RK611

DISKLESS CONT. NO. 3

MD-11-DZR6C-A

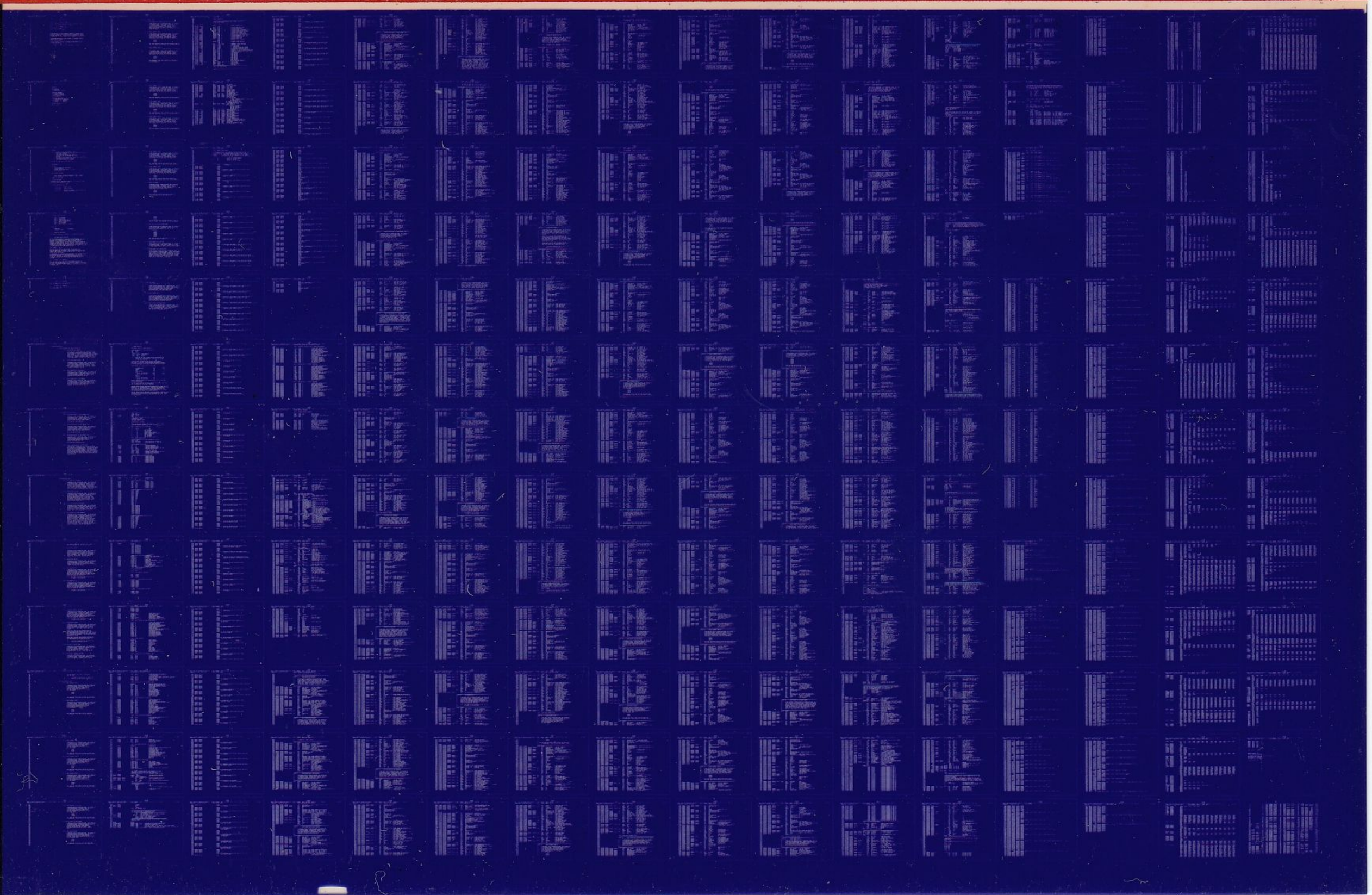
EP-DZR6C-A-DL-A

FICHE 1 OF 1

DEC 1976

digital

MADE IN USA



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IDENTIFICATION

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

PRODUCT NAME: RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3

DATE: DECEMBER, 1976

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: ROY SPITZER

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

2.2 PRELIMINARY PROGRAMS

RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 1 (DZR6A)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 2 (DZR6B)

