;SIMULATE READ DATA
4909
4910  025574  012737  000001  003614  7$:  MOV     #1,PR.BIT       ;ONE
4911  025602  004737  046156          8$:  JSR     PC,RDBIT        ;SIMULATE READ DATA
4912  025606  016237  000000  003440       MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
4913  025614  023737  003500  003440       CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
4914  025622  001417                       BEQ     9$              ;YES, SIMULATE NEXT BIT
4915  025624  012737  000003  003624       MOV     #3,WRDCNT       ;LOAD WORD COUNT
4916  025632  160137  003624               SUB     R1,WRDCNT
4917  025636  012737  000020  003622       MOV     #16.,BITCNT     ;LOAD BIT COUNT
4918  025644  160037  003622               SUB     R0,BITCNT
4919  025650  104150                       ERROR   150             ;CS1 INCORRECT DURING HEADER
4920  025652  012762  100000  000000       MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4921  025660  000522                       BR      TST30           ;;GO ON TO NEXT TEST
4922
4923  025662  005300                  9$:  DEC     R0              ;CHECK IF READY FOR NEXT WORD
4924  025664  001333                       BNE     6$              ;NO, GET NEXT BIT
4925  025666  005301                       DEC     R1              ;CHECK IF HEADER FINISHED
4926  025670  001326                       BNE     5$              ;NO, GET NEXT WORD
```

```
4927  025672  012700  000004                    MOV     #4,R0               ;LOAD COUNT FOR POSTAMBLE
4928  025676  013737  003614  003616  15$:      MOV     PR.BIT,M1.BIT       ;STORE LAST BIT
4929  025704  005037  003614                    CLR     PR.BIT              ;LOAD NEXT BIT
4930  025710  004737  046156                    JSR     PC,RDBIT            ;SIMULATE 1 BIT READ
4931  025714  005300                            DEC     R0                  ;CHECK IF TIME FOR READY
4932  025716  001367                            BNE     15$                 ;NO, CONTINUE WITH POSTAMBLE
4933  025720  016237  000000  003440            MOV     RKCS1(R2),T.CS1     ;GET CURRENT CS1
4934  025726  016237  000010  003450            MOV     RKCS2(R2),T.CS2     ;GET CURRENT CS2
4935  025734  012737  000224  003500            MOV     #RDY!RDHEAD&(^C<GO>),E.CS1 ;LOAD EXPECTED CS1
4936  025742  012737  000300  003510            MOV     #OR!IR,E.CS2        ;LOAD EXPECTED CS2
4937  025750  023737  003500  003440            CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
4938  025756  001401                            BEQ     16$                 ;YES, CHECK CS2
4939  025760  104151                            ERROR   151                 ;CS1 INCORRECT
4940  025762  023737  003510  003450  16$:      CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
4941  025770  001401                            BEQ     17$                 ;YES, CHECK DATA
4942  025772  104152                            ERROR   152                 ;CS2 INCORRECT
4943  025774  005037  003624            17$:    CLR     WRDCNT              ;INITIALIZE WORD COUNT
4944  026000  012703  066766                    MOV     #HEAD3,R3           ;GET ADDRESS OF DATA
4945  026004  012337  003522            20$:    MOV     (R3)+,E.DB          ;GET EXPECTED DATA
4946  026010  016237  000024  003462            MOV     RKDB(R2),T.DB       ;GET ACTUAL DATA
4947  026016  016237  000000  003440            MOV     RKCS1(R2),T.CS1     ;STORE COMMAND AND STATUS REG. 1
4948  026024  016237  000010  003450            MOV     RKCS2(R2),T.CS2     ;STORE COMMAND AND STATUS REG. 2
4949  026032  022737  000002  003624            CMP     #2,WRDCNT           ;CHECK IF LAST WORD IN DATA BUFFER
4950  026040  001003                            BNE     21$                 ;NO, CHECK CS1
4951  026042  012737  000100  003510            MOV     #IR,E.CS2           ;STORE EXPECTED CS2
4952  026050  023737  003500  003440  21$:      CMP     E.CS1,T.CS1         ;CHECK CS1 CORRECT
4953  026056  001402                            BEQ     22$                 ;YES, CHECK CS2
4954  026060  104153                            ERROR   153                 ;CS1 INCORRECT
4955  026062  000421                            BR      TST30               ;;GO ON TO NEXT TEST
4956
4957  026064  023737  003510  003450  22$:      CMP     E.CS2,T.CS2         ;CHECK CS2 CORRECT
4958  026072  001402                            BEQ     23$                 ;YES, CHECK DATA
4959  026074  104154                            ERROR   154                 ;CS2 INCORRECT
4960  026076  000413                            BR      TST30               ;;GO ON TO NEXT TEST
4961
4962  026100  023737  003522  003462  23$:      CMP     E.DB,T.DB           ;CHECK IF DATA CORRECT
4963  026106  001401                            BEQ     24$                 ;YES, GET NEXT HEADER WORD
4964  026110  104155                            ERROR   155                 ;DATA INCORRECT
4965  026112  005237  003624            24$:    INC     WRDCNT              ;INCREMENT WORD COUNT
4966  026116  022737  000003  003624            CMP     #3,WRDCNT           ;CHECK IF ALL THREE WORDS CHECK
4967  026124  001327                            BNE     20$                 ;NO, GET NEXT WORD
4968
4969                                    ;;*****************************************************************
4970                                    ;*TEST 30       READ LOOPBACK (PART 4)
4971                                    ;*
4972                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4973                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4974                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4975                                    ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4976                                    ;*      SIMULATE SECTOR PULSE, 22S ZEROES, A
4977                                    ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4978                                    ;*      FOLLOWING WORDS:
4979                                    ;*
4980                                    ;*              044444
4981                                    ;*              022222
4982                                    ;*              111111
```

```
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;**************************************************************
026126  000004                  TST30:  SCOPE
026130  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
026136  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
026142  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
026150  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
026156  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
026164  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
026170  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
026176  012762  000040  000026          MOV     #DMD,RKMR1(R2)
026204  005300                          DEC     R0
026206  001370                          BNE     1$
026210  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
026216  012762  000040  000026          MOV     #DMD,RKMR1(R2)
026224  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
026230  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
026234  012700  000341                  MOV     #225.,R0
026240  004737  046156          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
026244  005300                          DEC     R0
026246  001374                          BNE     2$
026250  012737  000001  003614          MOV     #1,PR.BIT
026256  004737  046156                  JSR     PC,RDBIT
026262  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
026266  012703  067002                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
026272  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
026300  012304          5$:     MOV     (R3)+,R4        ;GET DATA
026302  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
026306  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
026314  006004                          ROR     R4              ;GET NEXT BIT
026316  103403                          BCS     7$              ;CHECK IF 1
026320  005037  003614                  CLR     PR.BIT          ;NO, ZERO
026324  000403                          BR      8$              ;SIMULATE READ DATA
026326  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
026334  004737  046156          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
026340  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
026346  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
026354  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
026356  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
026364  160137  003624                  SUB     R1,WRDCNT
026370  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
026376  160037  003622                  SUB     R0,BITCNT
026402  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
026404  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
026412  000522                          BR      TST31           ;;GO ON TO NEXT TEST
                                
026414  005300          9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
026416  001333                          BNE     6$              ;NO, GET NEXT BIT
026420  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
026422  001326                          BNE     5$              ;NO, GET NEXT WORD
026424  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
026430  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
```

```
5039  026436  005037  003614                      CLR     PR.BIT          ;LOAD NEXT BIT
5040  026442  004737  046156                      JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
5041  026446  005300                              DEC     R0              ;CHECK IF TIME FOR READY
5042  026450  001367                              BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5043  026452  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5044  026460  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5045  026466  012737  000224  003500              MOV     #RDY!ROHEAD&(^C(GO)),E.CS1 ;LOAD EXPECTED CS1
5046  026474  012737  000300  003510              MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5047  026502  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5048  026510  001401                              BEQ     16$             ;YES, CHECK CS2
5049  026512  104151                              ERROR   151             ;CS1 INCORRECT
5050  026514  023737  003510  003450  16$:       CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5051  026522  001401                              BEQ     17$             ;YES, CHECK DATA
5052  026524  104152                              ERROR   152             ;CS2 INCORRECT
5053  026526  005037  003624            17$:      CLR     WRDCNT          ;INITIALIZE WORD COUNT
5054  026532  012703  067002                      MOV     #HEAD4,R3       ;GET ADDRESS OF DATA
5055  026536  012337  003522            20$:      MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5056  026542  016237  000024  003462              MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5057  026550  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5058  026556  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5059  026564  022737  000002  003624              CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5060  026572  001003                              BNE     21$             ;NO, CHECK CS1
5061  026574  012737  000100  003510              MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5062  026602  023737  003500  003440  21$:       CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5063  026610  001402                              BEQ     22$             ;YES, CHECK CS2
5064  026612  104153                              ERROR   153             ;CS1 INCORRECT
5065  026614  000421                              BR      TST31           ;;GO ON TO NEXT TEST
5066
5067  026616  023737  003510  003450  22$:       CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5068  026624  001402                              BEQ     23$             ;YES, CHECK DATA
5069  026626  104154                              ERROR   154             ;CS2 INCORRECT
5070  026630  000413                              BR      TST31           ;;GO ON TO NEXT TEST
5071
5072  026632  023737  003522  003462  23$:       CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5073  026640  001401                              BEQ     24$             ;YES, GET NEXT HEADER WORD
5074  026642  104155                              ERROR   155             ;DATA INCORRECT
5075  026644  005237  003624            24$:      INC     WRDCNT          ;INCREMENT WORD COUNT
5076  026650  022737  000003  003624              CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5077  026656  001327                              BNE     20$             ;NO, GET NEXT WORD
5078
5079                                  ;;*****************************************************************
5080                                  ;*TEST 31       READ LOOPBACK (PART 5)
5081                                  ;*
5082                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5083                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5084                                  ;*      26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5085                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5086                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
5087                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
5088                                  ;*      FOLLOWING WORDS.
5089                                  ;*
5090                                  ;*              052012
5091                                  ;*              100520
5092                                  ;*              052012
5093                                  ;*
5094                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
```

```
5095                                        ;*      IS TRANSRERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5096                                        ;*
5097                                        ;**************************************************************************
5098  026660  000004                       TST31:  SCOPE
5099  026662  012737  000144  001200               MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5100  026670  013702  001270                       MOV     $BASE,R2        ;LOAD RK611 BASE
5101  026674  012762  100000  000000               MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5102  026702  012762  000040  000026               MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5103  026710  012762  000025  000000               MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
5104  026716  012700  000312                       MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5105  026722  012762  000440  000026  1$:          MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
5106  026730  012762  000040  000026               MOV     #DMD,RKMR1(R2)
5107  026736  005300                               DEC     R0
5108  026740  001370                               BNE     1$
5109  026742  012762  000140  000026               MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5110  026750  012762  000040  000026               MOV     #DMD,RKMR1(R2)
5111  026756  005037  003614                       CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
5112  026762  005037  003616                       CLR     M1.BIT          ;  PREVIOUS BIT
5113  026766  012700  000341                       MOV     #225.,R0
5114  026772  004737  046156            2$:       JSR     PC,RDBIT        ;SIMULATE SYNCH
5115  026776  005300                               DEC     R0
5116  027000  001374                               BNE     2$
5117  027002  012737  000001  003614               MOV     #1,PR.BIT
5118  027010  004737  046156                       JSR     PC,RDBIT
5119  027014  012701  000003                       MOV     #3,R1           ;LOAD NUMBER OF WORDS
5120  027020  012703  067010                       MOV     #HEADS,R3       ;LOAD ADDRESS OF DATA
5121  027024  012737  000025  003500               MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
5122  027032  012304                       5$:     MOV     (R3)+,R4        ;GET DATA
5123  027034  012700  000020                       MOV     #16.,R0         ;LOAD BIT COUNT
5124  027040  013737  003614  003616  6$:          MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5125  027046  006004                               ROR     R4              ;GET NEXT BIT
5126  027050  103403                               BCS     7$              ;CHECK IF 1
5127  027052  005037  003614                       CLR     PR.BIT          ;NO, ZERO
5128  027056  000403                               BR      8$              ;SIMULATE READ DATA
5129
5130  027060  012737  000001  003614  7$:          MOV     #1,PR.BIT       ;ONE
5131  027066  004737  046156            8$:       JSR     PC,RDBIT        ;SIMULATE READ DATA
5132  027072  016237  000000  003440               MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5133  027100  023737  003500  003440               CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5134  027106  001417                               BEQ     9$              ;YES, SIMULATE NEXT BIT
5135  027110  012737  000003  003624               MOV     #3,WRDCNT       ;LOAD WORD COUNT
5136  027116  160137  003624                       SUB     R1,WRDCNT
5137  027122  012737  000020  003622               MOV     #16.,BITCNT     ;LOAD BIT COUNT
5138  027130  160037  003622                       SUB     R0,BITCNT
5139  027134  104150                               ERROR   150             ;CS1 INCORRECT DURING HEADER
5140  027136  012762  100000  000000               MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5141  027144  000522                               BR      TST32           ;;GO ON TO NEXT TEST
5142
5143  027146  005300                       9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5144  027150  001333                               BNE     6$              ;NO, GET NEXT BIT
5145  027152  005301                               DEC     R1              ;CHECK IF HEADER FINISHED
5146  027154  001326                               BNE     5$              ;NO, GET NEXT WORD
5147  027156  012700  000004                       MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5148  027162  013737  003614  003616  15$:         MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5149  027170  005037  003614                       CLR     PR.BIT          ;LOAD NEXT BIT
5150  027174  004737  046156                       JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
```

```
5151  027200  005300                          DEC     R0              ;CHECK IF TIME FOR READY
5152  027202  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5153  027204  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5154  027212  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5155  027220  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5156  027226  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5157  027234  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5158  027242  001401                          BEQ     16$             ;YES, CHECK CS2
5159  027244  104151                          ERROR   151             ;CS1 INCORRECT
5160  027246  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5161  027254  001401                          BEQ     17$             ;YES, CHECK DATA
5162  027256  104152                          ERROR   152             ;CS2 INCORRECT
5163  027260  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5164  027264  012703  067010                  MOV     #HEAD5,R3       ;GET ADDRESS OF DATA
5165  027270  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5166  027274  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5167  027302  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5168  027310  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5169  027316  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5170  027324  001003                          BNE     21$             ;NO, CHECK CS1
5171  027326  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5172  027334  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5173  027342  001402                          BEQ     22$             ;YES, CHECK CS2
5174  027344  104153                          ERROR   153             ;CS1 INCORRECT
5175  027346  000421                          BR      TST32           ;;GO ON TO NEXT TEST
5176
5177  027350  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5178  027356  001402                          BEQ     23$             ;YES, CHECK DATA
5179  027360  104154                          ERROR   154             ;CS2 INCORRECT
5180  027362  000413                          BR      TST32           ;;GO ON TO NEXT TEST
5181
5182  027364  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5183  027372  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5184  027374  104155                          ERROR   155             ;DATA INCORRECT
5185  027376  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5186  027402  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5187  027410  001327                          BNE     20$             ;NO, GET NEXT WORD
5188
5189                                  ;;*****************************************************************
5190                                  ;*TEST 32       READ HEADER IN 18 BIT MODE
5191                                  ;*
5192                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5193                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5194                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5195                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
5196                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
5197                                  ;*      FOLLOWING WORDS:
5198                                  ;*
5199                                  ;*              177777
5200                                  ;*              000000
5201                                  ;*              177777
5202                                  ;*
5203                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
5204                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5205                                  ;*
5206                                  ;;*****************************************************************
```

```
5207  027412  000004                    TST32:  SCOPE
5208  027414  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5209  027422  013702  001270                    MOV     $BASE,R2        ;LOAD RK611
5210  027426  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5211  027434  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5212  027442  012762  010025  000000            MOV     #CFMT!RDHEAD,RKCS1(R2) ;ISSUE READ HEADER (24 SECTOR FORMAT)
5213  027450  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5214  027454  012762  000440  000C26  1$:      MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5215  027462  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5216  027470  005300                            DEC     R0
5217  027472  001370                            BNE     1$
5218  027474  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5219  027502  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5220  027510  005037  003614                    CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
5221  027514  005037  003616                    CLR     M1.BIT          ;  PREVIOUS BIT
5222  027520  012700  000377                    MOV     #255.,R0
5223  027524  004737  046156            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
5224  027530  005300                            DEC     R0
5225  027532  001374                            BNE     2$
5226  027534  012737  000001  003614            MOV     #1,PR.BIT
5227  027542  004737  046156                    JSR     PC,RDBIT
5228  027546  012701  000003                    MOV     #3,R1           ;LOAD NUMBER OF WORDS
5229  027552  012703  066752                    MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5230  027556  012737  010025  003500            MOV     #CFMT!RDHEAD,E.CS1 ;LOAD EXPECTED CS1
5231  027564  012304                    5$:     MOV     (R3)+,R4        ;GET DATA
5232  027566  012700  000020                    MOV     #16.,R0         ;LOAD BIT COUNT
5233  027572  013737  003614  003616    6$:     MOV     PR.BIT,M1.BIT   ;STORE PRESENT BIT
5234  027600  006004                            ROR     R4              ;GET NEXT BIT
5235  027602  103403                            BCS     7$              ;CHECK IF 1
5236  027604  005037  003614                    CLR     PR.BIT          ;NO, ZERO
5237  027610  000403                            BR      8$              ;SIMULATE READ DATA
5238
5239  027612  012737  000001  003614    7$:     MOV     #1,PR.BIT       ;ONE
5240  027620  004737  046156            8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
5241  027624  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5242  027632  023737  003500  003440            CMP     E.CS1,T.CS1       ECK IF CS1 CORRECT
5243  027640  001417                            BEQ     9$              , S, SIMULATE NEXT BIT
5244  027644  012737  000003  003624            MOV     #3,WRDCNT       ;LOAD WORD COUNT
5245  027650  160137  003624                    SUB     R1,WRDCNT
5246  027654  012737  000020  003622            MOV     #16.,BITCNT     ;LOAD BIT COUNT
5247  027662  160037  003622                    SUB     R0,BITCNT
5248  027666  104156                            ERROR   156             ;CS1 INCORRECT DURING HEADER
5249  027670  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5250  027676  000522                            BR      TST33           ;;GO ON TO NEXT TEST
5251
5252  027700  005300                    9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5253  027702  001333                            BNE     6$              ;NO, GET NEXT BIT
5254  027704  005301                            DEC     R1              ;CHECK IF HEADER FINISHED
5255  027706  001326                            BNE     5$              ;NO, GET NEXT WORD
5256  027710  012700  000004                    MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5257  027714  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5258  027722  005037  003614                    CLR     PR.BIT          ;LOAD NEXT BIT
5259  027726  004737  046156                    JSR     PC,RDBIT        ;READ BIT
5260  027732  005300                            DEC     R0              ;CHECK IF TIME FOR READY
5261  027734  001367                            BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5262  027736  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
```

```
5263  027744  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5264  027752  012737  010224  003500          MOV     #CFMT!RDY!RDHEAD&(^C<GO>),E.CS1 ;LOAD EXPECTED CS1
5265  027760  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5266  027766  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5267  027774  001401                          BEQ     16$             ;YES, CHECK CS2
5268  027776  104157                          ERROR   157             ;CS1 INCORRECT
5269  030000  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5270  030006  001401                          BEQ     17$             ;YES, CHECK DATA
5271  030010  104160                          ERROR   160             ;CS2 INCORRECT
5272  030012  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5273  030016  012703  066752                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
5274  030022  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5275  030026  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5276  030034  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5277  030042  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5278  030050  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5279  030056  001003                          BNE     21$             ;NO, CHECK CS1
5280  030060  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
5281  030066  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5282  030074  001402                          BEQ     22$             ;YES, CHECK CS2
5283  030076  104161                          ERROR   161             ;CS1 INCORRECT
5284  030100  000421                          BR      TST33           ;;GO ON TO NEXT TEST
5285
5286  030102  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5287  030110  001402                          BEQ     23$             ;YES, CHECK DATA BUFFER
5288  030112  104162                          ERROR   162             ;CS2 INCORRECT
5289  030114  000413                          BR      TST33           ;;GO ON TO NEXT TEST
5290
5291  030116  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK DATA BUFFER CORRECT
5292  030124  001401                          BEQ     24$             ;YES, GET NEXT WORD
5293  030126  104163                          ERROR   163             ;DATA BUFFER INCORRECT
5294  030130  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5295  030134  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF FINISHED
5296  030142  001327                          BNE     20$             ;NO READ NEXT WORD
5297
5298                                  ;;*****************************************************************
5299                                  ;*TEST 33       SYNCH DETECT IN READ HEADER
5300                                  ;*
5301                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5302                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5303                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5304                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5305                                  ;*      SIMULATE SECTOR PULSE AND 350 ZEROES.  MAKE
5306                                  ;*      SURE READY REMAINS RESET AND THE SILO REMAINS
5307                                  ;*      EMPTY.
5308                                  ;*
5309                                  ;;*****************************************************************
5310  030144  000004                  TST33:  SCOPE
5311  030146  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5312  030154  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5313  030160  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5314  030166  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
5315  030174  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEAD
5316  030202  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5317  030206  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5318  030214  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
5319  030222  005300                        DEC     R0
5320  030224  001370                        BNE     1$
5321  030226  012762  000140  000026        MOV     #OMD!MSP,RKMR1(R2) ;SIMULATE TO SECTOR PULSE
5322  030234  012762  000040  000026        MOV     #OMD,RKMR1(R2)
5323  030242  005037  003614                CLR     PR.BIT             ;INITIALIZE PRESENT AND
5324  030246  005037  003616                CLR     M1.BIT             ;  PREVIOUS BIT
5325  030252  012737  000025  003500        MOV     #RDHEAD,E.CS1      ;LOAD EXPECTED CS1
5326  030260  012737  000100  003510        MOV     #IR,E.CS2          ;LOAD EXPECTED CS2
5327  030266  005037  003622                CLR     BITCNT             ;SIMULATE 350 ZEROES
5328  030272  004737  046156          2$:   JSR     PC,RDBIT
5329  030276  016237  000000  003440        MOV     RKCS1(R2),T.CS1    ;STORE CS1
5330  030304  016237  000010  003450        MOV     RKCS2(R2),T.CS2    ;STORE CS2
5331  030312  023737  003500  003440        CMP     E.CS1,T.CS1        ;CHECK IF CS1 CORRECT
5332  030320  001402                        BEQ     3$                 ;YES, CHECK CS2
5333  030322  104164                        ERROR   164                        ;CS1 INCORRECT
5334  030324  000447                        BR      TST34              ;;GO ON TO NEXT TEST
5335
5336  030326  023737  003510  003450  3$:   CMP     E.CS2,T.CS2        ;CHECK IF CS2 CORRECT
5337  030334  001402                        BEQ     4$                 ;YES, CHECK IF SILO EMPTY
5338  030336  104165                        ERROR   165                ;CS2 INCORRECT
5339  030340  000441                        BR      TST34              ;;GO ON TO NEXT TEST
5340  030342  005237  003622          4$:   INC     BITCNT             ;INCREMENT BIT COUNT
5341  030346  022737  000536  003622        CMP     #350.,BITCNT       ;CHECK IF FINISHED
5342  030354  001346                        BNE     2$                 ;NO, SIMULATE NEXT ZERO
5343  030356  005762  000024                TST     RKDB(R2)           ;READ DATA BUFFER
5344  030362  016237  000000  003440        MOV     RKCS1(R2),T.CS1    ;STORE CS1 AND CS2
5345  030370  016237  000010  003450        MOV     RKCS2(R2),T.CS2
5346  030376  012737  100224  003500        MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECT CS1
5347  030404  012737  100100  003510        MOV     #DCK!IR,E.CS2      ;LOAD EXPECTED CS2
5348  030412  023737  003500  003440        CMP     E.CS1,T.CS1        ;CHECK FOR CONTROLLER ERROR
5349  030420  001401                        BEQ     5$                 ;YES, CHECK FOR DATA LATE
5350  030422  104166                        ERROR   166                ;CS1 INCORRECT
5351  030424  023737  003510  003450  5$:   CMP     E.CS2,T.CS2        ;CHECK FOR DATA LATE
5352  030432  001401                        BEQ     6$                 ;YES, CHECK RK611
5353  030434  104167                        ERROR   167                ;CS2 INCORRECT
5354  030436  012762  100000  000000  6$:   MOV     #CCLR,RKCS1(R2)    ;CLEAR RK611
5355
5356                                  ;;*****************************************************************
5357                                  ;*TEST 34       ZERO SYNCH ON READ
5358                                  ;*
5359                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5360                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5361                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES,
5362                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF
5363                                  ;*      BIT TIME, A ONE, AND A HEADER CONSISTING OF THE
5364                                  ;*      THREE FOLLOWING WORDS:
5365                                  ;*
5366                                  ;*              177777
5367                                  ;*              000000
5368                                  ;*              177777
5369                                  ;*
5370                                  ;*      MAKE SURE THAT READY COMES AFTER THE THIRD WORD
5371                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5372                                  ;*
5373                                  ;*****************************************************************
5374  030444  000004                  TST34:  SCOPE
```

```
5375  030446  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5376  030454  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5377  030460  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5378  030466  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5379  030474  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
5380  030502  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5381  030506  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
5382  030514  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5383  030522  005300                          DEC     R0
5384  030524  001370                          BNE     1$
5385  030526  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5386  030534  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5387  030542  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;SHIFT DATA ONE HALF BIT TIME
5388  030550  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5389  030556  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
5390  030562  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
5391  030566  012700  000341                  MOV     #225.,R0
5392  030572  004737  046156          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
5393  030576  005300                          DEC     R0
5394  030600  001374                          BNE     2$
5395  030602  012737  000001  003614          MOV     #1,PR.BIT
5396  030610  004737  046156                  JSR     PC,RDBIT
5397  030614  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
5398  030620  012703  066752                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5399  030624  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
5400  030632  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
5401  030634  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
5402  030640  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
5403  030646  006004                          ROR     R4              ;GET NEXT BIT
5404  030650  103403                          BCS     7$              ;CHECK IF 1
5405  030652  005037  003614                  CLR     PR.BIT          ;NO, ZERO
5406  030656  000403                          BR      8$              ;SIMULATE READ DATA
5407
5408  030660  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
5409  030666  004737  046156          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
5410  030672  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5411  030700  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5412  030706  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
5413  030710  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
5414  030716  160137  003624                  SUB     R1,WRDCNT
5415  030722  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
5416  030730  160037  003622                  SUB     R0,BITCNT
5417  030734  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
5418  030736  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5419  030744  000522                          BR      TST35           ;;GO ON TO NEXT TEST
5420
5421  030746  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5422  030750  001333                          BNE     6$              ;NO, GET NEXT BIT
5423  030752  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
5424  030754  001326                          BNE     5$              ;NO, GET NEXT WORD
5425  030756  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5426  030762  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5427  030770  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
5428  030774  004737  046156                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
5429  031000  005300                          DEC     R0              ;CHECK IF TIME FOR READY
5430  031002  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
```

```
5431  031004  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5432  031012  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5433  031020  012737  000224  003500          MOV     #RDY!RDHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
5434  031026  012737  000300  003510          MOV     #DR!IR,E.CS2    ;LOAD EXPECTED CS2
5435  031034  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5436  031042  001401                          BEQ     16$             ;YES, CHECK CS2
5437  031044  104151                          ERROR   151             ;CS1 INCORRECT
5438  031046  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5439  031054  001401                          BEQ     17$             ;YES, CHECK DATA
5440  031056  104152                          ERROR   152             ;CS2 INCORRECT
5441  031060  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5442  031064  012703  066752                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
5443  031070  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5444  031074  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5445  031102  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5446  031110  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5447  031116  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5448  031124  001003                          BNE     21$             ;NO, CHECK CS1
5449  031126  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5450  031134  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5451  031142  001402                          BEQ     22$             ;YES, CHECK CS2
5452  031144  104153                          ERROR   153             ;CS1 INCORRECT
5453  031146  000421                          BR      TST35           ;;GO ON TO NEXT TEST
5454
5455  031150  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5456  031156  001402                          BEQ     23$             ;YES, CHECK DATA
5457  031160  104154                          ERROR   154             ;CS2 INCORRECT
5458  031162  000413                          BR      TST35           ;;GO ON TO NEXT TEST
5459
5460  031164  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5461  031172  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5462  031174  104155                          ERROR   155             ;DATA INCORRECT
5463  031176  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5464  031202  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5465  031210  001327                          BNE     20$             ;NO, GET NEXT WORD
5466
5467                                  .SBTTL  **MFM WRITE LOOPBACK TESTS
5468
5469                                  ;;*****************************************************************
5470                                  ;*TEST 35       WRITE ZEROS UNTIL SECTOR PULSE WITH WRITE HEADER
5471                                  ;*
5472                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5473                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5474                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5475                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
5476                                  ;*      INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
5477                                  ;*      ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
5478                                  ;*      WRITE GATE RESETS.
5479                                  ;*
5480                                  ;;*****************************************************************
5481  031212  000004                  TST35:  SCOPE
5482  031214  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5483  031222  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5484  031226  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5485  031234  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5486  031242  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;INITIALIZE ROM
```

```
 5487  031250  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5488  031256  012762  067254  000004          MOV     #WRBUFF,RKBA(R2) ;ISSUE WRITE HEADER
 5489  031264  012762  177777  000002          MOV     #-1,RKWC(R2)
 5490  031272  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
 5491  031300  012700  002364                  MOV     #<256.+98.+64.+256.+10.>*2,R0 ;ISSUE ENOUGH CLOCKS
 5492                                                                  ;  UNTIL READY FOR INDEX PULSE
 5493  031304  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 5494  031312  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5495  031320  005300                          DEC     R0
 5496  031322  001370                          BNE     1$
 5497  031324  012700  000004                  MOV     #4.,R0                  ;SIMULATE INDEX PULSE
 5498  031330  012762  000240  000026          MOV     #MIND!DMD,RKMR1(R2)
 5499  031336  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5500  031344  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 5501  031352  005300                          DEC     R0
 5502  031354  001370                          BNE     2$
 5503  031356  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5504  031364  012737  062040  003524          MOV     #DMD!MEMD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 5505                                                                  ;  MAINT. REG
 5506  031372  012700  000002                  MOV     #2,R0                   ;WAIT FOR WRITE GATE
 5507  031376  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 5508  031404  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5509  031412  005300                          DEC     R0
 5510  031414  001370                          BNE     3$
 5511  031416  005037  003626                  CLR     SECCNT                  ;CLEAR SECTOR COUNT
 5512  031422  005037  003612                  CLR     P1.BIT                  ;INITIALIZE BIT GENERATION
 5513  031426  005037  003614                  CLR     PR.BIT
 5514  031432  005037  003616                  CLR     M1.BIT
 5515  031436  005037  003620                  CLR     M2.BIT
 5516  031442  012700  000764                  MOV     #500.,R0                ;LOAD COUNT FOR 500 BITS
 5517  031446  012737  062464  003170          MOV     #EM230,EMW              ;LOAD ERROR MESSAGE
 5518  031454  005037  003622                  CLR     BITCNT                  ;CLEAR BIT COUNT
 5519  031460  004737  045206          5$:     JSR     PC,WRTBIT               ;WRITE ONE BIT
 5520  031464  104170                          ERROR   170                     ;ERROR IN WRITE
 5521  031466  005237  003622                  INC     BITCNT                  ;INCREMENT NUMBER OF BITS WRITTEN
 5522  031472  005300                          DEC     R0                      ;CHECK IF FINISHED
 5523  031474  001371                          BNE     5$                      ;NO, CONTINUE
 5524  031476  042737  040000  003524          BIC     #WRTGAT,E.MR1           ;GENERATE EXPECTED MR1
 5525  031504  052737  000100  003524          BIS     #MSP,E.MR1
 5526  031512  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;RAISE SECTOR PULSE
 5527  031520  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
 5528  031526  023737  003524  003464          CMP     E.MR1,T.MR1             ;STORE MAINT REG 1
 5529  031534  001401                          BEQ     10$                     ;YES, LOWER SECTOR PULSE
 5530  031536  104171                          ERROR   171                     ;WRITE GATE DID NOT RESET
 5531  031540  042737  000100  003524  10$:    BIC     #MSP,E.MR1              ;GENERATE EXPECTED MR1
 5532  031546  052737  040000  003524          BIS     #WRTGAT,E.MR1
 5533  031554  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;RESET SECTOR PULSE
 5534  031562  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
 5535  031570  023737  003524  003464          CMP     E.MR1,T.MR1             ;CHECK MR1 CORRECT
 5536  031576  001401                          BEQ     TST36                   ;YES, GO ON TO NEXT TEST
 5537  031600  104172                          ERROR   172                     ;WRITE GATE DID NOT SET
 5538
 5539                                  ;;*****************************************************************
 5540                                  ;*TEST 36       WRITE LOOPBACK (PART 1)
 5541                                  ;*
 5542                                  ;*      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.
                        ;*
                        ;*****************************************************************
031602  000004         TST36:  SCOPE
031604  012737  000144  001200        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
031612  013702  001270            MOV     $BASE,R2        ;LOAD RK611 BASE
031616  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
031624  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
031632  012762  066752  000004        MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
031640  012762  177775  000002        MOV     #-3,RKWC(R2)
031646  012762  000027  000000        MOV     #WRHEAD,RKCS1(R2)
031654  012700  000312            MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                        ;  READY FOR INDEX PULSE
031660  012762  000440  000026  1$:    MOV     #DMD!MCLK,RKMR1(R2)
031666  012762  000040  000026        MOV     #DMD,RKMR1(R2)
031674  005300                DEC     R0
031676  001370                BNE     1$
031700  012700  000004            MOV     #4,R0           ;ISSUE INDEX PULSE
031704  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
031712  012762  000640  000026  2$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
031720  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
031726  005300                DEC     R0
031730  001370                BNE     2$
031732  012762  000040  000026        MOV     #DMD,RKMR1(R2)
031740  012700  000010            MOV     #8.,R0          ;WAIT FOR WRITE GATE
031744  012762  000440  000026  3$:    MOV     #DMD!MCLK,RKMR1(R2)
031752  012762  000040  000026        MOV     #DMD,RKMR1(R2)
031760  005300                DEC     R0
031762  001370                BNE     3$
031764  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
031772  012762  000040  000026        MOV     #DMD,RKMR1(R2)
032000  005037  003626            CLR     SECCNT          ;INITIALIZE SECTOR COUNT
032004  012737  063036  003170        MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
032012  012737  062040  003524        MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                        ;  MAINT REG 1
032020  005037  003612            CLR     P1.BIT          ;INITIALIZE BIT GENERATION
032024  005037  003614            CLR     PR.BIT
032030  005037  003616            CLR     M1.BIT
032034  005037  003620            CLR     M2.BIT
032040  012700  000400            MOV     #256.,R0        ;SIMULATE SYNCH
032044  005037  003622            CLR     BITCNT          ;INITIALIZE BIT COUNT
032050  004737  045206        5$:    JSR     PC,WRTBIT       ;WRITE ONE BIT
032054  104170                ERROR   170             ;DATA INCORRECT
032056  005237  003622            INC     BITCNT
032062  005300                DEC     R0              ;CHECK IF READY FOR DATA
```

```
5599  032064  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5600  032066  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5601  032074  004737  045206                  JSR     PC,WRTBIT
5602  032100  104170                          ERROR   170             ;DATA INCORRECT
5603  032102  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5604  032106  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5605  032114  012703  066752                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5606  032120  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5607  032124  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5608  032126  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5609  032132  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5610  032140  013737  003614  003616          MOV     PR.BIT,M1.BIT
5611  032146  013737  003612  003614          MOV     P1.BIT,PR.BIT
5612  032154  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5613  032156  103403                          BCS     14$             ;CHECK IF ONE
5614  032160  005037  003612                  CLR     P1.BIT          ;ZERO
5615  032164  000403                          BR      15$             ;CLOCK IN BIT
5616
5617  032166  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5618  032174  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5619  032200  104170                          ERROR   170             ;BIT INCORRECT
5620  032202  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5621  032206  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5622  032210  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5623  032212  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5624  032214  001343                          BNE     10$             ;NO, GET NEXT WORD
5625  032216  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5626  032222  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5627  032230  013737  003614  003616          MOV     PR.BIT,M1.BIT
5628  032236  013737  003612  003614          MOV     P1.BIT,PR.BIT
5629  032244  005037  003612                  CLR     P1.BIT
5630  032250  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
5631  032254  104170                          ERROR   170             ;BIT INCORRECT
5632  032256  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5633  032262  005301                          DEC     R1              ;CHECK IF FINISHED
5634  032264  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5635  032266  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5636  032274  012700  000004                  MOV     #4,R0
5637  032300  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5638  032306  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5639  032314  005300                          DEC     R0
5640  032316  001370                          BNE     20$
5641  032320  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5642  032326  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5643  032334  012737  022040  003524          MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5644  032342  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5645  032350  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5646  032352  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5647  032354  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5648  032360  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5649  032366  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5650  032374  005300                          DEC     R0
5651  032376  001370                          BNE     26$
5652  032400  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5653  032406  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5654  032414  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
```

```
                                        BEQ     TST37           ;;YES, GO ON TO NEXT TEST
                                        ERROR   174             ;CSI INCORRECT

                                ;;*****************************************************************
                                ;*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.
                                ;*
                                ;*****************************************************************
032426  000004                TST37:  SCOPE
032430  012737  000144  001200        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
032436  013702  001270              MOV     $BASE,R2        ;LOAD RK611 BASE
032442  012762  100000  000000      MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
032450  012762  000040  000026      MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
032456  012762  066760  000004      MOV     #HEAD2,RKBA(R2) ;ISSUE WRITE HEADER
032464  012762  177775  000002      MOV     #-3,RKWC(R2)
032472  012762  000027  000000      MOV     #WRHEAD,RKCS1(R2)
032500  012700  000312              MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                        ;  READY FOR INDEX PULSE
032504  012762  000440  000026  1$:  MOV     #DMD!MCLK,RKMR1(R2)
032512  012762  000040  000026      MOV     #DMD,RKMR1(R2)
032520  005300                      DEC     R0
032522  001370                      BNE     1$
032524  012700  000004              MOV     #4,R0           ;ISSUE INDEX PULSE
032530  012762  000240  000026      MOV     #DMD!MIND,RKMR1(R2)
032536  012762  000640  000026  2$:  MOV     #DMD!MIND!MCLK,RKMR1(R2)
032544  012762  000240  000026      MOV     #DML!MIND,RKMR1(R2)
032552  005300                      DEC     R0
032554  001370                      BNE     2$
032556  012762  000040  000026      MOV     #DMD,RKMR1(R2)
032564  012700  000010              MOV     #8.,R0          ;WAIT FOR WRITE GATE
032570  012762  000440  000026  3$:  MOV     #DMD!MCLK,RKMR1(R2)
032576  012762  000040  000026      MOV     #DMD,RKMR1(R2)
032604  005300                      DEC     R0
032606  001370                      BNE     3$
032610  012762  000140  000026      MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
032616  012762  000040  000026      MOV     #DMD,RKMR1(R2)
032624  005037  003626              CLR     SECCNT          ;INITIALIZE SECTOR COUNT
032630  012737  063036  003170      MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
032636  012737  062040  003524      MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                        ;  MAINT REG 1
032644  005037  003612              CLR     P1.BIT          ;INITIALIZE BIT GENERATION
032650  005037  003614              CLR     PR.BIT
```

