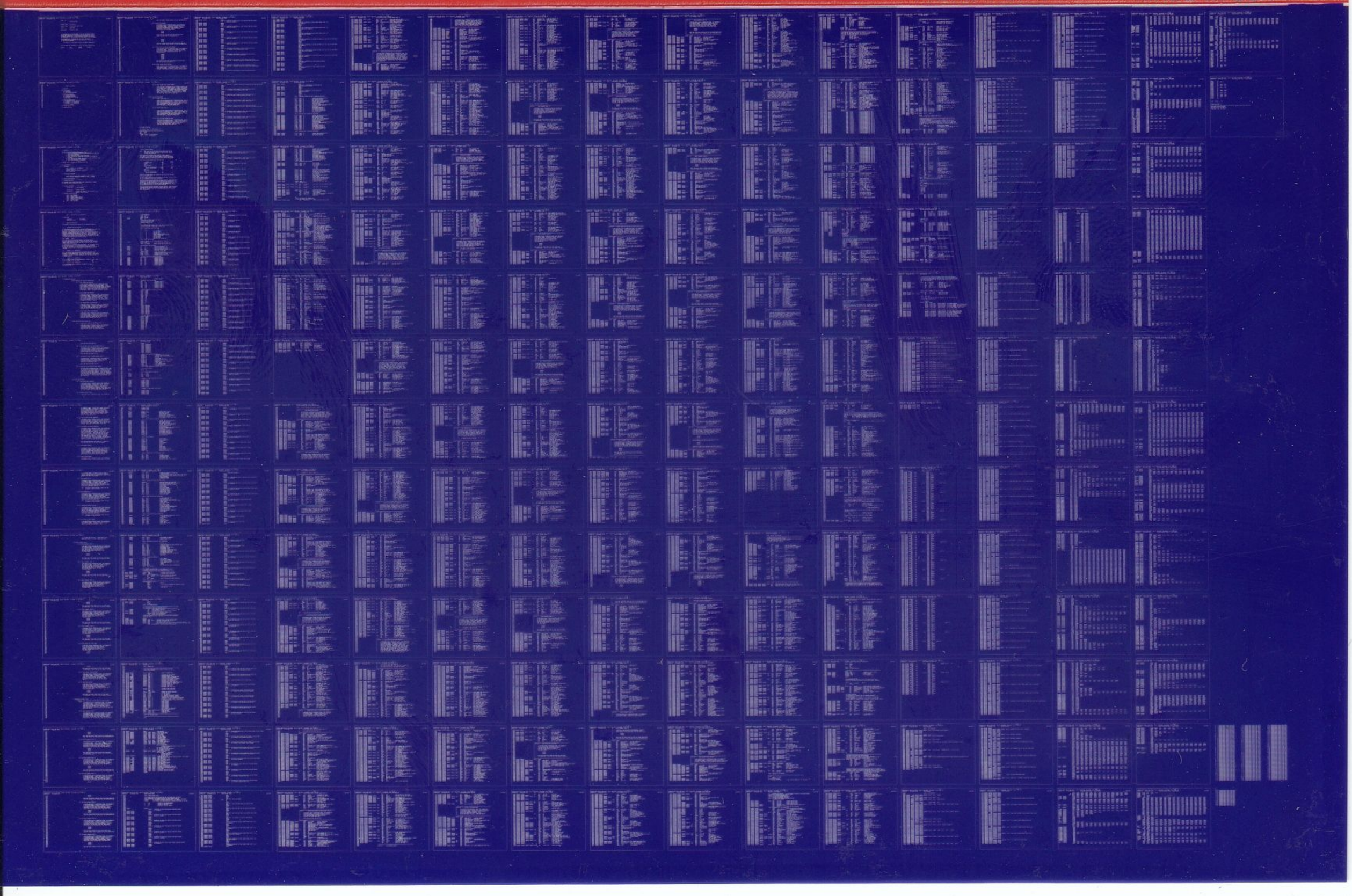
RK611,RK06,RK07

RK611 DSKLS PRT3
CZR6CD0

AH-9106D-MC

FICHE 1 OF 1

NOV 1980
digital
MADE IN USA



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                                IDENTIFICATION


                        PRODUCT CODE:   AC-9104D-MC

                        PRODUCT NAME:   CZR6CDO RK611 DSKLS PRT3

                        DATE:           JUNE 1980

                        MAINTAINER:     DIAGNOSTIC GROUP



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                        1.0 ABSTRACT

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

                        NO RK06 DRIVE IS REQUIRED FOR PROGRAM EXECUTION.


                        2.0 REQUIREMENTS

                        2.1 EQUIPMENT

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


                        2.2 PRELIMINARY PROGRAMS

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

                        3.0 OPERATING PROCEDURES

                        3.1 LOADING PROCEDURE

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


                        3.2 STARTING PROCEDURE

                                LOCATION 200    - START PROGRAM

                                LOCATION 204    - RESTART PROGRAM

                                LOCATION 214    - REQUEST BUS ADDRESS, VECTOR ADDRESS, AND
                                                  PRIORITY MODIFICATION
                        3.3 OPTIONAL SWITCH SETTINGS

                                SW15 -  HALT PROGRAM
                                SW14 -  LOOP ON TEST
                                SW13 -  INHIBIT ERROR TYPE OUT
                                SW12 -  ABORT AFTER 20 ERRORS
                                SW11 -  INHIBIT ITERATION COUNT
                                SW10 -  BELL ON ERROR
                                SW9  -  LOOP ON ERROR
```

SW8 - LOOP ON TEST IN SWITCHES 0-7

3.5 RUN TIME

FIRST PASS	30 SECONDS
SUBSEQUENT 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.

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


                TEST 13 SILO FILLING WITH NPR TRANSFERS

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


                TEST 14 SILO CAPICITY WITH NPR TRANSFERS

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


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


                TEST 15 BUS ADDRESS INHIBIT


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


                TEST 16 NON-EXISTENT MEMORY

                        CLEAR RK611 WITH A CONTROLLER CLEAR,  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
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                        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 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
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                                        ALL 66 WORD INTO THE SILO.  CHECK THAT ALL 66
                                        WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).



                                **MFM READ LOOPBACK TESTS

                                    TEST 23 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 24 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 25 READ LOOPBACK (PART 3)

                                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        IN DIAGNOSTIC MOVE.  ISSUE A READ HEADER TO AN RK06
                                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
                                        SIMULATE SECTOR PULSE, 255 ZEROES, A
                                        ONE, AND A HEADER CONSISTING OF THE THREE
                                        FOLLOWING WORDS:
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                                                        125252
                                                        052525
                                                        125252

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


                        TEST 26 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 27 READ LOOPBACK (PART 5)

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

                                        052012
                                        100520
                                        052012

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


                        TEST 30 READ HEADER IN 18 BIT MODE

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

                                        177777
                                        000000
```

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                                        177777

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


        TEST 31 SYNCH DETECT IN READ HEADER

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


        TEST 32 ZERO SYNCH ON READ

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

                        177777
                        000000
                        177777

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


**MFM WRITE LOOPBACK TESTS

        TEST 33 WRITE ZEROS UNTIL SECTOR PULSE WITH 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.
                CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
                INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
                ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
                WRITE GATE RESETS.


        TEST 34 WRITE LOOPBACK (PART 1)

                CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
                IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
                CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
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                                                177777
                                                000000
                                                177777

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


                                TEST 35 WRITE LOOPBACK (PART 2)

                                        CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER

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

                                                000000
                                                177777
                                                000000

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


                                TEST 36 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 37 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
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                                                        022222
                                                        111111

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


                        TEST 40 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 41 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 42 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 43 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 44 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 45 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 46 WRITE HEADER IN 24 SECTOR FORMAT

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


                                **TYPE B INSTRUCTION ERRORS

                                        TEST 47 FORMAT ERROR (PART 1)

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


                                        TEST 50 FORMAT ERROR (PART 2)


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


                                        TEST 51 FAULT SETTING CONTROLLER ERROR

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


                        6.0 ERROR REPORTING

                        THE GENERAL FORMAT OF ERROR REPORTS IS:

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

```
                        ZZZZZZ  WWWWWW  AAAAAA

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

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

THESE FIELDS (ALL VALUES GIVEN IN OCTAL) ARE:

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

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

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

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

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

```
                        ; *** REV 003 ***
                        .NLIST  CND,MD,MC
                        .LIST   ME
                        .ENABL  ABS,AMA
167400                  $SWR=   167400
000001                  $TN=    1
                        .TITLE  CZR6CD0 RK611 DSKLS CTRL PRT3
                        ;*COPYRIGHT (C) 1976,1980
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                        ;*
                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH                  USE
                        ;*      ------          --------------------
                        ;*        15            HALT ON ERROR
                        ;*        14            LOOP ON TEST
                        ;*        13            INHIBIT ERROR TYPEOUTS
                        ;*        12            ABORT PROGRAM AFTER 20 ERRORS
                        ;*        11            INHIBIT ITERATIONS
                        ;*        10            BELL ON ERROR
                        ;*         9            LOOP ON ERROR
                        ;*         8            LOOP ON TEST IN SWR<7:0>
                        .SBTTL  BASIC DEFINITIONS

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

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

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

```
                                ;*PRIORITY LEVEL DEFINITIONS
000000                          PR0=    0               ;;PRIORITY LEVEL 0
000040                          PR1=    40              ;;PRIORITY LEVEL 1
000100                          PR2=    100             ;;PRIORITY LEVEL 2
000140                          PR3=    140             ;;PRIORITY LEVEL 3
000200                          PR4=    200             ;;PRIORITY LEVEL 4
000240                          PR5=    240             ;;PRIORITY LEVEL 5
000300                          PR6=    300             ;;PRIORITY LEVEL 6
000340                          PR7=    340             ;;PRIORITY LEVEL 7

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

                                ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                          BIT15=  100000
040000                          BIT14=  40000
020000                          BIT13=  20000
010000                          BIT12=  10000
004000                          BIT11=  4000
002000                          BIT10=  2000
001000                          BIT09=  1000
000400                          BIT08=  400
000200                          BIT07=  200
000100                          BIT06=  100
000040                          BIT05=  40
000020                          BIT04=  20
000010                          BIT03=  10
000004                          BIT02=  4
000002                          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 IL.EGAL 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
```

```
  998          172352                  KIPAR5= 172352
  999          172354                  KIPAR6= 172354
 1000          172356                  KIPAR7= 172356
 1001
 1002          000114                  MEMVEC= 114                     ;MEMORY PARITY VECTOR
 1003          172100                  MEMBAS= 172100                  ;MEM PARITY OPTION
 1004          000004                  WR.PAR= 4                       ;WRITE BAD PARITY
 1005          000001                  PAR.EN= 1                       ;ENABLE PARITY ENABLE
 1006          120210                  AVECT1= 120210                  ;DEFINE RK611 VECTOR ADDRESS
 1007          000005                  APRIOR= 5                       ;DEFINE RK611 PRIORITY
 1008          177440                  ABASE=  177440                  ;DEFINE BASE OF RK611 REGISTERS
 1009
 1010                                  .SBTTL  RK611 CONTROLLER REGISTER DEFINITION
 1011
 1012          000000                  RKCS1=  0                       ;CONTROL AND STATUS REGISTER 1
 1013          000002                  RKWC=   2                       ;WORD COUNT REGISTER
 1014          000004                  RKBA=   4                       ;BUS ADDRESS REGISTER
 1015          000006                  RKDA=   6                       ;DESIRED TRACK SECTOR REGISTER
 1016          000010                  RKCS2=  10                      ;CONTROL AND STATUS REGISTER 2
 1017          000012                  RKDS=   12                      ;DRIVE STATUS REGISTER
 1018          000014                  RKER=   14                      ;ERROR REGISTER
 1019          000016                  RKASOF= 16                      ;ATTENTION SUMMARY AND OFFSET REGISTER
 1020          000020                  RKDCYL= 20                      ;DESIRED CYLINDER REGISTER
 1021          000024                  RKDB=   24                      ;DATA BUFFER
 1022          000026                  RKMR1=  26                      ;MAINTENANCE REGISTER 1
 1023          000034                  RKMR2=  34                      ;MAINTENANCE REGISTER 2
 1024          000036                  RKMR3=  36                      ;MAINTENANCE REGISTER 3
 1025          000030                  RKECPS= 30                      ;ECC POSITION INFORMATION
 1026          000032                  RKECPT= 32                      ;ECC PATTERN INFORMATION
 1027          000022                  RKSPAR= 22                      ;SPARE REGISTER
 1028
 1029                                  .SBTTL  DRIVE COMMANDS
 1030
 1031          000001                  SELDRV= 01                      ;SELECT DRIVE
 1032          000003                  PACK=   03                      ;PACK ACKNOWLEDGE
 1033          000005                  CLEAR=  05                      ;DRIVE CLEAR
 1034          000007                  UNLOAD= 07                      ;UNLOAD
 1035          000011                  SRTSPL= 11                      ;START SPINDLE
 1036          000013                  RECAL=  13                      ;RECALIBRATE
 1037          000015                  OFFSET= 15                      ;OFFSET
 1038          000017                  SEEK=   17                      ;SEEK
 1039          000021                  RDDATA= 21                      ;READ DATA
 1040          000023                  WRDATA= 23                      ;WRITE DATA
 1041          000025                  RDHEAD= 25                      ;READ HEADER
 1042          000027                  WRHEAD= 27                      ;WRITE HEADER AND DATA
 1043          000031                  WRTCHK= 31                      ;WRITE CHECK
 1044          000300                  INTR=   300                     ;GENERATE INTERRUPT TO CPU
 1045
 1046                                  .SBTTL  CONTROL AND STATUS REGISTER 1 BITS
 1047
 1048          000001                  GO=     BIT0                    ;GO BIT
 1049          000100                  IE=     BIT6                    ;INTERRUPT ENABLE
 1050          000200                  RDY=    BIT7                    ;CONTROLLER READY
 1051          000400                  BA16=   BIT8                    ;BUS ADDRESS BIT 16
 1052          001000                  BA17=   BIT9                    ;BUS ADDRESS BIT 17
 1053          002000                  CDT=    BIT10                   ;CONTROLLER DRIVE TYPE (0=RK06)
```

```
                                ;
                                ;  CONTROL AND STATUS REGISTER 1 BITS
                                ;

004000                  CTO=    BIT11                   ;CONTROLLER TIMED OUT WAITING FOR
                                                        ;  DRIVE RESPONSE
010000                  CFMT=   BIT12                   ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
020000                  SPAR=   BIT13                   ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
040000                  DI=     BIT14                   ;DRIVE INTERRUPT
100000                  CERR=   BIT15                   ;CONTROLLER ERROR
100000                  CCLR=   BIT15                   ;CONTROLLER CLEAR

                        .SBTTL  CONTROL AND STATUS REGISTER 2 BITS

000007                  DRVMSK= 7                       ;MASK FOR DRIVE SELECTION CODE
000010                  F'.S=   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)
004000                  WRL=    BIT11                   ;WRITE LOCK
```

```
1110            020000                  PIP=    BIT13                   ;POSITIONING IN PROGRESS
1111            040000                  DSC=    BIT14                   ;DRIVE STATUS CHANGE
1112            100000                  SVAL=   BIT15                   ;STATUS VALID
1113
1114                                    .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION
1115
1116            000017                  MESMSK= 17                      ;MESSAGE MASK
1117
1118            000020                  PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
1119            000040                  DMD=    BIT5                    ;DIAGNOSTIC MODE
1120            000100                  MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
1121            000200                  MIND=   BIT7                    ;MAINTENANCE INDEX
1122            000400                  MCLK=   BIT8                    ;MAINTENANCE CLOCK
1123            001000                  MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
1124            002000                  MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
1125            004000                  PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
1126            010000                  PCD=    BIT12                   ;PRECOMPENSATION DELAY
1127            020000                  ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
1128            040000                  WRTGAT= BIT14                   ;WRITE GATE
1129            100000                  RDGATE= BIT15                   ;READ GATE
1130
1131                                    .SBTTL  TRANSMITTED MESSAGE A
1132
1133            000020                  S.SEEK= BIT4                    ;SEEK COMMAND
1134            000040                  S.RECL= BIT5                    ;RECALIBRATE COMMAND
1135            000100                  S.STSP= BIT6                    ;START SPINDLE COMMAND
1136            000200                  S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
1137            000400                  S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
1138            001000                  S.FMT=  BIT9                    ;FORMAT
1139            002000                  S.UNLD= BIT10                   ;UNLOAD
1140            004000                  S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
1141                                    .SBTTL  TRAP CATCHER
1142
1143            000000                          .=0
1144                                    ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1145                                    ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1146                                    ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
1147            000174                          .=174
1148  000174    000000                DISPREG:  .WORD   0               ;;SOFTWARE DISPLAY REGISTER
1149  000176    000000                SWREG:    .WORD   0               ;;SOFTWARE SWITCH REGISTER
1150                                    .SBTTL  STARTING ADDRESS(ES)
1151  000200    000137  003662                JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
1152  000204    000137  003652                JMP     RESTRT          ;JUMP TO RESTART ROUTINE
1153            000214                        .=214
1154  000214    000137  003642                JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
1155                                    .SBTTL  ACT11 HOOKS
1156
1157                                    ;;**************************************************************
1158                                    ;HOOKS REQUIRED BY ACT11
1159            000220                        $SVPC=.                 ;SAVE PC
1160            000046                        .=46
1161  000046    042550                        $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1162            000052                        .=52
1163  000052    000000                        .WORD   0               ;;2)SET LOC.52 TO ZERO
1164            000220                        .=$SVPC                 ;; RESTORE PC
1165            000114                        .=MEMVEC
```

```
                                        MEMERR
                                        PR7
                                        .=1000
                                .SBTTL  APT PARAMETER BLOCK


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

                                $APTHD:
                                $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
                                $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
                                $TSTM:  .WORD           ;;RUN TIM OF LONGEST TEST
                                $PASTM: .WORD           ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
                                $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
                                        .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 FRRORS 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
```

```
 1247  001214                        $MAIL:                          ;;APT MAILBOX
 1248  001214  000000                $MSGTY: .WORD   AMSGTY  ;;MESSAGE TYPE CODE
 1249  001216  000000                $FATAL: .WORD   AFATAL  ;;FATAL ERROR NUMBER
 1250  001220  000000                $TESTN: .WORD   ATESTN  ;;TEST NUMBER
 1251  001222  000000                $PASS:  .WORD   APASS   ;;PASS COUNT
 1252  001224  000000                $DEVCT: .WORD   ADEVCT  ;;DEVICE COUNT
 1253  001226  000000                $UNIT:  .WORD   AUNIT   ;;I/O UNIT NUMBER
 1254  001230  000000                $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
 1255  001232  000000                $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
 1256  001234                        $ETABLE:                        ;;APT ENVIRONMENT TABLE
 1257  001234     000                $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
 1258  001235     000                $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
 1259  001236  000000                $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
 1260  001240  000000                $USWR:  .WORD   AUSWR   ;;USER SWITCHES
 1261  001242  000000                $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
 1262                                :*                      BITS 15-11=CPU TYPE
 1263                                :*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
 1264                                :*                              11/70=06,PDQ=07,Q=10
 1265                                :*                      BIT 10=REAL TIME CLOCK
 1266                                :*                      BIT  9=FLOATING POINT PROCESSOR
 1267                                :*                      BIT  8=MEMORY MANAGEMENT
 1268  001244     000                $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
 1269  001245     000                $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
 1270                                :*                      MEM.TYPE BYTE   --  (HIGH BYTE)
 1271                                :*                              900 NSEC CORE=001
 1272                                :*                              300 NSEC BIPOLAR=002
 1273                                :*                              500 NSEC MOS=003
 1274  001246  000000                $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
 1275                                :*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
 1276  001250     000                $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
 1277  001251     000                $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
 1278  001252  000000                $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
 1279  001254     000                $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
 1280  001255     000                $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
 1281  001256  000000                $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
 1282  001260     000                $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
 1283  001261     000                $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
 1284  001262  000000                $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
 1285  001264  120210                $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
 1286  001266  000000                $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
 1287  001270  177440                $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
 1288  001272  000000                $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
 1289  001274  000000                $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
 1290  001276  000000                $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
 1291  001300                        $ETEND:
 1292                                .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  055321                          EM200
001302  061500                          EM3000
001304  050560                          DT001
001306  051222                          DF001
                                ;       ERROR 2:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE A INCORRECT.
001310  055321                          EM200
001312  061543                          EM3001
001314  050560                          DT001
001316  051222                          DF001
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE B INCORRECT.
001320  055321                          EM200
001322  061567                          EM3002
001324  050560                          DT001
001326  051222                          DF001
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 CS1 INCORRECT.
001330  055403                          EM201
001332  061500                          EM3000
001334  050560                          DT001
001336  051222                          DF001
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE A INCORRECT.
001340  055403                          EM201
001342  061543                          EM3001
001344  050560                          DT001
001346  051222                          DF001
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE IS INCORRECT.
001350  055403                          EM201
001352  061567                          EM3002
001354  050560                          DT001
001356  051222                          DF001
                                ;       ERROR 7:  ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
                                ;                 CS1 INCORRECT
001360  055466                          EM202
001362  061500                          EM3000
001364  050560                          DT001
```

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 1349  001366  051222                        DF001
 1350                          ;       ERROR 10: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
 1351                          ;                 MESSAGE A INCORRECT.
 1352  001370  055466                        EM202
 1353  001372  061543                        EM3001
 1354  001374  050560                        DT001
 1355  001376  051222                        DF001
 1356                          ;       ERROR 11: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
 1357                          ;                 MESSAGE B INCORRECT.
 1358  001400  055466                        EM202
 1359  001402  061567                        EM3002
 1360  001404  050560                        DT001
 1361  001406  051222                        DF001
 1362                          ;       ERROR 12: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
 1363                          ;                 CS1 INCORRECT.
 1364  001410  055557                        EM203
 1365  001412  061500                        EM3000
 1366  001414  050560                        DT001
 1367  001416  051222                        DF001
 1368                          ;       ERROR 13: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
 1369                          ;                 MESSAGE A INCORRECT.
 1370  001420  055557                        EM203
 1371  001422  061543                        EM3001
 1372  001424  050560                        DT001
 1373  001426  051222                        DF001
 1374                          ;       ERROR 14: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
 1375                          ;                 MESSAGE B INCORRECT.
 1376  001430  055557                        EM203
 1377  001432  061567                        EM3002
 1378  001434  050560                        DT001
 1379  001436  051222                        DF001
 1380                          ;       ERROR 15: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
 1381                          ;                 CS1 INCORRECT AFTER SENDING DRIVE CLEAR.
 1382  001440  055651                        EM204
 1383  001442  061613                        EM3003
 1384  001444  050600                        DT015
 1385  001446  051246                        DF015
 1386                          ;       ERROR 16: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
 1387                          ;                 CS1 INCORRECT AFTER DATE SIMULATION.
 1388  001450  055651                        EM204
 1389  001452  061663                        EM3004
 1390  001454  050600                        DT015
 1391  001456  051246                        DF015
 1392                          ;       ERROR 17: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
 1393                          ;                 MAINT REG. 1 INCORRECT DURING DATA SIMULATION (SECTOR PULSE)
 1394  001460  055651                        EM204
 1395  001462  061735                        EM3005
 1396  001464  050610                        DT017
 1397  001466  051272                        DF017
 1398                          ;       ERROR 20: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
 1399                          ;                 MAINT REG. 1 INCORRECT DURING DATA SIMULATION (INDEX PULSE)
 1400  001470  055651                        EM204
 1401  001472  062037                        EM3006
 1402  001474  050610                        DT017
 1403  001476  051272                        DF017
 1404                          ;       ERROR 21: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
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1405                                    ;               MAINT REG. 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1406  001500  055651                          EM204
1407  001502  062140                          EM3007
1408  001504  050610                          DT017
1409  001506  051272                          DF017
1410                                    ;       ERROR 22: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1411                                    ;               CS1 INCORRECT AFTER SENDING DRIVE CLEAR
1412  001510  055737                          EM205
1413  001512  061613                          EM3003
1414  001514  050626                          DT022
1415  001516  051316                          DF022
1416                                    ;       ERROR 23: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1417                                    ;               BUS ADD INCORRECT AFTER SENDING DRIVE CLEAR.
1418  001520  055737                          EM205
1419  001522  062261                          EM3008
1420  001524  050626                          DT022
1421  001526  051316                          DF022
1422                                    ;       ERROR 24: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1423                                    ;               WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR
1424  001530  055737                          EM205
1425  001532  062341                          EM3009
1426  001534  050626                          DT022
1427  001536  051316                          DF022
1428                                    ;       ERROR 25: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1429                                    ;               MAINT REG 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1430  001540  055737                          EM205
1431  001542  062637                          EM3014
1432  001544  050646                          DT025
1433  001546  051342                          DF025
1434                                    ;       ERROR 26: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1435                                    ;               CS1 CHANGED DURING COMMAND EXECUTION
1436  001550  055737                          EM205
1437  001552  062420                          EM3010
1438  001554  050626                          DT022
1439  001556  051316                          DF022
1440                                    ;       ERROR 27: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1441                                    ;               BUS ADDRESS CHANGED BEFORE INDEX PULSE
1442  001560  055737                          EM205
1443  001562  062465                          EM3011
1444  001564  050626                          DT022
1445  001566  051316                          DF022
1446                                    ;       ERROR 30: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1447                                    ;               WORD COUNT CHANGED BEFORE INDEX PULSE
1448  001570  055737                          EM205
1449  001572  062534                          EM3012
1450  001574  050626                          DT022
1451  001576  051316                          DF022
1452                                    ;       ERROR 31: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1453                                    ;               CS1 CHANGED AFTER INDEX PULSE
1454  001600  055737                          EM205
1455  001602  062602                          EM3013
1456  001604  050660                          DT031
1457  001606  051366                          DF031
1458                                    ;       ERROR 32: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1459                                    ;               BUS ADDRESS CHANGED AFTER INDEX PULSE.
1460  001610  055737                          EM205
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 1461  001612  062710                    EM3015
 1462  001614  050660                    DT031
 1463  001616  051366                    DF031
 1464                            ;       ERROR 33: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
 1465                            ;                 WORD COUNT CHANGED AFTER INDEX PULSE
 1466  001620  055737                    EM205
 1467  001622  062756                    EM3016
 1468  001624  050660                    DT031
 1469  001626  051366                    DF031
 1470                            ;       ERROR 34: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
 1471                            ;                 MAINT REG 1 INCORRECT AFTER SECTOR PULSE
 1472  001630  055737                    EM205
 1473  001632  063336                    EM3025
 1474  001634  050660                    DT031
 1475  001636  051366                    DF031
 1476                            ;       ERROR 35:  ATTEMPTING AN NPR READ OF ONE WORD
 1477                            ;                  CS1 INCORRECT
 1478  001640  056025                    EM206
 1479  001642  061500                    EM3000
 1480  001644  050704                    DT035
 1481  001646  051412                    DF035
 1482                            ;       ERROR 36:  ATTEMPTING AN NPR READ OF ONE WORD
 1483                            ;                  CS2 INCORRECT
 1484  001650  056025                    EM206
 1485  001652  063023                    EM3018
 1486  001654  050704                    DT035
 1487  001656  051412                    DF035
 1488                            ;       ERROR 37:  ATTEMPTING AN NPR READ OF ONE WORD
 1489                            ;                  BUS ADDRESS INCORRECT
 1490  001660  056025                    EM206
 1491  001662  063067                    EM3019
 1492  001664  050704                    DT035
 1493  001666  051412                    DF035
 1494                            ;       ERROR 40:  ATTEMPTING AN NPR READ OF ONE WORD
 1495                            ;                  WORD COUNT REG INCORRECT
 1496  001670  056025                    EM206
 1497  001672  063115                    EM3020
 1498  001674  050704                    DT035
 1499  001676  051412                    DF035
 1500                            ;       ERROR 41:  ATTEMPTING AN NPR READ OF ONE WORD
 1501                            ;                  WORD READ INCORRECT
 1502  001700  056025                    EM206
 1503  001702  063146                    EM3021
 1504  001704  050730                    DT041
 1505  001706  051436                    DF041
 1506                            ;       ERROR 42:  ATTEMPTING AN NPR READ OF ONE WORD
 1507                            ;                  CS1 INCORRECT AFTER READING DATA BUFFER
 1508  001710  056025                    EM206
 1509  001712  063172                    EM3022
 1510  001714  050740                    DT042
 1511  001716  051462                    DF042
 1512                            ;       ERROR 43:  ATTEMPTING AN NPR READ OF ONE WORD
 1513                            ;                  CS2 INCORRECT AFTER READING DATA BUFFER
 1514  001720  056025                    EM206
 1515  001722  063242                    EM3023
 1516  001724  050740                    DT042
```

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1517  001726  051462                    DF042
1518                              ;       ERROR 44:  ATTEMPTING AN NPR READ OF ONE WORD
1519                              ;                  CS1 INCORRECT
1520  001730  056070                    EM207
1521  001732  061500                    EM3000
1522  001734  050704                    DT035
1523  001736  051412                    DF035
1524                              ;       ERROR 45:  ATTEMPTING AN NPR READ
1525                              ;                  CS2 INCORRECT
1526  001740  056070                    EM207
1527  001742  063023                    EM3018
1528  001744  050704                    DT035
1529  001746  051412                    DF035
1530                              ;       ERROR 46:  ATTEMPTING AN NPR READ
1531                              ;                  BUS ADDRESS INCORRECT
1532  001750  056070                    EM207
1533  001752  063067                    EM3019
1534  001754  050704                    DT035
1535  001756  051412                    DF035
1536                              ;       ERROR 47:  ATTEMPTING AN NPR READ
1537                              ;                  WORD COUNT INCORRECT
1538  001760  056070                    EM207
1539  001762  063115                    EM3020
1540  001764  050704                    DT035
1541  001766  051412                    DF035
1542                              ;       ERROR 50:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1543                              ;                  CS1 INCORRECT
1544  001770  056117                    EM208
1545  001772  061500                    EM3000
1546  001774  050704                    DT035
1547  001776  051412                    DF035
1548                              ;       ERROR 51:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1549                              ;                  CS2 INCORRECT
1550  002000  056117                    EM208
1551  002002  063023                    EM3018
1552  002004  050704                    DT035
1553  002006  051412                    DF035
1554                              ;       ERROR 52:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1555                              ;                  BUS ADDRESS INCORRECT
1556  002010  056117                    EM208
1557  002012  063067                    EM3019
1558  002014  050704                    DT035
1559  002016  051412                    DF035
1560                              ;       ERROR 53:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1561                              ;                  WORD COUNT INCORRECT
1562  002020  056117                    EM208
1563  002022  063115                    EM3020
1564  002024  050704                    DT035
1565  002026  051412                    DF035
1566                              ;       ERROR 54:  ATTEMPTING NPR READ
1567                              ;                  DATA BUFFER INCORRECT
1568  002030  056070                    EM207
1569  002032  063146                    EM3021
1570  002034  050754                    DT054
1571  002036  051506                    DF054
1572                              ;       ERROR 55:  ATTEMPTING NPR READ
```