3.0 OPERATING PROCEDURES

3.1 LOADING PROCEDURE

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

3.2 STARTING PROCEDURE

LOCATION 200 - START PROGRAM

LOCATION 204 - RESTART PROGRAM

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

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                        3.2 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.
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                                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 R C BIT SET. REPEAT FOR A WRITE HEADER WITH CDT SET IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.

TEST 3 READ HEADER DRIVE CLEAR MESSAGE

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

TEST 4 WRITE HEADER DRIVE CLEAR MESSAGE

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

**INDEX AND SECTOR PULSE DETECT ON

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

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

MAKE SURE READ GATE DOES SET.

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

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

MAKE SURE READ GATE DOES NOT SET.

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

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

MAKE SURE READ GATE DOES NOT SET.

TEST 10 INDEX PULSE DETECTION IN WRITE HEADER

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

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                                        **NPR READING OF MEMORY

                                                TEST 11 NPR OUTPUT DATA TRANSFER

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


                                                TEST 12 PARTIAL SILO FILLING

                                                        CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                                        SPECIFY A ONE WORD DATA TRANSFER.  CLOCK IN ALL
                                                        SPECIFIED WORDS INTO THE SILO.  CHECK WORD COUNT,
                                                        BUS ADDRESS, INPUT READY, AND OUTPUT READY.  MAKE
                                                        SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
                                                        INTO THE SILO.  CHECK THE SILO FOR CORRECT DATA.
                                                        REPEAT FOR WORD COUNTS 2-65.


                                                TEST 13 SILO FILLING WITH NPR TRANSFERS

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


                                                TEST 14 SILO CAPICITY WITH NPR TRANSFERS

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


                TEST 15 BUS ADDRESS INHIBIT

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


                TEST 16 NON-EXISTENT MEMORY

                        CLEAR RK611 WITH A CONTROLLER CLEAR,  PUT CONTROLLER
                        IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                        IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                        SPECIFY A ONE WORD DATA TO A NON-EXISTENT ADDRESS
                        (760000) AND MAKE SURE THE NON-EXISTENT  MEMORY ERROR
                        OCCURS IN THE RK611 CONTROLLER.


                TEST 17 BUS ADDRESS BIT 16

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

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


                TEST 20 BUS ADDRESS BIT 17

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

                        NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
                               OF MEMORY IS ON THE SYSTEM.
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TEST 21 ADDRESSING GREATER THAN 96K

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

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

TEST 22 UNIBUS PARITY ERROR

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

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

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

NOTE: THIS TEST IS EXECUTED ONLY IF MEMORY PARITY EXISTS FOR SPECIFIED LOCATION.

TEST 23 SILO FILL IN 18 BIT MODE

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

TEST 24 BIT 16 AND 17 READING WITH NPR

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

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

                        NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
                                ENABLE EXISTS FOR SPECIFIED LOCATION.


                **MFM READ LOOPBACK TESTS

                        TEST 25 READ LOOPBACK (PART 1)

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

                                        177777
                                        000000
                                        177777

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

                        TEST 26 READ LOOPBACK (PART 2)

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

                                        000000
                                        177777
                                        000000

                                MAKE SURE THAT READY COMES UP AFTER THIRD WORD
                                IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
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                        TEST 27 READ LOOPBACK (PART 3)

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

                                        125252
                                        052525
                                        125252

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


                        TEST 30 READ LOOPBACK (PART 4)

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

                                        044444
                                        022222
                                        111111

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


                        TEST 31 READ LOOPBACK (PART 5)

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

                                        052012
                                        100520
                                        052012

                                MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                IS TRANSRERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
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TEST 32 READ HEADER IN 18 BIT MODE