```
5711  032654  005037  003616                  CLR     M1.BIT
5712  032660  005037  003620                  CLR     M2.BIT
5713  032664  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5714  032670  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5715  032674  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5716  032700  104170                          ERROR   170             ;DATA INCORRECT
5717  032702  005237  003622                  INC     BITCNT
5718  032706  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5719  032710  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5720  032712  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5721  032720  004737  045206                  JSR     PC,WRTBIT
5722  032724  104170                          ERROR   170             ;DATA INCORRECT
5723  032726  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5724  032732  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5725  032740  012703  066760                  MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
5726  032744  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5727  032750  012304          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5728  032752  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5729  032756  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5730  032764  013737  003614  003616          MOV     PR.BIT,M1.BIT
5731  032772  013737  003612  003614          MOV     P1.BIT,PR.BIT
5732  033000  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5733  033002  103403                          BCS     14$             ;CHECK IF ONE
5734  033004  005037  003612                  CLR     P1.BIT          ;ZERO
5735  033010  000403                          BR      15$             ;CLOCK IN BIT
5736
5737  033012  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5738  033020  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5739  033024  104170                          ERROR   170             ;BIT INCORRECT
5740  033026  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5741  033032  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5742  033034  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5743  033036  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5744  033040  001343                          BNE     10$             ;NO, GET NEXT WORD
5745  033042  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5746  033046  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5747  033054  013737  003614  003616          MOV     PR.BIT,M1.BIT
5748  033062  013737  003612  003614          MOV     P1.BIT,PR.BIT
5749  033070  005037  003612                  CLR     P1.BIT
5750  033074  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
5751  033100  104170                          ERROR   170             ;BIT INCORRECT
5752  033102  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5753  033106  005301                          DEC     R1              ;CHECK IF FINISHED
5754  033110  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5755  033112  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5756  033120  012700  000004                  MOV     #4,R0
5757  033124  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5758  033132  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5759  033140  005300                          DEC     R0
5760  033142  001370                          BNE     20$
5761  033144  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5762  033152  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5763  033160  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5764  033166  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5765  033174  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5766  033176  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
```

```
                                25$:    MOV     #8.,R0          ;FINISH COMMAND
                                26$:    MOV     #DMD!MCLK,RKMR1(R2)
                                        MOV     #DMD,RKMR1(R2)
                                        DEC     R0
                                        BNE     26$
                                        MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
                                        MOV     #RDY!WRHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
                                        CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
                                        BEQ     TST40           ;;YES, GO ON TO NEXT TEST
                                        ERROR   174             ;CS1 INCORRECT

                        ;;*****************************************************************
                        ;*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 PULSE.
                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
                        ;*
                        ;*****************************************************************
                        TST40:  SCOPE
                                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
                                MOV     $BASE,R2        ;LOAD RK611 BASE
                                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
                                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
                                MOV     #HEAD3,RKBA(R2) ;ISSUE WRITE HEADER
                                MOV     #-3,RKWC(R2)
                                MOV     #WRHEAD,RKCS1(R2)
                                MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                        ;  READY FOR INDEX PULSE
                        1$:     MOV     #DMD!MCLK,RKMR1(R2)
                                MOV     #DMD,RKMR1(R2)
                                DEC     R0
                                BNE     1$
                                MOV     #4,R0           ;ISSUE INDEX PULSE
                                MOV     #DMD!MIND,RKMR1(R2)
                        2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
                                MOV     #DMD!MIND,RKMR1(R2)
                                DEC     R0
                                BNE     2$
                                MOV     #DMD,RKMR1(R2)
                                MOV     #8.,R0          ;WAIT FOR WRITE GATE
                        3$:     MOV     #DMD!MCLK,RKMR1(R2)
                                MOV     #DMD,RKMR1(R2)
                                DEC     R0
                                BNE     3$
                                MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
```

```
5823  033442  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5824  033450  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5825  033454  012737  063036  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5826  033462  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5827                                                                  ;   MAINT REG
5828  033470  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5829  033474  005037  003614                  CLR     PR.BIT
5830  033500  005037  003616                  CLR     M1.BIT
5831  033504  005037  003620                  CLR     M2.BIT
5832  033510  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5833  033514  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5834  033520  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5835  033524  104170                  000622  ERROR   170             ;DATA INCORRECT
5836  033526  005237  003622                  INC     BITCNT
5837  033532  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5838  033534  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5839  033536  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5840  033544  004737  045206                  JSR     PC,WRTBIT
5841  033550  104170                  000622  ERROR   170             ;DATA INCORRECT
5842  033552  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5843  033556  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5844  033564  012703  066766                  MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
5845  033570  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5846  033574  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5847  033576  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5848  033602  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5849  033610  013737  003614  003616          MOV     PR.BIT,M1.BIT
5850  033616  013737  003612  003614          MOV     P1.BIT,PR.BIT
5851  033624  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5852  033626  103403                          BCS     14$             ;CHECK IF ONE
5853  033630  005037  003612                  CLR     P1.BIT          ;ZERO
5854  033634  000403                          BR      15$             ;CLOCK IN BIT
5855
5856  033636  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5857  033644  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5858  033650  104170                  000622  ERROR   170             ;BIT INCORRECT
5859  033652  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5860  033656  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5861  033660  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5862  033662  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5863  033664  001343                          BNE     10$             ;NO, GET NEXT WORD
5864  033666  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5865  033672  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5866  033700  013737  003614  003616          MOV     PR.BIT,M1.BIT
5867  033706  013737  003612  003614          MOV     P1.BIT,PR.BIT
5868  033714  005037  003612                  CLR     P1.BIT
5869  033720  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
5870  033724  104170                  000622  ERROR   170             ;BIT INCORRECT
5871  033726  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5872  033732  005301                          DEC     R1              ;CHECK IF FINISHED
5873  033734  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5874  033736  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5875  033744  012700  000004                  MOV     #4,R0
5876  033750  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5877  033756  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5878  033764  005300                          DEC     R0
```

```
5879  033766  001370                          BNE     20$
5880  033770  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5881  033776  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5882  034004  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5883  034012  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5884  034020  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5885  034022  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5886  034024  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5887  034030  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5888  034036  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5889  034044  005300                          DEC     R0
5890  034046  001370                          BNE     26$
5891  034050  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5892  034056  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5893  034064  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5894  034072  001401                          BEQ     TST41           ;YES, GO ON TO NEXT TEST
5895  034074  104174                          ERROR   174             ;CS1 INCORRECT
5896
5897                                  ;;*****************************************************************
5898                                  ;*TEST 41        WRITE LOOPBACK (PART 4)
5899                                  ;*
5900                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5901                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5902                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5903                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5904                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5905                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AND INDEX PULSE:
5906                                  ;*
5907                                  ;*              044444
5908                                  ;*              022222
5909                                  ;*              111111
5910                                  ;*
5911                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX MODE.
5912                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5913                                  ;*
5914                                  ;*****************************************************************
5915  034076  000004          TST41:  SCOPE
5916  034100  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5917  034106  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5918  034112  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5919  034120  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5920  034126  012762  067002  000004          MOV     #HEAD4,RKBA(R2) ;ISSUE WRITE HEADER
5921  034134  012762  177775  000002          MOV     #-3,RKWC(R2)
5922  034142  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5923  034150  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5924                                                                  ;  READY FOR INDEX PULSE
5925  034154  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5926  034162  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5927  034170  005300                          DEC     R0
5928  034172  001370                          BNE     1$
5929  034174  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5930  034200  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5931  034206  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5932  034214  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5933  034222  005300                          DEC     R0
5934  034224  001370                          BNE     2$
```

```
5935  034226  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5936  034234  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5937  034240  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5938  034246  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5939  034254  005300                          DEC     R0
5940  034256  001370                          BNE     3$
5941  034260  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5942  034266  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5943  034274  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5944  034300  012737  063036  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5945  034306  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5946                                                  ;  MAINT REG 1
5947  034314  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5948  034320  005037  003614                  CLR     PR.BIT
5949  034324  005037  003616                  CLR     M1.BIT
5950  034330  005037  003620                  CLR     M2.BIT
5951  034334  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5952  034340  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5953  034344  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5954  034350  104170                          ERROR   170             ;DATA INCORRECT
5955  034352  005237  003622                  INC     BITCNT
5956  034356  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5957  034360  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5958  034362  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5959  034370  004737  045206                  JSR     PC,WRTBIT
5960  034374  104170                          ERROR   170             ;DATA INCORRECT
5961  034376  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5962  034402  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5963  034410  012703  067002                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
5964  034414  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5965  034420  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5966  034422  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5967  034426  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5968  034434  013737  003614  003616          MOV     PR.BIT,M1.BIT
5969  034442  013737  003612  003614          MOV     P1.BIT,PR.BIT
5970  034450  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5971  034452  103403                          BCS     14$             ;CHECK IF ONE
5972  034454  005037  003612                  CLR     P1.BIT          ;ZERO
5973  034460  000403                          BR      15$             ;CLOCK IN BIT
5974
5975  034462  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5976  034470  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5977  034474  104170                          ERROR   170             ;BIT INCORRECT
5978  034476  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5979  034502  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5980  034504  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5981  034506  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5982  034510  001343                          BNE     10$             ;NO, GET NEXT WORD
5983  034512  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5984  034516  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5985  034524  013737  003614  003616          MOV     PR.BIT,M1.BIT
5986  034532  013737  003612  003614          MOV     P1.BIT,PR.BIT
5987  034540  005037  003612                  CLR     P1.BIT
5988  034544  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
5989  034550  104170                          ERROR   170             ;BIT INCORRECT
5990  034552  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
```

```
5991  034556  005301                          DEC     R1              ;CHECK IF FINISHED
5992  034560  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5993  034562  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5994  034570  012700  000004                  MOV     #4,R0
5995  034574  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5996  034602  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5997  034610  005300                          DEC     R0
5998  034612  001370                          BNE     20$
5999  034614  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6000  034622  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6001  034630  012737  022040  003524          MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6002  034636  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6003  034644  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6004  034646  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6005  034650  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6006  034654  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6007  034662  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6008  034670  005300                          DEC     R0
6009  034672  001370                          BNE     26$
6010  034674  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6011  034702  012737  000226  003500          MOV     #RDY!WRHEAD&(^C<GO>),E.CS1 ;LOAD EXPECTED CS1
6012  034710  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6013  034716  001401                          BEQ     TST42           ;;YES, GO ON TO NEXT TEST
6014  034720  104174                          ERROR   174             ;CS1 INCORRECT
6015
6016                                  ;;*****************************************************************
6017                                  ;*TEST 42       WRITE LOOPBACK (PART 5)
6018                                  ;*
6019                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6020                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6021                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6022                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6023                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6024                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6025                                  ;*
6026                                  ;*              052012
6027                                  ;*              100520
6028                                  ;*              052012
6029                                  ;*
6030                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
6031                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
6032                                  ;*
6033                                  ;*****************************************************************
6034  034722  000004                  TST42:  SCOPE
6035  034724  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6036  034732  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6037  034736  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6038  034744  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6039  034752  012762  067010  000004          MOV     #HEAD5,RKBA(R2) ;ISSUE WRITE HEADER
6040  034760  012762  177775  000002          MOV     #-3,RKWC(R2)
6041  034766  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
6042  034774  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6043                                                                  ;  READY FOR INDEX PULSE
6044  035000  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6045  035006  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6046  035014  005300                          DEC     R0
```

```
6047  035216  001370                        BNE     1$
6048  035220  012700  000004                MOV     #4,R0           ;ISSUE INDEX PULSE
6049  035224  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
6050  035232  012762  000640  000026  2$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
6051  035240  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
6052  035246  005300                        DEC     R0
6053  035250  001370                        BNE     2$
6054  035252  012762  000040  000026        MOV     #DMD,RKMR1(R2)
6055  035260  012700  000010                MOV     #8.,R0          ;WAIT FOR WRITE GATE
6056  035264  012762  000440  000026  3$:   MOV     #DMD!MCLK,RKMR1(R2)
6057  035272  012762  000040  000026        MOV     #DMD,RKMR1(R2)
6058  035100  005300                        DEC     R0
6059  035102  001370                        BNE     3$
6060  035104  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6061  035112  012762  000040  000026        MOV     #DMD,RKMR1(R2)
6062  035120  005037  003626                CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6063  035124  012737  063036  003170        MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6064  035132  012737  062040  003524        MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6065                                                ;  MAINT REG 1
6066  035140  005037  003612                CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6067  035144  005037  003614                CLR     PR.BIT
6068  035150  005037  003616                CLR     M1.BIT
6069  035154  005037  003620                CLR     M2.BIT
6070  035160  012700  000400                MOV     #256.,R0        ;SIMULATE SYNCH
6071  035164  005037  003622                CLR     BITCNT          ;INITIALIZE BIT COUNT
6072  035170  004737  045206          5$:   JSR     PC,WRTBIT       ;WRITE ONE BIT
6073  035174  104170                        ERROR   170             ;DATA INCORRECT
6074  035176  005237  003622                INC     BITCNT
6075  035202  005300                        DEC     R0              ;CHECK IF READY FOR DATA
6076  035204  001371                        BNE     5$              ;NO, GENERATE NEXT BIT
6077  035206  012737  000001  003612        MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6078  035214  004737  045206                JSR     PC,WRTBIT
6079  035220  104170                        ERROR   170             ;DATA INCORRECT
6080  035222  005037  003622                CLR     BITCNT          ;INITIALIZE BIT COUNT
6081  035226  012737  063102  003170        MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6082  035234  012703  067010                MOV     #HEADS,R3       ;LOAD ADDRESS OF DATA
6083  035240  012700  000003                MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6084  035244  012304                  10$:  MOV     (R3)+,R4        ;GET NEXT WORD
6085  035246  012701  000020                MOV     #16.,R1         ;LOAD BIT COUNT
6086  035252  013737  003616  003620  12$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6087  035260  013737  003614  003616        MOV     PR.BIT,M1.BIT
6088  035266  013737  003612  003614        MOV     P1.BIT,PR.BIT
6089  035274  006004                        ROR     R4              ;SHIFT IN NEXT BIT
6090  035276  103403                        BCS     14$             ;CHECK IF ONE
6091  035300  005037  003612                CLR     P1.BIT          ;ZERO
6092  035304  000403                        BR      15$             ;CLOCK IN BIT
6093
6094  035306  012737  000001  003612  14$:  MOV     #1,P1.BIT       ;ONE
6095  035314  004737  045206          15$:  JSR     PC,WRTBIT       ;WRITE BIT
6096  035320  104170                        ERROR   170             ;BIT INCORRECT
6097  035322  005237  003622                INC     BITCNT          ;INCREMENT BIT COUNT
6098  035326  005301                        DEC     R1              ;CHECK IF WORD FINISHED
6099  035330  001350                        BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6100  035332  005300                        DEC     R0              ;CHECK IF HEADER COMPLETE
6101  035334  001343                        BNE     10$             ;NO, GET NEXT WORD
6102  035336  012701  000020                MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
```

```
6103  035342  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6104  035350  013737  003614  003616          MOV     PR.BIT,M1.BIT
6105  035356  013737  003612  003614          MOV     P1.BIT,PR.BIT
6106  035364  005037  003612                  CLR     P1.BIT
6107  035370  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
6108  035374  104170                          ERROR   170             ;BIT INCORRECT
6109  035376  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6110  035402  005301                          DEC     R1              ;CHECK IF FINISHED
6111  035404  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6112  035406  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX
6113  035414  012700  000004                  MOV     #4,R0
6114  035420  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6115  035426  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6116  035434  005300                          DEC     R0
6117  035436  001370                          BNE     20$
6118  035440  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6119  035446  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6120  035454  012737  022040  003524          MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6121  035462  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6122  035470  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6123  035472  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6124  035474  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6125  035500  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6126  035506  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6127  035514  005300                          DEC     R0
6128  035516  001370                          BNE     26$
6129  035520  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6130  035526  012737  000226  003500          MOV     #RDY!MRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
6131  035534  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6132  035542  001401                          BEQ     TST43           ;;YES, GO ON TO NEXT TEST
6133  035544  104174                          ERROR   174             ;CS1 INCORRECT
6134
6135                                  ;;*****************************************************************
6136                                  ;*TEST 43       WRITE LOOPBACK (PART 6)
6137                                  ;*
6138                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6139                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6140                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6141                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6142                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6143                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6144                                  ;*
6145                                  ;*              155555
6146                                  ;*              066666
6147                                  ;*              155555
6148                                  ;*
6149                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
6150                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
6151                                  ;*
6152                                  ;*****************************************************************
6153  035546  000004          TST43:  SCOPE
6154  035550  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6155  035556  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6156  035562  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6157  035570  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6158  035576  012762  067016  000004          MOV     #HEAD6,RKBA(R2) ;ISSUE WRITE HEADER
```

```
6159  035604  012762  177775  000002          MOV     #-3,RKWC(R2)
6160  035612  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
6161  035620  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6162                                                                  ;  READY FOR INDEX PULSE
6163  035624  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6164  035632  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6165  035640  005300                          DEC     R0
6166  035642  001370                          BNE     1$
6167  035644  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6168  035650  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6169  035656  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6170  035664  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6171  035672  005300                          DEC     R0
6172  035674  001370                          BNE     2$
6173  035676  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6174  035704  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6175  035710  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6176  035716  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6177  035724  005300                          DEC     R0
6178  035726  001370                          BNE     3$
6179  035730  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6180  035736  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6181  035744  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6182  035750  012737  063036  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6183  035756  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6184                                                                  ;  MAINT REG 1
6185  035764  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6186  035770  005037  003614                  CLR     PR.BIT
6187  035774  005037  003616                  CLR     M1.BIT
6188  036000  005037  003620                  CLR     M2.BIT
6189  036004  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6190  036010  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6191  036014  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6192  036020  104170                          ERROR   170             ;DATA INCORRECT
6193  036022  005237  003622                  INC     BITCNT
6194  036026  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6195  036030  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6196  036032  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6197  036040  004737  045206                  JSR     PC,WRTBIT
6198  036044  104170                          ERROR   170             ;DATA INCORRECT
6199  036046  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6200  036052  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6201  036060  012703  067016                  MOV     #HEAD6,R3       ;LOAD ADDRESS OF DATA
6202  036064  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6203  036070  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
6204  036072  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6205  036076  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6206  036104  013737  003614  003616          MOV     PR.BIT,M1.BIT
6207  036112  013737  003612  003614          MOV     P1.BIT,PR.BIT
6208  036120  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6209  036122  103403                          BCS     14$             ;CHECK IF ONE
6210  036124  005037  003612                  CLR     P1.BIT          ;ZERO
6211  036130  000403                          BR      15$             ;CLOCK IN BIT
6212
6213  036132  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
6214  036140  004737  045206          15$:     JSR     PC,WRTBIT       ;WRITE BIT
```

```
6215  036144  104170                          ERROR   170             ;BIT INCORRECT
6216  036146  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6217  036152  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6218  036154  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6219  036156  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6220  036160  001343                          BNE     10$             ;NO, GET NEXT WORD
6221  036162  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6222  036166  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6223  036174  013737  003614  003616          MOV     PR.BIT,M1.BIT
6224  036202  013737  003612  003614          MOV     P1.BIT,PR.BIT
6225  036210  005037  003612                  CLR     P1.BIT
6226  036214  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
6227  036220  104170                          ERROR   170             ;BIT INCORRECT
6228  036222  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6229  036226  005301                          DEC     R1              ;CHECK IF FINISHED
6230  036230  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6231  036232  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6232  036240  012700  000004                  MOV     #4,R0
6233  036244  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6234  036252  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6235  036260  005300                          DEC     R0
6236  036262  001370                          BNE     20$
6237  036264  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6238  036272  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6239  036300  012737  022040  003524          MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6240  036306  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6241  036314  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6242  036316  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6243  036320  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6244  036324  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6245  036332  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6246  036340  005300                          DEC     R0
6247  036342  001370                          BNE     26$
6248  036344  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6249  036352  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
6250  036360  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6251  036366  001401                          BEQ     TST44           ;YES, GO ON TO NEXT TEST
6252  036370  104174                          ERROR   174             ;CS1 INCORRECT
6253
6254                                  ;*****************************************************************
6255                                  ;*TEST 44       WRITE LOOPBACK (PART 7)
6256                                  ;*
6257                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6258                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6259                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6260                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6261                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6262                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6263                                  ;*
6264                                  ;*              104210
6265                                  ;*              104210
6266                                  ;*              104210
6267                                  ;*
6268                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
6269                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
6270                                  ;*
```

```
6271                                        ;;*****************************************************************
6272  036372  000004                        T$T44:  SCOPE
6273  036374  012737  000144  001200                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6274  036402  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
6275  036406  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6276  036414  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6277  036422  012762  067024  000004                MOV     #HEAD7,RKBA(R2) ;ISSUE WRITE HEADER
6278  036430  012762  177775  000002                MOV     #-3,RKWC(R2)
6279  036436  012762  000027  000000                MOV     #WRHEAD,RKCS1(R2)
6280  036444  012700  000312                        MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6281                                                                        ;  READY FOR INDEX PULSE
6282  036450  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
6283  036456  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6284  036464  005300                                DEC     R0
6285  036466  001370                                BNE     1$
6286  036470  012700  000004                        MOV     #4,R0           ;ISSUE INDEX PULSE
6287  036474  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
6288  036502  012762  000640  000026  2$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
6289  036510  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
6290  036516  005300                                DEC     R0
6291  036520  001370                                BNE     2$
6292  036522  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6293  036530  012700  000010                        MOV     #8.,R0          ;WAIT FOR WRITE GATE
6294  036534  012762  000440  000026  3$:   MOV     #DMD!MCLK,RKMR1(R2)
6295  036542  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6296  036550  005300                                DEC     R0
6297  036552  001370                                BNE     3$
6298  036554  012762  000140  000026                MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6299  036562  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6300  036570  005037  003626                        CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6301  036574  012737  063036  003170                MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6302  036602  012737  062040  003524                MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6303                                                                        ;  MAINT REG 1
6304  036610  005037  003612                        CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6305  036614  005037  003614                        CLR     PR.BIT
6306  036620  005037  003616                        CLR     M1.BIT
6307  036624  005037  003620                        CLR     M2.BIT
6308  036630  012700  000400                        MOV     #256.,R0        ;SIMULATE SYNCH
6309  036634  005037  003622                        CLR     BITCNT          ;INITIALIZE BIT COUNT
6310  036640  004737  045206          5$:   JSR     PC,WRTBIT       ;WRITE ONE BIT
6311  036644  104170                                ERROR   170             ;DATA INCORRECT
6312  036646  005237  003622                        INC     BITCNT
6313  036652  005300                                DEC     R0              ;CHECK IF READY FOR DATA
6314  036654  001371                                BNE     5$              ;NO, GENERATE NEXT BIT
6315  036656  012737  000001  003612                MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6316  036664  004737  045206                        JSR     PC,WRTBIT
6317  036670  104170                                ERROR   170             ;DATA INCORRECT
6318  036672  005037  003622                        CLR     BITCNT          ;INITIALIZE BIT COUNT
6319  036676  012737  063102  003170                MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6320  036704  012703  067024                        MOV     #HEAD7,R3       ;LOAD ADDRESS OF DATA
6321  036710  012700  000003                        MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6322  036714  012304                        10$:  MOV     (R3)+,R4        ;GET NEXT WORD
6323  036716  012701  000020                        MOV     #16.,R1         ;LOAD BIT COUNT
6324  036722  013737  003616  003620  12$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6325  036730  013737  003614  003616                MOV     PR.BIT,M1.BIT
6326  036736  013737  003612  003614                MOV     P1.BIT,PR.BIT
```

```
6327  036744  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6328  036746  103403                          BCS     14$             ;CHECK IF ONE
6329  036750  005037  003612                  CLR     P1.BIT          ;ZERO
6330  036754  000403                          BR      15$             ;CLOCK IN BIT
6331
6332  036756  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6333  036764  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6334  036770  104170                          ERROR   170             ;BIT INCORRECT
6335  036772  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6336  036776  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6337  037000  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6338  037002  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6339  037004  001343                          BNE     10$             ;NO, GET NEXT WORD
6340  037006  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6341  037012  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6342  037020  013737  003614  003616          MOV     PR.BIT,M1.BIT
6343  037026  013737  003612  003614          MOV     P1.BIT,PR.BIT
6344  037034  005037  003612                  CLR     P1.BIT
6345  037040  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
6346  037044  104170                          ERROR   170             ;BIT INCORRECT
6347  037046  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6348  037052  005301                          DEC     R1              ;CHECK IF FINISHED
6349  037054  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6350  037056  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6351  037064  012700  000004                  MOV     #4,R0
6352  037070  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6353  037076  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6354  037104  005300                          DEC     R0
6355  037106  001370                          BNE     20$
6356  037110  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6357  037116  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6358  037124  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6359  037132  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6360  037140  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6361  037142  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6362  037144  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6363  037150  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6364  037156  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6365  037164  005300                          DEC     R0
6366  037166  001370                          BNE     26$
6367  037170  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6368  037176  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
6369  037204  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6370  037212  001401                          BEQ     TST45           ;YES, GO ON TO NEXT TEST
6371  037214  104174                          ERROR   174             ;CS1 INCORRECT
6372
6373                          ;;*****************************************************************
6374                          ;*TEST 45       WRITE TWO HEADERS
6375                          ;*
6376                          ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6377                          ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6378                          ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6379                          ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6380                          ;*      INDEX PULSE, SECTOR PULSE, THREE WORD HEADER
6381                          ;*      CONSISTING OF THE FOLLOWING DATA:
6382                          ;*
```

```
                                        ;*              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.
                                        ;*
                                        ;;*****************************************************************
037216  000004                  T45:    SCOPE
037220  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
037226  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
037232  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
037240  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
037246  012762  066752  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
037254  012703  066752                  MOV     #HEAD1,R3
037260  012762  177772  000002          MOV     #-6,RKWC(R2)
037266  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
037274  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR INDEX PULSE
037300  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
037306  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037314  005300                          DEC     R0
037316  001370                          BNE     1$
037320  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
037324  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037332  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
037340  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037346  005300                          DEC     R0
037350  001370                          BNE     2$
037352  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
037356  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037364  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
037370  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
037374  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
037402  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037410  005300                          DEC     R0
037412  001370                          BNE     3$
037414  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
037422  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037430  012737  063036  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
037436  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
037444  005037  003612                  CLR     P1.BIT
037450  005037  003614                  CLR     PR.BIT
037454  005037  003616                  CLR     M1.BIT
037460  005037  003620                  CLR     M2.BIT
037464  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
037470  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
037474  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
```

```
6439  037500  104170                          ERROR   170             ;DATA INCORRECT
6440  037502  005237  003622                  INC     BITCNT
6441  037506  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6442  037510  001371                          BNE     5$              ;NO,GENERATE NEXT BIT
6443  037512  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6444  037520  004737  045206                  JSR     PC,WRTBIT
6445  037524  104170                          ERROR   170             ;DATA INCORRECT
6446  037526  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6447  037532  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6448  037540  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6449  037544  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6450  037546  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6451  037552  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6452  037560  013737  003614  003616          MOV     PR.BIT,M1.BIT
6453  037566  013737  003612  003614          MOV     P1.BIT,PR.BIT
6454  037574  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6455  037576  103403                          BCS     14$             ;CHECK IF ONE
6456  037600  005037  003612                  CLR     P1.BIT          ;ZERO
6457  037604  000403                          BR      15$             ;CLOCK IN BIT
6458
6459  037606  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6460  037614  004737  045206          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6461  037620  104170                          ERROR   170             ;BIT INCORRECT
6462  037622  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6463  037626  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6464  037630  001350                          BNE     12$             ;NO, CONTINUE
6465  037632  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6466  037634  001343                          BNE     10$             ;NO, GET NEXT WORD
6467  037636  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6468  037642  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6469  037650  013737  003614  003616          MOV     PR.BIT,M1.BIT
6470  037656  013737  003612  003614          MOV     P1.BIT,PR.BIT
6471  037664  005037  003612                  CLR     P1.BIT
6472  037670  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
6473  037674  104170                          ERROR   170             ;BIT INCORRECT
6474  037676  005237  003622                  INC     BITCNT          ;INCREMENT
6475  037702  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6476  037704  001356                          BNE     18$             ;NO, CONTINUE
6477  037706  005237  003626                  INC     SECCNT          ;INCREMENT
6478  037712  005305                          DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
6479  037714  001237                          BNE     4$              ;NO, DO SECOND HEADER
6480  037716  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6481  037724  012700  000004                  MOV     #4,R0
6482  037730  012762  000640  000026  2^$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6483  037736  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6484  037744  005300                          DEC     R0
6485  037746  001370                          BNE     20$
6486  037750  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6487  037756  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6488  037764  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
6489  037772  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
6490  040000  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6491  040002  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6492  040004  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6493  040010  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6494  040016  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
6495  040024  005300                          DEC     R0
6496  040026  001370                          BNE     26$
6497  040030  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6498  040036  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
6499  040044  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6500  040052  001401                          BEQ     TST46           ;;YES, GO ON TO NEXT TEST
6501  040054  104174                          ERROR   174
6502
6503                                  ;;*****************************************************************
6504                                  ;*TEST 46       DATA FIELD FILLING ON WRITE HEADER
6505                                  ;*
6506                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6507                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6508                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, AND
6509                                  ;*      SPECIFY TWO 3 WORD HEADERS CONSISTING OF THE
6510                                  ;*      FOLLOWING DATA:
6511                                  ;*
6512                                  ;*              125252
6513                                  ;*              052525
6514                                  ;*              125252
6515                                  ;*              052525
6516                                  ;*              125252
6517                                  ;*              052525
6518                                  ;*
6519                                  ;*      MAKE SURE THE DATA SYNCH ANY OTHER BITS OF DATA AND
6520                                  ;*      ECC FIELD ARE WRITTEN CORRECTLY.
6521                                  ;*
6522                                  ;*****************************************************************
6523  040056  000004                  TST46:  SCOPE
6524  040060  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6525  040066  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6526  040072  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6527  040100  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6528  040106  012762  066766  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE READ HEADER
6529  040114  012703  066766                  MOV     #HEAD3,R3
6530  040120  012762  177772  000002          MOV     #-2*3,RKWC(R2)
6531  040126  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
6532  040134  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
6533                                                                  ;  FOR INDEX PULSE
6534  040140  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6535  040146  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6536  040154  005300                          DEC     R0
6537  040156  001370                          BNE     1$
6538  040160  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6539  040164  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6540  040172  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6541  040200  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6542  040206  005300                          DEC     R0
6543  040210  001370                          BNE     2$
6544  040212  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6545  040220  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6546  040224  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6547  040232  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6548  040240  005300                          DEC     R0
6549  040242  001370                          BNE     3$
6550  040244  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
```

```
6551  040250  012705  000002                    MOV     #2,R5           ;LOAD NUMBER OF HEADERS
6552  040254  012762  000140  000026  4$:       MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6553  040262  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6554  040270  012737  063036  003170            MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6555  040276  012737  062040  003524            MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6556                                                                    ;  MAINT REG 1
6557  040304  005037  003612                    CLR     P1.BIT
6558  040310  005037  003614                    CLR     PR.BIT
6559  040314  005037  003616                    CLR     M1.BIT
6560  040320  005037  003620                    CLR     M2.BIT
6561  040324  012700  000400                    MOV     #255.,R0        ;SIMULATE SYNCH
6562  040330  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
6563  040334  004737  045206          5$:       JSR     PC,WRTBIT       ;WRITE ONE BIT
6564  040340  104170                            ERROR   170             ;DATA INCORRECT
6565  040342  005237  003622                    INC     BITCNT
6566  040346  005300                            DEC     R0              ;CHECK IF READY FOR DATA
6567  040350  001371                            BNE     5$              ;NO, GENERATE NEXT BIT
6568  040352  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6569  040360  004737  045206                    JSR     PC,WRTBIT
6570  040364  104170                            ERROR   170             ;DATA INCORRECT
6571  040366  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
6572  040372  012737  063102  003170            MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6573  040400  012700  000003                    MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6574  040404  012304                  10$:       MOV     (R3)+,R4        ;GET NEXT WORD
6575  040406  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
6576  040412  013737  003616  003620  12$:       MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6577  040420  013737  003614  003616            MOV     PR.BIT,M1.BIT
6578  040426  013737  003612  003614            MOV     P1.BIT,PR.BIT
6579  040434  006004                            ROR     R4              ;SHIFT IN NEXT BIT
6580  040436  103403                            BCS     14$             ;CHECK IF ONE
6581  040440  005037  003612                    CLR     P1.BIT          ;ZERO
6582  040444  000403                            BR      15$             ;CLOCK IN BIT
6583
6584  040446  012737  000001  003612  14$:       MOV     #1,P1.BIT       ;ONE
6585  040454  004737  045206          15$:       JSR     PC,WRTBIT       ;WRITE BIT
6586  040460  104170                            ERROR   170             ;BIT INCORRECT
6587  040462  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
6588  040466  005301                            DEC     R1              ;CHECK IF WORD FINISHED
6589  040470  001350                            BNE     12$             ;NO, CONTINUE
6590  040472  005300                            DEC     R0              ;CHECK IF HEADER COMPLETE
6591  040474  001343                            BNE     10$             ;NO, GET NEXT WORD
6592  040476  012737  063334  003170            MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
6593  040504  012701  000477                    MOV     #64.+255.,R1    ;LOAD COUNT
6594  040510  013737  003616  003620  18$:       MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6595  040516  013737  003614  003616            MOV     PR.BIT,M1.BIT
6596  040524  013737  003612  003614            MOV     P1.BIT,PR.BIT
6597  040532  005037  003612                    CLR     P1.BIT
6598  040536  004737  045206                    JSR     PC,WRTBIT       ;WRITE ZERO
6599  040542  104170                            ERROR   170             ;BIT INCORRECT
6600  040544  005301                            DEC     R1              ;CHECK IF READY FOR DATA
6601  040546  001360                            BNE     18$             ;NO, CONTINUE
6602  040550  012737  000001  003612            MOV     #1,P1.BIT       ;SET SYNCH BIT
6603  040556  004737  045206                    JSR     PC,WRTBIT       ;WRITE SYNCH BIT
6604  040562  104170                            ERROR   170             ;SYNCH BIT INCORRECT
6605  040564  012737  063402  003170            MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
6606  040572  005037  003622                    CLR     BITCNT          ;CLEAR BIT COUNT
```

```
6607  040576  012701  007777                    MOV     #256.*16.-1,R1  ;LOAD COUNT
6608  040602  013737  003616  003620  20$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6609  040610  013737  003614  003616            MOV     PR.BIT,M1.BIT
6610  040616  013737  003612  003614            MOV     P1.BIT,PR.BIT
6611  040624  005037  003612                    CLR     P1.BIT
6612  040630  004737  045206                    JSR     PC,WRTBIT       ;WRITE ZEROS
6613  040634  104170                            ERROR   170             ;BIT INCORRECT
6614  040636  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
6615  040642  005301                            DEC     R1              ;CHECK IF READY FOR ECC
6616  040644  001356                            BNE     20$             ;NO, CONTINUE
6617  040646  012701  000040                    MOV     #32.,R1         ;LOAD COUNT
6618  040652  042737  020000  003524            BIC     #ECCW,E.MR1     ;RESET ECCW BIT
6619  040660  004737  045206          21$:      JSR     PC,WRTBIT       ;WRITE ECC FIELD
6620  040664  104170                            ERROR   170             ;BIT INCORRECT
6621  040666  005237  003622                    INC     BITCNT          ;INCREMENT COUNT
6622  040672  005301                            DEC     R1              ;CHECK IF READY FOR POST AMBLE
6623  040674  001371                            BNE     21$             ;NO CONTINUE
6624  040676  052737  020000  003524            BIS     #ECCW,E.MR1     ;SET ECCW
6625  040704  012701  000012                    MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
6626  040710  004737  045206          22$:      JSR     PC,WRTBIT       ;WRITE POSTAMBLE
6627  040714  104170                            ERROR   170             ;BIT INCORRECT
6628  040716  005237  003622                    INC     BITCNT          ;INCREMENT COUNT
6629  040722  005301                            DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6630  040724  001371                            BNE     22$             ;NO, COMPLETE POSTAMBLE
6631  040726  005237  003626                    INC     SECCNT          ;INCREMENT COUNT
6632  040732  005305                            DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
6633  040734  001402                            BEQ     23$             ;YES, SIMULATE INDEX
6634  040736  000137  040254                    JMP     4$              ;NO GET NEXT HEADER
6635
6636  040742  012762  000240  000026  23$:      MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6637  040750  012700  000004                    MOV     #4,R0
6638  040754  012762  000640  000026  25$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
6639  040762  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
6640  040770  005300                            DEC     R0
6641  040772  001370                            BNE     25$
6642  040774  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6643  041002  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6644  041010  012737  022040  003524            MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6645  041016  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6646                                                                    ;  (WRITE GATE RESET)
6647  041024  001401                            BEQ     28$             ;YES, CHECK IF READY SET
6648  041026  104173                            ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6649  041030  012700  000010          28$:      MOV     #8.,R0          ;FINISH COMMAND
6650  041034  012762  000440  000026  29$:      MOV     #DMD!MCLK,RKMR1(R2)
6651  041042  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6652  041050  005300                            DEC     R0
6653  041052  001370                            BNE     29$
6654  041054  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6655  041062  012737  000226  003500            MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6656  041070  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6657  041076  001401                            BEQ     TST47           ;YES, GO TO NEXT TEST
6658  041100  104174                            ERROR   174             ;CS1 INCORRECT
6659
6660                                  ;;*****************************************************************
6661                                  ;*TEST 47        WRITE HEADER FOR 26 SECTORS
6662                                  ;*
```

```
                                        ;*      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, SPECIFYING
                                        ;*      66 WORDS.  MAKE SURE ALL 26 SECTORS ARE WRITTEN CORRECTLY.
                                        ;*
                                        ;.*****************************************************************
041102  000004                  ST47:   SCOPE
041104  012737  000010  001200          MOV     #10,STIMES      ;;DO 10 ITERATIONS
041112  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
041116  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
041124  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
041132  012762  067032  000004          MOV     #MPRBUF,RKBA(R2)        ;ISSUE READ HEADER
041140  012703  067032                  MOV     #MPRBUF,R3
041144  012762  177676  000002          MOV     #-22.*3,RKWC(R2)
041152  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
041160  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
                                                                ;  FOR INDEX PULSE
041164  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
041172  012762  000040  000026          MOV     #DMD,RKMR1(R2)
041200  005300                          DEC     R0
041202  001370                          BNE     1$
041204  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
041210  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
041216  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
041224  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
041232  005300                          DEC     R0
041234  001370                          BNE     2$
041236  012762  000040  000026          MOV     #DMD,RKMR1(R2)
041244  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
041250  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
041256  012762  000040  000026          MOV     #DMD,RKMR1(R2)
041264  005300                          DEC     R0
041266  001370                          BNE     3$
041270  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
041274  012705  000026                  MOV     #22.,R5         ;LOAD NUMBER OF HEADERS
041300  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
041306  012762  000040  000026          MOV     #DMD,RKMR1(R2)
041314  012737  063036  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
041322  012737  062040  003524          MOV     #DMD!MEND!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
041330  005037  003612                  CLR     P1.BIT
041334  005037  003614                  CLR     PR.BIT
041340  005037  003616                  CLR     M1.BIT
041344  005037  003620                  CLR     M2.BIT
041350  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
041354  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
041360  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
041364  104170                          ERROR   170             ;DATA INCORRECT
041366  005237  003622                  INC     BITCNT
041372  005300                          DEC     R0              ;CHECK IF READY FOR DATA
041374  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
041376  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
041404  004737  045206                  JSR     PC,WRTBIT
041410  104170                          ERROR   170             ;DATA INCORRECT
041412  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
041416  012737  063102  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
```