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1573                                    ;               CS1 INCORRECT AFTER READING DATA BUFFER
1574  002040  056070                                    EM207
1575  002042  063172                                    EM3022
1576  002044  050766                                    DT055
1577  002046  051532                                    DF055
1578                                    ;       ERROR 56:  ATTEMPTING NPR READ
1579                                    ;               CS2 INCORRECT AFTER READING DATA BUFFER
1580  002050  056070                                    EM207
1581  002052  063242                                    EM3023
1582  002054  050766                                    DT055
1583  002056  051532                                    DF055
1584                                    ;       ERROR 57:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1585                                    ;               INHIBIT CS1 INCORRECT
1586  002060  056170                                    EM209
1587  002062  061500                                    EM3000
1588  002064  050704                                    DT035
1589  002066  051412                                    DF035
1590                                    ;       ERROR 60:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1591                                    ;               INHIBIT CS2 INCORRECT
1592  002070  056170                                    EM209
1593  002072  063023                                    EM3018
1594  002074  050704                                    DT035
1595  002076  051412                                    DF035
1596                                    ;       ERROR 61:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1597                                    ;               INHIBIT BUS ADDRESS INCORRECT
1598  002100  056170                                    EM209
1599  002102  063067                                    EM3019
1600  002104  050704                                    DT035
1601  002106  051412                                    DF035
1602                                    ;       ERROR 62:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1603                                    ;               INHIBIT WORD COUNT INCORRECT
1604  002110  056170                                    EM209
1605  002112  063115                                    EM3020
1606  002114  050704                                    DT035
1607  002116  051412                                    DF035
1608                                    ;       ERROR 63:  ATTEMPTING NPR READ WITH IBA TO CHECK ZERO
1609                                    ;               DETECT-CS1 INCORRECT
1610  002120  056257                                    EM210
1611  002122  061500                                    EM3000
1612  002124  050704                                    DT035
1613  002126  051412                                    DF035
1614                                    ;       ERROR 64:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1615                                    ;               DETECT-CS2 INCORRECT
1616  002130  056257                                    EM210
1617  002132  063023                                    EM3018
1618  002134  050704                                    DT035
1619  002136  051412                                    DF035
1620                                    ;       ERROR 65:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1621                                    ;               DETECT-BUS ADDRESS INCORRECT
1622  002140  056257                                    EM210
1623  002142  063067                                    EM3019
1624  002144  050704                                    DT035
1625  002146  051412                                    DF035
1626                                    ;       ERROR 66:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1627                                    ;               DETECT-WORD COUNT INCORRECT
1628  002150  056257                                    EM210
```

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1629  002152  063115                    EM3020
1630  002154  050704                    DT035
1631  002156  051412                    DF035
1632                          ;         ERROR 67:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1633                          ;                    INCREMENT-DATA BUFFER INCORRECT
1634  002160  056170                    EM209
1635  002162  063146                    EM3021
1636  002164  050754                    DT054
1637  002166  051506                    DF054
1638                          ;         ERROR 70:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1639                          ;                    INCREMENT-CS1 INCORRECT AFTER READING DATA BUFFER
1640  002170  056170                    EM209
1641  002172  063172                    EM3022
1642  002174  050766                    DT055
1643  002176  051532                    DF055
1644                          ;         ERROR 71:  ATTEMPTING NPR READ WITH ADDRESS BUFFER INHIBIT
1645                          ;                    INCREMENT-CS2 INCORRECT AFTER READING DATA BUFFER
1646  002200  056170                    EM209
1647  002202  063242                    EM3023
1648  002204  050766                    DT055
1649  002206  051532                    DF055
1650                          ;         ERROR 72:  ATTEMPTING TO FORCE NON-EXISTANT MEMORY
1651                          ;                    CS1 INCORRECT
1652  002210  056373                    EM211
1653  002212  061500                    EM3000
1654  002214  051004                    DT072
1655  002216  051556                    DF072
1656                          ;         ERROR 73:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1657                          ;                    CS2 INCORRECT
1658  002220  056373                    EM211
1659  002222  063023                    EM3018
1660  002224  051004                    DT072
1661  002226  051556                    DF072
1662                          ;         ERROR 74:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1663                          ;                    ERROR REG INCORRECT
1664  002230  056373                    EM211
1665  002232  063312                    EM3024
1666  002234  051004                    DT072
1667  002236  051556                    DF072
1668                          ;         ERROR 75:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1669                          ;                    BUS ADDRESS INCORRECT
1670  002240  056373                    EM211
1671  002242  063067                    EM3019
1672  002244  051004                    DT072
1673  002246  051556                    DF072
1674                          ;         ERROR 76:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1675                          ;                    WORD COUNT INCORRECT
1676  002250  056373                    EM211
1677  002252  063115                    EM3020
1678  002254  051004                    DT072
1679  002256  051556                    DF072
1680                          ;         ERROR 77:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1681                          ;                    CS1 INCORRECT
1682  002260  056443                    EM212
1683  002262  061500                    EM3000
1684  002264  051034                    DT077
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1685  002266  051612                    DF077
1686                              ;     ERROR 100:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1687                              ;                 CS2 INCORRECT
1688  002270  056443                    EM212
1689  002272  063023                    EM3018
1690  002274  051034                    DT077
1691  002276  051612                    DF077
1692                              ;     ERROR 101: TESTING EXTENDED MEMORY ADDRESSING BITS
1693                              ;                CS1 INCORRECT
1694  002300  056513                    EM213
1695  002302  061500                    EM3000
1696  002304  050704                    DT035
1697  002306  051412                    DF035
1698                              ;     ERROR 102: TESTING EXTENDED MEMORY ADDRESSING BITS
1699                              ;                CS2 INCORRECT
1700  002310  056513                    EM213
1701  002312  063023                    EM3018
1702  002314  050704                    DT035
1703  002316  051412                    DF035
1704                              ;     ERROR 103: TESTING EXTENDED MEMORY ADDRESSING BITS
1705                              ;                BUS ADDRESS INCORRECT
1706  002320  056513                    EM213
1707  002322  063067                    EM3019
1708  002324  050704                    DT035
1709  002326  051412                    DF035
1710                              ;     ERROR 104: TESTING EXTEND MEMORY ADDRESSING BITS
1711                              ;                WORD COUNT INCORRECT
1712  002330  056513                    EM213
1713  002332  063115                    EM3020
1714  002334  050704                    DT035
1715  002336  051412                    DF035
1716                              ;     ERROR 105: TESTING EXTENDED MEMORY ADDRESSING BITS
1717                              ;                DATA BUFFER INCORRECT
1718  002340  056513                    EM213
1719  002342  063146                    EM3021
1720  002344  050730                    DT041
1721  002346  051436                    DF041
1722                              ;     ERROR 106: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1723                              ;                CS1 INCORRECT
1724  002350  056563                    EM214
1725  002352  061500                    EM3000
1726  002354  051004                    DT072
1727  002356  051556                    DF072
1728                              ;     ERROR 107: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1729                              ;                CS2 INCORRECT
1730  002360  056563                    EM214
1731  002362  063023                    EM3018
1732  002364  051004                    DT072
1733  002366  051556                    DF072
1734                              ;     ERROR 110: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1735                              ;                BUS ADDRESS INCORRECT
1736  002370  056563                    EM214
1737  002372  063067                    EM3019
1738  002374  051004                    DT072
1739  002376  051556                    DF072
1740                              ;     ERROR 111: ATEMPTING TO FORCE UNIBUS PARITY ERROR
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 1741                                   ;               WORD COUNT INCORRECT
 1742  002400  056563                           EM214
 1743  002402  063115                           EM3020
 1744  002404  051004                           DT072
 1745  002406  051556                           DF072
 1746                                   ;       ERROR 112: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
 1747                                   ;               CS1 INCORRECT
 1748  002410  056633                           EM215
 1749  002412  061500                           EM3000
 1750  002414  050704                           DT035
 1751  002416  051412                           DF035
 1752                                   ;       ERROR 113: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
 1753                                   ;               CS2 INCORRECT
 1754  002420  056633                           EM215
 1755  002422  063023                           EM3018
 1756  002424  050704                           DT035
 1757  002426  051412                           DF035
 1758                                   ;       ERROR 114: ATTEMPTING NPR READ OR LOCATION PRIOR TO BAD PARITY
 1759                                   ;               BUS ADDRESS INCORRECT
 1760  002430  056633                           EM215
 1761  002432  063067                           EM3019
 1762  002434  050704                           DT035
 1763  002436  051412                           DF035
 1764                                   ;       ERROR 115: ATTEMPTING NPR READ  OF LOCATION PRIOR TO BAD PARITY
 1765                                   ;               WORD COUNT INCORRECT
 1766  002440  056633                           EM215
 1767  002442  063023                           EM3018
 1768  002444  050704                           DT035
 1769  002446  051412                           DF035
 1770                                   ;       ERROR 116: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
 1771                                   ;               ERROR REG INCORRECT
 1772  002450  056563                           EM214
 1773  002452  063312                           EM3024
 1774  002454  051004                           DT072
 1775  002456  051556                           DF072
 1776                                   ;       ERROR 117: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
 1777                                   ;               CS1 INCORRECT
 1778  002460  056717                           EM216
 1779  002462  061500                           EM3000
 1780  002464  051034                           DT077
 1781  002466  051612                           DF077
 1782                                   ;       ERROR 120: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
 1783                                   ;               CS2 INCORRECT
 1784  002470  056717                           EM216
 1785  002472  063023                           EM3018
 1786  002474  051034                           DT077
 1787  002476  051612                           DF077
 1788                                   ;       ERROR 121: ATTEMPTING 18 BIT NPR READ
 1789                                   ;               CS1 INCORRECT
 1790  002500  056767                           EM217
 1791  002502  061500                           EM3000
 1792  002504  050704                           DT035
 1793  002506  051412                           DF035
 1794                                   ;       ERROR 122: ATTEMPTING 18 BIT NPR READ
 1795                                   ;               CS2 INCORRECT
 1796  002510  056767                           EM217
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 1797  002512  063023                    EM3018
 1798  002514  050704                    DT035
 1799  002516  051412                    DF035
 1800                          ;         ERROR 123: ATTEMPTING 18 BIT NPR READ
 1801                          ;                    BUS ADDRESS INCORRECT
 1802  002520  056767                    EM217
 1803  002522  063067                    EM3019
 1804  002524  050704                    DT035
 1805  002526  051412                    DF035
 1806                          ;         ERROR 124: ATTEMPTING 18 BIT NPR READ
 1807                          ;                    WORD COUNT INCORRECT
 1808  002530  056767                    EM217
 1809  002532  063115                    EM3020
 1810  002534  050704                    DT035
 1811  002536  051412                    DF035
 1812                          ;         ERROR 125: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
 1813                          ;                    CS1 INCORRECT
 1814  002540  057022                    EM218
 1815  002542  061500                    EM3000
 1816  002544  050704                    DT035
 1817  002546  051412                    DF035
 1818                          ;         ERROR 126: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
 1819                          ;                    CS2 INCORRECT
 1820  002550  057022                    EM218
 1821  002552  063023                    EM3018
 1822  002554  050704                    DT035
 1823  002556  051412                    DF035
 1824                          ;         ERROR 127: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
 1825                          ;                    BUS ADDRESS INCORRECT
 1826  002560  057022                    EM218
 1827  002562  063067                    EM3019
 1828  002564  050704                    DT035
 1829  002566  051412                    DF035
 1830                          ;         ERROR 130: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
 1831                          ;                    WORD COUNT INCORRECT
 1832  002570  057022                    EM218
 1833  002572  063115                    EM3020
 1834  002574  050704                    DT035
 1835  002576  051412                    DF035
 1836                          ;         ERROR 131: ATTEMPTING 18 BIT NPR READ
 1837                          ;                    DATA BUFFER INCORRECT
 1838  002600  056767                    EM217
 1839  002602  063146                    EM3021
 1840  002604  050740                    DT042
 1841  002606  051462                    DF042
 1842                          ;         ERROR 132: ATTEMPTING 18 BIT NPR READ
 1843                          ;                    CS1 INCORRECT AFTER READING DATA BUFFER
 1844  002610  056767                    EM217
 1845  002612  063172                    EM3022
 1846  002614  050766                    DT055
 1847  002616  051532                    DF055
 1848                          ;         ERROR 133: ATTEMPTING 18 BIT NPR READ
 1849                          ;                    CS2 INCORRECT AFTER READING DATA BUFFER
 1850  002620  056767                    EM217
 1851  002622  063242                    EM3023
 1852  002624  050766                    DT055
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1853  002626  051532                        DF055
1854                                ;       ERROR 134: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1855                                ;               CS1 INCORRECT
1856  002630  057102                        EM219
1857  002632  061500                        EM3000
1858  002634  050704                        DT035
1859  002636  051412                        DF035
1860                                ;       ERROR 135: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1861                                ;               CS2 INCORRECT
1862  002640  057102                        EM219
1863  002642  063023                        EM3018
1864  002644  050704                        DT035
1865  002646  051412                        DF035
1866                                ;       ERROR 136: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1867                                ;               BUS ADDRESS INCORRECT
1868  002650  057102                        EM219
1869  002652  063067                        EM3019
1870  002654  050704                        DT035
1871  002656  051412                        DF035
1872                                ;       ERROR 137: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1873                                ;               WORD COUNT INCORRECT
1874  002660  057102                        EM219
1875  002662  063115                        EM3020
1876  002664  050704                        DT035
1877  002666  051412                        DF035
1878                                ;       ERROR 140: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1879                                ;               CHECKING ZERO DETECT
1880                                ;               CS1 INCORRECT
1881  002670  057162                        EM220
1882  002672  061500                        EM3000
1883  002674  050704                        DT035
1884  002676  051412                        DF035
1885                                ;       ERROR 141: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1886                                ;               CHECKING ZERO DETECT
1887                                ;               CS2 INCORRECT
1888  002700  057162                        EM220
1889  002702  063023                        EM3018
1890  002704  050704                        DT035
1891  002706  051412                        DF035
1892                                ;       ERROR 142: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1893                                ;               CHECKING ZERO DETECT
1894                                ;               BUS ADDRESS INCORRECT
1895  002710  057162                        EM220
1896  002712  063067                        EM3019
1897  002714  050704                        DT035
1898  002716  051412                        DF035
1899                                ;       ERROR 143: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1900                                ;               CHECKING ZERO DETECT
1901                                ;               WORD COUNT INCORRECT
1902  002720  057162                        EM220
1903  002722  063115                        EM3020
1904  002724  050704                        DT035
1905  002726  051412                        DF035
1906                                ;       ERROR 144: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1907                                ;               DATA BUFFER INCORRECT
1908  002730  057102                        EM219
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 1909  002732  063146                        EM3021
 1910  002734  050730                        DT041
 1911  002736  051436                        DF041
 1912                          ;             ERROR 145: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
 1913                          ;                        CS1 INCORRECT AFTER READING DATA BUFFER
 1914  002740  057102                        EM219
 1915  002742  063172                        EM3022
 1916  002744  051034                        DT077
 1917  002746  051612                        DF077
 1918                          ;             ERROR 146: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
 1919                          ;                        CS2 INCORRECT AFTER READING DATA BUFFER
 1920  002750  057102                        EM219
 1921  002752  063242                        EM3023
 1922  002754  051034                        DT077
 1923  002756  051612                        DF077
 1924                          ;             ERROR 147:  UNEXPECTED MEMORY PARITY ENABLE TRAP
 1925  002760  055254                        EM000
 1926  002762  052434                        DH000C
 1927  002764  050554                        DT000
 1928  002766  051216                        DF000
 1929                          ;             ERROR 150: ATTEMPTING SIMULATION OF DATA IN READ HEADER
 1930                          ;                        CS1 INCORRECT
 1931  002770  057241                        EM221
 1932  002772  061500                        EM3000
 1933  002774  051050                        DT150
 1934  002776  051636                        DF150
 1935                          ;             ERROR 151: ATTEMPTING READ HEADER IN MAINTANENCE MODE
 1936                          ;                        CS1 INCORRECT AFTER COMPLETION OF COMMAND
 1937  003000  057316                        EM222
 1938  003002  063406                        EM3026
 1939  003004  050740                        DT042
 1940  003006  051462                        DF042
 1941                          ;             ERROR 152: ATTEMPTING READ HEADER IN MAINTANENCE MODE
 1942                          ;                        CS2 INCORRECT AFTER COMPLETION OF COMMAND
 1943  003010  057316                        EM222
 1944  003012  063455                        EM3027
 1945  003014  050740                        DT042
 1946  003016  051462                        DF042
 1947                          ;             ERROR 153: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 1948                          ;                        CS1 INCORRECT AFTER UNLOADING DATA BUFFER
 1949  003020  057371                        EM223
 1950  003022  063172                        EM3022
 1951  003024  050766                        DT055
 1952  003026  051532                        DF055
 1953                          ;             ERROR 154: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 1954                          ;                        CS2 INCORRECT AFTER UNLOADING DATA
 1955  003030  057371                        EM223
 1956  003032  063242                        EM3023
 1957  003034  050766                        DT055
 1958  003036  051532                        DF055
 1959                          ;             ERROR 155: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
 1960                          ;                        DATA READ INCORRECT
 1961  003040  057371                        EM223
 1962  003042  063146                        EM3021
 1963  003044  050754                        DT054
 1964  003046  051506                        DF054
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1965                                    ;       ERROR 156: ATTEMPTING SIMULATION OF DATA IN READ HEADER (20 BIT FORMAT)
1966                                    ;                  CS1 INCORRECT
1967  003050  057447                           EM224
1968  003052  061500                           EM3000
1969  003054  051050                           DT150
1970  003056  051636                           DF150
1971                                    ;       ERROR 157: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE/
1972                                    ;                  CS1 INCORRECT AFTER COMMAND COMPLETION
1973  003060  057544                           EM225
1974  003062  063406                           EM3026
1975  003064  050740                           DT042
1976  003066  051462                           DF042
1977                                    ;       ERROR 160: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE
1978                                    ;                  CS2 INCORRECT AFTER COMPLETION OF COMMAND
1979  003070  057544                           EM225
1980  003072  063455                           EM3027
1981  003074  050740                           DT042
1982  003076  051462                           DF042
1983                                    ;       ERROR 161: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
1984                                    ;                  CS1 INCORRECT AFTER UNLOADING DATA BUFFER
1985  003100  057631                           EM226
1986  003102  063172                           EM3022
1987  003104  050766                           DT055
1988  003106  051532                           DF055
1989                                    ;       ERROR 162: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
1990                                    ;                  CS2 INCORRECT AFTER UNLOADING DATA BUFFER
1991  003110  057631                           EM226
1992  003112  063242                           EM3023
1993  003114  050766                           DT055
1994  003116  051532                           DF055
1995                                    ;       ERROR 163: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
1996                                    ;                  DATA BUFFER INCORRECT
1997  003120  057631                           EM226
1998  003122  063146                           EM3021
1999  003124  050754                           DT054
2000  003126  051506                           DF054
2001                                    ;       ERROR 164: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2002                                    ;                  CS1 INCORRECT
2003  003130  057731                           EM227
2004  003132  061500                           EM3000
2005  003134  051064                           DT164
2006  003136  051662                           DF164
2007                                    ;       ERROR 165: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2008                                    ;                  CS2 INCORRECT
2009  003140  057731                           EM227
2010  003142  063023                           EM3018
2011  003144  051064                           DT164
2012  003146  051662                           DF164
2013                                    ;       ERROR 166: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2014                                    ;                  CS1 INCORRECT READING EMPTY SILO
2015  003150  057731                           EM227
2016  003152  063524                           EM3028
2017  003154  051064                           DT164
2018  003156  051662                           DF164
2019                                    ;       ERROR 167: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2020                                    ;                  CS1 INCORRECT READING EMPTY SILO
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 2021  003160  057731                          EM227
 2022  003162  063573                          EM3029
 2023  003164  051064                          DT164
 2024  003166  051662                          DF164
 2025                          ;               ERROR 170:  WRITE BIT ERRORS
 2026  003170  000000          ;MW:    0
 2027  003172  000000                          0
 2028  003174  051102                          DT170
 2029  003176  051706                          DF170
 2030                          ;               ERROR 171:  WRITE GATE NOT RESET WITH SECTOR PULSE
 2031  003200  060145                          EM231
 2032  003202  063642                          EM3030
 2033  003204  051126                          DT171
 2034  003206  051732                          DF171
 2035                          ;               ERROR 172:  WRITE GATE NOT SET WITH SECTOR PULSE RESET
 2036  003210  060267                          EM232
 2037  003212  063642                          EM3030
 2038  003214  051126                          DT171
 2039  003216  051732                          DF171
 2040                          ;               ERROR 173:  WRITE GATE NOT RESET WITH SECOND INDEX PULSE
 2041  003220  060515                          EM235
 2042  003222  063642                          EM3030
 2043  003224  051126                          DT171
 2044  003226  051732                          DF171
 2045                          ;               ERROR 174:  CS1 INCORRECT AT END OF WRITE HEADER
 2046  003230  060625                          EM236
 2047  003232  061500                          EM3000
 2048  003234  050600                          DT015
 2049  003236  051246                          DF015
 2050                          ;               ERROR 175: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
 2051                          ;               CS1 INCORRECT
 2052  003240  061175                          EM241
 2053  003242  061500                          EM3000
 2054  003244  051136                          DT175
 2055  003246  051756                          DF175
 2056                          ;               ERROR 176: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
 2057                          ;               CS2 INCORRECT
 2058  003250  061175                          EM241
 2059  003252  063023                          EM3018
 2060  003254  051136                          DT175
 2061  003256  051756                          DF175
 2062                          ;               ERROR 177: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
 2063                          ;               DRIVE STATUS REG INCORRECT
 2064  003260  061175                          EM241
 2065  003262  063670                          EM3031
 2066  003264  051136                          DT175
 2067  003266  051756                          DF175
 2068                          ;               ERROR 200: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
 2069                          ;               ERROR REG INCORRECT
 2070  003270  061175                          EM241
 2071  003272  063723                          EM3032
 2072  003274  051136                          DT175
 2073  003276  051756                          DF175
 2074                          ;               ERROR 201: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
 2075                          ;               CS1 INCORRECT
 2076  003300  061261                          EM242
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2077  003302  061500                    EM3000
2078  003304  051136                    DT175
2079  003306  051756                    DF175
2080                            ;       ERROR 202: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2081                            ;       CS2 INCORRECT
2082  003310  061261                    EM242
2083  003312  063023                    EM3018
2084  003314  051136                    DT175
2085  003316  051756                    DF175
2086                            ;       ERROR 203: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2087                            ;       DRIVE STATUS REG INCORRECT
2088  003320  061261                    EM242
2089  003322  063670                    EM3031
2090  003324  051136                    DT175
2091  003326  051756                    DF175
2092                            ;       ERROR 204: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2093                            ;       ERROR REGISTER INCORRECT
2094  003330  061261                    EM242
2095  003332  063723                    EM3032
2096  003334  051136                    DT175
2097  003336  051756                    DF175
2098                            ;       ERROR 205:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2099                            ;       CS1 INCORRECT
2100  003340  061345                    EM243
2101  003342  061500                    EM3000
2102  003344  051136                    DT175
2103  003346  051756                    DF175
2104                            ;       ERROR 206:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2105                            ;       CS2 INCORRECT
2106  003350  061345                    EM243
2107  003352  063023                    EM3018
2108  003354  051136                    DT175
2109  003356  051756                    DF175
2110                            ;       ERROR 207:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2111                            ;       DRIVE STATUS REG INCORRECT
2112  003360  061345                    EM243
2113  003362  063670                    EM3031
2114  003364  051136                    DT175
2115  003366  051756                    DF175
2116                            ;       ERROR 210:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
2117                            ;       ERROR REG INCORRECT
2118  003370  061345                    EM243
2119  003372  063723                    EM3032
2120  003374  051136                    DT175
2121  003376  051756                    DF175
2122                            ;       ERROR 211:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2123                            ;       CS1 INCORRECT
2124  003400  061446                    EM244
2125  003402  061500                    EM3000
2126  003404  051162                    DT211
2127  003406  052002                    DF211
2128                            ;       ERROR 212:  ATTEMPTING TO CLEAR CONTROLLER ERROR
2129                            ;       CS2 INCORRECT
2130  003410  061446                    EM244
2131  003412  063023                    EM3018
2132  003414  051162                    DT211
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2133  003416  052002                          DF211
2134                                ;         ERROR 213:  ATTEMPTING TO CLEAR CONTROLLER
2135                                ;         DRIVE STATUS REG INCORRECT
2136  003420  061446                          EM244
2137  003422  063670                          EM3031
2138  003424  051162                          DT211
2139  003426  052002                          DF211
2140                                ;         ERROR 214: ATTEMPTINT TO CLEAR CONTROLLER
2141                                ;         ERROR REG INCORRECT
2142  003430  061446                          EM244
2143  003432  063723                          EM3032
2144  003434  051162                          DT211
2145  003436  052002                          DF211
2146                                .SBTTL    TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER
2147
2148  003440  000000                T.CS1:    .WORD   0               ;CONTROL AND STATUS REGISTER 1
2149  003442  000000                T.WC:     .WORD   0               ;WORD COUNT REGISTER
2150  003444  000000                T.BA:     .WORD   0               ;BUS ADDRESS REGISTER
2151  003446  000000                T.DA:     .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2152  003450  000000                T.CS2:    .WORD   0               ;CONTROL AND STATUS REGISTER 2
2153  003452  000000                T.DS:     .WORD   0               ;DRIVE STATUS REGISTER
2154  003454  000000                T.ER:     .WORD   0               ;ERROR REGISTER
2155  003456  000000                T.ASOF:   .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2156  003460  000000                T.DCYL:   .WORD   0               ;DESIRED CYLINDER REGISTER
2157  003462  000000                T.DB:     .WORD   0               ;DATA BUFFER
2158  003464  000000                T.MR1:    .WORD   0               ;MAINTENANCE REGISTER 1
2159  003466  000000                T.MR2:    .WORD   0               ;MAINTENANCE REGISTER 2
2160  003470  000000                T.MR3:    .WORD   0               ;MAINTENANCE REGISTER 3
2161  003472  000000                T.ECPS:   .WORD   0               ;ECC POSITION INFORMATION
2162  003474  000000                T.ECPT:   .WORD   0               ;ECC PATTERN INFORMATION
2163  003476  000000                T.SPAR:   .WORD   0               ;SPARE REGISTER
2164
2165                                .SBTTL    EXPECTED RK611 CONTROLLER REGISTERS
2166
2167  003500  000000                E.CS1:    .WORD   0               ;CONTROL AND STATUS REGISTER 1
2168  003502  000000                E.WC:     .WORD   0               ;WORD COUNT REGISTER
2169  003504  000000                E.BA:     .WORD   0               ;BUS ADDRESS REGISTER
2170  003506  000000                E.DA:     .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2171  003510  000000                E.CS2:    .WORD   0               ;CONTROL AND STATUS REGISTER 2
2172  003512  000000                E.DS:     .WORD   0               ;DRIVE STATUS REGISTER
2173  003514  000000                E.ER:     .WORD   0               ;ERROR REGISTER
2174  003516  000000                E.ASOF:   .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2175  003520  000000                E.DCYL:   .WORD   0               ;DESIRED CYLINDER REGISTER
2176  003522  000000                E.DB:     .WORD   0               ;DATA BUFFER
2177  003524  000000                E.MR1:    .WORD   0               ;MAINTENANCE REGISTER 1
2178  003526  000000                E.MR2:    .WORD   0               ;MAINTENANCE REGISTER 2
2179  003530  000000                E.MR3:    .WORD   0               ;MAINTENANCE REGISTER 3
2180  003532  000000                E.ECPS:   .WORD   0               ;ECC POSITION INFORMATION
2181  003534  000000                E.ECPT:   .WORD   0               ;ECC PATTERN INFORMATION
2182  003536  000000                E.SPAR:   .WORD   0               ;SPARE REGISTER
2183
2184                                .SBTTL    PREVIOUS RK611 CONTROLLER REGISTERS
2185
2186  003540  000000                P.CS1:    .WORD   0               ;CONTROL AND STATUS REGISTER 1
2187  003542  000000                P.WC:     .WORD   0               ;WORD COUNT REGISTER
2188  003544  000000                P.BA:     .WORD   0               ;BUS ADDRESS REGISTER
```

```
2189  003546  000000                  P.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
2190  003550  000000                  P.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
2191  003552  000000                  P.DS:   .WORD   0               ;DRIVE STATUS REGISTER
2192  003554  000000                  P.ER:   .WORD   0               ;ERROR REGISTER
2193  003556  000000                  P.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
2194  003560  000000                  P.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
2195  003562  000000                  P.DB:   .WORD   0               ;DATA BUFFER
2196  003564  000000                  P.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
2197  003566  000000                  P.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
2198  003570  000000                  P.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
2199  003572  000000                  P.ECPS: .WORD   0               ;ECC POSITION INFORMATION
2200  003574  000000                  P.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
2201  003576  000000                  P.SPAR: .WORD   0               ;SPARE REGISTER
2202                                  .SBTTL  PROGRAM DEFINED VARIABLES
2203
2204  003600  000210                  RKVEC:  .WORD   210             ;RK611 VECTOR
2205  003602  000240                  RKPRI:  .WORD   PR5             ;RK611 PRIORITY
2206  003604  000000                  TRAPPC: .WORD   0               ;PC FOR MEMORY CHECK ENABLE TRAP
2207  003606  000000                  SRTFLG: .WORD   0               ;START FLAG
2208                                                                  ;  0 = 200
2209                                                                  ;  1 = 214
2210                                                                  ; -1 = 204
2211  003610  000000                  ERRCNT: .WORD   0               ;ERROR COUNT FOR SWITCH 12 ABORT
2212  003612  000000                  P1.BIT: .WORD   0               ;NEXT BIT IN DATA SIMULATION
2213  003614  000000                  PR.BIT: .WORD   0               ;PRESENT BIT IN DATA SIMULATION
2214  003616  000000                  M1.BIT: .WORD   0               ;PREVIOUS BIT IN DATA SIMULATION
2215  003620  000000                  M2.BIT: .WORD   0               ;BIT BEFORE PREVIOUS BIT
2216  003622  000000                  BITCNT: .WORD   0               ;BIT POSITION
2217  003624  000000                  WRDCNT: .WORD   0               ;WORD COUNT FOR NPR TRANSFER
2218  003626  000000                  SECCNT: .WORD   0               ;SECTOR COUNT
2219  003630  000000                  MEMPAR: .WORD   0               ;MEMORY EMABLE ON FIRST 24K
2220  003632  000015                  WAITIM: .WORD   15              ;WAIT TIME FOR CONTROLLER READY
2221  003634  000000                  SAVSWR: .WORD   0               ;STORAGE FOR SWITCH REGISTER
2222  003636  000000                  PARPRE: .WORD   0               ;PARITY OPTION PRESENT FOR
2223                                                                  ;  LOCATION USED
2224  003640  000000                  CSRPTR: .WORD   0               ;POINTER TO CSR TO BE  USED
2225                                  .SBTTL  PROGRAM SETUP
2226
2227  003642  012737  000001  003606  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
2228  003650  000406                          BR      START1
2229
2230  003652  012737  177777  003606  RESTRT: MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
2231  003660  000402                          BR      START1
2232
2233  003662  005037  003606          START:  CLR     SRTFLG          ;CLEAR START FLAG
2234  003666  000005                  START1: RESET                   ;RESET THE WHOLE SYSTEM
2235  003670  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
2236  003674  004737  046652                  JSR     PC,$TKINT       ;INIT KEYBOARD
2237  003700  012746  000340                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
2238  003704  012746  003712                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
2239  003710  000002                          RTI                     ;LOAD PSW
2240
2241  003712                          1$:
2242                                  .SBTTL  INITIALIZE THE COMMON TAGS
2243                                  ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
2244  003712  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
```

```
                        CLR     (R6)+           ;;CLEAR MEMORY LOCATION
                        CMP     #SWR,R6 ;;DONE?
                        BNE     .-6             ;;LOOP BACK IF NO
                        MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                ;;INITIALIZE A FEW VECTORS
                        MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
                        MOV     #340,@#IOTVEC+2 ;;LEVEL 7
                        MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
                        MOV     #340,@#EMTVEC+2 ;;LEVEL 7
                        MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
                        MOV     #340,@#TRAPVEC+2;LEVEL 7
                        MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
                        MOV     #340,@#PWRVEC+2 ;;LEVEL 7
                        MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
                        CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
                        CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
                        MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
                        MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
                        MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
                        MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
                        MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
                        MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
                        MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
                        CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
                        BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                ;;AND  THE HARDWARE SWR IS NOT = -1
                        BR      65$             ;;BRANCH IF NO TIMEOUT
                64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
                        RTI
                65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
                        MOV     #DISPREG,DISPLAY
                66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

                        CLR     $PASS           ;;CLEAR PASS COUNT
                        BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
                        BEQ     67$             ;;YES,USE NON-APT SWITCH
                        MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
                67$:
                        CLR     ERRCNT          ;CLEAR ERROR COUNT FOR SWITCH 12 ABORT
                .SBTTL  TYPE PROGRAM NAME
                ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
                        INC     #-1             ;;FIRST TIME?
                        BNE     68$             ;;BRANCH IF NO
                        CMP     #$ENDAD,@#42    ;;ACT-11?
                        BEQ     68$             ;;BRANCH IF YES
                        TYPE    ,69$            ;;TYPE ASCIZ STRING
                .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
                        TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
                        BNE     70$             ;;BRANCH IF YES
                        CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
                        BEQ     70$             ;;BRANCH IF YES
                        CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
                        BNE     71$             ;;BRANCH IF NO
                        GTSWR                   ;;GET SOFT-SWR SETTINGS
```

```
2301  004240  000403                          BR      71$
2302  004242  112737  000001  001134  70$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2303  004250                          71$:
2304  004250  000420                          BR      68$             ;;GET OVER THE ASCIZ
2305                                  ;;69$:   .ASCIZ  <CRLF>/CZR6CD0 RK611 DSKLS CTRL PRT3/<CRLF>
2306  004312                          68$:
2307  004312  005227  177777                  INC     #-1             ;TEST IF FIRST PASS
2308  004316  001002                          BNE     6$              ;NO - SKIP
2309  004320  104401  052150                  TYPE    ,OPR006         ;TYPE RUN TIME MESSAGE
2310  004324  022737  000001  003606  6$:     CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2311  004332  001122                          BNE     15$             ;NO, CONTINUE SETUP
2312  004334  104401  052036          5$:     TYPE    ,OPR001         ;TYPE 'RK611 BUS ADDRESS (  ) ='
2313  004340  013746  001270                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2314  004344  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2315  004346  104401  052070                  TYPE    ,OPR002
2316  004352  104412                          RDOCT                   ;GET VALUE
2317  004354  012637  001160                  MOV     (SP)+,$TMP0
2318  004360  001407                          BEQ     7$              ;CHECK IF <CR>
2319  004362  022737  160000  001160          CMP     #160000,$TMP0   ;CHECK IF IN I/O PAGE
2320  004370  101361                          BHI     5$
2321  004372  013737  001160  001270          MOV     $TMP0,$BASE     ;LOAD NEW BUS ADDRESS
2322  004400  104401  052076          7$:     TYPE    ,OPR003         ;TYPE 'RK611 VECTOR ADDRESS (  ) ='
2323  004404  013746  001264                  MOV     $VECT1,-(SP)    ;TYPE OUT VECTOR ADDRESS
2324  004410  042716  160000                  BIC     #160000,(SP)
2325  004414  104402                          TYPOC
2326  004416  104401  052070                  TYPE    ,OPR002
2327  004422  104412                          RDOCT                   ;GET VALUE
2328  004424  012637  001160                  MOV     (SP)+,$TMP0
2329  004430  001412                          BEQ     10$             ;CHECK IF <CR>
2330  004432  022737  001000  001160          CMP     #1000,$TMP0     ;CHECK IF LEGAL
2331  004440  101757                          BLOS    7$
2332  004442  042737  017777  001264          BIC     #17777,$VECT1   ;LOAD NEW VECTOR ADDRESS
2333  004450  053737  001160  001264          BIS     $TMP0,$VECT1
2334  004456  104401  052126          10$:    TYPE    ,OPR004         ;TYPE 'RK611 PRIORITY (  ) ='
2335  004462  005046                          CLR     -(SP)
2336  004464  113716  001265                  MOVB    $VECT1+1,(SP)
2337  004470  006216                          ASR     (SP)            ;SHIFT 5 BITS RIGHT
2338  004472  006216                          ASR     (SP)
2339  004474  006216                          ASR     (SP)
2340  004476  006216                          ASR     (SP)
2341  004500  006216                          ASR     (SP)
2342  004502  104402                          TYPOC
2343  004504  104401  052070                  TYPE    ,OPR002
2344  004510  104412                          RDOCT                   ;GET VALUE
2345  004512  012637  001160                  MOV     (SP)+,$TMP0
2346  004516  001430                          BEQ     15$             ;CHECK FOR DEFAULT
2347  004520  022737  000007  001160          CMP     #7,$TMP0        ;CHECK IF LEGAL
2348  004526  103753                          BLO     10$
2349  004530  022737  000004  001160          CMP     #4,$TMP0
2350  004536  101347                          BHI     10$
2351  004540  006337  001160                  ASL     $TMP0           ;SHIFT 5 BITS LEFT
2352  004544  006337  001160                  ASL     $TMP0
2353  004550  006337  001160                  ASL     $TMP0
2354  004554  006337  001160                  ASL     $TMP0
2355  004560  006337  001160                  ASL     $TMP0
2356  004564  042737  160000  001264          BIC     #160000,$VECT1  ;STORE NEW PRIORITY
```

```
 2357  004572  153737  001160  001265          BISB    $TMP0,$VECT1+1
 2358  004600  013737  001264  003600  15$:    MOV     $VECT1,RKVEC    ;STORE RK611 VECTOR
 2359  004606  042737  160000  003600          BIC     #160000,RKVEC
 2360  004614  113737  001265  003602          MOVB    $VECT1+1,RKPRI  ;STORE PRIORITY
 2361  004622  004737  043712                  JSR     PC,$SIZE        ;SIZE MEMORY
 2362  004626  013702  001270                  MOV     $BASE,R2        ;SET RK611 BASE
 2363  004632  005037  001202                  CLR     $ESCAPE         ;CLEAR ESCAPE
 2364
 2365  004636  012746  000000          NEWPAS: MOV     #PR0,-(SP)      ;ALLOW ALL INTERRUPTS
 2366  004642  012746  004650                  MOV     #TST1,-(SP)
 2367  004646  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.
                                ;*
                                ;;*****************************************************************
004650  000004                  TST1:   SCOPE
004652  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
004660  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
004664  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004672  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004700  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004706  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
004714  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004722  012762  012025  000000          MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE RDHEAD WITH CDT SET IN
                                                                ;  24 SECTOR FORMAT
004730  012700  000016                  MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004734  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004742  012762  000040  000026          MOV     #DMD,RKMR1(R2)
004750  005300                          DEC     R0
004752  001370                          BNE     1$
004754  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
004762  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
004770  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
004776  012737  012025  003500          MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
005004  012737  071027  003526          MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
005012  012737  037760  003530          MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
005020  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
005026  001405                          BEQ     2$              ;YES, CHECK MESSAGE A
005030  104001                          ERROR   1               ;CS1 INCORRECT
005032  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005040  000412                          BR      TST2            ;;GO TO NEXT TEST
005042  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005050  001401                          BEQ     3$              ;YES, CHECK MESSAGE B
005052  104002                          ERROR   2               ;MESS A INCORRECT
005054  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005062  001401                          BEQ     TST2            ;;YES, GO ON TO NEXT TEST
005064  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,
```

```
                                        ;*      CYLINDER 1777, HEAD 7, DRIVE 7.
                                        ;*
                                        ;;*****************************************************************
005066  000004                          TST2:   SCOPE
005070  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
005076  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
005102  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005110  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
005116  012762  001777  000020                  MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
005124  012762  003400  000006                  MOV     #3400,RKDA(R2)  ;LOAD TRACK
005132  012762  000007  000010                  MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
005140  012762  012027  000000                  MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE WRHEAD WITH CDT SET IN
                                                                        ;  24 SECTOR FORMAT
005146  012700  000016                          MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
005152  012762  000440  000026  1$:             MOV     #DMD!MCLK,RKMR1(R2)
005160  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
005166  005300                                  DEC     R0
005170  001370                                  BNE     1$
005172  016237  000000  003440                  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
005200  016237  000034  003466                  MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
005206  016237  000036  003470                  MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
005214  012737  012027  003500                  MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
005222  012737  071227  003526                  MOV     #S.SEEK!S.RTC!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
005230  012737  037760  003530                  MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
005236  023737  003500  003440                  CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
005244  001405                                  BEQ     2$              ;YES, CHECK MESSAGE A
005246  104004                                  ERROR   4               ;CS1 INCORRECT
005250  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005256  000412                                  BR      TST3            ;;GO TO NEXT TEST
005260  023737  003526  003466  2$:             CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005266  001401                                  BEQ     3$              ;YES, CHECK MESSAGE B
005270  104005                                  ERROR   5               ;MESS A INCORRECT
005272  023737  003530  003470  3$:             CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005300  001401                                  BEQ     TST3            ;;YES, GO ON TO NEXT TEST
005302  104006                                  ERROR   6               ;MESS B INCORRECT

                                        ;;*****************************************************************
                                        ;*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.
                                        ;*
                                        ;;*****************************************************************
005304  000004                          TST3:   SCOPE
005306  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
005314  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
005320  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005326  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
005334  012762  001777  000020                  MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
005342  012762  003400  000006                  MOV     #3400,RKDA(R2)  ;LOAD TRACK
005350  012762  000007  000010                  MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
005356  012762  012025  000000                  MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
                                                                        ;  24 SECTOR FORMAT
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```
 2480  005364  012700  000156                    MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
 2481  005370  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
 2482  005376  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 2483  005404  005300                            DEC     R0
 2484  005406  001370                            BNE     1$
 2485  005410  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 2486  005416  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
 2487  005424  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
 2488  005432  012737  012025  003500            MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
 2489  005440  012737  071407  003526            MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
 2490  005446  005037  003530                    CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
 2491  005452  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
 2492  005460  001405                            BEQ     2$              ;YES, CHECK CS2
 2493  005462  104007                            ERROR   7               ;CS1 INCORRECT
 2494  005464  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 2495  005472  000412                            BR      TST4            ;;GO TO NEXT TEST
 2496  005474  023737  003526  003466  2$:       CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
 2497  005502  001401                            BEQ     3$              ;YES, CHECK MESS B
 2498  005504  104010                            ERROR   10              ;MESS A INCORRECT
 2499  005506  023737  003530  003470  3$:       CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
 2500  005514  001401                            BEQ     TST4            ;;YES, GO ON TO NEXT TEST
 2501  005516  104011                            ERROR   11              ;MESS B INCORRECT
 2502
 2503                                    ;;*****************************************************************
 2504                                    ;*TEST 4        WRITE HEADER DRIVE CLEAR MESSAGE
 2505                                    ;*
 2506                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
 2507                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER WITH CDT SET
 2508                                    ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
 2509                                    ;*      CLOCK SEEK MESSAGE AND LOAD GENERATED DRIVE CLEAR
 2510                                    ;*      INTO SHIFT REGISTER.  MAKE SURE THE DRIVE CLEAR IS
 2511                                    ;*      GENERATED AND THE PROPER BITS ARE SET.
 2512                                    ;*
 2513                                    ;;*****************************************************************
 2514  005520  000004                    TST4:   SCOPE
 2515  005522  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 2516  005530  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
 2517  005534  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 2518  005542  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 2519  005550  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
 2520  005556  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
 2521  005564  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
 2522  005572  012762  012027  000000            MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
 2523                                                                    ;  24 SECTOR FORMAT
 2524  005600  012700  000156                    MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
 2525  005604  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
 2526  005612  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 2527  005620  005300                            DEC     R0
 2528  005622  001370                            BNE     1$
 2529  005624  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 2530  005632  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
 2531  005640  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
 2532  005646  012737  012027  003500            MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
 2533  005654  012737  071407  003526            MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
 2534  005662  005037  003530                    CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
 2535  005666  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
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2536  005674  001405                          BEQ     2$              ;YES, CHECK CS2
2537  005676  104012                          ERROR   12              ;CS1 INCORRECT
2538  005700  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2539  005706  000412                          BR      TST5            ;;GO TO NEXT TEST
2540  005710  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2541  005716  001401                          BEQ     3$              ;YES, CHECK MESS B
2542  005720  104013                          ERROR   13              ;MESS A INCORRECT
2543  005722  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2544  005730  001401                          BEQ     TST5            ;;YES, GO ON TO NEXT TEST
2545  005732  104014                          ERROR   14              ;MESS B INCORRECT
2546
2547
2548                                  .SBTTL  **INDEX AND SECTOR PULSE DETECT ON
2549
2550                                  ;;*******************************************************************
2551                                  ;*TEST 5        SECTOR PULSE DETECT IN READ HEADER (PART 1)
2552                                  ;*
2553                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2554                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2555                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2556                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2557                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES AND A ONE.
2558                                  ;*
2559                                  ;*      MAKE SURE READ GATE DOES SET.
2560                                  ;*
2561                                  ;;*******************************************************************
2562  005734  000004                  TST5:   SCOPE
2563  005736  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2564  005744  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2565  005750  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2566  005756  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2567  005764  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2568  005772  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2569  006000  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2570  006006  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2571  006012  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2572  006020  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2573  006026  005300                          DEC     R0
2574  006030  001370                          BNE     1$
2575  006032  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2576  006040  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2577  006046  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2578  006054  001405                          BEQ     2$              ;YES, CLOCK ZEROES
2579  006056  104015                          ERROR   15              ;CS1 INCORRECT
2580  006060  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2581  006066  000553                          BR      TST6            ;;GO ON TO NEXT TEST
2582
2583  006070  012762  000140  000026  2$:     MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
2584  006076  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2585  006104  012737  022040  003524          MOV     #MEMD!ECCM,E.MR1  ;LOAD EXPECT MAINT REG. 1
2586  006112  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2587  006116  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2588  006122  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROES
2589  006126  012700  000200                  MOV     #128.,R0        ;GENERATE 128 ZEROS UNTIL READ GATE
2590  006132  004737  043540          5$:     JSR     PC,RDBIT        ;READ A ZERO
2591  006136  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
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2592  006144  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2593  006152  001405                          BEQ     6$              ;YES, SIMULATE NEXT BIT
2594  006154  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2595  006156  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2596  006164  000514                          BR      TST6            ;;GO ON TO NEXT TEST
2597
2598  006166  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2599  006172  005300                          DEC     R0              ;CHECK READY OF READ GATE
2600  006174  001356                          BNE     5$              ;NO, CONTINUE
2601  006176  012737  122040  003524          MOV     #DMD!MEWD!ECCW!RDGATE,E.MR1  ;LOAD EXPECTED MR1
2602  006204  012700  000177                  MOV     #127.,R0        ;GENERATE 127 ZEROS
2603  006210  004737  043540          10$:    JSR     PC,RDBIT        ;READ A ZERO
2604  006214  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2605  006222  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2606  006230  001405                          BEQ     11$             ;YES, SIMULATE NEXT BIT
2607  006232  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2608  006234  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2609  006242  000465                          BR      TST6            ;;GO ON TO NEXT TEST
2610
2611  006244  005237  003622          11$:    INC     BITCNT          ;INCREMENT BIT COUNT
2612  006250  005300                          DEC     R0              ;CHECK IF ALL ZEROS ISSUED
2613  006252  001356                          BNE     10$             ;NO, CONTINUE
2614  006254  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2615  006262  004737  043540                  JSR     PC,RDBIT        ;READ A ONE
2616  006266  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2617  006274  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1
2618  006302  001405                          BEQ     12$             ;YES, CONTINUE
2619  006304  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2620  006306  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2621  006314  000440                          BR      TST6            ;;GO ON TO NEXT TEST
2622  006316  005237  003622          12$:    INC     BITCNT          ;INCREMENT BIT COUNT
2623  006322  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2624  006330  005037  003614                  CLR     PR.BIT
2625  006334  004737  043540                  JSR     PC,RDBIT        ;SIMULATE ZERO
2626  006340  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2627  006346  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2628  006354  001405                          BEQ     13$             ;CHECK CS1 CORRECT
2629  006356  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2630  006360  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2631  006366  000413                          BR      TST6            ;;GO TO NEXT TEST
2632
2633  006370  016237  000000  003440  13$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2634  006376  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2635  006404  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2636  006412  001401                          BEQ     TST6            ;;YES, GO TO NEXT TEST
2637  006414  104016                          ERROR   16              ;CS1 INCORRECT
2638
2639                                  ;;*****************************************************************
2640                                  ;*TEST 6        SECTOR PULSE DETECT IN READ HEADER (PART 2)
2641                                  ;*
2642                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2643                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2644                                  ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2645                                  ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2646                                  ;*      SIMULATE INDEX PULSE, 255 ZEROES AND A ONE.
2647                                  ;*
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                                        ;*      MAKE SURE READ GATE DOES NOT SET.
                                        ;*
                                        ;;*****************************************************************
006416  000004                  TST6:   SCOPE
006420  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
006426  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
006432  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006440  012762  000040  000000          MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
006446  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
006454  012762  000040  000026          MOV     #DMD,RKMR1(R2)
006462  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
006470  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
006474  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
006502  012762  000040  000026          MOV     #DMD,RKMR1(R2)
006510  005300                          DEC     R0
006512  001370                          BNE     1$
006514  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
006522  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
006530  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
006536  001405                          BEQ     2$              ;YES, CLOCK IN ZEROS
006540  104015                          ERROR   15
006542  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006550  000535                          BR      TST7            ;;GO ON TO NEXT TEST
006552                          2$:
006552  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDX PULSE
006560  012700  000004                  MOV     #4,R0
006564  012762  000640  000026  3$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
006572  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
006600  005300                          DEC     R0
006602  001370                          BNE     3$
006604  012762  000040  000026          MOV     #DMD,RKMR1(R2)
006612  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
006616  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
006624  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
006630  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
006634  012700  000377                  MOV     #255.,R0        ;GENERATE 255 ZEROES
006640  004737  043540          5$:     JSR     PC,RDBIT        ;READ A ZERO
006644  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006652  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006660  001405                          BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
006662  104020                          ERROR   20              ;MAINT REG. 1 INCORRECT
006664  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006672  000464                          BR      TST7            ;;GO ON TO NEXT TEST

006674  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
006700  005300                          DEC     R0              ;CHECK IF ALL ZEROES ISSUED
006702  001356                          BNE     5$              ;NO, CONTINUE
006704  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
006712  004737  043540                  JSR     PC,RDBIT        ;READ A ONE
006716  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006724  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006732  001405                          BEQ     7$              ;YES, CONTINUE
006734  104020                          ERROR   20              ;MAINT REG. 1 INCORRECT
006736  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006744  000437                          BR      TST7            ;;GO ON TO NEXT TEST
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2704  006746  005237  003622          7$:   INC     BITCNT           ;INCREMENT BIT COUNT
2705  006752  013737  003614  003616        MOV     PR.BIT,M1.BIT    ;LOAD ZERO FOR NEXT BIT
2706  006760  005037  003614                CLR     PR.BIT
2707  006764  004737  043540                JSR     PC,RDBIT         ;SIMULATE ZERO
2708  006770  016237  000026  003464        MOV     RKMR1(R2),T.MR1  ;STORE MAINTENANCE REG. 1
2709  006776  023737  003524  003464        CMP     E.MR1,T.MR1      ;CHECK MAINTENANCE REG. 1 CORRECT
2710  007004  001404                        BEQ     9$               ;CHECK CS1 CORRECT
2711  007006  012762  100000  000000        MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2712  007014  000413                        BR      TST7             ;;GO TO NEXT TEST
2713
2714  007016  016237  000000  003440  9$:   MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
2715  007024  012737  000025  003500        MOV     #RDHEAD,E.CS1    ;LOAD EXPECTED CS1
2716  007032  023737  003500  003440        CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
2717  007040  001401                        BEQ     TST7             ;;YES, GO TO NEXT TEST
2718  007042  104016                        ERROR   16               ;CS1 INCORRECT
2719
2720                                ;;*****************************************************************
2721                                ;*TEST 7        SECTOR PULSE DETECT IN READ HEADER (PART 3)
2722                                ;*
2723                                ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2724                                ;*      DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2725                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
2726                                ;*      CLOCK BOTH SEEK AND DRIVE CHECK MESSAGES.
2727                                ;*      SIMULATE 255 ZEROES AND A ONE.
2728                                ;*
2729                                ;*      MAKE SURE READ GATE DOES NOT SET.
2730                                ;*
2731                                ;;*****************************************************************
2732  007044  000004                TST7:   SCOPE
2733  007046  012737  000012  001200        MOV     #10.,$TIMES      ;;DO 10. ITERATIONS
2734  007054  013702  001270                MOV     $BASE,R2         ;LOAD RK611 BASE
2735  007060  012762  100000  000000        MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2736  007066  012762  000040  000000        MOV     #DMD,RKCS1(R2)   ;PUT RK611 IN DIAGNOSTIC MODE
2737  007074  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2738  007102  012762  000040  000026        MOV     #DMD,RKMR1(R2)
2739  007110  012762  000025  000000        MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2740  007116  012700  000312                MOV     #50.*4+2,R0      ;CLOCK UNTIL READY FOR SECTOR PULSE
2741  007122  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
2742  007130  012762  000040  000026        MOV     #DMD,RKMR1(R2)
2743  007136  005300                        DEC     R0
2744  007140  001370                        BNE     1$
2745  007142  016237  000000  003440        MOV     RKCS1(R2),T.CS1  ;STORE COMMAND AND STATUS REG. 1
2746  007150  012737  000025  003500        MOV     #RDHEAD,E.CS1    ;LOAD EXPECTED CS1
2747  007156  023737  003500  003440        CMP     E.CS1,T.CS1      ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2748  007164  001405                        BEQ     2$               ;YES, CLOCK IN ZEROS
2749  007166  104015                        ERROR   15
2750  007170  012762  100000  000000        MOV     #CCLR,RKCS1(R2)  ;CLEAR RK611
2751  007176  000515                        BR      TST10            ;;GO ON TO NEXT TEST
2752  007200                          2$:
2753  007202  005037  003622                CLR     BITCNT           ;INITIALIZE BIT COUNT
2754  007206  012737  000340  003524        MOV     #DMD!MEMD!ECCM,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
2755  007214  005037  003614                CLR     PR.BIT           ;INITIALIZE PRESENT AND PREVIOUS
2756  007220  005037  003616                CLR     M1.BIT           ;  BITS TO GENERATE ZEROS
2757  007224  012700  000377                MOV     #255.,R0         ;GENERATE 255 ZEROES
2758  007230  004737  043540          5$:   JSR     PC,RDBIT         ;READ A ZERO
2759  007234  016237  000026  003464        MOV     RKMR1(R2),T.MR1  ;STORE MAINTENANCE REG. 1
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2760  007240  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2761  007246  001405                          BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
2762  007250  104021                          ERROR   21              ;MAINT REG. 1 INCORREC.
2763  007252  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2764  007260  000464                          BR      TST10           ;;GO ON TO NEXT TEST
2765
2766  007262  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2767  007266  005300                          DEC     R0              ;CHECK IF ALL ZEROES ISSUED
2768  007270  001356                          BNE     5$              ;NO, CONTINUE
2769  007272  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2770  007300  004737  043540                  JSR     PC,RDBIT        ;READ A ONE
2771  007304  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2772  007312  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2773  007320  001405                          BEQ     7$              ;YES, CONTINUE
2774  007322  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2775  007324  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2776  007332  000437                          BR      TST10           ;;GO ON TO NEXT TEST
2777
2778  007334  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2779  007340  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2780  007346  005037  003614                  CLR     PR.BIT
2781  007352  004737  043540                  JSR     PC,RDBIT        ;SIMULATE ZERO
2782  007356  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2783  007364  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2784  007372  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2785  007374  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2786  007402  000413                          BR      TST10           ;;GO TO NEXT TEST
2787
2788  007404  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2789  007412  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2790  007420  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2791  007426  001401                          BEQ     TST10           ;;YES, GO TO NEXT TEST
2792  007430  104016                          ERROR   16              ;CS1 INCORRECT
2793
2794                                  ;;*****************************************************************
2795                                  ;*TEST 10       INDEX PULSE DETECTION IN WRITE HEADER
2796                                  ;*
2797                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2798                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
2799                                  ;*      TO AN RK06, IN 26 SECTOR FORMAT, TO CYLINDER 0, HEAD 0,
2800                                  ;*      DRIVE 0, WITH A ONE WORD TRANSFER.  CLOCK THROUGH THE
2801                                  ;*      SEEK AND THE DRIVE CLEAR MESSAGES.  ISSUE 200 CONTROLLER
2802                                  ;*      CLOCKS AND MAKE SURE WRITE GATE DOES NOT SET.  SIMULATE
2803                                  ;*      SECTOR PULSE AND 200 CONTROLLER CLOCKS MAKING SURE WRITE
2804                                  ;*      GATE DOES NOT SET.  SIMULATE INDEX PULSE AND MAKE SURE
2805                                  ;*      WRITE GATE SETS.
2806                                  ;*
2807                                  ;*****************************************************************
2808  007432  000004                  TST10:  SCOPE
2809  007434  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2810  007442  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2811  007446  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2812  007454  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2813  007462  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIAILZE ROM ADDRESS
2814  007470  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2815  007476  012762  064630  000004          MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
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2816  007504  012762  177777  000002          MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
2817  007512  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
2818  007520  012700  000312                  MOV     #50.*4+2,R0      ;CLOCK UNTIL READY FOR INDEX PULSE
2819  007524  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2820  007532  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2821  007540  005300                          DEC     R0
2822  007542  001370                          BNE     1$
2823  007544  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2824  007552  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
2825  007560  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2826  007566  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
2827  007574  012737  064630  003504          MOV     #WRBUFF,E.BA    ;LOAD EXPECTED BUS ADDRESS
2828  007602  012737  177777  003502          MOV     #-1,E.WC        ;LOAD EXPECTED WORD COUNT
2829  007610  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2830  007616  001403                          BEQ     2$              ;YES, CONTINUE
2831  007620  104022                          ERROR   22              ;CS1 INCORRECT
2832  007622  000137  010550                  JMP     60$             ;CLEAR CONTROLLER
2833
2834  007626  023737  003504  003444  2$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2835  007634  001403                          BEQ     3$              ;YES, CONTINUE
2836  007636  104023                          ERROR   23              ;BUS ADDRESS INCORRECT
2837  007640  000137  010550                  JMP     60$             ;CLEAR RK611
2838
2839  007644  023737  003502  003442  3$:     CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2840  007652  001403                          BEQ     4$              ;YES, CONTINUE
2841  007654  104024                          ERROR   24              ;WORD COUNT INCORRECT
2842  007656  000137  010550                  JMP     60$             ;CLEAR RK611
2843
2844  007662  012737  022040  003524  4$:     MOV     #ECCW!MEWD!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2845  007670  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2846  007674  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2847  007700  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2848  007706  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2849  007714  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2850  007722  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2851  007730  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2852  007736  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2853  007744  001403                          BEQ     6$              ;YES, CONTINUE
2854  007746  104025                          ERROR   25              ;MAINT REG 1 INCORRECT
2855  007750  000137  010550                  JMP     60$             ;CLEAR RK611
2856
2857  007754  005300                  6$:     DEC     R0              ;CHECK IF READY FOR SECTOR PULSE
2858  007756  001350                          BNE     5$              ;NO, GET NEXT BIT
2859  007760  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2860  007766  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
2861  007774  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG
2862  010002  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2863  010010  001403                          BEQ     10$             ;YES, CONTINUE
2864  010012  104026                          ERROR   26              ;CS1 INCORRECT
2865  010014  000137  010550                  JMP     60$             ;CLEAR RK611
2866
2867  010020  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2868  010026  001403                          BEQ     11$             ;YES, CONTINUE
2869  010030  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2870  010032  000137  010550                  JMP     60$             ;CLEAR RK611
2871
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2872  010036  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
2873  010044  001403                          BEQ     12$             ;YES, CONTINUE
2874  010046  104030                          ERROR   30              ;WORD COUNT INCORRECT
2875  010050  000137  010550                  JMP     60$             ;CLEAR RK611
2876
2877  010054  012700  000004          12$:    MOV     #4,R0           ;SIMULATE SECTOR PULSE
2878  010060  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2879  010066  012762  000540  000026  13$:    MOV     #DMD!MSP!MCLK,RKMR1(R2)
2880  010074  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2881  010102  005300                          DEC     R0
2882  010104  001370                          BNE     13$
2883  010106  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2884  010114  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2885  010122  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS AND REG.
2886  010130  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2887  010136  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 INCORRECT
2888  010144  001402                          BEQ     15$             ;YES, CONTINUE
2889  010146  104026                          ERROR   26              ;CS1 INCORRECT
2890  010150  000577                          BR      60$             ;CLEAR RK611
2891
2892  010152  023737  003504  003444  15$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2893  010160  001402                          BEQ     16$             ;YES, CONTINUE
2894  010162  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2895  010164  000571                          BR      60$             ;CLEAR RK611
2896
2897  010166  023737  003502  003442  16$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2898  010174  001402                          BEQ     20$             ;YES, CONTINUE
2899  010176  104030                          ERROR   30              ;WORD COUNT INCORRECT
2900  010200  000563                          BR      60$             ;CLEAR RK611
2901
2902  010202  005037  003622          20$:    CLR     BITCNT          ;INITIALIZE BIT COUNT
2903  010206  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2904  010212  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2)
2905  010220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2906  010226  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2907  010234  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2908  010242  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2909  010250  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2910  010256  001402                          BEQ     22$             ;YES, CONTINUE
2911  010260  104025                          ERROR   25              ;MAINT REG. 1 INCORRECT
2912  010262  000532                          BR      60$             ;CLEAR RK611
2913
2914  010264  005300                  22$:    DEC     R0              ;CHECK IF READY FOR INDEX PULSE
2915  010266  001351                          BNE     21$             ;NO, GET NEXT BIT
2916  010270  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2917  010276  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2918  010304  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2919  010312  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2920  010320  001402                          BEQ     23$             ;YES, CONTINUE
2921  010322  104026                          ERROR   26              ;CS1 INCORRECT
2922  010324  000511                          BR      60$             ;CLEAR RK611
2923
2924  010326  023737  003504  003444  23$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2925  010334  001402                          BEQ     24$             ;YES, CONTINUE
2926  010336  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2927  010340  000503                          BR      60$             ;CLEAR RK611
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2928
2929  010342  023737  003502  003442  24$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2930  010350  001402                          BEQ     25$             ;YES, CONTINUE
2931  010352  104030                          ERROR   30              ;WORD COUNT INCORRECT
2932  010354  000475                          BR      60$             ;CLEAR RK611
2933
2934  010356  012762  000240  000026  25$:    MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE PULSE
2935  010364  012700  000004                  MOV     #4,R0
2936  010370  012762  000640  000026  26$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
2937  010376  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
2938  010404  005300                          DEC     R0
2939  010406  001370                          BNE     26$
2940  010410  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2941  010416  012700  000002                  MOV     #2,R0           ;SIMULATE TWO CLOCK PULSES FOR WRITE
2942                                                                  ;  GATE TO COME UP
2943  010422  012762  000440  000026  27$:    MOV     #DMD!MCLK,RKMR1(R2)
2944  010430  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2945  010436  005300                          DEC     R0
2946  010440  001370                          BNE     27$
2947  010442  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2948  010450  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2949  010456  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2950  010464  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2951  010472  012737  062040  003524          MOV     #WRTGAT!MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2952  010500  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2953  010506  001401                          BEQ     28$             ;YES, CONTINUE
2954  010510  104031                          ERROR   31              ;CS1 INCORRECT
2955  010512  023737  003504  003444  28$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2956  010520  001401                          BEQ     29$             ;YES, CONTINUE
2957  010522  104032                          ERROR   32              ;BUS ADDRESS INCORRECT
2958  010524  023737  003502  003442  29$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2959  010532  001401                          BEQ     30$             ;YES, CONTINUE
2960  010534  104033                          ERROR   33              ;WORD COUNT INCORRECT
2961  010536  023737  003524  003464  30$:    CMP     E.MR1,T.MR1     ;CHECK MAINT REG 1 CORRECT
2962  010544  001401                          BEQ     60$             ;YES, CLEAR RK611
2963  010546  104034                          ERROR   34              ;MAINT REG. 1 INCORRECT
2964  010550  012762  100000  000000  60$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2965
2966                                  .SBTTL  **NPR READING OF MEMORY
2967
2968                                  ;;*****************************************************************
2969                                  ;*TEST 11       NPR OUTPUT DATA TRANSFER
2970                                  ;*
2971                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2972                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
2973                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 777, HEAD 7, DRIVE 7.
2974                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK BOTH SEEK
2975                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE INDEX PULSE.
2976                                  ;*      CLOCK IN FIRST WORD OF NPR TRANSFER.  CHECK INPUT READY,
2977                                  ;*      OUTPUT READY, BUS  ADDRESS, WORD COUNT, AND CONTENTS OF
2978                                  ;*      THE SILO.  REPEAT FOR 8 DIFFERENT DATA PATTERNS.
2979                                  ;*
2980                                  ;;*****************************************************************
2981  010556  000004          001200  TST11:  SCOPE
2982  010560  012737  000144          001200  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2983  010566  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
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 2984  010572  012703  064310                MOV     #PATTERN,R3      ;LOAD PATTERN ADDRESS
 2985  010576  012704  000010                MOV     #8.,R4           ;LOAD PATTERN COUNT
 2986  010602  012737  064632  003504        MOV     #WRBUFF+2,E.BA   ;LOAD EXPECTED BUS ADDRESS
 2987  010610  012737  000027  003500        MOV     #WRHEAD,E.CS1    ;LOAD EXPECTED CS1
 2988  010616  005037  003502                CLR     E.WC             ;LOAD EXPECTED WORD COUNT
 2989  010622  012737  010630  001110        MOV     #1$,$LPERR       ;LOAD LOOP ON ERROR LOCATION FOR
 2990                                                                 ;  SUBTEST LOOP
 2991
 2992  010630                          1$:
 2993  010630  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 2994  010636  011337  064630                MOV     (R3),WRBUFF      ;LOAD BUFFER FOR WRITE HEADER
 2995  010642  012762  000040  000026        MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN MAINT MODE
 2996  010650  012762  000777  000020        MOV     #777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS
 2997  010656  012762  003400  000006        MOV     #3400,RKDA(R2)   ;LOAD DISK ADDRESS
 2998  010664  012762  064630  000004        MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
 2999  010672  012762  000007  000010        MOV     #7,RKCS2(R2)     ;LOAD OTHER NUMBER
 3000  010700  012762  177777  000002        MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
 3001  010706  012762  000027  000000        MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
 3002  010714  012700  000312                MOV     #50.*4+2,R0      ;ISSUE CLOCKS UNTIL READY FOR
 3003                                                                 ;  INDEX PULSE
 3004  010720  012762  000440  000026  2$:   MOV     #DMD!MCLK,RKMR1(R2)
 3005  010726  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 3006  010734  005300                        DEC     R0
 3007  010736  001370                        BNE     2$
 3008  010740  012700  000004                MOV     #4,R0            ;SIMULATE INDEX PULSE
 3009  010744  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
 3010  010752  012762  000640  000026  3$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
 3011  010760  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
 3012  010766  005300                        DEC     R0
 3013  010770  001370                        BNE     3$
 3014  010772  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 3015  011000  012700  000045                MOV     #37.,R0          ;SIMULATE 1 NPR TRANSFER
 3016  011004  012762  000440  000026  4$:   MOV     #DMD!MCLK,RKMR1(R2)
 3017  011012  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 3018  011020  005300                        DEC     R0
 3019  011022  001370                        BNE     4$
 3020  011024  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3021  011032  016237  000004  003444        MOV     RKBA(R2),T.BA    ;STORE BUS ADDRESS REG
 3022  011040  016237  000002  003442        MOV     RKWC(R2),T.WC    ;STORE WORD COUNT
 3023  011046  012700  000024                MOV     #20.,R0          ;WAIT FOR OUTPUT READY
 3024  011052  005300                  5$:   DEC     R0
 3025  011054  001376                        BNE     5$
 3026  011056  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 3027  011064  012737  000307  003510        MOV     #OR!IR!7,E.CS2  ;LOAD EXPECTED CS2
 3028  011072  023737  003500  003440        CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
 3029  011100  001401                        BEQ     6$               ;YES, CHECK CS2
 3030  011102  104035                        ERROR   35               ;CS1 INCORRECT
 3031  011104  023737  003510  003450  6$:   CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
 3032  011112  001401                        BEQ     7$               ;YES, CONTINUE
 3033  011114  104036                        ERROR   36               ;CS2 INCORRECT
 3034  011116  023737  003504  003444  7$:   CMP     E.BA,T.BA        ;CHECK IF BUS ADDRESS INCREMENT OCCURRED
 3035  011124  001401                        BEQ     8$               ;YES, CONTINUE
 3036  011126  104037                        ERROR   37               ;BUS ADDRESS INCORRECT
 3037  011130  023737  003502  003442  8$:   CMP     E.WC,T.WC        ;CHECK WORD COUNT REG CORRECT
 3038  011136  001401                        BEQ     9$               ;YES, CONTINUE
 3039  011140  104040                        ERROR   40               ;WORD COUNT INCORRECT
```

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3040  011142  016237  000024  003462  9$:     MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3041  011150  011337  003522                  MOV     (R3),E.DB       ;LOAD EXPECTED DATA BUFFER
3042  011154  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3043  011162  001401                          BEQ     15$             ;YES,CONTINUE
3044  011164  104041                          ERROR   41              ;DATA BUFFER INCORRECT
3045  011166  016237  000000  003440  15$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3046  011174  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3047  011202  012737  000107  003510          MOV     #IR!7,E.CS2     ;LOAD EXPECTED CS2
3048  011210  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3049  011216  001401                          BEQ     17$             ;YES, CONTINUE
3050  011220  104042                          ERROR   42              ;CS1 INCORRECT
3051  011222  023737  003510  003450  17$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3052  011230  001401                          BEQ     20$             ;YES, CONTINUE
3053  011232  104043                          ERROR   43              ;CS2 INCORRECT
3054  011234  104415                  20$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3055  011236  005723                          TST     (R3)+           ;GENERATE ADDRESS OF NEXT CONFIG
3056  011240  005304                          DEC     R4              ;CHECK IF ALL 8 CONFIGS TRIED
3057  011242  001000                          BNE     TST12           ;;NO, TRY NEXT DATA PATTERN
3058
3059                                  ;;*****************************************************************
3060                                  ;*TEST 12       PARTIAL SILO FILLING
3061                                  ;*
3062                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3063                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3064                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3065                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK IN ALL
3066                                  ;*      SPECIFIED WORDS INTO THE SILO.  CHECK WORD COUNT,
3067                                  ;*      BUS ADDRESS, INPUT READY, AND OUTPUT READY.  MAKE
3068                                  ;*      SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
3069                                  ;*      INTO THE SILO.  CHECK THE SILO FOR CORRECT DATA.
3070                                  ;*      REPEAT FOR WORD COUNTS 2-65.
3071                                  ;*
3072                                  ;*****************************************************************
3073  011244  000004                  TS112:  SCOPE
3074  011246  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3075  011254  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3076  011260  012737  000001  001160          MOV     #1,$TMP0        ;LOAD NUMBER OF WORDS FOR DATA TRANSFER
3077  011266  012704  000065                  MOV     #65,R4          ;LOAD ITERATION COUNT
3078  011272  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3079  011300  012737  011306  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3080                                                                  ;  SUBTEST LOOP
3081
3082  011306                          1$:
3083  011306  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3084  011314  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3085  011322  012762  064406  000004          MOV     #NPRBUF,RKBA(R2)  ;LOAD BUS ADDRESS
3086  011330  012737  064406  003504          MOV     #NPRBUF,E.BA
3087  011336  013737  001160  003502          MOV     $TMP0,E.WC      ;LOAD WORD COUNT
3088  011344  005437  003502                  NEG     E.WC
3089  011350  013762  003502  000002          MOV     E.WC,RKWC(R2)
3090  011356  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3091  011364  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3092                                                                  ;  INDEX PULSE
3093  011370  012762  000440  000026  2$:     MOV     #DMD!MCLK,RKMR1(R2)
3094  011376  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3095  011404  005300                          DEC     R0
```

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3096  011406  001370                        BNE     2$
3097  011410  012700  000004                MOV     #4,R0           ;SIMULATE INDEX PULSE
3098  011414  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3099  011422  012762  000640  000026  3$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
3100  011430  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3101  011436  005300                        DEC     R0
3102  011440  001370                        BNE     3$
3103  011442  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3104  011450  012737  000300  003510        MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3105  011456  012700  000045          4$:   MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3106  011462  012762  000440  000026  5$:   MOV     #DMD!MCLK,RKMR1(R2)
3107  011470  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3108  011476  005300                        DEC     R0
3109  011500  001370                        BNE     5$
3110  011502  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3111  011510  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3112  011516  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3113  011524  022737  064406  003504        CMP     #NPRBUF,E.BA    ;CHECK IF FIRST WORD
3114  011532  001004                        BNE     7$              ;NO, STORE CS2
3115  011534  012700  000024                MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3116  011540  005300                  6$:   DEC     R0
3117  011542  001376                        BNE     6$
3118  011544  016237  000010  003450  7$:   MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3119  011552  062737  000002  003504        ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADD
3120  011560  005237  003502                INC     E.WC
3121  011564  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3122  011572  001401                        BEQ     8$              ;YES, CHECK CS2
3123  011574  104044                        ERROR   44              ;CS1 INCORRECT
3124  011576  023737  003510  003450  8$:   CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3125  011604  001401                        BEQ     9$              ;YES, CHECK BUSS ADDRESS REG.
3126  011606  104045                        ERROR   45              ;CS2 INCORRECT
3127  011610  023737  003504  003444  9$:   CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3128  011616  001401                        BEQ     10$             ;YES, CHECK WORD COUNT
3129  011620  104046                        ERROR   46              ;BUS ADDRESS INCORRECT
3130  011622  023737  003502  003442  10$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3131  011630  001401                        BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3132  011632  104047                        ERROR   47              ;WORD COUNT INCORRECT
3133  011634  005737  003502          11$:  TST     E.WC            ;CHECK IF FINISHED
3134  011640  001306                        BNE     4$              ;NO, TRANSFER NEXT WORD
3135  011642  012700  000112                MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3136  011646  012762  000440  000026  15$:  MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3137  011654  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3138  011662  005300                        DEC     R0
3139  011664  001370                        BNE     15$
3140  011666  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3141  011674  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3142  011702  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3143  011710  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3144  011716  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3145  011724  001401                        BEQ     16$             ;YES, CHECK CS2
3146  011726  104050                        ERROR   50              ;CS1 INCORRECT
3147  011730  023737  003510  003450  16$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3148  011736  001401                        BEQ     17$             ;YES, CHECK BUS ADDRESS
3149  011740  104051                        ERROR   51              ;CS2 INCORRECT
3150  011742  023737  003504  003444  17$:  CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3151  011750  001401                        BEQ     18$             ;YES, CHECK WORD COUNT
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3152  011752  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3153  011754  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3154  011762  001401                          BEQ     19$             ;YES, CONTINUE
3155  011764  104053                          ERROR   53              ;WORD COUNT INCORRECT
3156  011766  013701  001160          19$:    MOV     $TMP0,R1        ;LOAD NUMBER OF WORDS LOADED
3157  011772  012703  064406                  MOV     #NPRBUFF,R3     ;LOAD START ADDRESS
3158  011776  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINTOUT
3159  012002  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3160  012010  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3161  012014  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3162  012022  001401                          BEQ     26$             ;YES, CONTINUE
3163  012024  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3164  012026  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3165  012034  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3166  012042  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3167  012046  001003                          BNE     27$             ;NO, CONTINUE
3168  012050  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3169  012056  023737  003500  003440  27$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3170  012064  001401                          BEQ     28$             ;YES, CONTINUE
3171  012066  104055                          ERROR   55              ;CS1 INCORRECT
3172  012070  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3173  012076  001401                          BEQ     29$             ;YES, CONTINUE
3174  012100  104056                          ERROR   56              ;CS2 INCORRECT
3175  012102  005237  003624          29$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3176  012106  005301                          DEC     R1              ;DECREMENT WORDS READ
3177  012110  001334                          BNE     25$             ;CHECK IF ALL WORDS READ
3178  012112  104415                          SCOP1                   ;CHECK IF LOOP ON ERROR
3179  012114  005237  001160                  INC     $TMP0           ;INCREMENT WORDS READ FROM MEM
3180  012120  005304                          DEC     R4              ;CHECK IF FINISHED
3181  012122  001402                          BEQ     TST13           ;;YES, GO ON TO NEXT TEST
3182  012124  000137  011306                  JMP     1$              ;TRY NEXT WORD COUNT
3183
3184                                  ;;*****************************************************************
3185                                  ;*TEST 13       SILO FILLING WITH NPR TRANSFERS
3186                                  ;*
3187                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3188                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3189                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3190                                  ;*      SPECIFY A 66 WORD DATA TRANSFER, CLOCK IN ALL 66 WORDS
3191                                  ;*      INTO THE SILO.  CHECK INPUT READY, OUTPUT READY, BUS
3192                                  ;*      ADDRESS, WORD COUNT, AND CONTENTS OF THE SILO.
3193                                  ;*
3194                                  ;;*****************************************************************
3195  012130  000004                  TST13:  SCOPE
3196  012132  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3197  012140  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3198  012144  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3199  012152  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3200  012160  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3201  012166  012737  064410  003504          MOV     #NPRBUF+2,E.BA  ;LOAD BUS ADDRESS
3202  012174  012762  064406  000004          MOV     #NPRBUF,RKBA(R2)
3203  012202  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
3204  012210  012762  177676  000002          MOV     #-66.,RKWC(R2)
3205  012216  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3206  012224  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3207                                                                  ;  INDEX PULSE
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3208  012230  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3209  012236  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3210  012244  005300                          DEC     R0
3211  012246  001370                          BNE     1$
3212  012250  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3213  012254  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3214  012262  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3215  012270  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3216  012276  005300                          DEC     R0
3217  012300  001370                          BNE     2$
3218  012302  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3219  012310  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3220  012316  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3221  012322  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3222  012330  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3223  012336  005300                          DEC     R0
3224  012340  001370                          BNE     5$
3225  012342  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3226  012350  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3227  012356  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3228  012364  022737  064410  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
3229  012372  001004                          BNE     7$              ;NO, STORE CS2
3230  012374  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3231  012400  005300                  6$:     DEC     R0
3232  012402  001376                          BNE     6$
3233  012404  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3234  012412  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3235  012420  001401                          BEQ     8$              ;YES, CHECK CS2
3236  012422  104044                          ERROR   44              ;CS1 INCORRECT
3237  012424  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3238  012432  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
3239  012434  104045                          ERROR   45              ;CS2 INCORRECT
3240  012436  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3241  012444  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3242  012446  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
3243  012450  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3244  012456  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3245  012460  104047                          ERROR   47              ;WORD COUNT INCORRECT
3246  012462  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADDRESS
3247  012470  005237  003502                  INC     E.WC            ;
3248  012474  100710                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3249  012476  001004                          BNE     12$             ;CHECK IF LAST WORD
3250  012500  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3251  012506  000703                          BR      4$              ;PROCESS LAST WORD
3252
3253  012510  005037  003502          12$:    CLR     E.WC            ;ADJUST EXPECTED WORD COUNT
3254  012514  162737  000002  003504          SUB     #2,E.BA         ;  AND BUS ADDRESS
3255  012522  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3256  012526  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3257  012534  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3258  012542  005300                          DEC     R0
3259  012544  001370                          BNE     15$
3260  012546  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3261  012554  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3262  012562  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3263  012570  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
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3264  012576  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3265  012604  001401                          BEQ     16$             ;YES, CHECK CS2
3266  012606  104050                          ERROR   50              ;CS1 INCORRECT
3267  012610  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3268  012616  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3269  012620  104051                          ERROR   51              ;CS2 INCORRECT
3270  012622  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3271  012630  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3272  012632  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3273  012634  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3274  012642  001401                          BEQ     19$             ;YES, CHECK DATA
3275  012644  104053                          ERROR   53              ;WORD COUNT INCORRECT
3276  012646  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBER OF WORDS LOADED
3277  012652  012703  064406                  MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3278  012656  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR  PRINT OUT
3279  012662  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3280  012670  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3281  012676  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3282  012702  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3283  012710  001401                          BEQ     26$             ;YES, CONTINUE
3284  012712  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3285  012714  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
3286  012722  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3287  012726  001015                          BNE     28$             ;NO, GET CS2
3288  012730  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3289  012734  005300                  27$:    DEC     R0
3290  012736  001376                          BNE     27$
3291  012740  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3292  012746  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3293  012752  001003                          BNE     28$             ;NO, CONTINUE
3294  012754  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3295  012762  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3296  012770  001401                          BEQ     29$             ;YES, CHECK CS2
3297  012772  104055                          ERROR   55              ;CS1 INCORRECT
3298  012774  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3299  013002  001401                          BEQ     30$             ;YES, GET NEXT WORD
3300  013004  104056                          ERROR   56              ;CS2 INCORRECT
3301  013006  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3302  013012  005301                          DEC     R1              ;DECREMENT WORDS READ
3303  013014  001325                          BNE     25$             ;CHECK IF ALL WORDS READ
3304
3305                                  ;;*****************************************************************
3306                                  ;*TEST 14       SILO CAPICITY WITH NPR TRANSFERS
3307                                  ;*
3308                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3309                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3310                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0. HEAD 0, DRIVE 0.
3311                                  ;*      SPECIFY A 68 WORD DATA TRANSFER.  CLOCK IN 66
3312                                  ;*      WORDS INTO THE SILO.  MAKE SURE THAT SILO WILL STOP
3313                                  ;*      FILLING AT 66 WORDS.  TAKE ONE WORD FROM SILO AND
3314                                  ;*      CHECK IT.  CLOCK IN NEXT WORD.  MAKE SURE NO MORE
3315                                  ;*      THAN  ONE WORD IS CLOCKED IN THE SILO.  TAKE ONE
3316                                  ;*      WORD FROM SILO AND CHECK IT.  CLOCK IN NEXT WORD.
3317                                  ;*      CLOCK IN NEXT WORD.  MAKE SURE NO MORE THAN ONE WORD IS
3318                                  ;*      CLOCKED IN THE SILO.  TAKE ONE WORD FROM SILO AND
3319                                  ;*      CHECK IT. ATTEMPT TO CLOCK IN NEXT WORD AND
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                                        ;*      MAKE SURE NO WORDS ARE CLOCK INTO SILO.  UNLOAD THE
                                        ;*      SILO AND MAKE SURE ALL THE WORDS ARE CORRECT.
                                        ;*
                                        ;;*****************************************************************
013016  000004                  TST14:  SCOPE
013020  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
013026  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
013032  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
013040  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
013046  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
013054  012737  064410  003504          MOV     #NPRBUFF+2,E.BA ;LOAD BUS ADDRESS
013062  012762  064406  000004          MOV     #NPRBUF,RKBA(R2)
013070  012737  177675  003502          MOV     #-67.,E.WC      ;LOAD WORD COUNT
013076  012762  177674  000002          MOV     #-68.,RKWC(R2)
013104  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
013112  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
013116  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
013124  012762  000040  000026          MOV     #DMD,RKMR1(R2)
013132  005300                          DEC     R0
013134  001370                          BNE     1$
013136  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
013142  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
013150  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
013156  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
013164  005300                          DEC     R0
013166  001370                          BNE     2$
013170  012737  000040  000026          MOV     #DMD,RKMR1
013176  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
013204  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
013210  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
013216  012762  000040  000026          MOV     #DMD,RKMR1(R2)
013224  005300                          DEC     R0
013226  001370                          BNE     5$
013230  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND REG. 1
013236  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
013244  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
013252  022737  064410  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
013260  001004                          BNE     7$              ;NO, STORE CS2
013262  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
013266  005300                  6$:     DEC     R0
013270  001376                          BNE     6$
013272  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
013300  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
013306  001401                          BEQ     8$              ;YES, CHECK CS2
013310  104044                          ERROR   44              ;CS1 INCORRECT
013312  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
013320  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
013322  104045                          ERROR   45              ;CS2 INCORRECT
013324  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
013332  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
013334  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
013336  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
013344  001401                          BEQ     11$             ;YES, CHECK IF 1ST 65 WORDS TRANSFERRED
013346  104047                          ERROR   47              ;WORD COUNT INCORRECT
013350  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
```

```
3376  013356  005237  003502                    INC     E.WC
3377  013362  022737  177776  003502            CMP     #-2,E.WC        ;CHECK IF 65 WORDS IN SILO
3378  013370  101305                            BHI     4$              ;NO, GET NEXT WORD
3379  013372  001004                            BNE     12$             ;CHECK IF ALL 65 WORDS IN SILO
3380  013374  012737  000200  003510            MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3381  013402  000700                            BR      4$              ;PROCESS 66TH WORD
3382
3383  013404  005337  003502          12$:      DEC     E.WC            ;ADJUST WORD COUNT AND
3384  013410  162737  000002  003504            SUB     #2,E.BA         ;  BUS ADDRESS
3385  013416  012701  000003                    MOV     #3,R1
3386  013422  005037  003624                    CLR     WRDCNT
3387  013426  012703  064406                    MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3388  013432  012700  000112          13$:      MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3389  013436  012762  000440  000026  15$:      MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3390  013444  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3391  013452  005300                            DEC     R0
3392  013454  001370                            BNE     15$
3393  013456  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3394  013464  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3395  013472  016237  000004  003444            MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3396  013500  016237  000002  003442            MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3397  013506  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1
3398  013514  001401                            BEQ     16$             ;YES, CHECK CS2
3399  013516  104050                            ERROR   50              ;CS1 INCORRECT
3400  013520  023737  003510  003450  16$:      CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3401  013526  001401                            BEQ     17$             ;YES,CHECK BUS ADDRESS
3402  013530  104051                            ERROR   51              ;CS2 INCORRECT
3403  013532  023737  003504  003444  17$:      CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3404  013540  001401                            BEQ     18$             ;YES, CHECK WORD COUNT
3405  013542  104052                            ERROR   52              ;BUS ADDRESS INCORRECT
3406  013544  023737  003502  003442  18$:      CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3407  013552  001401                            BEQ     19$             ;YES, READ 1 WORD FROM SILO
3408  013554  104053                            ERROR   53              ;WORD COUNT INCORRECT
3409  013556  012737  000300  003510  19$:      MOV     #IR!OR,E.CS2    ;LOAD EXPECT CS2
3410  013564  016237  000024  003462            MOV     RKDB(R2),T.DB   ;STORE DATA BUFFER
3411  013572  012337  003522                    MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3412  013576  023737  003522  003462            CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3413  013604  001401                            BEQ     25$             ;YES, CONTINUE
3414  013606  104054                            ERROR   54              ;DATA BUFFER INCORRECT
3415  013610  016237  000000  003440  25$:      MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3416  013616  012700  000024                    MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3417  013622  005300                  26$:      DEC     R0
3418  013624  001376                            BNE     26$
3419  013626  016237  000010  003450            MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3420  013634  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF COMMAND STATUS REG. 1 CORRECT
3421  013642  001401                            BEQ     27$             ;YES, CHECK CS2
3422  013644  104055                            ERROR   55              ;CS1 INCORRECT
3423  013646  023737  003510  003450  27$:      CMP     E.CS2,T.CS2     ;CHECK IF COMMAND STATUS REG. 2 CORRECT
3424  013654  001401                            BEQ     30$             ;YES, DO NPR TRANSFER
3425  013656  104056                            ERROR   56              ;CS2 INCORRECT
3426  013660  012700  000045          30$:      MOV     #37.,R0         ;CLOCK IN ONE WORD (NPR TRANSFER)
3427  013664  012762  000440  000026  31$:      MOV     #DMD!MCLK,RKMR1(R2)
3428  013672  012762  000040  000026            MOV     #DMD,RKMR1(R2)
3429  013700  005300                            DEC     R0
3430  013702  001370                            BNE     31$
3431  013704  022701  000001                    CMP     #1,R1           ;CHECK IF 68TH WORD READ
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```
3432  013710  001410                        BEQ     32$             ;YES, NO NPR WILL TAKE PLACE
3433  013712  062737  000002  003504        ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
3434  013720  005237  003502                INC     E.WC
3435  013724  012737  000200  003510        MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3436  013732  016237  000000  003440  32$:  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3437  013740  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3438  013746  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3439  013754  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3440  013762  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3441  013770  001401                        BEQ     33$             ;YES, CHECK CS2
3442  013772  104044                        ERROR   44              ;CS1 INCORRECT
3443  013774  023737  003510  003450  33$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3444  014002  001401                        BEQ     34$             ;YES, CHECK BUS ADD
3445  014004  104045                        ERROR   45              ;CS2 INCORRECT
3446  014006  023737  003504  003444  34$:  CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3447  014014  001401                        BEQ     35$             ;YES, CHECK WORD COUNT
3448  014016  104046                        ERROR   46              ;BUS ADD INCORRECT
3449  014020  023737  003502  003442  35$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3450  014026  001401                        BEQ     36$             ;YES, CONTINUE
3451  014030  104047                        ERROR   47              ;WORD COUNT INCORRECT
3452  014032  005237  003624          36$:  INC     WRDCNT
3453  014036  005301                        DEC     R1              ;CHECK IF READ TO UNLOAD SILO
3454  014040  001402                        BEQ     39$             ;YES, READ DATA; BUFFER
3455  014042  000137  013432                JMP     13$             ;NO, INPUT NEXT WORD
3456
3457  014046  162737  000002  003504  39$:  SUB     #2,E.BA         ;ADJUST WORD COUNT AND BUS ADDRESS
3458  014054  005037  003502                CLR     E.WC
3459  014060  012737  000300  003510        MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3460  014066  012701  000101                MOV     #65.,R1         ;LOAD NUMBER OF WORDS LEFT
3461  014072  016237  000024  003462  40$:  MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3462  014100  012337  003522                MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3463  014104  023737  003522  003462        CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3464  014112  001401                        BEQ     41$             ;YES, CHECK CS1
3465  014114  104054                        ERROR   54              ;DATA BUFFER INCORRECT
3466  014116  016237  000000  003440  41$:  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3467  014124  022737  000002  003624        CMP     #2,WRDCNT       ;CHECK IF FIRST WORDS
3468  014132  001004                        BNE     43$             ;NO, DO NOT WAIT FOR INPUT READY
3469  014134  012700  000024                MOV     #20.,R0         ;WAIT FOR INPUT READY
3470  014140  005300                  42$:  DEC     R0
3471  014142  001376                        BNE     42$
3472  014144  016237  000010  003450  43$:  MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3473  014152  022701  000001                CMP     #1,R1           ;CHECK IF LAST WORD
3474  014156  001003                        BNE     44$             ;NO, CONTINUE
3475  014160  012737  000100  003510        MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3476  014166  023737  003500  003440  44$:  CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3477  014174  001401                        BEQ     45$             ;YES,CHECK CS2
3478  014176  104055                        ERROR   55              ;CS1 INCORRECT
3479  014200  023737  003510  003450  45$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3480  014206  001401                        BEQ     46$             ;YES, READ NEXT WORD ON SILO
3481  014210  104056                        ERROR   56              ;CS2 INCORRECT
3482  014212  005237  003624          46$:  INC     WRDCNT          ;INCREMENT WORD COUNT
3483  014216  005301                        DEC     R1              ;CHECK IF ALL WORDS READ
3484  014220  001324                        BNE     40$             ;NO, READ NEXT WORD
3485
3486                                  ;;.....................................................................
3487                                  ;*TEST 15       BUS ADDRESS INHIBIT
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                                        ;*
                                        ;*      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.
                                        ;*
                                        ;*****************************************************************
014222  000004                  TST15:  SCOPE
014224  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
014232  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
014236  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
014244  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
014252  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
014260  012737  064406  003504          MOV     #NPRBUF,E.BA    ;LOAD BUS ADDRESS
014266  012762  064406  000004          MOV     #NPRBUF,RKBA(R2)
014274  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
014302  012762  177676  000002          MOV     #-66.,RKWC(R2)
014310  012762  000020  000010          MOV     #BAI,RKCS2(R2)  ;SET BUS ADDRESS INCREMENT INHIBIT
014316  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
014324  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
014330  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
014336  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014344  005300                          DEC     R0
014346  001370                          BNE     1$
014350  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
014354  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014362  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
014370  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014376  005300                          DEC     R0
014400  001370                          BNE     2$
014402  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014410  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
014416  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
014422  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
014430  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014436  005300                          DEC     R0
014440  001370                          BNE     5$
014442  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
014450  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
014456  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
014464  022737  000101  003502          CMP     #65.,E.WC       ;CHECK IF FIRST WORD
014472  001004                          BNE     7$              ;NO, STORE CS2
014474  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
014500  005300                  6$:     DEC     R0
014502  001376                          BNE     6$
014504  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
014512  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
014520  001401                          BEQ     8$              ;YES, CHECK CS2
014522  104057                          ERROR   57              ;CS1 INCORRECT
014524  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
014532  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
014534  104060                          ERROR   60              ;CS2 INCORRECT
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3544  014536  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
3545  014544  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3546  014546  104061                          ERROR   61              ;BUS ADDRESS INCORRECT
3547  014550  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3548  014556  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3549  014560  104062                          ERROR   62              ;WORD COUNT INCORRECT
3550  014562  005237  003502          11$:    INC     E.WC            ;INCREMENT WORD COUNT
3551  014566  100713                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3552  014570  001004                          BNE     12$             ;CHECK IF LAST WORD
3553  014572  012737  000220  003510          MOV     #OR!BAI,E.CS2   ;LOAD EXPECTED COMMAND STATUS REG. 2
3554  014600  000706                          BR      4$              ;PROCESS THE LAST WORD
3555
3556  014602  005037  003502          12$:    CLR     E.WC            ;ADJUST WORD COUNT
3557  014606  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3558  014612  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3559  014620  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3560  014626  005300                          DEC     R0
3561  014630  001370                          BNE     15$
3562  014632  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3563  014640  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3564  014646  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3565  014654  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
3566  014662  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3567  014670  001401                          BEQ     16$             ;YES, CHECK CS2
3568  014672  104063                          ERROR   63              ;CS1 INCORRECT
3569  014674  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3570  014702  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3571  014704  104064                          ERROR   64              ;CS2 INCORRECT
3572  014706  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3573  014714  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3574  014716  104065                          ERROR   65              ;BUS ADDRESS INCORRECT
3575  014720  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3576  014726  001401                          BEQ     19$             ;YES, CHECK DATA
3577  014730  104066                          ERROR   66              ;WORD COUNT INCORRECT
3578  014732  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBERS OF WORDS LOADED
3579  014736  013737  064406  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3580  014744  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINT OUT
3581  014750  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3582  014756  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
3583  014764  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3584  014772  001401                          BEQ     26$             ;YES, CONTINUE
3585  014774  104067                          ERROR   67              ;DATA BUFFER INCORRECT
3586  014776  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3587  015004  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3588  015010  001015                          BNE     28$             ;NO, GET CS2
3589  015012  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3590  015016  005300                  27$:    DEC     R0
3591  015020  001376                          BNE     27$
3592  015022  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3593  015030  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3594  015034  001003                          BNE     28$             ;NO, CONTINUE
3595  015036  012737  000120  003510          MOV     #IR!BAI,E.CS2   ;LOAD EXPECTED CS2
3596  015044  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3597  015052  001401                          BEQ     29$             ;YES, CHECK CS2
3598  015054  104070                          ERROR   70              ;CS1 INCORRECT
3599  015056  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
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                                        BEQ     30$             ;YES, GET NEXT WORD
                                        ERROR   71              ;CS2 INCORRECT
                                30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
                                        DEC     R1              ;DECREMENT WORDS READ
                                        BNE     25$             ;CHECK IF ALL WORDS READ

                                ;;*****************************************************************
                                ;*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.
                                ;*
                                ;;*****************************************************************
017100  000004                  TST16:  SCOPE
017102  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
017110  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
017114  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
017122  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
017130  012737  160002  003504          MOV     #160002,E.BA    ;LOAD BUS ADDRESS
017136  012762  160000  000004          MOV     #160000,RKBA(R2)
017144  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
017152  012762  177676  000002          MOV     #-66.,RKWC(R2)
017160  012737  101626  003500          MOV     #CERR!RDY!BA16!BA17!WRHEAD&<^C<GO>>,E.CS1
017166  012762  001427  000000          MOV     #BA17!BA16!WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
017174  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
017200  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
017206  012762  000040  000026          MOV     #DMD,RKMR1(R2)
017214  005300                          DEC     R0
017216  001370                          BNE     1$
017220  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
017224  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
017232  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
017240  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
017246  005300                          DEC     R0
017250  001370                          BNE     2$
017252  012762  000040  000026          MOV     #DMD,RKMR1(R2)
017260  012700  000045                  MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
017264  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
017272  012762  000040  000026          MOV     #DMD,RKMR1(R2)
017300  005300                          DEC     R0
017302  001370                          BNE     5$
017304  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
017312  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
017320  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
017326  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
017334  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG.
017342  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG.
017346  012737  004100  003510          MOV     #IR!NEM,E.CS2   ;LOAD EXPECTED CS2
017354  032737  000200  003450          BIT     #OR,T.CS2
017362  001403                          BEQ     7$
017364  052737  000200  003510          BIS     #OR,E.CS2
```

```
3656  015372  023737  003500  003440  7$:     CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3657  015400  001401                          BEQ     8$              ;YES, CHECK CS2
3658  015402  104072                          ERROR   72              ;CS1 INCORRECT
3659  015404  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3660  015412  001401                          BEQ     9$              ;YES, CHECK ERROR REG.
3661  015414  104073                          ERROR   73              ;CS2 INCORRECT
3662  015416  023737  003514  003454  9$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
3663  015424  001401                          BEQ     10$             ;CHECK BUS ADDRESS
3664  015426  104074                          ERROR   74              ;ERROR REG INCORRECT
3665  015430  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3666  015436  001401                          BEQ     11$             ;YES, CHECK WORD COUNT
3667  015440  104075                          ERROR   75              ;BUS ADDRESS INCORRECT
3668  015442  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG.
3669  015450  001401                          BEQ     12$             ;YES, CLEAR RK611
3670  015452  104076                          ERROR   76              ;WORD COUNT INCORRECT
3671  015454  012762  100000  000000  12$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3672  015462  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3673  015470  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3674  015476  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
3675  015504  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3676  015512  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1
3677  015520  001401                          BEQ     15$             ;YES, CHECK CS2
3678  015522  104077                          ERROR   77              ;CS1 INCORRECT
3679  015524  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF NEM CLEARED
3680  015532  001401                          BEQ     TST17           ;;YES, GO ON TO NEXT TEST
3681  015534  104100                          ERROR   100             ;CS2 INCORRECT
3682
3683                                  ;;*****************************************************************
3684                                  ;*TEST 17       BUS ADDRESS BIT 16
3685                                  ;*
3686                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3687                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO  AN RK06
3688                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3689                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 200000.
3690                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
3691                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 177776.
3692                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
3693                                  ;*
3694                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 32K
3695                                  ;*             OF MEMORY IS ON THE SYSTEM.
3696                                  ;*
3697                                  ;*****************************************************************
3698  015536  000004                  TST17:  SCOPE
3699  015540  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3700  015546  005737  043750                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
3701  015552  100004                          BPL     1$              ;NO, BYPASS TEST
3702  015554  022737  002000  044216          CMP     #2000,$LSTBK    ;CHECK IF ENOUGH MEMORY
3703  015562  103417                          BLO     2$              ;YES, DO TEST
3704  015564                          1$:
3705  015564  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
3706  015572  005227  177777                  INC     #-1             ;ONLY DO ONCE
3707  015576  001007                          BNE     64$             ;NO, GO TO NEXT TEST
3708  015600  104401  052357                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
3709  015604  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
3710  015610  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3711  015612  104401  052367                  TYPE    ,TSTBY2
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3712  015616  000137  016652          64$:    JMP     TST20           ;GO TO NEXT TEST
3713
3714  015622  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3715  015626  012737  002000  172354          MOV     #2000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3716  015634  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3717  015640  013737  064406  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3718  015646  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3719  015652  012737  015660  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3720                                                                  ;  SUBTEST LOOP
3721
3722  015660                          3$:
3723  015660  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3724  015666  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3725  015674  012762  177777  000002          MOV     #-1,RKWC(R2)
3726  015702  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3727  015710  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3728  015716  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3729  015722  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3730  015730  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3731  015736  005300                          DEC     R0
3732  015740  001370                          BNE     5$
3733  015742  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3734  015746  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3735  015754  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3736  015762  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3737  015770  005300                          DEC     R0
3738  015772  001370                          BNE     6$
3739  015774  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3740  016002  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3741  016006  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3742  016014  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3743  016022  005300                          DEC     R0
3744  016024  001370                          BNE     7$
3745  016026  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3746  016034  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3747  016042  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3748  016050  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3749  016054  005300                  8$:     DEC     R0
3750  016056  001376                          BNE     8$
3751  016060  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3752  016066  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3753  016074  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3754  016102  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3755  016106  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3756  016114  001401                          BEQ     10$             ;YES, CHECK CS2
3757  016116  104101                          ERROR   101             ;CS1 INCORRECT
3758  016120  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3759  016126  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3760  016130  104102                          ERROR   102             ;CS2 INCORRECT
3761  016132  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3762  016140  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3763  016142  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3764  016144  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3765  016152  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3766  016154  104104                          ERROR   104             ;WORD COUNT INCORRECT
3767  016156  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
```