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

177777
000000
177777

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

TEST 33 SYNCH DETECT IN READ HEADER

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

TEST 34 ZERO SYNCH ON READ

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

177777
000000
177777

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

**MFM WRITE LOOPBACK TESTS

TEST 35 WRITE ZEROS UNTIL SECTOR PULSE WITH 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 36 WRITE LOOPBACK (PART 1)

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

177777
000000
177777

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

TEST 37 WRITE LOOPBACK (PART 2)

CLEAR THE RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER

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

000000
177777
000000

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

TEST 40 WRITE LOOPBACK (PART 3)

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

125252
052525
125252

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

TEST 41 WRITE LOOPBACK (PART 4)

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

044444
022222
111111

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

TEST 42 WRITE LOOPBACK (PART 5)

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

052012
100520
052012

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

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;TEST 43 WRITE LOOPBACK (PART 6)
;
;       CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTRCLLER
;       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
;       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
;       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
;       INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
;       CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
;
;               155555
;               066666
;               155555
;
;       MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
;       CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


;TEST 44 WRITE LOOPBACK (PART 7)
;
;       CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
;       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
;       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
;       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
;       INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
;       CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
;
;               104210
;               104210
;               104210
;
;       MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
;       CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION


;TEST 45 WRITE TWO HEADERS
;
;       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
;       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
;       IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
;       CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
;       INDEX PULSE, SECTOR PULSE, THREE WORD HEADER
;       CONSISTING OF THE FOLLOWING DATA:
;
;               177777
;               000000
;               177777
;
;       FOLLOW THAT BY A SECTOR PULSE AND ONE THREE WORD
;       HEADER CONSISTING OF THE FOLLOWING DATA:
```

```
                                        000000
                                        177777
                                        000000

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


TEST 46 DATA FIELD FILLING ON WRITE HEADER

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

                                        125252
                                        052525
                                        125252
                                        052525
                                        125252
                                        052525

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


TEST 47 WRITE HEADER FOR 26 SECTORS

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


TEST 50 WRITE HEADER IN 24 SECTOR FORMAT

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

```
                                        **TYPE B INSTRUCTION ERRORS

                                                TEST 51 FORMAT ERROR (PART 1)

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


                                                TEST 52 FORMAT ERROR (PART 2)


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


                                                TEST 53 FAULT SETTING CONTROLLER ERROR

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

6.0 ERROR REPORTING

THE GENERAL FORMAT OF ERROR REPORTS IS:

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

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

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

THESE FIELDS (ALL VALUES GIVEN IN OCTAL) ARE:

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

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

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

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

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

```
                                %
                        .NLIST  CND,MD,MC,TOC
                        .LIST   ME
                        .ENABL  ABS,AMA
167400                  $SWR=   167400
000001                  $TN=    1
                        .TITLE  RK611 DISKLESS CONTROLLER DIAGNOSTIC: P3 MD-11-DZR6CA
                        ;*COPYRIGHT (C) 1976
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY ROY SPITZER
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C2), SEPT 14, 1976.
                        ;*
                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH                  USE
                        ;*      ------          --------------------
                        ;*        15            HALT ON ERROR
                        ;*        14            LOOP ON TEST
                        ;*        13            INHIBIT ERROR TYPEOUTS
                        ;*        12            ABORT PROGRAM AFTER 20 ERRORS
                        ;*        11            INHIBIT ITERATIONS
                        ;*        10            BELL ON ERROR
                        ;*         9            LOOP ON ERROR
                        ;*         8            LOOP ON TEST IN SWR<7:0>
                        .SBTTL  BASIC DEFINITIONS

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

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

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

```
                        000006          SP=     %6              ;;STACK POINTER
                        000007          PC=     %7              ;;PROGRAM COUNTER

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

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

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

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

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;"T" BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
000034                  TRAPVEC=34              ;;"TRAP" TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
                        .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
```