```
 6719  041424  012700  000003              MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6720  041430  012304              10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 6721  041432  012701  000020              MOV     #16.,R1         ;LOAD BIT COUNT
 6722  041436  013737  003616  003620 12$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6723  041444  013737  003614  003616      MOV     PR.BIT,M1.BIT
 6724  041452  013737  003612  003614      MOV     P1.BIT,PR.BIT
 6725  041460  006004                      ROR     R4              ;SHIFT IN NEXT BIT
 6726  041462  103403                      BCS     14$             ;CHECK IF ONE
 6727  041464  005037  003612              CLR     P1.BIT          ;ZERO
 6728  041470  000403                      BR      15$             ;CLOCK IN BIT
 6729
 6730  041472  012737  000001  003612 14$:  MOV     #1,P1.BIT       ;ONE
 6731  041500  004737  045206        15$:  JSR     PC,WRTBIT       ;WRITE BIT
 6732  041504  104170                      ERROR   170             ;BIT INCORRECT
 6733  041506  005237  003622              INC     BITCNT          ;INCREMENT BIT COUNT
 6734  041512  005301                      DEC     R1              ;CHECK IF WORD FINISHED
 6735  041514  001350                      BNE     12$             ;NO, CONTINUE
 6736  041516  005300                      DEC     R0              ;CHECK IF HEADER COMPLETE
 6737  041520  001343                      BNE     10$             ;NO, GET NEXT WORD
 6738  041522  012737  063334  003170      MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
 6739  041530  012701  000477              MOV     #64.+255.,R1    ;LOAD COUNT
 6740  041534  013737  003616  003620 18$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6741  041542  013737  003614  003616      MOV     PR.BIT,M1.BIT
 6742  041550  013737  003612  003614      MOV     P1.BIT,PR.BIT
 6743  041556  005037  003612              CLR     P1.BIT
 6744  041562  004737  045206              JSR     PC,WRTBIT       ;WRITE ZERO
 6745  041566  104170                      ERROR   170             ;BIT INCORRECT
 6746  041570  005301                      DEC     R1              ;CHECK IF READY FOR DATA
 6747  041572  001360                      BNE     18$             ;NO, CONTINUE
 6748  041574  012737  000001  003612      MOV     #1,P1.BIT       ;SET SYNCH BIT
 6749  041602  004737  045206              JSR     PC,WRTBIT       ;WRITE SYNCH BIT
 6750  041606  104170                      ERROR   170             ;SYNCH BIT INCORRECT
 6751  041610  012737  063402  003170      MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
 6752  041616  005037  003622              CLR     BITCNT          ;CLEAR BIT COUNT
 6753  041622  012701  007777              MOV     #256.*16.-1,R1  ;LOAD COUNT
 6754  041626  013737  003616  003620 20$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6755  041634  013737  003614  003616      MOV     PR.BIT,M1.BIT
 6756  041642  013737  003612  003614      MOV     P1.BIT,PR.BIT
 6757  041650  005037  003612              CLR     P1.BIT
 6758  041654  004737  045206              JSR     PC,WRTBIT       ;WRITE ZEROS
 6759  041660  104170                      ERROR   170             ;BIT INCORRECT
 6760  041662  005237  003622              INC     BITCNT          ;INCREMENT BIT COUNT
 6761  041666  005301                      DEC     R1              ;CHECK IF READY FOR ECC
 6762  041670  001356                      BNE     20$             ;NO, CONTINUE
 6763  041672  012701  000040              MOV     #32.,R1         ;LOAD COUNT
 6764  041676  042737  020000  003524      BIC     #ECCW,E.MR1     ;RESET ECCW BIT
 6765  041704  004737  045206        21$:  JSR     PC,WRTBIT       ;WRITE ECC FIELD
 6766  041710  104170                      ERROR   170             ;BIT INCORRECT
 6767  041712  005237  003622              INC     BITCNT          ;INCREMENT COUNT
 6768  041716  005301                      DEC     R1              ;CHECK IF READY FOR POST AMBLE
 6769  041720  001371                      BNE     21$             ;NO CONTINUE
 6770  041722  052737  020000  003524      BIS     #ECCW,E.MR1     ;SET ECCW
 6771  041730  012701  000012              MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
 6772  041734  004737  045206        22$:  JSR     PC,WRTBIT       ;WRITE POSTAMBLE
 6773  041740  104170                      ERROR   170             ;BIT INCORRECT
 6774  041742  005237  003622              INC     BITCNT          ;INCREMENT COUNT
```

```
 6775  041746  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
 6776  041750  001371                          BNE     22$             ;NO, COMPLETE POSTAMBLE
 6777  041752  005237  003626                  INC     SECCNT          ;INCREMENT COUNT
 6778  041756  005305                          DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
 6779  041760  001402                          BEQ     23$             ;YES, SIMULATE INDEX
 6780  041762  000137  041300                  JMP     4$              ;NO GET NEXT HEADER
 6781
 6782  041766  012762  000240  000026  23$:    MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
 6783  041774  012700  000004                  MOV     #4,R0
 6784  042000  012762  000640  000026  25$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6785  042006  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6786  042014  005300                          DEC     R0
 6787  042016  001370                          BNE     25$
 6788  042020  012762  000040  000026          MOV     #CWD,RKMR1(R2)
 6789  042026  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6790  042034  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 6791  042042  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
 6792                                                                  ;  (WRITE GATE RESET)
 6793  042050  001401                          BEQ     28$             ;YES, CHECK IF READY SET
 6794  042052  104173                          ERROR   173             ;MAINTENANCE REG 1 INCORRECT
 6795  042054  012700  000010          28$:    MOV     #8.,R0          ;FINISH COMMAND
 6796  042060  012762  000440  000026  29$:    MOV     #DMD!MCLK,RKMR1(R2)
 6797  042066  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6798  042074  005300                          DEC     R0
 6799  042076  001370                          BNE     29$
 6800  042100  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6801  042106  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6802  042114  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6803  042122  001401                          BEQ     TST50           ;YES, GO TO NEXT TEST
 6804  042124  104174                          ERROR   174             ;CS1 INCORRECT
 6805
 6806                                  ;;*****************************************************************
 6807                                  ;*TEST 50       WRITE HEADER IN 24 SECTOR FORMAT
 6808                                  ;*
 6809                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
 6810                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
 6811                                  ;*      OF SIX WORDS IN 24 SECTOR FORMAT TO AN RK06, CYLINDER 0,
 6812                                  ;*      HEAD 0, DRIVE 0.  CLOCK THROUGH THE SEEK AND DRIVE CLEAR
 6813                                  ;*      MESSAGES, SIMULATE INDEX PULSE, SECTOR PULSE, 3 HEADER
 6814                                  ;*      WORDS, SYNCH AND DATA, ANOTHER SECTOR PULSE, 3 HEADER
 6815                                  ;*      WORDS, AND AN INDEX PULSE.  CHECK DATA WRITTEN TO MAKE
 6816                                  ;*      SURE ONLY LOW 16 BITS OF SILO ARE USED.
 6817                                  ;*
 6818                                  ;;*****************************************************************
 6819  042126  000004                  TST50:  SCOPE
 6820  042130  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6821  042136  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6822  042142  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6823  042150  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
 6824  042156  012762  066752  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
 6825  042164  012703  066752                  MOV     #HEAD1,R3
 6826  042170  012762  177772  000002          MOV     #-6,RKWC(R2)
 6827  042176  012762  010027  000000          MOV     #CFMT!WRHEAD,RKCS1(R2)
 6828  042204  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6829                                                                  ;  READY FOR INDEX PULSE
 6830  042210  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
```

```
6831  042216  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6832  042224  005300                          DEC     R0
6833  042226  001370                          BNE     1$
6834  042230  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6835  042234  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6836  042242  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6837  042250  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6838  042256  005300                          DEC     R0
6839  042260  001370                          BNE     2$
6840  042262  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
6841  042266  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6842  042274  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
6843  042300  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6844  042304  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6845  042312  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6846  042320  005300                          DEC     R0
6847  042322  001370                          BNE     3$
6848  042324  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6849  042332  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6850  042340  012737  063441  003170          MOV     #EM239,EMW      ;LOAD ERROR MESSAGE
6851  042346  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6852                                                                  ;  MAINT REG 1
6853  042354  005037  003612                  CLR     P1.BIT
6854  042360  005037  003614                  CLR     PR.BIT
6855  042364  005037  003616                  CLR     M1.BIT
6856  042370  005037  003620                  CLR     M2.BIT
6857  042374  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6858  042400  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6859  042404  004737  045206          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6860  042410  104170                          ERROR   170             ;DATA INCORRECT
6861  042412  005237  003622                  INC     BITCNT
6862  042416  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6863  042420  001371                          BNE     5$              ;NO,GENERATE NEXT BIT
6864  042422  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6865  042430  004737  045206                  JSR     PC,WRTBIT
6866  042434  104170                          ERROR   170             ;DATA INCORRECT
6867  042436  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6868  042442  012737  063533  003170          MOV     #EM240,EMW      ;LOAD ERROR MESSAGE
6869  042450  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6870  042454  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
6871  042456  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6872  042462  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6873  042470  013737  003614  003616          MOV     PR.BIT,M1.BIT
6874  042476  013737  003612  003614          MOV     P1.BIT,PR.BIT
6875  042504  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6876  042506  103403                          BCS     14$             ;CHECK IF ONE
6877  042510  005037  003612                  CLR     P1.BIT          ;ZERO
6878  042514  000403                          BR      15$             ;CLOCK IN BIT
6879
6880  042516  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
6881  042524  004737  045206          15$:     JSR     PC,WRTBIT       ;WRITE BIT
6882  042530  104170                          ERROR   170             ;BIT INCORRECT
6883  042532  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6884  042536  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6885  042540  001350                          BNE     12$             ;NO, CONTINUE
6886  042542  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
```

```
6887  042544  001343                          BNE     10$             ;NO, GET NEXT WORD
6888  042546  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6889  042552  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6890  042560  013737  003614  003616          MOV     PR.BIT,M1.BIT
6891  042566  013737  003612  003614          MOV     P1.BIT,PR.BIT
6892  042574  005037  003612                  CLR     P1.BIT
6893  042600  004737  045206                  JSR     PC,WRTBIT       ;WRITE ZERO
6894  042604  104170                          ERROR   170             ;BIT INCORRECT
6895  042606  005237  003622                  INC     BITCNT          ;INCREMENT
6896  042612  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6897  042614  001356                          BNE     18$             ;NO, CONTINUE
6898  042616  005237  003626                  INC     SECCNT          ;INCREMENT
6899  042622  005305                          DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
6900  042624  001237                          BNE     4$              ;NO, DO SECOND HEADER
6901  042626  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)';SIMULATE INDEX PULSE
6902  042634  012700  000004                  MOV     #4,R0
6903  042640  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6904  042646  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6905  042654  005300                          DEC     R0
6906  042656  001370                          BNE     20$
6907  042660  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6908  042666  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6909  042674  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
6910  042702  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
6911  042710  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6912  042712  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6913  042714  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6914  042720  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6915  042726  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6916  042734  005300                          DEC     R0
6917  042736  001370                          BNE     26$
6918  042740  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6919  042746  012737  010226  003500          MOV     #RDY!CFMT!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6920  042754  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6921  042762  001401                          BEQ     TST51           ;;YES, GO ON TO NEXT TEST
6922  042764  104174                          ERROR   174
6923
6924                                  .SBTTL  **TYPE B INSTRUCTION ERRORS
6925
6926                                  ;;*****************************************************************
6927                                  ;*TEST 51       FORMAT ERROR (PART 1)
6928                                  ;*
6929                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
6930                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
6931                                  ;*      RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0.
6932                                  ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
6933                                  ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
6934                                  ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
6935                                  ;*
6936                                  ;;*****************************************************************
6937  042766  000004                  TST51:  SCOPE
6938  042770  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6939  042776  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6940  043002  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
6941  043010  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
6942  043016  012762  000043  000020          MOV     #43,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
```

```
6943  043024  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEADER
6944  043032  012700  000132                  MOV     #22.*4+2,R0       ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
6945  043036  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6946  043044  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6947  043052  005300                          DEC     R0
6948  043054  001370                          BNE     1$
6949  043056  005062  000026                  CLR     RKMR1(R2)         ;FINISH COMMAND IN NORMAL MODE
6950  043062  013700  003632                  MOV     WAITIM,R0         ;WAIT FOR READY
6951  043066  105762  000000          2$:     TSTB    RKCS1(R2)
6952  043072  100402                          BMI     3$
6953  043074  005300                          DEC     R0
6954  043076  001373                          BNE     2$
6955  043100  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
6956  043106  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
6957  043114  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
6958  043122  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
6959  043130  012737  100224  003500          MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6960  043136  012737  000100  003510          MOV     #IR,E.CS2         ;LOAD EXPECTED CS2
6961  043144  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
6962  043152  012737  000020  003514          MOV     #FMTE,E.ER        ;LOAD EXPECTED ERROR REG
6963  043160  023737  003500  003440          CMP     E.CS1,T.CS1       ;CHECK COMMAND AND STATUS REG 1 CORRECT
6964  043166  001401                          BEQ     4$                ;YES, CONTINUE
6965  043170  104175                          ERROR   175
6966  043172  023737  003510  003450  4$:     CMP     E.CS2,T.CS2       ;CHECK COMMAND AND STATU REG 2 CORRECT
6967  043200  001401                          BEQ     5$                ;YES, CONTINUE
6968  043202  104176                          ERROR   176
6969  043204  023737  003512  003452  5$:     CMP     E.DS,T.DS         ;CHECK IF DRIVE STRATUS REG CORRECT
6970  043212  001401                          BEQ     6$                ;YES, CONTINUE
6971  043214  104177                          ERROR   177
6972  043216  023737  003514  003454  6$:     CMP     E.ER,T.ER         ;CHECK IF ERR REG CORRECT
6973  043224  001401                          BEQ     7$                ;YES, CONTINUE
6974  043226  104200                          ERROR   200
6975  043230  013737  003440  003540  7$:     MOV     T.CS1,P.CS1       ;STORE PREVIOUS CONTENTS OF
6976  043236  013737  003450  003550          MOV     T.CS2,P.CS2       ;  COMMAND AND STATUS REG 1
6977  043244  013737  003452  003552          MOV     T.DS,P.DS         ;  COMMAND AND STATUS REG 2
6978  043252  013737  003454  003554          MOV     T.ER,P.ER         ;  DRIVE STATUS REG
6979                                                                    ;  AND ERROR REG
6980  043260  012762  100000  000000          MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
6981  043266  016237  000000  003440          MOV     RKCS1(R2),T.CS1   ;STORE COMMAND AND STATUS REG 1
6982  043274  016237  000010  003450          MOV     RKCS2(R2),T.CS2   ;STORE COMMAND AND STATUS REG 2
6983  043302  016237  000012  003452          MOV     RKDS(R2),T.DS     ;STORE DRIVE STATUS REG
6984  043310  016237  000014  003454          MOV     RKER(R2),T.ER     ;STORE ERROR REG
6985  043316  012737  000200  003500          MOV     #RDY,E.CS1        ;LOAD EXPECTED CS1
6986  043324  012737  000100  003510          MOV     #IR,E.CS2         ;LOAD EXPECTED CS2
6987  043332  005037  003512                  CLR     E.DS              ;LOAD EXPECTED DRIVE STATUS REG
6988  043336  005037  003514                  CLR     E.ER              ;LOAD EXPECTED ERROR REG
6989  043342  023737  003500  003440          CMP     E.CS1,T.CS1       ;CHECK CS1 CORRECT
6990  043350  001401                          BEQ     11$               ;YES, CONTINUE
6991  043352  104211                          ERROR   211               ;CS1 INCORRECT
6992  043354  023737  003510  003450  11$:    CMP     E.CS2,T.CS2       ;CHECK CS2 CORRECT
6993  043362  001401                          BEQ     12$               ;YES, CONTINUE
6994  043364  104212                          ERROR   212               ;CS2 INCORRECT
6995  043366  023737  003512  003452  12$:    CMP     E.DS,T.DS         ;CHECK DRIVE STATUS CORRECT
6996  043374  001401                          BEQ     13$               ;YES, CONTINUE
6997  043376  104213                          ERROR   213               ;DRIVE STATUS REG INCORRECT
6998  043400  023737  003514  003454  13$:    CMP     E.ER,T.ER         ;CHECK IF ERROR REG CORRECT
```

```
  6999  043406  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
  7000  043410  104214                          ERROR   214             ;ERROR REG INCORRECT
  7001  043412                          14$:
  7002
  7003                                  ;;*****************************************************************
  7004                                  ;*TEST 52       FORMAT ERROR (PART 2)
  7005                                  ;*
  7006                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
  7007                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
  7008                                  ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0.
  7009                                  ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
  7010                                  ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
  7011                                  ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
  7012                                  ;*
  7013                                  ;;*****************************************************************
  7014  043412  000004                  TST52:  SCOPE
  7015  043414  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
  7016  043422  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
  7017  043426  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
  7018  043434  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
  7019  043442  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
  7020  043450  012762  010025  000000          MOV     #RDHEAD!CFMT,RKCS1(R2) ;ISSUE READ HEADER
  7021  043456  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
  7022  043462  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
  7023  043470  012762  000040  000026          MOV     #DMD,RKMR1(R2)
  7024  043476  005300                          DEC     R0
  7025  043500  001370                          BNE     1$
  7026  043502  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
  7027  043506  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
  7028  043512  105762  000000          2$:     TSTB    RKCS1(R2)
  7029  043516  100402                          BMI     3$
  7030  043520  005300                          DEC     R0
  7031  043522  001373                          BNE     2$
  7032  043524  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
  7033  043532  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
  7034  043540  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
  7035  043546  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
  7036  043554  012737  110224  003500          MOV     #CERR!RDY!RDHEAD!CFMT&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
  7037  043562  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
  7038  043570  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
  7039  043576  012737  000030  003514          MOV     #FMTE!DRPAR,E.ER        ;LOAD EXPECTED ERROR REG
  7040  043604  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
  7041  043612  001401                          BEQ     4$              ;YES, CONTINUE
  7042  043614  104201                          ERROR   201
  7043  043616  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
  7044  043624  001401                          BEQ     5$              ;YES, CONTINUE
  7045  043626  104202                          ERROR   202
  7046  043630  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
  7047  043636  001401                          BEQ     6$              ;YES, CONTINUE
  7048  043640  104203                          ERROR   203
  7049  043642  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
  7050  043650  001401                          BEQ     7$              ;YES, CONTINUE
  7051  043652  104204                          ERROR   204
  7052  043654  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
  7053  043662  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMANC AND STATUS REG 1
  7054  043670  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
```

```
7055  043676  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
7056                                                                  ;  AND ERROR REG
7057  043704  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
7058  043712  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7059  043720  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7060  043726  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7061  043734  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7062  043742  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7063  043750  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7064  043756  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7065  043762  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
7066  043766  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7067  043774  001401                          BEQ     11$             ;YES, CONTINUE
7068  043776  104211                          ERROR   211             ;CS1 INCORRECT
7069  044000  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
7070  044006  001401                          BEQ     12$             ;YES, CONTINUE
7071  044010  104212                          ERROR   212             ;CS2 INCORRECT
7072  044012  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7073  044020  001401                          BEQ     13$             ;YES, CONTINUE
7074  044022  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7075  044024  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7076  044032  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7077  044034  104214                          ERROR   214             ;ERROR REG INCORRECT
7078  044036                          14$:
7079
7080                                          ;;*****************************************************************
7081                                          ;*TEST 53       FAULT SETTING CONTROLLER ERROR
7082                                          ;*
7083                                          ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
7084                                          ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO
7085                                          ;*      AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE
7086                                          ;*      0.  CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.
7087                                          ;*      TURN OFF MAINTENANCE MODE.  MAKE SURE DRIVE
7088                                          ;*      AVAILABLE AND CONTROLLER ERROR SET.
7089                                          ;*
7090                                          ;;*****************************************************************
7091  044036  000004                  TST53:  SCOPE
7092  044040  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
7093  044046  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
7094  044052  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
7095  044060  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
7096  044066  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
7097  044074  012762  177775  000002          MOV     #-3,RKWC(R2)    ;LOAD WORD COUNT
7098  044102  012762  067254  000004          MOV     #WRBUFF,RKBA(R2) ;LOAD BUS ADDRESS
7099  044110  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;ISSUE WRITE HEADER
7100  044116  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
7101  044122  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
7102  044130  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7103  044136  005300                          DEC     R0
7104  044140  001370                          BNE     1$
7105  044142  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
7106  044146  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
7107  044152  105762  000000          2$:     TSTB    RKCS1(R2)
7108  044156  100402                          BMI     3$
7109  044160  005300                          DEC     R0
7110  044162  001373                          BNE     2$
```

```
7111  044164  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7112  044172  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7113  044200  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7114  044206  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7115  044214  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
7116  044222  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7117  044230  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
7118  044236  012737  000000  003514          MOV     #0,E.ER ;LOAD EXPECTED ERROR REG
7119  044244  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
7120  044252  001401                          BEQ     4$              ;YES, CONTINUE
7121  044254  104205                          ERROR   205
7122  044256  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
7123  044264  001401                          BEQ     5$              ;YES, CONTINUE
7124  044266  104206                          ERROR   206
7125  044270  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
7126  044276  001401                          BEQ     6$              ;YES, CONTINUE
7127  044300  104207                          ERROR   207
7128  044302  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
7129  044310  001401                          BEQ     7$              ;YES, CONTINUE
7130  044312  104210                          ERROR   210
7131  044314  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
7132  044322  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
7133  044330  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
7134  044336  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
7135                                                                  ;  AND ERROR REG
7136  044344  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
7137  044352  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7138  044360  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7139  044366  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7140  044374  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7141  044402  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7142  044410  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7143  044416  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7144  044422  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
7145  044426  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7146  044434  001401                          BEQ     11$             ;YES, CONTINUE
7147  044436  104211                          ERROR   211             ;CS1 INCORRECT
7148  044440  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
7149  044446  001401                          BEQ     12$             ;YES, CONTINUE
7150  044450  104212                          ERROR   212             ;CS2 INCORRECT
7151  044452  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7152  044460  001401                          BEQ     13$             ;YES, CONTINUE
7153  044462  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7154  044464  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7155  044472  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7156  044474  104214                          ERROR   214             ;ERROR REG INCORRECT
7157  044476                          14$:
7158
```

```
                                .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

044476                          $EOP:
044476  000004                          SCOPE
044500  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
044504  005037  001200                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
044510  005237  001222                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
044514  042737  100000  001222          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
044522  005327                          DEC     (PC)+           ;;LOOP?
044524  000001                  $EOPCT: .WORD   1
044526  003063                          BGT     $DOAGN          ;;YES
044530  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
044532  000001                  $ENDCT: .WORD   1
044534  044524                          $EOPCT
044536  104401  044544                  TYPE    ,65$            ;;TYPE ASCIZ STRING
044542  000407                          BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <12><15>/END PASS #/
044562                          64$:
044562  013746  001222                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                ;;TYPE PASS NUMBER
044566  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044570  104401  044576                  TYPE    ,67$            ;;TYPE ASCIZ STRING
044574  000421                          BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
044640                          66$:
044640  013746  001112                  MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                ;;TOTAL NUMBER OF ERRORS
044644  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044646  104401  001211                  TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
044652  005037  001112                  CLR     $ERTTL          ;;CLEAR ERROR TOTAL
044656  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
044662  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
044664  000005                          RESET                   ;;CLEAR THE WORLD
044666  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
044670  000240                          NOP                     ;;SAVE ROOM
044672  000240                          NOP                     ;;FOR
044674  000240                          NOP                     ;;ACT11
044676                          $DOAGN:
044676  000137                          JMP     @(PC)+          ;;RETURN
044700  004666                  $RTNAD: .WORD   NEWPAS
044702    377     377     000   $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
        044706                          .EVEN

                                .SBTTL  GENERATE BAD PARITY IN MEMORY

044706  013703  003640          WRTPAR: MOV     CSRPTR,R3       ;GET ADDRESS OF CSR TO BE USED
044712  012713  000004                  MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
044716  012737  000157  067270          MOV     #157,BADPAR     ;WRITE BAD PARITY
044724  012713  000001                  MOV     #PAR.EN,(R3)    ;ALLOW PARITY DETECTION
```

```
7215  044730  000207                          RTS     PC              ;RETURN
7216
7217                                  .SBTTL  CHECK FOR MEMORY CHECK ENABLE
7218
7219  044732  012737  045066  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
7220  044740  012737  000340  000006          MOV     #PR7,ERRVEC+2
7221  044746  012737  000000  067270          MOV     #0,BADPAR       ;LOAD GOOD PARITY
7222  044754  005037  003630                  CLR     MEMPAR          ;CLEAR FLAG
7223  044760  005037  003636                  CLR     PARPRE          ;CLEAR PARITY PRESENT FLAG
7224  044764  012703  172100                  MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
7225                                                                  ;  MEMORY CHECK ENABLE AVAILIBLE
7226  044770  012704  000001                  MOV     #1,R4           ;INITIALIZE MASK
7227  044774  012713  000001          16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
7228  045000  005713                  TST     (R3)
7229  045002  050437  003630                  BIS     R4,MEMPAR       ;SET PARITY PRESENT BIT
7230  045006  005737  003636                  TST     PARPRE          ;TEST IF PARITY PRESENT ALREADY SET
7231  045012  001017                          BNE     10$             ;YES - SKIP
7232  045014  012737  045072  000114          MOV     #30$,MEMVEC     ;SET UP PARITY TRAP VECTOR
7233  045022  012737  000340  000115          MOV     #PR7,MEMVEC+2
7234  045030  012713  000004                  MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
7235  045034  012737  177777  067270          MOV     #-1,BADPAR      ;TRY SET BAD PARITY IN BADPAR
7236  045042  012713  000001                  MOV     #PAR.EN,(R3)    ;SET TO TRAP ON PARITY ERROR
7237  045046  005737  067270                  TST     BADPAR          ;CAUSE TRAP IF BAD PARITY
7238
7239  045052  062703  000002          10$:    ADD     #2,R3           ;BUMP TO NEXT CSR
7240  045056  000241                  CLC
7241  045060  006104                  ROL     R4              ;ROTATE MASK
7242  045062  001344                  BNE     16$             ;SKIP IF MASK 0
7243  045064  000416                  BR      35$             ;ELSE GO TO EXIT
7244  045066  022626          20$:    CMP     (SP)+,(SP)+     ;CLEAN STACK
7245  045070  000770                  BR      10$
7246
7247  045072  022626          30$:    CMP     (SP)+,(SP)+     ;CLEAR STACK
7248  045074  005013                  CLR     (R3)            ;CLEAR CSR REGISTER
7249  045076  005037  067270                  CLR     BADPAR          ;CLEAN UP BAD PARITY
7250  045102  012713  000001                  MOV     #PAR.EN,(R3)    ;SET TO DETECT PARITY ERROR
7251  045106  010337  003640                  MOV     R3,CSRPTR       ;STORE CSR TO BE USED IN TESTS
7252  045112  012737  177777  003636          MOV     #-1,PARPRE      ;SET PARITY PRESENT FLAG
7253  045120  000754                  BR      10$             ;TEST NEXT CSR
7254
7255  045122  012737  000006  000004  35$:    MOV     #ERRVEC+2,ERRVEC        ;RESTORE TRAP CATCHER
7256  045130  005037  000006                  CLR     ERRVEC+2
7257  045134  005737  003630                  TST     MEMPAR          ;TEST IF ANY PARITY AVAILABLE
7258  045140  001006                          BNE     37$             ;YES - SKIP
7259  045142  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC        ;ELSE RESTORE TRAP CATCHER
7260  045150  005037  000116                  CLR     MEMVEC+2
7261  045154  000413                          BR      40$             ;SKIP
7262  045156  012737  046266  000114  37$:    MOV     #MEMERR,MEMVEC  ;ELSE SET FOR PARITY TRAPS
7263  045164  012737  000340  000116          MOV     #PR7,MEMVEC+2
7264  045172  012746  000000                  MOV     #PR0,-(SP)      ;SET PRIORITY 0
7265  045176  012746  045204                  MOV     #40$,-(SP)
7266  045202  000002                          RTI
7267  045204  000207          40$:    RTS     PC              ;RETURN
7268
7269                                  .SBTTL  SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE
7270
```

```
7271  045206  052737  002400  003524  WRTBIT: BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT. REG. 1
7272  045214  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIED 1ST UPWARD TRANSITION
7273  045222  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
7274  045230  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
7275  045236  001416                          BEQ     3$              ;YES, PROVIDE DOWNWARD TRANSISTION
7276  045240  012737  045260  001202          MOV     #1$,$ESCAPE     ;LOAD ESCAPE FOR LOOP ON ERROR
7277  045246  012737  066374  003172          MOV     #EMW1,EMW+2     ;LOAD ERROR MESSAGE
7278  045254  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7279  045256  000207                          RTS     PC              ;MR1 INCORRECT ON UPWARD TRANSITION
7280
7281  045260  032777  001000  133652  1$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7282  045266  001402                          BEQ     3$              ;NO, CONTINUE
7283  045270  000137  046142                  JMP     63$             ;YES, LOOP ON ERROR
7284
7285  045274  042737  014400  003524  3$:     BIC     #MCLK!PCA!PCD,E.MR1 ;INITIALIZE MAINTENANCE REG. 1
7286  045302  052737  042000  003524          BIS     #MEWD!WRTGAT,E.MR1
7287  045310  005737  003614                  TST     PR.BIT          ;CHECK IF ONE
7288  045314  001152                          BNE     20$             ;YES, SIMULATE ONE
7289  045316  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7290  045322  001023                          BNE     10$             ;YES, NO TRANSISTION
7291  045324  042737  002000  003524          BIC     #MEWD,E.MR1     ;INDICATE TRANSISTION
7292  045332  005737  003612                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
7293  045336  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
7294  045340  005737  003620                  TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7295  045344  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
7296  045346  052737  010000  003524          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
7297  045354  000406                          BR      10$             ;CLOCK IN ZERO
7298
7299  045356  005737  003620          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7300  045362  001003                          BNE     10$             ;CLOCK IN ZERO
7301  045364  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
7302  045372  012762  000040  000026  10$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
7303  045400  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7304  045406  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7305  045414  001416                          BEQ     12$             ;YES, CONTINUE
7306  045416  012737  045436  001202          MOV     #11$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7307  045424  012737  066463  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
7308  045432  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7309  045434  000207                          RTS     PC              ;MR1 INCORRECT
7310
7311  045436  032777  001000  133474  11$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7312  045444  001402                          BEQ     12$             ;NO, CONTINUE
7313  045446  000137  046142                  JMP     63$             ;YES, LOOP ON ERROR
7314
7315  045452  052737  002400  003524  12$:     BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT REG 1
7316  045460  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSISITION
7317  045466  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
7318  045474  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG. 1 CORRECT
7319  045502  001416                          BEQ     15$             ;YES, CONTINUE
7320  045504  012737  045524  001202          MOV     #13$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7321  045512  012737  066554  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
7322  045520  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7323  045522  000207                          RTS     PC              ;MR1 INCORRECT
7324
7325  045524  032777  001000  133406  13$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7326  045532  001402                          BEQ     15$             ;NO, CONTINUE
```

```
7327  045534  000137  046142                  JMP     63$             ;YES, LOOP ON ERROR
7328
7329  045540  052737  002000  003524  15$:    BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
7330  045546  042737  000400  003524          BIC     #MCLK,E.MR1
7331  045554  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SUPPLY LAST PART OF DATA
7332  045562  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7333  045570  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7334  045576  001414                          BEQ     18$             ;YES, RETURN
7335  045600  012737  045620  001202          MOV     #17$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7336  045606  012737  066643  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
7337  045614  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7338  045616  000207                          RTS     PC              ;MR1 INCORRECT
7339
7340  045620  032777  001000  133312  17$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7341  045626  001145                          BNE     63$             ;YES, LOOP ON ERROR
7342  045630  005037  001202          18$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7343  045634  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
7344  045640  000207                          RTS     PC              ;RETURN
7345
7346  045642  005737  003612          20$:    TST     P1.BIT          ;CHECK IN NEXT BIT A ONE
7347  045646  001007                          BNE     30$             ;YES, CHECK IF PRECOMP DELAY
7348  045650  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP ADVANCE
7349  045654  001415                          BEQ     40$             ;NO, CLOCK IN DATA BIT
7350  045656  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
7351  045664  000411                          BR      40$             ;CHECK MR1
7352
7353  045666  042737  000400  003524  30$:    BIC     #MCLK,E.MR1     ;RESET MAINT CLOCK IN EXPECTED MR1
7354  045674  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP DELAY
7355  045700  001003                          BNE     40$             ;NO, CHECK MR1
7356  045702  052737  010000  003524          BIS     #PCD,E.MR1      ;SET SET PRECOMP DELAY
7357  045710  012762  000040  000026  40$:    MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
7358  045716  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7359  045724  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK MR1 CORRECT
7360  045732  001414                          BEQ     42$             ;YES, CLOCK IN REST OF BIT
7361  045734  012737  045754  001202          MOV     #41$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7362  045742  012737  066463  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
7363  045750  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7364  045752  000207                          RTS     PC              ;MR1 INCORRECT
7365
7366  045754  032777  001000  133156  41$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7367  045762  001067                          BNE     63$             ;YES, LOOP ON ERROR
7368  045764  052737  000400  003524  42$:    BIS     #MCLK,E.MR1     ;CHREATE EXPECTED MAINT. REG. 1
7369  045772  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSITION
7370  046000  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
7371  046006  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
7372  046014  001414                          BEQ     45$             ;YES, CONTINUE
7373  046016  012737  046036  001202          MOV     #43$,$ESCAPE    ;LOAD ESCAPE
7374  046024  012737  066554  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
7375  046032  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7376  046034  000207                          RTS     PC              ;MR1 INCORRECT
7377
7378  046036  032777  001000  133074  43$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7379  046044  001036                          BNE     63$             ;YES, LOOP ON ERROR
7380  046046  042737  002400  003524  45$:    BIC     #MEWD!MCLK,E.MR1 ;SET TRANSISTION
7381  046054  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLOCK TRANSISTION
7382  046062  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
```

```
7383  046070  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7384  046076  001414                          BEQ     50$             ;YES, RETURN
7385  046100  012737  046120  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7386  046106  012737  066643  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
7387  046114  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7388  046116  000207                          RTS     PC              ;MR1 INCORRECT
7389
7390  046120  032777  001000  133012  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7391  046126  001005                          BNE     63$             ;YES, LOOP ON ERROR
7392  046130  005037  001202          50$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7393  046134  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
7394  046140  000207                          RTS     PC              ;RETURN
7395
7396  046142  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7397  046146  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
7398  046152  000177  132732                  JMP     @$LPERR         ;LOOP ON ERROR
7399
7400                                  .SBTTL  SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
7401
7402  046156  005737  003614          RDBIT:  TST     PR.BIT          ;CHECK IF ONE
7403  046162  001024                          BNE     10$             ;YES, SIMULATE ONE
7404  046164  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7405  046170  001404                          BEQ     4$              ;NO, INSERT TRANSITION
7406  046172  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;YES, DO NOT INSERT TRANSITION
7407  046200  000403                          BR      5$              ;CLOCK IN ZERO
7408
7409  046202  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2)  ;INSERT TRANSITION
7410  046210  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
7411  046216  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
7412  046224  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7413  046232  000207                          RTS     PC              ;RETURN
7414
7415  046234  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2)  ;CLOCK IN ONE
7416  046242  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7417  046250  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
7418  046256  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7419  046264  000207                          RTS     PC              ;RETURN
7420
7421                                  .SBTTL  MEMORY CHECK ENABLE TRAP
7422
7423  046266  012737  046302  001202  MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
7424  046274  011637  003604                  MOV     (SP),TRAPPC     ;STORE PC
7425  046300  104147                          ERROR   147             ;REPORT MEM PARITY ERROR
7426  046302  005037  001202          10$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7427  046306  032777  001000  132624          BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7428  046314  001001                          BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
7429  046316  000002                          RTI                     ;NO, RETURN
7430
7431  046320  012706  001100          15$:    MOV     #STACK,SP       ;INITIALIZE STACK
7432  046324  000177  132560                  JMP     @$LPERR         ;LOOP ON ERROR
7433
7434                                  .SBTTL  ROUTINE TO SIZE MEMORY
7435
7436                                  ;;*****************************************************************
7437                                  ;*CALL:
7438                                  ;*      JSR     PC,$SIZE
```

```
7439                                    ;*      RETURN
7440                                    ;*$LSTAD WILL CONTAIN:
7441                                    ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
7442                                    ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
7443                                    ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
7444                                    ;*$KT11 IS THE MEMORY MANAGEMENT KEY
7445                                    ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
7446                                    ;*      MUST BE SETUP BEFORE THE CALL
7447                                    ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
7448                                    ;*      DETERMINED BY ROUTINE
7449
7450  046330  010046                  $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
7451  046332  010146                          MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
7452  046334  010246                          MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
7453  046336  010346                          MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
7454  046340  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
7455  046344  013746  000006                  MOV     @#ERRVEC+2,-(SP)
7456  046350  010600                          MOV     SP,R0           ;;SAVE THE STACK POINTER
7457                                  ;;SET THE ERRVEC PS TO THE PRESENT PS
7458  046352  104400                          TRAP                    ;;PUSH OLD PSW AND PC ON STACK
7459  046354  012637  000006                  MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
7460  046360  012701  003776                  MOV     #3776,R1        ;;SETUP ADDRESS
7461  046364  105727                          TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
7462  046366  000200                  $KT11:  .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
7463  046370  100062                          BPL     $CORE           ;;BR IF NO
7464  046372  012737  046530  000004          MOV     #$KTNEX,@#ERRVEC        ;;SET FOR TIMEOUT
7465  046400  005737  177572                  TST     @#SR0           ;;KT11 ARE YOU THERE?
7466  046404  052737  100000  046366          BIS     #100000,$KT11   ;;YES--SET KT11 KEY
7467  046412  005046                          CLR     -(SP)           ;;INITIALIZE FOR "PAR" LOADING
7468  046414  012702  172340                  MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
7469  046420  012703  000010                  MOV     #^D8,R3         ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
7470  046424  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
7471  046432  011622                          MOV     (SP),(R2)+      ;;LOAD "PAR"
7472  046434  062716  000200                  ADD     #200,(SP)       ;;UPDATE FOR NEXT "PAR"
7473  046440  077307                          SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
7474  046442  012742  177600                  MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
7475  046446  005042                          CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
7476  046450  012737  046466  000004          MOV     #2$,@#ERRVEC    ;;CATCH TIMEOUT IF NO SR3
7477  046456  012737  000020  172516          MOV     #20,@#SR3       ;;ENABLE 22 BIT MODE
7478  046464  000401                          BR      3$              ;;THIS PDP-11 HAS A SR3 REGISTER
7479  046466  022626                  2$:     CMP     (SP)+,(SP)+     ;;CLEAN OFF THE STACK--NO SR3
7480  046470  005237  177572          3$:     INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
7481  046474  012737  046520  000004          MOV     #$KTOUT,@#ERRVEC        ;;SET FOR TIME OUT
7482  046502  005737  143776          4$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
7483  046506  062712  000040                  ADD     #40,(R2)        ;;MAKE A 1K STEP
7484  046512  023712  172356                  CMP     @#KIPAR7,(R2)   ;;LAST ONE?
7485  046516  101371                          BHI     4$              ;;NO--TRY IT
7486  046520  011202                  $KTOUT: MOV     (R2),R2         ;;GET LAST BANK+1
7487  046522  005037  177572                  CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
7488  046526  000421                          BR      $SIZEX
7489  046530  042737  100000  046366  $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
7490  046536  012737  046566  000004  $CORE:  MOV     #$CROUT,@#ERRVEC        ;;SET FOR TIMEOUT
7491  046544  005002                          CLR     R2              ;;SET UP BANK
7492  046546  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
7493  046552  062702  000040                  ADD     #40,R2          ;;1K STEP
7494  046556  005711                          TST     (R1)            ;;TRAP ON TIME OUT
```