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 3768  016164  013737  064406  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
 3769  016172  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 3770  016200  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
 3771  016202  104105                          ERROR   105             ;DATA INCORRECT
 3772  016204  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
 3773  016206  012737  001777  172354          MOV     #2000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
 3774  016214  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
 3775  016220  013737  064406  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
 3776  016226  013737  064410  140100          MOV     NPRBUF+2,140100
 3777  016234  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
 3778  016240  012737  016246  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 3779                                                                  ;  SUBTEST LOOP
 3780
 3781  016246                  20$:
 3782  016246  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3783  016254  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 3784  016262  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
 3785  016270  012762  177776  000002          MOV     #-2,RKWC(R2)
 3786  016276  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
 3787  016302  012762  177776  000004          MOV     #177776,RKBA(R2)
 3788  016310  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
 3789  016316  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
 3790  016324  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 3791  016330  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
 3792  016336  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3793  016344  005300                          DEC     R0
 3794  016346  001370                          BNE     21$
 3795  016350  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 3796  016354  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3797  016362  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 3798  016370  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3799  016376  005300                          DEC     R0
 3800  016400  001370                          BNE     22$
 3801  016402  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3802  016410  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
 3803  016414  012700  000045          23$:    MOV     #37.,R0
 3804  016420  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
 3805  016426  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3806  016434  005300                          DEC     R0
 3807  016436  001370                          BNE     24$
 3808  016440  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3809  016446  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
 3810  016454  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 3811  016462  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
 3812  016466  001404                          BEQ     26$             ;NO, GET CS2
 3813  016470  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 3814  016474  005300                  25$:    DEC     R0
 3815  016476  001376                          BNE     25$
 3816  016500  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 3817  016506  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 3818  016514  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
 3819  016522  001401                          BEQ     28$             ;YES, CHECK CS2
 3820  016524  104101                          ERROR   101             ;CS1 INCORRECT
 3821  016526  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
 3822  016534  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
 3823  016536  104102                          ERROR   102             ;CS2 INCORRECT
```

```
3824  016540  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3825  016546  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
3826  016550  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3827  016552  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3828  016560  001401                          BEQ     31$             ;YES, GET TEXT WORD
3829  016562  104104                          ERROR   104             ;WORD COUNT INCORRECT
3830  016564  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
3831  016572  005237  003502                  INC     E.WC            ;  WORD COUNT
3832  016576  005301                          DEC     R1              ;CHECK IF FINISHED
3833  016600  001305                          BNE     23$             ;NO, GET SECOND WORD
3834  016602  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
3835  016606  012703  064406                  MOV     #NPRBUF,R3      ;  DATA COMPARE
3836  016612  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3837  016620  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
3838  016624  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
3839  016632  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
3840  016634  104105                          ERROR   105             ;DATA BUFFER INCORRECT
3841  016636  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
3842  016640  001364                          BNE     35$             ;NO READ SECOND WORD
3843  016642  104415                          SCOP1                   ;CHECK IF LOOP ON ERROR
3844  016644  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3845
3846                                  ;;**********************************************************************
3847                                  ;*TEST 20       BUS ADDRESS BIT 17
3848                                  ;*
3849                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3850                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3851                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
3852                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 400000.
3853                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
3854                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 377776.
3855                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
3856                                  ;*
3857                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
3858                                  ;*             OF MEMORY IS ON THE SYSTEM.
3859                                  ;*
3860                                  ;;**********************************************************************
3861  016652  000004                  TST20:  SCOPE
3862  016654  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3863  016662  005737  043750                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
3864  016666  100004                          BPL     1$              ;NO, BYPASS TEST
3865  016670  022737  004000  044216          CMP     #4000,$LSTBK    ;CHECK IF ENOUGH MEMORY
3866  016676  103417                          BLO     2$              ;YES, DO TEST
3867  016700                          1$:
3868  016700  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
3869  016706  005227  177777                  INC     #-1             ;ONLY DO ONCE
3870  016712  001007                          BNE     64$             ;NO, GO TO NEXT TEST
3871  016714  104401  052357                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
3872  016720  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
3873  016724  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3874  016726  104401  052367                  TYPE    ,TSTBY2
3875  016732  000137  017766          64$:    JMP     TST21           ;GO TO NEXT TEST
3876
3877  016736  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3878  016742  012737  004000  172354          MOV     #4000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3879  016750  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
```

```
3880  016754  013737  064406  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3881  016762  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3882  016766  012737  016774  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3883                                                                  ;  SUBTEST LOOP
3884
3885  016774                          3$:
3886  016774  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3887  017002  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3888  017010  012762  177777  000002          MOV     #-1,RKWC(R2)
3889  017016  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
3890  017024  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
3891  017032  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3892  017036  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3893  017044  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3894  017052  005300                          DEC     R0
3895  017054  001370                          BNE     5$
3896  017056  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3897  017062  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3898  017070  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3899  017076  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3900  017104  005300                          DEC     R0
3901  017106  001370                          BNE     6$
3902  017110  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3903  017116  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3904  017122  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3905  017130  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3906  017136  005300                          DEC     R0
3907  017140  001370                          BNE     7$
3908  017142  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3909  017150  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3910  017156  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3911  017164  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3912  017170  005300                  8$:     DEC     R0
3913  017172  001376                          BNE     8$
3914  017174  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3915  017202  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3916  017210  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3917  017216  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3918  017222  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3919  017230  001401                          BEQ     10$             ;YES, CHECK CS2
3920  017232  104101                          ERROR   101             ;CS1 INCORRECT
3921  017234  023737  0C3510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3922  017242  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3923  017244  104102                          ERROR   102             ;CS2 INCORRECT
3924  017246  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3925  017254  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3926  017256  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3927  017260  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3928  017266  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3929  017270  104104                          ERROR   104             ;WORD COUNT INCORRECT
3930  017272  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3931  017300  013737  064406  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3932  017306  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3933  017314  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3934  017316  104105                          ERROR   105             ;DATA INCORRECT
3935  017320  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
```

```
 3936  017322  012737  003777  172354          MOV     #4000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
 3937  017330  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
 3938  017334  013737  064406  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
 3939  017342  013737  064410  140100          MOV     NPRBUF+2,140100
 3940  017350  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
 3941  017354  012737  017362  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 3942                                                                  ;  SUBTEST LOOP
 3943
 3944  017362                          20$:
 3945  017362  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3946  017370  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 3947  017376  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
 3948  017404  012762  177776  000002          MOV     #-2,RKWC(R2)
 3949  017412  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
 3950  017416  012762  177776  000004          MOV     #177776,RKBA(R2)
 3951  017424  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
 3952  017432  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
 3953  017440  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 3954  017444  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
 3955  017452  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3956  017460  005300                          DEC     R0
 3957  017462  001370                          BNE     21$
 3958  017464  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 3959  017470  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3960  017476  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 3961  017504  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3962  017512  005300                          DEC     R0
 3963  017514  001370                          BNE     22$
 3964  017516  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3965  017524  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
 3966  017530  012700  000045          23$:    MOV     #37.,R0
 3967  017534  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
 3968  017542  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3969  017550  005300                          DEC     R0
 3970  017552  001370                          BNE     24$
 3971  017554  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3972  017562  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
 3973  017570  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 3974  017576  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
 3975  017602  001404                          BEQ     26$             ;NO, GET CS2
 3976  017604  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 3977  017610  005300                  25$:    DEC     R0
 3978  017612  001376                          BNE     25$
 3979  017614  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 3980  017622  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 3981  017630  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
 3982  017636  001401                          BEQ     28$             ;YES, CHECK CS2
 3983  017640  104101                          ERROR   101             ;CS1 INCORRECT
 3984  017642  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
 3985  017650  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
 3986  017652  104102                          ERROR   102             ;CS2 INCORRECT
 3987  017654  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 3988  017662  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
 3989  017664  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
 3990  017666  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 3991  017674  001401                          BEQ     31$             ;YES, GET TEXT WORD
```

```
3992  017676  104104                          ERROR   104             ;WORD COUNT INCORRECT
3993  017700  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
3994  017706  005237  003502                  INC     E.WC            ;  WORD COUNT
3995  017712  005301                          DEC     R1              ;CHECK IF FINISHED
3996  017714  001305                          BNE     23$             ;NO, GET SECOND WORD
3997  017716  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
3998  017722  012703  064406                  MOV     #NPRBUF,R3      ;  DATA COMPARE
3999  017726  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4000  017734  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4001  017740  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
4002  017746  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
4003  017750  104105                          ERROR   105             ;DATA BUFFER INCORRECT
4004  017752  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
4005  017754  001364                          BNE     35$             ;NO READ SECOND WORD
4006  017756  104415                          SCOP1                   ;CHECK IF LOOP ON ERROR
4007  017760  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4008
4009                                  ;;**********************************************************************
4010                                  ;*TEST 21       ADDRESSING GREATER THAN 96K
4011                                  ;*
4012                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4013                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4014                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
4015                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 600000.
4016                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
4017                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 577776.
4018                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
4019                                  ;*
4020                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 96K
4021                                  ;*             OF MEMORY IS ON THE SYSTEM.
4022                                  ;*
4023                                  ;;**********************************************************************
4024  017766  000004                  TST21:  SCOPE
4025  017770  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4026  017776  005737  043750                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
4027  020002  100004                          BPL     1$              ;NO, BYPASS TEST
4028  020004  022737  006000  044216          CMP     #6000,$LSTBK    ;CHECK IF ENOUGH MEMORY
4029  020012  103417                          BLO     2$              ;YES, DO TEST
4030  020014                          1$:
4031  020014  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4032  020022  005227  177777                  INC     #-1             ;ONLY DO ONCE
4033  020026  001007                          BNE     64$             ;NO, GO TO NEXT TEST
4034  020030  104401  052357                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
4035  020034  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4036  020040  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4037  020042  104401  052367                  TYPE    ,TSTBY2
4038  020046  000137  021102          64$:    JMP     TST22           ;GO TO NEXT TEST
4039
4040  020052  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
4041  020056  012737  006000  172354          MOV     #6000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
4042  020064  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
4043  020070  013737  064406  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
4044  020076  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
4045  020102  012737  020110  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
4046                                                                  ;  SUBTEST LOOP
4047
```

```
 4048  020110                          3$:
 4049  020110  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4050  020116  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4051  020124  012762  177777  000002          MOV     #-1,RKWC(R2)
 4052  020132  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
 4053  020140  012762  001427  000000          MOV     #BA16!BA17!WRHEAD,RKCS1(R2)
 4054  020146  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4055  020152  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
 4056  020160  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4057  020166  005300                          DEC     R0
 4058  020170  001370                          BNE     5$
 4059  020172  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4060  020176  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4061  020204  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4062  020212  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4063  020220  005300                          DEC     R0
 4064  020222  001370                          BNE     6$
 4065  020224  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4066  020232  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
 4067  020236  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
 4068  020244  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4069  020252  005300                          DEC     R0
 4070  020254  001370                          BNE     7$
 4071  020256  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4072  020264  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
 4073  020272  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
 4074  020300  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4075  020304  005300                  8$:     DEC     R0
 4076  020306  001376                          BNE     8$
 4077  020310  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4078  020316  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4079  020324  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
 4080  020332  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
 4081  020336  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
 4082  020344  001401                          BEQ     10$             ;YES, CHECK CS2
 4083  020346  104101                          ERROR   101             ;CS1 INCORRECT
 4084  020350  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
 4085  020356  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
 4086  020360  104102                          ERROR   102             ;CS2 INCORRECT
 4087  020362  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
 4088  020370  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
 4089  020372  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
 4090  020374  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
 4091  020402  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
 4092  020404  104104                          ERROR   104             ;WORD COUNT INCORRECT
 4093  020406  016237  000024  003462  13$:    MOV     RKDS(R2),T.DB   ;READ DATA BUFFER
 4094  020414  013737  064406  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
 4095  020422  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 4096  020430  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
 4097  020432  104105                          ERROR   105             ;DATA INCORRECT
 4098  020434  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
 4099  020436  012737  005777  172354          MOV     #6000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
 4100  020444  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
 4101  020450  013737  064406  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
 4102  020456  013737  064410  140100          MOV     NPRBUF+2,140100
 4103  020464  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
```

```
 4104  020470  012737  020476  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 4105                                                                  ;  SUBTEST LOOP
 4106
 4107  020476                          20$:
 4108  020476  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4109  020504  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4110  020512  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
 4111  020520  012762  177776  000002          MOV     #-2,RKWC(R2)
 4112  020526  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
 4113  020532  012762  177776  000004          MOV     #177776,RKBA(R2)
 4114  020540  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
 4115  020546  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
 4116  020554  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4117  020560  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
 4118  020566  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4119  020574  005300                          DEC     R0
 4120  020576  001370                          BNE     21$
 4121  020600  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4122  020604  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4123  020612  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4124  020620  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4125  020626  005300                          DEC     R0
 4126  020630  001370                          BNE     22$
 4127  020636  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4128  020644  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
 4129  020644  012700  000045          23$:    MOV     #37.,R0
 4130  020650  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
 4131  020656  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 41 2  020664  005300                          DEC     R0
 4133  020666  001370                          BNE     24$
 4134  020670  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4135  020676  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
 4136  020704  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4137  020712  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
 4138  020716  001404                          BEQ     26$             ;NO, GET CS2
 4139  020720  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4140  020724  005300                  25$:    DEC     R0
 4141  020726  001376                          BNE     25$
 4142  020730  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 4143  020736  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4144  020744  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
 4145  020752  001401                          BEQ     28$             ;YES, CHECK CS2
 4146  020754  104101                          ERROR   101             ;CS1 INCORRECT
 4147  020756  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
 4148  020764  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
 4149  020766  104102                          ERROR   102             ;CS2 INCORRECT
 4150  020770  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4151  020776  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
 4152  021000  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
 4153  021002  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4154  021010  001401                          BEQ     31$             ;YES, GET TEXT WORD
 4155  021012  104104                          ERROR   104             ;WORD COUNT INCORRECT
 4156  021014  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
 4157  021022  005237  003502                  INC     E.WC            ;  WORD COUNT
 4158  021026  005301                          DEC     R1              ;CHECK IF FINISHED
 4159  021030  001305                          BNE     23$             ;NO, GET SECOND WORD
```

```
 4160  021032  012700  000002                    MOV     #2,R0             ;LOAD COUNT AND ADDRESS WORD
 4161  021036  012703  064406                    MOV     #NPRBUF,R3        ;  DATA COMPARE
 4162  021042  016237  000024  003462  35$:      MOV     RKDB(R2),T.DB     ;READ DATA BUFFER
 4163  021050  012337  003522                    MOV     (R3)+,E.DB        ;GET EXPECTED DATA
 4164  021054  023737  003522  003462            CMP     E.DB,T.DB         ;CHECK IF CORRECT
 4165  021062  001401                            BEQ     36$               ;YES, CHECK IF FINISHED
 4166  021064  104105                            ERROR   105               ;DATA BUFFER INCORRECT
 4167  021066  005300                  36$:      DEC     R0                ;CHECK IF FINISHED
 4168  021070  001364                            BNE     35$               ;NO READ SECOND WORD
 4169  021072  104415                            SCOP1                     ;CHECK IF LOOP ON ERROR
 4170  021074  012762  100000  000000            MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
 4171
 4172
 4173                                    ;;*****************************************************************
 4174                                    ;*TEST 22       SILO FILL IN 18 BIT MODE
 4175                                    ;*
 4176                                    ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
 4177                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 4178                                    ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0. DRIVE 0,
 4179                                    ;*      SPECIFY 66  WORD DATA TRANSFER.  CLOCK
 4180                                    ;*      ALL 66 WORD INTO THE SILO.   CHECK THAT ALL 66
 4181                                    ;*      WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).
 4182                                    ;*
 4183                                    ;;*****************************************************************
 4184  021102  000004                    TST22:  SCOPE
 4185  021104  012737  000144  001200            MOV     #100.,$TIMES      ;;DO 100. ITERATIONS
 4186  021112  013702  001270                    MOV     $BASE,R2          ;LOAD RK611 BASE
 4187  021116  012762  100000  000000            MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
 4188  021124  012762  000040  000026            MOV     #DMD,RKMR1(R2)    ;PUT RK611 IN MAINTENANCE MODE
 4189  021132  012762  177676  000002            MOV     #-66.,RKWC(R2)    ;LOAD WORD COUNT
 4190  021140  012737  177677  003502            MOV     #-65.,E.WC
 4191  021146  012762  064406  000004            MOV     #NPRBUF,RKBA(R2);LOAD BUS ADDRESS
 4192  021154  012737  064410  003504            MOV     #NPRBUF+2,E.BA
 4193  021162  012737  010027  003500            MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
 4194  021170  012762  010027  000000            MOV     #WRHEAD!CFMT,RKCS1(R2) ·ISSUE COMMAND
 4195  021176  012700  000312                    MOV     #50.*4+2,R0       ;ISSUE ENOUGH CLOCKS DATA
 4196                                                                      ;  INDEX PULSE
 4197  021202  012762  000440  000026  5$:       MOV     #DMD!MCLK,RKMR1(R2)
 4198  021210  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 4199  021216  005300                            DEC     R0
 4200  021220  001370                            BNE     5$
 4201  021222  012700  000004                    MOV     #4,R0             ;SIMULATE INDEX PULSE
 4202  021226  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 4203  021234  012762  000640  000026  6$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4204  021242  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 4205  021250  005300                            DEC     R0
 4206  021252  001370                            BNE     6$
 4207  021254  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 4208  021262  012737  0 ·300  003510            MOV     #IR!OR,E.CS2      ;LOAD EXPECTED CS2
 4209  021270  012701  C  102                    MOV     #66.,R1           ;ISSUE 66 NPR TRANSFERS
 4210  021274  012700  C  350            7$:     MOV     #40.,R0
 4211  021300  012762  0 0440  000026  8$:       MOV     #DMD!MCLK,RKMR1(R2)
 4212  021306  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 4213  021314  0  ·  0                           DEC     R0
 4214  021316  001370                            BNE     8$
 4215  021320  016237  000000  003440            MOV     RK(S1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
```

```
4216  021326  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG. 2
4217  021334  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4218  021342  022737  064410  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
4219  021350  001004                          BNE     10$             ;NO, CONTINUE
4220  021352  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4221  021356  005300                  9$:     DEC     R0
4222  021360  001376                          BNE     9$
4223  021362  016237  000010  003450  10$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4224  021370  005737  003502                  TST     E.WC            ;CHECK IF LAST WORD
4225  021374  001003                          BNE     11$             ;NO, CONTINUE
4226  021376  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
4227  021404  023737  003500  003440  11$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4228  021412  001401                          BEQ     12$             ;YES, CONTINUE
4229  021414  104121                          ERROR   121             ;CS1 INCORRECT
4230  021416  023737  003510  003450  12$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4231  021424  001401                          BEQ     13$             ;YES, CONTINUE
4232  021426  104122                          ERROR   122             ;CS2 INCORRECT
4233  021430  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4234  021436  001401                          BEQ     14$             ;YES, CONTINUE
4235  021440  104123                          ERROR   123             ;BUS ADDRESS INCORRECT
4236  021442  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG CORRECT
4237  021450  001401                          BEQ     15$             ;YES, CONTINUE
4238  021452  104124                          ERROR   124             ;WORD COUNT INCORRECT
4239  021454  062737  000002  003504  15$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
4240  021462  005237  003502                  INC     E.WC            ;  WORD COUNT
4241  021466  005301                          DEC     R1              ;CHECK IF SILO FULL
4242  021470  001301                          BNE     7$              ;NO, GET NEXT WORD
4243  021472  012700  000120                  MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
4244  021476  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
4245  021504  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4246  021512  005300                          DEC     R0
4247  021514  001370                          BNE     20$
4248  021516  162737  000002  003504          SUB     #2,E.BA         ;ADJUST BUS ADDRESS AND WORD COUNT
4249  021524  0050?*  003502                  CLR     E.WC
4250  021530  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4251  021536  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4252  021544  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4253  021552  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4254  021560  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4255  021566  001401                          BEQ     21$             ;YES, CONTINUE
4256  021570  104125                          ERROR   125             ;CS1 INCORRECT
4257  021572  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4258  021600  001401                          BEQ     22$             ;YES, CONTINUE
4259  021602  104126                          ERROR   126             ;CS2 INCORRECT
4260  021604  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS INCORRECT
4261  021612  001401                          BEQ     23$             ;YES, CONTINUE
4262  021614  104127                          ERROR   127             ;BUS ADDRESS INCORRECT
4263  021616  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4264  021624  001401                          BEQ     24$             ;YES, CONTINUE
4265  021626  104130                          ERROR   130             ;WORD COUNT INCORRECT
4266  021630  012703  064406          24$:    MOV     #NPRBUF,R3      ;LOAD BUFFER ADDRESS FOR COMPARE
4267  021634  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4268  021642  012701  000102                  MOV     #66.,R1         ;LOAD COUNT
4269  021646  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT
4270  021652  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;GET DATA BUFFER
4271  021660  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
```

```
4272  021664  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4273  021672  001401                          BEQ     26$             ;YES, CONTINUE
4274  021674  104131                          ERROR   131             ;DATA READ INCORRECT
4275  021676  012700  000050          26$:    MOV     #40.,R0         ;SET STALL
4276  021702  005300                  27$:    DEC     R0              ;RUN STALL TO ZERO
4277  021704  001376                          BNE     27$
4278  021706  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4279  021714  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4280  021722  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
4281  021726  001003                          BNE     28$             ;NO, CONTINUE
4282  021730  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4283  021736  023737  003500  003440  29$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4284  021744  001401                          BEQ     29$             ;YES, CONTINUE
4285  021746  104132                          ERROR   132             ;CS1 INCORRECT
4286  021750  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4287  021756  001401                          BEQ     30$             ;YES, CONTINUE
4288  021760  104133                          ERROR   133             ;CS2 INCORRECT
4289  021762  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4290  021766  005301                          DEC     R1              ;CHECK IF FINISHED
4291  021770  001330                          BNE     25$             ;NO, CONTINUE
4292
4293
4294                                  .SBTTL  **MFM READ LOOPBACK TESTS
4295
4296                                  ;;*********************************************************************
4297                                  ;*TEST 23       READ LOOPBACK (PART 1)
4298                                  ;*
4299                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
4300                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4301                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4302                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4303                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
4304                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4305                                  ;*      FOLLOWING WORDS:
4306                                  ;*
4307                                  ;*              177777
4308                                  ;*              000000
4309                                  ;*              177777
4310                                  ;*
4311                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4312                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4313                                  ;*
4314                                  ;*********************************************************************
4315  021772  000004                  TST23:  SCOPE
4316  021774  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4317  022002  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4318  022006  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4319  022014  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4320  022022  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
4321  022030  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4322  022034  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
4323  022042  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4324  022050  005300                          DEC     R0
4325  022052  001370                          BNE     1$
4326  022054  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4327  022062  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
 4328  022070  005037  003614                CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 4329  022074  005037  003616                CLR     M1.BIT          ;  PREVIOUS BIT
 4330  022100  012700  000341                MOV     #225.,R0
 4331  022104  004737  043540          2$:   JSR     PC,RDBIT        ;SIMULATE SYNCH
 4332  022110  005300                        DEC     R0
 4333  022112  001374                        BNE     2$
 4334  022114  012737  000001  003614        MOV     #1,PR.BIT
 4335  022122  004737  043540                JSR     PC,RDBIT
 4336  022126  012701  000003                MOV     #3,R1           ;LOAD NUMBER OF WORDS
 4337  022132  012703  064326                MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
 4338  022136  012737  000025  003500        MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 4339  022144  012304                  5$:   MOV     (R3)+,R4        ;GET DATA
 4340  022146  012700  000020                MOV     #16.,R0         ;LOAD BIT COUNT
 4341  022152  013737  003614  003616  6$:   MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 4342  022160  006004                        ROR     R4              ;GET NEXT BIT
 4343  022162  103403                        BCS     7$              ;CHECK IF 1
 4344  022164  005037  003614                CLR     PR.BIT          ;NO, ZERO
 4345  022170  000403                        BR      8$              ;SIMULATE READ DATA
 4346
 4347  022172  012737  000001  003614  7$:   MOV     #1,PR.BIT       ;ONE
 4348  022200  004737  043540          8$:   JSR     PC,RDBIT        ;SIMULATE READ DATA
 4349  022204  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 4350  022212  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 4351  022220  001417                        BEQ     9$              ;YES, SIMULATE NEXT BIT
 4352  022222  012737  000003  003624        MOV     #3,WRDCNT       ;LOAD WORD COUNT
 4353  022230  160137  003624                SUB     R1,WRDCNT
 4354  022234  012737  000020  003622        MOV     #16.,BITCNT     ;LOAD BIT COUNT
 4355  022242  160037  003622                SUB     R0,BITCNT
 4356  022246  104150                        ERROR   150             ;CS1 INCORRECT DURING HEADER
 4357  022250  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4358  022256  000522                        BR      TST24           ;;GO ON TO NEXT TEST
 4359
 4360  022260  005300                  9$:   DEC     R0              ;CHECK IF READY FOR NEXT WORD
 4361  022262  001333                        BNE     6$              ;NO, GET NEXT BIT
 4362  022264  005301                        DEC     R1              ;CHECK IF HEADER FINISHED
 4363  022266  001326                        BNE     5$              ;NO, GET NEXT WORD
 4364  022270  012700  000004                MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 4365  022274  013737  003614  003616  15$:   MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 4366  022302  005037  003614                CLR     PR.BIT          ;LOAD NEXT BIT
 4367  022306  004737  043540                JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 4368  022312  005300                        DEC     R0              ;CHECK IF TIME FOR READY
 4369  022314  001367                        BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 4370  022316  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 4371  022324  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 4372  022332  012737  000224  003500        MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4373  022340  012737  000300  003510        MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 4374  022346  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4375  022354  001401                        BEQ     16$             ;YES, CHECK CS2
 4376  022356  104151                        ERROR   151             ;CS1 INCORRECT
 4377  022360  023737  003510  003450  16$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4378  022366  001401                        BEQ     17$             ;YES, CHECK DATA
 4379  022370  104152                        ERROR   152             ;CS2 INCORRECT
 4380  022372  005037  003624          17$:  CLR     WRDCNT          ;INITIALIZE WORD COUNT
 4381  022376  012703  064326                MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
 4382  022402  012337  003522          20$:  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4383  022406  016237  000024  003462        MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
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 4384  022414  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4385  022422  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4386  022430  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4387  022436  001003                          BNE     21$             ;NO, CHECK CS1
 4388  022440  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4389  022446  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4390  022454  001402                          BEQ     22$             ;YES, CHECK CS2
 4391  022456  104153                          ERROR   153             ;CS1 INCORRECT
 4392  022460  000421                          BR      TST24           ;;GO ON TO NEXT TEST
 4393
 4394  022462  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4395  022470  001402                          BEQ     23$             ;YES, CHECK DATA
 4396  022472  104154                          ERROR   154             ;CS2 INCORRECT
 4397  022474  000413                          BR      TST24           ;;GO ON TO NEXT TEST
 4398
 4399  022476  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 4400  022504  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
 4401  022506  104155                          ERROR   155             ;DATA INCORRECT
 4402  022510  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
 4403  022514  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
 4404  022522  001327                          BNE     20$             ;NO, GET NEXT WORD
 4405
 4406                                  ;;*****************************************************************
 4407                                  ;*TEST 24       READ LOOPBACK (PART 2)
 4408                                  ;*
 4409                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4410                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
 4411                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 4412                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
 4413                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A ONE,
 4414                                  ;*      AND A HEADER CONSISTING OF THE THREE
 4415                                  ;*      FOLLOWING WORDS:
 4416                                  ;*
 4417                                  ;*              000000
 4418                                  ;*              177777
 4419                                  ;*              000000
 4420                                  ;*
 4421                                  ;*      MAKE SURE THAT READY COMES UP AFTER THIRD WORD
 4422                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
 4423                                  ;*
 4424                                  ;*****************************************************************
 4425  022524  000004                  TST24:  SCOPE
 4426  022526  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4427  022534  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4428  022540  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4429  022546  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4430  022554  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
 4431  022562  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 4432  022566  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
 4433  022574  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4434  022602  005300                          DEC     R0
 4435  022604  001370                          BNE     1$
 4436  022606  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 4437  022614  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4438  022622  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 4439  022626  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
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4440  022632  012700  000341                  MOV     #225.,R0
4441  022636  004737  043540          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
4442  022642  005300                          DEC     R0
4443  022644  001374                          BNE     2$
4444  022646  012737  000001  003614          MOV     #1,PR.BIT
4445  022654  004737  043540                  JSR     PC,RDBIT
4446  022660  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
4447  022664  012703  064334                  MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
4448  022670  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
4449  022676  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
4450  022700  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
4451  022704  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4452  022712  006004                          ROR     R4              ;GET NEXT BIT
4453  022714  103403                          BCS     7$              ;CHECK IF 1
4454  022716  005037  003614                  CLR     PR.BIT          ;NO, ZERO
4455  022722  000403                          BR      8$              ;SIMULATE READ DATA
4456
4457  022724  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
4458  022732  004737  043540          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
4459  022736  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
4460  022744  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
4461  022752  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
4462  022754  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
4463  022762  160137  003624                  SUB     R1,WRDCNT
4464  022766  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
4465  022774  160037  003622                  SUB     R0,BITCNT
4466  023000  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
4467  023002  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4468  023010  000522                          BR      TST25           ;;GO ON TO NEXT TEST
4469
4470  023012  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
4471  023014  001333                          BNE     6$              ;NO, GET NEXT BIT
4472  023016  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
4473  023020  001326                          BNE     5$              ;NO, GET NEXT WORD
4474  023022  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4475  023026  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4476  023034  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
4477  023040  004737  043540                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4478  023044  005300                          DEC     R0              ;CHECK IF TIME FOR READY
4479  023046  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4480  023050  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4481  023056  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4482  023064  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4483  023072  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4484  023100  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4485  023106  001401                          BEQ     16$             ;YES, CHECK CS2
4486  023110  104151                          ERROR   151             ;CS1 INCORRECT
4487  023112  023737  003510  003450  16$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4488  023120  001401                          BEQ     17$             ;YES, CHECK DATA
4489  023122  104152                          ERROR   152             ;CS2 INCORRECT
4490  023124  005037  003624          17$:     CLR     WRDCNT          ;INITIALIZE WORD COUNT
4491  023130  012703  064334                  MOV     #HEAD2,R3       ;GET ADDRESS OF DATA
4492  023134  012337  003522          20$:     MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4493  023140  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4494  023146  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4495  023154  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
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 4496  023162  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4497  023170  001003                          BNE     21$             ;NO, CHECK CS1
 4498  023172  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4499  023200  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4500  023206  001402                          BEQ     22$             ;YES, CHECK CS2
 4501  023210  104153                          ERROR   153             ;CS1 INCORRECT
 4502  023212  000421                          BR      TST25           ;;GO ON TO NEXT TEST
 4503
 4504  023214  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4505  023222  001402                          BEQ     23$             ;YES, CHECK DATA
 4506  023224  104154                          ERROR   154             ;CS2 INCORRECT
 4507  023226  000413                          BR      TST25           ;;GO ON TO NEXT TEST
 4508
 4509  023230  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 4510  023236  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
 4511  023240  104155                          ERROR   155             ;DATA INCORRECT
 4512  023242  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
 4513  023246  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
 4514  023254  001327                          BNE     20$             ;NO, GET NEXT WORD
 4515
 4516                                  ;;*****************************************************************
 4517                                  ;*TEST 25       READ LOOPBACK (PART 3)
 4518                                  ;*
 4519                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4520                                  ;*      IN DIAGNOSTIC MOVE.  ISSUE A READ HEADER TO AN RK06
 4521                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 4522                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
 4523                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
 4524                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
 4525                                  ;*      FOLLOWING WORDS:
 4526                                  ;*
 4527                                  ;*              125252
 4528                                  ;*              052525
 4529                                  ;*              125252
 4530                                  ;*
 4531                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
 4532                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
 4533                                  ;*
 4534                                  ;;*****************************************************************
 4535  023256  000004                  TST25:  SCOPE
 4536  023260  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4537  023266  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4538  023272  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4539  023300  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4540  023306  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
 4541  023314  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 4542  023320  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
 4543  023326  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4544  023334  005300                          DEC     R0
 4545  023336  001370                          BNE     1$
 4546  023340  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 4547  023346  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4548  023354  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 4549  023360  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
 4550  023364  012700  000341                  MOV     #225.,R0
 4551  023370  004737  043540          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
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 4552  023374  005300                          DEC     R0
 4553  023376  001374                          BNE     2$
 4554  023400  012737  000001  003614          MOV     #1,PR.BIT
 4555  023406  004737  043540                  JSR     PC,RDBIT
 4556  023412  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
 4557  023416  012703  064342                  MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
 4558  023422  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 4559  023430  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
 4560  023432  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
 4561  023436  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 4562  023444  006004                          ROR     R4              ;GET NEXT BIT
 4563  023446  103403                          BCS     7$              ;CHECK IF 1
 4564  023450  005037  003614                  CLR     PR.BIT          ;NO, ZERO
 4565  023454  000403                          BR      8$              ;SIMULATE READ DATA
 4566
 4567  023456  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
 4568  023464  004737  043540          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 4569  023470  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 4570  023476  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 4571  023504  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
 4572  023506  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
 4573  023514  160137  003624                  SUB     R1,WRDCNT
 4574  023520  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
 4575  023526  160037  003622                  SUB     R0,BITCNT
 4576  023532  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
 4577  023534  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4578  023542  000522                          BR      TST26           ;;GO ON TO NEXT TEST
 4579
 4580  023544  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
 4581  023546  001333                          BNE     6$              ;NO, GET NEXT BIT
 4582  023550  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
 4583  023552  001326                          BNE     5$              ;NO, GET NEXT WORD
 4584  023554  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 4585  023560  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 4586  023566  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
 4587  023572  004737  043540                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 4588  023576  005300                          DEC     R0              ;CHECK IF TIME FOR READY
 4589  023600  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 4590  023602  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 4591  023610  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 4592  023616  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4593  023624  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 4594  023632  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4595  023640  001401                          BEQ     16$             ;YES, CHECK CS2
 4596  023642  104151                          ERROR   151             ;CS1 INCORRECT
 4597  023644  023737  003510  003450  16$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4598  023652  001401                          BEQ     17$             ;YES, CHECK DATA
 4599  023654  104152                          ERROR   152             ;CS2 INCORRECT
 4600  023656  005037  003624          17$:     CLR     WRDCNT          ;INITIALIZE WORD COUNT
 4601  023662  012703  064342                  MOV     #HEAD3,R3       ;GET ADDRESS OF DATA
 4602  023666  012337  003522          20$:     MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4603  023672  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
 4604  023700  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4605  023706  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4606  023714  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4607  023722  001003                          BNE     21$             ;NO, CHECK CS1
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 4608  023724  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4609  023732  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4610  023740  001402                          BEQ     22$             ;YES, CHECK CS2
 4611  023742  104153                          ERROR   153             ;CS1 INCORRECT
 4612  023744  000421                          BR      TST26           ;;GO ON TO NEXT TEST
 4613
 4614  023746  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4615  023754  001402                          BEQ     23$             ;YES, CHECK DATA
 4616  023756  104154                          ERROR   154             ;CS2 INCORRECT
 4617  023760  000413                          BR      TST26           ;;GO ON TO NEXT TEST
 4618
 4619  023762  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 4620  023770  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
 4621  023772  104155                          ERROR   155             ;DATA INCORRECT
 4622  023774  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
 4623  024000  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
 4624  024006  001327                          BNE     20$             ;NO, GET NEXT WORD
 4625
 4626                                  ;;*****************************************************************
 4627                                  ;*TEST 26       READ LOOPBACK (PART 4)
 4628                                  ;*
 4629                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4630                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
 4631                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 4632                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
 4633                                  ;*      SIMULATE SECTOR PULSE, 225 ZEROES, A
 4634                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
 4635                                  ;*      FOLLOWING WORDS:
 4636                                  ;*
 4637                                  ;*              044444
 4638                                  ;*              022222
 4639                                  ;*              111111
 4640                                  ;*
 4641                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
 4642                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
 4643                                  ;*
 4644                                  ;;*****************************************************************
 4645  024010  000004                  TST26:  SCOPE
 4646  024012  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4647  024020  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4648  024024  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4649  024032  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4650  024040  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
 4651  024046  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 4652  024052  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
 4653  024060  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4654  024066  005300                          DEC     R0
 4655  024070  001370                          BNE     1$
 4656  024072  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 4657  024100  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4658  024106  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 4659  024112  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
 4660  024116  012700  000341                  MOV     #225.,R0
 4661  024122  004737  043540          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
 4662  024126  005300                          DEC     R0
 4663  024130  001374                          BNE     2$
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 4664  024132  012737  000001  003614          MOV     #1,PR.BIT
 4665  024140  004737  043540                  JSR     PC,RDBIT
 4666  024144  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
 4667  024150  012703  064356                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
 4668  024154  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 4669  024162  012304              5$:         MOV     (R3)+,R4        ;GET DATA
 4670  024164  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
 4671  024170  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 4672  024176  006004                          ROR     R4              ;GET NEXT BIT
 4673  024200  103403                          BCS     7$              ;CHECK IF 1
 4674  024202  005037  003614                  CLR     PR.BIT          ;NO, ZERO
 4675  024206  000403                          BR      8$              ;SIMULATE READ DATA
 4676
 4677  024210  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
 4678  024216  004737  043540          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 4679  024222  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 4680  024230  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 4681  024236  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
 4682  024240  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
 4683  024246  160137  003624                  SUB     R1,WRDCNT
 4684  024252  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
 4685  024260  160037  003622                  SUB     R0,BITCNT
 4686  024264  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
 4687  024266  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4688  024274  000522                          BR      TST27           ;;GO ON TO NEXT TEST
 4689
 4690  024276  005300              9$:         DEC     R0              ;CHECK IF READY FOR NEXT WORD
 4691  024300  001333                          BNE     6$              ;NO, GET NEXT BIT
 4692  024302  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
 4693  024304  001326                          BNE     5$              ;NO, GET NEXT WORD
 4694  024306  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 4695  024312  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 4696  024320  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
 4697  024324  004737  043540                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 4698  024330  005300                          DEC     R0              ;CHECK IF TIME FOR READY
 4699  024332  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 4700  024334  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 4701  024342  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 4702  024350  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4703  024356  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 4704  024364  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4705  024372  001401                          BEQ     16$             ;YES, CHECK CS2
 4706  024374  104151                          ERROR   151             ;CS1 INCORRECT
 4707  024376  023737  003510  003450  16$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4708  024404  001401                          BEQ     17$             ;YES, CHECK DATA
 4709  024406  104152                          ERROR   152             ;CS2 INCORRECT
 4710  024410  005037  003624          17$:     CLR     WRDCNT          ;INITIALIZE WORD COUNT
 4711  024414  012703  064356                  MOV     #HEAD4,R3       ;GET ADDRESS OF DATA
 4712  024420  012337  003522          20$:     MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4713  024424  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
 4714  024432  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4715  024440  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4716  024446  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4717  024454  001003                          BNE     21$             ;NO, CHECK CS1
 4718  024456  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4719  024464  023737  003500  003440  21$:     CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
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4720  024472  001402                          BEQ     22$             ;YES, CHECK CS2
4721  024474  104153                          ERROR   153             ;CS1 INCORRECT
4722  024476  000421                          BR      TST27           ;;GO ON TO NEXT TEST
4723
4724  024500  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4725  024506  001402                          BEQ     23$             ;YES, CHECK DATA
4726  024510  104154                          ERROR   154             ;CS2 INCORRECT
4727  024512  000413                          BR      TST27           ;;GO ON TO NEXT TEST
4728
4729  024514  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4730  024522  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4731  024524  104155                          ERROR   155             ;DATA INCORRECT
4732  024526  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4733  024532  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4734  024540  001327                          BNE     20$             ;NO, GET NEXT WORD
4735
4736                                  ;;*****************************************************************
4737                                  ;*TEST 27       READ LOOPBACK (PART 5)
4738                                  ;*
4739                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4740                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4741                                  ;*      26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4742                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4743                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
4744                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4745                                  ;*      FOLLOWING WORDS.
4746                                  ;*
4747                                  ;*              052012
4748                                  ;*              100520
4749                                  ;*              052012
4750                                  ;*
4751                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4752                                  ;*      IS TRANSRERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4753                                  ;*
4754                                  ;*****************************************************************
4755  024542  000004                  TST27:  SCOPE
4756  024544  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4757  024552  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
4758  024556  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4759  024564  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4760  024572  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
4761  024600  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4762  024604  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
4763  024612  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4764  024620  005300                          DEC     R0
4765  024622  001370                          BNE     1$
4766  024624  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4767  024632  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4768  024640  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
4769  024644  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
4770  024650  012700  000341                  MOV     #225.,R0
4771  024654  004737  043540          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
4772  024660  005300                          DEC     R0
4773  024662  001374                          BNE     2$
4774  024664  012737  000001  003614          MOV     #1,PR.BIT
4775  024672  004737  043540                  JSR     PC,RDBIT
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 4776  024676  012701  000003                MOV     #3,R1           ;LOAD NUMBER OF WORDS
 4777  024702  012703  064364                MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
 4778  024706  012737  000025  003500        MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 4779  024714  012304                5$:     MOV     (R3)+,R4        ;GET DATA
 4780  024716  012700  000020                MOV     #16.,R0         ;LOAD BIT COUNT
 4781  024722  013737  003614  003616  6$:   MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 4782  024730  006004                        ROR     R4              ;GET NEXT BIT
 4783  024732  103403                        BCS     7$              ;CHECK IF 1
 4784  024734  005037  003614                CLR     PR.BIT          ;NO, ZERO
 4785  024740  000403                        BR      8$              ;SIMULATE READ DATA
 4786
 4787  024742  012737  000001  003614  7$:   MOV     #1,PR.BIT       ;ONE
 4788  024750  004737  043540        8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 4789  024754  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 4790  024762  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 4791  024770  001417                        BEQ     9$              ;YES, SIMULATE NEXT BIT
 4792  024772  012737  000003  003624        MOV     #3,WRDCNT       ;LOAD WORD COUNT
 4793  025000  160137  003624                SUB     R1,WRDCNT
 4794  025004  012737  000020  003622        MOV     #16.,BITCNT     ;LOAD BIT COUNT
 4795  025012  160037  003622                SUB     R0,BITCNT
 4796  025016  104150                        ERROR   150             ;CS1 INCORRECT DURING HEADER
 4797  025020  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4798  025026  000522                        BR      TST30           ;;GO ON TO NEXT TEST
 4799
 4800  025030  005300                9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
 4801  025032  001333                        BNE     6$              ;NO, GET NEXT BIT
 4802  025034  005301                        DEC     R1              ;CHECK IF HEADER FINISHED
 4803  025036  001326                        BNE     5$              ;NO, GET NEXT WORD
 4804  025040  012700  000004                MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 4805  025044  013737  003614  003616  15$:   MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 4806  025052  005037  003614                CLR     PR.BIT          ;LOAD NEXT BIT
 4807  025056  004737  043540                JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 4808  025062  005300                        DEC     R0              ;CHECK IF TIME FOR READY
 4809  025064  001367                        BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 4810  025066  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 4811  025074  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 4812  025102  012737  000224  003500        MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4813  025110  012737  000300  003510        MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 4814  025116  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4815  025124  001401                        BEQ     16$             ;YES, CHECK CS2
 4816  025126  104151                        ERROR   151             ;CS1 INCORRECT
 4817  025130  023737  003510  003450  16$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4818  025136  001401                        BEQ     17$             ;YES, CHECK DATA
 4819  025140  104152                        ERROR   152             ;CS2 INCORRECT
 4820  025142  005037  003624          17$:  CLR     WRDCNT          ;INITIALIZE WORD COUNT
 4821  025146  012703  064364                MOV     #HEAD5,R3       ;GET ADDRESS OF DATA
 4822  025152  012337  003522          20$:  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4823  025156  016237  000024  003462        MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
 4824  025164  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4825  025172  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4826  025200  022737  000002  003624        CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4827  025206  001003                        BNE     21$             ;NO, CHECK CS1
 4828  025210  012737  000100  003510        MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4829  025216  023737  003500  003440  21$:   CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4830  025224  001402                        BEQ     22$             ;YES, CHECK CS2
 4831  025226  104153                        ERROR   153             ;CS1 INCORRECT
```