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

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

                        .SBTTL  RK611 CONTROLLER REGISTER DEFINITION

                        RKCS1=  0               ;CONTROL AND STATUS REGISTER 1
                        RKWC=   2               ;WORD COUNT REGISTER
                        RKBA=   4               ;BUS ADDRESS REGISTER
                        RKDA=   6               ;DESIRED TRACK SECTOR REGISTER
                        RKCS2=  10              ;CONTROL AND STATUS REGISTER 2
                        RKDS=   12              ;DRIVE STATUS REGISTER
                        RKER=   14              ;ERROR REGISTER
                        RKASOF= 16              ;ATTENTION SUMMARY AND OFFSET REGISTER
                        RKDCYL= 20              ;DESIRED CYLINDER REGISTER
                        RKDB=   24              ;DATA BUFFER
                        RKMR1=  26              ;MAINTENANCE REGISTER 1
                        RKMR2=  34              ;MAINTENANCE REGISTER 2
                        RKMR3=  36              ;MAINTENANCE REGISTER 3
                        RKECPS= 30              ;ECC POSITION INFORMATION
                        RKECPT= 32              ;ECC PATTERN INFORMATION
                        RKSPAR= 22              ;SPARE REGISTER

                        .SBTTL  DRIVE COMMANDS

                        SELDRV= 01              ;SELECT DRIVE
                        PACK=   03              ;PACK ACKNOWLEDGE
                        CLEAR=  05              ;DRIVE CLEAR
                        UNLOAD= 07              ;UNLOAD
                        SRTSPL= 11              ;START SPINDLE
                        RECAL=  13              ;RECALIBRATE
                        OFFSET= 15              ;OFFSET
                        SEEK=   17              ;SEEK
                        RDDATA= 21              ;READ DATA
                        WRDATA= 23              ;WRITE DATA
                        RDHEAD= 25              ;READ HEADER
                        WRHEAD= 27              ;WRITE HEADER AND DATA
                        WRTCHK= 31              ;WRITE CHECK
                        INTR=   300             ;GENERATE INTERRUPT TO CPU