```
7495  046560  022701  177776            CMP     #177776,R1      ;;LAST ONE
7496  046564  001370                    BNE     1$              ;;NO--TRY AGAIN
7497  046566  162701  004000  $CROUT:   SUB     #4000,R1
7498  046572  162702  000040  $SIZEX:   SUB     #40,R2          ;;DROP BACK
7499  046576  010006                    MOV     R0,SP           ;;RESTORE THE STACK
7500  046600  012637  000006            MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
7501  046604  012637  000004            MOV     (SP)+,@#ERRVEC
7502  046610  010137  046632            MOV     R1,$LSTAD       ;;LAST ADDRESS
7503  046614  010237  046634            MOV     R2,$LSTBK       ;;LAST BANK
7504  046620  012603                    MOV     (SP)+,R3        ;;RESTORE R3
7505  046622  012602                    MOV     (SP)+,R2        ;;RESTORE R2
7506  046624  012601                    MOV     (SP)+,R1        ;;RESTORE R1
7507  046626  012600                    MOV     (SP)+,R0        ;;RESTORE R0
7508  046630  000207                    RTS     PC
7509  046632  000000  $LSTAD:  .WORD   0               ;;CONTAINS THE LAST ADDRESS
7510  046634  000000  $LSTBK:  .WORD   0               ;;CONTAINS THE LAST BANK
7511                  .SBTTL  SCOPE HANDLER ROUTINE
7512
7513                  ;;**************************************************************
7514                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
7515                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
7516                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
7517                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
7518                  ;*SW14=1        LOOP ON TEST
7519                  ;*SW11=1        INHIBIT ITERATIONS
7520                  ;*SW09=1        LOOP ON ERROR
7521                  ;*SW08=1        LOOP ON TEST IN SWR<7:0>
7522                  ;*CALL
7523                  ;*      SCOPE           ;;SCOPE=IOT
7524
7525  046636  $SCOPE:
7526  046636  104407                    CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
7527  046640  032777  040000  132272  1$:       BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
7528  046646  001131                    BNE     $OVER           ;;YES IF SW14=1
7529                  ;#####START OF CODE FOR THE XOR TESTER#####
7530  046650  000416  $XTSTR:  BR      6$                      ;;IF RUNNING ON THE "XOR" TESTER CHANGE
7531                                                          ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
7532  046652  013746  000004            MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
7533  046656  012737  046676  000004    MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
7534  046664  005737  177060            TST     @#177060        ;;TIME OUT ON XOR?
7535  046670  012637  000004            MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
7536  046674  000500                    BR      $SVLAD          ;;GO TO THE NEXT TEST
7537  046676  022626          5$:       CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
7538  046700  012637  000004            MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
7539  046704  000440                    BR      7$              ;;LOOP ON THE PRESENT TEST
7540  046706  6$:;#####END OF CODE FOR THE XOR TESTER#####
7541  046706  032777  000400  132224    BIT     #BIT08,@SWR     ;;LOOP ON S.  :. TEST?
7542  046714  001421                    BEQ     2$              ;;BR IF NO
7543  046716  005046                    CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
7544  046720  117716  132214            MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
7545  046724  001414                    BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
7546  046726  022716  000053            CMP     #53,(SP)        ;;CHECK THE NUMBER IN THE SWR
7547  046732  002411                    BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
7548  046734  011637  001102            MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
7549  046740  005316                    DEC     (SP)            ;;BACKUP BY ONE
7550  046742  006316                    ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
```

```
7551  046744  062716  047150                  ADD     #$SWO8TBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
7552  046750  013637  001106                  MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
7553  046754  000466                          BR      $OVER           ;;GO LOOP ON THE TEST
7554  046756  005726                  8$:     TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
7555  046760  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
7556  046764  001421                          BEQ     3$              ;;BR IF NO
7557  046766  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
7558  046774  101015                          BHI     3$              ;;BR IF NO
7559  046776  032777  001000  132134          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
7560  047004  001404                          BEQ     4$              ;;BR IF NO
7561  047006  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
7562  047014  000446                          BR      $OVER
7563  047016  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
7564  047022  005037  001200                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
7565  047026  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
7566  047030  032777  004000  132102  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
7567  047036  001011                          BNE     1$              ;;BR IF YES
7568  047040  005737  001222                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
7569  047044  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
7570  047046  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
7571  047052  023737  001200  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
7572  047060  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
7573  047062  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
7574  047070  013737  047146  001200          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
7575  047076  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
7576  047102  113737  001102  001220          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
7577  047110  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
7578  047114  011637  001110                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
7579  047120  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
7580  047124  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
7581  047132  013777  001102  132002  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
7582  047140  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
7583  047144  000002                          RTI                     ;;FIXES PS
7584  047146  003720                  $MXCNT: 2000.                   ;;MAX. NUMBER OF ITERATIONS
7585  047150                          $SWO8TBL:
7586  047150  004706                          .WORD   TST1+2          ;;STARTING ADDRESS OF TEST 1
7587  047152  005124                          .WORD   TST2+2          ;;STARTING ADDRESS OF TEST 2
7588  047154  005342                          .WORD   TST3+2          ;;STARTING ADDRESS OF TEST 3
7589  047156  005556                          .WORD   TST4+2          ;;STARTING ADDRESS OF TEST 4
7590  047160  005772                          .WORD   TST5+2          ;;STARTING ADDRESS OF TEST 5
7591  047162  006454                          .WORD   TST6+2          ;;STARTING ADDRESS OF TEST 6
7592  047164  007102                          .WORD   TST7+2          ;;STARTING ADDRESS OF TEST 7
7593  047166  007470                          .WORD   TST10+2         ;;STARTING ADDRESS OF TEST 10
7594  047170  010614                          .WORD   TST11+2         ;;STARTING ADDRESS OF TEST 11
7595  047172  011302                          .WORD   TST12+2         ;;STARTING ADDRESS OF TEST 12
7596  047174  012166                          .WORD   TST13+2         ;;STARTING ADDRESS OF TEST 13
7597  047176  013054                          .WORD   TST14+2         ;;STARTING ADDRESS OF TEST 14
7598  047200  014260                          .WORD   TST15+2         ;;STARTING ADDRESS OF TEST 15
7599  047202  015136                          .WORD   TST16+2         ;;STARTING ADDRESS OF TEST 16
7600  047204  015574                          .WORD   TST17+2         ;;STARTING ADDRESS OF TEST 17
7601  047206  016710                          .WORD   TST20+2         ;;STARTING ADDRESS OF TEST 20
7602  047210  020024                          .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
7603  047212  021140                          .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
7604  047214  022376                          .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
7605  047216  023266                          .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
7606  047220  024112                          .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
```

```
7607  047222  024644                          .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
7608  047224  025376                          .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
7609  047226  026130                          .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
7610  047230  026662                          .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
7611  047232  027414                          .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
7612  047234  030146                          .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
7613  047236  030446                          .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
7614  047240  031214                          .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
7615  047242  031604                          .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
7616  047244  032430                          .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
7617  047246  033254                          .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
7618  047250  034100                          .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
7619  047252  034724                          .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
7620  047254  035550                          .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
7621  047256  036374                          .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
7622  047260  037220                          .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
7623  047262  040060                          .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
7624  047264  041104                          .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
7625  047266  042130                          .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
7626  047270  042770                          .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
7627  047272  043414                          .WORD   TST52+2         ;;STARTING ADDRESS OF TEST 52
7628  047274  044040                          .WORD   TST53+2         ;;STARTING ADDRESS OF TEST 53
7629                          ;;**************************************************************
7630                          .SBTTL  LOOP ON INTERNAL ERROR
7631
7632  047276  032777  001000  131634  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7633  047304  001405                          BEQ     5$              ;NO RETURN
7634  047306  105737  001103                  TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
7635  047312  001402                          BEQ     5$              ;NO, RETURN
7636  047314  013716  001110                  MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
7637  047320  000002                  5$:     RTI                     ;RETURN
7638                          .SBTTL  APT COMMUNICATIONS ROUTINE
7639
7640                          ;;**************************************************************
7641  047322  112737  000001  047566  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
7642  047330  112737  000001  047564  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
7643  047336  000403                          BR      $ATYC
7644  047340  112737  000001  047566  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
7645  047346                          $ATYC:
7646  047346  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7647  047350  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7648  047352  105737  047564                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
7649  047356  001450                          BEQ     5$              ;;IF NOT:  BR
7650  047360  122737  000001  001234          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
7651  047366  001031                          BNE     3$              ;;IF NOT:  BR
7652  047370  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
7653  047376  001425                          BEQ     3$              ;;IF NOT:  BR
7654  047400  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
7655  047404  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
7656  047412  005737  001214          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
7657  047416  001375                          BNE     1$              ;;IF NOT:  WAIT
7658  047420  010037  001230                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
7659  047424  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
7660  047426  001376                          BNE     2$
7661  047430  163700  001230                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
7662  047434  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
```

```
 7663  047436  010037  001232                    MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
 7664  047442  012737  000004  001214            MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
 7665  047450  000413                            BR      5$
 7666  047452  017637  000004  047476  3$:       MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
 7667  047460  062766  000002  000004            ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
 7668  047466  013746  177776                    MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
 7669  047472  004737  050330                    JSR     PC,$TYPE        ;;CALL TYPE MACRO
 7670  047476  000000                    4$:     .WORD   0
 7671  047500                            5$:
 7672  047500  105737  047566          10$:     TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
 7673  047504  001416                            BEQ     12$             ;;IF NOT:  BR
 7674  047506  005737  001234                    TST     $ENV            ;;RUNNING UNDER APT?
 7675  047512  001413                            BEQ     12$             ;;IF NOT:  BR
 7676  047514  005737  001214          11$:     TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
 7677  047520  001375                            BNE     11$             ;;IF NOT:  WAIT
 7678  047522  017637  000004  001216            MOV     @4(SP),$FATAL   ;;GET ERROR #
 7679  047530  062766  000002  000004            ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7680  047536  005237  001214                    INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
 7681  047542  105037  047566          12$:     CLRB    $FFLG           ;;CLEAR FATAL FLAG
 7682  047546  105037  047565                    CLRB    $LFLG           ;;CLEAR LOG FLAG
 7683  047552  105037  047564                    CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
 7684  047556  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
 7685  047560  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
 7686  047562  000207                            RTS     PC              ;;RETURN
 7687  047564     000                $MFLG:   .BYTE   0               ;;MESSG. FLAG
 7688  047565     000                $LFLG:   .BYTE   0               ;;LOG FLAG
 7689  047566     000                $FFLG:   .BYTE   0               ;;FATAL FLAG
 7690          047570                        .EVEN
 7691          000200                APTSIZE=200
 7692          000001                APTENV=001
 7693          000100                APTSPOOL=100
 7694          000040                APTCSUP=040
 7695                                .SBTTL  ERROR HANDLER ROUTINE
 7696
 7697                                ;;**********************************************************************
 7698                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 7699                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 7700                                ;*AND GO TO TYPERR ON ERROR
 7701                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 7702                                ;*SW15=1         HALT ON ERROR
 7703                                ;*SW13=1         INHIBIT ERROR TYPEOUTS
 7704                                ;*SW10=1         BELL ON ERROR
 7705                                ;*SW09=1         LOOP ON ERROR
 7706                                ;*CALL
 7707                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 7708
 7709  047570                        $ERROR:
 7710  047570  104407                            CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 7711  047572  105237  001103          7$:      INCB    $ERFLG          ;;SET THE ERROR FLAG
 7712  047576  001775                            BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 7713  047600  013777  001102  131334            MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
 7714  047606  032777  002000  131324            BIT     #BIT10,@SWR     ;;BELL ON ERROR?
 7715  047614  001402                            BEQ     1$              ;;NO - SKIP
 7716  047616  104401  001204                    TYPE    ,$BELL          ;;RING BELL
 7717  047622  005237  001112          1$:      INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
 7718  047626  011637  001116                    MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
```

```
 7719  047632  162737  000002  001116          SUB     #2,$ERRPC
 7720  047640  117737  131252  001114          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
 7721  047646  032777  020000  131264          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
 7722  047654  001004                          BNE     20$             ;;SKIP TYPEOUTS
 7723  047656  004737  047770                  JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
 7724  047662  104401  001211                  TYPE    ,$CRLF
 7725  047666                          20$:
 7726  047666  122737  000001  001234          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 7727  047674  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
 7728  047676  113737  001114  047710          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
 7729  047704  004737  047340                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
 7730  047710     000                  21$:    .BYTE   0
 7731  047711     000                          .BYTE   0
 7732  047712  000777                  22$:    BR      22$             ;;APT ERROR LOOP
 7733  047714  005777  131220          2$:     TST     @SWR            ;;HALT ON ERROR
 7734  047720  100002                          BPL     3$              ;;SKIP IF CONTINUE
 7735  047722  000000                          HALT                    ;;HALT ON ERROR!
 7736  047724  104407                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 7737  047726  032777  001000  131204  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
 7738  047734  001402                          BEQ     4$              ;;BR IF NO
 7739  047736  013716  001110                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
 7740  047742  005737  001202          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
 7741  047746  001402                          BEQ     5$              ;;BR IF NONE
 7742  047750  013716  001202                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
 7743  047754                          5$:
 7744  047754  022737  044666  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
 7745  047762  001001                          BNE     6$              ;;BRANCH IF NO
 7746  047764  000000                          HALT                    ;;YES
 7747  047766                          6$:
 7748  047766  000002                          RTI                     ;;RETURN
 7749
 7750                                  ;;*****************************************************************
 7751                                  .SBTTL  TYPE ERROR ROUTINE
 7752                                  ;*ENTRY JSR PC,TYPERR
 7753                                  ;*RETURN RTS PC
 7754                                  ;*
 7755                                  ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
 7756                                  ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
 7757                                  ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
 7758                                  ;*THE ERROR.
 7759                                  ;;*****************************************************************
 7760  047770  104413                  TYPERR: SAVREG
 7761  047772  113700  001114                  MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
 7762  047776  042700  177400                  BIC     #177400,R0      ;CLEAR UNUSED BITS
 7763  050002  005300                          DEC     R0              ;FORM INDEX FOR ERROR TABLE
 7764  050004  006300                          ASL     R0
 7765  050006  006300                          ASL     R0
 7766  050010  006300                          ASL     R0
 7767  050012  062700  001300          1$:     ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
 7768  050016  012037  050032                  MOV     (R0)+,2$        ;GET EM POINTER
 7769  050022  001404                          BEQ     3$              ;BRANCH IF THERE ISN'T ONE
 7770  050024  104401  001211                  TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
 7771  050030  104401                          TYPE                    ;TYPE ERROR MESSAGE (EM)
 7772  050032  000000          2$:     .WORD   0                       ;EM POINTER GOES HERE
 7773  050034  012037  050050          3$:     MOV     (R0)+,4$        ;GET DH POINTER
 7774  050040  001404                          BEQ     5$              ;BRANCH IF THERE ISN'T ONE
```

```
 7775  050042  104401  001211                TYPE    ,$CRLF          ;TYPE CR-LF
 7776  050046  104401                        TYPE                    ;TYPE DATA HEADER
 7777  050050  000000              4$:       .WORD   0               ;DH POINTER GOES HERE
 7778  050052  012001              5$:       MOV     (R0)+,R1        ;GET DT POINTER
 7779  050054  001445                        BEQ     20$             ;BRANCH IF THERE ARE NONE
 7780  050056  005004                        CLR     R4              ;RESET INDENT SWITCH
 7781  050060  012000                        MOV     (R0)+,R0        ;GET DF POINTER
 7782  050062  012002                        MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
 7783  050064  104401  001211                TYPE    ,$CRLF
 7784  050070  112003              10$:      MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
 7785  050072  105720                        TSTB    (R0)+           ;BUMP PAST FORMAT WORD
 7786  050074  005703                        TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
 7787  050076  001416                        BEQ     14$             ;NO - SKIP DATA PRINT
 7788  050100  005704                        TST     R4              ;CHECK IF INDENT WORDS
 7789  050102  001004                        BNE     12$             ;YES, GO INDENT
 7790  050104  013146              11$:      MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
 7791  050106  104402                        TYPOC                   ;TYPE IT
 7792  050110  005303                        DEC     R3              ;MORE DATA WORDS
 7793  050112  001403                        BEQ     13$             ;NO-BRANCH
 7794  050114  104401  054714        12$:      TYPE    ,SPACE2         ;TYPE SEPARATORS
 7795  050120  000771                        BR      11$             ;LOOP
 7796  050122  104401  001211        13$:      TYPE    ,$CRLF          ;TYPE <CR><LF>
 7797  050126  005710                        TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
 7798  050130  001401                        BEQ     14$             ;NO, DO NOT CHANGE INDENT
 7799  050132  005104                        COM     R4              ;CHANGE INDENT
 7800  050134  005302              14$:      DEC     R2              ;MORE DH'S?
 7801  050136  003414                        BLE     20$             ;NO-BRANCH
 7802  050140  012037  050150        15$:      MOV     (R0)+,18$       ;GET NEXT DH POINTER
 7803  050144  001751                        BEQ     10$             ;IF NO HEADER GET DATA
 7804  050146  005704                        TST     R4              ;INDENT?
 7805  050150  001402                        BEQ     17$             ;NO-BRANCH
 7806  050152  104401  054714                TYPE    ,SPACE2         ;INDENT
 7807  050156  104401              17$:      TYPE                    ;TYPE DH
 7808  050160  000000              18$:      .WORD   0               ;DH POINTER GOES HERE
 7809  050162  104401  001211                TYPE    ,$CRLF
 7810  050166  000740                        BR      10$             ;LOOP
 7811  050170  104414              20$:      RESREG
 7812  050172  005237  003610                INC     ERRCNT          ;INCREMENT ERROR COUNT
 7813  050176  032777  010000  130734        BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
 7814  050204  001421                        BEQ     25$             ;NO, RETURN
 7815  050206  022737  000024  003610        CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
 7816  050214  103015                        BHIS    25$             ;NO, RETURN
 7817  050216  104401  054717                TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
 7818                                                                ;  ERROR THRESHOLD EXCEEDED"
 7819  050222  005737  000042                TST     42              ;CHECK IF IN CHAIN MODE
 7820  050226  001407                        BEQ     30$             ;NO, HALT
 7821  050230  012737  000001  044524        MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
 7822  050236  012706  001100                MOV     #STACK,SP       ;INITIALIZE STACK
 7823  050242  000137  044476                JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
 7824  050246  000000              30$:      HALT
 7825  050250  000207              25$:      RTS     PC
 7826
 7827                                        .SBTTL  CONTROLLED PROGRAM HALT
 7828  050252  013702  001270      CTRHLT:   MOV     $BASE,R2        ;SET '611 BASE
 7829  050256  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 7830  050264  012706  001100                MOV     #STACK,SP       ;CLEAR STACK
```

```
7831  050270  104401  054650                  TYPE    ,OPRO07         ;TYPE HALT MESSAGE
7832  050274  005737  000042                  TST     42              ;TEST IF MONITOR PRESENT
7833  050300  001410                          BEQ     5$              ;NO - SKIP
7834  050302  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
7835  050306  005037  001202                  CLR     $ESCAPE         ;CLEAR ESCAPE
7836  050312  005037  044524                  CLR     $EOPCT          ;SET PASS COUNT TO 0
7837  050316  000137  044476                  JMP     $EOP            ;GO TO END OF PASS
7838
7839  050322  000000                  5$:     HALT                    ;HALT PROGRAM
7840  050324  000137  003666                  JMP     START1          ;DO RESTART IF CONTINUE
7841
7842                                  .SBTTL  TYPE ROUTINE
7843
7844                                  ;;*****************************************************************
7845                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
7846                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
7847                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
7848                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
7849                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
7850                                  ;*
7851                                  ;*CALL:
7852                                  ;*1) USING A TRAP INSTRUCTION
7853                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
7854                                  ;*OR
7855                                  ;*      TYPE
7856                                  ;*      MESADR
7857                                  ;*
7858
7859  050330  105737  001157  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
7860  050334  100002                  BPL     1$              ;;BR IF YES
7861  050336  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
7862  050340  000430                  BR      3$              ;;LEAVE
7863  050342  010046          1$:     MOV     R0,-(SP)        ;;SAVE R0
7864  050344  017600  000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
7865  050350  122737  000001  001234  CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7866  050356  001011                  BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
7867  050360  132737  000100  001235  BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
7868  050366  001405                  BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
7869  050370  010037  050400          MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
7870  050374  004737  047330          JSR     PC,$APTY3       ;;SPOOL MESSAGE TO APT
7871  050400  000000          61$:    .WORD   0               ;;MESSAGE ADDRESS
7872  050402  132737  000040  001235  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
7873  050410  001003                  BNE     60$             ;;YES,SKIP TYPE OUT
7874  050412  112046          2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
7875  050414  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
7876  050416  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
7877  050420  012600          60$:    MOV     (SP)+,R0        ;;RESTORE R0
7878  050422  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
7879  050426  000002                  RTI                     ;;RETURN
7880  050430  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
7881  050434  001430                  BEQ     8$
7882  050436  122716  00020           CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
7883  050442  001006                  BNE     5$
7884  050444  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
7885  050446  104401                  TYPE                    ;;TYPE A CR AND LF
7886  050450  001211                  $CRLF
```

```
7887  050452  105037  050606          CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
7888  050456  000755                  BR      2$              ;;GET NEXT CHARACTER
7889  050460  004737  050542  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
7890  050464  123726  001156  6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
7891  050470  001350                  BNE     2$              ;;IF NO GO GET NEXT CHAR.
7892  050472  013746  001154          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
7893                                                          ;;AND THE NULL CHAR.
7894  050476  105366  000001  7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
7895  050502  002770                  BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
7896  050504  004737  050542          JSR     PC,$TYPEC       ;;GO TYPE A NULL
7897  050510  105337  050606          DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
7898  050514  000770                  BR      7$              ;;LOOP
7899
7900                                  ;HORIZONTAL TAB PROCESSOR
7901
7902  050516  112716  000040  8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
7903  050522  004737  050542  9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
7904  050526  132737  000007  050606  BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
7905  050534  001372                  BNE     9$              ;;TAB STOP
7906  050536  005726                  TST     (SP)+           ;;POP SPACE OFF STACK
7907  050540  000724                  BR      2$              ;;GET NEXT CHARACTER
7908  050542  105777  130402  $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
7909  050546  100375                  BPL     $TYPEC
7910  050550  116677  000002  130374  MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
7911  050556  122766  000015  000002  CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
7912  050564  001003                  BNE     1$              ;;BRANCH IF NO
7913  050566  105037  050606          CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
7914  050572  000406                  BR      $TYPEX          ;;EXIT
7915  050574  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
7916  050602  001402                  BEQ     $TYPEX          ;;BRANCH IF YES
7917  050604  105227                  INCB    (PC)+           ;;COUNT THE CHARACTER
7918  050606  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
7919  050610  000207          $TYPEX: RTS     PC
7920
7921                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
7922
7923                                  ;;**************************************************************
7924                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
7925                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
7926                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
7927                                  ;*CALL:
7928                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7929                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
7930                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
7931                                  ;*      .BYTE   M               ;;M=1 OR 0
7932                                  ;*                                      ;;1=TYPE LEADING ZEROS
7933                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
7934                                  ;*
7935                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
7936                                  ;*$TYPOS OR $TYPOC
7937                                  ;*CALL:
7938                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7939                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
7940                                  ;*
7941                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
7942                                  ;*CALL:
```

```
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT
                                                                        ;;
050612  017646  000000                  $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
050616  116637  000001  051035                  MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
050624  112637  051037                          MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
050630  062716  000002                          ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
050634  000406                                  BR      $TYPON
050636  112737  000001  051035      $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
050644  112737  000006  051037              MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
050652  112737  000005  051034      $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
050660  010346                              MOV     R3,-(SP)        ;;SAVE R3
050662  010446                              MOV     R4,-(SP)        ;;SAVE R4
050664  010546                              MOV     R5,-(SP)        ;;SAVE R5
050666  113704  051037                      MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
050672  005404                              NEG     R4
050674  062704  000006                      ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
050700  110437  051036                      MOVB    R4,$OMODE       ;;SAVE IT FOR USE
050704  113704  051035                      MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
050710  016605  000012                      MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
050714  005003                              CLR     R3              ;;CLEAR THE OUTPUT WORD
050716  006105                  1$:         ROL     R5              ;;ROTATE MSB INTO "C"
050720  000404                              BR      3$              ;;GO DO MSB
050722  006105                  2$:         ROL     R5              ;;FORM THIS DIGIT
050724  006105                              ROL     R5
050726  006105                              ROL     R5
050730  010503                              MOV     R5,R3
050732  006103                  3$:         ROL     R3              ;;GET LSB OF THIS DIGIT
050734  105337  051036                      DECB    $OMODE          ;;TYPE THIS DIGIT?
050740  100016                              BPL     7$              ;;BR IF NO
050742  042703  177770                      BIC     #177770,R3      ;;GET RID OF JUNK
050746  001002                              BNE     4$              ;;TEST FOR 0
050750  005704                              TST     R4              ;;SUPPRESS THIS 0?
050752  001403                              BEQ     5$              ;;BR IF YES
050754  005204                  4$:         INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
050756  052703  000060                      BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
050762  052703  000040          5$:         BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
050766  110337  051032                      MOVB    R3,8$           ;;SAVE FOR TYPING
050772  104401  051032                      TYPE    ,8$             ;;GO TYPE THIS DIGIT
050776  105337  051034          7$:         DECB    $OCNT           ;;COUNT BY 1
051002  003347                              BGT     2$              ;;BR IF MORE TO DO
051004  002402                              BLT     6$              ;;BR IF DONE
051006  005204                              INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
051010  000744                              BR      2$              ;;GO DO THE LAST DIGIT
051012  012605                  6$:         MOV     (SP)+,R5        ;;RESTORE R5
051014  012604                              MOV     (SP)+,R4        ;;RESTORE R4
051016  012603                              MOV     (SP)+,R3        ;;RESTORE R3
051020  016666  000002  000004              MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
051026  012616                              MOV     (SP)+,(SP)
051030  000002                              RTI                     ;;RETURN
051032     000                  8$:         .BYTE   0               ;;STORAGE FOR ASCII DIGIT
051033     000                              .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
051034     000                  $OCNT:      .BYTE   0               ;;OCTAL DIGIT COUNTER
051035     000                  $OFILL:     .BYTE   0               ;;ZERO FILL SWITCH
051036  000000                  $OMODE:     .WORD   0               ;;NUMBER OF DIGITS TO TYPE
                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
```

```
 7999
 8000                                   ;;*********************************************************************
 8001                                   ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
 8002                                   ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
 8003                                   ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
 8004                                   ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
 8005                                   ;*REPLACED WITH SPACES.
 8006                                   ;*CALL:
 8007                                   ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
 8008                                   ;*      TYPDS                   ;;GO TO THE ROUTINE
 8009
 8010  051040                           $TYPDS:
 8011  051040  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 8012  051042  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 8013  051044  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 8014  051046  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
 8015  051050  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 8016  051052  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
 8017  051056  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
 8018  051062  100004                          BPL     1$              ;;BR IF INPUT IS POS.
 8019  051064  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
 8020  051066  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
 8021  051074  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
 8022  051076  012703  051254                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
 8023  051102  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
 8024  051106  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
 8025  051110  016001  051244                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
 8026  051114  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
 8027  051116  002402                          BLT     4$              ;;BR IF DONE
 8028  051120  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
 8029  051122  000774                          BR      3$
 8030  051124  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
 8031  051126  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
 8032  051130  001002                          BNE     5$              ;;FALL THROUGH IF 0
 8033  051132  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
 8034  051134  100407                          BMI     7$              ;;BR IF YES
 8035  051136  106316                  5$:     ASLB    (SP)            ;;MSD?
 8036  051140  103003                          BCC     6$              ;;BR IF NO
 8037  051142  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
 8038  051150  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
 8039  051154  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
 8040  051160  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
 8041  051162  005720                          TST     (R0)+           ;;JUST INCREMENTING
 8042  051164  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
 8043  051170  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
 8044  051172  003002                          BGT     8$              ;;GO TO EXIT
 8045  051174  010502                          MOV     R5,R2           ;;GET THE LSD
 8046  051176  000764                          BR      6$              ;;GO CHANGE TO ASCII
 8047  051200  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
 8048  051202  100003                          BPL     9$              ;;BR IF NO
 8049  051204  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
 8050  051212  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
 8051  051214  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
 8052  051216  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
 8053  051220  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 8054  051222  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
```

```
 8055  051224  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 8056  051226  104401  051254                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
 8057  051232  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
 8058  051240  012616                          MOV     (SP)+,(SP)
 8059  051242  000002                          RTI                     ;;RETURN TO USER
 8060  051244  023420                $DTBL:    10000.
 8061  051246  001750                          1000.
 8062  051250  000144                          100.
 8063  051252  000012                          10.
 8064  051254  000004                $DBLK:    .BLKW   4
 8065                                .SBTTL  TTY INPUT ROUTINE
 8066
 8067                                ;;**********************************************************************
 8068                                .ENABL  LSB
 8069  051264  000000                $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
 8070  051266  000000                $TKQIN: .WORD   0               ;;INPUT POINTER
 8071  051270  000000                $TKQOUT: .WORD  0               ;;OUTPUT POINTER
 8072  051272  000001                $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
 8073          051273                $TKQEND=.
 8074          051274                .EVEN
 8075
 8076                                ;*TK INITIALIZE ROUTINE
 8077                                ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
 8078                                ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
 8079                                ;
 8080                                ;*CALL:
 8081                                ;*      JSR     PC,$TKINT
 8082                                ;*      RETURN
 8083                                ;
 8084  051274  005037  051264        $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
 8085  051300  012737  051272  051266        MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
 8086  051306  013737  051266  051270        MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
 8087  051314  012737  051344  000060        MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
 8088  051322  012737  000200  000062        MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
 8089  051330  005777  127612                TST     @$TKB           ;;CLEAR DONE FLAG
 8090  051334  012777  000100  127602        MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
 8091  051342  000207                        RTS     PC              ;;RETURN TO CALLER
 8092
 8093                                ;*TK SERVICE ROUTINE
 8094                                ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
 8095                                ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
 8096                                ;*IT IN THE QUEUE.
 8097                                ;*IF THE CHARACTER IS A "CONTROL-C" (^C) $TKINT IS CALLED AND
 8098                                ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
 8099                                ;
 8100  051344  117746  127576        $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
 8101  051350  042716  177600                BIC     #^C177,(SP)     ;;STRIP THE JUNK
 8102  051354  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL C?
 8103  051360  001007                        BNE     1$              ;;BRANCH IF NO
 8104  051362  104401  052460                TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (^C)
 8105  051366  004737  051274                JSR     PC,$TKINT       ;;INIT THE KEYBOARD
 8106  051372  005726                        TST     (SP)+           ;;CLEAN UP STACK
 8107  051374  000137  050252                JMP     CTRHLT          ;;CONTROL C RESTART
 8108  051400  021627  000007        1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
 8109  051404  001004                        BNE     2$              ;;BRANCH IF NO
 8110  051406  022737  000176  001140        CMP     #SWREG,SWR      ;;IS SOFT SWR SELECTED?
```

```
8111  051414  001500                          BEQ     6$              ;;GO TO SWR CHANGE
8112
8113  051416                          2$:
8114  051416  022737  000001  051264          CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
8115  051424  001004                          BNE     3$              ;;BRANCH IF NO
8116  051426  104401  001204                  TYPE    ,$BELL          ;;RING THE TTY BELL
8117  051432  005726                          TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
8118  051434  000451                          BR      5$              ;;EXIT
8119  051436  021627  000023          3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
8120  051442  001021                          BNE     32$             ;;BRANCH IF NO
8121  051444  005077  127474                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
8122  051450  005726                          TST     (SP)+           ;;CLEAN CHAR OFF STACK
8123  051452  105777  127466          31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
8124  051456  100375                          BPL     31$             ;;LOOP UNTIL ITS THERE
8125  051460  117746  127462                  MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
8126  051464  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
8127  051470  022627  000021                  CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
8128  051474  001366                          BNE     31$             ;;BRANCH IF NO
8129  051476  012777  000100  127440          MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
8130  051504  000002                          RTI                     ;;RETURN
8131  051506  005237  051264          32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
8132  051512  021627  000140                  CMP     (SP),#140       ;;IS IT UPPER CASE?
8133  051516  002405                          BLT     4$              ;;BRANCH IF YES
8134  051520  021627  000175                  CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
8135  051524  003002                          BGT     4$              ;;BRANCH IF YES
8136  051526  042716  000040                  BIC     #40,(SP)        ;;MAKE IT UPPER CASE
8137  051532  112677  177530          4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
8138  051536  005237  051266                  INC     $TKQIN          ;;UPDATE THE POINTER
8139  051542  023727  051266  051273          CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
8140  051550  001003                          BNE     5$              ;;BRANCH IF NO
8141  051552  012737  051272  051266          MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
8142  051560  000002                  5$:     RTI                     ;;RETURN
8143
8144                                  ;;*****************************************************************
8145                                  ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
8146                                  ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
8147                                  ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
8148                                  ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
8149  051562  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
8150  051570  001124                          BNE     15$             ;;EXIT IF NOT
8151  051572  105777  127346                  TSTB    @$TKS           ;;IS A CHAR WAITING?
8152  051576  100121                          BPL     15$             ;;IF NOT, EXIT
8153  051600  1177..  127342                  MOVB    @$TKB,-(SP)     ;;YES
8154  051604  0427..  177600                  BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
8155  051610  021627  000007                  CMP     (SP),#7         ;;IS IT A CONTROL-G?
8156  051614  001300                          BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEJE
8157                                                                  ;;AND EXIT
8158
8159                                  ;;*****************************************************************
8160                                  ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
8161                                  ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
8162                                  ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
8163  051616  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
8164  051624  001674                          BEQ     2$              ;;BRANCH IF YES
8165  051626  005726                          TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
8166  051630  004737  051274                  JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
```

```
 8167  051634  005077  127304                 CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
 8168  051640  112737  000001  001135         MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
 8169
 8170  051646  104401  052472                 TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (↑G)
 8171  051652  104401  052477         $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
 8172  051656  013746  000176                 MOV     $WREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
 8173  051662  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 8174  051664  104401  052510                 TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
 8175  051670  005046                 19$:    CLR     -(SP)           ;;CLEAR COUNTER
 8176  051672  005046                         CLR     -(SP)           ;;THE NEW SWR
 8177  051674  105777  127244         7$:     TSTB    @$TKS           ;;CHAR THERE?
 8178  051700  100375                         BPL     7$              ;;IF NOT TRY AGAIN
 8179
 8180  051702  117746  127240                 MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
 8181  051706  042716  177600                 BIC     #↑C177,(SP)     ;;MAKE IT 7-BIT ASCII
 8182
 8183  051712  021627  000003                 CMP     (SP),#3         ;;IS IT A CONTROL-C?
 8184  051716  001015                         BNE     9$              ;;BRANCH IF NOT
 8185  051720  104401  052460                 TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (↑C)
 8186  051724  062706  000006                 ADD     #6,SP           ;;CLEAN UP STACK
 8187  051730  123727  001135  000001         CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
 8188  051736  001003                         BNE     8$              ;;BRANCH IF NO
 8189  051740  012777  000100  127176         MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
 8190  051746  000137  050252         8$:     JMP     CTRHLT          ;;CONTROL-C RESTART
 8191
 8192
 8193  051752  021627  000025         9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
 8194  051756  001005                         BNE     10$             ;;BRANCH IF NOT
 8195  051760  104401  052465                 TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (↑U)
 8196  051764  062706  000006         20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
 8197  051770  000737                         BR      19$             ;;LET'S TRY IT AGAIN
 8198
 8199
 8200  051772  021627  000015         10$:    CMP     (SP),#15        ;;IS IT A <CR>?
 8201  051776  001022                         BNE     16$             ;;BRANCH IF NO
 8202  052000  005766  000004                 TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
 8203  052004  001403                         BEQ     11$             ;;BRANCH IF YES
 8204  052006  016677  000002  127124         MOV     2(SP),@SWR      ;;SAVE NEW SWR
 8205  052014  062706  000006         11$:    ADD     #6,SP           ;;CLEAR UP STACK
 8206  052020  104401  001211         14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
 8207  052024  123727  001135  000001         CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
 8208  052032  001003                         BNE     15$             ;;BRANCH IF NOT
 8209  052034  012777  000100  127102         MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
 8210  052042  000002                 15$:    RTI                     ;;RETURN
 8211  052044  004737  050542         16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
 8212  052050  021627  000060                 CMP     (SP),#60        ;;CHAR < 0?
 8213  052054  002420                         BLT     18$             ;;BRANCH IF YES
 8214  052056  021627  000067                 CMP     (SP),#67        ;;CHAR > 7?
 8215  052062  003015                         BGT     18$             ;;BRANCH IF YES
 8216  052064  042726  000060                 BIC     #60,(SP)+       ;;STRIP-OFF ASCII
 8217  052070  005766  000002                 TST     2(SP)           ;;IS THIS THE FIRST CHAR
 8218  052074  001403                         BEQ     17$             ;;BRANCH IF YES
 8219  052076  006316                         ASL     (SP)            ;;NO, SHIFT PRESENT
 8220  052100  006316                         ASL     (SP)            ;;   CHAR OVER TO MAKE
 8221  052102  006316                         ASL     (SP)            ;;   ROOM FOR NEW ONE.
 8222  052104  005266  000002         17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
```

```
 8223  052110  056616  177776                 BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
 8224  052114  000667                         BR      7$              ;;GET THE NEXT ONE
 8225  052116  104401  001210         18$:    TYPE    ,$QUES          ;;TYPE ?(CR)(LF)
 8226  052122  000720                         BR      20$             ;;SIMULATE CONTROL-U
 8227                                 .DSABL  LSB
 8228
 8229
 8230                                 ;;*****************************************************************
 8231                                 ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 8232                                 ;*CALL:
 8233                                 ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
 8234                                 ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
 8235                                 ;*                              ;;WITH PARITY BIT STRIPPED OFF
 8236                                 ;
 8237
 8238  052124  011646                 $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
 8239  052126  016666  000004  000002         MOV     4(SP),2(SP)     ;;THE PS
 8240  052134  005066  000004                 CLR     4(SP)           ;;GET READY FOR A CHARACTER
 8241  052140  005046                         CLR     -(SP)           ;;PUT NEW PS ON STACK
 8242  052142  012746  052150                 MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
 8243  052146  000002                         RTI                     ;;POP NEW PC AND PS
 8244  052150                         64$:
 8245  052150  005737  051264         1$:     TST     $TKCNT          ;;WAIT ON A CHARACTER
 8246  052154  001775                         BEQ     1$
 8247  052156  005337  051264                 DEC     $TKCNT          ;;DECREMENT THE COUNTER
 8248  052162  117766  177102  000004         MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
 8249  052170  005237  051270                 INC     $TKQOUT         ;;UPDATE THE POINTER
 8250  052174  023727  051270  051273         CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
 8251  052202  001003                         BNE     2$              ;;BRANCH IF NO
 8252  052204  012737  051272  051270         MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
 8253  052212  000002                 2$:     RTI                     ;;RETURN
 8254                                 ;;*****************************************************************
 8255                                 ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 8256                                 ;*CALL:
 8257                                 ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 8258                                 ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 8259                                 ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 8260
 8261  052214  010346                 $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 8262  052216  005046                         CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
 8263  052220  012703  052450         1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 8264  052224  022703  052460         2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
 8265  052230  101456                         BLOS    4$              ;;BR IF YES
 8266  052232  104410                         RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 8267  052234  112613                         MOVB    (SP)+,(R3)      ;;GET CHARACTER
 8268  052236  122713  000177         10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
 8269  052242  001022                         BNE     5$              ;;BR IF NO
 8270  052244  005716                         TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
 8271  052246  001007                         BNE     6$              ;;BR IF NO
 8272  052250  112737  000134  052446         MOVB    #'\,9$          ;;TYPE A BACK SLASH
 8273  052256  104401  052446                 TYPE    ,9$
 8274  052262  012716  177777                 MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
 8275  052266  005303                 6$:     DEC     R3              ;;BACKUP BY ONE
 8276  052270  020327  052450                 CMP     R3,#$TTYIN      ;;STACK EMPTY?
 8277  052274  103434                         BLO     4$              ;;BR IF YES
 8278  052276  111337  052446                 MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
```