```
4832  025230  000421                          BR      TST30           ;;GO ON TO NEXT TEST
4833
4834  025232  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4835  025240  001402                          BEQ     23$             ;YES, CHECK DATA
4836  025242  104154                          ERROR   154             ;CS2 INCORRECT
4837  025244  000413                          BR      TST30           ;;GO ON TO NEXT TEST
4838
4839  025246  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4840  025254  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4841  025256  104155                          ERROR   155             ;DATA INCORRECT
4842  025260  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4843  025264  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4844  025272  001327                          BNE     20$             ;NO, GET NEXT WORD
4845
4846                                  ;;*****************************************************************
4847                                  ;*TEST 30       READ HEADER IN 18 BIT MODE
4848                                  ;*
4849                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4850                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4851                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4852                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
4853                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4854                                  ;*      FOLLOWING WORDS:
4855                                  ;*
4856                                  ;*              177777
4857                                  ;*              000000
4858                                  ;*              177777
4859                                  ;*
4860                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4861                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4862                                  ;*
4863                                  ;;*****************************************************************
4864  025274  000004          TST30:  SCOPE
4865  025276  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4866  025304  013702  001270                  MOV     $BASE,R2        ;LOAD RK611
4867  025310  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4868  025316  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4869  025324  012762  010025  000000          MOV     #CFMT!RDHEAD,RKCS1(R2) ;ISSUE READ HEADER (24 SECTOR FORMAT)
4870  025332  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4871  025336  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
4872  025344  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4873  025352  005300                          DEC     R0
4874  025354  001370                          BNE     1$
4875  025356  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
4876  025364  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4877  025372  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
4878  025376  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
4879  025402  012700  000377                  MOV     #255.,R0
4880  025406  004737  043540          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
4881  025412  005300                          DEC     R0
4882  025414  001374                          BNE     2$
4883  025416  012737  000001  003614          MOV     #1,PR.BIT
4884  025424  004737  043540                  JSR     PC,RDBIT
4885  025430  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
4886  025434  012703  064326                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
4887  025440  012737  010025  003500          MOV     #CFMT!RDHEAD,E.CS1 ;LOAD EXPECTED CS1
```

```
 4888  025446  012304                    5$:   MOV   (R3)+,R4          ;GET DATA
 4889  025450  012700  000020                  MOV   #16.,R0           ;LOAD BIT COUNT
 4890  025454  013737  003614  003616    6$:   MOV   PR.BIT,M1.BIT    ;STORE PRESENT BIT
 4891  025462  006004                          ROR   R4                ;GET NEXT BIT
 4892  025464  103403                          BCS   7$                ;CHECK IF 1
 4893  025466  005037  003614                  CLR   PR.BIT            ;NO, ZERO
 4894  025472  000403                          BR    8$                ;SIMULATE READ DATA
 4895
 4896  025474  012737  000001  003614    7$:   MOV   #1,PR.BIT         ;ONE
 4897  025502  004737  043540            8$:   JSR   PC,RDBIT          ;SIMULATE READ DATA
 4898  025506  016237  000000  003440          MOV   RKCS1(R2),T.CS1   ;READ COMMAND AND STATUS REG. 1
 4899  025514  023737  003500  003440          CMP   E.CS1,T.CS1       ;CHECK IF CS1 CORRECT
 4900  025522  001417                          BEQ   9$                ;YES, SIMULATE NEXT BIT
 4901  025524  012737  000003  003624          MOV   #3,WRDCNT         ;LOAD WORD COUNT
 4902  025532  160137  003624                  SUB   R1,WRDCNT
 4903  025536  012737  000020  003622          MOV   #16.,BITCNT       ;LOAD BIT COUNT
 4904  025544  160037  003622                  SUB   R0,BITCNT
 4905  025550  104156                          ERROR 156               ;CS1 INCORRECT DURING HEADER
 4906  025552  012762  100000  000000          MOV   #CCLR,RKCS1(R2)   ;CLEAR RK611
 4907  025560  000522                          BR    TST31             ;;GO ON TO NEXT TEST
 4908
 4909  025562  005300                    9$:   DEC   R0                ;CHECK IF READY FOR NEXT WORD
 4910  025564  001333                          BNE   6$                ;NO, GET NEXT BIT
 4911  025566  005301                          DEC   R1                ;CHECK IF HEADER FINISHED
 4912  025570  001326                          BNE   5$                ;NO, GET NEXT WORD
 4913  025572  012700  000004                  MOV   #4,R0             ;LOAD COUNT FOR POSTAMBLE
 4914  025576  013737  003614  003616   15$:   MOV   PR.BIT,M1.BIT    ;STORE LAST BIT
 4915  025604  005037  003614                  CLR   PR.BIT            ;LOAD NEXT BIT
 4916  025610  004737  043540                  JSR   PC,RDBIT          ;READ BIT
 4917  025614  005300                          DEC   R0                ;CHECK IF TIME FOR READY
 4918  025616  001367                          BNE   15$               ;NO, CONTINUE WITH POSTAMBLE
 4919  025620  016237  000000  003440          MOV   RKCS1(R2),T.CS1   ;GET CURRENT CS1
 4920  025626  016237  000010  003450          MOV   RKCS2(R2),T.CS2   ;GEY CURRENT CS2
 4921  025634  012737  010224  003500          MOV   #CFMT!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4922  025642  012737  000300  003510          MOV   #OR!IR,E.CS2      ;LOAD EXPECTED CS2
 4923  025650  023737  003500  003440          CMP   E.CS1,T.CS1       ;CHECK CS1 CORRECT
 4924  025656  001401                          BEQ   16$               ;YES, CHECK CS2
 4925  025660  104157                          ERROR 157               ;CS1 INCORRECT
 4926  025662  023737  003510  003450   16$:   CMP   E.CS2,T.CS2       ;CHECK CS2 CORRECT
 4927  025670  001401                          BEQ   17$               ;YES, CHECK DATA
 4928  025672  104160                          ERROR 160               ;CS2 INCORRECT
 4929  025674  005037  003624          17$:   CLR   WRDCNT            ;INITIALIZE WORD COUNT
 4930  025700  012703  064326                  MOV   #HEAD1,R3         ;GET ADDRESS OF DATA
 4931  025704  012337  003522          20$:   MOV   (R3)+,E.DB         ;GET EXPECTED DATA
 4932  025710  016237  000024  003462          MOV   RKDB(R2),T.DB     ;GET ACTUAL DATA
 4933  025716  016237  000000  003440          MOV   RKCS1(R2),T.CS1   ;STORE COMMAND AND STATUS REG. 1
 4934  025724  016237  000010  003450          MOV   RKCS2(R2),T.CS2   ;STORE COMMAND AND STATUS REG. 2
 4935  025732  022737  000002  003624          CMP   #2,WRDCNT         ;CHECK IF LAST WORD IN DATA BUFFER
 4936  025740  001003                          BNE   21$               ;NO, CHECK CS1
 4937  025742  012737  000100  003510          MOV   #IR,E.CS2         ;LOAD EXPECTED CS2
 4938  025750  023737  003500  003440   21$:   CMP   E.CS1,T.CS1       ;CHECK CS1 CORRECT
 4939  025756  001402                          BEQ   22$               ;YES, CHECK CS2
 4940  025760  104161                          ERROR 161               ;CS1 INCORRECT
 4941  025762  000421                          BR    TST31             ;;GO ON TO NEXT TEST
 4942
 4943  025764  023737  003510  003450   22$:   CMP   E.CS2,T.CS2       ;CHECK CS2 CORRECT
```

```
 4944  025772  001402                          BEQ     23$             ;YES, CHECK DATA BUFFER
 4945  025774  104162                          ERROR   162             ;CS2 INCORRECT
 4946  025776  000413                          BR      TST31           ;;GO ON TO NEXT TEST
 4947
 4948  026000  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK DATA BUFFER CORRECT
 4949  026006  001401                          BEQ     24$             ;YES, GET NEXT WORD
 4950  026010  104163                          ERROR   163             ;DATA BUFFER INCORRECT
 4951  026012  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
 4952  026016  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF FINISHED
 4953  026024  001327                          BNE     20$             ;NO READ NEXT WORD
 4954
 4955                                          ;;*****************************************************************
 4956                                          ;*TEST 31       SYNCH DETECT IN READ HEADER
 4957                                          ;*
 4958                                          ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4959                                          ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
 4960                                          ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 4961                                          ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
 4962                                          ;*      SIMULATE SECTOR PULSE AND 350 ZEROES.  MAKE
 4963                                          ;*      SURE READY REMAINS RESET AND THE SILO REMAINS
 4964                                          ;*      EMPTY.
 4965                                          ;*
 4966                                          ;;*****************************************************************
 4967  026026  000004                  TST31:  SCOPE
 4968  026030  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4969  026036  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4970  026042  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4971  026050  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
 4972  026056  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEAD
 4973  026064  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 4974  026070  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
 4975  026076  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4976  026104  005300                          DEC     R0
 4977  026106  001370                          BNE     1$
 4978  026110  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE TO SECTOR PULSE
 4979  026116  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4980  026124  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND
 4981  026130  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
 4982  026134  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 4983  026142  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 4984  026150  005037  003622                  CLR     BITCNT          ;SIMULATE 350 ZEROES
 4985  026154  004737  043540          2$:     JSR     PC,RDBIT
 4986  026160  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE CS1
 4987  026166  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE CS2
 4988  026174  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 4989  026202  001402                          BEQ     3$              ;YES, CHECK CS2
 4990  026204  104164                          ERROR   164                     ;CS1 INCORRECT
 4991  026206  000447                          BR      TST32           ;;GO ON TO NEXT TEST
 4992
 4993  026210  023737  003510  003450  3$:     CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
 4994  026216  001402                          BEQ     4$              ;YES, CHECK IF SILO EMPTY
 4995  026220  104165                          ERROR   165             ;CS2 INCORRECT
 4996  026222  000441                          BR      TST32           ;;GO ON TO NEXT TEST
 4997  026224  005237  003622          4$:     INC     BITCNT          ;INCREMENT BIT COUNT
 4998  026230  022737  000536  003622          CMP     #350.,BITCNT    ;CHECK IF FINISHED
 4999  026236  001346                          BNE     2$              ;NO, SIMULATE NEXT ZERO
```

```
                                        TST     RKDB(R2)          ;READ DATA BUFFER
                                        MOV     RKCS1(R2),T.CS1   ;STORE CS1 AND CS2
                                        MOV     RKCS2(R2),T.CS2
                                        MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECT CS1
                                        MOV     #DCK!IR,E.CS2     ;LOAD EXPECTED CS2
                                        CMP     E.CS1,T.CS1       ;CHECK FOR CONTROLLER ERROR
                                        BEQ     5$                ;YES, CHECK FOR DATA LATE
                                        ERROR   166               ;CS1 INCORRECT
                                5$:     CMP     E.CS2,T.CS2       ;CHECK FOR DATA LATE
                                        BEQ     6$                ;YES, CHECK RK611
                                        ERROR   167               ;CS2 INCORRECT
                                6$:     MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611

                                ;;*****************************************************************
                                ;*TEST 32       ZERO SYNCH ON READ
                                ;*
                                ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES,
                                ;*      SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF
                                ;*      BIT TIME, A ONE, AND A HEADER CONSISTING OF THE
                                ;*      THREE FOLLOWING WORDS:
                                ;*
                                ;*              177777
                                ;*              000000
                                ;*              177777
                                ;*
                                ;*      MAKE SURE THAT READY COMES AFTER THE THIRD WORD
                                ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                ;*
                                ;;*****************************************************************
                                TST32:  SCOPE
                                        MOV     #100.,$TIMES      ;;DO 100. ITERATIONS
                                        MOV     $BASE,R2          ;LOAD RK611 BASE
                                        MOV     #CCLR,RKCS1(R2)   ;CLEAR RK611
                                        MOV     #DMD,RKMR1(R2)    ;PUT RK611 IN DIAGNOSTIC MODE
                                        MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
                                        MOV     #50.*4+2,R0       ;ISSUE ENOUGH CLOCKS UNTIL READY
                                1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
                                        MOV     #DMD,RKMR1(R2)
                                        DEC     R0
                                        BNE     1$
                                        MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
                                        MOV     #DMD,RKMR1(R2)
                                        MOV     #DMD!MCLK,RKMR1(R2)  ;SHIFT DATA ONE HALF BIT TIME
                                        MOV     #DMD,RKMR1(R2)
                                        CLR     PR.BIT            ;INITIALIZE PRESENT BIT AND
                                        CLR     M1.BIT            ;  PREVIOUS BIT
                                        MOV     #225.,R0
                                2$:     JSR     PC,RDBIT          ;SIMULATE SYNCH
                                        DEC     R0
                                        BNE     2$
                                        MOV     #1,PR.BIT
                                        JSR     PC,RDBIT
                                        MOV     #3,R1             ;LOAD NUMBER OF WORDS
                                        MOV     #HEAD1,R3         ;LOAD ADDRESS OF DATA
```

```
 5056  026506  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 5057  026514  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
 5058  026516  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
 5059  026522  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5060  026530  006004                          ROR     R4              ;GET NEXT BIT
 5061  026532  103403                          BCS     7$              ;CHECK IF 1
 5062  026534  005037  003614                  CLR     PR.BIT          ;NO, ZERO
 5063  026540  000403                          BR      8$              ;SIMULATE READ DATA
 5064
 5065  026542  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
 5066  026550  004737  043540          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 5067  026554  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 5068  026562  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 5069  026570  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
 5070  026572  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
 5071  026600  160137  003624                  SUB     R1,WRDCNT
 5072  026604  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
 5073  026612  160037  003622                  SUB     R0,BITCNT
 5074  026616  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
 5075  026620  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5076  026626  000522                          BR      TST33           ;;GO ON TO NEXT TEST
 5077
 5078  026630  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
 5079  026632  001333                          BNE     6$              ;NO, GET NEXT BIT
 5080  026634  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
 5081  026636  001326                          BNE     5$              ;NO, GET NEXT WORD
 5082  026640  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 5083  026644  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 5084  026652  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
 5085  026656  004737  043540                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 5086  026662  005300                          DEC     R0              ;CHECK IF TIME FOR READY
 5087  026664  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 5088  026666  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 5089  026674  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 5090  026702  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 5091  026710  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 5092  026716  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 5093  026724  001401                          BEQ     16$             ;YES, CHECK CS2
 5094  026726  104151                          ERROR   151             ;CS1 INCORRECT
 5095  026730  023737  003510  003450  16$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 5096  026736  001401                          BEQ     17$             ;YES, CHECK DATA
 5097  026740  104152                          ERROR   152             ;CS2 INCORRECT
 5098  026742  005037  003624          17$:     CLR     WRDCNT          ;INITIALIZE WORD COUNT
 5099  026746  012703  064326                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
 5100  026752  012337  003522          20$:     MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 5101  026756  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
 5102  026764  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 5103  026772  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 5104  027000  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 5105  027006  001003                          BNE     21$             ;NO, CHECK CS1
 5106  027010  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 5107  027016  023737  003500  003440  21$:     CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 5108  027024  001402                          BEQ     22$             ;YES, CHECK CS2
 5109  027026  104153                          ERROR   153             ;CS1 INCORRECT
 5110  027030  000421                          BR      TST33           ;;GO ON TO NEXT TEST
 5111
```

```
5112  027032  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5113  027040  001402                          BEQ     23$             ;YES, CHECK DATA
5114  027042  104154                          ERROR   154             ;CS2 INCORRECT
5115  027044  000413                          BR      TST33           ;;GO ON TO NEXT TEST
5116
5117  027046  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5118  027054  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5119  027056  104155                          ERROR   155             ;DATA INCORRECT
5120  027060  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5121  027064  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5122  027072  001327                          BNE     20$             ;NO, GET NEXT WORD
5123
5124                                  .SBTTL  **MFM WRITE LOOPBACK TESTS
5125
5126                                  ;;*******************************************************************
5127                                  ;*TEST 33       WRITE ZEROS UNTIL SECTOR PULSE WITH WRITE HEADER
5128                                  ;*
5129                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5130                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5131                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5132                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
5133                                  ;*      INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
5134                                  ;*      ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
5135                                  ;*      WRITE GATE RESETS.
5136                                  ;*
5137                                  ;;*******************************************************************
5138  027074  000004                  TST33:  SCOPE
5139  027076  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5140  027104  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5141  027110  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5142  027116  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5143  027124  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;INITIALIZE ROM
5144  027132  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5145  027140  012762  064630  000004          MOV     #WRBUFF,RKBA(R2) ;ISSUE WRITE HEADER
5146  027146  012762  177777  000002          MOV     #-1,RKWC(R2)
5147  027154  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5148  027162  012700  002364                  MOV     #<256.+48.+64.+256.+10.>*2,R0 ;ISSUE ENOUGH CLOCKS
5149                                                                  ;  UNTIL READY FOR INDEX PULSE
5150  027166  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5151  027174  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5152  027202  005300                          DEC     R0
5153  027204  001370                          BNE     1$
5154  027206  012700  000004                  MOV     #4.,R0          ;SIMULATE INDEX PULSE
5155  027212  012762  000240  000026          MOV     #MIND!DMD,RKMR1(R2)
5156  027220  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5157  027226  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5158  027234  005300                          DEC     R0
5159  027236  001370                          BNE     2$
5160  027240  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5161  027246  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5162                                                                  ;  MAINT. REG
5163  027254  012700  000002                  MOV     #2,R0           ;WAIT FOR WRITE GATE
5164  027260  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5165  027266  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5166  027274  005300                          DEC     R0
5167  027276  001370                          BNE     3$
```

```
 5168  027300  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
 5169  027304  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 5170  027310  005037  003614                  CLR     PR.BIT
 5171  027314  005037  003616                  CLR     M1.BIT
 5172  027320  005037  003620                  CLR     M2.BIT
 5173  027324  012700  000764                  MOV     #500.,R0        ;LOAD COUNT FOR 500 BITS
 5174  027330  012737  060037  003170          MOV     #EM230,EMW      ;LOAD ERROR MESSAGE
 5175  027336  005037  003622                  CLR     BITCNT          ;CLEAR BIT COUNT
 5176  027342  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 5177  027346  104170                          ERROR   170             ;ERROR IN WRITE
 5178  027350  005237  003622                  INC     BITCNT          ;INCREMENT NUMBER OF BITS WRITTEN
 5179  027354  005300                          DEC     R0              ;CHECK IF FINISHED
 5180  027356  001371                          BNE     5$              ;NO, CONTINUE
 5181  027360  042737  040000  003524          BIC     #WRTGAT,E.MR1   ;GENERATE EXPECTED MR1
 5182  027366  052737  000100  003524          BIS     #MSP,E.MR1
 5183  027374  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;RAISE SECTOR PULSE
 5184  027402  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
 5185  027410  023737  003524  003464          CMP     E.MR1,T.MR1     ;STORE MAINT REG 1
 5186  027416  001401                          BEQ     10$             ;YES, LOWER SECTOR PULSE
 5187  027420  104171                          ERROR   171             ;WRITE GATE DID NOT RESET
 5188  027422  042737  000100  003524  10$:    BIC     #MSP,E.MR1      ;GENERATE EXPECTED MR1
 5189  027430  052737  040000  003524          BIS     #WRTGAT,E.MR1
 5190  027436  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;RESET SECTOR PULSE
 5191  027444  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
 5192  027452  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT
 5193  027460  001401                          BEQ     TST34           ;;YES, GO ON TO NEXT TEST
 5194  027462  104172                          ERROR   172             ;WRITE GATE DID NOT SET
 5195
 5196                                  ;;*****************************************************************
 5197                                  ;*TEST 34       WRITE LOOPBACK (PART 1)
 5198                                  ;*
 5199                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 5200                                  ;*      IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
 5201                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 5202                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 5203                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
 5204                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
 5205                                  ;*
 5206                                  ;*              177777
 5207                                  ;*              000000
 5208                                  ;*              177777
 5209                                  ;*
 5210                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
 5211                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
 5212                                  ;*
 5213                                  ;*****************************************************************
 5214  027464  000004                  TST34:  SCOPE
 5215  027466  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 5216  027474  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 5217  027500  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5218  027506  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 5219  027514  012762  064326  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
 5220  027522  012762  177775  000002          MOV     #-3,RKWC(R2)
 5221  027530  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
 5222  027536  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 5223                                                                  ;  READY FOR INDEX PULSE
```

```
 5224  027542  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 5225  027550  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5226  027556  005300                          DEC     R0
 5227  027560  001370                          BNE     1$
 5228  027562  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
 5229  027566  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 5230  027574  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5231  027602  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 5232  027610  005300                          DEC     R0
 5233  027612  001370                          BNE     2$
 5234  027614  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5235  027622  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 5236  027626  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 5237  027634  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5238  027642  005300                          DEC     R0
 5239  027644  001370                          BNE     3$
 5240  027646  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 5241  027654  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5242  027662  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
 5243  027666  012737  060411  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 5244  027674  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 5245                                                                  ;  MAINT REG 1
 5246  027702  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 5247  027706  005037  003614                  CLR     PR.BIT
 5248  027712  005037  003616                  CLR     M1.BIT
 5249  027716  005037  003620                  CLR     M2.BIT
 5250  027722  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 5251  027726  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5252  027732  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 5253  027736  104170                          ERROR   170             ;DATA INCORRECT
 5254  027740  005237  003622                  INC     BITCNT
 5255  027744  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 5256  027746  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
 5257  027750  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 5258  027756  004737  042570                  JSR     PC,WRTBIT
 5259  027762  104170                          ERROR   170             ;DATA INCORRECT
 5260  027764  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5261  027770  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 5262  027776  012703  064326                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
 5263  030002  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 5264  030006  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
 5265  030010  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 5266  030014  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5267  030022  013737  003614  003616          MOV     PR.BIT,M1.BIT
 5268  030030  013737  003612  003614          MOV     P1.BIT,PR.BIT
 5269  030036  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 5270  030040  103403                          BCS     14$             ;CHECK IF ONE
 5271  030042  005037  003612                  CLR     P1.BIT          ;ZERO
 5272  030046  000403                          BR      15$             ;CLOCK IN BIT
 5273
 5274  030050  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
 5275  030056  004737  042570          15$:     JSR     PC,WRTBIT       ;WRITE BIT
 5276  030062  104170                          ERROR   170             ;BIT INCORRECT
 5277  030064  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 5278  030070  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 5279  030072  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
```

```
 5280  030074  005300                        DEC     R0              ;CHECK IF HEADER COMPLETE
 5281  030076  001343                        BNE     10$             ;NO, GET NEXT WORD
 5282  030100  012701  000020                MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 5283  030104  013737  003616  003620  18$:  MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5284  030112  013737  003614  003616        MOV     PR.BIT,M1.BIT
 5285  030120  013737  003612  003614        MOV     P1.BIT,PR.BIT
 5286  030126  005037  003612                CLR     P1.BIT
 5287  030132  004737  042570                JSR     PC,WRTBIT       ;WRITE ZERO
 5288  030136  104170                        ERROR   170             ;BIT INCORRECT
 5289  030140  005237  003622                INC     BITCNT          ;INCREMENT BIT COUNT
 5290  030144  005301                        DEC     R1              ;CHECK IF FINISHED
 5291  030146  001356                        BNE     18$             ;NO, CLOCK NEXT BIT
 5292  030150  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
 5293  030156  012700  000004                MOV     #4,R0
 5294  030162  012762  000640  000026  20$:  MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5295  030170  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
 5296  030176  005300                        DEC     R0
 5297  030200  001370                        BNE     20$
 5298  030202  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 5299  030210  016237  000026  003464        MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 5300  030216  012737  022040  003524        MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 5301  030224  023737  003524  003464        CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 5302  030232  001401                        BEQ     25$             ;YES, CHECK IF READY SET
 5303  030234  104173                        ERROR   173             ;MAINT REG 1 INCORRECT
 5304  030236  012700  000010          25$:  MOV     #8.,R0          ;FINISH COMMAND
 5305  030242  012762  000440  000026  26$:  MOV     #DMD!MCLK,RKMR1(R2)
 5306  030250  012762  000040  000026        MOV     #DMD,RKMR1(R2)
 5307  030256  005300                        DEC     R0
 5308  030260  001370                        BNE     26$
 5309  030262  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 5310  030270  012737  000226  003500        MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 5311  030276  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 5312  030304  001401                        BEQ     TST35           ;;YES, GO ON TO NEXT TEST
 5313  030306  104174                        ERROR   174             ;CS1 INCORRECT
 5314
 5315                                ;;*****************************************************************
 5316                                ;*TEST 35       WRITE LOOPBACK (PART 2)
 5317                                ;*
 5318                                ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 5319                                ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 5320                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 5321                                ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 5322                                ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
 5323                                ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
 5324                                ;*
 5325                                ;*              000000
 5326                                ;*              177777
 5327                                ;*              000000
 5328                                ;*
 5329                                ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
 5330                                ;*      IS TRANSFERRED.  CHECK FOR CORRECT WRITE ENCODED DATA
 5331                                ;*      AND PRECOMPENSATION.
 5332                                ;*
 5333                                ;*****************************************************************
 5334  030310  000004                TST35:  SCOPE
 5335  030312  012737  000144  001200        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
```

```
 5336  030320  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
 5337  030324  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5338  030332  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 5339  030340  012762  064334  000004            MOV     #HEAD2,RKBA(R2) ;ISSUE WRITE HEADER
 5340  030346  012762  177775  000002            MOV     #-3,RKWC(R2)
 5341  030354  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2)
 5342  030362  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 5343                                                                    ;  READY FOR INDEX PULSE
 5344  030366  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
 5345  030374  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 5346  030402  005300                            DEC     R0
 5347  030404  001370                            BNE     1$
 5348  030406  012700  000004                    MOV     #4,R0           ;ISSUE INDEX PULSE
 5349  030412  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 5350  030420  012762  000640  000026  2$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5351  030426  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 5352  030434  005300                            DEC     R0
 5353  030436  001370                            BNE     2$
 5354  030440  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 5355  030446  012700  000010                    MOV     #8.,R0          ;WAIT FOR WRITE GATE
 5356  030452  012762  000440  000026  3$:       MOV     #DMD!MCLK,RKMR1(R2)
 5357  030460  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 5358  030466  005300                            DEC     R0
 5359  030470  001370                            BNE     3$
 5360  030472  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 5361  030500  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 5362  030506  005037  003626                    CLR     SECCNT          ;INITIALIZE SECTOR COUNT
 5363  030512  012737  060411  003170            MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 5364  030520  012737  062040  003524            MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 5365                                                                    ;  MAINT REG 1
 5366  030526  005037  003612                    CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 5367  030532  005037  003614                    CLR     PR.BIT
 5368  030536  005037  003616                    CLR     M1.BIT
 5369  030542  005037  003620                    CLR     M2.BIT
 5370  030546  012700  000400                    MOV     #256.,R0        ;SIMULATE SYNCH
 5371  030552  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 5372  030556  004737  042570          5$:       JSR     PC,WRTBIT       ;WRITE ONE BIT
 5373  030562  104170                            ERROR   170             ;DATA INCORRECT
 5374  030564  005237  003622                    INC     BITCNT
 5375  030570  005300                            DEC     R0              ;CHECK IF READY FOR DATA
 5376  030572  001371                            BNE     5$              ;NO, GENERATE NEXT BIT
 5377  030574  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 5378  030602  004737  042570                    JSR     PC,WRTBIT
 5379  030606  104170                            ERROR   170             ;DATA INCORRECT
 5380  030610  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 5381  030614  012737  060455  003170            MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 5382  030622  012703  064334                    MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
 5383  030626  012700  000003                    MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 5384  030632  012304                  10$:       MOV     (R3)+,R4        ;GET NEXT WORD
 5385  030634  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
 5386  030640  013737  003616  003620  12$:       MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5387  030646  013737  003614  003616            MOV     PR.BIT,M1.BIT
 5388  030654  013737  003612  003614            MOV     P1.BIT,PR.BIT
 5389  030662  006004                            ROR     R4              ;SHIFT IN NEXT BIT
 5390  030664  103403                            BCS     14$             ;CHECK IF ONE
 5391  030666  005037  003612                    CLR     P1.BIT          ;ZERO
```

```
5392  030672  000403                          BR      15$             ;CLOCK IN BIT
5393
5394  030674  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5395  030702  004737  042570          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5396  030706  104170                          ERROR   170             ;BIT INCORRECT
5397  030710  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5398  030714  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5399  030716  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5400  030720  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5401  030722  001343                          BNE     10$             ;NO, GET NEXT WORD
5402  030724  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5403  030730  013737  003616  003620  19$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5404  030736  013737  003614  003616          MOV     PR.BIT,M1.BIT
5405  030744  013737  003612  003614          MOV     P1.BIT,PR.BIT
5406  030752  005037  003612                  CLR     P1.BIT
5407  030756  004737  042570                  JSR     PC,WRTBIT       ;WRITE ZERO
5408  030762  104170                          ERROR   170             ;BIT INCORRECT
5409  030764  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5410  030770  005301                          DEC     R1              ;CHECK IF FINISHED
5411  030772  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5412  030774  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5413  031002  012700  000004                  MOV     #4,R0
5414  031006  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5415  031014  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5416  031022  005300                          DEC     R0
5417  031024  001370                          BNE     20$
5418  031026  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5419  031034  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5420  031042  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5421  031050  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5422  031056  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5423  031060  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5424  031062  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5425  031066  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5426  031074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5427  031102  005300                          DEC     R0
5428  031104  001370                          BNE     26$
5429  031106  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5430  031114  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5431  031122  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5432  031130  001401                          BEQ     TST36           ;;YES, GO ON TO NEXT TEST
5433  031132  104174                          ERROR   174             ;CS1 INCORRECT
5434
5435                                  ;;*****************************************************************
5436                                  ;*TEST 36       WRITE LOOPBACK (PART 3)
5437                                  ;*
5438                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5439                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5440                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5441                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  STIMULATE
5442                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5443                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
5444                                  ;*
5445                                  ;*              125252
5446                                  ;*              052525
5447                                  ;*              125252
```

```
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
                                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
                                        ;*
                                        ;**************************************************************
031134  000004                  TST36:  SCOPE
031136  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
031144  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
031150  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
031156  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
031164  012762  064342  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE WRITE HEADER
031172  012762  177775  000002          MOV     #-3,RKWC(R2)
031200  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
031206  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR INDEX PULSE
031212  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
031220  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031226  005300                          DEC     R0
031230  001370                          BNE     1$
031232  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
031236  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
031244  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
031252  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
031260  005300                          DEC     R0
031262  001370                          BNE     2$
031264  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031272  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
031276  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
031304  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031312  005300                          DEC     R0
031314  001370                          BNE     3$
031316  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
031324  012762  000040  000026          MOV     #DMD,RKMR1(R2)
031332  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
031336  012737  060411  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
031344  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
031352  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
031356  005037  003614                  CLR     PR.BIT
031362  005037  003616                  CLR     M1.BIT
031366  005037  003620                  CLR     M2.BIT
031372  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
031376  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
031402  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
031406  104170                          ERROR   170             ;DATA INCORRECT
031410  005237  003622                  INC     BITCNT
031414  005300                          DEC     R0              ;CHECK IF READY FOR DATA
031416  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
031420  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
031426  004737  042570                  JSR     PC,WRTBIT
031432  104170                          ERROR   170             ;DATA INCORRECT
031434  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
031440  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
031446  012703  064342                  MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
031452  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
031456  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
```

```
5504  031460  012701  000020                    MOV     #16.,R1          ;LOAD BIT COUNT
5505  031464  013737  003616  003620  12$:      MOV     M1.BIT,M2.BIT    ;SHIFT BITS
5506  031472  013737  003614  003616            MOV     PR.BIT,M1.BIT
5507  031500  013737  003612  003614            MOV     P1.BIT,PR.BIT
5508  031506  006004                            ROR     R4               ;SHIFT IN NEXT BIT
5509  031510  103403                            BCS     14$              ;CHECK IF ONE
5510  031512  005037  003612                    CLR     P1.BIT           ;ZERO
5511  031516  000403                            BR      15$              ;CLOCK IN BIT
5512
5513  031520  012737  000001  003612  14$:      MOV     #1,P1.BIT        ;ONE
5514  031526  004737  042570          15$:      JSR     PC,WRTBIT        ;WRITE BIT
5515  031532  104170                            ERROR   170              ;BIT INCORRECT
5516  031534  005237  003622                    INC     BITCNT           ;INCREMENT BIT COUNT
5517  031540  005301                            DEC     R1               ;CHECK IF WORD FINISHED
5518  031542  001350                            BNE     12$              ;NO, CONTINUE WITH NEXT BIT
5519  031544  005300                            DEC     R0               ;CHECK IF HEADER COMPLETE
5520  031546  001343                            BNE     10$              ;NO, GET NEXT WORD
5521  031550  012701  000020                    MOV     #16.,R1          ;LOAD BIT COUNT FOR NEXT WORD
5522  031554  013737  003616  003620  18$:      MOV     M1.BIT,M2.BIT    ;SHIFT BITS
5523  031562  013737  003614  003616            MOV     PR.BIT,M1.BIT
5524  031570  013737  003612  003614            MOV     P1.BIT,PR.BIT
5525  031576  005037  003612                    CLR     P1.BIT
5526  031602  004737  042570                    JSR     PC,WRTBIT        ;WRITE ZERO
5527  031606  104170                            ERROR   170              ;BIT INCORRECT
5528  031610  005237  003622                    INC     BITCNT           ;INCREMENT BIT COUNT
5529  031614  005301                            DEC     R1               ;CHECK IF FINISHED
5530  031616  001356                            BNE     18$              ;NO, CLOCK NEXT BIT
5531  031620  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5532  031626  012700  000004                    MOV     #4,R0
5533  031632  012762  000640  000026  20$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
5534  031640  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5535  031646  005300                            DEC     R0
5536  031650  001370                            BNE     20$
5537  031652  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5538  031660  016237  000026  003464            MOV     RKMR1(R2),T.MR1  ;GET MAINT REG 1
5539  031666  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5540  031674  023737  003524  003464            CMP     E.MR1,T.MR1      ;CHECK MR1 CORRECT (WRITE GATE RESET)
5541  031702  001401                            BEQ     25$              ;YES, CHECK IF READY SET
5542  031704  104173                            ERROR   173              ;MAINT REG 1 INCORRECT
5543  031706  012700  000010          25$:      MOV     #8.,R0           ;FINISH COMMAND
5544  031712  012762  000440  000026  26$:      MOV     #DMD!MCLK,RKMR1(R2)
5545  031720  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5546  031726  005300                            DEC     R0
5547  031730  001370                            BNE     26$
5548  031732  016237  000000  003440            MOV     RKCS1(R2),T.CS1  ;GET COMMAND AND STATUS REG 1
5549  031740  012737  000226  003500            MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5550  031746  023737  003500  003440            CMP     E.CS1,T.CS1      ;CHECK IF CS1 CORRECT
5551  031754  001401                            BEQ     TST37            ;;YES, GO ON TO NEXT TEST
5552  031756  104174                            ERROR   174              ;CS1 INCORRECT
5553
5554                                  ;;*****************************************************************
5555                                  ;*TEST 37       WRITE LOOPBACK (PART 4)
5556                                  ;*
5557                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5558                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5559                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
```

```
5560                                    ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5561                                    ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5562                                    ;*      CONSISTING OF THE FOLLOWING DATA, AND AND INDEX PULSE:
5563                                    ;*
5564                                    ;*              044444
5565                                    ;*              022222
5566                                    ;*              111111
5567                                    ;*
5568                                    ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX MODE.
5569                                    ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5570                                    ;*
5571                                    ;;*****************************************************************
5572  031760  000004                    TST37:  SCOPE
5573  031762  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5574  031770  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
5575  031774  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5576  032002  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5577  032010  012762  064356  000004            MOV     #HEAD4,RKBA(R2) ;ISSUE WRITE HEADER
5578  032016  012762  177775  000002            MOV     #-3,RKWC(R2)
5579  032024  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2)
5580  032032  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5581                                                                    ;  READY FOR INDEX PULSE
5582  032036  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
5583  032044  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5584  032052  005300                            DEC     R0
5585  032054  001370                            BNE     1$
5586  032056  012700  000004                    MOV     #4,R0           ;ISSUE INDEX PULSE
5587  032062  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5588  032070  012762  000640  000026  2$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
5589  032076  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5590  032104  005300                            DEC     R0
5591  032106  001370                            BNE     2$
5592  032110  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5593  032116  012700  000010                    MOV     #8.,R0          ;WAIT FOR WRITE GATE
5594  032122  012762  000440  000026  3$:       MOV     #DMD!MCLK,RKMR1(R2)
5595  032130  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5596  032136  005300                            DEC     R0
5597  032140  001370                            BNE     3$
5598  032142  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5599  032150  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5600  032156  005037  003626                    CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5601  032162  012737  060411  003170            MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5602  032170  012737  062040  003524            MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5603                                                                    ;  MAINT REG 1
5604  032176  005037  003612                    CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5605  032202  005037  003614                    CLR     PR.BIT
5606  032206  005037  003616                    CLR     M1.BIT
5607  032212  005037  003620                    CLR     M2.BIT
5608  032216  012700  000400                    MOV     #256.,R0        ;SIMULATE SYNCH
5609  032222  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
5610  032226  004737  042570            5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5611  032232  104170                            ERROR   170             ;DATA INCORRECT
5612  032234  005237  003622                    INC     BITCNT
5613  032240  005300                            DEC     R0              ;CHECK IF READY FOR DATA
5614  032242  001371                            BNE     5$              ;NO, GENERATE NEXT BIT
5615  032244  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
```

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 5616  032252  004737  042570                  JSR     PC,WRTBIT
 5617  032256  104170                          ERROR   170             ;DATA INCORRECT
 5618  032260  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5619  032264  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 5620  032272  012703  064356                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
 5621  032276  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 5622  032302  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 5623  032304  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 5624  032310  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5625  032316  013737  003614  003616          MOV     PR.BIT,M1.BIT
 5626  032324  013737  003612  003614          MOV     P1.BIT,PR.BIT
 5627  032332  006004                  .       ROR     R4              ;SHIFT IN NEXT BIT
 5628  032334  103403                          BCS     14$             ;CHECK IF ONE
 5629  032336  005037  003612                  CLR     P1.BIT          ;ZERO
 5630  032342  000403                          BR      15$             ;CLOCK IN BIT
 5631
 5632  032344  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
 5633  032352  004737  042570          15$:    JSR     PC,WRTBIT       ;WRITE BIT
 5634  032356  104170                          ERROR   170             ;BIT INCORRECT
 5635  032360  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 5636  032364  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 5637  032366  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
 5638  032370  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 5639  032372  001343                          BNE     10$             ;NO, GET NEXT WORD
 5640  032374  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 5641  032400  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5642  032406  013737  003614  003616          MOV     PR.BIT,M1.BIT
 5643  032414  013737  003612  003614          MOV     P1.BIT,PR.BIT
 5644  032422  005037  003612                  CLR     P1.BIT
 5645  032426  004737  042570                  JSR     PC,WRTBIT       ;WRITE ZERO
 5646  032432  104170                          ERROR   170             ;BIT INCORRECT
 5647  032434  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 5648  032440  005301                          DEC     R1              ;CHECK IF FINISHED
 5649  032442  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
 5650  032444  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
 5651  032452  012700  000004                  MOV     #4,R0
 5652  032456  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5653  032464  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 5654  032472  005300                          DEC     R0
 5655  032474  001370                          BNE     20$
 5656  032476  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5657  032504  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 5658  032512  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 5659  032520  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 5660  032526  001401                          BEQ     25$             ;YES, CHECK IF READY SET
 5661  032530  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
 5662  032532  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
 5663  032536  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 5664  032544  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5665  032552  005300                          DEC     R0
 5666  032554  001370                          BNE     26$
 5667  032556  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 5668  032564  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 5669  032572  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 5670  032600  001401                          BEQ     TST40           ;;YES, GO ON TO NEXT TEST
 5671  032602  104174                          ERROR   174             ;CS1 INCORRECT
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5672
5673                                    ;;*****************************************************************
5674                                    ;*TEST 40       WRITE LOOPBACK (PART 5)
5675                                    ;*
5676                                    ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5677                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5678                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5679                                    ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5680                                    ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5681                                    ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
5682                                    ;*
5683                                    ;*              052012
5684                                    ;*              100520
5685                                    ;*              052012
5686                                    ;*
5687                                    ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
5688                                    ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5689                                    ;*
5690                                    ;*****************************************************************
5691  032604  000004                    TST40:  SCOPE
5692  032606  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5693  032614  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
5694  032620  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5695  032626  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5696  032634  012762  064364  000004            MOV     #HEAD5,RKBA(R2) ;ISSUE WRITE HEADER
5697  032642  012762  177775  000002            MOV     #-3,RKWC(R2)
5698  032650  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2)
5699  032656  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5700                                                                    ;  READY FOR INDEX PULSE
5701  032662  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
5702  032670  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5703  032676  005300                            DEC     R0
5704  032700  001370                            BNE     1$
5705  032702  012700  000004                    MOV     #4,R0           ;ISSUE INDEX PULSE
5706  032706  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5707  032714  012762  000640  000026  2$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
5708  032722  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5709  032730  005300                            DEC     R0
5710  032732  001370                            BNE     2$
5711  032734  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5712  032742  012700  000010                    MOV     #8.,R0          ;WAIT FOR WRITE GATE
5713  032746  012762  000440  000026  3$:       MOV     #DMD!MCLK,RKMR1(R2)
5714  032754  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5715  032762  005300                            DEC     R0
5716  032764  001370                            BNE     3$
5717  032766  012762  000140  000026            MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5718  032774  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5719  033002  005037  003626                    CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5720  033006  012737  060411  003170            MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5721  033014  012737  062040  003524            MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5722                                                                    ;  MAINT REG 1
5723  033022  005037  003612                    CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5724  033026  005037  003614                    CLR     PR.BIT
5725  033032  005037  003616                    CLR     M1.BIT
5726  033036  005037  003620                    CLR     M2.BIT
5727  033042  012700  000400                    MOV     #256.,R0        ;SIMULATE SYNCH
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5728  033046  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
5729  033052  004737  042570          5$:       JSR     PC,WRTBIT       ;WRITE ONE BIT
5730  033056  104170                            ERROR   170             ;DATA INCORRECT
5731  033060  005237  003622                    INC     BITCNT
5732  033064  005300                            DEC     R0              ;CHECK IF READY FOR DATA
5733  033066  001371                            BNE     5$              ;NO, GENERATE NEXT BIT
5734  033070  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5735  033076  004737  042570                    JSR     PC,WRTBIT
5736  033102  104170                            ERROR   170             ;DATA INCORRECT
5737  033104  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
5738  033110  012737  060455  003170            MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5739  033116  012703  064364                    MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
5740  033122  012700  000003                    MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5741  033126  012304                  10$:      MOV     (R3)+,R4        ;GET NEXT WORD
5742  033130  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
5743  033134  013737  003616  003620  12$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5744  033142  013737  003614  003616            MOV     PR.BIT,M1.BIT
5745  033150  013737  003612  003614            MOV     P1.BIT,PR.BIT
5746  033156  006004                            ROR     R4              ;SHIFT IN NEXT BIT
5747  033160  103403                            BCS     14$             ;CHECK IF ONE
5748  033162  005037  003612                    CLR     P1.BIT          ;ZERO
5749  033166  000403                            BR      15$             ;CLOCK IN BIT
5750
5751  033170  012737  000001  003612  14$:      MOV     #1,P1.BIT       ;ONE
5752  033176  004737  042570          15$:      JSR     PC,WRTBIT       ;WRITE BIT
5753  033202  104170                            ERROR   170             ;BIT INCORRECT
5754  033204  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
5755  033210  005301                            DEC     R1              ;CHECK IF WORD FINISHED
5756  033212  001350                            BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5757  033214  005300                            DEC     R0              ;CHECK IF HEADER COMPLETE
5758  033216  001343                            BNE     10$             ;NO, GET NEXT WORD
5759  033220  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5760  033224  013737  003616  003620  18$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5761  033232  013737  003614  003616            MOV     PR.BIT,M1.BIT
5762  033240  013737  003612  003614            MOV     P1.BIT,PR.BIT
5763  033246  005037  003612                    CLR     P1.BIT
5764  033252  004737  042570                    JSR     PC,WRTBIT       ;WRITE ZERO
5765  033256  104170                            ERROR   170             ;BIT INCORRECT
5766  033260  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
5767  033264  005301                            DEC     R1              ;CHECK IF FINISHED
5768  033266  001356                            BNE     18$             ;NO, CLOCK NEXT BIT
5769  033270  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5770  033276  012700  000004                    MOV     #4,R0
5771  033302  012762  000640  000026  20$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
5772  033310  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5773  033316  005300                            DEC     R0
5774  033320  001370                            BNE     20$
5775  033322  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5776  033330  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5777  033336  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5778  033344  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5779  033352  001401                            BEQ     25$             ;YES, CHECK IF READY SET
5780  033354  104173                            ERROR   173             ;MAINT REG 1 INCORRECT
5781  033356  012700  000010          25$:      MOV     #8.,R0          ;FINISH COMMAND
5782  033362  012762  000440  000026  26$:      MOV     #DMD!MCLK,RKMR1(R2)
5783  033370  012762  000040  000026            MOV     #DMD,RKMR1(R2)
```

```
5784  033376  005300                          DEC     R0
5785  033400  001370                          BNE     26$
5786  033402  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5787  033410  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5788  033416  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5789  033424  001401                          BEQ     TST41           ;;YES, GO ON TO NEXT TEST
5790  033426  104174                          ERROR   174             ;CS1 INCORRECT
5791
5792                                  ;;*****************************************************************
5793                                  ;*TEST 41       WRITE LOOPBACK (PART 6)
5794                                  ;*
5795                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5796                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5797                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5798                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5799                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5800                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
5801                                  ;*
5802                                  ;*              155555
5803                                  ;*              066666
5804                                  ;*              155555
5805                                  ;*
5806                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
5807                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5808                                  ;*
5809                                  ;;*****************************************************************
5810  033430  000004                  TST41:  SCOPE
5811  033432  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5812  033440  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5813  033444  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5814  033452  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5815  033460  012762  064372  000004          MOV     #HEAD6,RKBA(R2) ;ISSUE WRITE HEADER
5816  033466  012762  177775  000002          MOV     #-3,RKWC(R2)
5817  033474  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5818  033502  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5819                                                                  ;  READY FOR INDEX PULSE
5820  033506  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5821  033514  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5822  033522  005300                          DEC     R0
5823  033524  001370                          BNE     1$
5824  033526  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5825  033532  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5826  033540  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5827  033546  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5828  033554  005300                          DEC     R0
5829  033556  001370                          BNE     2$
5830  033560  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5831  033566  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5832  033572  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5833  033600  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5834  033606  005300                          DEC     R0
5835  033610  001370                          BNE     3$
5836  033612  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5837  033620  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5838  033626  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5839  033632  012737  060411  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
```

```
5840  033640  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5841                                                    ;  MAINT REG 1
5842  033646  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5843  033652  005037  003614                  CLR     PR.BIT
5844  033656  005037  003616                  CLR     M1.BIT
5845  033662  005037  003620                  CLR     M2.BIT
5846  033666  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5847  033672  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5848  033676  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5849  033702  104170                  ERROR   170             ;DATA INCORRECT
5850  033704  005237  003622                  INC     BITCNT
5851  033710  005300                  DEC     R0              ;CHECK IF READY FOR DATA
5852  033712  001371                  BNE     5$              ;NO, GENERATE NEXT BIT
5853  033714  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5854  033722  004737  042570                  JSR     PC,WRTBIT
5855  033726  104170                  ERROR   170             ;DATA INCORRECT
5856  033730  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5857  033734  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5858  033742  012703  064372                  MOV     #HEAD6,R3       ;LOAD ADDRESS OF DATA
5859  033746  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5860  033752  012304          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5861  033754  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5862  033760  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5863  033766  013737  003614  003616          MOV     PR.BIT,M1.BIT
5864  033774  013737  003612  003614          MOV     P1.BIT,PR.BIT
5865  034002  006004                  ROR     R4              ;SHIFT IN NEXT BIT
5866  034004  103403                  BCS     14$             ;CHECK IF ONE
5867  034006  005037  003612                  CLR     P1.BIT          ;ZERO
5868  034012  000403                  BR      15$             ;CLOCK IN BIT
5869
5870  034014  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5871  034022  004737  042570          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5872  034026  104170                  ERROR   170             ;BIT INCORRECT
5873  034030  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5874  034034  005301                  DEC     R1              ;CHECK IF WORD FINISHED
5875  034036  001350                  BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5876  034040  005300                  DEC     R0              ;CHECK IF HEADER COMPLETE
5877  034042  001343                  BNE     10$             ;NO, GET NEXT WORD
5878  034044  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5879  034050  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5880  034056  013737  003614  003616          MOV     PR.BIT,M1.BIT
5881  034064  013737  003612  003614          MOV     P1.BIT,PR.BIT
5882  034072  005037  003612                  CLR     P1.BIT
5883  034076  004737  042570                  JSR     PC,WRTBIT       ;WRITE ZERO
5884  034102  104170                  ERROR   170             ;BIT INCORRECT
5885  034104  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5886  034110  005301                  DEC     R1              ;CHECK IF FINISHED
5887  034112  001356                  BNE     18$             ;NO, CLOCK NEXT BIT
5888  034114  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5889  034122  012700  000004                  MOV     #4,R0
5890  034126  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5891  034134  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5892  034142  005300                  DEC     R0
5893  034144  001370                  BNE     20$
5894  034146  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5895  034154  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
```

```
5896  034162  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5897  034170  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5898  034176  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5899  034200  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5900  034202  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5901  034206  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5902  034214  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5903  034222  005300                          DEC     R0
5904  034224  001370                          BNE     26$
5905  034226  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5906  034234  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5907  034242  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5908  034250  001401                          BEQ     TST42           ;;YES, GO ON TO NEXT TEST
5909  034252  104174                          ERROR   174             ;CS1 INCORRECT
5910
5911                                  ;;*****************************************************************
5912                                  ;*TEST 42       WRITE LOOPBACK (PART 7)
5913                                  ;*
5914                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5915                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5916                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5917                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5918                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5919                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
5920                                  ;*
5921                                  ;*              104210
5922                                  ;*              104210
5923                                  ;*              104210
5924                                  ;*
5925                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
5926                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5927                                  ;*
5928                                  ;;*****************************************************************
5929  034254  000004                  TST42:  SCOPE
5930  034256  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5931  034264  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5932  034270  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5933  034276  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5934  034304  012762  064400  000004          MOV     #HEAD7,RKBA(R2) ;ISSUE WRITE HEADER
5935  034312  012762  177775  000002          MOV     #-3,RKWC(R2)
5936  034320  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5937  034326  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5938                                                                  ;  READY FOR INDEX PULSE
5939  034332  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5940  034340  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5941  034346  005300                          DEC     R0
5942  034350  001370                          BNE     1$
5943  034352  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5944  034356  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5945  034364  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5946  034372  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5947  034400  005300                          DEC     R0
5948  034402  001370                          BNE     2$
5949  034404  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5950  034412  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5951  034416  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
```

```
 5952  034424  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5953  034432  005300                          DEC     R0
 5954  034434  001370                          BNE     3$
 5955  034436  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 5956  034444  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5957  034452  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
 5958  034456  012737  060411  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 5959  034464  012737  062040  003524          MOV     #DMD!MEWD!ECCW'WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 5960                                                                  ;  MAINT REG 1
 5961  034472  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 5962  034476  005037  003614                  CLR     PR.BIT
 5963  034502  005037  003616                  CLR     M1.BIT
 5964  034506  005037  003620                  CLR     M2.BIT
 5965  034512  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 5966  034516  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5967  034522  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 5968  034526  104170                          ERROR   170             ;DATA INCORRECT
 5969  034530  005237  003622                  INC     BITCNT
 5970  034534  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 5971  034536  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
 5972  034540  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 5973  034546  004737  042570                  JSR     PC,WRTBIT
 5974  034552  104170                          ERROR   170             ;DATA INCORRECT
 5975  034554  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 5976  034560  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 5977  034566  012703  064400                  MOV     #HEAD7,R3       ;LOAD ADDRESS OF DATA
 5978  034572  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 5979  034576  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 5980  034600  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 5981  034604  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5982  034612  013737  003614  003616          MOV     PR.BIT,M1.BIT
 5983  034620  013737  003612  003614          MOV     P1.BIT,PR.BIT
 5984  034626  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 5985  034630  103403                          BCS     14$             ;CHECK IF ONE
 5986  034632  005037  003612                  CLR     P1.BIT          ;ZERO
 5987  034636  000403                          BR      15$             ;CLOCK IN BIT
 5988
 5989  034640  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
 5990  034646  004737  042570          15$:    JSR     PC,WRTBIT       ;WRITE BIT
 5991  034652  104170                          ERROR   170             ;BIT INCORRECT
 5992  034654  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 5993  034660  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 5994  034662  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
 5995  034664  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 5996  034666  001343                          BNE     10$             ;NO, GET NEXT WORD
 5997  034670  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 5998  034674  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 5999  034702  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6000  034710  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6001  034716  005037  003612                  CLR     P1.BIT
 6002  034722  004737  042570                  JSR     PC,WRTBIT       ;WRITE ZERO
 6003  034726  104170                          ERROR   170             ;BIT INCORRECT
 6004  034730  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6005  034734  005301                          DEC     R1              ;CHECK IF FINISHED
 6006  034736  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
 6007  034740  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
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 6008  034746  012700  000004                    MOV     #4,R0
 6009  034752  012762  000640  000026  20$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6010  034760  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 6011  034766  005300                            DEC     R0
 6012  034770  001370                            BNE     20$
 6013  034772  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6014  035000  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6015  035006  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 6016  035014  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 6017  035022  001401                            BEQ     25$             ;YES, CHECK IF READY SET
 6018  035024  104173                            ERROR   173             ;MAINT REG 1 INCORRECT
 6019  035026  012700  000010            25$:    MOV     #8.,R0          ;FINISH COMMAND
 6020  035032  012762  000440  000026  26$:      MOV     #DMD!MCLK,RKMR1(R2)
 6021  035040  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6022  035046  005300                            DEC     R0
 6023  035050  001370                            BNE     26$
 6024  035052  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6025  035060  012737  000226  003500            MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6026  035066  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6027  035074  001401                            BEQ     TST43           ;;YES, GO ON TO NEXT TEST
 6028  035076  104174                            ERROR   174             ;CS1 INCORRECT
 6029
 6030                                    ;;*****************************************************************
 6031                                    ;*TEST 43       WRITE TWO HEADERS
 6032                                    ;*
 6033                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6034                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6035                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 6036                                    ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 6037                                    ;*      INDEX PULSE, SECTOR PULSE, THREE WORD HEADER
 6038                                    ;*      CONSISTING OF THE FOLLOWING DATA:
 6039                                    ;*
 6040                                    ;*              177777
 6041                                    ;*              000000
 6042                                    ;*              177777
 6043                                    ;*
 6044                                    ;*      FOLLOW THAT BY A SECTOR PULSE AND ONE THREE WORD
 6045                                    ;*      HEADER CONSISTING OF THE FOLLOWING DATA:
 6046                                    ;*
 6047                                    ;*              000000
 6048                                    ;*              177777
 6049                                    ;*              000000
 6050                                    ;*
 6051                                    ;*      SIMULATE AN INDEX PULSE AND MAKE SURE READY COMES UP.
 6052                                    ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMENSATION.
 6053                                    ;*
 6054                                    ;*****************************************************************
 6055  035100  000004                    TST43:  SCOPE
 6056  035102  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6057  035110  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
 6058  035114  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6059  035122  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
 6060  035130  012762  064326  000004            MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
 6061  035136  012703  064326                    MOV     #HEAD1,R3
 6062  035142  012762  177772  000002            MOV     #-6,RKWC(R2)
 6063  035150  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2)
```

```
 6064  035156  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6065                                                                    ;  READY FOR INDEX PULSE
 6066  035162  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)
 6067  035170  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6068  035176  005300                            DEC     R0
 6069  035200  001370                            BNE     1$
 6070  035202  012700  000004                    MOV     #4,R0           ;ISSUE INDEX PULSE
 6071  035206  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 6072  035214  012762  000640  000026  2$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6073  035222  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 6074  035230  005300                            DEC     R0
 6075  035232  001370                            BNE     2$
 6076  035234  005037  003626                    CLR     SECCNT          ;CLEAR SECTOR COUNT
 6077  035240  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6078  035246  012705  000002                    MOV     #2,R5           ;LOAD NUMBER OF HEADERS
 6079  035252  012700  000010                    MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6080  035256  012762  000440  000026  3$:       MOV     #DMD!MCLK,RKMR1(R2)
 6081  035264  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6082  035272  005300                            DEC     R0
 6083  035274  001370                            BNE     3$
 6084  035276  012762  000140  000026  4$:       MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6085  035304  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6086  035312  012737  060411  003170            MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 6087  035320  012737  062040  003524            MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6088                                                                    ;  MAINT REG 1
 6089  035326  005037  003612                    CLR     P1.BIT
 6090  035332  005037  003614                    CLR     PR.BIT
 6091  035336  005037  003616                    CLR     M1.BIT
 6092  035342  005037  003620                    CLR     M2.BIT
 6093  035346  012700  000400                    MOV     #256.,R0        ;SIMULATE SYNCH
 6094  035352  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 6095  035356  004737  042570          5$:       JSR     PC,WRTBIT       ;WRITE ONE BIT
 6096  035362  104170                            ERROR   170             ;DATA INCORRECT
 6097  035364  005237  003622                    INC     BITCNT
 6098  035370  005300                            DEC     R0              ;CHECK IF READY FOR DATA
 6099  035372  001371                            BNE     5$              ;NO,GENERATE NEXT BIT
 6100  035374  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6101  035402  004737  042570                    JSR     PC,WRTBIT
 6102  035406  104170                            ERROR   170             ;DATA INCORRECT
 6103  035410  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 6104  035414  012737  060455  003170            MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 6105  035422  012700  000003                    MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6106  035426  012304                  10$:       MOV     (R3)+,R4        ;GET NEXT WORD
 6107  035430  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
 6108  035434  013737  003616  003620  12$:       MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6109  035442  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6110  035450  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6111  035456  006004                            ROR     R4              ;SHIFT IN NEXT BIT
 6112  035460  103403                            BCS     14$             ;CHECK IF ONE
 6113  035462  005037  003612                    CLR     P1.BIT          ;ZERO
 6114  035466  000403                            BR      15$             ;CLOCK IN BIT
 6115
 6116  035470  012737  000001  003612  14$:       MOV     #1,P1.BIT       ;ONE
 6117  035476  004737  042570          15$:       JSR     PC,WRTBIT       ;WRITE BIT
 6118  035502  104170                            ERROR   170             ;BIT INCORRECT
 6119  035504  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
```

```
 6120  035510  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 6121  035512  001350                          BNE     12$             ;NO, CONTINUE
 6122  035514  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 6123  035516  001343                          BNE     10$             ;NO, GET NEXT WORD
 6124  035520  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 6125  035524  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6126  035532  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6127  035540  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6128  035546  005037  003612                  CLR     P1.BIT
 6129  035552  004737  042570                  JSR     PC,WRTBIT       ;WRITE ZERO
 6130  035556  104170                          ERROR   170             ;BIT INCORRECT
 6131  035560  005237  003622                  INC     BITCNT          ;INCREMENT
 6132  035564  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
 6133  035566  001356                          BNE     18$             ;NO, CONTINUE
 6134  035570  005237  003626                  INC     SECCNT          ;INCREMENT
 6135  035574  005305                          DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
 6136  035576  001237                          BNE     4$              ;NO, DO SECOND HEADER
 6137  035600  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
 6138  035606  012700  000004                  MOV     #4,R0
 6139  035612  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6140  035620  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6141  035626  005300                          DEC     R0
 6142  035630  001370                          BNE     20$
 6143  035632  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6144  035640  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6145  035646  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
 6146  035654  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
 6147  035662  001401                          BEQ     25$             ;YES, CHECK IF READY SET
 6148  035664  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
 6149  035666  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
 6150  035672  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 6151  035700  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6152  035706  005300                          DEC     R0
 6153  035710  001370                          BNE     26$
 6154  035712  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6155  035720  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6156  035726  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6157  035734  001401                          BEQ     TST44           ;;YES, GO ON TO NEXT TEST
 6158  035736  104174                          ERROR   174
 6159
 6160                                  ;;*****************************************************************
 6161                                  ;*TEST 44       DATA FIELD FILLING ON WRITE HEADER
 6162                                  ;*
 6163                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6164                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6165                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, AND
 6166                                  ;*      SPECIFY TWO 3 WORD HEADERS CONSISTING OF THE
 6167                                  ;*      FOLLOWING DATA:
 6168                                  ;*
 6169                                  ;*              125252
 6170                                  ;*              052525
 6171                                  ;*              125252
 6172                                  ;*              052525
 6173                                  ;*              125252
 6174                                  ;*              052525
 6175                                  ;*
```

```
                                        ;*      MAKE SURE THE DATA SYNCH ANY OTHER BITS OF DATA AND
                                        ;*      ECC FIELD ARE WRITTEN CORRECTLY.
                                        ;*
                                        ;;*****************************************************************
035740  000004                          TST44:  SCOPE
035742  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
035750  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
035754  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
035762  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
035770  012762  064342  000004                  MOV     #HEAD3,RKBA(R2) ;ISSUE READ HEADER
035776  012703  064342                          MOV     #HEAD3,R3
036002  012762  177772  000002                  MOV     #-2*3,RKWC(R2)
036010  012762  000027  000000                  MOV     #WRHEAD,RKCS1(R2)
036016  012700  000312                          MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
                                                                        ;  FOR INDEX PULSE
036022  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
036030  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
036036  005300                                  DEC     R0
036040  001370                                  BNE     1$
036042  012700  000004                          MOV     #4,R0           ;ISSUE INDEX PULSE
036046  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
036054  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
036062  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
036070  005300                                  DEC     R0
036072  001370                                  BNE     2$
036074  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
036102  012700  000010                          MOV     #8.,R0          ;WAIT FOR WRITE GATE
036106  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
036114  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
036122  005300                                  DEC     R0
036124  001370                                  BNE     3$
036126  005037  003626                          CLR     SECCNT          ;CLEAR SECTOR COUNT
036132  012705  000002                          MOV     #2,R5           ;LOAD NUMBER OF HEADERS
036136  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
036144  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
036152  012737  060411  003170                  MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
036160  012737  062040  003524                  MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                        ;  MAINT REG 1
036166  005037  003612                          CLR     P1.BIT
036172  005037  003614                          CLR     PR.BIT
036176  005037  003616                          CLR     M1.BIT
036202  005037  003620                          CLR     M2.BIT
036206  012700  000400                          MOV     #256.,R0        ;SIMULATE SYNCH
036212  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
036216  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
036222  104170                          ERROR   170             ;DATA INCORRECT
036224  005237  003622                          INC     BITCNT
036230  005300                                  DEC     R0              ;CHECK IF READY FOR DATA
036232  001371                                  BNE     5$              ;NO, GENERATE NEXT BIT
036234  012737  000001  003612                  MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
036242  004737  042570                          JSR     PC,WRTBIT
036246  104170                          ERROR   170             ;DATA INCORRECT
036250  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
036254  012737  060455  003170                  MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
036262  012700  000003                          MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
036266  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
```

```
 6232  036270  012701  000020                    MOV     #16.,R1          ;LOAD BIT COUNT
 6233  036274  013737  003616  003620  12$:      MOV     M1.BIT,M2.BIT    ;SHIFT BITS
 6234  036302  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6235  036310  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6236  036316  006004                            ROR     R4               ;SHIFT IN NEXT BIT
 6237  036320  103403                            BCS     14$              ;CHECK IF ONE
 6238  036322  005037  003612                    CLR     P1.BIT           ;ZERO
 6239  036326  000403                            BR      15$              ;CLOCK IN BIT
 6240
 6241  036330  012737  000001  003612  14$:      MOV     #1,P1.BIT        ;ONE
 6242  036336  004737  042570          15$:      JSR     PC,WRTBIT        ;WRITE BIT
 6243  036342  104170                            ERROR   170              ;BIT INCORRECT
 6244  036344  005237  003622                    INC     BITCNT           ;INCREMENT BIT COUNT
 6245  036350  005301                            DEC     R1               ;CHECK IF WORD FINISHED
 6246  036352  001350                            BNE     12$              ;NO, CONTINUE
 6247  036354  005300                            DEC     R0               ;CHECK IF HEADER COMPLETE
 6248  036356  001343                            BNE     10$              ;NO, GET NEXT WORD
 6249  036360  012737  060707  003170            MOV     #EM237,EMW       ;LOAD ERROR MESSAGE
 6250  036366  012701  000477                    MOV     #64.*255.,R1     ;LOAD COUNT
 6251  036372  013737  003616  003620  18$:      MOV     M1.BIT,M2.BIT    ;SHIFT BITS
 6252  036400  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6253  036406  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6254  036414  005037  003612                    CLR     P1.BIT
 6255  036420  004737  042570                    JSR     PC,WRTBIT        ;WRITE ZERO
 6256  036424  104170                            ERROR   170              ;BIT INCORRECT
 6257  036426  005301                            DEC     R1               ;CHECK IF READY FOR DATA
 6258  036430  001360                            BNE     18$              ;NO, CONTINUE
 6259  036432  012737  000001  003612            MOV     #1,P1.BIT        ;SET SYNCH BIT
 6260  036440  004737  042570                    JSR     PC,WRTBIT        ;WRITE SYNCH BIT
 6261  036444  104170                            ERROR   170              ;SYNCH BIT INCORRECT
 6262  036446  012737  060755  003170            MOV     #EM238,EMW       ;LOAD ERROR MESSAGE
 6263  036454  005037  003622                    CLR     BITCNT           ;CLEAR BIT COUNT
 6264  036460  012701  007777                    MOV     #256.*16.-1,R1   ;LOAD COUNT
 6265  036464  013737  003616  003620  20$:      MOV     M1.BIT,M2.BIT    ;SHIFT BITS
 6266  036472  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6267  036500  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6268  036506  005037  003612                    CLR     P1.BIT
 6269  036512  004737  042570                    JSR     PC,WRTBIT        ;WRITE ZEROS
 6270  036516  104170                            ERROR   170              ;BIT INCORRECT
 6271  036520  005237  003622                    INC     BITCNT           ;INCREMENT BIT COUNT
 6272  036524  005301                            DEC     R1               ;CHECK IF READY FOR ECC
 6273  036526  001356                            BNE     20$              ;NO, CONTINUE
 6274  036530  012701  000040                    MOV     #32.,R1          ;LOAD COUNT
 6275  036534  042737  020000  003524            BIC     #ECCW,E.MR1      ;RESET ECCW BIT
 6276  036542  004737  042570          21$:      JSR     PC,WRTBIT        ;WRITE ECC FIELD
 6277  036546  104170                            ERROR   170              ;BIT INCORRECT
 6278  036550  005237  003622                    INC     BITCNT           ;INCREMENT COUNT
 6279  036554  005301                            DEC     R1               ;CHECK IF READY FOR POST AMBLE
 6280  036556  001371                            BNE     21$              ;NO CONTINUE
 6281  036560  052737  020000  003524            BIS     #ECCW,E.MR1      ;SET ECCW
 6282  036566  012701  000012                    MOV     #10.,R1          ;CHECK IF READY FOR NEXT HEADER
 6283  036572  004737  042570          22$:      JSR     PC,WRTBIT        ;WRITE POSTAMBLE
 6284  036576  104170                            ERROR   170              ;BIT INCORRECT
 6285  036600  005237  003622                    INC     BITCNT           ;INCREMENT COUNT
 6286  036604  005301                            DEC     R1               ;CHECK IF READY FOR NEXT HEADER
 6287  036606  001371                            BNE     22$              ;NO, COMPLETE POSTAMBLE
```