                        .SBTTL  CONTROL AND STATUS REGISTER 1 BITS

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

```
                        CONTROL AND STATUS REGISTER 1 BITS

1087    002000          CDT=    BIT10           ;CONTROLLER DRIVE TYPE (0=RK06)
1088    004000          CTO=    BIT11           ;CONTROLLER TIMED OUT WAITING FOR
1089                                            ;  DRIVE RESPONSE
1090    010000          CFMT=   BIT12           ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
1091    020000          SPAR=   BIT13           ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
1092    040000          DI=     BIT14           ;DRIVE INTERRUPT
1093    100000          CERR=   BIT15           ;CONTROLLER ERROR
1094    100000          CCLR=   BIT15           ;CONTROLLER CLEAR
1095
1096                    .SBTTL  CONTROL AND STATUS REGISTER 2 BITS
1097
1098    000007          DRVMSK= 7               ;MASK FOR DRIVE SELECTION CODE
1099    000010          RLS=    BIT3            ;DESELECT OR RELEASE DRIVE IN BITS 0-2
1100    000020          BAI=    BIT4            ;BUS ADDRESS INCREMENT INHIBIT
1101    000040          SCLR=   BIT5            ;CLEAR CONTROLLER AND ALL DRIVES
1102    000100          IR=     BIT6            ;INPUT READY
1103    000200          OR=     BIT7            ;OUTPUT READY
1104    000400          UFE=    BIT8            ;UNIT FIELD ERROR
1105    001000          MDS=    BIT9            ;MULTIPLE DRIVE SELECT
1106    002000          PGE=    BIT10           ;PROGRAMMING ERROR
1107    004000          NEM=    BIT11           ;NON-EXISTENT MEMORY
1108    010000          NED=    BIT12           ;NON-EXISTENT DRIVE
1109    020000          UPE=    BIT13           ;UNIBUS PARITY ERROR
1110    040000          WCE=    BIT14           ;WRITE CHECK ERROR
1111    100000          DLT=    BIT15           ;DATA LATE ERROR
1112
1113                    .SBTTL  ERROR REGISTER BIT DEFINITION
1114
1115    000001          ILF=    BIT0            ;ILLEGAL FUNCTION CODE
1116    000002          SKI=    BIT1            ;SEEK INCOMPLETE
1117    000004          NXF=    BIT2            ;NON-EXECUTABLE DRIVE FUNCTION
1118    000010          DRPAR=  BIT3            ;DRIVE DETECTED DRIVE BUS PARITY ERROR
1119    000020          FMTE=   BIT4            ;FORMAT ERROR
1120    000040          DTYE=   BIT5            ;DRIVE TYPE ERROR
1121    000100          ECH=    BIT6            ;ECC HARD
1122    000200          BSE=    BIT7            ;BAD SECTOR ERROR
1123    000400          HVRC=   BIT8            ;HEADER VRC ERRROR
1124    001000          COE=    BIT9            ;CYLINDER ADDRESS OVERFLOW ERROR
1125    002000          IDAE=   BIT10           ;INVALID DISK ADDRESS ERROR
1126    004000          WLE=    BIT11           ;WRITE LOCK ERROR
1127    010000          DTE=    BIT12           ;DRIVE TIMING ERROR
1128    020000          OPI=    BIT13           ;OPERATION (SEARCH) INCOMPLETE
1129    040000          UNS=    BIT14           ;DRIVE UNSAFE
1130    100000          DCK=    BIT15           ;DATA CHECK
1131
1132                    .SBTTL  STATUS REGISTER BIT DEFINITION
1133
1134    000001          DRA=    BIT0            ;DRIVE AVAILABLE (CONTROLLER IS SET IF
1135                                            ;  THIS BIT IS RESET)
1136    000004          OFST=   BIT2            ;DRIVE OFFSET
1137    000010          ACLO=   BIT3            ;AC LOW
1138    000020          SPDLSS= BIT4            ;SPEED LOSS
1139    000040          DROT=   BIT5            ;DRIVE OFF TRACK
1140    000100          VV=     BIT6            ;VOLUME VALID
1141    000200          DRDY=   BIT7            ;DRIVE READY
1142    000400          DDT=    BIT8            ;DRIVE TYPE (0=RK06)
```

```
1143            004000                  WRL=    BIT11                   ;WRITE LOCK
1144            020000                  PIP=    BIT13                   ;POSITIONING IN PROGRESS
1145            040000                  DSC=    BIT14                   ;DRIVE STATUS CHANGE
1146            100000                  SVAL=   BIT15                   ;STATUS VALID
1147
1148                                    .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION
1149
1150            000017                  MESMSK= 17                      ;MESSAGE MASK
1151
1152            000020                  PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
1153            000040                  DMD=    BIT5                    ;DIAGNOSTIC MODE
1154            000100                  MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
1155            000200                  MIND=   BIT7                    ;MAINTENANCE INDEX
1156            000400                  MCLK=   BIT8                    ;MAINTENANCE CLOCK
1157            001000                  MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
1158            002000                  MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
1159            004000                  PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
1160            010000                  PCD=    BIT12                   ;PRECOMPENSATION DELAY
1161            020000                  ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
1162            040000                  WRTGAT= BIT14                   ;WRITE GATE
1163            100000                  RDGATE= BIT15                   ;READ GATE
1164
1165                                    .SBTTL  TRANSMITTED MESSAGE A
1166
1167            000020                  S.SEEK= BIT4                    ;SEEK COMMAND
1168            000040                  S.RECL= BIT5                    ;RECALIBRATE COMMAND
1169            000100                  S.STSP= BIT6                    ;START SPINDLE COMMAND
1170            000200                  S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
1171            000400                  S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
1172            001000                  S.FMT=  BIT9                    ;FORMAT
1173            002000                  S.UNLD= BIT10                   ;UNLOAD
1174            004000                  S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
1175                                    .SBTTL  TRAP CATCHER
1176
1177            000000                          .=0
1178                                    ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1179                                    ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1180                                    ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
1181            000174                          .=174
1182  000174   000000          DISPREG:  .WORD   0                       ;;SOFTWARE DISPLAY REGISTER
1183  000176   000C00          SWREG:    .WORD   0                       ;;SOFTWARE SWITCH REGISTER
1184                                    .SBTTL  STARTING ADDRESS(ES)
1185  000200   000137  003656          JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
1186  000204   000137  003646          JMP     RESTRT                  ;JUMP TO RESTART ROUTINE
1187            000214                  .=214
1188  000214   000137  003636          JMP     PARM                    ;JUMP TO OPERATOR ASSIGNED PARMETERS
1189                                    .SBTTL  ACT11 HOOKS
1190
1191                                    ;;*****************************************************************
1192                                    ;HOOKS REQUIRED BY ACT11
1193            000220                  $SVPC=.                         ;SAVE PC
1194            000046                  .=46
1195  000046   044662                  $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1196            000052                  .=52
1197  000052   000000                  .WORD   0                       ;;2)SET LOC.52 TO ZERO
1198            000220                  .=$SVPC                         ;; RESTORE PC
```

```
                 000114                  .=MEMVEC
       000114    046216                  MEMERR
       000116    000340                  PR7
                 001000                  .=1000
                                 .SBTTL  APT PARAMETER BLOCK

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

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