```
8279  052302  104401  052446          TYPE    9$              ;;GO TYPE
8280  052306  000746                  BR      2$              ;;GO READ ANOTHER CHAR.
8281  052310  005716          5$:     TST     (SP)            ;;RUBOUT KEY SET?
8282  052312  001406                  BEQ     7$              ;;BR IF NO
8283  052314  112737  000134  052446  MOVB    #'\,9$          ;;TYPE A BACK SLASH
8284  052322  104401  052446          TYPE    9$
8285  052326  005016                  CLR     (SP)            ;;CLEAR THE RUBOUT KEY
8286  052330  122713  000025  7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
8287  052334  001003                  BNE     8$              ;;BR IF NO
8288  052336  104401  052465          TYPE    $CNTLU          ;;TYPE A CONTROL "U"
8289  052342  000726                  BR      1$              ;;GO START OVER
8290  052344  122713  000022  8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
8291  052350  001011                  BNE     3$              ;;BRANCH IF NO
8292  052352  105013                  CLRB    (R3)            ;;CLEAR THE CHARACTER
8293  052354  104401  001211          TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
8294  052360  104401  052450          TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
8295  052364  000717                  BR      2$              ;;GO PICKUP ANOTHER CHACTER
8296  052366  104401  001210  4$:     TYPE    ,$QUES          ;;TYPE A '?'
8297  052372  000712                  BR      1$              ;;CLEAR THE BUFFER AND LOOP
8298  052374  111337  052446  3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
8299  052400  104401  052446          TYPE    9$
8300  052404  122723  000015          CMPB    #15,(R3)+       ;;CHECK FOR RETURN
8301  052410  001305                  BNE     2$              ;;LOOP IF NOT RETURN
8302  052412  105063  177777          CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
8303  052416  104401  001212          TYPE    ,$LF            ;;TYPE A LINE FEED
8304  052422  005726                  TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
8305  052424  012603                  MOV     (SP)+,R3        ;;RESTORE R3
8306  052426  011646                  MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
8307  052430  016666  000004  000002  MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
8308  052436  012766  052450  000004  MOV     #$TTYIN,4(SP)
8309  052444  000002                  RTI                     ;;RETURN
8310  052446     000          9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
8311  052447     000                  .BYTE   0               ;;TERMINATOR
8312  052450  000010          $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
8313  052460  041536  005015     000  $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
8314  052465     136  006525  000012  $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
8315  052472  043536  005015     000  $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
8316  052477     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR = /
8317  052504  036440  000040
8318  052512  020040  042516  020127  $MNEW:  .ASCIZ  /  NEW = /
8319  052526  020075     000
8320          052522                  .EVEN
8321                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
8322
8323                                  ;;*****************************************************************
8324                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
8325                                  ;*CHANGE IT TO BINARY.
8326                                  ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
8327                                  ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
8328                                  ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED, THE COMPLETE NUMBER MUST
8329                                  ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
8330                                  ;*CALL:
8331                                  ;*      RDOCT                   ;;READ AN OCTAL NUMBER
8332                                  ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
8333                                  ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
8334
```

```
 8335  052522  011646                    $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
 8336  052524  016666  000004  000002            MOV     4(SP),2(SP)     ;;INPUT NUMBER
 8337  052532  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 8338  052534  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 8339  052536  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 8340  052540  104411                    1$:     RDLIN                   ;;READ AN ASCIZ LINE
 8341  052542  012600                            MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
 8342  052544  010037  052650                    MOV     R0,5$           ;;AND SAVE IT
 8343  052550  005001                            CLR     R1              ;;CLEAR DATA WORD
 8344  052552  005002                            CLR     R2
 8345  052554  112046                    2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
 8346  052556  001420                            BEQ     3$              ;;IF ZERO GET OUT
 8347  052560  122716  000060                    CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
 8348  052564  003026                            BGT     4$              ;;IS AN OCTAL DIGIT
 8349  052566  122716  000067                    CMPB    #'7,(SP)
 8350  052572  002423                            BLT     4$
 8351  052574  006301                            ASL     R1              ;;*2
 8352  052576  006102                            ROL     R2
 8353  052600  006301                            ASL     R1              ;;*4
 8354  052602  006102                            ROL     R2
 8355  052604  006301                            ASL     R1              ;;*8
 8356  052606  006102                            ROL     R2
 8357  052610  042716  177770                    BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
 8358  052614  062601                            ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
 8359  052616  000756                            BR      2$              ;;LOOP
 8360  052620  005726                    3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 8361  052622  010166  000012                    MOV     R1,12(SP)       ;;SAVE THE RESULT
 8362  052626  010237  052660                    MOV     R2,$HIOCT
 8363  052632  012602                            MOV     (SP)+,R2        ;;POP STACK INTO R2
 8364  052634  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
 8365  052636  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
 8366  052640  000002                            RTI                     ;;RETURN
 8367  052642  005726                    4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
 8368  052644  105010                            CLRB    (R0)            ;;SET A TERMINATOR
 8369  052646  104401                            TYPE                    ;;TYPE UP THRU THE BAD CHAR.
 8370  052650  000000                    5$:     .WORD   0
 8371  052652  104401  001210                    TYPE    ,$QUES          ;;"?" "CR" & "LF"
 8372  052656  000730                            BR      1$              ;;TRY AGAIN
 8373  052660  000000                    $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
 8374                                    .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
 8375
 8376                                    ;;******************************************************************
 8377                                    ;*SAVE R0-R5
 8378                                    ;*CALL:
 8379                                    ;*      SAVREG
 8380                                    ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
 8381                                    ;*
 8382                                    ;*TOP---(+16)
 8383                                    ;* +2---(+18)
 8384                                    ;* +4---R5
 8385                                    ;* +6---R4
 8386                                    ;* +8---R3
 8387                                    ;*+10---R2
 8388                                    ;*+12---R1
 8389                                    ;*+14---R0
 8390
```

```
 8391  052662                          $SAVREG:
 8392  052662  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 8393  052664  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 8394  052666  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 8395  052670  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
 8396  052672  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
 8397  052674  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 8398  052676  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
 8399  052702  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
 8400  052706  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
 8401  052712  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
 8402  052716  000002                          RTI
 8403
 8404                                  ;*RESTORE R0-R5
 8405                                  ;*CALL:
 8406                                  ;*      RESREG
 8407  052720                          $RESREG:
 8408  052720  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
 8409  052724  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
 8410  052730  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
 8411  052734  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
 8412  052740  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
 8413  052742  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
 8414  052744  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
 8415  052746  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 8416  052750  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 8417  052752  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 8418  052754  000002                          RTI
 8419
 8420                                  .SBTTL  POWER DOWN AND UP ROUTINE
 8421
 8422                                  ;;*****************************************************************
 8423
 8424                                  ;POWER DOWN ROUTINE
 8425  052756  017737  126156  003634  $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
 8426  052764  012737  053004  000024          MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
 8427  052772  012737  000340  000026          MOV     #PR7,PWRVEC+2
 8428  053000  000000                          HALT
 8429  053002  000776                          BR      .-2     ;HANG UP
 8430
 8431                                  ;;*****************************************************************
 8432
 8433                                  ;POWER UP ROUTINE
 8434  053004  005037  053100          $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
 8435  053010  012737  000144  053102          MOV     #100.,$PWRCT+2
 8436  053016  005237  053100          1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
 8437  053022  001375                          BNE     1$
 8438  053024  005337  053102                  DEC     $PWRCT+2
 8439  053030  001372                          BNE     1$
 8440  053032  012737  052756  000024          MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
 8441  053040  012737  000340  000026          MOV     #PR7,PWRVEC+2
 8442  053046  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
 8443  053052  104401  053104                  TYPE    ,$POWER         ;TYPE POWER
 8444  053056  004737  044732                  JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
 8445  053062  013777  003634  126050          MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
 8446  053070  013702  001270                  MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
```

```
8447  053074  000177  126006                  JMP     @$LPADR ;GO BACK TO LAST TEST
8448
8449  053100  000000  000000          $PWRCT: .WORD   0,0             ;TELETYPE TIME OUT
8450  053104  047520  042527  000122 $POWER: .ASCIZ  /POWER/
8451                                          .EVEN
8452                                  .SBTTL  TRAP DECODER
8453
8454                                  ;;**********************************************************************
8455                                  ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
8456                                  ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
8457                                  ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
8458                                  ;*GO TO THAT ROUTINE.
8459
8460  053112  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
8461  053114  016600  000002                 MOV     2(SP),R0        ;;GET TRAP ADDRESS
8462  053120  005740                         TST     -(R0)           ;;BACKUP BY 2
8463  053122  111000                         MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
8464  053124  006300                         ASL     R0              ;;POSITION FOR INDEXING
8465  053126  016000  053146                 MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
8466  053132  000200                         RTS     R0              ;;GO TO ROUTINE
8467
8468
8469                                  ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
8470
8471  053134  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
8472  053136  016666  000004  000002         MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
8473  053144  000002                         RTI                     ;;RESTORE THE PSW
8474
8475                                  .SBTTL  TRAP TABLE
8476
8477                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
8478                                  ;*BY THE "TRAP" INSTRUCTION.
8479
8480                                  ;       ROUTINE
8481                                  ;       -------
8482  053146  053134                  $TRPAD: .WORD   $TRAP2
8483  053150  050330                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
8484  053152  050636                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
8485  053154  050612                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
8486  053156  050652                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
8487  053160  051040                          $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
8488
8489  053162  051652                          $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
8490
8491  053164  051562                          $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
8492  053166  052124                          $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
8493  053170  052214                          $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
8494  053172  052522                          $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
8495  053174  052662                          $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
8496  053176  052720                          $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
8497  053200  047276                          $COP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
8498                                        .SBTTL  DATA TABLE FOR PRINT OUT
8499
8500  053202  001220  003604                DT000:  .WORD   $TESTN,TRAPPC
8501  053206  001220  001116  003500        DT001:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MP3
8502  053214  003440  003526  003466
8503  053222  003530  003470
8504  053226  001220  001116  003500        DT015:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1
8505  053234  003440
8506  053236  001220  001116  003524        DT017:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,PR.BIT,M1.BIT,BITCNT
8507  053244  003464  003614  003616
8508  053252  003622
8509  053254  001220  001116  003500        DT022:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC
8510  053262  003440  003504  003444
8511  053270  003502  003442
8512  053274  001220  001116  003524        DT025:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,BITCNT
8513  053302  003464  003622
8514  053306  001220  001116  003500        DT031:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC,E.MR1,T.MR1
8515  053314  003440  003504  003444
8516  053322  003502  003442  003524
8517  053330  003464
8518  053332  001220  001116  003500        DT035:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.BA,T.BA
8519  053340  003440  003510  003450
8520  053346  003504  003444                        .WORD   E.WC,T.WC
8521  053352  003502  003442
8522  053356  001220  001116  003522        DT041:  .WORD   $TESTN,$ERRPC,E.DB,T.DB
8523  053364  003462
8524  053366  001220  001116  003500        DT042:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
8525  053374  003440  003510  003450
8526  053402  001220  001116  003522        DT054:  .WORD   $TESTN,$ERRPC,E.DB,T.DB,WRDCNT
8527  053410  003462  003624
8528  053414  001220  001116  003500        DT055:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,WRDCNT
8529  053422  003440  003510  003450
8530  053430  003624
8531  053432  001220  001116  003500        DT072:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
8532  053440  003440  003510  003450
8533  053446  003514  003454
8534  053452  003504  003444  003502                .WORD   E.BA,T.BA,E.WC,T.WC
8535  053460  003442
8536  053462  001220  001116  003500        DT077:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
8537  053470  003440  003510  003450
8538  053476  001220  001116  003500        DT150:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,WRDCNT,BITCNT
8539  053504  003440  003624  003622
8540  053512  001220  001116  003500        DT164:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS1,BITCNT
8541  053520  003440  003510  003440
8542  053526  003622
8543  053530  001220  001116  003524        DT170:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT,SECCNT
8544  053536  003464  003612  003614
8545  053544  003616  003620  003622
8546  053552  003626
8547  053554  001220  001116  003524        DT171:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
8548  053562  003464
8549  053564  001220  001116  003500        DT175:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
8550  053572  003440  003510  003450
8551  053600  003512  003452  003514
8552  053606  003454
8553  053610  001220  001116  003500        DT211:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
```

```
 8554  053616  003440  003510  003450
 8555  053624  003512  003452  003514
 8556  053632  003454
 8557  053634  003540  003550  003552          .WORD   P.CS1,P.CS2,P.DS,P.ER
 8558  053642  003554
```

```
8559                                        .SBTTL  DATA FORMAT FOR PRINT OUT
8560
8561  053644  000001                DF000:  .WORD   1
8562  053646      002   000                 .BYTE   2,0
8563  053650  000005                DF001:  .WORD   5               ;ERRORS 1-14
8564  053652      000   000                 .BYTE   0,0
8565  053654  055030                        .WORD   DH000A
8566  053656      000   000                 .BYTE   0,0
8567  053660  055046                        .WORD   DH000B
8568  053662      002   000                 .BYTE   2,0
8569  053664  055112                        .WORD   DH001A
8570  053666      000   000                 .BYTE   0,0
8571  053670  055171                        .WORD   DH001B
8572  053672      006   000                 .BYTE   6,0
8573  053674  000005                DF015:  .WORD   5               ;ERRORS 15-16
8574  053676      000   000                 .BYTE   0,0
8575  053700  055030                        .WORD   DH000A
8576  053702      000   000                 .BYTE   0,0
8577  053704  055046                        .WORD   DH000B
8578  053706      002   000                 .BYTE   2,0
8579  053710  055250                        .WORD   DH015A
8580  053712      000   000                 .BYTE   0,0
8581  053714  055267                        .WORD   DH015B
8582  053716      002   000                 .BYTE   2,0
8583  053720  000005                DF017:  .WORD   5               ;ERROR 17-21
8584  053722      000   000                 .BYTE   0,0
8585  053724  055030                        .WORD   DH000A
8586  053726      000   000                 .BYTE   0,0
8587  053730  055046                        .WORD   DH000B
8588  053732      002   000                 .BYTE   2,0
8589  053734  055305                        .WORD   DH017A
8590  053736      000   000                 .BYTE   0,0
8591  053740  055351                        .WORD   DH017B
8592  053742      005   000                 .BYTE   5,0
8593  053744  000005                DF022:  .WORD   5               ;ERROR 22-24
8594  053746      000   000                 .BYTE   0,0
8595  053750  055030                        .WORD   DH000A
8596  053752      000   000                 .BYTE   0,0
8597  053754  055046                        .WORD   DH000B
8598  053756      002   000                 .BYTE   2,0
8599  053760  055417                        .WORD   DH022A
8600  053762      000   000                 .BYTE   0,0
8601  053764  055476                        .WORD   DH022B
8602  053766      006   000                 .BYTE   6,0
8603  053770  000005                DF025:  .WORD   5               ;ERROR 25
8604  053772      000   000                 .BYTE   0,0
8605  053774  055030                        .WORD   DH000A
8606  053776      000   000                 .BYTE   0,0
8607  054000  055046                        .WORD   DH000B
8608  054002      002   000                 .BYTE   2,0
8609  054004  055553                        .WORD   DH025A
8610  054006      000   000                 .BYTE   0,0
8611  054010  055577                        .WORD   DH025B
8612  054012      003   000                 .BYTE   3,0
8613  054014  000005                DF031:  .WORD   5               ;ERROR 31-34
8614  054016      000   000                 .BYTE   0,0
```

```
 8615  054020  055030                        .WORD   DH000A
 8616  054022     000      000               .BYTE   0,0
 8617  054024  055046                        .WORD   DH000B
 8618  054026     002      000               .BYTE   2,0
 8619  054030  055625                        .WORD   DH031A
 8620  054032     000      000               .BYTE   0,0
 8621  054034  055724                        .WORD   DH031B
 8622  054036     010      000               .BYTE   8.,0
 8623  054040  000005                DF035:  .WORD   5               ;ERRORS 35-40
 8624  054042     000      000               .BYTE   0,0
 8625  054044  055030                        .WORD   DH000A
 8626  054046     000      000               .BYTE   0,0
 8627  054050  055046                        .WORD   DH000B
 8628  054052     002      000               .BYTE   2,0
 8629  054054  056022                        .WORD   DH035A
 8630  054056     000      000               .BYTE   0,0
 8631  054060  056121                        .WORD   DH035B
 8632  054062     010      000               .BYTE   8.,0
 8633  054064  000005                DF041:  .WORD   5               ;ERROR 41
 8634  054066     000      000               .BYTE   0,0
 8635  054070  055030                        .WORD   DH000A
 8636  054072     000      000               .BYTE   0,0
 8637  054074  055046                        .WORD   DH000B
 8638  054076     002      000               .BYTE   2,0
 8639  054100  056216                        .WORD   DH041A
 8640  054102     000      000               .BYTE   0,0
 8641  054104  056233                        .WORD   DH041B
 8642  054106     002      000               .BYTE   2,0
 8643  054110  000005                DF042:  .WORD   5               ;ERRORS 42-43
 8644  054112     000      000               .BYTE   0,0
 8645  054114  055030                        .WORD   DH000A
 8646  054116     000      000               .BYTE   0,0
 8647  054120  055046                        .WORD   DH000B
 8648  054122     002      000               .BYTE   2,0
 8649  054124  056250                        .WORD   DH042A
 8650  054126     000      000               .BYTE   0,0
 8651  054130  056307                        .WORD   DH042B
 8652  054132     004      000               .BYTE   4,0
 8653  054134  000005                DF054:  .WORD   5               ;ERROR 54
 8654  054136     000      000               .BYTE   0,0
 8655  054140  055030                        .WORD   DH000A
 8656  054142     000      000               .BYTE   0,0
 8657  054144  055046                        .WORD   DH000B
 8658  054146     002      000               .BYTE   2,0
 8659  054150  056345                        .WORD   DH054A
 8660  054152     000      000               .BYTE   0,0
 8661  054154  056372                        .WORD   DH054B
 8662  054156     003      000               .BYTE   3,0
 8663  054160  000005                DF055:  .WORD   5               ;ERROR 55
 8664  054162     000      000               .BYTE   0,0
 8665  054164  055030                        .WORD   DH000A
 8666  054166     000      000               .BYTE   0,0
 8667  054170  055046                        .WORD   DH000B
 8668  054172     002      000               .BYTE   2,0
 8669  054174  056420                        .WORD   DH055A
 8670  054176     000      000               .BYTE   0,0
```

```
 8671  054200  056465                        .WORD   DH055B
 8672  054202     005  000                   .BYTE   5,0
 8673  054204  000007                DF072:  .WORD   7
 8674  054206     000  000                   .BYTE   0,0
 8675  054210  055030                        .WORD   DH000A
 8676  054212     000  000                   .BYTE   0,0
 8677  054214  055046                        .WORD   DH000B
 8678  054216     002  000                   .BYTE   2,0
 8679  054220  056533                        .WORD   DH072A
 8680  054222     000  000                   .BYTE   0,0
 8681  054224  056572                        .WORD   DH072B
 8682  054226     004  000                   .BYTE   4,0
 8683  054230  056630                        .WORD   DH072C
 8684  054232     000  000                   .BYTE   0,0
 8685  054234  056707                        .WORD   DH072D
 8686  054236     006  000                   .BYTE   6,0
 8687  054240  000007                DF077:  .WORD   7
 8688  054242     000  000                   .BYTE   0,0
 8689  054244  055030                        .WORD   DH000A
 8690  054246     000  000                   .BYTE   0,0
 8691  054250  055046                        .WORD   DH000B
 8692  054252     002  000                   .BYTE   2,0
 8693  054254  056533                        .WORD   DH072A
 8694  054256     000  000                   .BYTE   0,0
 8695  054260  056572                        .WORD   DH072B
 8696  054262     004  000                   .BYTE   4,0
 8697  054264  000005                DF150:  .WORD   5                       ;ERROR 150
 8698  054266     000  000                   .BYTE   0,0
 8699  054270  055030                        .WORD   DH000A
 8700  054272     000  000                   .BYTE   0,0
 8701  054274  055046                        .WORD   DH000B
 8702  054276     002  000                   .BYTE   2,0
 8703  054300  056764                        .WORD   DH150A
 8704  054302     000  000                   .BYTE   0,0
 8705  054304  057020                        .WORD   DH150B
 8706  054306     004  000                   .BYTE   4,0
 8707  054310  000005                DF164:  .WORD   5                       ;ERROR 164
 8708  054312     000  000                   .BYTE   0,0
 8709  054314  055030                        .WORD   DH000A
 8710  054316     000  000                   .BYTE   0,0
 8711  054320  055046                        .WORD   DH000B
 8712  054322     002  000                   .BYTE   2,0
 8713  054324  057056                        .WORD   DH164A
 8714  054326     000  000                   .BYTE   0,0
 8715  054330  057122                        .WORD   DH164B
 8716  054332     005  000                   .BYTE   5,0
 8717  054334  000005                DF170:  .WORD   5               ;ERROR 170
 8718  054336     000  000                   .BYTE   0,0
 8719  054340  055030                        .WORD   DH000A
 8720  054342     000  000                   .BYTE   0,0
 8721  054344  055046                        .WORD   DH000B
 8722  054346     002  000                   .BYTE   2,0
 8723  054350  057170                        .WORD   DH170C
 8724  054352     000  000                   .BYTE   0,0
 8725  054354  057267                        .WORD   DH170B
 8726  054356     010  000                   .BYTE   8.,0
```

```
8727  054360  000005          DF171:  .WORD   5               ;ERRORS 171-174
8728  054362     000  000             .BYTE   0,0
8729  054364  055030                  .WORD   DH000A
8730  054366     000  000             .BYTE   0,0
8731  054370  055046                  .WORD   DH000B
8732  054372     002  000             .BYTE   2,0
8733  054374  057365                  .WORD   DH171A
8734  054376     000  000             .BYTE   0,0
8735  054400  057404                  .WORD   DH171B
8736  054402     002  000             .BYTE   2,0
8737  054404  000005          DF175:  .WORD   5               ;ERRORS 175-210
8738  054406     000  000             .BYTE   0,0
8739  054410  055030                  .WORD   DH000A
8740  054412     000  000             .BYTE   0,0
8741  054414  055046                  .WORD   DH000B
8742  054416     002  000             .BYTE   2,0
8743  054420  057422                  .WORD   DH175A
8744  054422     000  000             .BYTE   0,0
8745  054424  057521                  .WORD   DH175B
8746  054426     010  000             .BYTE   8.,0
8747  054430  000007          DF211:  .WORD   7               ;ERRORS 211-214
8748  054432     000  000             .BYTE   0,0
8749  054434  055030                  .WORD   DH000A
8750  054436     000  000             .BYTE   0,0
8751  054440  055046                  .WORD   DH000B
8752  054442     002  000             .BYTE   2,0
8753  054444  057422                  .WORD   DH175A
8754  054446     000  000             .BYTE   0,0
8755  054450  057521                  .WORD   DH175B
8756  054452     010  000             .BYTE   8.,0
8757  054454  057616                  .WORD   DH211A
8758  054456     000  000             .BYTE   0,0
8759  054460  057644                  .WORD   DH211B
8760  054462     004  000              BYTE   4,0
```

```
                                        .SBTTL  ASCII MESSAGES
                                        
054464  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 VECTOR ADDRESS ( /
054472  020061  042526  052103
054500  051117  040440  042104
054506  042522  051523  024040
054514  000040
054516  024440  036440  000040  OPR002: .ASCIZ  / ) = /
054524  045522  030466  020061  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS (
054532  042526  052103  051117
054540  040440  042104  042522
054546  051523  024040  000040
054554  045522  030466  020061  OPR004: .ASCIZ  /RK611 PRIORITY ( /
054562  051120  047511  044522
054570  054524  024040  000040
054576  005015  047062  020104  OPR006: .ASCIZ  <15><12>/2ND PASS RUN TIME IS APPROX 8 MINUTES/<15><12>
054604  040520  051523  051040
054612  047125  052040  046511
054620  020105  051511  040440
054626  050120  047522  020130
054634  020070  044515  052516
054642  042524  006523  000012
054650  005015  025052  025052  OPR007: .ASCIZ  <15><12>/*****   PROGRAM HALTED   ******/<15><12>
054656  020052  020040  051120
054664  043517  040522  020115
054672  040510  052114  042105
054700  020040  025040  025052
054706  025052  006452  000012
054714  020040      000         SPACE2: .ASCIZ  /  /
054717      015 050012  047522  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
054724  051107  046501  040440
054732  047502  052122  042105
054740  041040  041505  052501
054746  042523  042440  051122
054754  051117  052040  051110
054762  051505  047510  042114
054770  042440  041530  042505
054776  042504  006504  000012
055004  005015  042524  052123  TSTBY1: .ASCIZ  <15><12>/TEST /
055012  000040
055014  041040  050131  051501  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
055022  042523  006504  000012
```

```
8803                                        .SBTTL  DATA HEADERS
8804
8805  055030  042524  052123  020040  DH0000A: .ASCIZ  /TEST    ERROR/
8806  055036  020040  051105  047522
8807  055044  000122
8808  055046  052516  020115  020040  DH0000B: .ASCIZ  /NUM     PC/
8809  055054  020040  041520     000
8810  055061     124  051505  020124  DH0000C: .ASCII  /TEST    TRAP/<15><12>
8811  055066  020040  052040  040522
8812  055074  006520     012
8813  055077     116  046525  020040           .ASCIZ  /NUM     PC/
8814  055104  020040  050040  000103
8815  055112  054105  042520  052103  DH001A: .ASCIZ  /EXPECT  ACUTAL  EXPECT  ACTUAL  EXPECT  ACTUAL
8816  055120  020040  041501  052125
8817  055126  046101  020040  054105
8818  055134  042520  052103  020040
8819  055142  041501  052524  046101
8820  055150  020040  054105  042520
8821  055156  052103  020040  041501
8822  055164  052524  046101     000
8823  055171     122  041513  030523  DH001B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
8824  055176  020040  051040  041513
8825  055204  030523  020040  046440
8826  055212  051505  020123  020101
8827  055220  046440  051505  020123
8828  055226  020101  046440  051505
8829  055234  020123  020102  046440
8830  055242  051505  020123  000102
8831  055250  054105  042520  052103  DH015A: .ASCIZ  /EXPECT  ACTUAL/
8832  055256  020040  041501  052524
8833  055264  046101     000
8834  055267     122  041513  030523  DH015B: .ASCIZ  /RKCS1   RKCS1/
8835  055274  020040  051040  041513
8836  055302  030523     000
8837  055305     105  050130  041505  DH017A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PREVOUS BIT/
8838  055312  020124  040440  052103
8839  055320  040525  020114  050040
8840  055326  042522  042523  052116
8841  055334  050040  042522  047526
8842  055342  051525  041040  052111
8843  055350     000
8844  055351     122  046513  030522  DH017B: .ASCIZ  /RKMR1   RKMR1   BIT     BIT     COUNT/
8845  055356  020040  051040  046513
8846  055364  030522  020040  041040
8847  055372  052111  020040  020040
8848  055400  041040  052111  020040
8849  055406  020040  041440  052517
8850  055414  052116     000
8851  055417     105  050130  041505  DH022A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8852  055424  020124  040440  052103
8853  055432  040525  020114  042440
8854  055440  050130  041505  020124
8855  055446  040440  052103  040525
8856  055454  020114  042440  050130
8857  055462  041505  020124  040440
8858  055470  052103  040525  000114
```

```
8859  055476  045522  051503  020061  DH0228: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC/
8860  055504  020040  045522  051503
8861  055512  020061  020040  045522
8862  055520  040502  020040  020040
8863  055526  045522  040502  020040
8864  055534  020040  045522  041527
8865  055542  020040  020040  045522
8866  055550  041527      000
8867  055553     105  050130  041505  DH025A: .ASCIZ  /EXPECT  ACTUAL  BIT/
8868  055560  020124  040440  052103
8869  055566  040525  020114  041040
8870  055574  052111      000
8871  055577     122  046513  030522  DH025B: .ASCIZ  /RKMR1   RKMR1   COUNT/
8872  055604  020040  051040  046513
8873  055612  030522  020040  041440
8874  055620  052517  052116      000
8875  055625     105  050130  041505  DH031A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8876  055632  020124  040440  052103
8877  055640  040525  020114  042440
8878  055646  050130  041505  020124
8879  055654  040440  052103  040525
8880  055662  020114  042440  050130
8881  055670  041505  020124  040440
8882  055676  052103  040525  020114
8883  055704  042440  050130  041505
8884  055712  020124  040440  052103
8885  055720  040525  000114
8886  055724  045522  051503  020061  DH031B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC    RKMR1   RKMR1/
8887  055732  020040  045522  051503
8888  055740  020061  020040  045522
8889  055746  040502  020040  020040
8890  055754  045522  040502  020040
8891  055762  020040  045522  041527
8892  055770  020040  020040  045522
8893  055776  041527  020040  020040
8894  056004  045522  051115  020061
8895  056012  020040  045522  051115
8896  056020  000061
8897  056022  054105  042520  052103  DH035A: .ASCII  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8898  056030  020040  041501  052524
8899  056036  046101  020040  054105
8900  056044  042520  052103  020040
8901  056052  041501  052524  046101
8902  056060  020040  054105  042520
8903  056066  052103  020040  041501
8904  056074  052524  046101
8905  056100  020040  054105  042520          .ASCIZ  /  EXPECT  ACTUAL/
8906  056106  052103  020040  041501
8907  056114  052524  046101      000
8908  056121     122  041513  030523  DH035B: .ASCII  /RKCS1   RKCS1   RKCS2   RKCS2   RKBA    RKBA/
8909  056126  020040  051040  041513
8910  056134  030523  020040  051040
8911  056142  041513  031123  020040
8912  056150  051040  041513  031123
8913  056156  020040  051040  041113
8914  056164  020101  020040  051040
```

```
8915  056172  041113  000101
8916  056175  000040  020040  051040          .ASCIZ  /    RKWC    RKWC/
8917  056202  053513  020103  020040
8918  056210  051040  053513  000103
8919  056216  054105  042520  052103  DH041A: .ASCIZ  /EXPECT  WORD/
8920  056224  020040  047527  042122
8921  056232  000000
8922  056233  000127  051117  020104  DH041B: .ASCIZ  /WORD    READ/
8923  056240  020040  051040  040505
8924  056246  000104
8925  056250  054105  042520  052103  DH042A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
8926  056256  020040  041501  052524
8927  056264  046101  020040  054105
8928  056272  042520  052103  020040
8929  056300  041501  052524  046101
8930  056306  000000
8931  056307  000122  041513  030523  DH042B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
8932  056314  020040  051040  041513
8933  056322  030523  020040  051040
8934  056330  041513  031123  020040
8935  056336  051040  041513  031123
8936  056344  000000
8937  056345  000105  050130  041505  DH054A: .ASCIZ  /EXPECT  WORD    WORD/
8938  056352  020124  053440  051117
8939  056360  020104  020040  053440
8940  056366  051117  000104
8941  056372  047527  042122  020040  DH054B: .ASCIZ  /WORD    READ    COUNT/
8942  056400  020040  042522  042101
8943  056406  020040  020040  047503
8944  056414  047125  000124
8945  056420  054105  042520  052103  DH055A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  WORD/
8946  056426  020040  041501  052524
8947  056434  046101  020040  054105
8948  056442  042520  052103  020040
8949  056450  041501  052524  046101
8950  056456  020040  047527  042122
8951  056464  000000
8952  056465  000122  041513  030523  DH055B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
8953  056472  020040  051040  041513
8954  056500  030523  020040  051040
8955  056506  041513  031123  020040
8956  056514  051040  041513  031123
8957  056522  020040  041440  052517
8958  056530  052116  000000
8959  056533  000105  050130  041505  DH072A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
8960  056540  020124  040440  052103
8961  056546  040525  020114  042440
8962  056554  050130  041505  020124
8963  056562  040440  052103  040525
8964  056570  000114
8965  056572  045522  051503  020061  DH072B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
8966  056600  020040  045522  051503
8967  056606  020061  020040  045522
8968  056614  051503  020062  020040
8969  056622  045522  051503  000062
8970  056630  054105  042520  052103  DH072C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL
```

```
8971  056636  020040  041501  052524
8972  056644  046101  020040  054105
8973  056652  042520  052103  020040
8974  056660  041501  052524  046101
8975  056666  020040  054105  042520
8976  056674  052103  020040  041501
8977  056702  052524  046101     000
8978  056707     122  042513  020122  DH072D: .ASCIZ  /RKER    RKER    RKBA    RKBA    RKWC    RKWC/
8979  056714  020040  051040  042513
8980  056722  020122  020040  051040
8981  056730  041113  020101  020040
8982  056736  051040  041113  020101
8983  056744  020040  051040  053513
8984  056752  020103  020040  051040
8985  056760  053513  000103
8986  056764  054105  042520  052103  DH150A: .ASCIZ  /EXPECT  ACTUAL  WORD    BIT/
8987  056772  020040  041501  052524
8988  057000  046101  020040  047527
8989  057006  042122  020040  020040
8990  057014  044502  000124
8991  057020  045522  051503  020061  DH150B: .ASCIZ  /RKCS1   RKCS1   COUNT   COUNT/
8992  057026  020040  045522  051503
8993  057034  020061  020040  047503
8994  057042  047125  020124  020040
8995  057050  047503  047125  000124
8996  057056  054105  042520  052103  DH164A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  BIT/
8997  057064  020040  041501  052524
8998  057072  046101  020040  054105
8999  057100  042520  052103  020040
9000  057106  041501  052524  046101
9001  057114  020040  044502  000124
9002  057122  045522  051503  020061  DH164B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
9003  057130  020040  045522  051503
9004  057136  020061  020040  045522
9005  057144  051503  020062  020040
9006  057152  045522  051503  020062
9007  057160  020040  047503  047125
9008  057166  000124
9009  057170  054105  042520  052103  DH170A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT     SECTOR/
9010  057176  020040  041501  052524
9011  057204  046101  020040  051120
9012  057212  051505  047105  020124
9013  057220  051120  051505  047105
9014  057226  020124  051120  051505
9015  057234  047105  020124  051120
9016  057242  051505  047105  020124
9017  057250  044502  020124  020040
9018  057256  020040  042523  052103
9019  057264  051117     000
9020  057267     122  046513  030522  DH170B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT   COUNT/
9021  057274  020040  051040  046513
9022  057302  030522  020040  041040
9023  057310  052111  030453  020040
9024  057316  041040  052111  020040
9025  057324  020040  041040  052111
9026  057332  030455  020040  041040
```

```
9027  057340  052111  031055  020040
9028  057346  041440  052517  052116
9029  057354  020040  041440  052517
9030  057362  052116     000
9031  057365     105  050130  041505  DH171A: .ASCIZ  /EXPECT  ACTUAL/
9032  057372  020124  040440  052103
9033  057400  040525  000114
9034  057404  045522  051115  020061  DH171B: .ASCIZ  /RKMR1   RKMR1/
9035  057412  020040  045522  051115
9036  057420  000061
9037  057422  054105  042520  052103  DH175A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
9038  057430  020040  041501  052524
9039  057436  046101  020040  054105
9040  057444  042520  052103  020040
9041  057452  041501  052524  046101
9042  057460  020040  054105  042520
9043  057466  052103  020040  041501
9044  057474  052524  046101  020040
9045  057502  054105  042520  052103
9046  057510  020040  041501  052524
9047  057516  046101     000
9048  057521     122  041513  030523  DH175B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKDS    RKDS    RKER    RKER/
9049  057526  020040  051040  041513
9050  057534  030523  020040  051040
9051  057542  041513  031123  020040
9052  057550  051040  041513  031123
9053  057556  020040  051040  042113
9054  057564  020123  020040  051040
9055  057572  042113  020123  020040
9056  057600  051040  042513  020122
9057  057606  020040  051040  042513
9058  057614  000122
9059  057616  051120  053105  047511  DH211A: .ASCIZ  /PREVIOUS REG CONTENTS/
9060  057624  051525  051040  043505
9061  057632  041440  047117  042524
9062  057640  052116  000123
9063  057644  045522  051503  020061  DH211B: .ASCIZ  /RKCS1   RKCS2   RKDS    RKER/
9064  057652  020040  045522  051503
9065  057660  020062  020040  045522
9066  057666  051504  020040  020040
9067  057674  045522  051105     000
```

```
9068                                    .SBTTL  ERROR MESSAGES
9069
9070  057701     125  042516  050130  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
9071  057706  041505  042524  020104
9072  057714  042515  047515  054522
9073  057722  050040  051101  052111
9074  057730  020131  047105  041101
9075  057736  042514  052040  040522
9076  057744  000120
9077  057746  052101  042524  050115  EM200:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER/
9078  057754  044524  043516  052040
9079  057762  020117  044103  041505
9080  057770  020113  042523  045505
9081  057776  046440  051505  040523
9082  060004  042507  043040  047522
9083  060012  020115  042522  042101
9084  060020  044040  040505  042504
9085  060026  000122
9086  060030  052101  042524  050115  EM201:   ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER/
9087  060036  044524  043516  052040
9088  060044  020117  044103  041505
9089  060052  020113  042523  045505
9090  060060  046440  051505  040523
9091  060066  042507  043040  047522
9092  060074  020115  051127  052111
9093  060102  020105  042510  042101
9094  060110  051105     000
9095  060113     101  052124  046505  EM202:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM READ HEADER/
9096  060120  052120  047111  020107
9097  060126  047524  041440  042510
9098  060134  045503  041440  042514
9099  060142  051101  042040  044522
9100  060150  042526  046440  051505
9101  060156  040523  042507  043040
9102  060164  047522  020115  042522
9103  060172  042101  044040  040505
9104  060200  042504  000122
9105  060204  052101  042524  050115  EM203:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM WRITE HEADER/
9106  060212  044524  043516  052040
9107  060220  020117  044103  041505
9108  060226  020113  046103  040505
9109  060234  020122  051104  053111
9110  060242  020105  042515  051523
9111  060250  043501  020105  051106
9112  060256  046517  053440  044522
9113  060264  042524  044040  040505
9114  060272  042504  000122
9115  060276  052101  042524  050115  EM204:  .ASCIZ  /ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT/
9116  060304  044524  043516  040440
9117  060312  051040  040505  020104
9118  060320  042510  042101  051105
9119  060326  052040  020117  044103
9120  060334  041505  020113  042523
9121  060342  052103  051117  050040
9122  060350  046125  042523  042040
9123  060356  052105  041505  000124
```