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6288  036610  005237  003626                    INC     SECCNT          ;INCREMENT COUNT
6289  036614  005305                            DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
6290  036616  001402                            BEQ     23$             ;YES, SIMULATE INDEX
6291  036620  000137  036136                    JMP     4$              ;NO GET NEXT HEADER
6292
6293  036624  012762  000240  000026  23$:     MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6294  036632  012700  000004                    MOV     #4,R0
6295  036636  012762  000640  000026  25$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6296  036644  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
6297  036652  005300                            DEC     R0
6298  036654  001370                            BNE     25$
6299  036656  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6300  036664  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6301  036672  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6302  036700  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6303                                                                    ;  (WRITE GATE RESET)
6304  036706  001401                            BEQ     28$             ;YES, CHECK IF READY SET
6305  036710  104173                            ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6306  036712  012700  000010            28$:    MOV     #8.,R0          ;FINISH COMMAND
6307  036716  012762  000440  000026  29$:     MOV     #DMD!MCLK,RKMR1(R2)
6308  036724  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6309  036732  005300                            DEC     R0
6310  036734  001370                            BNE     29$
6311  036736  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6312  036744  012737  000226  003500            MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6313  036752  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6314  036760  001401                            BEQ     TST45           ;;YES, GO TO NEXT TEST
6315  036762  104174                            ERROR   174             ;CS1 INCORRECT
6316
6317                                    ;;*****************************************************************
6318                                    ;*TEST 45       WRITE HEADER FOR 26 SECTORS
6319                                    ;*
6320                                    ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6321                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6322                                    ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, SPECIFYING
6323                                    ;*      66 WORDS.  MAKE SURE ALL 26 SECTORS ARE WRITTEN CORRECTLY.
6324                                    ;*
6325                                    ;;*****************************************************************
6326  036764  000004                    TST45:  SCOPE
6327  036766  012737  000010  001200            MOV     #10,$TIMES      ;;DO 10 ITERATIONS
6328  036774  013702  001270                    MOV     $BASE,R2        ;LOAD RK611 BASE
6329  037000  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6330  037006  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6331  037014  012762  064406  000004            MOV     #NPRBUF,RKBA(R2)        ;ISSUE READ HEADER
6332  037022  012703  064406                    MOV     #NPRBUF,R3
6333  037026  012762  177676  000002            MOV     #-22.*3,RKWC(R2)
6334  037034  012762  000027  000000            MOV     #WRHEAD,RKCS1(R2)
6335  037042  012700  000312                    MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
6336                                                                    ;  FOR INDEX PULSE
6337  037046  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)
6338  037054  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6339  037062  005300                            DEC     R0
6340  037064  001370                            BNE     1$
6341  037066  012700  000004                    MOV     #4,R0           ;ISSUE INDEX PULSE
6342  037072  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
6343  037100  012762  000640  000026  2$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
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```
 6344  037106  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6345  037114  005300                          DEC     R0
 6346  037116  001370                          BNE     2$
 6347  037120  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6348  037126  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6349  037132  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 6350  037140  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6351  037146  005300                          DEC     R0
 6352  037150  001370                          BNE     3$
 6353  037152  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
 6354  037156  012705  000026                  MOV     #22.,R5         ;LOAD NUMBER OF HEADERS
 6355  037162  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6356  037170  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6357  037176  012737  060411  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 6358  037204  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6359                                                                  ;  MAINT REG 1
 6360  037212  005037  003612                  CLR     P1.BIT
 6361  037216  005037  003614                  CLR     PR.BIT
 6362  037222  005037  003616                  CLR     M1.BIT
 6363  037226  005037  003620                  CLR     M2.BIT
 6364  037232  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 6365  037236  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6366  037242  004737  042570          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 6367  037246  104170                          ERROR   170             ;DATA INCORRECT
 6368  037250  005237  003622                  INC     BITCNT
 6369  037254  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 6370  037256  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
 6371  037260  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6372  037266  004737  042570                  JSR     PC,WRTBIT
 6373  037272  104170                          ERROR   170             ;DATA INCORRECT
 6374  037274  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6375  037300  012737  060455  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 6376  037306  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6377  037312  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
 6378  037314  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 6379  037320  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6380  037326  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6381  037334  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6382  037342  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 6383  037344  103403                          BCS     14$             ;CHECK IF ONE
 6384  037346  005037  003612                  CLR     P1.BIT          ;ZERO
 6385  037352  000403                          BR      15$             ;CLOCK IN BIT
 6386
 6387  037354  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
 6388  037362  004737  042570          15$:     JSR     PC,WRTBIT       ;WRITE BIT
 6389  037366  104170                          ERROR   170             ;BIT INCORRECT
 6390  037370  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6391  037374  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 6392  037376  001350                          BNE     12$             ;NO, CONTINUE
 6393  037400  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 6394  037402  001343                          BNE     10$             ;NO, GET NEXT WORD
 6395  037404  012737  060707  003170          MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
 6396  037412  012701  000477                  MOV     #64.*255.,R1    ;LOAD COUNT
 6397  037416  013737  003616  003620  18$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6398  037424  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6399  037432  013737  003612  003614          MOV     P1.BIT,PR.BIT
```

```
6400  037440  005037  003612                    CLR     P1.BIT
6401  037444  004737  042570                    JSR     PC,WRTBIT       ;WRITE ZERO
6402  037450  104170                            ERROR   170             ;BIT INCORRECT
6403  037452  005301                            DEC     R1              ;CHECK IF READY FOR DATA
6404  037454  001360                            BNE     18$             ;NO, CONTINUE
6405  037456  012737  000001  003612            MOV     #1,P1.BIT       ;SET SYNCH BIT
6406  037464  004737  042570                    JSR     PC,WRTBIT       ;WRITE SYNCH BIT
6407  037470  104170                            ERROR   170             ;SYNCH BIT INCORRECT
6408  037472  012737  060755  003170            MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
6409  037500  005037  003622                    CLR     BITCNT          ;CLEAR BIT COUNT
6410  037504  012701  007777                    MOV     #256.*16.-1,R1  ;LOAD COUNT
6411  037510  013737  003616  003620  20$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6412  037516  013737  003614  003616            MOV     PR.BIT,M1.BIT
6413  037524  013737  003612  003614            MOV     P1.BIT,PR.BIT
6414  037532  005037  003612                    CLR     P1.BIT
6415  037536  004737  042570                    JSR     PC,WRTBIT       ;WRITE ZEROS
6416  037542  104170                            ERROR   170             ;BIT INCORRECT
6417  037544  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
6418  037550  005301                            DEC     R1              ;CHECK IF READY FOR ECC
6419  037552  001356                            BNE     20$             ;NO, CONTINUE
6420  037554  012701  000040                    MOV     #32.,R1         ;LOAD COUNT
6421  037560  042737  020000  003524            BIC     #ECCW,E.MR1     ;RESET ECCW BIT
6422  037566  004737  042570          21$:      JSR     PC,WRTBIT       ;WRITE ECC FIELD
6423  037572  104170                            ERROR   170             ;BIT INCORRECT
6424  037574  005237  003622                    INC     BITCNT          ;INCREMENT COUNT
6425  037600  005301                            DEC     R1              ;CHECK IF READY FOR POST AMBLE
6426  037602  001371                            BNE     21$             ;NO CONTINUE
6427  037604  052737  020000  003524            BIS     #ECCW,E.MR1     ;SET ECCW
6428  037612  012701  000012                    MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
6429  037616  004737  042570          22$:      JSR     PC,WRTBIT       ;WRITE POSTAMBLE
6430  037622  104170                            ERROR   170             ;BIT INCORRECT
6431  037624  005237  003622                    INC     BITCNT          ;INCREMENT COUNT
6432  037630  005301                            DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6433  037632  001371                            BNE     22$             ;NO, COMPLETE POSTAMBLE
6434  037634  005237  003626                    INC     SECCNT          ;INCREMENT COUNT
6435  037640  005305                            DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
6436  037642  001402                            BEQ     23$             ;YES, SIMULATE INDEX
6437  037644  000137  037162                    JMP     4$              ;NO GET NEXT HEADER
6438
6439  037650  012762  000240  000026  23$:      MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6440  037656  012700  000004                    MOV     #4,R0
6441  037662  012762  000640  000026  25$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
6442  037670  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
6443  037676  005300                            DEC     R0
6444  037700  001370                            BNE     25$
6445  037702  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6446  037710  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6447  037716  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6448  037724  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6449                                                                    ;  (WRITE GATE RESET)
6450  037732  001401                            BEQ     28$             ;YES, CHECK IF READY SET
6451  037734  104173                            ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6452  037736  012700  000010          28$:      MOV     #8.,R0          ;FINISH COMMAND
6453  037742  012762  000440  000026  29$:      MOV     #DMD!MCLK,RKMR1(R2)
6454  037750  012762  000040  000026            MOV     #DMD,RKMR1(R2)
6455  037756  005300                            DEC     R0
```

```
                        BNE     29$
037762  016237  000000  003440  MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
037770  012737  000226  003500  MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
037776  023737  003500  003440  CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
040004  001401                  BEQ     TST46           ;;YES, GO TO NEXT TEST
040006  104174                  ERROR   174             ;CS1 INCORRECT

                        ;;*****************************************************************
                        ;*TEST 46       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.
                        ;*
                        ;;*****************************************************************
040010  000004         TST46:  SCOPE
040012  012737  000144  001200  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
040020  013702  001270          MOV     $BASE,R2        ;LOAD RK611 BASE
040024  012762  100000  000000  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
040032  012762  000040  000026  MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
040040  012762  064326  000004  MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
040046  012703  064326          MOV     #HEAD1,R3
040052  012762  177772  000002  MOV     #-6,RKWC(R2)
040060  012762  010027  000000  MOV     #CFMT!WRHEAD,RKCS1(R2)
040066  012700  000312          MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                        ;  READY FOR INDEX PULSE
040072  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
040100  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040106  005300                  DEC     R0
040110  001370                  BNE     1$
040112  012700  000004          MOV     #4,R0           ;ISSUE INDEX PULSE
040116  012762  000240  000026  MOV     #DMD!MIND,RKMR1(R2)
040124  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
040132  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
040140  005300                  DEC     R0
040142  001370                  BNE     2$
040144  005037  003626          CLR     SECCNT          ;CLEAR SECTOR COUNT
040150  012762  000040  000026  MOV     #DMD,RKMR1(R2)
040156  012705  000002          MOV     #2,R5           ;LOAD NUMBER OF HEADERS
040162  012700  000010          MOV     #8.,R0          ;WAIT FOR WRITE GATE
040166  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
040174  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040202  005300                  DEC     R0
040204  001370                  BNE     3$
040206  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
040214  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040222  012737  061014  003170          MOV     #EM239,EMW      ;LOAD ERROR MESSAGE
040230  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                        ;  MAINT REG 1
040236  005037  003612          CLR     P1.BIT
040242  005037  003614          CLR     PR.BIT
```

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 6512  040246  005037  003616                    CLR     M1.BIT
 6513  040252  005037  003620                    CLR     M2.BIT
 6514  040256  012700  000400                    MOV     #256.,R0        ;SIMULATE SYNCH
 6515  040262  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 6516  040266  004737  042570          5$:       JSR     PC,WRTBIT       ;WRITE ONE BIT
 6517  040272  104170                            ERROR   170             ;DATA INCORRECT
 6518  040274  005237  003622                    INC     BITCNT
 6519  040300  005300                            DEC     R0              ;CHECK IF READY FOR DATA
 6520  040302  001371                            BNE     5$              ;NO,GENERATE NEXT BIT
 6521  040304  012737  000001  003612            MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6522  040312  004737  042570                    JSR     PC,WRTBIT
 6523  040316  104170                            ERROR   170             ;DATA INCORRECT
 6524  040320  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
 6525  040324  012737  061106  003170            MOV     #EM240,EMW      ;LOAD ERROR MESSAGE
 6526  040332  012700  000003                    MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6527  040336  012304                  10$:      MOV     (R3)+,R4        ;GET NEXT WORD
 6528  040340  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
 6529  040344  013737  003616  003620  12$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6530  040352  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6531  040360  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6532  040366  006004                            ROR     R4              ;SHIFT IN NEXT BIT
 6533  040370  103403                            BCS     14$             ;CHECK IF ONE
 6534  040372  005037  003612                    CLR     P1.BIT          ;ZERO
 6535  040376  000403                            BR      15$             ;CLOCK IN BIT
 6536
 6537  040400  012737  000001  003612  14$:      MOV     #1,P1.BIT       ;ONE
 6538  040406  004737  042570          15$:      JSR     PC,WRTBIT       ;WRITE BIT
 6539  040412  104170                            ERROR   170             ;BIT INCORRECT
 6540  040414  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
 6541  040420  005301                            DEC     R1              ;CHECK IF WORD FINISHED
 6542  040422  001350                            BNE     12$             ;NO, CONTINUE
 6543  040424  005300                            DEC     R0              ;CHECK IF HEADER COMPLETE
 6544  040426  001343                            BNE     10$             ;NO, GET NEXT WORD
 6545  040430  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 6546  040434  013737  003616  003620  18$:      MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6547  040442  013737  003614  003616            MOV     PR.BIT,M1.BIT
 6548  040450  013737  003612  003614            MOV     P1.BIT,PR.BIT
 6549  040456  005037  003612                    CLR     P1.BIT
 6550  040462  004737  042570                    JSR     PC,WRTBIT       ;WRITE ZERO
 6551  040466  104170                            ERROR   170             ;BIT INCORRECT
 6552  040470  005237  003622                    INC     BITCNT          ;INCREMENT
 6553  040474  005301                            DEC     R1              ;CHECK IF READY FOR NEXT HEADER
 6554  040476  001356                            BNE     18$             ;NO, CONTINUE
 6555  040500  005237  003626                    INC     SECCNT          ;INCREMENT
 6556  040504  005305                            DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
 6557  040506  001237                            BNE     4$              ;NO, DO SECOND HEADER
 6558  040510  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
 6559  040516  012700  000004                    MOV     #4,R0
 6560  040522  012762  000640  000026  20$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6561  040530  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
 6562  040536  005300                            DEC     R0
 6563  040540  001370                            BNE     20$
 6564  040542  012762  000040  000026            MOV     #DMD,RKMR1(R2)
 6565  040550  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6566  040556  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
 6567  040564  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
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6568  040572  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6569  040574  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6570  040576  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6571  040602  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6572  040610  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6573  040616  005300                          DEC     R0
6574  040620  001370                          BNE     26$
6575  040622  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6576  040630  012737  010226  003500          MOV     #RDY!CFMT!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6577  040636  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6578  040644  001401                          BEQ     TST47           ;;YES, GO ON TO NEXT TEST
6579  040646  104174                          ERROR   174
6580
6581                                  .SBTTL  **TYPE B INSTRUCTION ERRORS
6582
6583                                  ;;*******************************************************************
6584                                  ;*TEST 47       FORMAT ERROR (PART 1)
6585                                  ;*
6586                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
6587                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
6588                                  ;*      RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0.
6589                                  ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
6590                                  ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
6591                                  ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
6592                                  ;*
6593                                  ;;*******************************************************************
6594  040650  000004          TST47:  SCOPE
6595  040652  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6596  040660  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6597  040664  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
6598  040672  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
6599  040700  012762  000043  000020          MOV     #43,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
6600  040706  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEADER
6601  040714  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
6602  040720  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6603  040726  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6604  040734  005300                          DEC     R0
6605  040736  001370                          BNE     1$
6606  040740  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
6607  040744  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
6608  040750  105762  000000          2$:     TSTB    RKCS1(R2)
6609  040754  100402                          BMI     3$
6610  040756  005300                          DEC     R0
6611  040760  001373                          BNE     2$
6612  040762  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
6613  040770  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
6614  040776  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
6615  041004  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
6616  041012  012737  100224  003500          MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6617  041020  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
6618  041026  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
6619  041034  012737  000020  003514          MOV     #FMTE,E.ER      ;LOAD EXPECTED ERROR REG
6620  041042  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
6621  041050  001401                          BEQ     4$              ;YES, CONTINUE
6622  041052  104175                          ERROR   175
6623  041054  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
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6624  041062  001401                          BEQ     5$              ;YES, CONTINUE
6625  041064  104176                          ERROR   176
6626  041066  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
6627  041074  001401                          BEQ     6$              ;YES, CONTINUE
6628  041076  104177                          ERROR   177
6629  041100  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
6630  041106  001401                          BEQ     7$              ;YES, CONTINUE
6631  041110  104200                          ERROR   200
6632  041112  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
6633  041120  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
6634  041126  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
6635  041134  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
6636                                                                  ;  AND ERROR REG
6637  041142  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6638  041150  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
6639  041156  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
6640  041164  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
6641  041172  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
6642  041200  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
6643  041206  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
6644  041214  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
6645  041220  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
6646  041224  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
6647  041232  001401                          BEQ     11$             ;YES, CONTINUE
6648  041234  104211                          ERROR   211             ;CS1 INCORRECT
6649  041236  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
6650  041244  001401                          BEQ     12$             ;YES, CONTINUE
6651  041246  104212                          ERROR   212             ;CS2 INCORRECT
6652  041250  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
6653  041256  001401                          BEQ     13$             ;YES, CONTINUE
6654  041260  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
6655  041262  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
6656  041270  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
6657  041272  104214                          ERROR   214             ;ERROR REG INCORRECT
6658  041274                          14$:
6659
6660                                          ;;*************************************************************
6661                                          ;*TEST 50       FORMAT ERROR (PART 2)
6662                                          ;*
6663                                          ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
6664                                          ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
6665                                          ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0.
6666                                          ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
6667                                          ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
6668                                          ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
6669                                          ;*
6670                                          ;;*************************************************************
6671  041274  000004                  TST50:  SCOPE
6672  041276  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6673  041304  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6674  041310  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
6675  041316  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
6676  041324  012762  000003  000020          MOV     #3,RKDCY(R2)    ;LOAD CYLINDER ADDRESS REG
6677  041332  012762  010025  000000          MOV     #RDHEAD!CFMT,RKCS1(R2) ;ISSUE READ HEADER
6678  041340  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
6679  041344  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
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 6680  041352  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6681  041360  005300                          DEC     R0
 6682  041362  001370                          BNE     1$
 6683  041364  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
 6684  041370  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
 6685  041374  105762  000000          2$:     TSTB    RKCS1(R2)
 6686  041400  100402                          BMI     3$
 6687  041402  005300                          DEC     R0
 6688  041404  001373                          BNE     2$
 6689  041406  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6690  041414  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6691  041422  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6692  041430  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6693  041436  012737  110224  003500          MOV     #CERR!RDY!RDHEAD!CFMT&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6694  041444  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6695  041452  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
 6696  041460  012737  000030  003514          MOV     #FMTE!DRPAR,E.ER        ;LOAD EXPECTED ERROR REG
 6697  041466  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
 6698  041474  001401                          BEQ     4$              ;YES, CONTINUE
 6699  041476  104201                          ERROR   201
 6700  041500  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
 6701  041506  001401                          BEQ     5$              ;YES, CONTINUE
 6702  041510  104202                          ERROR   202
 6703  041512  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STPATUS REG CORRECT
 6704  041520  001401                          BEQ     6$              ;YES, CONTINUE
 6705  041522  104203                          ERROR   203
 6706  041524  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
 6707  041532  001401                          BEQ     7$              ;YES, CONTINUE
 6708  041534  104204                          ERROR   204
 6709  041536  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
 6710  041544  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
 6711  041552  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
 6712  041560  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
 6713                                          ;  AND ERROR REG
 6714  041566  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6715  041574  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6716  041602  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6717  041610  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6718  041616  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6719  041624  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 6720  041632  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6721  041640  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
 6722  041644  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
 6723  041650  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 6724  041656  001401                          BEQ     11$             ;YES, CONTINUE
 6725  041660  104211                          ERROR   211             ;CS1 INCORRECT
 6726  041662  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 6727  041670  001401                          BEQ     12$             ;YES, CONTINUE
 6728  041672  104212                          ERROR   212             ;CS2 INCORRECT
 6729  041674  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
 6730  041702  001401                          BEQ     13$             ;YES, CONTINUE
 6731  041704  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
 6732  041706  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
 6733  041714  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
 6734  041716  104214                          ERROR   214             ;ERROR REG INCORRECT
 6735  041720                          14$:
```

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 6736
 6737                                   ;;*****************************************************************
 6738                                   ;*TEST 51       FAULT SETTING CONTROLLER ERROR
 6739                                   ;*
 6740                                   ;*       CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
 6741                                   ;*       CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO
 6742                                   ;*       AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE
 6743                                   ;*       0.  CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.
 6744                                   ;*       TURN OFF MAINTENANCE MODE.  MAKE SURE DRIVE
 6745                                   ;*       AVAILABLE AND CONTROLLER ERROR SET.
 6746                                   ;*
 6747                                   ;;*****************************************************************
 6748  041720  000004                  TST51:  SCOPE
 6749  041722  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6750  041730  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6751  041734  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
 6752  041742  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
 6753  041750  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
 6754  041756  012762  177775  000002          MOV     #-3,RKWC(R2)    ;LOAD WORD COUNT
 6755  041764  012762  064630  000004          MOV     #WRBUFF,RKBA(R2) ;LOAD BUS ADDRESS
 6756  041772  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;ISSUE WRITE HEADER
 6757  042000  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
 6758  042004  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6759  042012  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6760  042020  005300                          DEC     R0
 6761  042022  001370                          BNE     1$
 6762  042024  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
 6763  042030  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
 6764  042034  105762  000000          2$:     TSTB    RKCS1(R2)
 6765  042040  100402                          BMI     3$
 6766  042042  005300                          DEC     R0
 6767  042044  001373                          BNE     2$
 6768  042046  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6769  042054  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6770  042062  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6771  042070  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6772  042076  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6773  042104  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6774  042112  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
 6775  042120  012737  000000  003514          MOV     #0,E.ER ;LOAD EXPECTED ERROR REG
 6776  042126  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
 6777  042134  001401                          BEQ     4$              ;YES, CONTINUE
 6778  042136  104205                          ERROR   205
 6779  042140  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
 6780  042146  001401                          BEQ     5$              ;YES, CONTINUE
 6781  042150  104206                          ERROR   206
 6782  042152  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
 6783  042160  001401                          BEQ     6$              ;YES, CONTINUE
 6784  042162  104207                          ERROR   207
 6785  042164  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
 6786  042172  001401                          BEQ     7$              ;YES, CONTINUE
 6787  042174  104210                          ERROR   210
 6788  042176  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
 6789  042204  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
 6790  042212  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
 6791  042220  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
```

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 6792                                                                ;  AND ERROR REG
 6793  042226  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6794  042234  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 6795  042242  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 6796  042250  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
 6797  042256  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 6798  042264  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 6799  042272  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 6800  042300  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
 6801  042304  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
 6802  042310  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 6803  042316  001401                          BEQ     11$             ;YES, CONTINUE
 6804  042320  104211                          ERROR   211             ;CS1 INCORRECT
 6805  042322  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 6806  042330  001401                          BEQ     12$             ;YES, CONTINUE
 6807  042332  104212                          ERROR   212             ;CS2 INCORRECT
 6808  042334  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
 6809  042342  001401                          BEQ     13$             ;YES, CONTINUE
 6810  042344  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
 6811  042346  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
 6812  042354  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
 6813  042356  104214                          ERROR   214             ;ERROR REG INCORRECT
 6814  042360                          14$:
 6815
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                                .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

042360  .                       $EOP:
042360  000004                          SCOPE
042362  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
042366  005037  001200                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
042372  005237  001222                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
042376  042737  100000  001222          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
042404  005327                          DEC     (PC)+           ;;LOOP?
042406  000001                  $EOPCT: .WORD   1
042410  003063                          BGT     $DOAGN          ;;YES
042412  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
042414  000001                  $ENDCT: .WORD   1
042416  042406                          $EOPCT
042420  104401  042426                  TYPE    ,65$            ;;TYPE ASCIZ STRING
042424  000407                          BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <12><15>/END PASS #/
042444                          64$:
042444  013746  001222                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                ;;TYPE PASS NUMBER
042450  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
042452  104401  042460                  TYPE    ,67$            ;;TYPE ASCIZ STRING
042456  000421                          BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
042522                          66$:
042522  013746  001112                  MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                ;;TOTAL NUMBER OF ERRORS
042526  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
042530  104401  001211                  TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
042534  005037  001112                  CLR     $ERTTL          ;;CLEAR ERROR TOTAL
042540  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
042544  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
042546  000005                          RESET                   ;;CLEAR THE WORLD
042550  004?10                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
042552  000240                          NOP                     ;;SAVE ROOM
042554  000240                          NOP                     ;;FOR
042556  000240                          NOP                     ;;ACT11
042560                          $DOAGN:
042560  000137                          JMP     @(PC)+          ;;RETURN
042562  004636                  $RTNAD: .WORD   NEWPAS
042564    377     377     000   $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
          042570                        .EVEN


                                .SBTTL  SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE

042570  052737  002400  003524  WRTBIT: BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT. REG. 1
042576  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIED 1ST UPWARD TRANSITION
042604  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
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6872  042612  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
6873  042620  001416                          BEQ     3$              ;YES, PROVIDE DOWNWARD TRANSISTION
6874  042622  012737  042642  001202          MOV     #1$,$ESCAPE     ;LOAD ESCAPE FOR LOOP ON ERROR
6875  042630  012737  063747  003172          MOV     #EMW1,EMW+2     ;LOAD ERROR MESSAGE
6876  042636  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6877  042640  000207                          RTS     PC              ;MR1 INCORRECT ON UPWARD TRANSITION
6878
6879  042642  032777  001000  136270  1$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6880  042650  001402                          BEQ     3$              ;NO, CONTINUE
6881  042652  000137  043524                  JMP     63$             ;YES, LOOP ON ERROR
6882
6883  042656  042737  014400  003524  3$:     BIC     #MCLK!PCA!PCD,E.MR1 ;INITIALIZE MAINTENANCE REG. 1
6884  042664  052737  042000  003524          BIS     #MEWD!WRTGAT,E.MR1
6885  042672  005737  003614                  TST     PR.BIT          ;CHECK IF ONE
6886  042676  001152                          BNE     20$             ;YES, SIMULATE ONE
6887  042700  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
6888  042704  001023                          BNE     10$             ;YES, NO TRANSISTION
6889  042706  042737  002000  003524          BIC     #MEWD,E.MR1     ;INDICATE TRANSISTION
6890  042714  005737  003612                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
6891  042720  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
6892  042722  005737  003620                  TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
6893  042726  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
6894  042730  052737  010000  003524          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
6895  042736  000406                          BR      10$             ;CLOCK IN ZERO
6896
6897  042740  005737  003620          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
6898  042744  001003                          BNE     10$             ;CLOCK IN ZERO
6899  042746  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
6900  042754  012762  000040  000026  10$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
6901  042762  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6902  042770  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6903  042776  001416                          BEQ     12$             ;YES, CONTINUE
6904  043000  012737  043020  001202          MOV     #11$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6905  043006  012737  064036  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6906  043014  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6907  043016  000207                          RTS     PC              ;MR1 INCORRECT
6908
6909  043020  032777  001000  136112  11$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6910  043026  001402                          BEQ     12$             ;NO, CONTINUE
6911  043030  000137  043524                  JMP     63$             ;YES, LOOP ON ERROR
6912
6913  043034  052737  002400  003524  12$:     BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT REG 1
6914  043042  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSISITION
6915  043050  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
6916  043056  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG. 1 CORRECT
6917  043064  001416                          BEQ     15$             ;YES, CONTINUE
6918  043066  012737  043106  001202          MOV     #13$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6919  043074  012737  064127  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
6920  043102  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6921  043104  000207                          RTS     PC              ;MR1 INCORRECT
6922
6923  043106  032777  001000  136024  13$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6924  043114  001402                          BEQ     15$             ;NO, CONTINUE
6925  043116  000137  043524                  JMP     63$             ;YES, LOOP ON ERROR
6926
6927  043122  052737  002000  003524  15$:     BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
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 6928  043130  042737  000400  003524          BIC     #MCLK,E.MR1
 6929  043136  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SUPPLY LAST PART OF DATA
 6930  043144  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
 6931  043152  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
 6932  043160  001414                          BEQ     18$             ;YES, RETURN
 6933  043162  012737  043202  001202          MOV     #17$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
 6934  043170  012737  064216  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
 6935  043176  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
 6936  043200  000207                          RTS     PC              ;MR1 INCORRECT
 6937
 6938  043202  032777  001000  135730  17$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6939  043210  001145                          BNE     63$             ;YES, LOOP ON ERROR
 6940  043212  005037  001202          18$:    CLR     $ESCAPE         ;CLEAR ESCAPE
 6941  043216  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
 6942  043222  000207                          RTS     PC              ;RETURN
 6943
 6944  043224  005737  003612          20$:    TST     P1.BIT          ;CHECK IN NEXT BIT A ONE
 6945  043230  001007                          BNE     30$             ;YES, CHECK IF PRECOMP DELAY
 6946  043232  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP ADVANCE
 6947  043236  001415                          BEQ     40$             ;NO, CLOCK IN DATA BIT
 6948  043240  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
 6949  043246  000411                          BR      40$             ;CHECK MR1
 6950
 6951  043250  042737  000400  003524  30$:    BIC     #MCLK,E.MR1     ;RESET MAINT CLOCK IN EXPECTED MR1
 6952  043256  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP DELAY
 6953  043262  001003                          BNE     40$             ;NO, CHECK MR1
 6954  043264  052737  010000  003524          BIS     #PCD,E.MR1      ;SET SET PRECOMP DELAY
 6955  043272  012762  000040  000026  40$:    MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
 6956  043300  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
 6957  043306  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK MR1 CORRECT
 6958  043314  001414                          BEQ     42$             ;YES, CLOCK IN REST OF BIT
 6959  043316  012737  043336  001202          MOV     #41$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
 6960  043324  012737  064036  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
 6961  043332  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
 6962  043334  000207                          RTS     PC              ;MR1 INCORRECT
 6963
 6964  043336  032777  001000  135574  41$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6965  043344  001067                          BNE     63$             ;YES, LOOP ON ERROR
 6966  043346  052737  000400  003524  42$:    BIS     #MCLK,E.MR1     ;CHREATE EXPECTED MAINT. REG. 1
 6967  043354  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSITION
 6968  043362  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
 6969  043370  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
 6970  043376  001414                          BEQ     45$             ;YES, CONTINUE
 6971  043400  012737  043420  001202          MOV     #43$,$ESCAPE    ;LOAD ESCAPE
 6972  043406  012737  064127  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
 6973  043414  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
 6974  043416  000207                          RTS     PC              ;MR1 INCORRECT
 6975
 6976  043420  032777  001000  135512  43$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6977  043426  001036                          BNE     63$             ;YES, LOOP ON ERROR
 6978  043430  042737  002400  003524  45$:    BIC     #MEWD!MCLK,E.MR1 ;SET TRANSISTION
 6979  043436  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLOCK TRANSISTION
 6980  043444  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
 6981  043452  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
 6982  043460  001414                          BEQ     50$             ;YES, RETURN
 6983  043462  012737  043502  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
```

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 6984  043470  012737  064216  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
 6985  043476  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
 6986  043500  000207                          RTS     PC              ;MR1 INCORRECT
 6987
 6988  043502  032777  001000  135430  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6989  043510  001005                          BNE     63$             ;YES, LOOP ON ERROR
 6990  043512  005037  001202          50$:    CLR     $ESCAPE         ;CLEAR ESCAPE
 6991  043516  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
 6992  043522  000207                          RTS     PC              ;RETURN
 6993
 6994  043524  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
 6995  043530  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
 6996  043534  000177  135350                  JMP     @$LPERR         ;LOOP ON ERROR
 6997
 6998                                  .SBTTL  SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
 6999
 7000  043540  005737  003614          RDBIT:  TST     PR.BIT          ;CHECK IF ONE
 7001  043544  001024                          BNE     10$             ;YES, SIMULATE ONE
 7002  043546  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
 7003  043552  001404                          BEQ     4$              ;NO, INSERT TRANSITION
 7004  043554  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;YES, DO NOT INSERT TRANSITION
 7005  043562  000403                          BR      5$              ;CLOCK IN ZERO
 7006
 7007  043564  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2)  ;INSERT TRANSITION
 7008  043572  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
 7009  043600  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
 7010  043606  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 7011  043614  000207                          RTS     PC              ;RETURN
 7012
 7013  043616  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2)  ;CLOCK IN ONE
 7014  043624  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 7015  043632  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
 7016  043640  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 7017  043646  000207                          RTS     PC              ;RETURN
 7018
 7019                                  .SBTTL  MEMORY CHECK ENABLE TRAP
 7020
 7021  043650  012737  043664  001202  MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
 7022  043656  011637  003604                  MOV     (SP),TRAPPC     ;STORE PC
 7023  043662  104147                          ERROR   147             ;REPORT MEM PARITY ERROR
 7024  043664  005037  001202          10$:    CLR     $ESCAPE         ;CLEAR ESCAPE
 7025  043670  032777  001000  135242          BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 7026  043676  001001                          BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
 7027  043700  000002                          RTI                     ;NO, RETURN
 7028
 7029  043702  012706  001100          15$:    MOV     #STACK,SP       ;INITIALIZE STACK
 7030  043706  000177  135176                  JMP     @$LPERR         ;LOOP ON ERROR
 7031
 7032                                  .SBTTL  ROUTINE TO SIZE MEMORY
 7033
 7034                                  ;;******************************************************************
 7035                                  ;*CALL:
 7036                                  ;*      JSR     PC,$SIZE
 7037                                  ;*      RETURN
 7038                                  ;*$LSTAD WILL CONTAIN:
 7039                                  ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
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                        ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
                        ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
                        ;*$KT11 IS THE MEMORY MANAGEMENT KEY
                        ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
                        ;*      MUST BE SETUP BEFORE THE CALL
                        ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
                        ;*      DETERMINED BY ROUTINE