```
                                .SBTTL  COMMON TAGS

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

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

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

```
1281  001214                  $MAIL:                  ;;APT MAILBOX
1282  001214  000000          $MSGTY: .WORD   AMSGTY  ;;MESSAGE TYPE CODE
1283  001216  000000          $FATAL: .WORD   AFATAL  ;;FATAL ERROR NUMBER
1284  001220  000000          $TESTN: .WORD   ATESTN  ;;TEST NUMBER
1285  001222  000000          $PASS:  .WORD   APASS   ;;PASS COUNT
1286  001224  000000          $DEVCT: .WORD   ADEVCT  ;;DEVICE COUNT
1287  001226  000000          $UNIT:  .WORD   AUNIT   ;;I/O UNIT NUMBER
1288  001230  000000          $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
1289  001232  000000          $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
1290  001234                  $ETABLE:                ;;APT ENVIRONMENT TABLE
1291  001234     000          $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
1292  001235     000          $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
1293  001236  000000          $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
1294  001240  000000          $USWR:  .WORD   ALSWR   ;;USER SWITCHES
1295  001242  000000          $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
1296                          ;*                      BITS 15-11=CPU TYPE
1297                          ;*                           11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1298                          ;*                           11/70=06,PDQ=07,Q=10
1299                          ;*                      BIT 10=REAL TIME CLOCK
1300                          ;*                      BIT  9=FLOATING POINT PROCESSOR
1301                          ;*                      BIT  8=MEMORY MANAGEMENT
1302  001244     000          $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
1303  001245     000          $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
1304                          ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
1305                          ;*                           900 NSEC CORE=001
1306                          ;*                           300 NSEC BIPOLAR=002
1307                          ;*                           500 NSEC MOS=003
1308  001246  000000          $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
1309                          ;*                       MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1310  001250     000          $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
1311  001251     000          $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
1312  001252  000000          $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
1313  001254     000          $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
1314  001255     000          $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
1315  001256  000000          $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
1316  001260     000          $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
1317  001261     000          $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
1318  001262  000000          $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
1319  001264  120210          $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1320  001266  000000          $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1321  001270  177440          $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1322  001272  000000          $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
1323  001274  000000          $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
1324  001276  000000          $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
1325  001300                  $ETEND:
1326                          .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  057676                          EM200
001302  064055                          EM3000
001304  053136                          DT001
001306  053600                          DF001
                                ;       ERROR 2:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE A INCORRECT.
001310  057676                          EM200
001312  064120                          EM3001
001314  053136                          DT001
001316  053600                          DF001
                                ;       ERROR 3:  ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER
                                ;                 MESSAGE B INCORRECT.
001320  057676                          EM200
001322  064144                          EM3002
001324  053136                          DT001
001326  053600                          DF001
                                ;       ERROR 4:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 CS1 INCORRECT.
001330  057760                          EM201
001332  064055                          EM3000
001334  053136                          DT001
001336  053600                          DF001
                                ;       ERROR 5:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE A INCORRECT.
001340  057760                          EM201
001342  064120                          EM3001
001344  053136                          DT001
001346  053600                          DF001
                                ;       ERROR 6:  ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER
                                ;                 MESSAGE IS INCORRECT.