```
 9124  060364  052101  042524  050115  EM205:  .ASCIZ  /ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT/
 9125  060372  044524  043516  040440
 9126  060400  053440  044522  042524
 9127  060406  044040  040505  042504
 9128  060414  020122  047524  041440
 9129  060422  042510  045503  044440
 9130  060430  042116  054105  050040
 9131  060436  046125  042523  042040
 9132  060444  052105  041505  000124
 9133  060452  052101  042524  050115  EM206:  .ASCIZ  /ATTEMPTING AN NPR READ OF ONE WORD/
 9134  060460  044524  043516  040440
 9135  060466  020116  050116  020122
 9136  060474  042522  042101  047440
 9137  060502  020106  047117  020105
 9138  060510  047527  042122     000
 9139  060515     101  052124  046505  EM207:  .ASCIZ  /ATTEMPTING AN NPR READ/
 9140  060522  052120  047111  020107
 9141  060530  047101  047040  051120
 9142  060536  051040  040505  000104
 9143  060544  052101  042524  050115  EM208:  .ASCIZ  /ATTEMPTING NPR READ CHECKING ZERO DETECT/
 9144  060552  044524  043516  047040
 9145  060560  051120  051040  040505
 9146  060566  020104  044103  041505
 9147  060574  044513  043516  055040
 9148  060602  051105  020117  042504
 9149  060610  042524  052103     000
 9150  060615     101  052124  046505  EM209:  .ASCIZ  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 9151  060622  052120  047111  020107
 9152  060630  050116  020122  042522
 9153  060636  042101  053440  052111
 9154  060644  020110  052502  020123
 9155  060652  042101  051104  051505
 9156  060660  020123  047111  051103
 9157  060666  046505  047105  020124
 9158  060674  047111  044510  044502
 9159  060702  000124
 9160  060704  052101  042524  050115  EM210:  .ASCII  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 9161  060712  044524  043516  047040
 9162  060720  051120  051040  040505
 9163  060726  020104  044527  044124
 9164  060734  041040  051525  040440
 9165  060742  042104  042522  051523
 9166  060750  044440  041516  042522
 9167  060756  042515  052116  044440
 9168  060764  044116  041111  052111
 9169  060772  041440  042510  045503          .ASCIZ  / CHECKING ZERO DETECT/
 9170  061000  047111  020107  042532
 9171  061006  047522  042040  052105
 9172  061014  041505  000124
 9173  061020  052101  042524  050115  EM211:  .ASCIZ  /ATTEMPTING TO FORCE NON-EXISTENT MEMORY/
 9174  061026  044524  043516  052040
 9175  061034  020117  047506  041522
 9176  061042  020105  047516  026516
 9177  061050  054105  051511  042524
 9178  061056  052116  046440  046505
 9179  061064  051117  000131
```

```
 9180  061070  052101  042524  050115  EM212:  .ASCIZ  /ATTEMPTING TO CLEAR NON-EXISTENT MEMORY/
 9181  061076  044524  043516  052040
 9182  061104  020117  046103  040505
 9183  061112  020122  047516  026516
 9184  061120  054105  051511  042524
 9185  061126  052116  046440  046505
 9186  061134  051117  000131
 9187  061140  042524  052123  047111  EM213:  .ASCIZ  /TESTING EXTENDED MEMORY ADDRESSING BITS/
 9188  061146  020107  054105  042524
 9189  061154  042116  042105  046440
 9190  061162  046505  051117  020131
 9191  061170  042101  051104  051505
 9192  061176  044523  043516  041040
 9193  061204  052111  000123
 9194  061210  052101  042524  050115  EM214:  .ASCIZ  /ATTEMPTING TO FORCE UNIBUS PARITY ERROR/
 9195  061216  044524  043516  052040
 9196  061224  020117  047506  041522
 9197  061232  020105  047125  041111
 9198  061240  051525  050040  051101
 9199  061246  052111  020131  051105
 9200  061254  047522  000122
 9201  061260  052101  042524  050115  EM215:  .ASCIZ  /ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY/
 9202  061266  044524  043516  047040
 9203  061274  051120  051040  040505
 9204  061302  020104  043117  046040
 9205  061310  041517  052101  047511
 9206  061316  020116  051120  047511
 9207  061324  020122  047524  041040
 9208  061332  042101  050040  051101
 9209  061340  052111  000131
 9210  061344  052101  042524  050115  EM216:  .ASCIZ  /ATTEMPTING TO CLEAR UNIBUS PARITY ERROR/
 9211  061352  044524  043516  052040
 9212  061360  020117  046103  040505
 9213  061366  020122  047125  041111
 9214  061374  051525  050040  051101
 9215  061402  052111  020131  051105
 9216  061410  047522  000122
 9217  061414  052101  042524  050115  EM217:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ/
 9218  061422  044524  043516  030440
 9219  061430  020070  044502  020124
 9220  061436  050116  020122  042522
 9221  061444  042101     000
 9222  061447     101  052124  046505  EM218:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT/
 9223  061454  052120  047111  020107
 9224  061462  034061  041040  052111
 9225  061470  047040  051120  051040
 9226  061476  040505  020104  044103
 9227  061504  041505  044513  043516
 9228  061512  055040  051105  020117
 9229  061520  042504  042524  052103
 9230  061526     000
 9231  061527     101  052124  046505  EM219:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
 9232  061534  052120  047111  020107
 9233  061542  034061  041040  052111
 9234  061550  047040  051120  051040
 9235  061556  040505  020104  044527
```

```
9236  061564  044124  041040  052111
9237  061572  030440  020066  050050
9238  061600  024501  051440  052105
9239  061606     000
9240  061607     101  052124  046505  EM220:  .ASCII  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
9241  061614  052120  047111  020107
9242  061622  034061  041040  052111
9243  061630  047040  051120  051040
9244  061636  040505  020104  044527
9245  061644  044124  041040  052111
9246  061652  030440  020066  050050
9247  061660  024501  051440  052105
9248  061666  052101  042524  050115  EM221:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER/
9249  061674  044524  043516  051440
9250  061702  046511  046125  052101
9251  061710  047511  020116  043117
9252  061716  042040  052101  020101
9253  061724  047111  051040  040505
9254  061732  020104  042510  042101
9255  061740  051105     000
9256  061743     101  052124  046505  EM222:  .ASCIZ  /ATTEMPTING READ HEADER IN MAINTANENCE MODE/
9257  061750  052120  047111  020107
9258  061756  042522  042101  044040
9259  061764  040505  042504  020122
9260  061772  047111  046440  044501
9261  062000  052116  047101  047105
9262  062006  042503  046440  042117
9263  062014  000105
9264  062016  052101  042524  050115  EM223:  .ASCIZ  /ATTEMPTING DATA BUFFER READ AFTER READ HEADER/
9265  062024  044524  043516  042040
9266  062032  052101  020101  052502
9267  062040  043106  051105  051040
9268  062046  040505  020104  043101
9269  062054  042524  020122  042522
9270  062062  042103  044040  040505
9271  062070  042504  000122
9272  062074  052101  042524  050115  EM224:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER (18 BIT FORMAT)/
9273  062102  044524  043516  051440
9274  062110  046511  046125  052101
9275  062116  047511  020116  043117
9276  062124  042040  052101  020101
9277  062132  047111  051040  040505
9278  062140  020104  042510  042101
9279  062146  051105  024040  034061
9280  062154  041040  052111  043040
9281  062162  051117  040515  024524
9282  062170     000
9283  062171     101  052124  046505  EM225:  .ASCIZ  /ATTEMPTING READ HEADER (18 BIT FORMAT) IN MAINT MODE/
9284  062176  052120  047111  020107
9285  062204  042522  042101  044040
9286  062212  040505  042504  020122
9287  062220  030450  020070  044502
9288  062226  020124  047506  046522
9289  062234  052101  020051  047111
9290  062242  046440  044501  052116
9291  062250  046440  042117  000105
```

```
 9292  062256  052101  042524  050115  EM226:  .ASCII  /ATTEMPTING DATA BUFFER READ AFTER/<12><15>
 9293  062264  044524  043516  042040
 9294  062272  052101  020101  052502
 9295  062300  043106  051105  051040
 9296  062306  040505  020104  043101
 9297  062314  042524  005122     015
 9298  062321     122  040505  020104          .ASCIZ  /READ HEADER IN 18 BIT FORMAT/
 9299  062326  042510  042101  051105
 9300  062334  044440  020116  034061
 9301  062342  041040  052111  043040
 9302  062350  051117  040515  000124
 9303  062356  052101  042524  050115  EM227:  .ASCII  /ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER/<15><12>
 9304  062364  044524  043516  052040
 9305  062372  020117  044103  041505
 9306  062400  020113  054523  041516
 9307  062406  020110  042504  042524
 9308  062414  052103  047440  020116
 9309  062422  042522  042101  044040
 9310  062430  040505  042504  006522
 9311  062436     012
 9312  062437     103  042510  045503          .ASCIZ  /CHECKING ZERO DETECT/
 9313  062444  047111  020107  042532
 9314  062452  047522  042040  052105
 9315  062460  041505  000124
 9316  062464  052101  042524  050115  EM230:  .ASCII  /ATTEMPTING TO CHECK WRITING OF ZEROES BETWEEN INDEX/<15><12>
 9317  062472  044524  043516  052040
 9318  062500  020117  044103  041505
 9319  062506  020113  051127  052111
 9320  062514  047111  020107  043117
 9321  062522  055040  051105  042517
 9322  062530  020123  042502  053524
 9323  062536  042505  020116  047111
 9324  062544  042504  006530     012
 9325  062551     101  042116  051440          .ASCIZ  /AND SECTOR PULSE/
 9326  062556  041505  047524  020122
 9327  062564  052520  051514  000105
 9328  062572  052101  042524  050115  EM231:  .ASCII  /ATTEMPTING TO RESET WRITE GATE BY SETTING/<15><12>
 9329  062600  044524  043516  052040
 9330  062606  020117  042522  042523
 9331  062614  020124  051127  052111
 9332  062622  020105  040507  042524
 9333  062630  041040  020131  042523
 9334  062636  052124  047111  006507
 9335  062644     012
 9336  062645     123  041505  047524          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 9337  062652  020122  052520  051514
 9338  062660  020105  047111  040440
 9339  062666  053440  044522  042524
 9340  062674  044040  040505  042504
 9341  062702  020122  047503  046515
 9342  062710  047101  000104
 9343  062714  052101  042524  050115  EM232:  .ASCII  /ATTEMPTING TO SET WRITE GATE BY RESETTING/<15><12>
 9344  062722  044524  043516  052040
 9345  062730  020117  042523  020124
 9346  062736  051127  052111  020105
 9347  062744  040507  042524  041040
```

```
 9348  062752  020131  042522  042523
 9349  062760  052124  047111  006507
 9350  062766     012
 9351  062767     123  041505  047524          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 9352  062774  020122  052520  051514
 9353  063002  020105  047111  040440
 9354  063010  053440  044522  042524
 9355  063016  044040  040505  042504
 9356  063024  020122  047503  046515
 9357  063032  047101  000104
 9358  063036  052101  042524  050115  EM233:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH OF HEADER/
 9359  063044  044524  043516  052040
 9360  063052  020117  051127  052111
 9361  063060  020105  054523  041516
 9362  063066  020110  043117  044040
 9363  063074  040505  042504  000122
 9364  063102  052101  042524  050115  EM234:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA/
 9365  063110  044524  043516  052040
 9366  063116  020117  051127  052111
 9367  063124  020105  042510  042101
 9368  063132  051105  042040  052101
 9369  063140  000101
 9370  063142  052101  042524  050115  EM235:  .ASCII  /ATTEMPTING TO RESET WRITE GATE WITH SECOND/<15><12>
 9371  063150  044524  043516  052040
 9372  063156  020117  042522  042523
 9373  063164  020124  051127  052111
 9374  063172  020105  040507  042524
 9375  063200  053440  052111  020110
 9376  063206  042523  047503  042116
 9377  063214  005015
 9378  063216  047111  042504  020130          .ASCIZ  /INDEX PULSE OF WRITE HEADER/
 9379  063224  052520  051514  020105
 9380  063232  043117  053440  044522
 9381  063240  042524  044040  040505
 9382  063246  042504  000122
 9383  063252  052101  042524  050115  EM236:  .ASCIZ  /ATTEMPTING TO COMPLETE WRITE HEADER IN MAINT MODE/
 9384  063260  044524  043516  052040
 9385  063266  020117  047503  050115
 9386  063274  042514  042524  053440
 9387  063302  044522  042524  044040
 9388  063310  040505  042504  020122
 9389  063316  047111  046440  044501
 9390  063324  052116  046440  042117
 9391  063332  020105
 9392  063334  052101  042524  050115  EM237:  .ASCIZ  /ATTEMPTING TO WRITE GAP OR DATA SYNCH/
 9393  063342  044524  043516  052040
 9394  063350  020117  051127  052111
 9395  063356  020105  040507  020120
 9396  063364  051117  042040  052101
 9397  063372  020101  054523  041516
 9398  063400  000110
 9399  063402  052101  042524  050115  EM238:  .ASCIZ /ATTEMPTING TO WRITE DATA FIELD/
 9400  063410  044524  043516  052040
 9401  063416  020117  051127  052111
 9402  063424  020105  040504  040524
 9403  063432  043040  042511  042114
```

```
9404  063440     000
9405  063441     101  052124  046505  EM239:  .ASCIZ  /ATTEMPING TO WRITE SYNCH OF HEADER USING 24 SECTOR FORMAT/
9406  063446  044520  043516  052040
9407  063454  020117  051127  052111
9408  063462  020105  054523  041516
9409  063470  020110  043117  044040
9410  063476  040505  042504  020122
9411  063504  051525  047111  020107
9412  063512  032062  051440  041505
9413  063520  047524  020122  047506
9414  063526  046522  052101     000
9415  063533     101  052124  046505  EM240:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA USING 24 SECTOR FORMAT/
9416  063540  052120  047111  020107
9417  063546  047524  053440  044522
9418  063554  042524  044040  040505
9419  063562  042504  020122  040504
9420  063570  040524  052440  044523
9421  063576  043516  031040  020064
9422  063604  042523  052103  051117
9423  063612  043040  051117  040515
9424  063620  000124
9425  063622  052101  042524  050115  EM241:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26 SECTOR)/
9426  063630  044524  043516  052040
9427  063636  020117  047506  041522
9428  063644  020105  047506  046522
9429  063652  052101  042440  051122
9430  063660  051117  024040  043103
9431  063666  052115  036440  031040
9432  063674  020066  042523  052103
9433  063702  051117  000051
9434  063706  052101  042524  050115  EM242:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24 SECTOR)/
9435  063714  044524  043516  052040
9436  063722  020117  047506  041522
9437  063730  020105  047506  046522
9438  063736  052101  042440  051122
9439  063744  051117  024040  043103
9440  063752  052115  036440  031040
9441  063760  020064  042523  052103
9442  063766  051117  000051
9443  063772  052101  042524  050115  EM243:  .ASCIZ  /ATTEMPING TO FORCE CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS/
9444  064000  047111  020107  047524
9445  064006  043040  051117  042503
9446  064014  041440  047117  051124
9447  064022  046117  042514  020122
9448  064030  051105  047522  020122
9449  064036  044527  044124  043040
9450  064044  052501  052114  041040
9451  064052  052111  044440  020116
9452  064060  051104  053111  020105
9453  064066  042515  051523     000
9454  064073     101  052124  046505  EM244:  .ASCIZ  /ATTEMPTING TO CLEAR ERROR/
9455  064100  052120  047111  020107
9456  064106  047524  041440  042514
9457  064114  051101  042440  051122
9458  064122  051117     000
9459  064125     103  046517  040515  EM3000: .ASCIZ  /COMMAND AND STATUS REG 1 INCORRECT
```

```
 9460  064132  042116  040440  042116
 9461  064140  051440  040524  052524
 9462  064146  020123  042522  020107
 9463  064154  020061  047111  047503
 9464  064162  051122  041505  000124
 9465  064170  042515  051523  043501  EM3001: .ASCIZ  /MESSAGE A INCORRECT/
 9466  064176  020105  020101  047111
 9467  064204  047503  051122  041505
 9468  064212  000124
 9469  064214  042515  051523  043501  EM3002: .ASCIZ  /MESSAGE B INCORRECT/
 9470  064222  020105  020102  047111
 9471  064230  047503  051122  041505
 9472  064236  000124
 9473  064240  051503  020061  047111  EM3003: .ASCIZ  /CS1 INCORRECT AFTER SENDING DRIVE CLEAR
 9474  064246  047503  051122  041505
 9475  064254  020124  043101  042524
 9476  064262  020122  042523  042116
 9477  064270  047111  020107  051104
 9478  064276  053111  020105  046103
 9479  064304  040505  000122
 9480  064310  051503  020061  047111  EM3004: .ASCIZ  /CS1 INCORRECT AFTER AFTER DATA SIMULATION/
 9481  064316  047503  051122  041505
 9482  064324  020124  043101  042524
 9483  064332  020122  043101  042524
 9484  064340  020122  040504  040524
 9485  064346  051440  046511  046125
 9486  064354  052101  047511  000116
 9487  064362  040515  047111  020124  EM3005:  ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9488  064370  042522  027107  030440
 9489  064376  044440  041516  051117
 9490  064404  042522  052103  042040
 9491  064412  051125  047111  020107
 9492  064420  040504  040524  051440
 9493  064426  046511  046125  052101
 9494  064434  047511     116
 9495  064437     015  040412  052106          .ASCIZ  <15><12>/AFTER SECTOR PULSE/
 9496  064444  051105  051440  041505
 9497  064452  047524  020122  052520
 9498  064460  051514  000105
 9499  064464  040515  047111  020124  EM3006: .ASCII   MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9500  064472  042522  027107  030440
 9501  064500  044440  041516  051117
 9502  064506  042522  052103  042040
 9503  064514  051125  047111  020107
 9504  064522  040504  040524  051440
 9505  064530  046511  046125  052101
 9506  064536  047511     116
 9507  064541     015  040412  052106          .ASCIZ  <15><12>/AFTER INDEX PULSE/
 9508  064546  051105  044440  042116
 9509  064554  054105  050040  046125
 9510  064562  042523     000
 9511  064565     115  044501  052116  EM3007: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9512  064572  051040  043505  020056
 9513  064600  020061  047111  047503
 9514  064606  051122  041505  020124
 9515  064614  052504  044522  043516
```

```
 9516  064622  042040  052101  020101
 9517  064630  044523  052515  040514
 9518  064636  044524  047117
 9519  064642  005015  047516  051440          .ASCIZ  <15><12>/NO SECTOR OR INDEX PULSE SUPPLIED/
 9520  064650  041505  047524  020122
 9521  064656  051117  044440  042116
 9522  064664  054105  050040  046125
 9523  064672  042523  051440  050125
 9524  064700  046120  042511  000104
 9525  064706  052502  020123  042101  EM3008: .ASCIZ  /BUS ADDRESS INCORRECT AFTER SENDING DRIVE CLEAR/
 9526  064714  051104  051505  020123
 9527  064722  047111  047503  051122
 9528  064730  041505  020124  043101
 9529  064736  042524  020122  042523
 9530  064744  042116  047111  020107
 9531  064752  051104  053111  020105
 9532  064760  046103  040505  000122
 9533  064766  047527  042122  041440  EM3009: .ASCIZ  /WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR/
 9534  064774  052517  052116  044440
 9535  065002  041516  051117  042522
 9536  065010  052103  040440  052106
 9537  065016  051105  051440  047105
 9538  065024  044504  043516  042040
 9539  065032  044522  042526  041440
 9540  065040  042514  051101     000
 9541  065045     103  030523  041440  EM3010: .ASCIZ  /CSI CHANGED DURING COMMAND EXECUTION/
 9542  065052  040510  043516  042105
 9543  065060  042040  051125  047111
 9544  065066  020107  047503  046515
 9545  065074  047101  020104  054105
 9546  065102  041505  052125  047511
 9547  065110  000116
 9548  065112  052502  020123  042101  EM3011: .ASCIZ  /BUS ADDRESS CHANGED BEFORE INDEX PULSE/
 9549  065120  051104  051505  020123
 9550  065126  044103  047101  042507
 9551  065134  020104  042502  047506
 9552  065142  042522  044440  042116
 9553  065150  054105  050040  046125
 9554  065156  042523     000
 9555  065161     127  051117  020104  EM3012: .ASCIZ  /WORD COUNT CHANGED BEFORE INDEX PULSE/
 9556  065166  047503  047125  020124
 9557  065174  044103  047101  042507
 9558  065202  020104  042502  047506
 9559  065210  042522  044440  042116
 9560  065216  054105  050040  046125
 9561  065224  042523     000
 9562  065227     103  030523  041440  EM3013: .ASCIZ  /CSI CHANGE AFTER INDEX PULSE/
 9563  065234  040510  043516  020105
 9564  065242  043101  042524  020122
 9565  065250  047111  042504  020130
 9566  065256  052520  051514  000105
 9567  065264  040515  047111  020124  EM3014: .ASCIZ  /MAINT REG 1 INCORRECT BEFORE INDEX PULSE/
 9568  065272  042522  020107  020061
 9569  065300  047111  047503  051122
 9570  065306  041505  020124  042502
 9571  065314  047506  042522  044440
```

```
 9572  065322  042116  054105  050040
 9573  065330  046125  042523     000
 9574  065335     102  051525  040440  EM3015: .ASCIZ  /BUS ADDRESS CHANGED AFTER INDEX PULSE/
 9575  065342  042104  042522  051523
 9576  065350  041440  040510  043516
 9577  065356  042105  040440  052106
 9578  065364  051105  044440  042116
 9579  065372  054105  050040  046125
 9580  065400  042523     000
 9581  065403     127  051117  020104  EM3016: .ASCIZ  /WORD COUNT CHANGED AFTER INDEX PULSE/
 9582  065410  047503  047125  020124
 9583  065416  044103  047101  042507
 9584  065424  020104  043101  042524
 9585  065432  020122  047111  042504
 9586  065440  020130  052520  051514
 9587  065446  000105
 9588  065450  047503  046515  047101  EM3018: .ASCIZ  /COMMAND AND STATUS REG. 2 INCORRECT/
 9589  065456  020104  047101  020104
 9590  065464  052123  052101  051525
 9591  065472  051040  043505  020056
 9592  065500  020062  047111  047503
 9593  065506  051122  041505  000124
 9594  065514  052502  020123  042101  EM3019: .ASCIZ  /BUS ADD REG INCORRECT/
 9595  065522  020104  042522  020107
 9596  065530  047111  047503  051122
 9597  065536  041505  000124
 9598  065542  047527  042122  041440  EM3020: .ASCIZ  /WORD COUNT REG INCORRECT/
 9599  065550  052517  052116  051040
 9600  065556  043505  044440  041516
 9601  065564  051117  042522  052103
 9602  065572     000
 9603  065573     104  052101  020101  EM3021: .ASCIZ  /DATA READ INCORRECT/
 9604  065600  042522  042101  044440
 9605  065606  041516  051117  042522
 9606  065614  052103     000
 9607  065617     103  030523  044440  EM3022: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
 9608  065624  041516  051117  042522
 9609  065632  052103  040440  052106
 9610  065640  051105  051040  040505
 9611  065646  044504  043516  042040
 9612  065654  052101  020101  052502
 9613  065662  043106  051105     000
 9614  065667     103  031123  044440  FM3023: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
 9615  065674  041516  051117  042522
 9616  065702  052103  040440  052106
 9617  065710  051105  051040  040505
 9618  065716  044504  043516  042040
 9619  065724  052101  020101  052502
 9620  065732  043106  051105     000
 9621  065737     105  051122  051117  EM3024: .ASCIZ  /ERROR REG INCORRECT/
 9622  065744  051040  043505  044440
 9623  065752  041516  051117  042522
 9624  065760  052103     000
 9625  065763     115  044501  052116  EM3025: .ASCIZ  /MAINT REG 1 INCORRECT AFTER INDEX PULSE/
 9626  065770  051040  043505  030440
 9627  065776  044440  041516  051117
```

```
 9628  066004  042522  052103  040440
 9629  066012  052106  051105  044440
 9630  066020  042116  054105  050040
 9631  066026  046125  042523     000
 9632  066033     103  030523  044440  EM3026: .ASCIZ  /CS1 INCORRECT AFTER COMMAND COMPLETION/
 9633  066040  041516  051117  042522
 9634  066046  052103  040440  052106
 9635  066054  051105  041440  046517
 9636  066062  040515  042116  041440
 9637  066070  046517  046120  052105
 9638  066076  047511  000116
 9639  066102  051503  020062  047111  EM3027: .ASCIZ  /CS2 INCORRECT AFTER COMMAND COMPLETION/
 9640  066110  047503  051122  041505
 9641  066116  020124  043101  042524
 9642  066124  020122  047503  046515
 9643  066132  047101  020104  047503
 9644  066140  050115  042514  044524
 9645  066146  047117     000
 9646  066151     103  030523  044440  EM3028: .ASCIZ  /CS1 INCORRECT AFTER READING EMPTY SILO/
 9647  066156  041516  051117  042522
 9648  066164  052103  040440  052106
 9649  066172  051105  051040  040505
 9650  066200  044504  043516  042440
 9651  066206  050115  054524  051440
 9652  066214  046111  000117
 9653  066220  051503  020062  047111  EM3029: .ASCIZ  /CS2 INCORRECT AFTER READING EMPTY SILO/
 9654  066226  047503  051122  041505
 9655  066234  020124  043101  042524
 9656  066242  020122  042522  042101
 9657  066250  047111  020107  046505
 9658  066256  052120  020131  044523
 9659  066264  047514     000
 9660  066267     115  044501  052116  EM3030: .ASCIZ  /MAINT REG 1 INCORRECT/
 9661  066274  051040  043505  030440
 9662  066302  044440  041516  051117
 9663  066310  042522  052103     000
 9664  066315     104  044522  042526  EM3031: .ASCIZ  /DRIVE STATUS REG INCORRECT/
 9665  066322  051440  040524  052524
 9666  066330  020123  042522  020107
 9667  066336  047111  047503  051122
 9668  066344  041505  000124
 9669  066350  051105  047522  020122  EM3032: .ASCIZ  /ERROR REG INCORRECT/
 9670  066356  042522  020107  047111
 9671  066364  047503  051122  041505
 9672  066372  000124
 9673  066374  051115  020061  047111  EMW1:   .ASCIZ  /MR1 INCORRECT ON 1ST UPWARD TRANSISTION OF MAINT CLOCK/
 9674  066402  047503  051122  041505
 9675  066410  020124  047117  030440
 9676  066416  052123  052440  053520
 9677  066424  051101  020104  051124
 9678  066432  047101  044523  052123
 9679  066440  047511  020116  043117
 9680  066446  046440  044501  052116
 9681  066454  041440  047514  045503
 9682  066462     000
 9683  066463     115  030522  044440  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISTION OF MAINT CLOCK/
```

```
 9684  066470  041516  051117  042522
 9685  066476  052103  047440  020116
 9686  066504  051461  020124  047504
 9687  066512  047127  040527  042122
 9688  066520  052040  040522  051516
 9689  066526  051511  044524  047117
 9690  066534  047440  020106  040515
 9691  066542  047111  020124  046103
 9692  066550  041517  000113
 9693  066554  051115  020061  047111  EMW3:   .ASCIZ  /MR1 INCORRECT ON 2ND UPWARD TRANSISTION OF MAINT CLOCK/
 9694  066562  047503  051122  041505
 9695  066570  020124  047117  031040
 9696  066576  042116  052440  053520
 9697  066604  051101  020104  051124
 9698  066612  047101  044523  052123
 9699  066620  047511  020116  043117
 9700  066626  046440  044501  052116
 9701  066634  041440  047514  045503
 9702  066642     000
 9703  066643     115  030522  044440  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSISTION OF MAINT CLOCK/
 9704  066650  041516  051117  042522
 9705  066656  052103  047440  020116
 9706  066664  047062  020104  047504
 9707  066672  047127  040527  042122
 9708  066700  052040  040522  051516
 9709  066706  051511  044524  047117
 9710  066714  047440  020106  040515
 9711  066722  047111  020124  046103
 9712  066730  041517  000113
```

```
                                        .SBTTL  DATA PATTERNS

                                        .EVEN
066734  000000                  PATTERN: .WORD   000000
066736  177777                           .WORD   177777
066740  125252                           .WORD   125252
066742  052515                           .WORD   052515
066744  101706                           .WORD   101706
066746  060422                           .WORD   060422
066750  130715                           .WORD   130715
066752  177777                  HEAD1:   .WORD   177777
066754  000000                           .WORD   000000
066756  177777                           .WORD   177777
066760  000000                  HEAD2:   .WORD   000000
066762  177777                           .WORD   177777
066764  000000                           .WORD   000000
066766  125252                  HEAD3:   .WORD   125252
066770  052525                           .WORD   052525
066772  125252                           .WORD   125252
066774  052525                           .WORD   052525
066776  125252                           .WORD   125252
067000  052525                           .WORD   052525
067002  044444                  HEAD4:   .WORD   044444
067004  022222                           .WORD   022222
067006  111111                           .WORD   111111
067010  052012                  HEAD5:   .WORD   052012
067012  100520                           .WORD   100520
067014  052012                           .WORD   052012
067016  155555                  HEAD6:   .WORD   155555
067020  066666                           .WORD   066666
067022  155555                           .WORD   155555
067024  104210                  HEAD7:   .WORD   104210
067026  104210                           .WORD   104210
067030  104210                           .WORD   104210
067032     100      100         NPRBUF:  .BYTE   100,100
067034     101      101                  .BYTE   101,101
067036     102      102                  .BYTE   102,102
067040     103      103                  .BYTE   103,103
067042     104      104                  .BYTE   104,104
067044     105      105                  .BYTE   105,105
067046     106      106                  .BYTE   106,106
067050     107      107                  .BYTE   107,107
067052     110      110                  .BYTE   110,110
067054     111      111                  .BYTE   111,111
067056     112      112                  .BYTE   112,112
067060     113      113                  .BYTE   113,113
067062     114      114                  .BYTE   114,114
067064     115      115                  .BYTE   115,115
067066     116      116                  .BYTE   116,116
067070     117      117                  .BYTE   117,117
067072     120      120                  .BYTE   120,120
067074     121      121                  .BYTE   121,121
067076     122      122                  .BYTE   122,122
067100     123      123                  .BYTE   123,123
067102     124      124                  .BYTE   124,124
067104     125      125                  .BYTE   125,125
```

```
 9769  067106      126      126                .BYTE   126,126
 9770  067110      127      127                .BYTE   127,127
 9771  067112      130      130                .BYTE   130,130
 9772  067114      131      131                .BYTE   131,131
 9773  067116      132      132                .BYTE   132,132
 9774  067120      133      133                .BYTE   133,133
 9775  067122      134      134                .BYTE   134,134
 9776  067124      135      135                .BYTE   135,135
 9777  067126      136      136                .BYTE   136,136
 9778  067130      137      137                .BYTE   137,137
 9779  067132      140      140                .BYTE   140,140
 9780  067134      141      141                .BYTE   141,141
 9781  067136      142      142                .BYTE   142,142
 9782  067140      143      143                .BYTE   143,143
 9783  067142      144      144                .BYTE   144,144
 9784  067144      145      145                .BYTE   145,145
 9785  067146      146      146                .BYTE   146,146
 9786  067150      147      147                .BYTE   147,147
 9787  067152      150      150                .BYTE   150,150
 9788  067154      151      151                .BYTE   151,151
 9789  067156      152      152                .BYTE   152,152
 9790  067160      153      153                .BYTE   153,153
 9791  067162      154      154                .BYTE   154,154
 9792  067164      155      155                .BYTE   155,155
 9793  067166      156      156                .BYTE   156,156
 9794  067170      157      157                .BYTE   157,157
 9795  067172      160      160                .BYTE   160,160
 9796  067174      161      161                .BYTE   161,161
 9797  067176      162      162                .BYTE   162,162
 9798  067200      163      163                .BYTE   163,163
 9799  067202      164      164                .BYTE   164,164
 9800  067204      165      165                .BYTE   165,165
 9801  067206      166      166                .BYTE   166,166
 9802  067210      167      167                .BYTE   167,167
 9803  067212      170      170                .BYTE   170,170
 9804  067214      171      171                .BYTE   171,171
 9805  067216      172      172                .BYTE   172,172
 9806  067220      173      173                .BYTE   173,173
 9807  067222      174      174                .BYTE   174,174
 9808  067224      175      175                .BYTE   175,175
 9809  067226      176      176                .BYTE   176,176
 9810  067230      177      177                .BYTE   177,177
 9811  067232      200      200                .BYTE   200,200
 9812  067234      201      201                .BYTE   201,201
 9813  067236      202      202                .BYTE   202,202
 9814  067240      203      203                .BYTE   203,203
 9815  067242      204      204                .BYTE   204,204
 9816  067244      205      205                .BYTE   205,205
 9817  067246      206      206                .BYTE   206,206
 9818  067250      207      207                .BYTE   207,207
 9819  067252      210      210                .BYTE   210,210
 9820  067254   000102                 WRBUFF: .BLKW   66.
 9821           067270                 BADPAR= WRBUFF+14
 9822           000001                 .END
```

```
ABASE = 177440          1046#   1284    1325
ABORT   054717          7817    8790#
ACDW1 = 000000          1284    1327
ACDW2 = 000000          1284    1328
ACLO  = 000010          1141#
ACPUOP= 000000          1284    1299
ADDW0 = 000000          1284
ADDW1 = 000000          1284
ADDW10= 000000          1284
ADDW11= 000000          1284
ADDW12= 000000          1284
ADDW13= 000000          1284
ADDW14= 000000          1284
ADDW15= 000000          1284
ADDW2 = 000000          1284
ADDW3 = 000000          1284
ADDW4 = 000000          1284
ADDW5 = 000000          1284
ADDW6 = 000000          1284
ADDW7 = 000000          1284
ADDW8 = 000000          1284
ADDW9 = 000000          1284
ADEVCT= 000000          1284    1290
ADEVM = 000000          1284    1326
AENV  = 000000          1284    1295
AENVM = 000000          1284    1296
AFATAL= 000000          1284    1287
AMADR1= 000000          1284    1312
AMADR2= 000000          1284    1316
AMADR3= 000000          1284    1319
AMADR4= 000000          1284    1322
AMAMS1= 000000          1284    1306
AMAMS2= 000000          1284    1314
AMAMS3= 000000          1284    1317
AMAMS4= 000000          1284    1320
AMSGAD= 000000          1284    1292
AMSGLG= 000000          1284    1293
AMSGTY= 000000          1284    1286
AMTYP1= 000000          1284    1307
AMTYP2= 000000          1284    1315
AMTYP3= 000000          1284    1318
AMTYP4= 000000          1284    1321
APASS = 000000          1284    1289
APRIOR= 000005          1045#   1284
APTCSU= 000040          7694#   7872
APTENV= 000001          7650    7692#   7726    7865
APTSIZ= 000200          2319    7691#
APTSPO= 000100          7652    7693#   7867
ASWREG= 000000          1284    1297
ATESTN= 000000          1284    1288
AUNIT = 000000          1284    1291
AUSWR = 000000          1284    1298
AVECT1= 120210          1044#   1284    1323
AVECT2= 000000          1284    1324
BADPAR= 067270          4261    4262    4327    4328    4400*   4557    4558    4634*   7213*   7221*   7235*   7237    7249*
                        9821#
```

```
BAI     = 000020          1104*  3547   3562   3592   3621   3634
BA16    = 000400          1089*  3665   3666   3765   3766   3827   3991   4091   4092   4153
BA17    = 001000          1090*  3665   3666   3928   3929   3990   4091   4092   4153   4154
BITCNT  003622            2254*  2625*  2637*  2650*  2661*  2718*  2731*  2743*  2792*  2805*  2817*  2884*  2941*
                          4697*  4698*  4807*  4808*  4917*  4918*  5027*  5028*  5137*  5138*  5246*  5247*  5327*
                          5340*  5341   5415*  5416*  5518*  5521*  5594*  5597*  5603*  5620*  5632*  5714*  5717*
                          5723*  5740*  5752*  5833*  5836*  5842*  5859*  5871*  5952*  5955*  5961*  5978*  5990*
                          6071*  6074*  6080*  6097*  6109*  6190*  6193*  6199*  6216*  6228*  6309*  6312*  6318*
                          6335*  6347*  6437*  6440*  6446*  6462*  6474*  6562*  6565*  6571*  6587*  6606*  6614*
                          6621*  6628*  6708*  6711*  6717*  6733*  6752*  6760*  6767*  6774*  6858*  6861*  6867*
                          6883*  6895*  8505   8512   8538   8540   8543
BIT0    = 000001           990*  1086   1119   1138
BIT00   = 000001           980*   990
BIT01   = 000002           979*   989
BIT02   = 000004           978*   988
BIT03   = 000010           977*   987
BIT04   = 000020           976*   986
BIT05   = 000040           975*   985
BIT06   = 000100           974*   984
BIT07   = 000200           973*   983
BIT08   = 000400           972*   982   7541
BIT09   = 001000           971*   981   7559   7737
BIT1    = 000002           989*  1120
BIT10   = 002000           970*  1091   1110   1129   1162   1177   7714
BIT11   = 004000           969*  1092   1111   1130   1147   1163   1178   7566
BIT12   = 010000           968*  1094   1112   1131   1164
BIT13   = 020000           967*  1095   1113   1132   1148   1165   7721
BIT14   = 040000           966*  1096   1114   1133   1149   1166   7527
BIT15   = 100000           965*  1097   1098   1115   1134   1150   1167
BIT2    = 000004           988*  1121   1140
BIT3    = 000010           987*  1103   1122   1141
BIT4    = 000020           986*  1104   1123   1142    156   1171
BIT5    = 000040           985*  1105   1124   1143   1157   1172
BIT6    = 000100           984*  1087   1106   1125   1144   1158   1173
BIT7    = 000200           983*  1088   1107   1126   1145   1159   1174
BIT8    = 000400           982*  1089   1108   1127   1146   1160   1175
BIT9    = 001000           981*  1090   1109   1128   1161   1176
BPTVEC= 000014             997*
BSE     = 000200          1126*
CCLR    = 100000          1098*  2424   2445   2469   2490   2512   2533   2556   2577   2604   2619   2634   2647
                          2659   2669   2693   2708   2728   2740   2750   2774   2789   2802   2814   2824   2850
                          3003   3032   3122   3238   3367   3541   3659   3710   3762   3821   3883   3925   3984
                          4046   4088   4147   4209   4257   4307   4323   4399   4416   4553   4635   4661   4700
                          4771   4810   4881   4920   4991   5030   5101   5140   5210   5249   5313   5354   5377
                          5418   5484   5560   5680   5799   5918   6037   6156   6275   6401   6526   6672   6822
                          6980   7057   7136   7829
CDT     = 002000          1091*  2429   2439   2474   2484   2517   2527   2561   2571
CERR    = 100000          1097*  3665   4263   4378   5346   6959   7036   7115
CFMT    = 010000          1094*  2429   2439   2474   2484   2517   2527   2561   2571   4422   4423   4559   4560
                          5212   5230   5264   6827   6919   7020   7036
CKSWR   = 104407          7526   7710   7736   8491*
CLEAR   = 000005          1071*
COE     = 001000          1128*
CR      = 000015           905*  7911   7921
CRLF    = 000200           906*  2344   7882   7921
CSRPTR  003640            2262*  7211   7251*
```