043712  010046          $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
043714  010146                  MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
043716  010246                  MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
043720  010346                  MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
043722  013746  000004          MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
043726  013746  000006          MOV     @#ERRVEC+2,-(SP)
043732  010600                  MOV     SP,R0           ;;SAVE THE STACK POINTER
                        ;;SET THE ERRVEC PS TO THE PRESENT PS
043734  104400                  TRAP                    ;;PUSH OLD PSW AND PC ON STACK
043736  012637  000006          MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
043742  012701  003776          MOV     #3776,R1        ;;SETUP ADDRESS
043746  105727                  TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
043750  000200          $KT11:  .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
043752  100062                  BPL     $CORE           ;;BR IF NO
043754  012737  044112  000004  MOV     #$KTNEX,@#ERRVEC ;;SET FOR TIMEOUT
043762  005737  177572          TST     @#SR0           ;;KT11 ARE YOU THERE?
043766  052737  100000  043750  BIS     #100000,$KT11   ;;YES--SET KT11 KEY
043774  005046                  CLR     -(SP)           ;;INITIALIZE FOR "PAR" LOADING
043776  012702  172340          MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
044002  012703  000010          MOV     #^D8,R3         ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
044006  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
044014  011622                  MOV     (SP),(R2)+      ;;LOAD "PAR"
044016  062716  000200          ADD     #200,(SP)       ;;UPDATE FOR NEXT "PAR"
044022  077307                  SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
044024  012742  177600          MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
044030  005042                  CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
044032  012737  044050  000004  MOV     #2$,@#ERRVEC    ;;CATCH TIMEOUT IF NO SR3
044040  012737  000020  172516  MOV     #20,@#SR3       ;;ENABLE 22 BIT MODE
044046  000401                  BR      3$              ;;THIS PDP-11 HAS A SR3 REGISTER
044050  022626          2$:     CMP     (SP)+,(SP)+     ;;CLEAN OFF THE STACK--NO SR3
044052  005237  177572  3$:     INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
044056  012737  044102  000004  MOV     #$KTOUT,@#ERRVEC ;;SET FOR TIME OUT
044064  005737  143776  4$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
044070  062712  000040          ADD     #40,(R2)        ;;MAKE A 1K STEP
044074  023712  172356          CMP     @#KIPAR7,(R2)   ;;LAST ONE?
044100  101371                  BHI     4$              ;;NO--TRY IT
044102  011202          $KTOUT: MOV     (R2),R2         ;;GET LAST BANK+1
044104  005037  177572          CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
044110  000421                  BR      $SIZEX
044112  042737  100000  043750  $KTNEX: BIC    #100000,$KT11   ;;KT11 NON-EXISTENT
044120  012737  044150  000004  $CORE:  MOV    #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
044126  005002                  CLR     R2              ;;SET UP BANK
044130  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
044134  062702  000040          ADD     #40,R2          ;;1K STEP
044140  005711                  TST     (R1)            ;;TRAP ON TIME OUT
044142  022701  177776          CMP     #177776,R1      ;;LAST ONE
044146  001370                  BNE     1$              ;;NO--TRY AGAIN
044150  162701  004000  $CROUT: SUB     #4000,R1
```

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7096  044154  162702  000040          $SIZEX: SUB     #40,R2          ;;DROP BACK
7097  044160  010006                          MOV     R0,SP           ;;RESTORE THE STACK
7098  044162  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
7099  044166  012637  000004                  MOV     (SP)+,@#ERRVEC
7100  044172  010137  044214                  MOV     R1,$LSTAD       ;;LAST ADDRESS
7101  044176  010237  044216                  MOV     R2,$LSTBK       ;;LAST BANK
7102  044202  012603                          MOV     (SP)+,R3        ;;RESTORE R3
7103  044204  012602                          MOV     (SP)+,R2        ;;RESTORE R2
7104  044206  012601                          MOV     (SP)+,R1        ;;RESTORE R1
7105  044210  012600                          MOV     (SP)+,R0        ;;RESTORE R0
7106  044212  000207                          RTS     PC
7107  044214  000000                  $LSTAD: .WORD   0               ;;CONTAINS THE LAST ADDRESS
7108  044216  000000                  $LSTBK: .WORD   0               ;;CONTAINS THE LAST BANK
7109                                  .SBTTL  SCOPE HANDLER ROUTINE
7110
7111                                  ;;**************************************************************
7112                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
7113                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
7114                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
7115                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
7116                                  ;*SW14=1         LOOP ON TEST
7117                                  ;*SW11=1         INHIBIT ITERATIONS
7118                                  ;*SW09=1         LOOP ON ERROR
7119                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
7120                                  ;*CALL
7121                                  ;*      SCOPE           ;;SCOPE=IOT
7122
7123  044220                          $SCOPE:
7124  044220  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
7125  044222  032777  040000  134710  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
7126  044230  001131                          BNE     $OVER           ;;YES IF SW14=1
7127                                  ;#####START OF CODE FOR THE XOR TESTER#####
7128  044232  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
7129                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
7130  044234  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
7131  044240  012737  044260  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
7132  044246  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
7133  044252  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
7134  044256  000500                          BR      $SVLAD          ;;GO TO THE NEXT TEST
7135  044260  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
7136  044262  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
7137  044266  000440                          BR      7$              ;;LOOP ON THE PRESENT TEST
7138  044270                          6$:;#####END OF CODE FOR THE XOR TESTER#####
7139  044270  032777  000400  134642          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
7140  044276  001421                          BEQ     2$              ;;BR IF NO
7141  044300  005046                          CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
7142  044302  117716  134632                  MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
7143  044306  001414                          BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
7144  044310  022716  000051                  CMP     #51,(SP)        ;;CHECK THE NUMBER IN THE SWR
7145  044314  002417                          BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
7146  044316  011637  001102                  MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
7147  044322  005316                          DEC     (SP)            ;;BACKUP BY ONE
7148  044324  006316                          ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
7149  044326  062716  044532                  ADD     #$SW08TBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
7150  044332  013637  001106                  MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
7151  044336  000466                          BR      $OVER           ;;GO LOOP ON THE TEST
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7152  044340  005726                  8$:     TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
7153  044342  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
7154  044346  001421                          BEQ     3$              ;;BR IF NO
7155  044350  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
7156  044356  101015                          BHI     3$              ;;BR IF NO
7157  044360  032777  001000  134552          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
7158  044366  001404                          BEQ     4$              ;;BR IF NO
7159  044370  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
7160  044376  000446                          BR      $OVER
7161  044400  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
7162  044404  005037  001200                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
7163  044410  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
7164  044412  032777  004000  134520  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
7165  044420  001011                          BNE     1$              ;;BR IF YES
7166  044422  005737  001222                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
7167  044426  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
7168  044430  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
7169  044434  023737  001200  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
7170  044442  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
7171  044444  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
7172  044452  013737  044530  001200          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
7173  044460  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
7174  044464  113737  001102  001220          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
7175  044472  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
7176  044476  011637  001110                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
7177  044502  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
7178  044506  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
7179  044514  013777  001102  134420  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
7180  044522  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
7181  044526  000002                          RTI                     ;;FIXES PS
7182  044530  003720                  $MXCNT: 2000.                   ;;MAX. NUMBER OF ITERATIONS
7183  044532                          $SW08TBL:
7184  044532  004652                          .WORD   TST1+2          ;;STARTING ADDRESS OF TEST 1
7185  044534  005070                          .WORD   TST2+2          ;;STARTING ADDRESS OF TEST 2
7186  044536  005306                          .WORD   TST3+2          ;;STARTING ADDRESS OF TEST 3
7187  044540  005522                          .WORD   TST4+2          ;;STARTING ADDRESS OF TEST 4
7188  044542  005736                          .WORD   TST5+2          ;;STARTING ADDRESS OF TEST 5
7189  044544  006420                          .WORD   TST6+2          ;;STARTING ADDRESS OF TEST 6
7190  044546  007046                          .WORD   TST7+2          ;;STARTING ADDRESS OF TEST 7
7191  044550  007434                          .WORD   TST10+2         ;;STARTING ADDRESS OF TEST 10
7192  044552  010560                          .WORD   TST11+2         ;;STARTING ADDRESS OF TEST 11
7193  044554  011246                          .WORD   TST12+2         ;;STARTING ADDRESS OF TEST 12
7194  044556  012132                          .WORD   TST13+2         ;;STARTING ADDRESS OF TEST 13
7195  044560  013020                          .WORD   TST14+2         ;;STARTING ADDRESS OF TEST 14
7196  044562  014224                          .WORD   TST15+2         ;;STARTING ADDRESS OF TEST 15
7197  044564  015102                          .WORD   TST16+2         ;;STARTING ADDRESS OF TEST 16
7198  044566  015540                          .WORD   TST17+2         ;;STARTING ADDRESS OF TEST 17
7199  044570  016654                          .WORD   TST20+2         ;;STARTING ADDRESS OF TEST 20
7200  044572  017770                          .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
7201  044574  021104                          .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
7202  044576  021774                          .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
7203  044600  022526                          .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
7204  044602  023260                          .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
7205  044604  024012                          .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
7206  044606  024544                          .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
7207  044610  025276                          .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
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 7208  044612  026030                        .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
 7209  044614  026330                        .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
 7210  044616  027076                        .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
 7211  044620  027466                        .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
 7212  044622  030312                        .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
 7213  044624  031136                        .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
 7214  044626  031762                        .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
 7215  044630  032606                        .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
 7216  044632  033432                        .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
 7217  044634  034256                        .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
 7218  044636  035102                        .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
 7219  044640  035742                        .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
 7220  044642  036766                        .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
 7221  044644  040012                        .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
 7222  044646  040652                        .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
 7223  044650  041276                        .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
 7224  044652  041722                        .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
 7225                                ;;**************************************************************
 7226                                .SBTTL  LOOP ON INTERNAL ERROR
 7227
 7228  044654  032777  001000  134256 SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 7229  044662  001405                        BEQ     5$              ;NO RETURN
 7230  044664  105737  001103                TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
 7231  044670  001402                        BEQ     5$              ;NO, RETURN
 7232  044672  013716  001110                MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
 7233  044676  000002                 5$:    RTI                     ;RETURN
 7234                                .SBTTL  APT COMMUNICATIONS ROUTINE
 7235
 7236                                ;;**************************************************************
 7237  044700  112737  000001  045144 $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
 7238  044706  112737  000001  045142 $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
 7239  044714  000403                        BR      $ATYC
 7240  044716  112737  000001  045144 $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
 7241  044724                         $ATYC:
 7242  044724  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7243  044726  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 7244  044730  105737  045142                TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
 7245  044734  001450                        BEQ     5$              ;;IF NOT:  BR
 7246  044736  122737  000001  001234        CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
 7247  044744  001031                        BNE     3$              ;;IF NOT:  BR
 7248  044746  132737  000100  001235        BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
 7249  044754  001425                        BEQ     3$              ;;IF NOT:  BR
 7250  044756  017600  000004                MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
 7251  044762  062766  000002  000004        ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7252  044770  005737  001214         1$:    TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
 7253  044774  001375                        BNE     1$              ;;IF NOT:  WAIT
 7254  044776  010037  001230                MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
 7255  045002  105720                 2$:    TSTB    (R0)+           ;;FIND END OF MESSAGE
 7256  045004  001376                        BNE     2$
 7257  045006  163700  001230                SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
 7258  045012  006200                        ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
 7259  045014  010037  001232                MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
 7260  045020  012737  000004  001214        MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
 7261  045026  000413                        BR      5$
 7262  045030  017637  000004  045054 3$:    MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
 7263  045036  062766  000002  000004        ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
```

```
7264  045044  013746  177776          MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
7265  045050  004737  045706          JSR     PC,$TYPE        ;;CALL TYPE MACRO
7266  045054  000000            4$:   .WORD   0
7267  045056                    5$:
7268  045056  105737  045144    10$:  TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
7269  045062  001416                  BEQ     12$             ;;IF NOT:  BR
7270  045064  005737  001234          TST     $ENV            ;;RUNNING UNDER APT?
7271  045070  001413                  BEQ     12$             ;;IF NOT:  BR
7272  045072  005737  001214    11$:  TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
7273  045076  001375                  BNE     11$             ;;IF NOT:  WAIT
7274  045100  017637  000004  001216  MOV     @4(SP),$FATAL   ;;GET ERROR #
7275  045106  062766  000002  000004  ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
7276  045114  005237  001214          INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
7277  045120  105037  045144    12$:  CLRB    $FFLG           ;;CLEAR FATAL FLAG
7278  045124  105037  045143          CLRB    $LFLG           ;;CLEAR LOG FLAG
7279  045130  105037  045142          CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
7280  045134  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
7281  045136  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
7282  045140  000207                  RTS     PC              ;;RETURN
7283  045142     000    $MFLG:  .BYTE   0               ;;MESSG. FLAG
7284  045143     000    $LFLG:  .BYTE   0               ;;LOG FLAG
7285  045144     000    $FFLG:  .BYTE   0               ;;FATAL FLAG
7286          045146            .EVEN
7287          000200    APTSIZE=200
7288          000001    APTENV=001
7289          000100    APTSPOOL=100
7290          000040    APTCSUP=040
7291                    .SBTTL  ERROR HANDLER ROUTINE
7292
7293                    ;;**************************************************************
7294                    ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
7295                    ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
7296                    ;*AND GO TO TYPERR ON ERROR
7297                    ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
7298                    ;*SW15=1        HALT ON ERROR
7299                    ;*SW13=1        INHIBIT ERROR TYPEOUTS
7300                    ;*SW10=1        BELL ON ERROR
7301                    ;*SW09=1        LOOP ON ERROR
7302                    ;*CALL
7303                    ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
7304
7305  045146            $ERROR:
7306  045146  104407          CKSWR                           ;;TEST FOR CHANGE IN SOFT-SWR
7307  045150  105237  001103  7$:   INCB    $ERFLG          ;;SET THE ERROR FLAG
7308  045154  001775          BEQ     7$                      ;;DON'T LET THE FLAG GO TO ZERO
7309  045156  013777  001102  133756  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
7310  045164  032777  002000  133746  BIT     #BIT10,@SWR     ;;BELL ON ERROR?
7311  045172  001402          BEQ     1$                      ;;NO - SKIP
7312  045174  104401  001204          TYPE    ,$BELL          ;;RING BELL
7313  045200  005237  001112  1$:    INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
7314  045204  011637  001116          MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
7315  045210  162737  000002  001116  SUB     #2,$ERRPC
7316  045216  117737  133674  001114  MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
7317  045224  032777  020000  133706  BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
7318  045232  001004          BNE     20$                     ;;SKIP TYPEOUTS
7319  045234  004737  045346          JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
```

```
7320  045240  104401  001211                TYPE    ,$CRLF
7321  045244                        20$:
7322  045244  122737  000001  001234        CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7323  045252  001007                        BNE     2$              ;;NO,SKIP APT ERROR REPORT
7324  045254  113737  001114  045266        MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
7325  045262  004737  044716                JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
7326  045266     000                21$:    .BYTE   0
7327  045267     000                        .BYTE   0
7328  045270  000777                22$:    BR      22$             ;;APT ERROR LOOP
7329  045272  005777  133642        2$:     TST     @SWR            ;;HALT ON ERROR
7330  045276  100002                        BPL     3$              ;;SKIP IF CONTINUE
7331  045300  000000                        HALT                    ;;HALT ON ERROR!
7332  045302  104407                        CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
7333  045304  032777  001000  133626  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
7334  045312  001402                        BEQ     4$              ;;BR IF NO
7335  045314  013716  001110                MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
7336  045320  005737  001202        4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
7337  045324  001402                        BEQ     5$              ;;BR IF NONE
7338  045326  013716  001202                MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
7339  045332                        5$:
7340  045332  022737  042550  000042        CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
7341  045340  001001                        BNE     6$              ;;BRANCH IF NO
7342  045342  000000                        HALT                    ;;YES
7343  045344                        6$:
7344  045344  000002                        RTI                     ;;RETURN
7345
7346                                ;;*****************************************************************
7347                                .SBTTL  TYPE ERROR ROUTINE
7348                                ;*ENTRY JSR PC,TYPERR
7349                                ;*RETURN RTS PC
7350                                ;*
7351                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
7352                                ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
7353                                ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
7354                                ;*THE ERROR.
7355                                ;;*****************************************************************
7356  045346  104413                TYPERR: SAVREG
7357  045350  113700  001114                MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
7358  045354  042700  177400                BIC     #177400,R0      ;CLEAR UNUSED BITS
7359  045360  005300                        DEC     R0              ;FORM INDEX FOR ERROR TABLE
7360  045362  006300                        ASL     R0
7361  045364  006300                        ASL     R0
7362  045366  006300                        ASL     R0
7363  045370  062700  001300        1$:     ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
7364  045374  012037  045410                MOV     (R0)+,2$        ;GET EM POINTER
7365  045400  001404                        BEQ     3$              ;BRANCH IF THERE ISN'T ONE
7366  045402  104401  001211                TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
7367  045406  104401                        TYPE                    ;TYPE ERROR MESSAGE (EM)
7368  045410  000000                2$:     .WORD   0               ;EM POINTER GOES HERE
7369  045412  012037  045426        3$:     MOV     (R0)+,4$        ;GET DH POINTER
7370  045416  001404                        BEQ     5$              ;BRANCH IF THERE ISN'T ONE
7371  045420  104401  001211                TYPE    ,$CRLF          ;TYPE CR-LF
7372  045424  104401                        TYPE                    ;TYPE DATA HEADER
7373  045426  000000                4$:     .WORD   0               ;DH POINTER GOES HERE
7374  045430  012001                5$:     MOV     (R0)+,R1        ;GET DT POINTER
7375  045432  001445                        BEQ     20$             ;BRANCH IF THERE ARE NONE
```

```
 7376  045434  005004                        CLR     R4              ;RESET INDENT SWITCH
 7377  045436  012000                        MOV     (R0)+,R0        ;GET DF POINTER
 7378  045440  012002                        MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
 7379  045442  104401  001211                TYPE    ,$CRLF
 7380  045446  112003                10$:    MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
 7381  045450  105720                        TSTB    (R0)+           ;BUMP PAST FORMAT WORD
 7382  045452  005703                        TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
 7383  045454  001416                        BEQ     14$             ;NO - SKIP DATA PRINT
 7384  045456  005704                        TST     R4              ;CHECK IF INDENT WORDS
 7385  045460  001004                        BNE     12$             ;YES, GO INDENT
 7386  045462  013146                11$:    MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
 7387  045464  104402                        TYPOC                   ;TYPE IT
 7388  045466  005303                        DEC     R3              ;MORE DATA WORDS
 7389  045470  001403                        BEQ     13$             ;NO-BRANCH
 7390  045472  104401  052267          12$:  TYPE    ,SPACE2         ;TYPE SEPARATORS
 7391  045476  000771                        BR      11$             ;LOOP
 7392  045500  104401  001211          13$:  TYPE    ,$CRLF          ;TYPE <CR><LF>
 7393  045504  005710                        TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
 7394  045506  001401                        BEQ     14$             ;NO, DO NOT CHANGE INDENT
 7395  045510  005104                        COM     R4              ;CHANGE INDENT
 7396  045512  005302                14$:    DEC     R2              ;MORE DH'S?
 7397  045514  003414                        BLE     20$             ;NO-BRANCH
 7398  045516  012037  045536          15$:  MOV     (R0)+,18$       ;GET NEXT DH POINTER
 7399  045522  001751                        BEQ     10$             ;IF NO HEADER GET DATA
 7400  045524  005704                        TST     R4              ;INDENT?
 7401  045526  001402                        BEQ     17$             ;NO-BRANCH
 7402  045530  104401  052267                TYPE    ,SPACE2         ;INDENT
 7403  045534  104401                17$:    TYPE                    ;TYPE DH
 7404  045536  000000                18$:    .WORD   0               ;DH POINTER GOES HERE
 7405  045540  104401  001211                TYPE    ,$CRLF
 7406  045544  000740                        BR      10$             ;LOOP
 7407  045546  104414                20$:    RESREG
 7408  045550  005237  003610                INC     ERRCNT          ;INCREMENT ERROR COUNT
 7409  045554  032777  010000  133356        BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
 7410  045562  001421                        BEQ     25$             ;NO, RETURN
 7411  045564  022737  000024  003610        CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
 7412  045572  103015                        BHIS    25$             ;NO, RETURN
 7413  045574  104401  052272                TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
 7414                                                                ;  ERROR THRESHOLD EXCEEDED"
 7415  045600  005737  000042                TST     42              ;CHECK IF IN CHAIN MODE
 7416  045604  001407                        BEQ     30$             ;NO, HALT
 7417  045606  012737  000001  042406        MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
 7418  045614  012706  001100                MOV     #STACK,SP       ;INITIALIZE STACK
 7419  045620  000137  042360                JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
 7420  045624  000000                30$:    HALT
 7421  045626  000207                25$:    RTS     PC
 7422
 7423                                .SBTTL  CONTROLLED PROGRAM HALT
 7424  045630  013702  001270        CTRHLT: MOV     $BASE,R2        ;SET '611 BASE
 7425  045634  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 7426  045642  012706  001100                MOV     #STACK,SP       ;CLEAR STACK
 7427  045646  104401  052223                TYPE    ,OPR007         ;TYPE HALT MESSAGE
 7428  045652  005737  000042                TST     42              ;TEST IF MONITOR PRESENT
 7429  045656  001410                        BEQ     5$              ;NO - SKIP
 7430  045660  105037  001103                CLRB    $ERFLG          ;CLEAR ERROR FLAG
 7431  045664  005037  001202                CLR     $ESCAPE         ;CLEAR ESCAPE
```

```
7432  045670  005037  042406                  CLR     $EOPCT          ;SET PASS COUNT TO 0
7433  045674  000137  042360                  JMP     $EOP            ;GO TO END OF PASS
7434
7435  045700  000000                  5$:     HALT                    ;HALT PROGRAM
7436  045702  000137  003666                  JMP     START1          ;DO RESTART IF CONTINUE
7437
7438                                  .SBTTL  TYPE ROUTINE
7439
7440                                  ;;*****************************************************************
7441                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
7442                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
7443                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
7444                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
7445                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
7446                                  ;*
7447                                  ;*CALL:
7448                                  ;*1) USING A TRAP INSTRUCTION
7449                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
7450                                  ;*OR
7451                                  ;*      TYPE
7452                                  ;*      MESADR
7453                                  ;*
7454
7455  045706  105737  001157          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
7456  045712  100002                  1$:     BPL     1$              ;;BR IF YES
7457  045714  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
7458  045716  000430                          BR      3$              ;;LEAVE
7459  045720  010046                          MOV     R0,-(SP)        ;;SAVE R0
7460  045722  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
7461  045726  122737  000001  001234          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7462  045734  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
7463  045736  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
7464  045744  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
7465  045746  010037  045756                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
7466  045752  004737  044706                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
7467  045756  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
7468  045760  132737  000040  001235  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
7469  045766  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
7470  045770  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
7471  045772  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
7472  045774  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
7473  045776  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
7474  046000  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
7475  046004  000002                          RTI                     ;;RETURN
7476  046006  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
7477  046012  001430                          BEQ     8$
7478  046014  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
7479  046020  001006                          BNE     5$
7480  046022  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
7481  046024  104401                          TYPE                    ;;TYPE A CR AND LF
7482  046026  001211                          $CRLF
7483  046030  105037  046164                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
7484  046034  000755                          BR      2$              ;;GET NEXT CHARACTER
7485  046036  004737  046120          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
7486  046042  123726  001156          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
7487  046046  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
```

```
 7488  046050  013746  001154                 MOV     $NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
 7489                                                                    ;;AND THE NULL CHAR.
 7490  046054  105366  000001          7$:     DECB    1(SP)            ;;DOES A NULL NEED TO BE TYPED?
 7491  046060  002770                         BLT     6$               ;;BR IF NO--GO POP THE NULL OFF OF STACK
 7492  046062  004737  046120                 JSR     PC,$TYPEC        ;;GO TYPE A NULL
 7493  046066  105337  046164                 DECB    $CHARCNT         ;;DO NOT COUNT AS A COUNT
 7494  046072  000770                         BR      7$               ;;LOOP
 7495
 7496                                  ;HORIZONTAL TAB PROCESSOR
 7497
 7498  046074  112716  000040          8$:     MOVB    #' ,(SP)         ;;REPLACE TAB WITH SPACE
 7499  046100  004737  046120          9$:     JSR     PC,$TYPEC        ;;TYPE A SPACE
 7500  046104  132737  000007  046164         BITB    #7,$CHARCNT      ;;BRANCH IF NOT AT
 7501  046112  001372                         BNE     9$               ;;TAB STOP
 7502  046114  005726                         TST     (SP)+            ;;POP SPACE OFF STACK
 7503  046116  000724                         BR      2$               ;;GET NEXT CHARACTER
 7504  046120  105777  133024          $TYPEC: TSTB    @$TPS            ;;WAIT UNTIL PRINTER IS READY
 7505  046124  100375                         BPL     $TYPEC
 7506  046126  116677  000002  133016         MOVB    2(SP),@$TPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 7507  046134  122766  000015  000002         CMPB    #CR,2(SP)        ;;IS CHARACTER A CARRIAGE RETURN?
 7508  046142  001003                         BNE     1$               ;;BRANCH IF NO
 7509  046144  105037  046164                 CLRB    $CHARCNT         ;;YES--CLEAR CHARACTER COUNT
 7510  046150  000406                         BR      $TYPEX           ;;EXIT
 7511  046152  122766  000012  000002  1$:     CMPB    #LF,2(SP)        ;;IS CHARACTER A LINE FEED?
 7512  046160  001402                         BEQ     $TYPEX           ;;BRANCH IF YES
 7513  046162  105227                         INCB    (PC)+            ;;COUNT THE CHARACTER
 7514  046164  000000          $CHARCNT:.WORD  0                        ;;CHARACTER COUNT STORAGE
 7515  046166  000207          $TYPEX: RTS     PC
 7516
 7517                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
 7518
 7519                                  ;;**********************************************************************
 7520                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
 7521                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
 7522                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
 7523                                  ;*CALL:
 7524                                  ;*      MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
 7525                                  ;*      TYPOS                    ;;CALL FOR TYPEOUT
 7526                                  ;*      .BYTE   N                ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
 7527                                  ;*      .BYTE   M                ;;M=1 OR 0
 7528                                  ;*                                       ;;1=TYPE LEADING ZEROS
 7529                                  ;*                                       ;;0=SUPPRESS LEADING ZEROS
 7530                                  ;*
 7531                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
 7532                                  ;*$TYPOS OR $TYPOC
 7533                                  ;*CALL:
 7534                                  ;*      MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
 7535                                  ;*      TYPON                    ;;CALL FOR TYPEOUT
 7536                                  ;*
 7537                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
 7538                                  ;*CALL:
 7539                                  ;*      MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
 7540                                  ;*      TYPOC                    ;;CALL FOR TYPEOUT
 7541
 7542  046170  017646  000000          $TYPOS: MOV     @(SP),-(SP)      ;;PICKUP THE MODE
 7543  046174  116637  000001  046413         MOVB    1(SP),$OFILL     ;;LOAD ZERO FILL SWITCH
```

```
 7544  046202  112637  046415                MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
 7545  046206  062716  000002                ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
 7546  046212  000406                        BR      $TYPON
 7547  046214  112737  000001  046413  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
 7548  046222  112737  000006  046415        MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
 7549  046230  112737  000005  046412  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
 7550  046236  010346                        MOV     R3,-(SP)        ;;SAVE R3
 7551  046240  010446                        MOV     R4,-(SP)        ;;SAVE R4
 7552  046242  010546                        MOV     R5,-(SP)        ;;SAVE R5
 7553  046244  113704  046415                MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
 7554  046250  005404                        NEG     R4
 7555  046252  062704  000006                ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
 7556  046256  110437  046414                MOVB    R4,$OMODE       ;;SAVE IT FOR USE
 7557  046262  113704  046413                MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
 7558  046266  016605  000012                MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
 7559  046272  005003                        CLR     R3              ;;CLEAR THE OUTPUT WORD
 7560  046274  006105                1$:     ROL     R5              ;;ROTATE MSB INTO "C"
 7561  046276  000404                        BR      3$              ;;GO DO MSB
 7562  046300  006105                2$:     ROL     R5              ;;FORM THIS DIGIT
 7563  046302  006105                        ROL     R5
 7564  046304  006105                        ROL     R5
 7565  046306  010503                        MOV     R5,R3
 7566  046310  006103                3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
 7567  046312  105337  046414                DECB    $OMODE          ;;TYPE THIS DIGIT?
 7568  046316  100016                        BPL     7$              ;;BR IF NO
 7569  046320  042703  177770                BIC     #177770,R3      ;;GET RID OF JUNK
 7570  046324  001002                        BNE     4$              ;;TEST FOR 0
 7571  046326  005704                        TST     R4              ;;SUPPRESS THIS 0?
 7572  046330  001403                        BEQ     5$              ;;BR IF YES
 7573  046332  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 7574  046334  052703  000060                BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 7575  046340  052703  000040          5$:   BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
 7576  046344  110337  046410                MOVB    R3,8$           ;;SAVE FOR TYPING
 7577  046350  104401  046410                TYPE    ,8$             ;;GO TYPE THIS DIGIT
 7578  046354  105337  046412          7$:   DECB    $OCNT           ;;COUNT BY 1
 7579  046360  003347                        BGT     2$              ;;BR IF MORE TO DO
 7580  046362  002402                        BLT     6$              ;;BR IF DONE
 7581  046364  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
 7582  046366  000744                        BR      2$              ;;GO DO THE LAST DIGIT
 7583  046370  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
 7584  046372  012604                        MOV     (SP)+,R4        ;;RESTORE R4
 7585  046374  012603                        MOV     (SP)+,R3        ;;RESTORE R3
 7586  046376  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
 7587  046404  012616                        MOV     (SP)+,(SP)
 7588  046406  000002                        RTI                     ;;RETURN
 7589  046410     000                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
 7590  046411     000                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 7591  046412     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
 7592  046413     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
 7593  046414  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
 7594                          .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
 7595
 7596                          ;;**************************************************************
 7597                          ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
 7598                          ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
 7599                          ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
```

```
                        ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
                        ;*REPLACED WITH SPACES.
                        ;*CALL:
                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                        ;*      TYPDS                   ;;GO TO THE ROUTINE

046416                  $TYPDS:
046416  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
046420  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
046422  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
046424  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
046426  010546                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
046430  012746  020200          MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
046434  016605  000020          MOV     20(SP),R5       ;;GET THE INPUT NUMBER
046440  100004                  BPL     1$              ;;BR IF INPUT IS POS.
046442  005405                  NEG     R5              ;;MAKE THE BINARY NUMBER POS.
046444  112766  000055  000001  MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
046452  005000          1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
046454  012703  046632          MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
046460  112723  000040          MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
046464  005002          2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
046466  016001  046622          MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
046472  160105          3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
046474  002402                  BLT     4$              ;;BR IF DONE
046476  005202                  INC     R2              ;;INCREASE THE BCD DIGIT BY 1
046500  000774                  BR      3$
046502  060105          4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
046504  005702                  TST     R2              ;;CHECK IF BCD DIGIT=0
046506  001002                  BNE     5$              ;;FALL THROUGH IF 0
046510  105716                  TSTB    (SP)            ;;STILL DOING LEADING 0'S?
046512  100407                  BMI     7$              ;;BR IF YES
046514  106316          5$:     ASLB    (SP)            ;;MSD?
046516  103003                  BCC     6$              ;;BR IF NO
046520  116663  000001  177777  MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
046526  052702  000060          BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
046532  052702  000040          BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
046536  110223                  MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
046540  005720                  TST     (R0)+           ;;JUST INCREMENTING
046542  020027  000010          CMP     R0,#10          ;;CHECK THE TABLE INDEX
046546  002746                  BLT     2$              ;;GO DO THE NEXT DIGIT
046550  003002                  BGT     8$              ;;GO TO EXIT
046552  010502                  MOV     R5,R2           ;;GET THE LSD
046554  000764                  BR      6$              ;;GO CHANGE TO ASCII
046556  105726          8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
046560  100003                  BPL     9$              ;;BR IF NO
046562  116663  177777  177776  MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
046570  105013          9$:     CLRB    (R3)            ;;SET THE TERMINATOR
046572  012605                  MOV     (SP)+,R5        ;;POP STACK INTO R5
046574  012603                  MOV     (SP)+,R3        ;;POP STACK INTO R3
046576  012602                  MOV     (SP)+,R2        ;;POP STACK INTO R2
046600  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
046602  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
046604  104401  046632          TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
046610  016666  000002  000004  MOV     2(SP),4(SP)     ;;ADJUST THE STACK
046616  012616                  MOV     (SP)+,(SP)
046620  000002                  RTI                     ;;RETURN TO USER
```

```
 7656  046622  023420                  $DTBL:  10000.
 7657  046624  001750                          1000.
 7658  046626  000144                          100.
 7659  046630  000012                          10.
 7660  046632  000004                  $DBLK:  .BLKW   4
 7661                                  .SBTTL  TTY INPUT ROUTINE
 7662
 7663                                  ;;*****************************************************************
 7664                                  .ENABL  LSB
 7665  046642  000000                  $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
 7666  046644  000000                  $TKQIN: .WORD   0               ;;INPUT POINTER
 7667  046646  000000                  $TKQOUT: .WORD  0               ;;OUTPUT POINTER
 7668  046650  000001                  $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
 7669          046651                  $TKQEND=.
 7670          046652                  .EVEN
 7671
 7672                                  ;*TK INITIALIZE ROUTINE
 7673                                  ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
 7674                                  ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
 7675                                  ;
 7676                                  ;*CALL:
 7677                                  ;*      JSR     PC,$TKINT
 7678                                  ;*      RETURN
 7679                                  ;
 7680  046652  005037  046642          $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
 7681  046656  012737  046650  046644          MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
 7682  046664  013737  046644  046646          MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
 7683  046672  012737  046722  000060          MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
 7684  046700  012737  000200  000062          MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
 7685  046706  005777  132234                  TST     @$TKB           ;;CLEAR DONE FLAG
 7686  046712  012777  000100  132224          MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
 7687  046720  000207                          RTS     PC              ;;RETURN TO CALLER
 7688
 7689                                  ;*TK SERVICE ROUTINE
 7690                                  ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
 7691                                  ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
 7692                                  ;*IT IN THE QUEUE.
 7693                                  ;*IF THE CHARACTER IS A "CONTROL-C" (^C) $TKINT IS CALLED AND
 7694                                  ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
 7695                                  ;
 7696  046722  117746  132220          $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
 7697  046726  042716  177600                  BIC     #^C177,(SP)     ;;STRIP THE JUNK
 7698  046732  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL C?
 7699  046736  001007                          BNE     1$              ;;BRANCH IF NO
 7700  046740  104401  050036                  TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (^C)
 7701  046744  004737  046652                  JSR     PC,$TKINT       ;;INIT THE KEYBOARD
 7702  046750  005726                          TST     (SP)+           ;;CLEAN UP STACK
 7703  046752  000137  045630                  JMP     CTRHLT          ;;CONTROL C RESTART
 7704  046756  021627  000007          1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
 7705  046762  001004                          BNE     2$              ;;BRANCH IF NO
 7706  046764  022737  000176  001140          CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
 7707  046772  001500                          BEQ     6$              ;;GO TO SWR CHANGE
 7708
 7709  046774                          2$:
 7710  046774  022737  000001  046642          CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
 7711  047002  001004                          BNE     3$              ;;BRANCH IF NO
```

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7712  047004  104401  001204          TYPE    ,$BELL          ;;RING THE TTY BELL
7713  047010  005726                  TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
7714  047012  000451                  BR      5$              ;;EXIT
7715  047014  021627  000023  3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
7716  047020  001021                  BNE     32$             ;;BRANCH IF NO
7717  047022  005077  132116          CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7718  047026  005726                  TST     (SP)+           ;;CLEAN CHAR OFF STACK
7719  047030  105777  132110  31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
7720  047034  100375                  BPL     31$             ;;LOOP UNTIL ITS THERE
7721  047036  117746  132104          MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
7722  047042  042716  177600          BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
7723  047046  022627  000021          CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
7724  047052  001366                  BNE     31$             ;;BRANCH IF NO
7725  047054  012777  000100  132062  MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
7726  047062  000002                  RTI                     ;;RETURN
7727  047064  005237  046642  32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
7728  047070  021627  000140          CMP     (SP),#140       ;;IS IT UPPER CASE?
7729  047074  002405                  BLT     4$              ;;BRANCH IF YES
7730  047076  021627  000175          CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
7731  047102  003002                  BGT     4$              ;;BRANCH IF YES
7732  047104  042716  000040          BIC     #40,(SP)        ;;MAKE IT UPPER CASE
7733  047110  112677  177530  4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
7734  047114  005237  046644          INC     $TKQIN          ;;UPDATE THE POINTER
7735  047120  023727  046644  046651  CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
7736  047126  001003                  BNE     5$              ;;BRANCH IF NO
7737  047130  012737  046650  046644  MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
7738  047136  000002          5$:     RTI                     ;;RETURN
7739
7740                                  ;;**********************************************************************
7741                                  ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
7742                                  ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
7743                                  ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
7744                                  ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
7745  047140  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
7746  047146  001124                  BNE     15$             ;;EXIT IF NOT
7747  047150  105777  131770          TSTB    @$TKS           ;;IS A CHAR WAITING?
7748  047154  100121                  BPL     15$             ;;IF NOT, EXIT
7749  047156  117746  131764          MOVB    @$TKB,-(SP)     ;;YES
7750  047162  042716  177600          BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
7751  047166  021627  000007          CMP     (SP),#7         ;;IS IT A CONTROL-G?
7752  047172  001300                  BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
7753                                                          ;;AND EXIT
7754
7755                                  ;;**********************************************************************
7756                                  ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
7757                                  ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
7758                                  ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
7759  047174  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
7760  047202  001674                  BEQ     2$              ;;BRANCH IF YES
7761  047204  005726                  TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
7762  047206  004737  046652          JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
7763  047212  005077  131726          CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7764  047216  112737  000001  001135  MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
7765
7766  047224  104401  050050          TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
7767  047230  104401  050055  $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
```

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7768  047234  013746  000176          MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
7769  047240  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
7770  047242  104401  050066          TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
7771  047246  005046          19$:    CLR     -(SP)           ;;CLEAR COUNTER
7772  047250  005046                  CLR     -(SP)           ;;THE NEW SWR
7773  047252  105777  131666  7$:     TSTB    @$TKS           ;;CHAR THERE?
7774  047256  100375                  BPL     7$              ;;IF NOT TRY AGAIN
7775
7776  047260  117746  131662          MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
7777  047264  042716  177600          BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
7778
7779  047270  021627  000003          CMP     (SP),#3         ;;IS IT A CONTROL-C?
7780  047274  001015                  BNE     9$              ;;BRANCH IF NOT
7781  047276  104401  050036          TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (^C)
7782  047302  062706  000006          ADD     #6,SP           ;;CLEAN UP STACK
7783  047306  123727  001135  000001  CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
7784  047314  001003                  BNE     8$              ;;BRANCH IF NO
7785  047316  012777  000100  131620  MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
7786  047324  000137  045630  8$:     JMP     CTRHLT          ;;CONTROL-C RESTART
7787
7788
7789  047330  021627  000025  9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
7790  047334  001005                  BNE     10$             ;;BRANCH IF NOT
7791  047336  104401  050043          TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
7792  047342  062706  000006  20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
7793  047346  000737                  BR      19$             ;;LET'S TRY IT AGAIN
7794
7795
7796  047350  021627  000015  10$:    CMP     (SP),#15        ;;IS IT A <CR>?
7797  047354  001022                  BNE     16$             ;;BRANCH IF NO
7798  047356  005766  000004          TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
7799  047362  001403                  BEQ     11$             ;;BRANCH IF YES
7800  047364  016677  000002  131546  MOV     2(SP),@SWR      ;;SAVE NEW SWR
7801  047372  062706  000006  11$:    ADD     #6,SP           ;;CLEAR UP STACK
7802  047376  104401  001211  14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
7803  047402  123727  001135  000001  CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
7804  047410  001003                  BNE     15$             ;;BRANCH IF NOT
7805  047412  012777  000100  131524  MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
7806  047420  000002          15$:    RTI                     ;;RETURN
7807  047422  004737  046120  16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
7808  047426  021627  000060          CMP     (SP),#60        ;;CHAR < 0?
7809  047432  002420                  BLT     18$             ;;BRANCH IF YES
7810  047434  021627  000067          CMP     (SP),#67        ;;CHAR > 7?
7811  047440  003015                  BGT     18$             ;;BRANCH IF YES
7812  047442  042726  000060          BIC     #60,(SP)+       ;;STRIP-OFF ASCII
7813  047446  005766  000002          TST     2(SP)           ;;IS THIS THE FIRST CHAR
7814  047452  001403                  BEQ     17$             ;;BRANCH IF YES
7815  047454  006316                  ASL     (SP)            ;;NO, SHIFT PRESENT
7816  047456  006316                  ASL     (SP)            ;;    CHAR OVER TO MAKE
7817  047460  006316                  ASL     (SP)            ;;    ROOM FOR NEW ONE.
7818  047462  005266  000002  17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
7819  047466  056616  177776          BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
7820  047472  000667                  BR      7$              ;;GET THE NEXT ONE
7821  047474  104401  001210  18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
7822  047500  000720                  BR      20$             ;;SIMULATE CONTROL-U
7823                          .DSABL  LSB
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```
 7824
 7825
 7826                                   ;;*****************************************************************
 7827                                   ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 7828                                   ;*CALL:
 7829                                   ;*      RDCHR                    ;;GET A CHARACTER FROM THE QUEUE
 7830                                   ;*      RETURN HERE              ;;CHARACTER IS ON THE STACK
 7831                                   ;*                               ;;WITH PARITY BIT STRIPPED OFF
 7832                                   ;
 7833
 7834  047502  011646                   $RDCHR: MOV     (SP),-(SP)       ;;PUSH DOWN THE PC AND
 7835  047504  016666  000004  000002           MOV     4(SP),2(SP)      ;;THE PS
 7836  047512  005066  000004                   CLR     4(SP)            ;;GET READY FOR A CHARACTER
 7837  047516  005046                           CLR     -(SP)            ;;PUT NEW PS ON STACK
 7838  047520  012746  047526                   MOV     #64$,-(SP)       ;;PUT NEW PC ON  STACK
 7839  047524  000002                           RTI                      ;;POP NEW PC AND PS
 7840  047526                           64$:
 7841  047526  005737  046642           1$:     TST     $TKCNT           ;;WAIT ON A CHARACTER
 7842  047532  001775                           BEQ     1$
 7843  047534  005337  046642                   DEC     $TKCNT           ;;DECREMENT THE COUNTER
 7844  047540  117766  177102  000004           MOVB    @$TKQOUT,4(SP)   ;;GET ONE CHARACTER
 7845  047546  005237  046646                   INC     $TKQOUT          ;;UPDATE THE POINTER
 7846  047552  023727  046646  046651           CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
 7847  047560  001003                           BNE     2$               ;;BRANCH IF NO
 7848  047562  012737  046650  046646           MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
 7849  047570  000002                   2$:     RTI                      ;;RETURN
 7850                                   ;;*****************************************************************
 7851                                   ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 7852                                   ;*CALL:
 7853                                   ;*      RDLIN                    ;;INPUT A STRING FROM THE TTY
 7854                                   ;*      RETURN HERE              ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 7855                                   ;*                               ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 7856
 7857  047572  010346                   $RDLIN: MOV     R3,-(SP)         ;;SAVE R3
 7858  047574  005046                           CLR     -(SP)            ;;CLEAR THE RUBOUT KEY
 7859  047576  012703  050026           1$:     MOV     #$TTYIN,R3       ;;GET ADDRESS
 7860  047602  022703  050036           2$:     CMP     #$TTYIN+8.,R3    ;;BUFFER FULL?
 7861  047606  101456                           BLOS    4$               ;;BR IF YES
 7862  047610  104410                           RDCHR                    ;;GO READ ONE CHARACTER FROM THE TTY
 7863  047612  112613                           MOVB    (SP)+,(R3)       ;;GET CHARACTER
 7864  047614  122713  000177           10$:    CMPB    #177,(R3)        ;;IS IT A RUBOUT
 7865  047620  001022                           BNE     5$               ;;BR IF NO
 7866  047622  005716                           TST     (SP)             ;;IS THIS THE FIRST RUBOUT?
 7867  047624  001007                           BNE     6$               ;;BR IF NO
 7868  047626  112737  000134  050024           MOVB    #'\,9$           ;;TYPE A BACK SLASH
 7869  047634  104401  050024                   TYPE    ,9$
 7870  047640  012716  177777                   MOV     #-1,(SP)         ;;SET THE RUBOUT KEY
 7871  047644  005303                   6$:     DEC     R3               ;;BACKUP BY ONE
 7872  047646  020327  050026                   CMP     R3,#$TTYIN       ;;STACK EMPTY?
 7873  047652  103434                           BLO     4$               ;;BR IF YES
 7874  047654  111337  050024                   MOVB    (R3),9$          ;;SETUP TO TYPEOUT THE DELETED CHAR.
 7875  047660  104401  050024                   TYPE    ,9$              ;;GO TYPE
 7876  047664  000746                           BR      2$               ;;GO READ ANOTHER CHAR.
 7877  047666  005716                   5$:     TST     (SP)             ;;RUBOUT KEY SET?
 7878  047670  001406                           BEQ     7$               ;;BR IF NO
 7879  047672  112737  000134  050024           MOVB    #'\,9$           ;;TYPE A BACK SLASH
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7880  047700  104401  050024            TYPE    ,9$
7881  047704  005016                    CLR     (SP)            ;;CLEAR THE RUBOUT KEY
7882  047706  122713  000025    7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
7883  047712  001003                    BNE     8$              ;;BR IF NO
7884  047714  104401  050043            TYPE    ,$CNTLU         ;;TYPE A CONTROL 'U'
7885  047720  000726                    BR      1$              ;;GO START OVER
7886  047722  122713  000022    8$:     CMPB    #22,(R3)        ;;IS CHARACTER A '^R'?
7887  047726  001011                    BNE     3$              ;;BRANCH IF NO
7888  047730  105013                    CLRB    (R3)            ;;CLEAR THE CHARACTER
7889  047732  104401  001211            TYPE    ,$CRLF          ;;TYPE A 'CR' & 'LF'
7890  047736  104401  050026            TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
7891  047742  000717                    BR      2$              ;;GO PICKUP ANOTHER CHACTER
7892  047744  104401  001210    4$:     TYPE    ,$QUES          ;;TYPE A '?'
7893  047750  000712                    BR      1$              ;;CLEAR THE BUFFER AND LOOP
7894  047752  111337  050024    3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
7895  047756  104401  050024            TYPE    ,9$
7896  047762  122723  000015            CMPB    #15,(R3)+       ;;CHECK FOR RETURN
7897  047766  001305                    BNE     2$              ;;LOOP IF NOT RETURN
7898  047770  105063  177777            CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
7899  047774  104401  001212            TYPE    ,$LF            ;;TYPE A LINE FEED
7900  050000  005726                    TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
7901  050002  012603                    MOV     (SP)+,R3        ;;RESTORE R3
7902  050004  011646                    MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
7903  050006  016666  000004  000002    MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
7904  050014  012766  050026  000004    MOV     #$TTYIN,4(SP)
7905  050022  000002                    RTI                     ;;RETURN
7906  050024     000    9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
7907  050025     000                    .BYTE   0               ;;TERMINATOR
7908  050026  000010    $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
7909  050036  041536  005015     000  $CNTLC: .ASCIZ  /^C/<15><12>    ;;CONTROL 'C'
7910  050043     136  006525  000012  $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL 'U'
7911  050050  043536  005015     000  $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL 'G'
7912  050055     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR = /
7913  050062  036440  000040
7914  050066  020040  042516  020127  $MNEW:  .ASCIZ  /  NEW = /
7915  050074  020075     000
7916          050100                    .EVEN
7917                                    .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
7918
7919                                    ;;*****************************************************************
7920                                    ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
7921                                    ;*CHANGE IT TO BINARY.
7922                                    ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
7923                                    ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A '?' WILL BE TYPED
7924                                    ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
7925                                    ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
7926                                    ;*CALL:
7927                                    ;*      RDOCT                   ;;READ AN OCTAL NUMBER
7928                                    ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
7929                                    ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
7930
7931  050100  011646            $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
7932  050102  016666  000004  000002    MOV     4(SP),2(SP)     ;;INPUT NUMBER
7933  050110  010046                    MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7934  050112  010146                    MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7935  050114  010246                    MOV     R2,-(SP)        ;;PUSH R2 ON STACK
```

```
 7936  050116  104411                 1$:     RDLIN                   ;;READ AN ASCIZ LINE
 7937  050120  012600                         MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
 7938  050122  010037  050226                 MOV     R0,5$           ;;AND SAVE IT
 7939  050126  005001                         CLR     R1              ;;CLEAR DATA WORD
 7940  050130  005002                         CLR     R2
 7941  050132  112046                 2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
 7942  050134  001420                         BEQ     3$              ;;IF ZERO GET OUT
 7943  050136  122716  000060               CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
 7944  050142  003026                         BGT     4$              ;;IS AN OCTAL DIGIT
 7945  050144  122716  000067               CMPB    #'7,(SP)
 7946  050150  002423                         BLT     4$
 7947  050152  006301                         ASL     R1              ;;*2
 7948  050154  006102                         ROL     R2
 7949  050156  006301                         ASL     R1              ;;*4
 7950  050160  006102                         ROL     R2
 7951  050162  006301                         ASL     R1              ;;*8
 7952  050164  006102                         ROL     R2
 7953  050166  042716  177770               BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
 7954  050172  062601                         ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
 7955  050174  000756                         BR      2$              ;;LOOP
 7956  050176  005726                 3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 7957  050200  010166  000012               MOV     R1,12(SP)       ;;SAVE THE RESULT
 7958  050204  010237  050236               MOV     R2,$HIOCT
 7959  050210  012602                         MOV     (SP)+,R2        ;;POP STACK INTO R2
 7960  050212  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
 7961  050214  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
 7962  050216  000002                         RTI                     ;;RETURN
 7963  050220  005726                 4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
 7964  050222  105010                         CLRB    (R0)            ;;SET A TERMINATOR
 7965  050224  104401                         TYPE                    ;;TYPE UP THRU THE BAD CHAR.
 7966  050226  000000                 5$:     .WORD   0
 7967  050230  104401  001210               TYPE    ,$QUES          ;;"?" "CR" & "LF"
 7968  050234  000730                         BR      1$              ;;TRY AGAIN
 7969  050236  000000                 $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
 7970                                 .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
 7971
 7972                                 ;;******************************************************************
 7973                                 ;*SAVE R0-R5
 7974                                 ;*CALL:
 7975                                 ;*      SAVREG
 7976                                 ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
 7977                                 ;*
 7978                                 ;*TOP---(+16)
 7979                                 ;* +2---(+18)
 7980                                 ;* +4---R5
 7981                                 ;* +6---R4
 7982                                 ;* +8---R3
 7983                                 ;*+10---R2
 7984                                 ;*+12---R1
 7985                                 ;*+14---R0
 7986
 7987  050240                         $SAVREG:
 7988  050240  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7989  050242  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 7990  050244  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 7991  050246  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
```

```
                                        MOV     R4,-(SP)        ;;PUSH R4 ON STACK
                                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
                                        MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
                                        MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
                                        MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
                                        MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
                                        RTI

                                ;*RESTORE R0-R5
                                ;*CALL:
                                ;*      RESREG
                                $RESREG:
                                        MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
                                        MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
                                        MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
                                        MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
                                        MOV     (SP)+,R5        ;;POP STACK INTO R5
                                        MOV     (SP)+,R4        ;;POP STACK INTO R4
                                        MOV     (SP)+,R3        ;;POP STACK INTO R3
                                        MOV     (SP)+,R2        ;;POP STACK INTO R2
                                        MOV     (SP)+,R1        ;;POP STACK INTO R1
                                        MOV     (SP)+,R0        ;;POP STACK INTO R0
                                        RTI

                                .SBTTL  POWER DOWN AND UP ROUTINE

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

                                ;POWER DOWN ROUTINE
                                $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
                                        MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
                                        MOV     #PR7,PWRVEC+2
                                        HALT
                                        BR      .-2     ;HANG UP

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

                                ;POWER UP ROUTINE
                                $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
                                        MOV     #100.,$PWRCT+2
                                1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
                                        BNE     1$
                                        DEC     $PWRCT+2
                                        BNE     1$
                                        MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
                                        MOV     #PR7,PWRVEC+2
                                        MOV     #STACK,SP       ;FORCE STACK
                                        TYPE    ,$POWER         ;TYPE POWER
                                        MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
                                        MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
                                        JMP     @$LPADR ;GO BACK TO LAST TEST

                                $PWRCT: .WORD   0,0             ;TELETYPE TIME OUT
                                $POWER: .ASCIZ  /POWER/
                                        .EVEN
                                .SBTTL  TRAP DECODER
```

```
8048
8049                                    ;;**********************************************************************
8050                                    ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
8051                                    ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
8052                                    ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
8053                                    ;*GO TO THAT ROUTINE.
8054
8055  050464  010046                    $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
8056  050466  016600  000002                   MOV     2(SP),R0        ;;GET TRAP ADDRESS
8057  050472  005740                           TST     -(R0)           ;;BACKUP BY 2
8058  050474  111000                           MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
8059  050476  006300                           ASL     R0              ;;POSITION FOR INDEXING
8060  050500  016000  050520                   MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
8061  050504  000200                           RTS     R0              ;;GO TO ROUTINE
8062
8063
8064                                    ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
8065
8066  050506  011646                    $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
8067  050510  016666  000004  000002            MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
8068  050516  000002                           RTI                     ;;RESTORE THE PSW
8069
8070                                    .SBTTL  TRAP TABLE
8071
8072                                    ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
8073                                    ;*BY THE "TRAP" INSTRUCTION.
8074
8075                                    ;       ROUTINE
8076                                    ;       -------
8077  050520  050506                    $TRPAD: .WORD   $TRAP2
8078  050522  045706                            $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
8079  050524  046214                            $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
8080  050526  046170                            $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
8081  050530  046230                            $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
8082  050532  046416                            $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
8083
8084  050534  047230                            $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
8085
8086  050536  047140                            $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
8087  050540  047502                            $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
8088  050542  047572                            $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
8089  050544  050100                            $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
8090  050546  050240                            $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
8091  050550  050276                            $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
8092  050552  044654                            SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
                                        .SBTTL  DATA TABLE FOR PRINT OUT

050554  001220  003604          DT000:  .WORD   $TESTN,TRAPPC
050560  001220  001116  003500  DT001:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MR3
050566  003440  003526  003466
050574  003530  003470
050600  001220  001116  003500  DT015:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1
050606  003440
050610  001220  001116  003524  DT017:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,PR.BIT,M1.BIT,BITCNT
050616  003464  003614  003616
050624  003622
050626  001220  001116  003500  DT022:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC
050634  003440  003504  003444
050642  003502  003442
050646  001220  001116  003524  DT025:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,BITCNT
050654  003464  003622
050660  001220  001116  003500  DT031:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC,E.MR1,T.MR1
050666  003440  003504  003444
050674  003502  003442  003524
050702  003464
050704  001220  001116  003500  DT035:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.BA,T.BA
050712  003440  003510  003450
050720  003504  003444
050724  003502  003442          .WORD   E.WC,T.WC
050730  001220  001116  003522  DT041:  .WORD   $TESTN,$ERRPC,E.DB,T.DB
050736  003462
050740  001220  001116  003500  DT042:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
050746  003440  003510  003450
050754  001220  001116  003522  DT054:  .WORD   $TESTN,$ERRPC,E.DB,T.DB,WRDCNT
050762  003462  003624
050766  001220  001116  003500  DT055:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,WRDCNT
050774  003440  003510  003450
051002  003624
051004  001220  001116  003500  DT072:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
051012  003440  003510  003450
051020  003514  003454
051024  003504  003444  003502          .WORD   E.BA,T.BA,E.WC,T.WC
051032  003442
051034  001220  001116  003500  DT077:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2
051042  003440  003510  003450
051050  001220  001116  003500  DT150:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,WRDCNT,BITCNT
051056  003440  003624  003622
051064  001220  001116  003500  DT164:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS1,BITCNT
051072  003440  003510  003440
051100  003622
051102  001220  001116  003524  DT170:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT,SECCNT
051110  003464  003612  003614
051116  003616  003620  003622
051124  003626
051126  001220  001116  003524  DT171:  .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
051134  003464
051136  001220  001116  003500  DT175:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
051144  003440  003510  003450
051152  003512  003452  003514
051160  003454
051162  001220  001116  003500  DT211:  .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
```

```
 8149  051170  003440  003510  003450
 8150  051176  003512  003452  003514
 8151  051204  003454
 8152  051206  003540  003550  003552          .WORD   P.CS1,P.CS2,P.DS,P.ER
 8153  051214  003554
```

```
8154                                    .SBTTL  DATA FORMAT FOR PRINT OUT
8155
8156  051216  000001            DF000:  .WORD   1
8157  051220     002      000           .BYTE   2,0
8158  051222  000005            DF001:  .WORD   5               ;ERRORS 1-14
8159  051224     000      000           .BYTE   0,0
8160  051226  052403                    .WORD   DH000A
8161  051230     000      000           .BYTE   0,0
8162  051232  052421                    .WORD   DH000B
8163  051234     002      000           .BYTE   2,0
8164  051236  052465                    .WORD   DH001A
8165  051240     000      000           .BYTE   0,0
8166  051242  052544                    .WORD   DH001B
8167  051244     006      000           .BYTE   6,0
8168  051246  000005            DF015:  .WORD   5               ;ERRORS 15-16
8169  051250     000      000           .BYTE   0,0
8170  051252  052403                    .WORD   DH000A
8171  051254     000      000           .BYTE   0,0
8172  051256  052421                    .WORD   DH000B
8173  051260     002      000           .BYTE   2,0
8174  051262  052623                    .WORD   DH015A
8175  051264     000      000           .BYTE   0,0
8176  051266  052642                    .WORD   DH015B
8177  051270     002      000           .BYTE   2,0
8178  051272  000005            DF017:  .WORD   5               ;ERROR 17-21
8179  051274     000      000           .BYTE   0,0
8180  051276  052403                    .WORD   DH000A
8181  051300     000      000           .BYTE   0,0
8182  051302  052421                    .WORD   DH000B
8183  051304     002      000           .BYTE   2,0
8184  051306  052660                    .WORD   DH017A
8185  051310     000      000           .BYTE   0,0
8186  051312  052724                    .WORD   DH017B
8187  051314     005      000           .BYTE   5,0
8188  051316  000005            DF022:  .WORD   5               ;ERROR 22-24
8189  051320     000      000           .BYTE   0,0
8190  051322  052403                    .WORD   DH000A
8191  051324     000      000           .BYTE   0,0
8192  051326  052421                    .WORD   DH000B
8193  051330     002      000           .BYTE   2,0
8194  051332  052772                    .WORD   DH022A
8195  051334     000      000           .BYTE   0,0
8196  051336  053051                    .WORD   DH022B
8197  051340     006      000           .BYTE   6,0
8198  051342  000005            DF025:  .WORD   5               ;ERROR 25
8199  051344     000      000           .BYTE   0,0
8200  051346  052403                    .WORD   DH000A
8201  051350     000      000           .BYTE   0,0
8202  051352  052421                    .WORD   DH000B
8203  051354     002      000           .BYTE   2,0
8204  051356  053126                    .WORD   DH025A
8205  051360     000      000           .BYTE   0,0
8206  051362  053152                    .WORD   DH025B
8207  051364     003      000           .BYTE   3,0
8208  051366  000005            DF031:  .WORD   5               ;ERROR 31-34
8209  051370     000      000           .BYTE   0,0
```

```
 8210  051372  052403                        .WORD   DH000A
 8211  051374     000      000               .BYTE   0,0
 8212  051376  052421                        .WORD   DH000B
 8213  051400     002      000               .BYTE   2,0
 8214  051402  053200                        .WORD   DH031A
 8215  051404     000      000               .BYTE   0,0
 8216  051406  053277                        .WORD   DH031B
 8217  051410     010      000               .BYTE   8.,0
 8218  051412  000005                DF035:  .WORD   5               ;ERRORS 35-40
 8219  051414     000      000               .BYTE   0,0
 8220  051416  052403                        .WORD   DH000A
 8221  051420     000      000               .BYTE   0,0
 8222  051422  052421                        .WORD   DH000B
 8223  051424     002      000               .BYTE   2,0
 8224  051426  053375                        .WORD   DH035A
 8225  051430     000      000               .BYTE   0,0
 8226  051432  053474                        .WORD   DH035B
 8227  051434     010      000               .BYTE   8.,0
 8228  051436  000005                DF041:  .WORD   5               ;ERROR 41
 8229  051440     000      000               .BYTE   0,0
 8230  051442  052403                        .WORD   DH000A
 8231  051444     000      000               .BYTE   0,0
 8232  051446  052421                        .WORD   DH000B
 8233  051450     002      000               .BYTE   2,0
 8234  051452  053571                        .WORD   DH041A
 8235  051454     000      000               .BYTE   0,0
 8236  051456  053606                        .WORD   DH041B
 8237  051460     002      000               .BYTE   2,0
 8238  051462  000005                DF042:  .WORD   5               ;ERRORS 42-43
 8239  051464     000      000               .BYTE   0,0
 8240  051466  052403                        .WORD   DH000A
 8241  051470     000      000               .BYTE   0,0
 8242  051472  052421                        .WORD   DH000B
 8243  051474     002      000               .BYTE   2,0
 8244  051476  053623                        .WORD   DH042A
 8245  051500     000      000               .BYTE   0,0
 8246  051502  053662                        .WORD   DH042B
 8247  051504     004      000               .BYTE   4,0
 8248  051506  000005                DF054:  .WORD   5               ;ERROR 54
 8249  051510     000      000               .BYTE   0,0
 8250  051512  052403                        .WORD   DH000A
 8251  051514     000      000               .BYTE   0,0
 8252  051516  052421                        .WORD   DH000B
 8253  051520     002      000               .BYTE   2,0
 8254  051522  053720                        .WORD   DH054A
 8255  051524     000      000               .BYTE   0,0
 8256  051526  053745                        .WORD   DH054B
 8257  051530     003      000               .BYTE   3,0
 8258  051532  000005                DF055:  .WORD   5               ;ERROR 55
 8259  051534     000      000               .BYTE   0,0
 8260  051536  052403                        .WORD   DH000A
 8261  051540     000      000               .BYTE   0,0
 8262  051542  052421                        .WORD   DH000B
 8263  051544     002      000               .BYTE   2,0
 8264  051546  053773                        .WORD   DH055A
 8265  051550     000      000               .BYTE   0,0
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```
 8266  051552  054040                      .WORD   DH055B
 8267  051554     005      000             .BYTE   5,0
 8268  051556  000007              DF072:  .WORD   7
 8269  051560     000      000             .BYTE   0,0
 8270  051562  052403                      .WORD   DH000A
 8271  051564     000      000             .BYTE   0,0
 8272  051566  052421                      .WORD   DH000B
 8273  051570     002      000             .BYTE   2,0
 8274  051572  054106                      .WORD   DH072A
 8275  051574     000      000             .BYTE   0,0
 8276  051576  054145                      .WORD   DH072B
 8277  051600     004      000             .BYTE   4,0
 8278  051602  054203                      .WORD   DH072C
 8279  051604     000      000             .BYTE   0,0
 8280  051606  054262                      .WORD   DH072D
 8281  051610     006      000             .BYTE   6,0
 8282  051612  000007              DF077:  .WORD   7
 8283  051614     000      000             .BYTE   0,0
 8284  051616  052403                      .WORD   DH000A
 8285  051620     000      000             .BYTE   0,0
 8286  051622  052421                      .WORD   DH000B
 8287  051624     002      000             .BYTE   2,0
 8288  051626  054106                      .WORD   DH072A
 8289  051630     000      000             .BYTE   0,0
 8290  051632  054145                      .WORD   DH072B
 8291  051634     004      000             .BYTE   4,0
 8292  051636  000005              DF150:  .WORD   5               ;ERROR 150
 8293  051640     000      000             .BYTE   0,0
 8294  051642  052403                      .WORD   DH000A
 8295  051644     000      000             .BYTE   0,0
 8296  051646  052421                      .WORD   DH000B
 8297  051650     002      000             .BYTE   2,0
 8298  051652  054337                      .WORD   DH150A
 8299  051654     000      000             .BYTE   0,0
 8300  051656  054373                      .WORD   DH150B
 8301  051660     004      000             .BYTE   4,0
 8302  051662  000005              DF164:  .WORD   5               ;ERROR 164
 8303  051664     000      000             .BYTE   0,0
 8304  051666  052403                      .WORD   DH000A
 8305  051670     000      000             .BYTE   0,0
 8306  051672  052421                      .WORD   DH000B
 8307  051674     002      000             .BYTE   2,0
 8308  051676  054431                      .WORD   DH164A
 8309  051700     000      000             .BYTE   0,0
 8310  051702  054475                      .WORD   DH164B
 8311  051704     005      000             .BYTE   5,0
 8312  051706  000005              DF170:  .WORD   5       ;ERROR 170
 8313  051710     000      000             .BYTE   0,0
 8314  051712  052403                      .WORD   DH000A
 8315  051714     000      000             .BYTE   0,0
 8316  051716  052421                      .WORD   DH000B
 8317  051720     002      000             .BYTE   2,0
 8318  051722  054543                      .WORD   DH170A
 8319  051724     000      000             .BYTE   0,0
 8320  051726  054642                      .WORD   DH170B
 8321  051730     010      000             .BYTE   8.,0
```

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 8322  051732  000005                DF171:  .WORD   5               ;ERRORS 171-174
 8323  051734     000      000               .BYTE   0,0
 8324  051736  052403                        .WORD   DH000A
 8325  051740     000      000               .BYTE   0,0
 8326  051742  052421                        .WORD   DH000B
 8327  051744     002      000               .BYTE   2,0
 8328  051746  054740                        .WORD   DH171A
 8329  051750     000      000               .BYTE   0,0
 8330  051752  054757                        .WORD   DH171B
 8331  051754     002      000               .BYTE   2,0
 8332  051756  000005                DF175:  .WORD   5               ;ERRORS 175-210
 8333  051760     000      000               .BYTE   0,0
 8334  051762  052403                        .WORD   DH000A
 8335  051764     000      000               .BYTE   0,0
 8336  051766  052421                        .WORD   DH000B
 8337  051770     002      000               .BYTE   2,0
 8338  051772  054775                        .WORD   DH175A
 8339  051774     000      000               .BYTE   0,0
 8340  051776  055074                        .WORD   DH175B
 8341  052000     010      000               .BYTE   8.,0
 8342  052002  000007                DF211:  .WORD   7               ;ERRORS 211-214
 8343  052004     000      000               .BYTE   0,0
 8344  052006  052403                        .WORD   DH000A
 8345  052010     000      000               .BYTE   0,0
 8346  052012  052421                        .WORD   DH000B
 8347  052014     002      000               .BYTE   2,0
 8348  052016  054775                        .WORD   DH175A
 8349  052020     000      000               .BYTE   0,0
 8350  052022  055074                        .WORD   DH175B
 8351  052024     010      000               .BYTE   8.,0
 8352  052026  055171                        .WORD   DH211A
 8353  052030     000      000               .BYTE   0,0
 8354  052032  055217                        .WORD   DH211B
 8355  052034     004      000               .BYTE   4,0
```

```
                                        .SBTTL  ASCII MESSAGES

052036  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 VECTOR ADDRESS ( /
052044  020061  042526  052103
052052  051117  040440  042104
052060  042522  051523  024040
052066  000040
052070  024440  036440  000040  OPR002: .ASCIZ  / ) = /
052076  045522  030466  020061  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
052104  042526  052103  051117
052112  040440  042104  042522
052120  051523  024040  000040
052126  045522  030466  020061  OPR004: .ASCIZ  /RK611 PRIORITY ( /
052134  051120  047511  044522
052142  054524  024040  000040
052150  005015  047062  020104  OPR006: .ASCIZ  <15><12>/2ND PASS RUN TIME IS APPROX 13 MINUTES/<15><12>
052156  040520  051523  051040
052164  047125  052040  046511
052172  020105  051511  040440
052200  050120  047522  020130
052206  031461  046440  047111
052214  052125  051505  005015
052222     000
052223     015  025012  025052  OPR007: .ASCIZ  <15><12>/*****   PROGRAM HALTED   ******/<15><12>
052230  025052  020040  050040
052236  047522  051107  046501
052244  044040  046101  042524
052252  020104  020040  025052
052260  025052  025052  005015
052266     000
052267     040  000040          SPACE2: .ASCIZ  /  /
052272  005015  051120  043517  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
052300  040522  020115  041101
052306  051117  042524  020104
052314  042502  040503  051525
052322  020105  051105  047522
052330  020122  044124  042522
052336  044123  046117  020104
052344  054105  042503  042105
052352  042105  005015     000
052357     015  052012  051505  TSTBY1: .ASCIZ  <15><12>/TEST /
052364  020124     000
052367     040  054502  040520  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
052374  051523  042105  005015
052402     000
```

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 8401                                   .SBTTL  DATA HEADERS
 8402
 8403  052403     124  051505  020124  DH000A: .ASCIZ  /TEST    ERROR/
 8404  052410  020040  042440  051122
 8405  052416  051117     000
 8406  052421     116  046525  020040  DH000B: .ASCIZ  /NUM     PC/
 8407  052426  020040  050040  000103
 8408  052434  042524  052123  020040  DH000C: .ASCII  /TEST    TRAP/<15><12>
 8409  052442  020040  051124  050101
 8410  052450  005015
 8411  052452  052516  020115  020040          .ASCIZ  /NUM     PC/
 8412  052460  020040  041520     000
 8413  052465     105  050130  041505  DH001A: .ASCIZ  /EXPECT  ACUTAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8414  052472  020124  040440  052503
 8415  052500  040524  020114  042440
 8416  052506  050130  041505  020124
 8417  052514  040440  052103  040525
 8418  052522  020114  042440  050130
 8419  052530  041505  020124  040440
 8420  052536  052103  040525  000114
 8421  052544  045522  051503  020061  DH001B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
 8422  052552  020040  045522  051503
 8423  052560  020061  020040  042515
 8424  052566  051523  040440  020040
 8425  052574  042515  051523  040440
 8426  052602  020040  042515  051523
 8427  052610  041040  020040  042515
 8428  052616  051523  041040     000
 8429  052623     105  050130  041505  DH015A: .ASCIZ  /EXPECT  ACTUAL/
 8430  052630  020124  040440  052103
 8431  052636  040525  000114
 8432  052642  045522  051503  020061  DH015B: .ASCIZ  /RKCS1   RKCS1/
 8433  052650  020040  045522  051503
 8434  052656  000061
 8435  052660  054105  042520  052103  DH017A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PREVOUS BIT/
 8436  052666  020040  041501  052524
 8437  052674  046101  020040  051120
 8438  052702  051505  047105  020124
 8439  052710  051120  053105  052517
 8440  052716  020123  044502  000124
 8441  052724  045522  051115  020061  DH017B: .ASCIZ  /RKMR1   RKMR1   BIT     BIT     COUNT/
 8442  052732  020040  045522  051115
 8443  052740  020061  020040  044502
 8444  052746  020124  020040  020040
 8445  052754  044502  020124  020040
 8446  052762  020040  047503  047125
 8447  052770  000124
 8448  052772  054105  042520  052103  DH022A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8449  053000  020040  041501  052524
 8450  053006  046101  020040  054105
 8451  053014  042520  052103  020040
 8452  053022  041501  052524  046101
 8453  053030  020040  054105  042520
 8454  053036  052103  020040  041501
 8455  053044  052524  046101     000
 8456  053051     122  041513  030523  DH022B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC/
```