001350  057760                          EM201
001352  064144                          EM3002
001354  053136                          DT001
001356  053600                          DF001
                                ;       ERROR 7:  ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
                                ;                 CS1 INCORRECT
001360  060043                          EM202
001362  064055                          EM3000
001364  053136                          DT001
```

```
1383  001366  053600                    DF001
1384                            ;       ERROR 10: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1385                            ;                 MESSAGE A INCORRECT.
1386  001370  060043                    EM202
1387  001372  064120                    EM3001
1388  001374  053136                    DT001
1389  001376  053600                    DF001
1390                            ;       ERROR 11: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM READ HEADER
1391                            ;                 MESSAGE B INCORRECT.
1392  001400  060043                    EM202
1393  001402  064144                    EM3002
1394  001404  053136                    DT001
1395  001406  053600                    DF001
1396                            ;       ERROR 12: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1397                            ;                 CS1 INCORRECT.
1398  001410  060134                    EM203
1399  001412  064055                    EM3000
1400  001414  053136                    DT001
1401  001416  053600                    DF001
1402                            ;       ERROR 13: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1403                            ;                 MESSAGE A INCORRECT.
1404  001420  060134                    EM203
1405  001422  064120                    EM3001
1406  001424  053136                    DT001
1407  001426  053600                    DF001
1408                            ;       ERROR 14: ATTEMPTING TO CHECK DRIVE CLEAR MESSAGE FROM WRITE HEADER
1409                            ;                 MESSAGE B INCORRECT.
1410  001430  060134                    EM203
1411  001432  064144                    EM3002
1412  001434  053136                    DT001
1413  001436  053600                    DF001
1414                            ;       ERROR 15: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1415                            ;                 CS1 INCORRECT AFTER SENDING DRIVE CLEAR.
1416  001440  060226                    EM204
1417  001442  064170                    EM3003
1418  001444  053156                    DT015
1419  001446  053624                    DF015
1420                            ;       ERROR 16: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1421                            ;                 CS1 INCORRECT AFTER DATE SIMULATION.
1422  001450  060226                    EM204
1423  001452  064240                    EM3004
1424  001454  053156                    DT015
1425  001456  053624                    DF015
1426                            ;       ERROR 17: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1427                            ;                 MAINT REG. 1 INCORRECT DURING DATA SIMULATION (SECTOR PULSE)
1428  001460  060226                    EM204
1429  001462  064312                    EM3005
1430  001464  053166                    DT017
1431  001466  053650                    DF017
1432                            ;       ERROR 20: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
1433                            ;                 MAINT REG. 1 INCORRECT DURING DATA SIMULATION (INDEX PULSE)
1434  001470  060226                    EM204
1435  001472  064414                    EM3006
1436  001474  053166                    DT017
1437  001476  053650                    DF017
1438                            ;       ERROR 21: ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT
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1439                                    ;                       MAINT REG. 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1440  001500  060226                    ;       EM204
1441  001502  064515                    ;       EM3007
1442  001504  053166                    ;       DT017
1443  001506  053650                    ;       DF017
1444                                    ;       ERROR 22: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1445                                    ;                 CS1 INCORRECT AFTER SENDING DRIVE CLEAR
1446  001510  060314                    ;       EM205
1447  001512  064170                    ;       EM3003
1448  001514  053204                    ;       DT022
1449  001516  053674                    ;       DF022
1450                                    ;       ERROR 23: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1451                                    ;                 BUS ADD INCORRECT AFTER SENDING DRIVE CLEAR.
1452  001520  060314                    ;       EM205
1453  001522  064636                    ;       EM3008
1454  001524  053204                    ;       DT022
1455  001526  053674                    ;       DF022
1456                                    ;       ERROR 24: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1457                                    ;                 WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR
1458  001530  060314                    ;       EM205
1459  001532  064716                    ;       EM3009