```
CTO    = 004000          1092#
CTRHLT  050252          7828#   8107    8190
DCK    = 100000          1134#   5347
DOISP  = 177570           912#   1257    2307
DOT    = 000400          1146#
DF000   053644          1966    8561#
DF001   053650          1351    1357    1363    1369    1375    1381    1387    1393    1399    1405    1411    1417    8563#
DF015   053674          1423    1429    2087    8573#
DF017   053720          1435    1441    1447    8583#
DF022   053744          1453    1459    1465    1477    1483    1489    8593#
DF025   053770          1471    8603#
DF031   054014          1495    1501    1507    1513    8613#
DF035   054040          1519    1525    1531    1537    1561    1567    1573    1579    1585    1591    1597    1603    1627
                        1633    1639    1645    1651    1657    1663    1669    1735    1741    1747    1753    1789    1795
                        1801    1807    1831    1837    1843    1849    1855    1861    1867    1873    1897    1903    1909
                        1915    1922    1929    1936    1943    8623#
DF041   054064          1543    1759    1949    8633#
DF042   054110          1549    1555    1879    1978    1984    2014    2020    8643#
DF054   054134          1609    1675    2002    2038    8653#
DF055   054160          1615    1621    1681    1687    1885    1891    1990    1996    2026    2032    8663#
DF072   054204          1693    1699    1705    1711    1717    1765    1771    1777    1783    1813    8673#
DF077   054240          1723    1729    1819    1825    1955    1961    8687#
DF150   054264          1972    2008    8697#
DF164   054310          2044    2050    2056    2062    8707#
DF170   054334          2067    8717#
DF171   054360          2072    2077    2082    8727#
DF175   054404          2093    2099    2105    2111    2117    2123    2129    2135    2141    2147    2153    2159    8737#
DF211   054430          2165    2171    2177    2183    8747#
DH000A  055030          8565    8575    8585    8595    8605    8615    8625    8635    8645    8655    8665    8675    8689
                        8699    8709    8719    8729    8739    8749    8805#
DH000B  055046          8567    8577    8587    8597    8607    8617    8627    8637    8647    8657    8667    8677    8691
                        8701    8711    8721    8731    8741    8751    8808#
DH000C  055061          1964    8810#
DH001A  055112          8569    8815#
DH001B  055171          8571    8823#
DH015A  055250          8579    8831#
DH015B  055267          8581    8834#
DH017A  055305          8589    8837#
DH017B  055351          8591    8844#
DH022A  055417          8599    8851#
DH022B  055476          8601    8859#
DH025A  055553          8609    8867#
DH025B  055577          8611    8871#
DH031A  055625          8619    8875#
DH031B  055724          8621    8886#
DH035A  056022          8629    8897#
DH035B  056121          8631    8908#
DH041A  056216          8639    8919#
DH041B  056233          8641    8922#
DH042A  056250          8649    8925#
DH042B  056307          8651    8931#
DH054A  056345          8659    8937#
DH054B  056372          8661    8941#
DH055A  056420          8669    8945#
DH055B  056465          8671    8952#
DH072A  056533          8679    8693    8959#
```

```
DH072B  056572            8681    8695    8965*
DH072C  056630            8683    8970*
DH072D  056707            8685    8978*
DH150A  056764            8703    8986*
DH150B  057020            8705    8991*
DH164A  057056            8713    8996*
DH164B  057122            8715    9002*
DH170A  057170            8723    9009*
DH170B  057267            8725    9020*
DH171A  057365            8733    9031*
DH171B  057404            8735    9034*
DH175A  057422            8743    8753    9037*
DH175B  057521            8745    8755    9048*
DH211A  057616            8757    9059*
DH211B  057644            8759    9063*
DI    = 040000            1096*
DISPLA  001142            1257*   2307*   2315*   7581*   7713*
DISPRE  000174            1186*   2315
DLT   = 100000            1115*
DMD   = 000040            1157*   2425    2432    2433    2470    2477    2478    2513    2520    2521    2557    2564    2565
                          2605    2606    2607    2610    2611    2622    2623    2624    2640    2694    2695    2696    2699
                          2700    2711    2713    2714    2717    2719    2775    2776    2777    2780    2781    2793    2851
                          2852    2853    2858    2859    2883    2886    2887    2888    2889    2917    2918    2919    2922
                          2943    2944    2945    2946    2973    2975    2976    2979    2982    2983    2990    3034    3043
                          3044    3048    3049    3050    3053    3055    3056    3123    3132    3133    3137    3138    3139
                          3142    3145    3146    3175    3176    3239    3247    3248    3252    3253    3254    3257    3260
                          3261    3295    3296    3368    3376    3377    3381    3382    3383    3386    3389    3390    3428
                          3429    3466    3467    3542    3551    3552    3556    3557    3558    3561    3564    3565    3597
                          3598    3660    3669    3670    3674    3675    3676    3679    3681    3682    3763    3768    3769
                          3773    3774    3775    3778    3780    3781    3822    3830    3831    3835    3836    3837    3840
                          3843    3844    3926    3931    3932    3936    3937    3938    3941    3943    3944    3985    3993
                          3994    3998    3999    4000    4003    4006    4007    4089    4094    4095    4099    4100    4101
                          4104    4106    4107    4148    4156    4157    4161    4162    4163    4166    4169    4170    4258
                          4266    4267    4271    4272    4273    4276    4278    4279    4324    4332    4333    4337    4338
                          4339    4342    4344    4345    4369    4370    4417    4426    4427    4431    4432    4433    4436
                          4440    4441    4473    4474    4554    4563    4564    4568    4569    4570    4573    4576    4577
                          4600    4601    4662    4665    4666    4669    4670    4772    4775    4776    4779    4780    4882
                          4885    4886    4889    4890    4992    4995    4996    4999    5000    5102    5105    5106    5109
                          5110    5211    5214    5215    5218    5219    5314    5317    5318    5321    5322    5378    5381
                          5382    5385    5386    5387    5388    5485    5486    5487    5493    5494    5498    5499    5500
                          5503    5504    5507    5508    5526    5533    5561    5567    5568    5572    5573    5574    5577
                          5579    5580    5583    5584    5587    5635    5637    5638    5641    5643    5648    5649    5681
                          5687    5688    5692    5693    5694    5697    5699    5700    5703    5704    5707    5755    5757
                          5758    5761    5763    5768    5769    5800    5806    5807    5811    5812    5813    5816    5818
                          5819    5822    5823    5826    5874    5876    5877    5880    5882    5887    5888    5919    5925
                          5926    5930    5931    5932    5935    5937    5938    5941    5942    5945    5993    5995    5996
                          5999    6001    6006    6007    6038    6044    6045    6049    6050    6051    6054    6056    6057
                          6060    6061    6064    6112    6114    6115    6118    6120    6125    6126    6157    6163    6164
                          6168    6169    6170    6173    6175    6176    6179    6180    6183    6231    6233    6234    6237
                          6239    6244    6245    6276    6282    6283    6287    6288    6289    6292    6294    6295    6298
                          6299    6302    6350    6352    6353    6356    6358    6363    6364    6402    6409    6410    6414
                          6415    6416    6420    6423    6424    6427    6428    6430    6480    6482    6483    6486    6488
                          6493    6494    6527    6534    6535    6539    6540    6541    6544    6546    6547    6552    6553
                          6555    6636    6638    6639    6642    6644    6650    6651    6673    6690    6681    6685    6686
                          6687    6690    6692    6693    6698    6699    6701    6782    6784    6785    6788    6790    6796
                          6797    6823    6830    6831    6835    6836    6837    6841    6844    6845    6848    6849    6851
```

```
                        6901  6903  6904  6907  6909  6914  6915  6941  6945  6946  7018  7022  7023
                        7095  7101  7102  7272  7302  7316  7331  7357  7369  7381  7406  7409  7410
                        7411  7412  7415  7416  7417  7418
DRA    = 000001         1138# 6961  7038  7117
DRDY   = 000200         1145#
DROT   = 000040         1143#
DRPAR  = 000010         1122# 7039
DRVMSK= 000007          1102#
DSC    = 040000         1149#
DSWR   = 177570          911# 1256  2306
DTE    = 010000         1131#
DTYE   = 000040         1124#
DT000    053202         1965  8500#
DT001    053206         1350  1356  1362  1368  1374  1380  1386  1392  1398  1404  1410  1416  8501#
DT015    053226         1422  1428  2086  8504#
DT017    053236         1434  1440  1446  8506#
DT022    053254         1452  1458  1464  1476  1482  1488  8509#
DT025    053274         1470  8512#
DT031    053306         1494  1500  1506  1512  8514#
DT035    053332         1518  1524  1530  1536  1560  1566  1572  1578  1584  1590  1596  1602  1626
                        1632  1638  1644  1650  1656  1662  1668  1734  1740  1746  1752  1788  1794
                        1800  1806  1830  1836  1842  1848  1854  1860  1866  1872  1896  1902  1908
                        1914  1921  1928  1935  1942  8518#
DT041    053356         1542  1758  1948  8522#
DT042    053366         1548  1554  1878  1977  1983  2013  2019  8524#
DT054    053402         1608  1674  2001  2037  8526#
DT055    053414         1614  1620  1680  1686  1884  1890  1989  1995  2025  2031  8528#
DT072    053432         1692  1698  1704  1710  1716  1764  1770  1776  1782  1812  8531#
DT077    053462         1722  1728  1818  1824  1954  1960  8536#
DT150    053476         1971  2007  8538#
DT164    053512         2043  2049  2055  2061  8540#
DT170    053530         2066  8543#
DT171    053554         2071  2076  2081  8547#
DT175    053564         2092  2098  2104  2110  2116  2122  2128  2134  2140  2146  2152  2158  8549#
DT211    053610         2164  2170  2176  2182  8553#
ECCW   = 020000         1165# 2624  2640  2719  2793  2883  2990  5504  5587  5643  5707  5763  5826
                        5882  5945  6001  6064  6120  6183  6239  6302  6358  6430  6488  6555  6618
                        6624  6644  6701  6764  6770  6790  6851  6909
ECH    = 000100         1125#
EMTVEC= 000030          1000# 2290* 2291*
EMW     003170          2064# 5517* 5586* 5604* 5706* 5724* 5825* 5843* 5944* 5962* 6063* 6081* 6182*
                        6200* 6301* 6319* 6429* 6447* 6554* 6572* 6592* 6605* 6700* 6718* 6738* 6751*
                        6850* 6868* 7277* 7307* 7321* 7336* 7362* 7374* 7386*
EMW1     066374         7277  9673#
EMW2     066463         7307  7362  9683#
EMW3     066554         7321  7374  9693#
EMW4     066643         7336  7386  9703#
EM000    057701         1963  9070#
EM200    057746         1348  1354  1360  9077#
EM201    060030         1366  1372  1378  9086#
EM202    060113         1384  1390  1396  9095#
EM203    060204         1402  1408  1414  9105#
EM204    060276         1420  1426  1432  1438  1444  9115#
EM205    060364         1450  1456  1462  1468  1474  1480  1486  1492  1498  1504  1510  9124#
EM206    060452         1516  1522  1528  1534  1540  1546  1552  9133#
EM207    060515         1558  1564  1570  1576  1606  1612  1618  9139#
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
EM208   060544          1582    1588    1594    1600    9143#
EM209   060615          1624    1630    1636    1642    1672    1678    1684    9150#
EM210   060704          1648    1654    1660    1666    9160#
EM211   061020          1690    1696    1702    1708    1714    9173#
EM212   061070          1720    1726    9180#
EM213   061140          1732    1738    1744    1750    1756    9187#
EM214   061210          1762    1768    1774    1780    1810    9194#
EM215   061260          1786    1792    1798    1804    9201#
EM216   061344          1816    1822    9210#
EM217   061414          1828    1834    1840    1846    1876    1882    1888    9217#
EM218   061447          1852    1858    1864    1870    9222#
EM219   061527          1894    1900    1906    1912    1946    1952    1958    9231#
EM220   061607          1919    1926    1933    1940    9240#
EM221   061666          1969    9248#
EM222   061743          1975    1981    9256#
EM223   062016          1987    1993    1999    9264#
EM224   062074          2005    9272#
EM225   062171          2011    2017    9283#
EM226   062256          2023    2029    2035    9292#
EM227   062356          2041    2047    2053    2059    9303#
EM230   062464          5517    9316#
EM231   062572          2069    9328#
EM232   062714          2074    9343#
EM233   063036          5586    5706    5825    5944    6063    6182    6301    6429    6554    6700    9358#
EM234   063102          5604    5724    5843    5962    6081    6200    6319    6447    6572    6718    9364#
EM235   063142          2079    9370#
EM236   063252          2084    9383#
EM237   063334          6592    6738    9392#
EM238   063402          6605    6751    9399#
EM239   063441          6850    9405#
EM240   063533          6868    9415#
EM241   063622          2090    2096    2102    2108    9425#
EM242   063706          2114    2120    2126    2132    9434#
EM243   063772          2138    2144    2150    2156    9443#
EM244   064073          2162    2168    2174    2180    9454#
EM3000  064125          1349    1367    1385    1403    1517    1559    1583    1625    1649    1691    1721    1733    1763
                        1787    1817    1829    1853    1895    1920    1970    2006    2042    2085    2091    2115    2139
                        2163    9459#
EM3001  064170          1355    1373    1391    1409    9465#
EM3002  064214          1361    1379    1397    1415    9439#
EM3003  064240          1421    1451    9473#
EM3004  064310          1427    9480#
EM3005  064362          1433    9487#
EM3006  064464          1439    9499#
EM3007  064565          1445    9511#
EM3008  064706          1457    9525#
EM3009  064766          1463    9533#
EM3010  065045          1475    9541#
EM3011  065112          1481    9548#
EM3012  065161          1487    9555#
EM3013  065227          1493    9562#
EM3014  065264          1469    9567#
EM3015  065335          1499    9574#
EM3016  065403          1505    9581#
EM3018  065450          1523    1565    1589    1631    1655    1697    1727    1739    1769    1793    1805    1823    1835
                        1859    1901    1927    2048    2097    2121    2145    2169    9588#
```

```
EM3019  065514  1529  1571  1595  1637  1661  1709  1745  1775  1799  1841  1865  1907  1934
                9594#
EM3020  065542  1535  1577  1601  1643  1667  1715  1751  1781  1847  1871  1913  1941  9598#
EM3021  065573  1541  1607  1673  1757  1877  1947  2000  2036  9603#
EM3022  065617  1547  1613  1679  1883  1953  1988  2024  9607#
EM3023  065667  1553  1619  1685  1889  1959  1994  2030  9614#
EM3024  065737  1703  1811  9621#
EM3025  065763  1511  9625#
EM3026  066033  1976  2012  9632#
EM3027  066102  1982  2018  9639#
EM3028  066151  2054  9646#
EM3029  066220  2060  9653#
EM3030  066267  2070  2075  2080  9660#
EM3031  066315  2103  2127  2151  2175  9664#
EM3032  066350  2109  2133  2157  2181  9669#
ERRCNT  003610  2249#  2323*  7812*  7815
ERRVEC= 000004   993#  2304  2305*  2316*  7219*  7220*  7255*  7256*  7454  7455  7459*  7464*  7476*
                7481*  7490*  7500*  7501*  7532  7533*  7535*  7538*
E.ASOF  003516  2212#
E.BA    003504  2207#  2866*  2873  2906  2931  2963  2994  3025*  3073  3125*  3152  3158*  3166
                3189  3240*  3267  3279  3285*  3293*  3309  3369*  3396  3408  3414*  3423*  3442
                3472*  3485  3496*  3543*  3583  3611  3661*  3704  3792*  3800  3825*  3863  3869*
                3955*  3963  3988*  4026  4032*  4118*  4126  4151*  4189  4195*  4262*  4298  4328*
                4362  4381*  4389  4421*  4447  4462  4468*  4477*  4489  4558*  4593  4614  8509
                8514  8518  8534
E.CS1   003500  2205#  2439*  2442  2484*  2487  2527*  2530  2571*  2574  2615*  2616  2673*  2674
                2704*  2705  2754*  2755  2785*  2786  2828*  2829  2865*  2868  2901  2926  2958
                2991  3026*  3067  3087  3117*  3160  3183  3208  3237*  3273  3303  3334  3366*
                3402  3436  3459  3479  3515  3540*  3577  3605  3635  3665*  3695  3713*  3715
                3765*  3794  3827*  3857  3928*  3957  3990*  4020  4091*  4120  4153*  4183  4263*
                4292  4310*  4312  4329*  4356  4378*  4383  4422*  4456  4483  4512  4559*  4587
                4608  4628  4681*  4693  4715*  4717  4732  4791*  4803  4825*  4827  4842  4901*
                4913  4935*  4937  4952  5011*  5023  5045*  5047  5062  5121*  5133  5155*  5157
                5172  5230*  5242  5264*  5266  5281  5325*  5331  5346*  5348  5399*  5411  5433*
                5435  5450  5653*  5654  5773*  5774  5892*  5893  6011*  6012  6130*  6131  6249*
                6250  6368*  6369  6498*  6499  6655*  6656  6801*  6802  6919*  6920  6959*  6963
                6985*  6989  7036*  7040  7062*  7066  7115*  7119  7141*  7145  8501  8504  8509
                8514  8518  8524  8528  8531  8536  8538  8540  8549  8553
E.CS2   003510  2209#  3066*  3070  3086*  3090  3143*  3163  3186  3207*  3211  3258*  3276  3289*
                3306  3318*  3337*  3337  3387*  3405  3419*  3439  3448*  3462  3474*  3482  3498*
                3514*  3518  3562*  3580  3592*  3608  3621*  3634*  3638  3691*  3694*  3698  3714*
                3718  3791*  3797  3856*  3860  3954*  3960  4019*  4023  4117*  4123  4182*  4186
                4290*  4295  4312*  4315  4355*  4359  4379*  4386  4437*  4455*  4459  4486  4496*
                4511*  4515  4574*  4590  4611  4627*  4631  4716*  4720  4731*  4737  4826*  4830
                4841*  4847  4936*  4940  4951*  4957  5046*  5050  5061*  5067  5156*  5160  5171*
                5177  5265*  5269  5280*  5286  5326*  5336  5347*  5351  5434*  5438  5449*  5455
                6960*  6966  6986*  6992  7037*  7043  7063*  7069  7116*  7122  7142*  7148  8518
                8524  8528  8531  8536  8540  8549  8553
E.DA    003506  2208#
E.DB    003522  2214#  3080*  3081  3199*  3200  3320*  3321  3450*  3451  3501*  3502  3618*  3622
                3807*  3808  3876*  3877  3970*  3971  4039*  4040  4133*  4134  4202*  4203  4500*
                4501  4621*  4622  4725*  4742  4835*  4852  4945*  4962  5055*  5072  5165*  5182
                5274*  5291  5443*  5460  8522  8526
E.DCYL  003520  2213#
E.DS    003512  2210#  6961*  6969  6987*  6995  7038*  7046  7064*  7072  7117*  7125  7143*  7151
                8549  8553
```

```
E.ECPS  003532          2218#
E.ECPT  003534          2219#
E.ER    003514          2211#  3690*  3701   4291*  4304   4382*  4395   6962*  6972   6988*  6998   7039*  7049
                        7065*  7075   7118*  7128   7144*  7154   8531   8549   8553
E.MR1   003524          2215#  2624*  2631   2640*  2644   2656   2666   2719*  2725   2737   2748   2793*  2799
                        2811   2822   2883*  2891   2948   2990*  3000   5504*  5524*  5525*  5528   5531*  5532*
                        5535   5587*  5643*  5644   5707*  5763*  5764   5826*  5882*  5883   5945*  6001*  6002
                        6064*  6120*  6121   6183*  6239*  6240   6302*  6358*  6359   6430*  6488*  6489   6555*
                        6618*  6624*  6644*  6645   6701*  6764*  6770*  6790*  6791   6851*  6909*  6910   7271*
                        7274   7285*  7286*  7291*  7296*  7301*  7304   7315*  7318   7329*  7330*  7333   7350*
                        7353*  7356*  7359   7368*  7371   7380*  7383   8506   8512   8514   8543   8547
E.MR2   003526          2216#  2440*  2447   2485*  2492   2528*  2535   2572*  2579   8501
E.MR3   003530          2217#  2441*  2450   2486*  2495   2529*  2538   2573*  2582   8501
E.SPAR  003536          2220#
E.WC    003502          2206#  2867*  2878   2911   2936   2968   2997   3027*  3076   3126*  3127*  3128   3159*
                        3169   3172   3192   3242*  3282   3286*  3292*  3312   3371*  3411   3415*  3416   3422*
                        3445   3473*  3488   3497*  3545*  3571   3586   3589*  3595*  3614   3663*  3707   3793*
                        3803   3823*  3850   3866   3870*  3956*  3966   3986*  4013   4029   4033*  4119*  4129
                        4149*  4176   4192   4196*  4260*  4301   4326*  4365   4380*  4392   4419*  4453   4465
                        4469*  4478*  4492   4556*  4596   4617   8509   8514   8521   8534
FMTE    = 000020        1123#  6962   7039
GNS     = ****** U      1185   2343   7182   7189   8483   8484   8485   8486   8487   8489   8491   8492   8493
                        8494   8495   8496   8497
GO      = 000001        1086#  3665   4263   4378   4715   4825   4935   5045   5155   5264   5346   5433   5653
                        5773   5892   6011   6130   6249   6368   6498   6655   6801   6919   6959   7036   7115
GTSWR   = 104406        2338   8489#
HEAD1   066752          4680   4724   5229   5273   5398   5442   5562   5605   6403   6404   6824   6825   9723#
HEAD2   066760          4790   4834   5682   5725   9726#
HEAD3   066766          4900   4944   5801   5844   6528   6529   9729#
HEAD4   067002          5010   5054   5920   5963   9735#
HEAD5   067010          5120   5164   6039   6082   9738#
HEAD6   067016          6158   6201   9741#
HEAD7   067024          6277   6320   9744#
HT      = 000011         903#  7880   7921
HVRC    = 000400        1127#
IDAE    = 002000        1129#
IE      = 000100        1087#
ILF     = 000001        1119#
INTR    = 000300        1082#
IOTVEC= 000020           998#  2288*  2289*
IR      = 000100        1106#  3066   3086   3143   3207   3258   3318   3333   3387   3448   3498   3514   3562
                        3621   3634   3691   3714   3791   3856   3954   4019   4117   4182   4290   4311   4355
                        4379   4437   4496   4511   4574   4627   4716   4731   4826   4841   4936   4951   5046
                        5061   5156   5171   5265   5280   5326   5347   5434   5449   6960   6986   7037   7063
                        7116   7142
KIPAR0= 172340          1031#  7440   7468
KIPAR1= 172342          1032#
KIPAR2= 172344          1033#
KIPAR3= 172346          1034#
KIPAR4= 172350          1035#
KIPAR5= 172352          1036#
KIPAR6= 172354          1037#  3754*  3812*  3917*  3975*  4080*  4138*
KIPAR7= 172356          1038#  7484
KIPDR0= 172300          1020#
KIPDR1= 172302          1021#
KIPDR2= 172304          1022#
```

```
KIPDR3= 172306          1023#
KIPDR4= 172310          1024#
KIPDR5= 172312          1025#
KIPDR6= 172314          1026#
KIPDR7= 172316          1027#
LF    = 000012           904#  7915  7921
MCLK  = 000400          1160#  2432  2477  2520  2564  2610  2699  2713  2780  2858  2886  2888  2918
                        2943   2945  2975  2982  3043  3049  3055  3132  3138  3145  3175  3247  3253
                        3260   3295  3376  3382  3389  3428  3466  3551  3557  3564  3597  3669  3675
                        3681   3768  3774  3780  3830  3836  3843  3931  3937  3943  3993  3999  4006
                        4094   4100  4106  4156  4162  4169  4266  4272  4278  4332  4338  4344  4369
                        4426   4432  4440  4473  4563  4569  4576  4600  4665  4775  4885  4995  5105
                        5214   5317  5381  5387  5493  5499  5507  5567  5573  5579  5637  5648  5687
                        5693   5699  5757  5768  5806  5812  5818  5876  5887  5925  5931  5937  5995
                        6006   6044  6050  6056  6114  6125  6163  6169  6175  6233  6244  6282  6288
                        6294   6352  6363  6409  6415  6423  6482  6493  6534  6540  6546  6638  6650
                        6680   6686  6692  6784  6796  6830  6836  6844  6903  6914  6945  7022  7101
                        7271   7272  7285  7315  7316  7330  7353  7368  7369  7380  7406  7409  7411
                        7415   7417
MDS   = 001000          1109#
MEMBAS= 172100          1041#  7224
MEMERR  046266          1204   7262  7423#
MEMPAR  003630          2257#  7222* 7229* 7257
MEMVEC= 000114          1040#  1203  7232* 7233* 7259* 7260* 7262* 7263*
MERD  = 001000          1161#  7409  7417
MESMSK= 000017          1154#
MEMD  = 002000          1162#  2624  2640  2719  2793  2883  2990  5504  5587  5643  5707  5763  5826
                        5882   5945  6001  6064  6120  6183  6239  6302  6358  6430  6488  6555  6644
                        6701   6790  6851  6909  7271  7286  7291  7315  7329  7380
MIND  = 000200          1159#  2711  2713  2714  2973  2975  2976  3048  3049  3050  3137  3138  3139
                        3252   3253  3254  3381  3382  3383  3556  3557  3558  3674  3675  3676  3773
                        3774   3775  3835  3836  3837  3936  3937  3938  3998  3999  4000  4099  4100
                        4101   4161  4162  4163  4271  4272  4273  4337  4338  4339  4431  4432  4433
                        4568   4569  4570  5498  5499  5500  5572  5573  5574  5635  5637  5638  5692
                        5693   5694  5755  5757  5758  5811  5812  5813  5874  5876  5877  5930  5931
                        5932   5993  5995  5996  6049  6050  6051  6112  6114  6115  6168  6169  6170
                        6231   6233  6234  6287  6288  6289  6350  6352  6353  6414  6415  6416  6480
                        6482   6483  6539  6540  6541  6636  6638  6639  6685  6686  6687  6782  6784
                        6785   6835  6836  6837  6901  6903  6904
MMVEC = 000250          1009#
MSP   = 000100          1158#  2606  2622  2695  2776  2852  2917  2918  2919  4669  4779  4889  4999
                        5109   5218  5321  5385  5486  5525  5526  5531  5583  5703  5822  5941  6060
                        6179   6298  6427  6552  6698  6848
M1.BIT  003616          2252#  2627* 2662* 2721* 2744* 2795* 2818* 4672* 4684* 4708* 4782* 4794* 4818*
                        4892*  4904* 4928* 5002* 5014* 5038* 5112* 5124* 5148* 5221* 5233* 5257* 5324*
                        5390*  5402* 5426* 5514* 5591* 5609  5610* 5626  5627* 5711* 5729  5730* 5746
                        5747*  5830* 5848  5849* 5865  5866* 5949* 5967  5968* 5984  5985* 6068* 6086
                        6087*  6103  6104* 6187* 6205  6206* 6222  6223* 6306* 6324  6325* 6341  6342*
                        6434*  6451  6452* 6468  6469* 6559* 6576  6577* 6594  6595* 6608  6609* 6705*
                        6722   6723* 6740  6741* 6754  6755* 6855* 6872  6873* 6889  6890* 7289  7348
                        7354   7404  8506  8543
M2.BIT  003620          2253#  5515* 5592* 5609* 5626* 5712* 5729* 5746* 5831* 5848* 5865* 5950* 5967*
                        5984*  6069* 6086* 6103* 6188* 6205* 6222* 6307* 6324* 6341* 6435* 6451* 6468*
                        6560*  6576* 6594* 6608* 6706* 6722* 6740* 6754* 6856* 6872* 6889* 7294  7299
                        8543
NED   = 010000          1112#
```

```
NEM     = 004000          1111#  3691
NEWPAS    004666          2403#  7205
NPRBUF    067032          3124   3125   3152   3196   3240   3241   3267   3316   3369   3370   3396   3426   3543
                          3544   3618   3756   3807   3814   3815   3874   3919   3970   3977   3978   4037   4082
                          4133   4140   4141   4200   4420   4421   4447   4495   6674   6675   9747#
NXF     = 000004          1121#
OFFSET= 000015            1075#
OFST    = 000004          1140#
OPI     = 020000          1132#
OPR001    054464          2350   8763#
OPR002    054516          2353   2364   2381   8768#
OPR003    054524          2360   8769#
OPR004    054554          2372   8773#
OPR006    054576          2347   8776#
OPR007    054650          7831   8783#
OR      = 000200          1107#  3066   3143   3258   3289   3318   3387   3419   3448   3474   3498   3562   3592
                          3621   3692   3694   3791   3856   3954   4019   4117   4182   4290   4355   4379   4437
                          4455   4496   4574   4716   4826   4936   5046   5156   5265   5434
PACK    = 000003          1070#
PARCHK    044732          2403   7219#  8444
PARM      003642          1192   2265#
PARPRE    003636          2260#  6240   4540   7223#  7230   7252#
PAR.EN= 000001            1043#  7214   7227   7236   7250
PAT     = 000020          1156#
PATTER    066734          3023   9716#
PCA     = 004000          1163#  7285   7301   7350
PCD     = 010000          1164#  7285   7296   7356
PGE     = 002000          1110#
PIP     = 020000          1148#
PIRQ    = 177772           910#
PIRQVE= 000240            1004#
PR.BIT    003614          2251#  2626#  2653#  2662   2663#  2720#  2734#  2744   2745#  2794#  2808#  2818   2819#
                          4671#  4677#  4684   4687#  4690#  4708   4709#  4781#  4787#  4794   4797#  4800#  4818
                          4819#  4891#  4897#  4904   4907#  4910#  4928   4929#  5001#  5007#  5014   5017#  5020#
                          5038   5039#  5111#  5117#  5124   5127#  5130#  5148   5149#  5220#  5226#  5233   5236#
                          5239#  5257   5258#  5323#  5389#  5395#  5402   5405#  5408#  5426   5427#  5513#  5590#
                          5610   5611#  5627   5628#  5710#  5730   5731#  5747   5748#  5829#  5849   5850#  5866
                          5867#  5948#  5968   5969#  5985   5986#  6067#  6087   6088#  6104   6105#  6186#  6206
                          6207#  6223   6224#  6305#  6325   6326#  6342   6343#  6433#  6452   6453#  6469   6470#
                          6558#  6577   6578#  6595   6596#  6609   6610#  6704#  6723   6724#  6741   6742#  6755
                          6756#  6854#  6873   6874#  6890   6891#  7287   7402   8506   8543
PR0     = 000000           927#  2404   7264
PR1     = 000040           928#
PR2     = 000100           929#
PR3     = 000140           930#
PR4     = 000200           931#
PR5     = 000240           932#  2243
PR6     = 000300           933#
PR7     = 000340           934#  1205   2275   7220   7233   7263   8427   8441
PS      = 177776           907#   908
PSW     = 177776           908#
PWRVEC= 000024             999#  2294#  2295#  8426#  8427#  8440#  8441#
P.ASOF    003556          2231#
P.BA      003544          2226#
P.CS1     003540          2224#  6975#  7052#  7131#  8557
P.CS2     003550          2228#  6976#  7053#  7132#  8557
```

```
P.DA    003546          2227#
P.DB    003562          2233#
P.DCYL  003560          2232#
P.DS    003552          2229#  6977*  7054*  7133*  8557
P.ECPS  003572          2237#
P.ECPT  003574          2238#
P.ER    003554          2230#  6978*  7055*  7134*  8557
P.MR1   003564          2234#
P.MR2   003566          2235#
P.MR3   003570          2236#
P.SPAR  003576          2239#
P.WC    003542          2225#
P1.BIT  003612          2250#  5512*  5589*  5600*  5611   5614*  5617*  5628   5629*  5709*  5720*  5731   5734*
                        5737*  5748   5749*  5828*  5839*  5850   5853*  5856*  5867   5868*  5947*  5958*  5969
                        5972*  5975*  5986   5987*  6066*  6077*  6088   6091*  6094*  6105   6106*  6185*  6196*
                        6207   6210*  6213*  6224   6225*  6304*  6315*  6326   6329*  6332*  6343   6344*  6432*
                        6443*  6453   6456*  6459*  6470   6471*  6557*  6568*  6578   6581*  6584*  6596   6597*
                        6602*  6610   6611*  6703*  6714*  6724   6727*  6730*  6742   6743*  6748*  6756   6757*
                        6853*  6864*  6874   6877*  6880*  6891   6892*  7292   7346   8543
RDBIT   046156          2629   2642   2654   2664   2723   2735   2746   2797   2809   2820   4674   4678   4691
                        4710   4784   4788   4801   4820   4894   4898   4911   4930   5004   5008   5021   5040
                        5114   5118   5131   5150   5223   5227   5240   5259   5328   5392   5396   5409   5428
                        7402#
RDCHR = 104410          8266   8492#
RDDATA= 000021          1077#
RDGATE= 100000          1167#  2640
RDHEAD= 000025          1079#  2429   2439   2517   2527   2608   2615   2673   2697   2704   2754   2778   2785
                        2628   4663   4681   4715   4773   4791   4825   4883   4901   4935   4993   5011   5045
                        5103   5121   5155   5212   5230   5264   5315   5325   5346   5379   5399   5433   6943
                        6959   7020   7036
RDLIN = 104411          8340   8493#
RDOCT = 104412          2354   2385   2382   8494#
RDY   = 000200          1088#  3665   3713   4263   4310   4378   4715   4825   4935   5045   5155   5264   5346
                        5433   5653   5773   5892   6011   6130   6249   6368   6498   6655   6801   6919   6959
                        6985   7036   7062   7115   7141
RECAL = 000013          1074#
RESREG= 104414          7811   8496#
RESTRT  003652          1190   2268#
RESVEC= 000010           994#
RKASOF= 000016          1057#
RKBA  = 000004          1052#  2854*  2863   2899   2924   2956   2988   3037*  3060   3124*  3150   3181   3241*
                        3265   3301   3370*  3394   3434   3477   3544*  3569   3603   3662*  3687   3785   3826*
                        3848   3948   3989*  4011   4111   4152*  4174   4261*  4283   4327*  4349   4375   4420*
                        4445   4481   4557*  4581   4606   5488*  5562*  5682*  5801*  5920*  6039*  6158*  6277*
                        6403*  6528*  6674*  6824*  7098*
RKCS1 = 000000          1050#  2424*  2429*  2436   2445*  2469*  2474*  2481   2490*  2512*  2517*  2524   2533*
                        2556*  2561*  2568   2577*  2604*  2608*  2614   2619*  2634*  2647*  2659*  2669*  2672
                        2693*  2694*  2697*  2703   2708*  2728*  2740*  2750*  2753   2774*  2775*  2778*  2784
                        2789*  2802*  2814*  2824*  2827   2850*  2856*  2862   2898   2923   2955   2987   3003*
                        3032*  3040*  3059   3084   3122*  3129*  3149   3179   3203   3238*  3244*  3264   3299
                        3324   3367*  3373*  3393   3432   3454   3475   3505   3541*  3548*  3568   3601   3625
                        3659*  3666*  3685   3710*  3711   3762*  3766*  3784   3821*  3828*  3847   3883*  3925*
                        3929*  3947   3984*  3991*  4010   4046*  4088*  4092*  4110   4147*  4154*  4173   4209*
                        4257*  4264*  4282   4307*  4308   4323*  4330*  4348   4373   4399*  4416*  4423*  4444
                        4479   4507   4553*  4560*  4580   4604   4625   4635*  4661*  4663*  4692   4700*  4713
                        4727   4771*  4773*  4802   4810*  4823   4837   4881*  4883*  4912   4920*  4933   4947
```

```
                    4991* 4993* 5022  5030* 5043  5057  5101* 5103* 5132  5140* 5153  5167  5210*
                    5212* 5241  5249* 5262  5276  5313* 5315* 5329  5344  5354* 5377* 5379* 5410
                    5418* 5431  5445  5484* 5490* 5560* 5564* 5652  5680* 5684* 5772  5799* 5803*
                    5891  5918* 5922* 6010  6037* 6041* 6129  6156* 6160* 6248  6275* 6279* 6367
                    6401* 6406* 6497  6526* 6531* 6654  6672* 6677* 6800  6822* 6827* 6918  6943*
                    6951  6955  6980* 6981  7020* 7028  7032  7057* 7058  7099* 7107  7111  7136*
                    7137  7829*
RKCS2 = 000010       1054* 2428* 2473* 2516* 2560* 3038* 3065  3085  3157  3180  3204  3272  3300
                    3330  3401  3433  3458  3476  3511  3547* 3576  3602  3631  3686  3712  3790
                    3855  3953  4018  4116  4181  4289  4309  4354  4374  4452  4480  4508  4586
                    4605  4626  4714  4728  4824  4838  4934  4948  5044  5058  5154  5168  5263
                    5277  5330  5345  5432  5446  6940* 6956  6982  7017* 7033  7059  7094* 7112
                    7138
RKDA  = 000006       1053* 2427* 2472* 2515* 2559* 3036*
RKDB  = 000024       1059* 3079  3198  3319  3449  3500  3620  3806  3875  3969  4038  4132  4201
                    4499  4620  4726  4836  4946  5056  5166  5275  5343  5444
RKDCYL= 000020       1058* 2426* 2471* 2514* 2558* 3035* 6942* 7019* 7096*
RKDS  = 000012       1055* 6957  6983  7034  7060  7113  7139
RKECPS= 000030       1063*
RKECPT= 000032       1064*
RKER  = 000014       1056* 3689  4285  4377  6958  6984  7035  7061  7114  7140
RKMR1 = 000026       1060* 2425* 2432* 2433* 2470* 2477* 2478* 2513* 2520* 2521* 2557* 2564* 2565*
                    2605* 2606* 2607* 2610* 2611* 2622* 2623* 2630  2643  2655  2665  2695* 2696*
                    2699* 2700* 2711* 2713* 2714* 2717* 2724  2736  2747  2776* 2777* 2780* 2781*
                    2798  2810  2921  2851* 2852* 2853* 2858* 2859* 2886* 2887* 2888* 2889* 2890
                    2917* 2918* 2919* 2922* 2943* 2944* 2945* 2946* 2947  2973* 2975* 2976* 2979*
                    2982* 2983* 2986  3034* 3043* 3044* 3048* 3049* 3050* 3053* 3055* 3056* 3123*
                    3132* 3133* 3137* 3138* 3139* 3142* 3145* 3146* 3175* 3176* 3239* 3247* 3248*
                    3252* 3253* 3254* 3257* 3260* 3261* 3295* 3296* 3368* 3376* 3377* 3381* 3382*
                    3383* 3386* 3389* 3390* 3428* 3429* 3466* 3467* 3542* 3551* 3552* 3556* 3557*
                    3558* 3561* 3564* 3565* 3597* 3598* 3660* 3669* 3670* 3674* 3675* 3676* 3679*
                    3681* 3682* 3763* 3768* 3769* 3773* 3774* 3775* 3778* 3780* 3781* 3822* 3830*
                    3831* 3835* 3836* 3837* 3840* 3843* 3844* 3926* 3931* 3932* 3936* 3937* 3938*
                    3941* 3943* 3944* 3985* 3993* 3994* 3998* 3999* 4000* 4003* 4006* 4007* 4089*
                    4094* 4095* 4099* 4100* 4101* 4104* 4106* 4107* 4148* 4156* 4157* 4161* 4162*
                    4163* 4166* 4169* 4170* 4258* 4266* 4267* 4271* 4272* 4273* 4276* 4278* 4279*
                    4324* 4332* 4333* 4337* 4338* 4339* 4342* 4344* 4345* 4369* 4370* 4417* 4426*
                    4427* 4431* 4432* 4433* 4436* 4440* 4441* 4473* 4474* 4554* 4563* 4564* 4568*
                    4569* 4570* 4573* 4576* 4577* 4600* 4601* 4662* 4665* 4666* 4669* 4670* 4772*
                    4775* 4776* 4779* 4780* 4882* 4885* 4886* 4889* 4890* 4992* 4995* 4996* 4999*
                    5000* 5102* 5105* 5106* 5109* 5110* 5211* 5214* 5215* 5218* 5219* 5314* 5317*
                    5318* 5321* 5322* 5378* 5381* 5382* 5385* 5386* 5387* 5388* 5485* 5486* 5487*
                    5493* 5494* 5498* 5499* 5500* 5503* 5507* 5508* 5526* 5527  5533* 5534  5561*
                    5567* 5568* 5572* 5573* 5574* 5577* 5579* 5580* 5583* 5584* 5635* 5637* 5638*
                    5641* 5642  5648* 5649* 5681* 5687* 5688* 5692* 5693* 5694* 5697* 5699* 5700*
                    5703* 5704* 5755* 5757* 5758* 5761* 5762  5768* 5769* 5800* 5806* 5807* 5811*
                    5812* 5813* 5816* 5818* 5819* 5822* 5823* 5874* 5876* 5877* 5880* 5881  5887*
                    5888* 5919* 5925* 5926* 5930* 5931* 5932* 5935* 5937* 5938* 5941* 5942* 5993*
                    5995* 5996* 5999* 6000  6006* 6007* 6038* 6044* 6045* 6049* 6050* 6051* 6054*
                    6056* 6057* 6060* 6061* 6112* 6114* 6115* 6118* 6119  6125* 6126* 6157* 6163*
                    6164* 6168* 6169* 6170* 6173* 6175* 6176* 6179* 6180* 6231* 6233* 6234* 6237*
                    6238  6244* 6245* 6276* 6282* 6283* 6287* 6288* 6289* 6292* 6294* 6295* 6298*
                    6299* 6350* 6352* 6353* 6356* 6357  6363* 6364* 6402* 6409* 6410* 6414* 6415*
                    6416* 6420* 6423* 6424* 6427* 6428* 6480* 6482* 6483* 6486* 6487  6493* 6494*
                    6527* 6534* 6535* 6539* 6540* 6541* 6544* 6546* 6547* 6552* 6553* 6636* 6638*
                    6639* 6642* 6643  6650* 6651* 6673* 6680* 6681* 6685* 6686* 6687* 6690* 6692*
```