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8457  053056  020040  051040  041513
8458  053064  030523  020040  051040
8459  053072  041113  020101  020040
8460  053100  051040  041113  020101
8461  053106  020040  051040  053513
8462  053114  020103  020040  051040
8463  053122  053513  000103
8464  053126  054105  042520  052103  DH025A: .ASCIZ  /EXPECT  ACTUAL  BIT/
8465  053134  020040  041501  052524
8466  053142  046101  020040  044502
8467  053150  000124
8468  053152  045522  051115  020061  D4025B: .ASCIZ  /RKMR1   RKMR1   COUNT/
8469  053160  020040  045522  051115
8470  053166  020061  020040  047503
8471  053174  047125  000124
8472  053200  054105  042520  052103  DH031A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8473  053206  020040  041501  052524
8474  053214  046101  020040  054105
8475  053222  042520  052103  020040
8476  053230  041501  052524  046101
8477  053236  020040  054105  042520
8478  053244  052103  020040  041501
8479  053252  052524  046101  020040
8480  053260  054105  042520  052103
8481  053266  020040  041501  052524
8482  053274  046101     000
8483  053277     122  041513  030523  DH031B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC    RKMR1   RKMR1/
8484  053304  020040  051040  041513
8485  053312  030523  020040  051040
8486  053320  041113  020101  020040
8487  053326  051040  041113  020101
8488  053334  020040  051040  053513
8489  053342  020103  020040  051040
8490  053350  053513  020103  020040
8491  053356  051040  046513  030522
8492  053364  020040  051040  046513
8493  053372  030522     000
8494  053375     105  050130  041505  DH035A: .ASCII  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
8495  053402  020124  040440  052103
8496  053410  040525  020114  042440
8497  053416  050130  041505  020124
8498  053424  040440  052103  040525
8499  053432  020114  042440  050130
8500  053440  041505  020124  040440
8501  053446  052103  040525     114
8502  053453     040  042440  050130          .ASCIZ  /  EXPECT  ACTUAL/
8503  053460  041505  020124  040440
8504  053466  052103  040525  000114
8505  053474  045522  051503  020061  DH035B: .ASCII  /RKCS1   RKCS1   RKCS2   RKCS2   RKBA    RKBA/
8506  053502  020040  045522  051503
8507  053510  020061  020040  045522
8508  053516  051503  020062  020040
8509  053524  045522  051503  020062
8510  053532  020040  045522  040502
8511  053540  020040  020040  045522
8512  053546  040502
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 8513  053550  020040  020040  045522          .ASCIZ  /    RKWC    RKWC/
 8514  053556  041527  020040  020040
 8515  053564  045522  041527     000
 8516  053571     105  050130  041505  DH041A: .ASCIZ  /EXPECT  WORD/
 8517  053576  020124  053440  051117
 8518  053604  000104
 8519  053606  047527  042122  020040  DH041B: .ASCIZ  /WORD    READ/
 8520  053614  020040  042522  042101
 8521  053622     000
 8522  053623     105  050130  041505  DH042A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 8523  053630  020124  040440  052103
 8524  053636  040525  020114  042440
 8525  053644  050130  041505  020124
 8526  053652  040440  052103  040525
 8527  053660  000114
 8528  053662  045522  051503  020061  DH042B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
 8529  053670  020040  045522  051503
 8530  053676  020061  020040  045522
 8531  053704  051503  020062  020040
 8532  053712  045522  051503  000062
 8533  053720  054105  042520  052103  DH054A: .ASCIZ  /EXPECT  WORD    WORD/
 8534  053726  020040  047527  042122
 8535  053734  020040  020040  047527
 8536  053742  042122     000
 8537  053745     127  051117  020104  DH054B: .ASCIZ  /WORD    READ    COUNT/
 8538  053752  020040  051040  040505
 8539  053760  020104  020040  041440
 8540  053766  052517  052116     000
 8541  053773     105  050130  041505  DH055A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  WORD/
 8542  054000  020124  040440  052103
 8543  054006  040525  020114  042440
 8544  054014  050130  041505  020124
 8545  054022  040440  052103  040525
 8546  054030  020114  053440  051117
 8547  054036  000104
 8548  054040  045522  051503  020061  DH055B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
 8549  054046  020040  045522  051503
 8550  054054  020061  020040  045522
 8551  054062  051503  020062  020040
 8552  054070  045522  051503  020062
 8553  054076  020040  047503  047125
 8554  054104  000124
 8555  054106  054105  042520  052103  DH072A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
 8556  054114  020040  041501  052524
 8557  054122  046101  020040  054105
 8558  054130  042520  052103  020040
 8559  054136  041501  052524  046101
 8560  054144     000
 8561  054145     122  041513  030523  DH072B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
 8562  054152  020040  051040  041513
 8563  054160  030523  020040  051040
 8564  054166  041513  031123  020040
 8565  054174  051040  041513  031123
 8566  054202     000
 8567  054203     105  050130  041505  DH072C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8568  054210  020124  040440  052103
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 8569  054216  040525  020114  042440
 8570  054224  050130  041505  020124
 8571  054232  040440  052103  040525
 8572  054240  020114  042440  050130
 8573  054246  041505  020124  040440
 8574  054254  052103  040525  000114
 8575  054262  045522  051105  020040  DH072D: .ASCIZ  /RKER    RKER    RKBA    RKBA    RKWC    RKWC/
 8576  054270  020040  045522  051105
 8577  054276  020040  020040  045522
 8578  054304  040502  020040  020040
 8579  054312  045522  040502  020040
 8580  054320  020040  045522  041527
 8581  054326  020040  020040  045522
 8582  054334  041527     000
 8583  054337     105  050130  041505  DH150A: .ASCIZ  /EXPECT  ACTUAL  WORD    BIT/
 8584  054344  020124  040440  052103
 8585  054352  040525  020114  053440
 8586  054360  051117  020104  020040
 8587  054366  041040  052111     000
 8588  054373     122  041513  030523  DH150B: .ASCIZ  /RKCS1   RKCS1   COUNT   COUNT/
 8589  054400  020040  051040  041513
 8590  054406  030523  020040  041440
 8591  054414  052517  052116  020040
 8592  054422  041440  052517  052116
 8593  054430     000
 8594  054431     105  050130  041505  DH164A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  BIT/
 8595  054436  020124  040440  052103
 8596  054444  040525  020114  042440
 8597  054452  050130  041505  020124
 8598  054460  040440  052103  040525
 8599  054466  020114  041040  052111
 8600  054474     000
 8601  054475     122  041513  030523  DH164B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
 8602  054502  020040  051040  041513
 8603  054510  030523  020040  051040
 8604  054516  041513  031123  020040
 8605  054524  051040  041513  031123
 8606  054532  020040  041440  052517
 8607  054540  052116     000
 8608  054543     105  050130  041505  DH170A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT     SECTOR/
 8609  054550  020124  040440  052103
 8610  054556  040525  020114  050040
 8611  054564  042522  042523  052116
 8612  054572  050040  042522  042523
 8613  054600  052116  050040  042522
 8614  054606  042523  052116  050040
 8615  054614  042522  042523  052116
 8616  054622  041040  052111  020040
 8617  054630  020040  051440  041505
 8618  054636  047524  000122
 8619  054642  045522  051115  020061  DH170B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT   COUNT/
 8620  054650  020040  045522  051115
 8621  054656  020061  020040  044502
 8622  054664  025524  020061  020040
 8623  054672  044502  020124  020040
 8624  054700  020040  044502  026524
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 8625  054706  020061  020040  044502
 8626  054714  026524  020062  020040
 8627  054722  047503  047125  020124
 8628  054730  020040  047503  047125
 8629  054736  000124
 8630  054740  054105  042520  052103  DH171A: .ASCIZ  /EXPECT  ACTUAL/
 8631  054746  020040  041501  052524
 8632  054754  046101     000
 8633  054757     122  046513  030522  DH171B: .ASCIZ  /RKMR1   RKMR1/
 8634  054764  020040  051040  046513
 8635  054772  030522     000
 8636  054775     105  050130  041505  D4175A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8637  055002  020124  040440  052103
 8638  055010  040525  020114  042440
 8639  055016  050130  041505  020124
 8640  055024  040440  052103  040525
 8641  055032  020114  042440  050130
 8642  055040  041505  020124  040440
 8643  055046  052103  040525  020114
 8644  055054  042440  050130  041505
 8645  055062  020124  040440  052103
 8646  055070  040525  000114
 8647  055074  045522  051503  020061  DH175B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   RKDS    RKDS    RKER    RKER/
 8648  055102  020040  045522  051503
 8649  055110  020061  020040  045522
 8650  055116  051503  020062  020040
 8651  055124  045522  051503  020062
 8652  055132  020040  045522  051504
 8653  055140  020040  020040  045522
 8654  055146  051504  020040  020040
 8655  055154  045522  051105  020040
 8656  055162  020040  045522  051105
 8657  055170     000
 8658  055171     120  042522  044526  DH211A: .ASCIZ  /PREVIOUS REG CONTENTS/
 8659  055176  052517  020123  042522
 8660  055204  020107  047503  052116
 8661  055212  047105  051524     000
 8662  055217     122  041513  030523  DH211B: .ASCIZ  /RKCS1   RKCS2   RKDS    RKER/
 8663  055224  020040  051040  041513
 8664  055232  031123  020040  051040
 8665  055240  042113  020123  020040
 8666  055246  051040  042513  000122
```

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 8667                                   .SBTTL  ERROR MESSAGES
 8668
 8669  055254  047125  054105  042520  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
 8670  055262  052103  042105  046440
 8671  055270  046505  051117  020131
 8672  055276  040520  044522  054524
 8673  055304  042440  040516  046102
 8674  055312  020105  051124  050101
 8675  055320     000
 8676  055321     101  052124  046505  EM200:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER/
 8677  055326  052120  047111  020107
 8678  055334  047524  041440  042510
 8679  055342  045503  051440  042505
 8680  055350  020113  042515  051523
 8681  055356  043501  020105  051106
 8682  055364  046517  051040  040505
 8683  055372  020104  042510  042101
 8684  055400  051105     000
 8685  055403     101  052124  046505  EM201:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER/
 8686  055410  052120  047111  020107
 8687  055416  047524  041440  042510
 8688  055424  045503  051440  042505
 8689  055432  020113  042515  051523
 8690  055440  043501  020105  051106
 8691  055446  046517  053440  044522
 8692  055454  042524  044040  040505
 8693  055462  042504  000122
 8694  055466  052101  042524  050115  EM202:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM READ HEADER/
 8695  055474  044524  043516  052040
 8696  055502  020117  044103  041505
 8697  055510  020113  046103  040505
 8698  055516  020122  051104  053111
 8699  055524  020105  042515  051523
 8700  055532  043501  020105  051106
 8701  055540  046517  051040  040505
 8702  055546  020104  042510  042101
 8703  055554  051105     000
 8704  055557     101  052124  046505  EM203:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM WRITE HEADER/
 8705  055564  052120  047111  020107
 8706  055572  047524  041440  042510
 8707  055600  045503  041440  042514
 8708  055606  051101  042040  044522
 8709  055614  042526  046440  051505
 8710  055622  040523  042507  043040
 8711  055630  047522  020115  051127
 8712  055636  052111  020105  042510
 8713  055644  042101  051105     000
 8714  055651     101  052124  0465    EM204:  .ASCIZ  /ATTEMPTING A READ HEADER TO CHECK SECTOR PULSF DETECT/
 8715  055656  052120  047111  02010/
 8716  055664  020101  042522  042101
 8717  055672  044040  040505  042504
 8718  055700  020122  047524  041440
 8719  055706  042510  045503  051440
 8720  055714  041505  047524  020122
 8721  055722  052520  051514  020105
 8722  055730  042504  042524  052103
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 8723  055736     000
 8724  055737     101  052124  046505  EM205:  .ASCIZ  /ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT/
 8725  055744  052120  047111  020107
 8726  055752  020101  051127  052111
 8727  055760  020105  042510  042101
 8728  055766  051105  052040  020117
 8729  055774  044103  041505  020113
 8730  056002  047111  042504  020130
 8731  056010  052520  051514  020105
 8732  056016  042504  042524  052103
 8733  056024     000
 8734  056025     101  052124  046505  EM206:  .ASCIZ  /ATTEMPTING AN NPR READ OF ONE WORD/
 8735  056032  052120  047111  020107
 8736  056040  047101  047040  051120
 8737  056046  051040  040505  020104
 8738  056054  043117  047440  042516
 8739  056062  053440  051117  000104
 8740  056070  052101  042524  050115  EM207:  .ASCIZ  /ATTEMPTING AN NPR READ/
 8741  056076  044524  043516  040440
 8742  056104  020116  050116  020122
 8743  056112  042522  042101     000
 8744  056117     101  052124  046505  EM208:  .ASCIZ  /ATTEMPTING NPR READ CHECKING ZERO DETECT/
 8745  056124  052120  047111  020107
 8746  056132  050116  020122  042522
 8747  056140  042101  041440  042510
 8748  056146  045503  047111  020107
 8749  056154  042532  047522  042040
 8750  056162  052105  041505  000124
 8751  056170  052101  042524  050115  EM209:  .ASCIZ  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 8752  056176  044524  043516  047040
 8753  056204  051120  051040  040505
 8754  056212  020104  044527  044124
 8755  056220  041040  051525  040440
 8756  056226  042104  042522  051523
 8757  056234  044440  041516  042522
 8758  056242  042515  052116  044440
 8759  056250  044116  041111  052111
 8760  056256     000
 8761  056257     101  052124  046505  EM210:  .ASCII  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 8762  056264  052120  047111  020107
 8763  056272  050116  020122  042522
 8764  056300  042101  053440  052111
 8765  056306  020110  052502  020123
 8766  056314  042101  051104  051505
 8767  056322  020123  047111  051103
 8768  056330  046505  047105  020124
 8769  056336  047111  044510  044502
 8770  056344     124
 8771  056345     040  044103  041505          .ASCIZ  / CHECKING ZERO DETECT/
 8772  056352  044513  043516  055040
 8773  056360  051105  020117  042504
 8774  056366  042524  052103     000
 8775  056373     101  052124  046505  EM211:  .ASCIZ  /ATTEMPTING TO FORCE NON-EXISTENT MEMORY/
 8776  056400  052120  047111  020107
 8777  056406  047524  043040  051117
 8778  056414  042503  047040  047117
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 8779  056422  042455  044530  052123
 8780  056430  047105  020124  042515
 8781  056436  047515  054522     000
 8782  056443     101  052124  046505  EM212:  .ASCIZ  /ATTEMPTING TO CLEAR NON-EXISTENT MEMORY/
 8783  056450  052120  047111  020107
 8784  056456  047524  041440  042514
 8785  056464  051101  047040  047117
 8786  056472  042455  044530  052123
 8787  056500  047105  020124  042515
 8788  056506  047515  054522     000
 8789  056513     124  051505  044524  EM213:  .ASCIZ  /TESTING EXTENDED MEMORY ADDRESSING BITS/
 8790  056520  043516  042440  052130
 8791  056526  047105  042504  020104
 8792  056534  042515  047515  054522
 8793  056542  040440  042104  042522
 8794  056550  051523  047111  020107
 8795  056556  044502  051524     000
 8796  056563     101  052124  046505  EM214:  .ASCIZ  /ATTEMPTING TO FORCE UNIBUS PARITY ERROR/
 8797  056570  052120  047111  020107
 8798  056576  047524  043040  051117
 8799  056604  042503  052440  044516
 8800  056612  052502  020123  040520
 8801  056620  044522  054524  042440
 8802  056626  051122  051117     000
 8803  056633     101  052124  046505  EM215:  .ASCIZ  /ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY/
 8804  056640  052120  047111  020107
 8805  056646  050116  020122  042522
 8806  056654  042101  047440  020106
 8807  056662  047514  040503  044524
 8808  056670  047117  050040  044522
 8809  056676  051117  052040  020117
 8810  056704  040502  020104  040520
 8811  056712  044522  054524     000
 8812  056717     101  052124  046505  EM216:  .ASCIZ  /ATTEMPTING TO CLEAR UNIBUS PARITY ERROR/
 8813  056724  052120  047111  020107
 8814  056732  047524  041440  042514
 8815  056740  051101  052440  044516
 8816  056746  052502  020123  040520
 8817  056754  044522  054524  042440
 8818  056762  051122  051117     000
 8819  056767     101  052124  046505  EM217:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ/
 8820  056774  052120  047111  020107
 8821  057002  034061  041040  052111
 8822  057010  047040  051120  051040
 8823  057016  040505  000104
 8824  057022  052101  042524  050115  EM218:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT/
 8825  057030  044524  043516  030440
 8826  057036  020070  044502  020124
 8827  057044  050116  020122  042522
 8828  057052  042101  041440  042510
 8829  057060  045503  047111  020107
 8830  057066  042532  047522  042040
 8831  057074  052105  041505  000124
 8832  057102  052101  042524  050115  EM219:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
 8833  057110  044524  043516  030440
 8834  057116  020070  044502  020124
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 8835  057124  050116  020122  042522
 8836  057132  042101  053440  052111
 8837  057140  020110  044502  020124
 8838  057146  033061  024040  040520
 8839  057154  020051  042523  000124
 8840  057162  052101  042524  050115  EM220:  .ASCII  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
 8841  057170  044524  043516  030440
 8842  057176  020070  044502  020124
 8843  057204  050116  020122  042522
 8844  057212  042101  053440  052111
 8845  057220  020110  044502  020124
 8846  057226  033061  024040  040520
 8847  057234  020051  042523     124
 8848  057241     101  052124  046505  EM221:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER/
 8849  057246  052120  047111  020107
 8850  057254  044523  052515  040514
 8851  057262  044524  047117  047440
 8852  057270  020106  040504  040524
 8853  057276  044440  020116  042522
 8854  057304  042101  044040  040505
 8855  057312  042504  000122
 8856  057316  052101  042524  050115  EM222:  .ASCIZ  /ATTEMPTING READ HEADER IN MAINTANENCE MODE/
 8857  057324  044524  043516  051040
 8858  057332  040505  020104  042510
 8859  057340  042101  051105  044440
 8860  057346  020116  040515  047111
 8861  057354  040524  042516  041516
 8862  057362  020105  047515  042504
 8863  057370     000
 8864  057371     101  052124  046505  EM223:  .ASCIZ  /ATTEMPTING DATA BUFFER READ AFTER READ HEADER/
 8865  057376  052120  047111  020107
 8866  057404  040504  040524  041040
 8867  057412  043125  042506  020122
 8868  057420  042522  042101  040440
 8869  057426  052106  051105  051040
 8870  057434  040505  020104  042510
 8871  057442  042101  051105     000
 8872  057447     101  052124  046505  EM224:  .ASCIZ  /ATTEMPTING SIMULATION OF DATA IN READ HEADER (18 BIT FORMAT)/
 8873  057454  052120  047111  020107
 8874  057462  044523  052515  040514
 8875  057470  044524  047117  047440
 8876  057476  020106  040504  040524
 8877  057504  044440  020116  042522
 8878  057512  042101  044040  040505
 8879  057520  042504  020122  030450
 8880  057526  020070  044502  020124
 8881  057534  047506  046522  052101
 8882  057542  000051
 8883  057544  052101  042524  050115  EM225:  .ASCIZ  /ATTEMPTING READ HEADER (18 BIT FORMAT) IN MAINT MODE/
 8884  057552  044524  043516  051040
 8885  057560  040505  020104  042510
 8886  057566  042101  051105  024040
 8887  057574  034061  041040  052111
 8888  057602  043040  051117  040515
 8889  057610  024524  044440  020116
 8890  057616  040515  047111  020124
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 8891  057624  047515  042504     000
 8892  057631     101  052124  046505  EM226:  .ASCII  /ATTEMPTING DATA BUFFER READ AFTER/<12><15>
 8893  057636  052120  047111  020107
 8894  057644  040504  040524  041040
 8895  057652  043125  042506  020122
 8896  057660  042522  042101  040440
 8897  057666  052106  051105  006412
 8898  057674  042522  042101  044040          .ASCIZ  /READ HEADER IN 18 BIT FORMAT/
 8899  057702  040505  042504  020122
 8900  057710  047111  030440  020070
 8901  057716  044502  020124  047506
 8902  057724  046522  052101     000
 8903  057731     101  052124  046505  EM227:  .ASCII  /ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER/<15><12>
 8904  057736  052120  047111  020107
 8905  057744  047524  041440  042510
 8906  057752  045503  051440  047131
 8907  057760  044103  042040  052105
 8908  057766  041505  020124  047117
 8909  057774  051040  040505  020104
 8910  060002  042510  042101  051105
 8911  060010  005015
 8912  060012  044103  041505  044513          .ASCIZ  /CHECKING ZERO DETECT/
 8913  060020  043516  055040  051105
 8914  060026  020117  042504  042524
 8915  060034  052103     000
 8916  060037     101  052124  046505  EM230:  .ASCII  /ATTEMPTING TO CHECK WRITING OF ZEROES BETWEEN INDEX/<15><12>
 8917  060044  052120  047111  020107
 8918  060052  047524  041440  042510
 8919  060060  045503  053440  044522
 8920  060066  044524  043516  047440
 8921  060074  020106  042532  047522
 8922  060102  051505  041040  052105
 8923  060110  042527  047105  044440
 8924  060116  042116  054105  005015
 8925  060124  047101  020104  042523          .ASCIZ  /AND SECTOR PULSE/
 8926  060132  052103  051117  050040
 8927  060140  046125  042523     000
 8928  060145     101  052124  046505  EM231:  .ASCII  /ATTEMPTING TO RESET WRITE GATE BY SETTING/<15><12>
 8929  060152  052120  047111  020107
 8930  060160  047524  051040  051505
 8931  060166  052105  053440  044522
 8932  060174  042524  043440  052101
 8933  060202  020105  054502  051440
 8934  060210  052105  044524  043516
 8935  060216  005015
 8936  060220  042523  052103  051117          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 8937  060226  050040  046125  042523
 8938  060234  044440  020116  020101
 8939  060242  051127  052111  020105
 8940  060250  042510  042101  051105
 8941  060256  041440  046517  040515
 8942  060264  042116     000
 8943  060267     101  052124  046505  EM232:  .ASCII  /ATTEMPTING TO SET WRITE GATE BY RESETTING/<15><12>
 8944  060274  052120  047111  020107
 8945  060302  047524  051440  052105
 8946  060310  053440  044522  042524
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 8947  060316  043440  052101  020105
 8948  060324  054502  051040  051505
 8949  060332  052105  044524  043516
 8950  060340  005015
 8951  060342  042523  052103  051117          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 8952  060350  050040  046125  042523
 8953  060356  044440  020116  020101
 8954  060364  051127  052111  020105
 8955  060372  042510  042101  051105
 8956  060400  041440  046517  040515
 8957  060406  042116     000
 8958  060411     101  052124  046505  EM233:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH OF HEADER/
 8959  060416  052120  047111  020107
 8960  060424  047524  053440  044522
 8961  060432  042524  051440  047131
 8962  060440  044103  047440  020106
 8963  060446  042510  042101  051105
 8964  060454     000
 8965  060455     101  052124  046505  EM234:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA/
 8966  060462  052120  047111  020107
 8967  060470  047524  053440  044522
 8968  060476  042524  044040  040505
 8969  060504  042504  020122  040504
 8970  060512  040524     000
 8971  060515     101  052124  046505  EM235:  .ASCII  /ATTEMPTING TO RESET WRITE GATE WITH SECOND/<15><12>
 8972  060522  052120  047111  020107
 8973  060530  047524  051040  051505
 8974  060536  052105  053440  044522
 8975  060544  042524  043440  052101
 8976  060552  020105  044527  044124
 8977  060560  051440  041505  047117
 8978  060566  006504     012
 8979  060571     111  042116  054105          .ASCIZ  /INDEX PULSE OF WRITE HEADER/
 8980  060576  050040  046125  042523
 8981  060604  047440  020106  051127
 8982  060612  052111  020105  042510
 8983  060620  042101  051105     000
 8984  060625     101  052124  046505  EM236:  .ASCIZ  /ATTEMPTING TO COMPLETE WRITE HEADER IN MAINT MODE/
 8985  060632  052120  047111  020107
 8986  060640  047524  041440  046517
 8987  060646  046120  052105  020105
 8988  060654  051127  052111  020105
 8989  060662  042510  042101  051105
 8990  060670  044440  020116  040515
 8991  060676  047111  020124  047515
 8992  060704  042504     000
 8993  060707     101  052124  046505  EM237:  .ASCIZ  /ATTEMPTING TO WRITE GAP OR DATA SYNCH/
 8994  060714  052120  047111  020107
 8995  060722  047524  053440  044522
 8996  060730  042524  043440  050101
 8997  060736  047440  020122  040504
 8998  060744  040524  051440  047131
 8999  060752  044103     000
 9000  060755     101  052124  046505  EM238:  .ASCIZ /ATTEMPTING TO WRITE DATA FIELD/
 9001  060762  052120  047111  020107
 9002  060770  047524  053440  044522
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 9003  060776  042524  042040  052101
 9004  061004  020101  044506  046105
 9005  061012  000104
 9006  061014  052101  042524  050115  EM239:  .ASCIZ  /ATTEMPING TO WRITE SYNCH OF HEADER USING 24 SECTOR FORMAT/
 9007  061022  047111  020107  047524
 9008  061030  053440  044522  042524
 9009  061036  051440  047131  044103
 9010  061044  047440  020106  042510
 9011  061052  042101  051105  052440
 9012  061060  044523  043516  052040
 9013  061066  020064  042523  052103
 9014  061074  051117  043040  051117
 9015  061102  040515  000124
 9016  061106  052101  042524  050115  EM240:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA USING 24 SECTOR FORMAT/
 9017  061114  044524  043516  052040
 9018  061122  020117  051127  052111
 9019  061130  020105  042510  042101
 9020  061136  051105  042040  052101
 9021  061144  020101  051525  047111
 9022  061152  020107  032062  051440
 9023  061160  041505  047524  020122
 9024  061166  047506  046522  052101
 9025  061174     000
 9026  061175     101  052124  046505  EM241:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26 SECTOR)/
 9027  061202  052120  047111  020107
 9028  061210  047524  043040  051117
 9029  061216  042503  043040  051117
 9030  061224  040515  020124  051105
 9031  061232  047522  020122  041450
 9032  061240  046506  020124  020075
 9033  061246  033062  051440  041505
 9034  061254  047524  024522     000
 9035  061261     101  052124  046505  EM242:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24 SECTOR)/
 9036  061266  052120  047111  020107
 9037  061274  047524  043040  051117
 9038  061302  042503  043040  051117
 9039  061310  040515  020124  051105
 9040  061316  047522  020122  041450
 9041  061324  046506  020124  020075
 9042  061332  032062  051440  041505
 9043  061340  047524  024522     000
 9044  061345     101  052124  046505  EM243:  .ASCIZ  /ATTEMPING TO FORCE CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS/
 9045  061352  044520  043516  052040
 9046  061360  020117  047506  041522
 9047  061366  020105  047503  052116
 9048  061374  047522  046114  051105
 9049  061402  042440  051122  051117
 9050  061410  053440  052111  020110
 9051  061416  040506  046125  020124
 9052  061424  044502  020124  047111
 9053  061432  042040  044522  042526
 9054  061440  046440  051505  000123
 9055  061446  052101  042524  050115  EM244:  .ASCIZ  /ATTEMPTING TO CLEAR ERROR/
 9056  061454  044524  043516  052040
 9057  061462  020117  046103  040505
 9058  061470  020122  051105  047522
```

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 9059  061476  000122
 9060  061500  047503  046515  047101  EM3000: .ASCIZ  /COMMAND AND STATUS REG 1 INCORRECT/
 9061  061506  020104  047101  020104
 9062  061514  052123  052101  051525
 9063  061522  051040  043505  030440
 9064  061530  044440  041516  051117
 9065  061536  042522  052103     000
 9066  061543     115  051505  040523  EM3001: .ASCIZ  /MESSAGE A INCORRECT/
 9067  061550  042507  040440  044440
 9068  061556  041516  051117  042522
 9069  061564  052103     000
 9070  061567     115  051505  040523  EM3002: .ASCIZ  /MESSAGE B INCORRECT/
 9071  061574  042507  041040  044440
 9072  061602  041516  051117  042522
 9073  061610  052103     000
 9074  061613     103  030523  044440  EM3003: .ASCIZ  /CS1 INCORRECT AFTER SENDING DRIVE CLEAR/
 9075  061620  041516  051117  042522
 9076  061626  052103  040440  052106
 9077  061634  051105  051440  047105
 9078  061642  044504  043516  042040
 9079  061650  044522  042526  041440
 9080  061656  042514  051101     000
 9081  061663     103  030523  044440  EM3004: .ASCIZ  /CS1 INCORRECT AFTER AFTER DATA SIMULATION/
 9082  061670  041516  051117  042522
 9083  061676  052103  040440  052106
 9084  061704  051105  040440  052106
 9085  061712  051105  042040  052101
 9086  061720  020101  044523  052515
 9087  061726  040514  044524  047117
 9088  061734     000
 9089  061735     115  044501  052116  EM3005: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9090  061742  051040  043505  020056
 9091  061750  020061  047111  047503
 9092  061756  051122  041505  020124
 9093  061764  052504  044522  043516
 9094  061772  042040  052101  020101
 9095  062000  044523  052515  040514
 9096  062006  044524  047117
 9097  062012  005015  043101  042524          .ASCIZ  <15><12>/AFTER SECTOR PULSE/
 9098  062020  020122  042523  052103
 9099  062026  051117  050040  046125
 9100  062034  042523     000
 9101  062037     115  044501  052116  EM3006: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9102  062044  051040  043505  020056
 9103  062052  020061  047111  047503
 9104  062060  051122  041505  020124
 9105  062066  052504  044522  043516
 9106  062074  042040  052101  020101
 9107  062102  044523  052515  040514
 9108  062110  044524  047117
 9109  062114  005015  043101  042524          .ASCIZ  <15><12>/AFTER INDEX PULSE/
 9110  062122  020122  047111  042504
 9111  062130  020130  052520  051514
 9112  062136  000105
 9113  062140  040515  047111  020124  EM3007: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9114  062146  042522  027107  030440
```

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 9115  062154  044440  041516  051117
 9116  062162  042522  052103  042040
 9117  062170  051125  047111  020107
 9118  062176  040504  040524  051440
 9119  062204  046511  046125  052101
 9120  062212  047511     116
 9121  062215     015  047012  020117          .ASCIZ  <15><12>/NO SECTOR OR INDEX PULSE SUPPLIED/
 9122  062222  042523  052103  051117
 9123  062230  047440  020122  047111
 9124  062236  042504  020130  052520
 9125  062244  051514  020105  052523
 9126  062252  050120  044514  042105
 9127  062260     000
 9128  062261     102  051525  040440  EM3008: .ASCIZ  /BUS ADDRESS INCORRECT AFTER SENDING DRIVE CLEAR/
 9129  062266  042104  042522  051523
 9130  062274  044440  041516  051117
 9131  062302  042522  052103  040440
 9132  062310  052106  051105  051440
 9133  062316  047105  044504  043516
 9134  062324  042040  044522  042526
 9135  062332  041440  042514  051101
 9136  062340     000
 9137  062341     127  051117  020104  EM3009: .ASCIZ  /WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR/
 9138  062346  047503  047125  020124
 9139  062354  047111  047503  051122
 9140  062362  041505  020124  043101
 9141  062370  042524  020122  042523
 9142  062376  042116  047111  020107
 9143  062404  051104  053111  020105
 9144  062412  046103  040505  000122
 9145  062420  051503  020061  044103  EM3010: .ASCIZ  /CS1 CHANGED DURING COMMAND EXECUTION/
 9146  062426  047101  042507  020104
 9147  062434  052504  044522  043516
 9148  062442  041440  046517  040515
 9149  062450  042116  042440  042530
 9150  062456  052503  044524  047117
 9151  062464     000
 9152  062465     102  051525  040440  EM3011: .ASCIZ  /BUS ADDRESS CHANGED BEFORE INDEX PULSE/
 9153  062473  042104  042522  051523
 9154  062500  041440  040510  043516
 9155  062506  042105  041040  043105
 9156  062514  051117  020105  047111
 9157  062522  042504  020130  052520
 9158  062530  051514  000105
 9159  062534  047527  042122  041440  EM3012: .ASCIZ  /WORD COUNT CHANGED BEFORE INDEX PULSE/
 9160  062542  052517  052116  041440
 9161  062550  040510  043516  042105
 9162  062556  041040  043105  051117
 9163  062564  020105  047111  042504
 9164  062572  020130  052520  051514
 9165  062600  000105
 9166  062602  051503  020061  044103  EM3013: .ASCIZ  /CS1 CHANGE AFTER INDEX PULSE/
 9167  062610  047101  042507  040440
 9168  062616  052106  051105  044440
 9169  062624  042116  054105  050040
 9170  062632  046125  042523     000
```

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 9171  062637     115  044501  052116  EM3014: .ASCIZ  /MAINT REG 1 INCORRECT BEFORE INDEX PULSE/
 9172  062644  051040  043505  030440
 9173  062652  044440  041516  051117
 9174  062660  042522  052103  041040
 9175  062666  043105  051117  020105
 9176  062674  047111  042504  020130
 9177  062702  052520  051514  000105
 9178  062710  052502  020123  042101  EM3015: .ASCIZ  /BUS ADDRESS CHANGED AFTER INDEX PULSE/
 9179  062716  051104  051505  020123
 9180  062724  044103  047101  042507
 9181  062732  020104  043101  042524
 9182  062740  020122  047111  042504
 9183  062746  020130  052520  051514
 9184  062754  000105
 9185  062756  047527  042122  041440  EM3016: .ASCIZ  /WORD COUNT CHANGED AFTER INDEX PULSE/
 9186  062764  052517  052116  041440
 9187  062772  040510  043516  042105
 9188  063000  040440  052106  051105
 9189  063006  044440  042116  054105
 9190  063014  050040  046125  042523
 9191  063022     000
 9192  063023     103  046517  040515  EM3018: .ASCIZ  /COMMAND AND STATUS REG. 2 INCORRECT/
 9193  063030  042116  040440  042116
 9194  063036  051440  040524  052524
 9195  063044  020123  042522  027107
 9196  063052  031040  044440  041516
 9197  063060  051117  042522  052103
 9198  063066     000
 9199  063067     102  051525  040440  EM3019: .ASCIZ  /BUS ADD REG INCORRECT/
 9200  063074  042104  051040  043505
 9201  063102  044440  041516  051117
 9202  063110  042522  052103     000
 9203  063115     127  051117  020104  EM3020: .ASCIZ  /WORD COUNT REG INCORRECT/
 9204  063122  047503  047125  020124
 9205  063130  042522  020107  047111
 9206  063136  047503  051122  041505
 9207  063144  000124
 9208  063146  040504  040524  051040  EM3021: .ASCIZ  /DATA READ INCORRECT/
 9209  063154  040505  020104  047111
 9210  063162  047503  051122  041505
 9211  063170  000124
 9212  063172  051503  020061  047111  EM3022: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
 9213  063200  047503  051122  041505
 9214  063206  020124  043101  042524
 9215  063214  020122  042522  042101
 9216  063222  047111  020107  040504
 9217  063230  040524  041040  043125
 9218  063236  042506  000122
 9219  063242  051503  020062  047111  EM3023: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
 9220  063250  047503  051122  041505
 9221  063256  020124  043101  042524
 9222  063264  020122  042522  042101
 9223  063272  047111  020107  040504
 9224  063300  040524  041040  043125
 9225  063306  042506  000122
 9226  063312  051105  047522  020122  EM3024: .ASCIZ  /ERROR REG INCORRECT/
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 9227  063320  042522  020107  047111
 9228  063326  047503  051122  041505
 9229  063334  000124
 9230  063336  040515  047111  020124  EM3025: .ASCIZ  /MAINT REG 1 INCORRECT AFTER INDEX PULSE/
 9231  063344  042522  020107  020061
 9232  063352  047111  047503  051122
 9233  063360  041505  020124  043101
 9234  063366  042524  020122  047111
 9235  063374  042504  020130  052520
 9236  063402  051514  000105
 9237  063406  051503  020061  047111  EM3026: .ASCIZ  /CS1 INCORRECT AFTER COMMAND COMPLETION/
 9238  063414  047503  051122  041505
 9239  063422  020124  043101  042524
 9240  063430  020122  047503  046515
 9241  063436  047101  020104  047503
 9242  063444  050115  042514  044524
 9243  063452  047117     000
 9244  063455     103  031123  044440  EM3027: .ASCIZ  /CS2 INCORRECT AFTER COMMAND COMPLETION/
 9245  063462  041516  051117  042522
 9246  063470  052103  040440  052106
 9247  063476  051105  041440  046517
 9248  063504  040515  042116  041440
 9249  063512  046517  046120  052105
 9250  063520  047511  000116
 9251  063524  051503  020061  047111  EM3028: .ASCIZ  /CS1 INCORRECT AFTER READING EMPTY SILO/
 9252  063532  047503  051122  041505
 9253  063540  020124  043101  042524
 9254  063546  020122  042522  042101
 9255  063554  047111  020107  046505
 9256  063562  052120  020131  044523
 9257  063570  047514     000
 9258  063573     103  031123  044440  EM3029: .ASCIZ  /CS2 INCORRECT AFTER READING EMPTY SILO/
 9259  063600  041516  051117  042522
 9260  063606  052103  040440  052106
 9261  063614  051105  051040  040505
 9262  063622  044504  043516  042440
 9263  063630  050115  054524  051440
 9264  063636  046111  000117
 9265  063642  040515  047111  020124  EM3030: .ASCIZ  /MAINT REG 1 INCORRECT/
 9266  063650  042522  020107  020061
 9267  063656  047111  047503  051122
 9268  063664  041505  000124
 9269  063670  051104  053111  020105  EM3031: .ASCIZ  /DRIVE STATUS REG INCORRECT/ '
 9270  063676  052123  052101  051525
 9271  063704  051040  043505  044440
 9272  063712  041516  051117  042522
 9273  063720  052103     000
 9274  063723     105  051122  051117  EM3032: .ASCIZ  /ERROR REG INCORRECT/
 9275  063730  051040  043505  044440
 9276  063736  041516  051117  042522
 9277  063744  052103     000
 9278  063747     115  030522  044440  EMW1:   .ASCIZ  /MR1 INCORRECT ON 1ST UPWARD TRANSISTION OF MAINT CLOCK/
 9279  063754  041516  051117  042522
 9280  063762  052103  047440  020116
 9281  063770  051461  020124  050125
 9282  063776  040527  042122  052040
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 9283  064004  040522  051516  051511
 9284  064012  044524  047117  047440
 9285  064020  020106  040515  047111
 9286  064026  020124  046103  041517
 9287  064034  000113
 9288  064036  051115  020061  047111  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISTION OF MAINT CLOCK/
 9289  064044  047503  051122  041505
 9290  064052  020124  047117  030440
 9291  064060  052123  042040  053517
 9292  064066  053516  051101  020104
 9293  064074  051124  047101  044523
 9294  064102  052123  047511  020116
 9295  064110  043117  046440  044501
 9296  064116  052116  041440  047514
 9297  064124  045503     000
 9298  064127     115  030522  044440  EMW3:   .ASCIZ  /MR1 INCORRECT ON 2ND UPWARD TRANSISTION OF MAINT CLOCK/
 9299  064134  041516  051117  042522
 9300  064142  052103  047440  020116
 9301  064150  047062  020104  050125
 9302  064156  040527  042122  052040
 9303  064164  040522  051516  051511
 9304  064172  044524  047117  047440
 9305  064200  020106  040515  047111
 9306  064206  020124  046103  041517
 9307  064214  000113
 9308  064216  051115  020061  047111  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSISTION OF MAINT CLOCK/
 9309  064224  047503  051122  041505
 9310  064232  020124  047117  031040
 9311  064240  042116  042040  053517
 9312  064246  053516  051101  020104
 9313  064254  051124  047101  044523
 9314  064262  052123  047511  020116
 9315  064270  043117  046440  044501
 9316  064276  052116  041440  047514
 9317  064304  045503     000
```

```
                                .SBTTL  DATA PATTERNS

                        064310  .EVEN
064310  000000          PATTERN: .WORD   000000
064312  177777                   .WORD   177777
064314  125252                   .WORD   125252
064316  052515                   .WORD   052515
064320  101706                   .WORD   101706
064322  060422                   .WORD   060422
064324  130715                   .WORD   130715
064326  177777          HEAD1:   .WORD   177777
064330  000000                   .WORD   000000
064332  177777                   .WORD   177777
064334  000000          HEAD2:   .WORD   000000
064336  177777                   .WORD   177777
064340  000000                   .WORD   000000
064342  125252          HEAD3:   .WORD   125252
064344  052525                   .WORD   052525
064346  125252                   .WORD   125252
064350  052525                   .WORD   052525
064352  125252                   .WORD   125252
064354  052525                   .WORD   052525
064356  044444          HEAD4:   .WORD   044444
064360  022222                   .WORD   022222
064362  111111                   .WORD   111111
064364  052012          HEAD5:   .WORD   052012
064366  100520                   .WORD   100520
064370  052012                   .WORD   052012
064372  155555          HEAD6:   .WORD   155555
064374  066666                   .WORD   066666
064376  155555                   .WORD   155555
064400  104210          HEAD7:   .WORD   104210
064402  104210                   .WORD   104210
064404  104210                   .WORD   104210
064406     100     100  NPRBUF:  .BYTE   100,100
064410     101     101           .BYTE   101,101
064412     102     102           .BYTE   102,102
064414     103     103           .BYTE   103,103
064416     104     104           .BYTE   104,104
064420     105     105           .BYTE   105,105
064422     106     106           .BYTE   106,106
064424     107     107           .BYTE   107,107
064426     110     110           .BYTE   110,110
064430     111     111           .BYTE   111,111
064432     112     112           .BYTE   112,112
064434     113     113           .BYTE   113,113
064436     114     114           .BYTE   114,114
064440     115     115           .BYTE   115,115
064442     116     116           .BYTE   116,116
064444     117     117           .BYTE   117,117
064446     120     120           .BYTE   120,120
064450     121     121           .BYTE   121,121
064452     122     122           .BYTE   122,122
064454     123     123           .BYTE   123,123
064456     124     124           .BYTE   124,124
064460     125     125           .BYTE   125,125
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 9374  064462      126      126                    .BYTE   126,126
 9375  064464      127      127                    .BYTE   127,127
 9376  064466      130      130                    .BYTE   130,130
 9377  064470      131      131                    .BYTE   131,131
 9378  064472      132      132                    .BYTE   132,132
 9379  064474      133      133                    .BYTE   133,133
 9380  064476      134      134                    .BYTE   134,134
 9381  064500      135      135                    .BYTE   135,135
 9382  064502      136      136                    .BYTE   136,136
 9383  064504      137      137                    .BYTE   137,137
 9384  064506      140      140                    .BYTE   140,140
 9385  064510      141      141                    .BYTE   141,141
 9386  064512      142      142                    .BYTE   142,142
 9387  064514      143      143                    .BYTE   143,143
 9388  064516      144      144                    .BYTE   144,144
 9389  064520      145      145                    .BYTE   145,145
 9390  064522      146      146                    .BYTE   146,146
 9391  064524      147      147                    .BYTE   147,147
 9392  064526      150      150                    .BYTE   150,150
 9393  064530      151      151                    .BYTE   151,151
 9394  064532      152      152                    .BYTE   152,152
 9395  064534      153      153                    .BYTE   153,153
 9396  064536      154      154                    .BYTE   154,154
 9397  064540      155      155                    .BYTE   155,155
 9398  064542      156      156                    .BYTE   156,156
 9399  064544      157      157                    .BYTE   157,157
 9400  064546      160      160                    .BYTE   160,160
 9401  064550      161      161                    .BYTE   161,161
 9402  064552      162      162                    .BYTE   162,162
 9403  064554      163      163                    .BYTE   163,163
 9404  064556      164      164                    .BYTE   164,164
 9405  064560      165      165                    .BYTE   165,165
 9406  064562      166      166                    .BYTE   166,166
 9407  064564      167      167                    .BYTE   167,167
 9408  064566      170      170                    .BYTE   170,170
 9409  064570      171      171                    .BYTE   171,171
 9410  064572      172      172                    .BYTE   172,172
 9411  064574      173      173                    .BYTE   173,173
 9412  064576      174      174                    .BYTE   174,174
 9413  064600      175      175                    .BYTE   175,175
 9414  064602      176      176                    .BYTE   176,176
 9415  064604      177      177                    .BYTE   177,177
 9416  064606      200      200                    .BYTE   200,200
 9417  064610      201      201                    .BYTE   201,201
 9418  064612      202      202                    .BYTE   202,202
 9419  064614      203      203                    .BYTE   203,203
 9420  064616      204      204                    .BYTE   204,204
 9421  064620      205      205                    .BYTE   205,205
 9422  064622      206      206                    .BYTE   206,206
 9423  064624      207      207                    .BYTE   207,207
 9424  064626      210      210                    .BYTE   210,210
 9425  064630   000102                   WRBUFF:  .BLKW   66.
 9426           064644                   BADPAR=  WRBUFF+14
 9427           000001                   .END
```

```
ABASE = 177440          1008#   1246    1287
ABORT   052272          7413    8387#
ACDW1 = 000000          1246    1289
ACDW2 = 000000          1246    1290
ACLO  = 000010          1103#
ACPUOP= 000000          1246    1261
ADDW0 = 000000          1246
ADDW1 = 000000          1246
ADDW10= 000000          1246
ADDW11= 000000          1246
ADDW12= 000000          1246
ADDW13= 000000          1246
ADDW14= 000000          1246
ADDW15= 000000          1246
ADDW2 = 000000          1246
ADDW3 = 000000          1246
ADDW4 = 000000          1246
ADDW5 = 000000          1246
ADDW6 = 000000          1246
ADDW7 = 000000          1246
ADDW8 = 000000          1246
ADDW9 = 000000          1246
ADEVCT= 000000          1246    1252
ADEVM = 000000          1246    1288
AENV  = 000000          1246    1257
AENVM = 000000          1246    1258
AFATAL= 000000          1246    1249
AMADR1= 000000          1246    1274
AMADR2= 000000          1246    1278
AMADR3= 000000          1246    1281
AMADR4= 000000          1246    1284
AMAMS1= 000000          1246    1268
AMAMS2= 000000          1246    1276
AMAMS3= 000000          1246    1279
AMAMS4= 000000          1246    1282
AMSGAD= 000000          1246    1254
AMSGLG= 000000          1246    1255
AMSGTY= 000000          1246    1248
AMTYP1= 000000          1246    1269
AMTYP2= 000000          1246    1277
AMTYP3= 000000          1246    1280
AMTYP4= 000000          1246    1283
APASS = 000000          1246    1251
APRIOR= 000005          1007#   1246
APTCSU= 000040          7290#   7468
APTENV= 000001          7246    7288#   7322    7461
APTSIZ= 000200          2281    7287#
APTSPO= 000100          7248    7289#   7463
ASWREG= 000000          1246    1259
ATESTN= 000000          1246    1250
AUNIT = 000000          1246    1253
AUSWR = 000000          1246    1260
AVECT1= 120210          1006#   1246    1285
AVECT2= 000000          1246    1286
BADPAR= 064644          9426#
BAI   = 000020          1066#   3508    3523    3553    3582    3595
```

```
BA16  = 000400  1051#  3626   3627   3726   3727   3788   3952   4052   4053   4114
BA17  = 001000  1052#  3626   3627   3889   3890   3951   4052   4053   4114   4115
BITCNT  003622  2216#  2586*  2598*  2611*  2622*  2679*  2692*  2704*  2753*  2766*  2778*  2845*  2902*
                4354*  4355*  4464*  4465*  4574*  4575*  4684*  4685*  4794*  4795*  4903*  4904*  4984*
                4997*  4998   5072*  5073*  5175*  5178*  5251*  5254*  5260*  5277*  5289*  5371*  5374*
                5380*  5397*  5409*  5490*  5493*  5499*  5516*  5528*  5609*  5612*  5618*  5635*  5647*
                5728*  5731*  5737*  5754*  5766*  5847*  5850*  5856*  5873*  5885*  5966*  5969*  5975*
                5992*  6004*  6094*  6097*  6103*  6119*  6131*  6219*  6222*  6228*  6244*  6263*  6271*
                6278*  6285*  6365*  6368*  6374*  6390*  6409*  6417*  6424*  6431*  6515*  6518*  6524*
                6540*  6552*  8101   8107   8133   8135   8138
BIT0  = 000001   952#  1048   1081   1100
BIT00 = 000001   942#   952
BIT01 = 000002   941#   951
BIT02 = 000004   940#   950
BIT03 = 000010   939#   949
BIT04 = 000020   938#   948
BIT05 = 000040   937#   947
BIT06 = 000100   936#   946
BIT07 = 000200   935#   945
BIT08 = 000400   934#   944   7159
BIT09 = 001000   933#   943   7157   7333
BIT1  = 000002   951#  1082
BIT10 = 002000   932#  1053   1072   1091   1124   1139   7310
BIT11 = 004000   931#  1054   1073   1092   1109   1125   1140   7164
BIT12 = 010000   930#  1056   1074   1093   1126
BIT13 = 020000   929#  1057   1075   1094   1110   1127   7317
BIT14 = 040000   928#  1058   1076   1095   1111   1128   7125
BIT15 = 100000   927#  1059   1060   1077   1096   1112   1129
BIT2  = 000004   950#  1083   1102
BIT3  = 000010   949#  1065   1084   1103
BIT4  = 000020   948#  1066   1085   1104   1118   1133
BIT5  = 000040   947#  1067   1086   1105   1119   1134
BIT6  = 000100   946#  1049   1068   1087   1106   1120   1135
BIT7  = 000200   945#  1050   1069   1088   1107   1121   1136
BIT8  = 000400   944#  1051   1070   1089   1108   1122   1137
BIT9  = 001000   943#  1052   1071   1090   1123   1138
BPTVEC= 000014   959#
BSE   = 000200  1088#
CCLR  = 100000  1060#  2385   2406   2430   2451   2473   2494   2517   2538   2565   2580   2595   2608
                2620   2630   2654   2669   2689   2701   2711   2735   2750   2763   2775   2785   2811
                2964   2993   3083   3199   3328   3502   3620   3671   3723   3782   3844   3886   3945
                4007   4049   4108   4170   4187   4318   4357   4428   4467   4538   4577   4648   4687
                4758   4797   4867   4906   4970   5011   5034   5075   5141   5217   5337   5456   5575
                5694   5813   5932   6058   6183   6329   6479   6637   6714   6793   7425
CDT   = 002000  1053#  2390   2400   2435   2445   2478   2488   2522   2532
CERR  = 100000  1059#  3626   5003   6616   6693   6772
CFMT  = 010000  1056#  2390   2400   2435   2445   2478   2488   2522   2532   4193   4194   4869   4887
                4921   6484   6576   6677   6693
CKSWR = 104407  7124   7306   7332   8086#
CLEAR = 000005  1033#
COE   = 001000  1090#
CR    = 000015   867#  7507   7517
CRLF  = 000200   868#  2306   7478   7517
CSRPTR  003640  2224#
CTO   = 004000  1054#
CTRHLT  045630  7424#  7703   7786
```

```
DCK    = 100000          1096#   5004
DDISP  = 177570           874#   1219    2269
DDT    = 000400          1108#
DF000    051216          1928    8156#
DF001    051222          1313    1319    1325    1331    1337    1343    1349    1355    1361    1367    1373    1379    8158#
DF015    051246          1385    1391    2049    8168#
DF017    051272          1397    1403    1409    8178#
DF022    051316          1415    1421    1427    1439    1445    1451    8188#
DF025    051342          1433    8198#
DF031    051366          1457    1463    1469    1475    8208#
DF035    051412          1481    1487    1493    1499    1523    1529    1535    1541    1547    1553    1559    1565    1589
                         1595    1601    1607    1613    1619    1625    1631    1697    1703    1709    1715    1751    1757
                         1763    1769    1793    1799    1805    1811    1817    1823    1829    1835    1859    1865    1871
                         1877    1884    1891    1898    1905    8218#
DF041    051436          1505    1721    1911    8228#
DF042    051462          1511    1517    1841    1940    1946    1976    1982    8238#
DF054    051506          1571    1637    1964    2000    8248#
DF055    051532          1577    1583    1643    1649    1847    1853    1952    1958    1988    1994    8258#
DF072    051556          1655    1661    1667    1673    1679    1727    1733    1739    1745    1775    8268#
DF077    051612          1685    1691    1781    1787    1917    1923    8282#
DF150    051636          1934    1970    8292#
DF164    051662          2006    2012    2018    2024    8302#
DF170    051706          2029    8312#
DF171    051732          2034    2039    2044    8322#
DF175    051756          2055    2061    2067    2073    2079    2085    2091    2097    2103    2109    2115    2121    8332#
DF211    052002          2127    2133    2139    2145    8342#
DH000A   052403          8160    8170    8180    8190    8200    8210    8220    8230    8240    8250    8260    8270    8284
                         8294    8304    8314    8324    8334    8344    8403#
DH000B   052421          8162    8172    8182    8192    8202    8212    8222    8232    8242    8252    8262    8272    8286
                         8296    8306    8316    8326    8336    8346    8406#
DH000C   052434          1926    8408#
DH001A   052465          8164    8413#
DH001B   052544          8166    8421#
DH015A   052623          8174    8429#
DH015B   052642          8176    8432#
DH017A   052660          8184    8435#
DH017B   052724          8186    8441#
DH022A   052772          8194    8448#
DH022B   053051          8196    8456#
DH025A   053126          8204    8464#
DH025B   053152          8206    8468#
DH031A   053200          8214    8472#
DH031B   053277          8216    8483#
DH035A   053375          8224    8494#
DH035B   053474          8226    8505#
DH041A   053571          8234    8516#
DH041B   053606          8236    8519#
DH042A   053623          8244    8522#
DH042B   053662          8246    8528#
DH054A   053720          8254    8533#
DH054B   053745          8256    8537#
DH055A   053773          8264    8541#
DH055B   054040          8266    8548#
DH072A   054106          8274    8288    8555#
DH072B   054145          8276    8290    8561#
DH072C   054203          8278    8567#
```

```
DH072D  054262            8280    8575#
DH150A  054337            8298    8583#
DH150B  054373            8300    8588#
DH164A  054431            8308    8594#
DH164B  054475            8310    8601#
DH170A  054543            8318    8608#
DH170B  054642            8320    8619#
DH171A  054740            8328    8630#
DH171B  054757            8330    8633#
DH175A  054775            8338    8348    8636#
DH175B  055074            8340    8350    8647#
DH211A  055171            8352    8658#
DH211B  055217            8354    8662#
DI    = 040000            1058#
DISPLA  001142            1219#   2269*   2277*   7179*   7309*
DISPRE  000174            1148#   2277
DLT   = 100000            1077#
DMD   = 000040            1119#   2386    2393    2394    2431    2438    2439    2474    2481    2482    2518    2525    2526
                          2566    2567    2568    2571    2572    2583    2584    2585    2601    2655    2656    2657    2660
                          2661    2672    2674    2675    2678    2680    2736    2737    2738    2741    2742    2754    2812
                          2813    2814    2819    2820    2844    2847    2848    2849    2850    2878    2879    2880    2883
                          2904    2905    2906    2907    2934    2936    2937    2940    2943    2944    2951    2995    3004
                          3005    3009    3010    3011    3014    3016    3017    3084    3093    3094    3098    3099    3100
                          3103    3106    3107    3136    3137    3200    3208    3209    3213    3214    3215    3218    3221
                          3222    3256    3257    3329    3337    3338    3342    3343    3344    3347    3350    3351    3389
                          3390    3427    3428    3503    3512    3513    3517    3518    3519    3522    3525    3526    3558
                          3559    3621    3630    3631    3635    3636    3637    3640    3642    3643    3724    3729    3730
                          3734    3735    3736    3739    3741    3742    3783    3791    3792    3796    3797    3798    3801
                          3804    3805    3887    3892    3893    3897    3898    3899    3902    3904    3905    3946    3954
                          3955    3959    3960    3961    3964    3967    3968    4050    4055    4056    4063    4061    4062
                          4065    4067    4068    4109    4117    4118    4122    4123    4124    4127    4130    4131    4188
                          4197    4198    4202    4203    4204    4207    4211    4212    4244    4245    4319    4322    4323
                          4326    4327    4429    4432    4433    4436    4437    4539    4542    4543    4546    4547    4649
                          4652    4653    4656    4657    4759    4762    4763    4766    4767    4868    4871    4872    4875
                          4876    4971    4974    4975    4978    4979    5035    5038    5039    5042    5043    5044    5045
                          5142    5143    5144    5150    5151    5155    5156    5157    5160    5161    5164    5165    5183
                          5190    5218    5224    5225    5229    5230    5231    5234    5236    5237    5240    5241    5244
                          5292    5294    5295    5298    5300    5305    5306    5338    5344    5345    5349    5350    5351
                          5354    5356    5357    5360    5361    5364    5412    5414    5415    5418    5420    5425    5426
                          5457    5463    5464    5468    5469    5470    5473    5475    5476    5479    5480    5483    5531
                          5533    5534    5537    5539    5544    5545    5576    5582    5583    5587    5588    5589    5592
                          5594    5595    5598    5599    5602    5650    5652    5653    5656    5658    5663    5664    5695
                          5701    5702    5706    5707    5708    5711    5713    5714    5717    5718    5721    5769    5771
                          5772    5775    5777    5782    5783    5814    5820    5821    5825    5826    5827    5830    5832
                          5833    5836    5837    5840    5888    5890    5891    5894    5896    5901    5902    5933    5939
                          5940    5944    5945    5946    5949    5951    5952    5955    5956    5959    6007    6009    6010
                          6013    6015    6020    6021    6059    6066    6067    6071    6072    6073    6077    6080    6081
                          6084    6085    6087    6137    6139    6140    6143    6145    6150    6151    6184    6191    6192
                          6196    6197    6198    6201    6203    6204    6209    6210    6212    6293    6295    6296    6299
                          6301    6307    6308    6330    6337    6338    6342    6343    6344    6347    6349    6350    6355
                          6356    6358    6439    6441    6442    6445    6447    6453    6454    6480    6487    6488    6492
                          6493    6494    6498    6501    6502    6505    6506    6508    6558    6560    6561    6564    6566
                          6571    6572    6598    6602    6603    6675    6679    6680    6752    6758    6759    6870    6900
                          6914    6929    6955    6967    6979    7004    7007    7008    7009    7010    7013    7014    7015
                          7016
DRA   = 000001            1100#   6618    6695    6774
```

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DRDY  = 000200  1107#
DROT  = 000040  1105#
DRPAR = 000010  1084#  6696
DRVMSK= 000007  1064#
DSC   = 040000  1111#
DSWR  = 177570   873#  1218  2268
DTE   = 010000  1093#
DTYE  = 000040  1086#
DT000   050554  1927  8095#
DT001   050560  1312  1318  1324  1330  1336  1342  1348  1354  1360  1366  1372  1378  8096#
DT015   050600  1384  1390  2048  8099#
DT017   050610  1396  1402  1408  8101#
DT022   050626  1414  1420  1426  1438  1444  1450  8104#
DT025   050646  1432  8107#
DT031   050660  1456  1462  1468  1474  8109#
DT035   050704  1480  1486  1492  1498  1522  1528  1534  1540  1546  1552  1558  1564  1588
                1594  1600  1606  1612  1618  1624  1630  1696  1702  1708  1714  1750  1756
                1762  1768  1792  1798  1804  1810  1816  1822  1828  1834  1858  1864  1870
                1876  1883  1890  1897  1904  8113#
DT041   050730  1504  1720  1910  8117#
DT042   050740  1510  1516  1840  1939  1945  1975  1981  8119#
DT054   050754  1570  1636  1963  1999  8121#
DT055   050766  1576  1582  1642  1648  1846  1852  1951  1957  1987  1993  8123#
DT072   051004  1654  1660  1666  1672  1678  1726  1732  1738  1744  1774  8126#
DT077   051034  1684  1690  1780  1786  1916  1922  8131#
DT150   051050  1933  1969  8133#
DT164   051064  2005  2011  2017  2023  8135#
DT170   051102  2028  8138#
DT171   051126  2033  2038  2043  8142#
DT175   051136  2054  2060  2066  2072  2078  2084  2090  2096  2102  2108  2114  2120  8144#
DT211   051162  2126  2132  2138  2144  8148#
ECCW  = 020000  1127#  2585  2601  2680  2754  2844  2951  5161  5244  5300  5364  5420  5483
                5539  5602  5658  5721  5777  5840  5896  5959  6015  6087  6145  6212  6275
                6281  6301  6358  6421  6427  6447  6508  6566
ECH   = 000100  1087#
EMTVEC= 000030   962#  2252*  2253*
EMW     003170  2026#  5174*  5243*  5261*  5363*  5381*  5482*  5500*  5601*  5619*  5720*  5738*  5839*
                5857*  5958*  5976*  6086*  6104*  6211*  6229*  6249*  6262*  6357*  6375*  6395*  6408*
                6507*  6525*  6875*  6905*  6919*  6934*  6960*  6972*  6984*
EMW1    063747  6875  9278#
EMW2    064036  6905  6960  9288#
EMW3    064127  6919  6972  9298#
EMW4    064216  6934  6984  9308#
EM000   055254  1925  8669#
EM200   055321  1310  1316  1322  8676#
EM201   055403  1328  1334  1340  8685#
EM202   055466  1346  1352  1358  8694#
EM203   055557  1364  1370  1376  8704#
EM204   055651  1382  1388  1394  1400  1406  8714#
EM205   055737  1412  1418  1424  1430  1436  1442  1448  1454  1460  1466  1472  8724#
EM206   056025  1478  1484  1490  1496  1502  1508  1514  8734#
EM207   056070  1520  1526  1532  1538  1568  1574  1580  8740#
EM208   056117  1544  1550  1556  1562  8744#
EM209   056170  1586  1592  1598  1604  1634  1640  1646  8751#
EM210   056257  1610  1616  1622  1628  8761#
EM211   056373  1652  1658  1664  1670  1676  8775#
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EM212   056443          1682    1688    8782#
EM213   056513          1694    1700    1706    1712    1718    8789#
EM214   056563          1724    1730    1736    1742    1772    8796#
EM215   056633          1748    1754    1760    1766    8803#
EM216   056717          1778    1784    8812#
EM217   056767          1790    1796    1802    1808    1838    1844    1850    8819#
EM218   057022          1814    1820    1826    1832    8824#
EM219   057102          1856    1862    1868    1874    1908    1914    1920    8832#
EM220   057162          1881    1888    1895    1902    8840#
EM221   057241          1931    8848#
EM222   057316          1937    1943    8856#
EM223   057371          1949    1955    1961    8864#
EM224   057447          1967    8872#
EM225   057544          1973    1979    8883#
EM226   057631          1985    1991    1997    8892#
EM227   057731          2003    2009    2015    2021    8903#
EM230   060037          5174    8916#
EM231   060145          2031    8928#
EM232   060267          2036    8943#
EM233   060411          5243    5363    5482    5601    5720    5839    5958    6086    6211    6357    8958#
EM234   060455          5261    5381    5500    5619    5738    5857    5976    6104    6229    6375    8965#
EM235   060515          2041    8971#
EM236   060625          2046    8984#
EM237   060707          6249    6395    8993#
EM238   060755          6262    6408    9000#
EM239   061014          6507    9006#
EM240   061106          6525    9016#
EM241   061175          2052    2058    2064    2070    9026#
EM242   061261          2076    2082    2088    2094    9035#
EM243   061345          2100    2106    2112    2118    9044#
EM244   061446          2124    2130    2136    2142    9055#
EM3000  061500          1311    1329    1347    1365    1479    1521    1545    1587    1611    1653    1683    1695    1725
                        1749    1779    1791    1815    1857    1882    1932    1968    2004    2047    2053    2077    2101
                        2125    9060#
EM3001  061543          1317    1335    1353    1371    9066#
EM3002  061567          1323    1341    1359    1377    9070#
EM3003  061613          1383    1413    9074#
EM3004  061663          1389    9081#
EM3005  061735          1395    9089#
EM3006  062037          1401    9101#
EM3007  062140          1407    9113#
EM3008  062261          1419    9128#
EM3009  062341          1425    9137#
EM3010  062420          1437    9145#
EM3011  062465          1443    9152#
EM3012  062534          1449    9159#
EM3013  062602          1455    9166#
EM3014  062637          1431    9171#
EM3015  062710          1461    9178#
EM3016  062756          1467    9185#
EM3018  063023          1485    1527    1551    1593    1617    1659    1689    1701    1731    1755    1767    1785    1797
                        1821    1863    1889    2010    2059    2083    2107    2131    9192#
EM3019  063067          1491    1533    1557    1599    1623    1671    1707    1737    1761    1803    1827    1869    1896
                        9199#
EM3020  063115          1497    1539    1563    1605    1629    1677    1713    1743    1809    1833    1875    1903    9203#
EM3021  063146          1503    1569    1635    1719    1839    1909    1962    1998    9208#
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EM3022  063172          1509    1575    1641    1845    1915    1950    1986    9212#
EM3023  063242          1515    1581    1647    1851    1921    1956    1992    9219#
EM3024  063312          1665    1773    9226#
EM3025  063336          1473    9230#
EM3026  063406          1938    1974    9237#
EM3027  063455          1944    1980    9244#
EM3028  063524          2016    9251#
EM3029  063573          2022    9258#
EM3030  063642          2032    2037    2042    9265#
EM3031  063670          2065    2089    2113    2137    9269#
EM3032  063723          2071    2095    2119    2143    9274#
ERRCNT  003610          2211#   2285*   7408*   7411
ERRVEC= 000004           955#   2266    2267*   2278*   7052    7053    7057*   7062*   7074*   7079*   7088*   7098*   7099*
                        7130    7131*   7133*   7136*
E.ASOF  003516          2174#
E.BA    003504          2169#   2827*   2834    2867    2892    2924    2955    2986*   3034    3086*   3113    3119*   3127
                        3150    3201*   3228    3240    3246*   3254*   3270    3330*   3357    3369    3375*   3384*   3403
                        3433*   3446    3457*   3504*   3544    3572    3622*   3665    3753*   3761    3786*   3824    3830*
                        3916*   3924    3949*   3987    3993*   4079*   4087    4112*   4150    4156*   4192*   4218    4233
                        4239*   4248*   4260    8104    8109    8113    8129
E.CS1   003500          2167#   2400*   2403    2445*   2448    2488*   2491    2532*   2535    2576*   2577    2634*   2635
                        2665*   2666    2715*   2716    2746*   2747    2789*   2790    2826*   2829    2862    2887    2919
                        2952    2987*   3028    3048    3078*   3121    3144    3169    3198*   3234    3264    3295    3327*
                        3363    3397    3420    3440    3476    3501*   3538    3566    3596    3626*   3656    3674*   3676
                        3726*   3755    3788*   3818    3889*   3918    3951*   3981    4052*   4081    4114*   4144    4193*
                        4227    4254    4283    4338*   4350    4372*   4374    4389    4448*   4460    4482*   4484    4499
                        4558*   4570    4592*   4594    4609    4668*   4680    4702*   4704    4719    4778*   4790    4812*
                        4814    4829    4887*   4899    4921*   4923    4938    4982*   4988    5003*   5005    5056*   5068
                        5090*   5092    5107    5310*   5311    5430*   5431    5549*   5550    5668*   5669    5787*   5788
                        5906*   5907    6025*   6026    6155*   6156    6312*   6313    6458*   6459    6576*   6577    6616*
                        6620    6642*   6646    6693*   6697    6719*   6723    6772*   6776    6798*   6802    8096    8099
                        8104    8109    8113    8119    8123    8126    8131    8133    8135    8144    8148
E.CS2   003510          2171#   3027*   3031    3047*   3051    3104*   3124    3147    3168*   3172    3219*   3237    3250*
                        3267    3279*   3294*   3298    3348*   3366    3380*   3400    3409*   3423    3435*   3443    3459*
                        3475*   3479    3523*   3541    3553*   3569    3582*   3595*   3599    3652*   3655*   3659    3675*
                        3679    3752*   3758    3817*   3821    3915*   3921    3980*   3984    4078*   4084    4143*   4147
                        4208*   4226*   4230    4257    4267*   4282*   4286    4373*   4377    4388*   4394    4483*   4487
                        4498*   4504    4593*   4597    4608*   4614    4703*   4707    4718*   4724    4813*   4817    4828*
                        4834    4922*   4926    4937*   4943    4983*   4993    5004*   5008    5091*   5095    5106*   5112
                        6617*   6623    6643*   6649    6694*   6700    6720*   6726    6773*   6779    6799*   6805    8113
                        8119    8123    8126    8131    8135    8144    8148
E.DA    003506          2170#
E.DB    003522          2176#   3041*   3042    3160*   3161    3281*   3282    3411*   3412    3462*   3463    3579*   3583
                        3768*   3769    3837*   3838    3931*   3932    4000*   4001    4094*   4095    4163*   4164    4271*
                        4272    4382*   4399    4492*   4509    4602*   4619    4712*   4729    4822*   4839    4931*   4948
                        5100*   5117    8117    8121
E.DCYL  003520          2175#
E.DS    003512          2172#   6618*   6626    6644*   6652    6695*   6703    6721*   6729    6774*   6782    6800*   6808
                        8144    8148
E.ECPS  003532          2180#
E.ECPT  003534          2181#
E.ER    003514          2173#   3651*   3662    6619*   6629    6645*   6655    6696*   6706    6722*   6732    6775*   6785
                        6801*   6811    8126    8144    8148
E.MR1   003524          2177#   2585*   2592    2601*   2605    2617    2627    2680*   2686    2698    2709    2754*   2760
                        2772    2783    2844*   2852    2909    2951*   2961    5161*   5181*   5182*   5185    5188*   5189*
                        5192    5244*   5300*   5301    5364*   5420*   5421    5483*   5539*   5540    5602*   5658*   5659
```

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                    5721* 5777* 5778  5840* 5896* 5897  5959* 6015* 6016  6087* 6145* 6146  6212*
                    6275* 6281* 6301* 6302  6358* 6421* 6427* 6447* 6448  6508* 6566* 6567  6869*
                    6872  6883* 6884* 6889* 6894* 6899* 6902  6913* 6916  6927* 6928* 6931  6948*
                    6951* 6954* 6957  6966* 6969  6978* 6981  8101  8107  8109  8138  8142
E.MR2   003526      2178# 2401* 2408  2446* 2453  2489* 2496  2533* 2540  8096
E.MR3   003530      2179# 2402* 2411  2447* 2456  2490* 2499  2534* 2543  8096
E.SPAR  003536      2182#
E.WC    003502      2168# 2828* 2839  2872  2897  2929  2958  2988* 3037  3087* 3088* 3089  3120*
                    3130  3133  3153  3203* 3243  3247* 3253* 3273  3332* 3372  3376* 3377  3383*
                    3406  3434* 3449  3458* 3506* 3532  3547  3550* 3556* 3575  3624* 3668  3754*
                    3764  3784* 3811  3827  3831* 3917* 3927  3947* 3974  3990  3994* 4080* 4090
                    4110* 4137  4153  4157* 4190* 4224  4236  4240* 4249* 4263  8104  8109  8116
                    8129
FMTE  = 000020      1085# 6619  6696
GNS   = ****** U    1147  2305  6839  6846  8078  8079  8080  8081  8082  8084  8086  8087  8088
                    8089  8090  8091  8092
GO    = 000001      1048# 3626  4372  4482  4592  4702  4812  4921  5003  5090  5310  5430  5549
                    5668  5787  5906  6025  6155  6312  6458  6576  6616  6693  6772
GTSWR = 104406      2300  8084#
HEAD1   064326      4337  4381  4886  4930  5055  5099  5219  5262  6060  6061  6481  6482  9328#
HEAD2   064334      4447  4491  5339  5382  9331#
HEAD3   064342      4557  4601  5458  5501  6185  6186  9334#
HEAD4   064356      4667  4711  5577  5620  9340#
HEAD5   064364      4777  4821  5696  5739  9343#
HEAD6   064372      5815  5858  9346#
HEAD7   064400      5934  5977  9349#
HT    = 000011       865# 7476  7517
HVRC  = 000400      1089#
IDAE  = 002000      1091#
IE    = 000100      1049#
ILF   = 000001      1081#
INTR  = 000300      1044#
IOTVEC= 000020       960# 2250* 2251*
IR    = 000100      1068# 3027  3047  3104  3168  3219  3279  3294  3348  3409  3459  3475  3523
                    3582  3595  3652  3675  3752  3817  3915  3980  4078  4143  4208  4267  4282
                    4373  4388  4483  4498  4593  4608  4703  4718  4813  4828  4922  4937  4983
                    5004  5091  5106  6617  6643  6694  6720  6773  6799
KIPAR0= 172340       993# 7038  7066
KIPAR1= 172342       994#
KIPAR2= 172344       995#
KIPAR3= 172346       996#
KIPAR4= 172350       997#
KIPAR5= 172352       998#
KIPAR6= 172354       999# 3715* 3773* 3878* 3936* 4041* 4099*
KIPAR7= 172356      1000# 7082
KIPDR0= 172300       982#
KIPDR1= 172302       983#
KIPDR2= 172304       984#
KIPDR3= 172306       985#
KIPDR4= 172310       986#
KIPDR5= 172312       987#
KIPDR6= 172314       988#
KIPDR7= 172316       989#
LF    = 000012       866# 7511  7517
MCLK  = 000400      1122# 2393  2438  2481  2525  2571  2660  2674  2741  2819  2847  2849  2879
                    2904  2906  2936  2943  3004  3010  3016  3093  3099  3106  3136  3208  3214
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0183

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                    3221    3256    3337    3343    3350    3389    3427    3512    3518    3525    3558    3630    3636
                    3642    3729    3735    3741    3791    3797    3804    3892    3898    3904    3954    3960    3967
                    4055    4061    4067    4117    4123    4130    4197    4203    4211    4244    4322    4432    4542
                    4652    4762    4871    4974    5038    5044    5150    5156    5164    5224    5230    5236    5294
                    5305    5344    5350    5356    5414    5425    5463    5469    5475    5533    5544    5582    5588
                    5594    5652    5663    5701    5707    5713    5771    5782    5820    5826    5832    5890    5901
                    5939    5945    5951    6009    6020    6066    6072    6080    6139    6150    6191    6197    6203
                    6295    6307    6337    6343    6349    6441    6453    6487    6493    6501    6560    6571    6602
                    6679    6758    6869    6870    6883    6913    6914    6928    6951    6966    6967    6978    7004
                    7007    7009    7013    7015
MDS    = 001000     1071#
MEMBAS= 172100      1003#
MEMERR  043650      1166    7021#
MEMPAR  003630      2219#
MEMVEC= 000114      1002#   1165
MERD   = 001000     1123#   7007    7015
MESMSK= 000017      1116#
MEWD   = 002000     1124#   2585    2601    2680    2754    2844    2951    5161    5244    5300    5364    5420    5483
                    5539    5602    5658    5721    5777    5840    5896    5959    6015    6087    6145    6212    6301
                    6358    6447    6508    6566    6869    6884    6889    6913    6927    6978
MIND   = 000200     1121#   2672    2674    2675    2934    2936    2937    3009    3010    3011    3098    3099    3100
                    3213    3214    3215    3342    3343    3344    3517    3518    3519    3635    3636    3637    3734
                    3735    3736    3796    3797    3798    3897    3898    3899    3959    3960    3961    4060    4061
                    4062    4122    4123    4124    4202    4203    4204    5155    5156    5157    5229    5230    5231
                    5292    5294    5295    5349    5350    5351    5412    5414    5415    5468    5469    5470    5531
                    5533    5534    5587    5588    5589    5650    5652    5653    5706    5707    5708    5769    5771
                    5772    5825    5826    5827    5888    5890    5891    5944    5945    5946    6007    6009    6010
                    6071    6072    6073    6137    6139    6140    6196    6197    6198    6293    6295    6296    6342
                    6343    6344    6439    6441    6442    6492    6493    6494    6558    6560    6561
MMVEC  = 000250      971#
MSP    = 000100     1120#   2567    2583    2656    2737    2813    2878    2879    2880    4326    4436    4546    4656
                    4766    4875    4978    5042    5143    5182    5183    5188    5240    5360    5479    5598    5717
                    5836    5955    6084    6209    6355    6505
M1.BIT  003616      2214#   2588*   2623*   2682*   2705*   2756*   2779*   4329*   4341*   4365*   4439*   4451*   4475*
                    4549*   4561*   4585*   4659*   4671*   4695*   4769*   4781*   4805*   4878*   4890*   4914*   4981*
                    5047*   5059*   5083*   5171*   5248*   5266    5267*   5283    5284*   5368*   5386    5387*   5403
                    5404*   5487*   5505    5506*   5522    5523*   5606*   5624    5625*   5641    5642*   5725*   5743
                    5744*   5760    5761*   5844*   5862    5863*   5879    5880*   5963*   5981    5982*   5998    5999*
                    6091*   6108    6109*   6125    6126*   6216*   6233    6234*   6251    6252*   6265    6266*   6362*
                    6379    6380*   6397    6398*   6411    6412*   6512*   6529    6530*   6546    6547*   6887    6946
                    6952    7002    8101    8138
M2.BIT  003620      2215#   5172*   5249*   5266*   5283*   5369*   5386*   5403*   5488*   5505*   5522*   5607*   5624*
                    5641*   5726*   5743*   5760*   5845*   5862*   5879*   5964*   5981*   5998*   6092*   6108*   6125*
                    6217*   6233*   6251*   6265*   6363*   6379*   6397*   6411*   6513*   6529*   6546*   6892    6897
                    8138
NED    = 010000     1074#
NEM    = 004000     1073#   3652
NEWPAS  004636      2365#   6862
NPRBUF  064406      3085    3086    3113    3157    3201    3202    3228    3277    3330    3331    3357    3387    3504
                    3505    3579    3717    3768    3775    3776    3835    3880    3931    3938    3939    3998    4043
                    4094    4101    4102    4161    4191    4192    4218    4266    6331    6332    9352#
NXF    = 000004     1083#
OFFSET= 000015      1037#
OFST   = 000004     1102#
OPI    = 020000     1094#
OPR001  052000      2312    8358#
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OPR002  052070          2315    2326    2343    8363#
OPR003  052076          2322    8364#
OPR004  052126          2334    8368#
OPR006  052150          2309    8371#
OPR007  052223          7427    8379#
OR     = 000200         1069#   3027    3104    3219    3250    3279    3348    3380    3409    3435    3459    3523    3553
                        3582    3653    3655    3752    3817    3915    3980    4078    4143    4208    4226    4267    4373
                        4483    4593    4703    4813    4922    5091
PACK   = 000003         1032#
PARM    003642          1154    2227#
PARPRE  003636          2222#
PAR.EN= 000001          1005#
PAT    = 000020         1118#
PATTER  064310          2984    9321#
PCA    = 004000         1125#   6883    6899    6948
PCD    = 010000         1126#   6883    6894    6954
PGE    = 002000         1072#
PIP    = 020000         1110#
PIRQ   = 177772          872#
PIRQVE= 000240           966#
PR.BIT  003614          2213#   2587*   2614*   2623    2624*   2681*   2695*   2705    2706*   2755*   2769*   2779    2780*
                        4328*   4334*   4341    4344*   4347*   4365    4366*   4438*   4444*   4451    4454*   4457*   4475
                        4476*   4548*   4554*   4561    4564*   4567*   4585    4586*   4658*   4664*   4671    4674*   4677*
                        4695    4696*   4768*   4774*   4781    4784*   4787*   4805    4806*   4877*   4883*   4890    4893*
                        4896*   4914    4915*   4980*   5046*   5052*   5059    5062*   5065*   5083    5084*   5170*   5247*
                        5267    5268*   5284    5285*   5367*   5387    5388*   5404    5405*   5486*   5506    5507*   5523
                        5524*   5605*   5625    5626*   5642    5643*   5724*   5744    5745*   5761    5762*   5843*   5863
                        5864*   5880    5881*   5962*   5982    5983*   5999    6000*   6090*   6109    6110*   6126    6127*
                        6215*   6234    6235*   6252    6253*   6266    6267*   6361*   6380    6381*   6398    6399*   6412
                        6413*   6511*   6530    6531*   6547    6548*   6885    7000    8101    8138
PR0    = 000000          889#   2365
PR1    = 000040          890#
PR2    = 000100          891#
PR3    = 000140          892#
PR4    = 000200          893#
PR5    = 000240          894#   2205
PR6    = 000300          895#
PR7    = 000340          896#   1167    2237    8023    8037
PS     = 177776          869#    870
PSW    = 177776          870#
PWRVEC= 000024           961#   2256*   2257*   8022*   8023*   8036*   8037*
P.ASOF  003556          2193#
P.BA    003544          2188#
P.CS1   003540          2186#   6632*   6709*   6788*   8152
P.CS2   003550          2190#   6633*   6710*   6789*   8152
P.DA    003546          2189#
P.DB    003562          2195#
P.DCYL  003560          2194#
P.DS    003552          2191#   6634*   6711*   6790*   8152
P.ECPS  003572          2199#
P.ECPT  003574          2200#
P.ER    003554          2192#   6635*   6712*   6791*   8152
P.MR1   003564          2196#
P.MR2   003566          2197#
P.MR3   003570          2198#
P.SPAR  003576          2201#
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P.WC    003542          2187#
P1.BIT  003612          2212#  5169*  5246*  5257*  5268   5271*  5274*  5285   5286*  5366*  5377*  5388   5391*
                        5394*  5405   5406*  5485*  5496*  5507   5510*  5513*  5524   5525*  5604*  5615*  5626
                        5629*  5632*  5643   5644*  5723*  5734*  5745   5748*  5751*  5762   5763*  5842*  5853*
                        5864   5867*  5870*  5881   5882*  5961*  5972*  5983   5986*  5989*  6000   6001*  6089*
                        6100*  6110   6113*  6116*  6127   6128*  6214*  6225*  6235   6238*  6241*  6253   6254*
                        6259*  6267   6268*  6360*  6371*  6381   6384*  6387*  6399   6400*  6405*  6413   6414*
                        6510*  6521*  6531   6534*  6537*  6548   6549*  6890   6944   8138
RDBIT   043540          2590   2603   2615   2625   2684   2696   2707   2758   2770   2781   4331   4335   4348
                        4367   4441   4445   4458   4477   4551   4555   4568   4587   4661   4665   4678   4697
                        4771   4775   4788   4807   4880   4884   4897   4916   4985   5049   5053   5066   5085
                        7000#
RDCHR = 104410          7862   8087#
RDDATA= 000021          1039#
RDGATE= 100000          1129#  2601
RDHEAD= 000025          1041#  2390   2400   2478   2488   2569   2576   2634   2658   2665   2715   2739   2746
                        2789   4320   4338   4372   4430   4448   4482   4540   4558   4592   4650   4668   4702
                        4760   4778   4812   4869   4887   4921   4972   4982   5003   5036   5056   5090   6600
                        6616   6677   6693
RDLIN = 104411          7936   8088#
RDOCT = 104412          2316   2327   2344   8089#
RDY   = 000200          1050#  3626   3674   4372   4482   4592   4702   4812   4921   5003   5090   5310   5430
                        5549   5668   5787   5906   6025   6155   6312   6458   6576   6616   6642   6693   6719
                        6772   6798
RECAL = 000013          1036#
RESREG= 104414          7407   8091#
RESTRT  003652          1152   2230#
RESVEC= 000010           956#
RKASOF= 000016          1019#
RKBA  = 000004          1014#  2815*  2824   2860   2885   2917   2949   2998*  3021   3085*  3111   3142   3202*
                        3226   3262   3331*  3355   3395   3438   3505*  3530   3564   3623*  3648   3746   3787*
                        3809   3909   3950*  3972   4072   4113*  4135   4191*  4216   4252   5145*  5219*  5339*
                        5458*  5577*  5696*  5815*  5934*  6060*  6185*  6331*  6481*  6755*
RKCS1 = 000000          1012#  2385*  2390*  2397   2406*  2430*  2435*  2442   2451*  2473*  2478*  2485   2494*
                        2517*  2522*  2529   2538*  2565*  2569*  2575   2580*  2595*  2608*  2620*  2630*  2633
                        2654*  2655*  2658*  2664   2669*  2689*  2701*  2711*  2714   2735*  2736*  2739*  2745
                        2750*  2763*  2775*  2785*  2788   2811*  2817*  2823   2859   2884   2916   2948   2964*
                        2993*  3001*  3020   3045   3083*  3090*  3110   3140   3164   3199*  3205*  3225   3260
                        3285   3328*  3334*  3354   3393   3415   3436   3466   3502*  3509*  3529   3562   3586
                        3620*  3627*  3646   3671*  3672   3723*  3727*  3745   3782*  3789*  3808   3844*  3886*
                        3890*  3908   3945*  3952*  3971   4007*  4049*  4053*  4071   4108*  4115*  4134   4170*
                        4187*  4194*  4215   4250   4278   4318*  4320*  4349   4357*  4370   4384   4428*  4430*
                        4459   4467*  4480   4494   4538*  4540*  4569   4577*  4590   4604   4648*  4650*  4679
                        4687*  4700   4714   4758*  4760*  4789   4797*  4810   4824   4867*  4869*  4898   4906*
                        4919   4933   4970*  4972*  4986   5001   5011*  5034*  5036*  5067   5075*  5088   5102
                        5141*  5147*  5217*  5221*  5309   5337*  5341*  5429   5456*  5460*  5548   5575*  5579*
                        5667   5694*  5698*  5786   5813*  5817*  5905   5932*  5936*  6024   6058*  6063*  6154
                        6183*  6188*  6311   6329*  6334*  6457   6479*  6484*  6575   6600*  6608   6612   6637*
                        6638   6677*  6685   6689   6714*  6715   6756*  6764   6768   6793*  6794   7425*
RKCS2 = 000010          1016#  2389*  2434*  2477*  2521*  2999*  3026   3046   3118   3141   3165   3233   3261
                        3291   3362   3394   3419   3437   3472   3508*  3537   3563   3592   3647   3673   3751
                        3816   3914   3979   4077   4142   4223   4251   4279   4371   4385   4481   4495   4591
                        4605   4701   4715   4811   4825   4920   4934   4987   5002   5089   5103   6597*  6613
                        6639   6674*  6690   6716   6751*  6769   6795
RKDA  = 000006          1015#  2388*  2433*  2476*  2520*  2997*
RKDB  = 000024          1021#  3040   3159   3280   3410   3461   3581   3767   3836   3930   3999   4093   4162
```

```
                    4270   4383   4493   4603   4713   4823   4932   5000   5101
RKDCYL= 000020       1020#  2387*  2432*  2475*  2519*  2996*  6599*  6676*  6753*
RKDS  = 000012       1017#  6614   6640   6691   6717   6770   6796
RKECPS= 000030       1025#
RKECPT= 000032       1026#
RKER  = 000014       1018#  3650   6615   6641   6692   6718   6771   6797
RKMR1 = 000026       1022#  2386*  2393*  2394*  2431*  2438*  2439*  2474*  2481*  2482*  2518*  2525*  2526*
                     2566*  2567*  2568*  2571*  2572*  2583*  2584*  2591   2604   2616   2626   2656*  2657*
                     2660*  2661*  2672*  2674*  2675*  2678*  2685   2697   2708   2737*  2738*  2741*  2742*
                     2759   2771   2782   2812*  2813*  2814*  2819*  2820*  2847*  2848*  2849*  2850*  2851
                     2878*  2879*  2880*  2883*  2904*  2905*  2906*  2907*  2908   2934*  2936*  2937*  2940*
                     2943*  2944*  2947   2995*  3004*  3005*  3009*  3010*  3011*  3014*  3016*  3017*  3084*
                     3093*  3094*  3098*  3099*  3100*  3103*  3106*  3107*  3136*  3137*  3200*  3208*  3209*
                     3213*  3214*  3215*  3218*  3221*  3222*  3256*  3257*  3329*  3337*  3338*  3342*  3343*
                     3344*  3347*  3350*  3351*  3389*  3390*  3427*  3428*  3503*  3512*  3513*  3517*  3518*
                     3519*  3522*  3525*  3526*  3558*  3559*  3621*  3630*  3631*  3635*  3636*  3637*  3640*
                     3642*  3643*  3724*  3729*  3730*  3734*  3735*  3736*  3739*  3741*  3742*  3783*  3791*
                     3792*  3796*  3797*  3798*  3801*  3804*  3805*  3887*  3892*  3893*  3897*  3898*  3899*
                     3902*  3904*  3905*  3946*  3954*  3955*  3959*  3960*  3961*  3964*  3967*  3968*  4050*
                     4055*  4056*  4060*  4061*  4062*  4065*  4067*  4068*  4109*  4117*  4118*  4122*  4123*
                     4124*  4127*  4130*  4131*  4188*  4197*  4198*  4202*  4203*  4204*  4207*  4211*  4212*
                     4244*  4245*  4319*  4322*  4323*  4326*  4327*  4429*  4432*  4433*  4436*  4437*  4539*
                     4542*  4543*  4546*  4547*  4649*  4652*  4653*  4656*  4657*  4759*  4762*  4763*  4766*
                     4767*  4868*  4871*  4872*  4875*  4876*  4971*  4974*  4975*  4978*  4979*  5035*  5038*
                     5039*  5042*  5043*  5044*  5045*  5142*  5143*  5144*  5150*  5151*  5155*  5156*  5157*
                     5160*  5164*  5165*  5183*  5184   5190*  5191   5218*  5224*  5225*  5229*  5230*  5231*
                     5234*  5236*  5237*  5240*  5241*  5292*  5294*  5295*  5298*  5299   5305*  5306*  5338*
                     5344*  5345*  5349*  5350*  5351*  5354*  5356*  5357*  5360*  5361*  5412*  5414*  5415*
                     5418*  5419   5425*  5426*  5457*  5463*  5464*  5468*  5469*  5470*  5473*  5475*  5476*
                     5479*  5480*  5531*  5533*  5534*  5537*  5538   5544*  5545*  5576*  5582*  5583*  5587*
                     5588*  5589*  5592*  5594*  5595*  5598*  5599*  5650*  5652*  5653*  5656*  5657   5663*
                     5664*  5695*  5701*  5702*  5706*  5707*  5708*  5711*  5713*  5714*  5717*  5718*  5769*
                     5771*  5772*  5775*  5776   5782*  5783*  5814*  5820*  5821*  5825*  5826*  5827*  5830*
                     5832*  5833*  5836*  5837*  5888*  5890*  5891*  5894*  5895   5901*  5902*  5933*  5939*
                     5940*  5944*  5945*  5946*  5949*  5951*  5952*  5955*  5956*  6007*  6009*  6010*  6013*
                     6014   6020*  6021*  6059*  6066*  6067*  6071*  6072*  6073*  6077*  6080*  6081*  6084*
                     6085*  6137*  6139*  6140*  6143*  6144   6150*  6151*  6184*  6191*  6192*  6196*  6197*
                     6198*  6201*  6203*  6204*  6209*  6210*  6293*  6295*  6296*  6299*  6300   6307*  6308*
                     6330*  6337*  6338*  6342*  6343*  6344*  6347*  6349*  6350*  6355*  6356*  6439*  6441*
                     6442*  6445*  6446   6453*  6454*  6480*  6487*  6488*  6492*  6493*  6494*  6498*  6501*
                     6502*  6505*  6506*  6558*  6560*  6561*  6564*  6565   6571*  6572*  6598*  6602*  6603*
                     6606*  6675*  6679*  6680*  6683*  6752*  6758*  6759*  6762*  6870*  6871   6900*  6901
                     6914*  6915   6929*  6930   6955*  6956   6967*  6968   6979*  6980   7004*  7007*  7008*
                     7009*  7010*  7013*  7014*  7015*  7016*

RKMR2 = 000034       1023#  2398   2443   2486   2530
RKMR3 = 000036       1024#  2399   2444   2487   2531
RKPRI   003602       2205#  2360*
RKSPAR= 000022       1027#
RKVEC   003600       2204#  2358*  2359*
RKWC  = 000002       1013#  2816*  2825   2861   2886   2918   2950   3000*  3022   3089*  3112   3143   3204*
                     3227   3263   3333*  3356   3396   3439   3507*  3531   3565   3625*  3649   3725*  3747
                     3785*  3810   3888*  3910   3948*  3973   4051*  4073   4111*  4136   4189*  4217   4253
                     5146*  5220*  5340*  5459*  5578*  5697*  5816*  5935*  6062*  6187*  6333*  6483*  6754*

RLS   = 000010       1065#
SAVREG= 104413       7356   8090#
SAVSWR  003634       2221#  8021*  8040
```

```
SCLR  = 000040   1067#  6597   6674   6751
SCOP1 = 104415   3054   3178   3772   3843   3935   4006   4098   4169   8092#
SCOP1$  044654   7228#  8092
SECCNT  003626   2218#  5168*  5242*  5362*  5481*  5600*  5719*  5838*  5957*  6076*  6134*  6207*  6288*
                 6353*  6434*  6497*  6555*  8138
SEEK  = 000017   1038#
SELDRV= 000001   1031#
SKI   = 000002   1082#
SPACE2  052267   7390   7402   8386#
SPAR  = 020000   1057#
SPDLSS= 000020   1104#
SRTFLG  003606   2207#  2227*  2230*  2233*  2310
SRTSPL= 000011   1035#
SR0   = 177572    975#  3716*  3718*  3774*  3777*  3879*  3881*  3937*  3940*  4042*  4044*  4100*  4103*
                 7063   7078*  7085*
SR1   = 177574    976#
SR2   = 177576    977#
SR3   = 172516    978#  7075*
STACK = 001100    860#  2235   2248   6995   7029   7418   7426   8038
START   003662   1151   2233#
START1  003666   2228   2231   2234#  7436
STKLMT= 177774    871#
SVAL  = 100000   1112#  6618   6695   6774
SWR     001140   1218#  2246   2268*  2270   2276*  2283*  2298   6879   6909   6923   6938   6964   6976
                 6988   7025   7125   7139   7142   7157   7164   7228   7310   7317   7329   7333   7409
                 7706   7745   7800*  8021   8040*
SWREG   000176   1149#  2276   2298   7706   7745   7768
SW0   = 000001    924#
SW00  = 000001    914#   924
SW01  = 000002    913#   923
SW02  = 000004    912#   922
SW03  = 000010    911#   921
SW04  = 000020    910#   920
SW05  = 000040    909#   919
SW06  = 000100    908#   918
SW07  = 000200    907#   917
SW08  = 000400    906#   916
SW09  = 001000    905#   915
SW1   = 000002    923#
SW10  = 002000    904#
SW11  = 004000    903#
SW12  = 010000    902#   7409
SW13  = 020000    901#
SW14  = 040000    900#
SW15  = 100000    899#
SW2   = 000004    922#
SW3   = 000010    921#
SW4   = 000020    920#
SW5   = 000040    919#
SW6   = 000100    918#
SW7   = 000200    917#
SW8   = 000400    916#
SW9   = 001000    915#   6879   6909   6923   6938   6964   6976   6988   7025   7228
S.CLR = 000400   1137#  2489   2533
S.FMT = 001000   1138#  2401   2446   2489   2533
S.PACK= 004000   1140#
```

```
S.RECL= 000040          1134#
S.RTC = 000200          1136#   2446
S.SEEK= 000020          1133#   2401    2446
S.STSP= 000100          1135#
S.UNLD= 002000          1139#
TBITVE= 000014           957#
TKVEC = 000060           964#   7683*   7684*
TPVEC = 000064           965#
TRAPPC  003604          2206#   7022*   8095
TRAPVE= 000034           963#   2254*   2255*
TRTVEC= 000014           958#
TSTBY1  052357          3708    3871    4034    8396#
TSTBY2  052367          3711    3874    4037    8398#
TST1    004650          2366    2382#   7184
TST10   007432          2751    2764    2776    2786    2791    2808#   7191
TST11   010556          2981#   7192
TST12   011244          3057    3073#   7193
TST13   012130          3181    3195#   7194
TST14   013016          3324#   7195
TST15   014222          3498#   7196
TST16   015100          3617#   7197
TST17   015536          3680    3698#   7198
TST2    005066          2407    2412    2427#   7185
TST20   016652          3712    3861#   7199
TST21   017766          3875    4024#   7200
TST22   021102          4038    4184#   7201
TST23   021772          4315#   7202
TST24   022524          4358    4392    4397    4425#   7203
TST25   023256          4468    4502    4507    4535#   7204
TST26   024010          4578    4612    4617    4645#   7205
TST27   024542          4688    4722    4727    4755#   7206
TST3    005304          2452    2457    2470#   7186
TST30   025274          4798    4832    4837    4864#   7207
TST31   026026          4907    4941    4946    4967#   7208
TST32   026326          4991    4996    5031#   7209
TST33   027074          5076    5110    5115    5138#   7210
TST34   027464          5193    5214#   7211
TST35   030310          5312    5334#   7212
TST36   031134          5432    5453#   7213
TST37   031760          5551    5572#   7214
TST4    005520          2495    2500    2514#   7187
TST40   032604          5670    5691#   7215
TST41   033430          5789    5810#   7216
TST42   034254          5908    5929#   7217
TST43   035100          6027    6055#   7218
TST44   035740          6157    6180#   7219
TST45   036764          6314    6326#   7220
TST46   040010          6460    6476#   7221
TST47   040650          6578    6594#   7222
TST5    005734          2539    2544    2562#   7188
TST50   041274          6671#   7223
TST51   041720          6748#   7224
TST6    006416          2581    2596    2609    2621    2631    2636    2651#   7189
TST7    007044          2670    2690    2702    2712    2717    2732#   7190
TYPDS = 104405          6843    6850    8082#
TYPE  = 104401          2292    2309    2312    2315    2322    2326    2334    2343    3708    3711    3871    3874    4034
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                    4037    6837    6844    6851    7312    7320    7366    7367    7371    7372    7379    7390    7392
                    7402    7403    7405    7413    7427    7481    7577    7652    7700    7712    7766    7767    7770
                    7781    7791    7802    7821    7869    7875    7880    7884    7889    7890    7892    7895    7899
                    7965    7967    8039    8078#
TYPERR  045346      7319    7356#
TYPOC = 104402      2314    2325    2342    3710    3873    4036    7387    7769    8079#
TYPON = 104404      8081#
TYPOS = 104403      8080#
T.ASOF  003456      2155#
T.BA    003444      2150#   2824*   2834    2860*   2867    2885*   2892    2917*   2924    2949*   2955    3021*   3034
                    3111*   3127    3142*   3150    3226*   3240    3262*   3270    3355*   3369    3395*   3403    3438*
                    3446    3530*   3544    3564*   3572    3648*   3665    3746*   3761    3809*   3824    3909*   3924
                    3972*   3987    4072*   4087    4135*   4150    4216*   4233    4252*   4260    8104    8109    8113
                    8129
T.CS1   003440      2148#   2397*   2403    2442*   2448    2485*   2491    2529*   2535    2575*   2577    2633*   2635
                    2664*   2666    2714*   2716    2745*   2747    2788*   2790    2823*   2829    2859*   2862    2884*
                    2887    2916*   2919    2948*   2952    3020*   3028    3045*   3048    3110*   3121    3140*   3144
                    3164*   3169    3225*   3234    3260*   3264    3285*   3295    3354*   3363    3393*   3397    3415*
                    3420    3436*   3440    3466*   3476    3529*   3538    3562*   3566    3586*   3596    3646*   3656
                    3672*   3676    3745*   3755    3808*   3818    3908*   3918    3971*   3981    4071*   4081    4134*
                    4144    4215*   4227    4250*   4254    4278*   4283    4349*   4350    4370*   4374    4384*   4389
                    4459*   4460    4480*   4484    4494*   4499    4569*   4570    4590*   4594    4604*   4609    4679*
                    4680    4700*   4704    4714*   4719    4789*   4790    4810*   4814    4824*   4829    4898*   4899
                    4919*   4923    4933*   4938    4986*   4988    5001*   5005    5067*   5068    5088*   5092    5102*
                    5107    5309*   5311    5429*   5431    5548*   5550    5667*   5669    5786*   5788    5905*   5907
                    6024*   6026    6154*   6156    6311*   6313    6457*   6459    6575*   6577    6612*   6620    6632
                    6638*   6646    6689*   6697    6709    6715*   6723    6768*   6776    6788    6794*   6802    8096
                    8099    8104    8109    8113    8119    8123    8126    8131    8133    8135    8144    8148
T.CS2   003450      2152#   3026*   3031    3046*   3051    3118*   3124    3141*   3147    3165*   3172    3233*   3237
                    3261*   3267    3291*   3298    3362*   3366    3394*   3400    3419*   3423    3437*   3443    3472*
                    3479    3537*   3541    3563*   3569    3592*   3599    3647*   3653    3659    3673*   3679    3751*
                    3758    3816*   3821    3914*   3921    3979*   3984    4077*   4084    4142*   4147    4223*   4230
                    4251*   4257    4279*   4286    4371*   4377    4385*   4394    4481*   4487    4495*   4504    4591*
                    4597    4605*   4614    4701*   4707    4715*   4724    4811*   4817    4825*   4834    4920*   4926
                    4934*   4943    4987*   4993    5002*   5008    5089*   5095    5103*   5112    6613*   6623    6633
                    6639*   6649    6690*   6700    6710    6716*   6726    6769*   6779    6789    6795*   6805    8113
                    8119    8123    8126    8131    8144    8148
T.DA    003446      2151#
T.DB    003462      2157#   3040*   3042    3159*   3161    3280*   3282    3410*   3412    3461*   3463    3581*   3583
                    3767*   3769    3836*   3838    3930*   3932    3999*   4001    4093*   4095    4162*   4164    4270*
                    4272    4383*   4399    4493*   4509    4603*   4619    4713*   4729    4823*   4839    4932*   4948
                    5101*   5117    8117    8121
T.DCYL  003460      2156#
T.DS    003452      2153#   6614*   6626    6634    6640*   6652    6691*   6703    6711    6717*   6729    6770*   6782
                    6790    6796*   6808    8144    8148
T.ECPS  003472      2161#
T.ECPT  003474      2162#
T.ER    003454      2154#   3650*   3662    6615*   6629    6635    6641*   6655    6692*   6706    6712    6718*   6732
                    6771*   6785    6791    6797*   6811    8126    8144    8148
T.MR1   003464      2158#   2591*   2592    2604*   2605    2616*   2617    2626*   2627    2685*   2686    2697*   2698
                    2708*   2709    2759*   2760    2771*   2772    2782*   2783    2851*   2852    2908*   2909    2947*
                    2961    5184*   5185    5191*   5192    5299*   5301    5419*   5421    5538*   5540    5657*   5659
                    5776*   5778    5895*   5897    6014*   6016    6144*   6146    6300*   6302    6446*   6448    6565*
                    6567    6871*   6872    6901*   6902    6915*   6916    6930*   6931    6956*   6957    6968*   6969
                    6980*   6981    8101    8107    8109    8138    8142
T.MR2   003466      2159#   2398*   2408    2443*   2453    2486*   2496    2530*   2540    8096
```

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T.MR3   003470          2160#  2399*  2411   2444*  2456   2487*  2499   2531*  2543   8096
T.SPAR  003476          2163#
T.WC    003442          2149#  2825*  2839   2861*  2872   2886*  2897   2918*  2929   2950*  2958   3022*  3037
                        3112*  3130   3143*  3153   3227*  3243   3263*  3273   3356*  3372   3396*  3406   3439*
                        3449   3531*  3547   3565*  3575   3649*  3668   3747*  3764   3810*  3827   3910*  3927
                        3973*  3990   4073*  4090   4136*  4153   4217*  4236   4253*  4263   8104   8109   8116
                        8129
UFE    = 000400         1070#
UNLOAD= 000007          1034#
UNS    = 040000         1095#
UPE    = 020000         1075#
VV     = 000100         1106#
WAITIM  003632          2220#  6607   6684   6763
WCE    = 040000         1076#
WLE    = 004000         1092#
WRBUFF  064630          2815   2827   2986   2994*  2998   5145   6755   9425#  9426
WRDATA= 000023          1040#
WRDCNT  003624          2217#  3158*  3175*  3278*  3286   3301*  3386*  3452*  3467   3482*  3580*  3587   3602*
                        4269*  4289*  4352*  4353*  4380*  4386   4402*  4403   4462*  4463*  4490*  4496   4512*
                        4513   4572*  4573*  4600*  4606   4622*  4623   4682*  4683*  4710*  4716   4732*  4733
                        4792*  4793*  4820*  4826   4842*  4843   4901*  4902*  4929*  4935   4951*  4952   5070*
                        5071*  5098*  5104   5120*  5121   8121   8123   8133
WRHEAD= 000027          1042#  2435   2445   2522   2532   2817   2826   2987   3001   3078   3090   3198   3205
                        3327   3334   3501   3509   3626   3627   3726   3727   3788   3789   3889   3890   3951
                        3952   4052   4053   4114   4115   4193   4194   5147   5221   5310   5341   5430   5460
                        5549   5579   5668   5698   5787   5817   5906   5936   6025   6063   6155   6188   6312
                        6334   6458   6484   6576   6756   6772
WRL    = 004000         1109#
WRTBIT  042570          5176   5252   5258   5275   5287   5372   5378   5395   5407   5491   5497   5514   5526
                        5610   5616   5633   5645   5729   5735   5752   5764   5848   5854   5871   5883   5967
                        5973   5990   6002   6095   6101   6117   6129   6220   6226   6242   6255   6260   6269
                        6276   6283   6366   6372   6388   6401   6406   6415   6422   6429   6516   6522   6538
                        6550   6869#
WRTCHK= 000031          1043#
WRTGAT= 040000          1128#  2951   5161   5181   5189   5244   5364   5483   5602   5721   5840   5959   6087
                        6212   6358   6508   6884
WR.PAR= 000004          1004#
$APTHD  001000          1178   1184#
$ASTAT= ****** U        7268   7283
$ATYC   044724          7239   7241#
$ATY1   044700          7237#
$ATY3   044706          7238#  7466
$ATY4   044716          7240#  7325
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                        4757   4866   4969   5033   5140   5216   5336   5455   5574   5693   5812   5931   6057
                        6182   6328   6478   6596   6673   6750   7424   8041
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$BDDAT  001126          1212#
$BELL   001204          1238#  7312   7345   7712   7909
$CDW1   001274          1289#
$CDW2   001276          1290#
$CHARC  046164          7483*  7493*  7500   7509*  7514#
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$CNTLG  050050  7766  7911#
$CNTLU  050043  7791  7884  7910#
$CORE  044120  7061  7088#
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               7909  7970
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$DOAGN  042560  6833  6854  6860#
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$ERTTL  001112  1205#  6848  6852*  7313*  7345
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$ETEND  001300  1190  1291#
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$FILLS  001155  1225#  7517
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$GET42  042540  6853#
$GTSWR  047230  7767#  8084
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$HIBTS  001000  1185#
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$ITEMB  001114  1206#  7316*  7324  7345  7357
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$KT11  043750  3700  3863  4026  7060#  7064*  7087*
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$LFLG  045143  7278*  7284#
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                7176*  7182  7232  7335
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$MAIL   001214            1186    1190    1247#   2280    2296    7174    7322    7461
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$MAMS2  001250            1276#
$MAMS3  001254            1279#
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$MBADR  001002            1186#
$MFLG   045142            7238*   7244    7279*   7283#
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$MSWR   050055            7767    7912#
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$MTYP4  001261            1283#
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                          3606#   3608    3683#   3685    3846#   3848    4009#   4011    4173#   4175    4296#   4298    4406#
                          4408    4516#   4518    4626#   4628    4736#   4738    4846#   4848    4955#   4957    5013#   5015
                          5126#   5128    5196#   5198    5315#   5317    5435#   5437    5554#   5556    5673#   5675    5792#
                          5794    5911#   5913    6030#   6032    6160#   6162    6317#   6319    6463#   6465    6583#   6585
                          6660#   6662    6737#   6739
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$OMODE  046414            7544*   7548*   7553    7556*   7567*   7593#
$OVER   044514            7126    7151    7160    7170    7179#
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$PASTM  001006            1188#
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$PWRCT  050452            8030*   8031*   8032*   8034*   8044#
$PWRDN  050334            2256    8021#   8036
$PWRUP  050362            8022    8030#
$QUES   001210            1239#   7345    7517    7821    7892    7909    7967    7970
$RDCHR  047502            7834#   8087
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$RDLIN  047572            7857#   8088
$RDOCT  050100            7931#   8089
$RDSZ = 000010            7850#
$RESRE  050276            8003#   8091
$RTNAD  042562            6862#
$R2A  = ****** U          8092
$SAVRE  050240            7987#   8090
$SCOPE  044220            2250    7123#
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                          7124    7306    7332    7340    7704    7709    7710    7740    7916
$SIZE   043712            2361    7048#
$SIZEX  044154            7086    7096#
$STUP = 177777            2227#
$SVLAD  044460            7134    7173#
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                        3074   3196  3325  3499  3618  3699  3862  4025  4185  4316  4426  4536  4646
                        4756   4865  4968  5032  5139  5215  5335  5454  5573  5692  5811  5930  6056
                        6181   6327  6477  6595  6672  6749  6822  6828  6855  6861  6863  7115  7116
                        7117   7118  7119  7125  7137  7139  7140  7153  7154  7155  7162  7163  7164
                        7176   7179  7182  7297  7298  7299  7300  7301  7310  7317  7329  7333  7345
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$SWRMK= 000000           856   857  7119  7120  7143
$SWOBT  044532          7149  7183#
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                        4646*  4756* 4865* 4968* 5032* 5139* 5215* 5335* 5454* 5573* 5692* 5811* 5930*
                        6056*  6181* 6327* 6477* 6595* 6672* 6749* 6828* 7162* 7169  7172* 7182
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$TKCNT  046642          7665#  7680* 7710  7727* 7841  7843*
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$TKQSR  046650          7668#  7681  7737  7848
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$TMP2   001164          1230#
$TMP3   001166          1231#
$TMP4   001170          1232#
$TMP5   001172          1233#
$TMP6   001174          1234#
$TMP7   001176          1235#
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$TPFLG  001157          1227#  7455  7517
$TPS    001150          1222#  7504  7517
$TRAP   050464          2254   8055#
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$TYPEC  046120          7485    7492    7499    7504#   7505    7807
$TYPEX  046166          7510    7512    7515#
$TYPOC  046214          7547#   8079
$TYPON  046230          7546    7549#   8081
$TYPOS  046170          7542#   8080
$UNIT   001226          1253#
$UNITM  001010          1189#
$USWR   001240          1260#
$VECT1  001264          1285#   2323    2332*   2333*   2336    2356*   2357*   2358    2360
$VECT2  001266          1286#
$XTSTR  044232          7128#
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$$SWOB= 000052          7183#   7184    7185#   7186#   7187#   7188#   7189#   7190#   7191#   7192#   7193#   7194#   7195#
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                        7209#   7210#   7211#   7212#   7213*   7214#   7215#   7216#   7217#   7218#   7219#   7220#   7221#
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.       = 065034        1143#   1147#   1153#   1159    1160#   1162#   1164#   1165#   1168#   1174    1175#   1177#   1179#
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                        7660#   7664    7668#   7669    7670#   7908#   7909    7916#   7970    8025    9320#   9425#
.$ASTA= ****** U        7238    7241
.$X     = 001000        1174#   1179
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CLRPSW  1191#
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ENDCOM     1#   967#
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        2854  2864  2869  2874  2889  2894  2899  2911  2921  2926  2931  2954  2957  2960  2963
        3030  3033  3036  3039  3044  3050  3053  3123  3126  3129  3132  3146  3149  3152  3155
        3163  3171  3174  3236  3239  3242  3245  3266  3269  3272  3275  3284  3297  3300  3365
        3368  3371  3374  3399  3402  3405  3408  3414  3422  3425  3442  3445  3448  3451  3465
        3478  3481  3540  3543  3546  3549  3568  3571  3574  3577  3585  3598  3601  3658  3661
        3664  3667  3670  3678  3681  3757  3760  3763  3766  3771  3820  3823  3826  3829  3840
        3920  3923  3926  3929  3934  3983  3986  3989  3992  4003  4083  4086  4089  4092  4097
        4146  4149  4152  4155  4166  4229  4232  4235  4238  4256  4259  4262  4265  4274  4285
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        4599  4611  4616  4621  4686  4706  4709  4721  4726  4731  4796  4816  4819  4831  4836
        4841  4905  4925  4928  4940  4945  4950  4990  4995  5007  5010  5074  5094  5097  5109
        5114  5119  5177  5187  5194  5253  5259  5276  5288  5303  5313  5373  5379  5396  5408
        5423  5433  5492  5498  5515  5527  5542  5552  5611  5617  5634  5646  5661  5671  5730
        5736  5753  5765  5780  5790  5849  5855  5872  5884  5899  5909  5968  5974  5991  6003
        6018  6028  6096  6102  6118  6130  6148  6158  6221  6227  6243  6256  6261  6270  6277
        6284  6305  6315  6367  6373  6389  6402  6407  6416  6423  6430  6451  6461  6517  6523
        6539  6551  6569  6579  6622  6625  6628  6631  6648  6651  6654  6657  6699  6702  6705
        6708  6725  6728  6731  6734  6778  6781  6784  6787  6804  6807  6810  6813  7023
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FORERR  1191#  6596  6673  6750
GETPRI     1#   967#  7056
GETSWR     1#   967#  2293#
LDLPER  1191#  2989  3079  3719  3778  3882  3941  4045  4104
MSG     2370#  2372  2415#  2417  2460#  2462  2503#  2505  2550#  2552  2639#  2641  2720#  2722  2794#
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        3846#  3848  4009#  4011  4173#  4175  4296#  4298  4406#  4408  4516#  4518  4626#  4628  4736#
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        6465  6583#  6585  6660#  6662  6737#  6739
MULT       1#   967#
NEWTST     1#   967#  2370  2415  2460  2503  2550  2639  2720  2794  2968  3059  3184  3305  3486
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        5315  5435  5554  5673  5792  5911  6030  6160  6317  6463  6583  6660  6737
POP        1#   967#  7280  7281  7647  7959  8008
PUSH       1#   967#  7241  7243  7264  7605  7933  7988
RDLOOP  1191#  4317  4427  4537  4647  4757  5033
REPORT     1#   967#
SCOPE    862#  2382  2427  2470  2514  2562  2651  2732  2808  2981  3073  3195  3324  3498  3617
        3698  3861  4024  4184  4315  4425  4535  4645  4755  4864  4967  5031  5138  5214  5334
        5453  5572  5691  5810  5929  6055  6180  6326  6476  6594  6671  6748  6826
SEKMSG  1191#  2384  2429
SETPRI     1#   967#  7837
SETTRA  8070#  8079  8080  8081  8082  8084  8086  8087  8088  8089  8090  8091  8092
SETUP      1#   967#  2241
SKIP       1#   967#  2407  2412  2452  2457  2495  2500  2539  2544  2581  2596  2609  2621  2631
        2636  2670  2690  2702  2712  2717  2751  2764  2776  2786  2791  3057  3181  3680  4358
        4392  4397  4468  4502  4507  4578  4612  4617  4688  4722  4727  4798  4832  4837  4907
        4941  4946  4991  4996  5076  5110  5115  5193  5312  5432  5551  5670  5789  5908  6027
        6157  6314  6460  6578
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SPACE    967#
SPREAD  1191#   2653    2734
STARS      1#    967#   1157   1171   1173   1180   1193   1242   1245   2370   2381   2415   2426   2460   2469
        2503   2513   2550   2561   2639   2650   2720   2731   2794   2807   2968   2980   3059   3072   3184
        3194   3305   3323   3486   3497   3606   3616   3683   3697   3846   3860   4009   4023   4173   4183
        4296   4314   4406   4424   4516   4534   4626   4644   4736   4754   4846   4863   4955   4966   5013
        5030   5126   5137   5196   5213   5315   5333   5435   5452   5554   5571   5673   5690   5792   5809
        5911   5928   6030   6054   6160   6179   6317   6325   6463   6475   6583   6593   6660   6670   6737
        6747   6818   7034   7111   7225   7236   7293   7346   7355   7440   7519   7596   7663   7740   7755
        7826   7850   7919   7972   8018   8027   8049
SWRSU      1#    967#  2264#
TRMTRP  8070#
TSTMEM  1191#   3700    3863   4026
TYPBIN     1#    967#
TYPDEC     1#    967#   6841   6848
TYPNAM     1#    967#   2286
TYPNUM     1#    967#
TYPOCS     1#    967#
TYPOCT     1#    967#   2313   3709   3872   4035   7768
TYPTXT     1#    967#   6837   6844
WRLOOP  1191#   5216    5336   5455   5574   5693   5812   5931
WRTRK   1191#   6182    6328
WRTRK1  1191#   6057    6478
$$CMRE  1191#
$$CMTM  1191#   1228    1229   1230   1231   1232   1233   1234   1235
$$ESCA     1#    967#
$$NEWT     1#    967#   2370   2415   2460   2503   2550   2639   2720   2794   2968   3059   3184   3305   3486
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        5315   5435   5554   5673   5792   5911   6030   6160   6317   6463   6583   6660   6737
$$SET   8070#   8079    8080   8081   8082   8084   8086   8087   8088   8089   8090   8091   8092
$$SETM  2280#
$$SKIP     1#    967#   2407   2412   2452   2457   2495   2500   2539   2544   2581   2596   2609   2621   2631
        2636   2670   2690   2702   2712   2717   2751   2764   2776   2786   2791   3057   3181   3680   4358
        4392   4397   4468   4502   4507   4578   4612   4617   4688   4722   4727   4798   4832   4837   4907
        4941   4946   4991   4996   5076   5110   5115   5193   5312   5432   5551   5670   5789   5908   6027
        6157   6314   6460   6578
.EQUAT     1#    834#   857
.HEADE     1#    834#   836
.KT11      1#    834#   967
.SETUP     1#    834#  2227
.SWRHI     1#    834#   845
.SWRLO   834#    857#
.SACT1     1#    834#  1155
.SAPTB     1#   1243#
.SAPTH     1#    834#  1169
.SAPTY     1#    834#  7234
.SASTA     1#
.SCATC     1#    834#  1141
.SCMTA     1#    834#  1191
.SDB2D     1#
.SDB20     1#
.SDIV      1#
.SEOP      1#    834#  6816
.SERRO     1#    834#  7291
.SERRT     1#    834#
```

```
.$MULT      1#
.$POWE      1#    834#
.$RAND      1#
.$RDDE      1#
.$RDOC      1#    834#   7917
.$READ      1#    834#   7661
.$R2AZ      1#
.$SAVE      1#    834#   7970
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#    834#   7109
.$SIZE      1#    834#   7032
.$SUPR      1#
.$TRAP      1#    834#   8047
.$TYPB      1#
.$TYPD      1#    834#   7594
.$TYPE      1#    834#   7438
.$TYPO      1#    834#   7517
.$40CA      1#
.1170       1#


. ABS.  065034     000

 ERRORS DETECTED:  0

DSKZ:CZR6CD.BIN,DSKZ:CZR6CD.LST/CRF/SOL/NL:TOC=DSKZ:CZR6CD.SML,CZR6CD.P11
RUN-TIME: 73 107 9 SECONDS
RUN-TIME RATIO: 351/190=1.8
CORE USED:  41K  (81 PAGES)
```