```
                    6693* 6698* 6699* 6782* 6784* 6785* 6788* 6789  6796* 6797* 6823* 6830* 6831*
                    6935* 6836* 6837* 6841* 6844* 6845* 6848* 6849* 6901* 6903* 6904* 6907* 6908
                    6914* 6915* 6941* 6945* 6946* 6949* 7018* 7022* 7023* 7026* 7095* 7101* 7102*
                    7105* 7272* 7273  7302* 7303  7316* 7317  7321* 7332  7357* 7358  7369* 7370
                    7381* 7382  7406* 7409* 7410* 7411* 7412* 7415* 7416* 7417* 7418*
RKMR2 = 000034      1061# 2437  2482  2525  2569
RKMR3 = 000036      1062# 2438  2483  2526  2570
RKPRI   003602      2243# 2398*
RKSPAR= 000022      1065#
RKVEC   003600      2242# 2396* 2397*
RKWC  = 000002      1051# 2855* 2864  2900  2925  2957  2989  3039* 3061  3128* 3151  3182  3243*
                    3266  3302  3372* 3395  3435  3478  3546* 3570  3604  3664* 3688  3764* 3786
                    3824* 3849  3927* 3949  3987* 4012  4090* 4112  4150* 4175  4259* 4284  4325*
                    4350  4376  4418* 4446  4482  4555* 4582  4607  5489* 5563* 5683* 5802* 5921*
                    6040* 6159* 6278* 6405* 6530* 6676* 6826* 7097*
RLS   = 000010      1103#
SAVREG= 104413      7760  8495#
SAVSWR  003634      2259# 8425* 8445
SCLR  = 000040      1105# 6940  7017  7094
SCOPI = 104415      3093  3217  3811  3882  3974  4045  4137  4208  4318  4398  8497#
SCOPI$  047276      7632# 8497
SECCNT  003626      2256# 5511* 5585* 5705* 5824* 5943* 6062* 6181* 6300* 6419* 6477* 6550* 6631*
                    6696* 6777* 6840* 6898* 8543
SEEK  = 000017      1076#
SELDRV= 000001      1069#
SKI   = 000002      1120#
SPACE2  054714      7794  7806  8789#
SPAR  = 020000      1095#
SPDLSS= 000020      1142#
SRTFLG  003606      2245# 2265* 2268* 2271* 2348
SRTSPL= 000011      1073#
SR0   = 177572      1013# 3755* 3757* 3813* 3816* 3918* 3920* 3976* 3979* 4081* 4083* 4139* 4142*
                    7465  7480* 7487*
SR1   = 177574      1014#
SR2   = 177576      1015#
SR3   = 172516      1016# 7477*
STACK = 001100       898# 2273  2286  7397  7431  7822  7830  8442
START   003662      1189  2271#
START1  003666      2266  2269  2272# 7840
STKLMT= 177774       909#
SVAL  = 100000      1150# 6961  7038  7117
SWR     001140      1256# 2284  2306* 2308  2314* 2321* 2336  7281  7311  7325  7340  7366  7378
                    7390  7427  7527  7541  7544  7559  7566  7632  7714  7721  7733  7737  7813
                    8110  8149  8204* 8425  8445*
SWREG   000176      1187# 2314  2336  8110  8149  8172
SW0   = 000001       962#
SW00  = 000001       952#  962
SW01  = 000002       951#  961
SW02  = 000004       950#  960
SW03  = 000010       949#  959
SW04  = 000020       948#  958
SW05  = 000040       947#  957
SW06  = 000100       946#  956
SW07  = 000200       945#  955
SW08  = 000400       944#  954
SW09  = 001000       943#  953
```

```
SW1    = 000002            961#
SW10   = 002000            942#
SW11   = 004000            941#
SW12   = 010000            940#  7813
SW13   = 020000            939#
SW14   = 040000            938#
SW15   = 100000            937#
SW2    = 000004            960#
SW3    = 000010            959#
SW4    = 000020            958#
SW5    = 000040            957#
SW6    = 000100            956#
SW7    = 000200            955#
SW8    = 000400            954#
SW9    = 001000            953#  7281  7311  7325  7340  7366  7378  7390  7427  7632
S.CLR  = 000400           1175#  2528  2572
S.FMT  = 001000           1176#  2440  2485  2528  2572
S.PACK= 004000            1178#
S.RECL= 000040            1172#
S.RTC  = 000200           1174#  2485
S.SEEK= 000020            1171#  2440  2485
S.STSP= 000100            1173#
S.UNLD= 002000            1177#
TBITVE= 000014             995#
TKVEC  = 000060           1002#  8087*  8088*
TPVEC  = 000064           1003#
TRAPPC  003604            2244#  7424*  8500
TRAPVE= 000034            1001#  2292*  2293*
TRTVEC= 000014             996#
TSTBY1  055004            3747   3910   4073   4245   4545   8799#
TSTBY2  055014            3750   3913   4076   4248   4548   8801#
TST1    004704            2405   2421#  7586
TST10   007466            2790   2803   2815   2825   2830   2847#  7593
TST11   010612            3020#  7594
TST12   011300            3096   3112#  7595
TST13   012164            3220   3234#  7596
TST14   013052            3363#  7597
TST15   014256            3537#  7598
TST16   015134            3656#  7599
TST17   015572            3719   3737#  7600
TST2    005122            2446   2451   2466#  7587
TST20   016706            3751   3900#  7601
TST21   020022            3914   4063#  7602
TST22   021136            4077   4238#  7603
TST23   022374            4249   4413#  7604
TST24   023264            4538#  7605
TST25   024110            4549   4658#  7606
TST26   024642            4701   4735   4740   4768#  7607
TST27   025374            4811   4845   4850   4878#  7608
TST3    005340            2491   2496   2509#  7588
TST30   026126            4921   4955   4960   4988#  7609
TST31   026660            5031   5065   5070   5098#  7610
TST32   027412            5141   5175   5180   5207#  7611
TST33   030144            5250   5284   5289   5310#  7612
TST34   030444            5334   5339   5374#  7613
TST35   031212            5419   5453   5458   5481#  7614
```

```
TST36   031602          5536    5557#   7615
TST37   032426          5655    5677#   7616
TST4    005554          2534    2539    2553#   7589
TST40   033252          5775    5796#   7617
TST41   034076          5894    5915#   7618
TST42   034722          6013    6034#   7619
TST43   035546          6132    6153#   7620
TST44   036372          6251    6272#   7621
TST45   037216          6370    6398#   7622
TST46   040056          6500    6523#   7623
TST47   041102          6657    6669#   7624
TST5    005770          2578    2583    2601#   7590
TST50   042126          6803    6819#   7625
TST51   042766          6921    6937#   7626
TST52   043412          7014#   7627
TST53   044036          7091#   7628
TST6    006452          2620    2635    2648    2660    2570    2675    2690#   7591
TST7    007100          2709    2729    2741    2751    2756    2771#   7592
TYPDS = 104405          7186    7193    8487#
TYPE  = 104401          2330    2347    2350    2353    2360    2364    2372    2381    3747    3750    3910    3913    4073
                        4076    4245    4248    4545    4548    7180    7187    7194    7716    7724    7770    7771    7775
                        7776    7783    7794    7796    7806    7807    7809    7817    7831    7885    7981    8056    8104
                        8116    8170    8171    8174    8185    8195    8206    8225    8273    8279    8284    8288    8293
                        8294    8296    8299    8303    8369    8371    8443    8483#
TYPERR  047770          7723    7760#
TYPOC = 104402          2352    2363    2380    3749    3912    4075    4247    4547    7791    8173    8484#
TYPON = 104404          8486#
TYPOS = 104403          8485#
T.ASOF  003456          2193#
T.BA    003444          2188#   2863*   2873    2899*   2906    2924*   2931    2956*   2963    2988*   2994    3060*   3073
                        3150*   3166    3181*   3189    3265*   3279    3301*   3309    3394*   3408    3434*   3442    3477*
                        3485    3569*   3583    3603*   3611    3687*   3704    3785*   3800    3848*   3863    3948*   3963
                        4011*   4026    4111*   4126    4174*   4189    4283*   4298    4349*   4362    4375*   4389    4445*
                        4462    4481*   4489    4581*   4593    4606*   4614    8509    8514    8518    8534
T.CS1   003440          2186#   2436*   2442    2481*   2487    2524*   2530    2568*   2574    2614*   2616    2672*   2674
                        2703*   2705    2753*   2755    2784*   2786    2827*   2829    2862*   2868    2898*   2901    2923*
                        2926    2955*   2958    2987*   2991    3059*   3067    3084*   3087    3149*   3160    3179*   3183
                        3203*   3208    3264*   3273    3299*   3303    3324*   3334    3393*   3402    3432*   3436    3454*
                        3459    3475*   3479    3505*   3515    3568*   3577    3601*   3605    3625*   3635    3685*   3695
                        3711*   3715    3784*   3794    3847*   3857    3947*   3957    4010*   4020    4110*   4120    4173*
                        4183    4282*   4292    4308*   4312    4348*   4356    4373*   4383    4444*   4456    4479*   4483
                        4507*   4512    4580*   4587    4604*   4608    4625*   4628    4692*   4693    4713*   4717    4727*
                        4732    4802*   4803    4823*   4827    4837*   4842    4912*   4913    4933*   493?    4947*   4952
                        5022*   5023    5043*   5047    5057*   5062    5132*   5133    5153*   5157    5167*   5172    5241*
                        5242    5262*   5266    5276*   5281    5329*   5331    5344*   5348    5410*   5411    5431*   5435
                        5445*   5450    5652*   5654    5772*   5774    5891*   5893    6010*   6012    6129*   6131    6248*
                        6250    6367*   6369    6497*   6499    6654*   6656    6800*   6802    6918*   6920    6955*   6963
                        6975    6981*   6989    7032*   7040    7052    7058*   7066    7111*   7119    7131    7137*   7145
                        8501    8504    8509    8514    8518    8524    8528    8531    8536    8538    8540    8549    8553
T.CS2   003450          2190#   3065*   3070    3085*   3090    3157*   3163    3180*   3186    3204*   3211    3272*   3276
                        3300*   3306    3330*   3337    3401*   3405    3433*   3439    3458*   3462    3476*   3482    3511*
                        3518    3576*   3580    3602*   3608    3631*   3638    3686*   3692    3698    3712*   3718    3790*
                        3797    3855*   3860    3953*   3960    4018*   4023    4116*   4123    4181*   4186    4289*   4295
                        4309*   4315    4354*   4359    4374*   4386    4452*   4459    4480*   4486    4508*   4515    4586*
                        4590    4605*   4611    4626*   4631    4714*   4720    4728*   4737    4824*   4830    4838*   4847
                        4934*   4940    4948*   4957    5044*   5050    5058*   5067    5154*   5160    5168*   5177    5263*
```

```
                    5269    5277*   5286    5330*   5336    5345*   5351    5432*   5438    5446*   5455    6956*   6966
                    6976    6982*   6992    7033*   7043    7053    7059*   7069    7112*   7122    7132    7138*   7148
                    8518    8524    8528    8531    8536    8549    8553
T.DA      003446    2189#
T.DB      003462    2195#   3079*   3081    3198*   3200    3319*   3321    3449*   3451    3500*   3502    3620*   3622
                    3806*   3808    3875*   3877    3969*   3971    4038*   4040    4132*   4134    4201*   4203    4499*
                    4501    4620*   4622    4726*   4742    4836*   4852    4946*   4962    5056*   5072    5166*   5182
                    5275*   5291    5444*   5460    8522    8526
T.DCYL    003460    2194#
T.DS      003452    2191#   6957*   6969    6977    6983*   6995    7034*   7046    7054    7060*   7072    7113*   7125
                    7133    7139*   7151    8549    8553
T.ECPS    003472    2199#
T.ECPT    003474    2200#
T.ER      003454    2192#   3689*   3701    4285*   4304    4377*   4395    6958*   6972    6978    6984*   6998    7035*
                    7049    7055    7061*   7075    7114*   7128    7134    7140*   7154    8531    8549    8553
T.MR1     003464    2196#   2630*   2631    2643*   2644    2655*   2656    2665*   2666    2724*   2725    2736*   2737
                    2747*   2748    2798*   2799    2810*   2811    2821*   2822    2890*   2891    2947*   2948    2986*
                    3000    5527*   5528    5534*   5535    5642*   5644    5762*   5764    5881*   5883    6000*   6002
                    6119*   6121    6238*   6240    6357*   6359    6487*   6489    6643*   6645    6789*   6791    6908*
                    6910    7273*   7274    7303*   7304    7317*   7318    7332*   7333    7358*   7359    7370*   7371
                    7382*   7383    8506    8512    8514    8543    8547
T.MR2     003466    2197#   2437*   2447    2482*   2492    2525*   2535    2569*   2579    8501
T.MR3     003470    2198#   2438*   2450    2483*   2495    2526*   2538    2570*   2582    8501
T.SPAR    003476    2201#
T.WC      003442    2187#   2864*   2878    2900*   2911    2925*   2936    2957*   2968    2989*   2997    3061*   3076
                    3151*   3169    3182*   3192    3266*   3282    3302*   3312    3395*   3411    3435*   3445    3478*
                    3488    3570*   3586    3604*   3614    3688*   3707    3786*   3803    3849*   3866    3949*   3966
                    4012*   4029    4112*   4129    4175*   4192    4284*   4301    4350*   4365    4376*   4392    4446*
                    4465    4482*   4492    4582*   4596    4607*   4617    8509    8514    8521    8534
UFE     = 000400    1108#
UNLOAD= 000007      1072#
UNS     = 040000    1133#
UPE     = 020000    1113#   4290    4379
VV      = 000100    1144#
WAITIM    003632    2258#   6950    7027    7106
WCE     = 040000    1114#
WLE     = 004000    1130#
WRBUFF    067254    2854    2866    3025    3033*   3037    5488    7098    9820#   9821
WRDATA= 000023      1078#
WRDCNT    003624    2255#   3197*   3214*   3317*   3325    3340*   3425*   3491*   3506    3521*   3619*   3626    3641*
                    4498*   4518*   4695*   4696*   4723*   4729    4745*   4746    4805*   4806*   4833*   4839    4855*
                    4856    4915*   4916*   4943*   4949    4965*   4966    5025*   5026*   5053*   5059    5075*   5076
                    5135*   5136*   5163*   5169    5185*   5186    5244*   5245*   5272*   5278    5294*   5295    5413*
                    5414*   5441*   5447    5463*   5464    8526    8528    8538
WRHEAD= 000027      1080#   2474    2484    2561    2571    2856    2865    3026    3040    3117    3129    3237    3244
                    3366    3373    3540    3548    3665    3666    3765    3766    3827    3828    3928    3929    3990
                    3991    4091    4092    4153    4154    4263    4264    4329    4330    4378    4422    4423    4559
                    4560    5490    5564    5653    5684    5773    5803    5892    5922    6011    6041    6130    6160
                    6249    6279    6368    6406    6498    6531    6655    6677    6801    6827    6919    7099    7115
WRL     = 004000    1147#
WRTBIT    045206    5519    5595    5601    5618    5630    5715    5721    5738    5750    5834    5840    5857    5869
                    5953    5959    5976    5988    6072    6078    6095    6107    6191    6197    6214    6226    6310
                    6316    6333    6345    6438    6444    6460    6472    6563    6569    6585    6598    6603    6612
                    6619    6626    6709    6715    6731    6744    6749    6758    6765    6772    6859    6865    6881
                    6893    7271#
WRTCHK= 000031      1081#
```

```
WRTGAT= 040000C          1166#  2990   5504   5524   5532   5587   5707   5826   5945   6064   6183   6302   6430
                         6555   6701   6851   7286
WRTPAR  044706           4252   4552   7211#
WR.PAR= 000004           1042#  7212   7234
$APTHD  001000           1216   1222#
$ASTAT= ****** U         7672   7687
$ATYC   047346           7643   7645#
$ATY1   047322           7641#
$ATY3   047330           7642#  7870
$ATY4   047340           7644#  7729
$AUTOB  001134           1253#  2340*  8163   8320
$BASE   001270           1325#  2351   2359*  2400   2423   2468   2511   2555   2603   2692   2773   2849   3022
                         3114   3236   3365   3539   3658   3753   3916   4079   4251   4415   4551   4660   4770
                         4880   4990   5100   5209   5312   5376   5483   5559   5679   5798   5917   6036   6155
                         6274   6400   6525   6671   6821   6939   7016   7093   7828   8446
$BDADR  001122           1248#
$BDDAT  001126           1250#
$BELL   001204           1276#  7716   7749   8116   8313
$CDW1   001274           1327#
$CDW2   001276           1328#
$CHARC  050606           7887*  7897*  7904   7913*  7918#
$CKSWR  051562           8149#  8491
$CMTAG  001100           1236#  2281   2282   2290   2296   2297   2298
$CM3    = 000000         1266#
$CM4    = 000010         1266#  1267#  1268#  1269#  1270#  1271#  1272#  1273#  1274#
$CNTLC  052460           8104   8185   8313#
$CNTLG  052472           8170   8315#
$CNTLU  052465           8195   8288   8314#
$CORE   046536           7463   7490#
$CPUOP  001242           1299#
$CRLF   001211           1278#  7194   7724   7749   7770   7775   7783   7796   7809   7886   7921   8206   8293
                         8313   8374
$CROUT  046566           7490   7497#
$DBLK   051254           8022   8056   8064#
$DEVCT  001224           1290#
$DEVM   001272           1326#
$DOAGN  044676           7176   7197   7203#
$DTBL   051244           8025   8060#
$ENDAD  044666           1199   2328   7199#  7744
$ENDCT  044532           2296   7178#
$ENULL  044702           7206#
$ENV    001234           1295#  2334   7650   7674   7726   7865
$ENVM   001235           1296#  2319   7652   7867   7872
$EOP    044476           7168#  7823   7837
$EOPCT  044524           2296*  7175#  7179   7821*  7836*
$ERFLG  001103           1239#  7516   7555   7557   7563*  7585   7634   7711*  7749   7834*
$ERMAX  001115           1245#  2299*  7557   7580*  7585
$ERROR  047570           2290   7709#
$ERRPC  001116           1246#  7718*  7719*  7720   7749   8501   8504   8506   8509   8512   8514   8518   8522
                         8524   8526   8528   8531   8536   8538   8540   8543   8547   8549   8553
$ERRTB  001300           1345#  7767
$ERTTL  001112           1243#  7191   7195*  7717*  7749
$ESCAP  001202           1275#  2298*  2401*  7276*  7306*  7320*  7335*  7342*  7361*  7373*  7385*  7392*  7396*
                         7423*  7426*  7579*  7740   7742   7749   7835*
$ETABL  001234           1294#
$ETEND  001300           1228   1329#
```

```
$FATAL  001216          1287#  7678#
$FFLG   047566          7641#  7644#  7672  7681#  7689#
$FILLC  001156          1264#  7890   7921
$FILLS  001155          1263#  7921
$GDADR  001120          1247#
$GDDAT  001124          1249#
$GET42  044656          7196#
$GTSWR  051652          8171#  8489
$HD   = 000000           883
$HIBTS  001000          1223#
$HIOCT  052660          8362#  8373#
$ICNT   001104          1240#  7570#  7571  7573#  7584
$INTAG  001135          1254#  8168#  8187  8207  8320
$ITEMB  001114          1244#  7720#  7728  7749  7761
$KTNEX  046530          7464   7489#
$KTOUT  046520          7481   7486#
$KTI1   046366          3739   3902   4065  7462#  7466#  7489#
$LF     001212          1279#  7749   7921  8303   8313   8374
$LFLG   047565          7682#  7688#
$LPADR  001106          1241#  2300#  7552#  7561#  7577#  7582  7584  8447
$LPERR  001110          1242#  2301#  3028#  3118#  3758#  3817#  3921#  3980#  4084#  4143#  4253#  4319#  7398
                        7432   7561   7578#  7584   7636   7739
$LSTAD  046632          7502#  7509#
$LSTBK  046634          3741   3904   4067  7503#  7510#
$MADR1  001246          1312#
$MADR2  001252          1316#
$MADR3  001256          1319#
$MADR4  001262          1322#
$MAIL   001214          1224   1228   1285#  2318   2334   7576  7726  7865
$MAMS1  001244          1306#
$MAMS2  001250          1314#
$MAMS3  001254          1317#
$MAMS4  001260          1320#
$MBADR  001002          1224#
$MFLG   047564          7642#  7648   7683#  7687#
$MNEW   052510          8174   8318#
$MSGAD  001230          1292#  7658#  7661
$MSGLG  001232          1293#  7663#
$MSGTY  001214          1286#  7656   7664#  7676   7680#
$MSWR   052477          8171   8316#
$MTYP1  001245          1307#
$MTYP2  001251          1315#
$MTYP3  001255          1318#
$MTYP4  001261          1321#
$MXCNT  047146          7574   7584#
$NULL   001154          1262#  7892   7921
$NWTST= 000001          2409#  2411   2454#  2456   2499#  2501  2542#  2544  2589#  2591  2678#  2680  2759#
                        2761   2833#  2835   3007#  3009   3098#  3100  3223#  3225  3344#  3346  3525#  3527
                        3645#  3647   3722#  3724   3885#  3887  4048#  4050  4211#  4213  4402#  4404  4522#
                        4524   4639#  4641   4749#  4751   4859#  4861  4969#  4971  5079#  5081  5189#  5191
                        5298#  5300   5356#  5358   5469#  5471  5539#  5541  5658#  5660  5778#  5780  5897#
                        5899   6016#  6018   6135#  6137   6254#  6256  6373#  6375  6503#  6505  6660#  6662
                        6806#  6808   6926#  6928   7003#  7005  7080#  7082
$OCNT   051034          7953#  7982#  7995#
$OMODE  051036          7948#  7952#  7957  7960#  7971#  7997#
$OVER   047132          7528   7553   7562  7572   7581#
```

```
$PASS   001222          1289#  2318*  7172*  7173*  7184   7206   7568   7585
$PASTM  001006          1226#
$POWER  053104          8443   8450#
$PWRCT  053100          8434*  8435*  8436*  8438*  8449#
$PWRON  052756          2294   8425#  8440
$PWRUP  053004          8426   8434#
$QUES   001210          1277#  7749   7921   8225   8296   8313   8371   8374
$RDCHR  052124          8238#  8492
$RDDEC= ****** U        8495
$RDLIN  052214          8261#  8493
$RDOCT  052522          8335#  8494
$RDSZ = 000010          8254#
$RESRE  052720          8407#  8496
$RTNAD  044700          7205#
$R2A  = ****** U        8497
$SAVRE  052662          8391#  8495
$SCOPE  046636          2288   7525#
$SETUP= 000137          2265#  2287   2288   2290   2292   2294   2296   2297   2298   2300   2328   2331   7170
                        7526   7710   7736   7744   8108   8113   8114   8144   8320
$SIZE   046330          2399   7450#
$SIZEX  046572          7488   7498#
$STUP = 177777          2265#
$SVLAD  047076          7536   7575#
$SVPC = 000220          1197#  1202
$SWR  = 167400           871#   883    887    888    889    890    891    892    893    894   1274   1275   1276
                        2297   2298   2300   2301   2422   2467   2510   2554   2602   2691   2772   2848   3021
                        3113   3235   3364   3538   3657   3738   3901   4064   4239   4414   4539   4659   4769
                        4879   4989   5099   5208   5311   5375   5482   5558   5678   5797   5916   6035   6154
                        6273   6399   6524   6670   6820   6938   7015   7092   7165   7171   7198   7204   7206
                        7517   7518   7519   7520   7521   7527   7539   7541   7542   7555   7556   7557   7564
                        7565   7566   7578   7581   7584   7701   7702   7703   7704   7705   7714   7721   7733
                        7737   7749
$SWREG  001236          1297#  2321
$SWRMK= 000000           894    895   7521   7522   7545
$SWOST  047150          7551   7585#
$TESTN  001220          1288#  3748   3911   4074   4246   4546   7576*  8500   8501   8504   8506   8509   8512
                        8514   8518   8522   8524   8526   8528   8531   8536   8538   8540   8543   8547   8549
                        8553
$TIMES  001200          1274#  2297*  2422*  2467*  2510*  2554*  2602*  2691*  2772*  2848*  3021*  3113*  3235*
                        3364*  3538*  3657*  3738*  3744*  3901*  3907*  4064*  4070*  4239*  4293*  4414*  4539*
                        4542*  4659*  4769*  4879*  4989*  5099*  5208*  5311*  5375*  5482*  5558*  5678*  5797*
                        5916*  6035*  6154*  6273*  6399*  6524*  6670*  6820*  6938*  7015*  7092*  7171*  7564*
                        7571   7574*  7584
$TKB    001146          1259#  8068   8089   8100   8125   8153   8180
$TKCNT  051264          8069#  8084*  8114   8131*  8245   8247*
$TKINT  051274          2274   8084#  8105   8166
$TKQEN= 051273          8073#  8139   8250
$TKQIN  051266          8070#  8085*  8086   8137*  8138*  8139   8141*
$TKQOU  051270          8071#  8086*  8248   8249*  8250   8252*
$TKQSR  051272          8072#  8085   8141   8252
$TKS    001144          1258#  8068   8090*  8121*  8123   8129*  8151   8167*  8177   8189*  8209*
$TKSRV  051344          8087   8100#
$TMP0   001160          1266#  2355*  2357   2359   2366*  2368   2371   2383*  2385   2387   2389*  2390*  2391*
                        2392*  2393*  2395   3115*  3126   3195   3218*
$TMP1   001162          1267#
$TMP2   001164          1268#
```

```
$TMP3   001166          1269#
$TMP4   001170          1270#
$TMP5   001172          1271#
$TMP6   001174          1272#
$TMP7   001176          1273#
$TN   = 000054           872#   883   2409  2422#  2446  2451  2454  2467#  2491  2496  2499  2510#  2534
                        2539  2542  2554#  2578  2583  2589  2602#  2620  2635  2648  2660  2670  2675
                        2678  2691#  2709  2729  2741  2751  2756  2759  2772#  2790  2803  2815  2825
                        2830  2833  2848#  3007  3021#  3096  3098  3113#  3220  3223  3235#  3344  3364#
                        3525  3538#  3645  3657#  3719  3722  3738#  3743  3885  3901#  3906  4048  4064#
                        4069  4211  4239#  4242  4402  4414#  4522  4535#  4542  4639  4659#  4701  4735
                        4740  4749  4769#  4811  4845  4850  4859  4879#  4921  4955  4960  4969  4989#
                        5031  5065  5070  5079  5099#  5141  5175  5180  5189  5208#  5250  5284  5289
                        5298  5311#  5334  5339  5356  5375#  5419  5453  5458  5469  5482#  5536  5539
                        5558#  5655  5658  5678#  5[illegible]  5778  5797#  5894  5897  5916#  6013  6016  6035#
                        6132  6135  6154#  6251  6254  6273#  6370  6373  6399#  6500  6503  6524#  6657
                        6660  6670#  6803  6806  6820#  6921  6926  6938#  7003  7015#  7080  7092#  7546
                        7586
$TPB    001152          1261#  7910*  7921
$TPFLG  001157          1265#  7859   7921
$TPS    001150          1260#  7908   7921
$TRAP   053112          2292   8460#
$TRAP2  053134          8471#  8482
$TRP  = 000016          8475#  8484#  8485#  8486#  8487#  8488#  8489   8490#  84    8492#  8493#  8494#  8495#
                        8496#  8497#  8498#
$TRPAD  053146          8465   8482#
$TSTM   001004          1225#
$TSTNM  001102          1238#  7170*  7516  7548*  7575*  7576  7581  7585  7713  7749
$TTYIN  052450          8263   8264   8276  8294   8308   8312#
$TYPBN= ****** U        8488
$TYPDS  051040          8010#  8487
$TYPE   050330          7669   7859#  8475  8483
$TYPEC  050542          7889   7896   7903  7908#  7909   8211
$TYPEX  050610          7914   7916   7919#
$TYPOC  050636          7951#  8484
$TYPON  050652          7950   7953#  8486
$TYPOS  050612          7946#  8485
$UNIT   001226          1291#
$UNITM  001010          1227#
$USWR   001240          1298#
$VECT1  001264          1323#  2361   2370*  2371*  2374   2394*  2395*  2396  2398
$VECT2  001266          1324#
$XTSTR  046650          7530#
$$GET4= 000000          7198#
$$SW08= 000054          7585#  7586  7587#  7588#  7589#  7590#  7591#  7592#  7593#  7594#  7595#  7596#  7597#
                        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#
$OFILU  051035          7947*  7951*  7961  7996#
$40CA[illegible]= ****** U  7527   7723
.     = 067460          1181#  1185#  1191#  1197  1198#  1200#  1202#  1203#  1206#  1212  1213#  1215#  1217#
                        1235#  1280  2285  2300  2301  7183#  7206  7207#  7584  7585  7690#  7749  7921
                        8064#  8068  8072#  8073  8074#  8312#  8313  8320#  8374  8429  9820#
.$ASTA= ****** U        7642   7645
.$X   = 001000          1212#  1217
```

```
BYPASS  1229#  3743  3906  4069  4242  4542
CLRMSG  1229#  2511  2555
CLRPSW  1229#
COMMEN  1005#
ENDCOM  1005#
ERROR    899#  2444  2449  2452  2489  2494  2497  2532  2537  2540  2576  2581  2584  2618  2633
        2646  2658  2668  2676  2707  2727  2739  2757  2788  2801  2813  2831  2870  2875  2880
        2893  2903  2908  2913  2928  2933  2938  2950  2960  2965  2970  2993  2996  2999  3002
        3069  3072  3075  3078  3083  3089  3092  3162  3165  3168  3171  3185  3188  3191  3194
        3202  3210  3213  3275  3278  3281  3284  3305  3308  3311  3314  3323  3336  3339  3404
        3407  3410  3413  3438  3441  3444  3447  3453  3461  3464  3481  3484  3487  3490  3504
        3517  3520  3579  3582  3585  3588  3607  3610  3613  3616  3624  3637  3640  3697  3700
        3703  3706  3709  3717  3720  3796  3799  3802  3805  3810  3859  3862  3865  3868  3879
        3959  3962  3965  3968  3973  4022  4025  4028  4031  4042  4122  4125  4128  4131  4136
        4185  4188  4191  4194  4205  4294  4297  4300  4303  4306  4314  4317  4358  4361  4364
        4367  4385  4388  4391  4394  4397  4458  4461  4464  4467  4485  4488  4491  4494  4503
        4514  4517  4589  4592  4595  4598  4610  4613  4616  4619  4624  4630  4633  4699  4719
        4722  4734  4739  4744  4809  4829  4832  4844  4849  4854  4919  4939  4942  4954  4959
        4964  5029  5049  5052  5064  5069  5074  5139  5159  5162  5174  5179  5184  5248  5268
        5271  5283  5288  5293  5333  5338  5350  5353  5417  5437  5440  5452  5457  5462  5520
        5530  5537  5596  5602  5619  5631  5646  5656  5716  5722  5739  5751  5766  5776  5835
        5841  5858  5870  5885  5895  5954  5960  5977  5989  6004  6014  6073  6079  6096  6108
        6123  6133  6192  6198  6215  6227  6242  6252  6311  6317  6334  6346  6361  6371  6439
        6445  6461  6473  6491  6501  6564  6570  6586  6595  6604  6613  6620  6627  6648  6658
        6710  6716  6732  6745  6750  6759  6766  6773  6794  6804  6860  6866  6882  6894  6912
        6922  6965  6968  6971  6974  6991  6994  6997  7000  7042  7045  7048  7051  7068  7071
        7074  7077  7121  7124  7127  7130  7147  7150  7153  7156  7425
ESCAPE  1005#
FORERR  1229#  6939  7016  7093
GETPRI  1005#  7458
GETSWR  1005#  2331#
LDLPER  1229#  3028  3118  3758  3817  3921  3980  4084  4143  4253  4319
MSG     2409#  2411  2454#  2456  2499#  2501  2542#  2544  2589#  2591  2678#  2680  2759#  2761  2833#
        2835  3007#  3009  3098#  3100  3223#  3225  3344#  3346  3525#  3527  3645#  3647  3722#  3724
        3885#  3887  4048#  4050  4211#  4213  4402#  4404  4522#  4524  4639#  4641  4749#  4751  4859#
        4861  4969#  4971  5079#  5081  5189#  5191  5298#  5300  5356#  5358  5469#  5471  5539#  5541
        5658#  5660  5778#  5780  5897#  5899  6016#  6018  6135#  6137  6254#  6256  6373#  6375  6503#
        6505  6660#  6662  6806#  6808  6926#  6928  7003#  7005  7080#  7082
MULT    1005#
NEWTST  1005#  2409  2454  2499  2542  2589  2678  2759  2833  3007  3098  3223  3344  3525  3645
        3722  3885  4048  4211  4402  4522  4639  4749  4859  4969  5079  5189  5298  5356  5469
        5539  5658  5778  5897  6016  6135  6254  6373  6503  6660  6806  6926  7003  7080
POP     1005#  7684  7685  8051  8363  8412
PUSH    1005#  7645  7647  7668  8010  8337  8392
RDLOOP  1229#  4660  4770  4880  4990  5100  5376
REPORT  1005#
SCOPE    900#  2421  2466  2509  2553  2601  2690  2771  2847  3020  3112  3234  3363  3537  3656
        3737  3900  4063  4238  4413  4538  4658  4768  4878  4988  5098  5207  5310  5374  5481
        5557  5677  5796  5915  6034  6153  6272  6398  6523  6669  6819  6937  7014  7091  7169
SEKMSG  1229#  2423  2468
SETPRI  1005#  8241
SETTRA  8475#  8484  8485  8486  8487  8489  8491  8492  8493  8494  8495  8496  8497
SETUP   1005#  2279
SKIP    1005#  2446  2451  2491  2496  2534  2539  2578  2583  2620  2635  2648  2660  2670  2675
        2709  2729  2741  2751  2756  2790  2803  2815  2825  2830  3096  3220  3719  4701  4735
        4740  4811  4845  4850  4921  4955  4960  5031  5065  5070  5141  5175  5180  5250  5284
```

```
            5289    5334    5339    5419    5453    5458    5536    5655    5775    5894    6013    6132    6251    6370    6500
            6657    6803    6921
SLASH       1005#
SPACE       1005#
SPREAD      1229#   2692    2773
STARS       1005#   1195    1209    1211    1218    1231    1280    1283    2409    2420    2454    2465    2499    2508    2542
            2552    2589    2600    2678    2689    2759    2770    2833    2846    3007    3019    3098    3111    3223    3233
            3344    3362    3525    3536    3645    3655    3722    3736    3885    3899    4048    4062    4211    4237    4402
            4412    4522    4537    4639    4657    4749    4767    4859    4877    4969    4987    5079    5097    5189    5206
            5298    5309    5356    5373    5469    5480    5539    5556    5658    5676    5778    5795    5897    5914    6016
            6033    6135    6152    6254    6271    6373    6397    6503    6522    6620    6668    6806    6818    6926    6936
            7003    7013    7080    7090    7161    7436    7513    7629    7640    7697    7750    7759    7844    7923    8000
            8067    8144    8159    8230    8254    8323    8376    8422    8431    8454
SWRSU       1005#   2302#
TRMTRP      8475#
TSTMEM      1229#   3739    3902    4065
TYPBIN      1005#
TYPDEC      1005#   7184    7191
TYPNAM      1005#   2324
TYPNUM      1005#
TYPOCS      1005#
TYPOCT      1005#   2351    3748    3911    4074    4246    4546    8172
TYPTXT      1005#   7180    7187
WRLOOP      1229#   5559    5679    5798    5917    6036    6155    6274
WRTRK       1229#   6525    6671
WRTRK1      1229#   6400    6821
SSCMRE      1229#
SSCMTM      1229#   1266    1267    1268    1269    1270    1271    1272    1273
SSESCA      1005#
SSNEWT      1005#   2409    2454    2499    2542    2589    2678    2759    2833    3007    3098    3223    3344    3525    3645
            3722    3885    4048    4211    4402    4522    4639    4749    4859    4969    5079    5189    5298    5356    5469
            5539    5658    5778    5897    6016    6135    6254    6373    6503    6660    6806    6926    7003    7080
SSSET       8475#   8484    8485    8486    8487    8489    8491    8492    8493    8494    8495    8496    8497
SSSETM      2318#
SSSKIP      1005#   2446    2451    2491    2496    2534    2539    2578    2583    2620    2635    2648    2660    2670    2675
            2709    2729    2741    2751    2756    2790    2803    2815    2825    2830    3096    3220    3719    4701    4735
            4740    4811    4845    4850    4921    4955    4960    5031    5055    5070    5141    5175    5180    5250    5284
            5289    5334    5339    5419    5453    5458    5536    5655    5775    5894    6013    6132    6251    6370    6500
            6657    6803    6921
.EQUAT       871#    895
.HEADE       871#    873
.KT11        871#   1005
.SETUP       871#   2265
.SWRHI       871#    883
.SWRLO       871#    895#
.SACT1       871#   1193
.SAPTB      1281#
.SAPTH       871#   1207
.SAPTY       871#   7638
.SCATC       871#   1179
.SCMTA       871#   1229
.SEOP        871#   7159
.SERRO       871#   7695
.SERRT       871#
.SPOWE       871#
.SRDOC       871#   8321
```

```
.$READ    871#   8065
.$SAVE    871#   8374
.$SCOP    871#   7511
.$SIZE    871#   7434
.$TRAP    871#   8452
.$TYPO    871#   7998
.$TYPE    871#   7842
.$TYPO    871#   7921


. ABS.  067460     000


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 DSKZ:DZR6CB.BIN,DSKZ:DZR6CB.SEQ/CRF/SOL/DOC=DZR6CB
 RUN-TIME: 29 28 3 SECONDS
 RUN-TIME RATIO: 211/61=3.4
 CORE USED:  35K  (70 PAGES)

 DOCUMENT PAGES:  207


EOF1DZR6CBSEQ              00010000      770323            PDP10 411
```