1460  001534  053204                    ;       DT022
1461  001536  053674                    ;       DF022
1462                                    ;       ERROR 25: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1463                                    ;                 MAINT REG 1 INCORRECT DURING DATA SIMULATION (NO INDEX OR SECTOR)
1464  001540  060314                    ;       EM205
1465  001542  065214                    ;       EM3014
1466  001544  053224                    ;       DT025
1467  001546  053720                    ;       DF025
1468                                    ;       ERROR 26: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1469                                    ;                 CS1 CHANGED DURING COMMAND EXECUTION
1470  001550  060314                    ;       EM205
1471  001552  064775                    ;       EM3010
1472  001554  053204                    ;       DT022
1473  001556  053674                    ;       DF022
1474                                    ;       ERROR 27: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1475                                    ;                 BUS ADDRESS CHANGED BEFORE INDEX PULSE
1476  001560  060314                    ;       EM205
1477  001562  065042                    ;       EM3011
1478  001564  053204                    ;       DT022
1479  001566  053674                    ;       DF022
1480                                    ;       ERROR 30: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1481                                    ;                 WORD COUNT CHANGED BEFORE INDEX PULSE
1482  001570  060314                    ;       EM205
1483  001572  065111                    ;       EM3012
1484  001574  053204                    ;       DT022
1485  001576  053674                    ;       DF022
1486                                    ;       ERROR 31: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1487                                    ;                 CS1 CHANGED AFTER INDEX PULSE
1488  001600  060314                    ;       EM205
1489  001602  065157                    ;       EM3013
1490  001604  053236                    ;       DT031
1491  001606  053744                    ;       DF031
1492                                    ;       ERROR 32: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1493                                    ;                 BUS ADDRESS CHANGED AFTER INDEX PULSE.
1494  001610  060314                    ;       EM205
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1495  001612  065265                  EM3015
1496  001614  053236                  DT031
1497  001616  053744                  DF031
1498                          ;       ERROR 33: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1499                          ;                 WORD COUNT CHANGED AFTER INDEX PULSE
1500  001620  060314                  EM205
1501  001622  065333                  EM3016
1502  001624  053236                  DT031
1503  001626  053744                  DF031
1504                          ;       ERROR 34: ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT
1505                          ;                 MAINT REG 1 INCORRECT AFTER SECTOR PULSE
1506  001630  060314                  EM205
1507  001632  065713                  EM3025
1508  001634  053236                  DT031
1509  001636  053744                  DF031
1510                          ;       ERROR 35:  ATTEMPTING AN NPR READ OF ONE WORD
1511                          ;                  CS1 INCORRECT
1512  001640  060402                  EM206
1513  001642  064055                  EM3000
1514  001644  053262                  DT035
1515  001646  053770                  DF035
1516                          ;       ERROR 36:  ATTEMPTING AN NPR READ OF ONE WORD
1517                          ;                  CS2 INCORRECT
1518  001650  060402                  EM206
1519  001652  065400                  EM3018
1520  001654  053262                  DT035
1521  001656  053770                  DF035
1522                          ;       ERROR 37:  ATTEMPTING AN NPR READ OF ONE WORD
1523                          ;                  BUS ADDRESS INCORRECT
1524  001660  060402                  EM206
1525  001662  065444                  EM3019
1526  001664  053262                  DT035
1527  001666  053770                  DF035
1528                          ;       ERROR 40:  ATTEMPTING AN NPR READ OF ONE WORD
1529                          ;                  WORD COUNT REG INCORRECT
1530  001670  060402                  EM206
1531  001672  065472                  EM3020
1532  001674  053262                  DT035
1533  001676  053770                  DF035
1534                          ;       ERROR 41:  ATTEMPTING AN NPR READ OF ONE WORD
1535                          ;                  WORD READ INCORRECT
1536  001700  060402                  EM206
1537  001702  065523                  EM3021
1538  001704  053306                  DT041
1539  001706  054014                  DF041
1540                          ;       ERROR 42:  ATTEMPTING AN NPR READ OF ONE WORD
1541                          ;                  CS1 INCORRECT AFTER READING DATA BUFFER
1542  001710  060402                  EM206
1543  001712  065547                  EM3022
1544  001714  053316                  DT042
1545  001716  054040                  DF042
1546                          ;       ERROR 43:  ATTEMPTING AN NPR READ OF ONE WORD
1547                          ;                  CS2 INCORRECT AFTER READING DATA BUFFER
1548  001720  060402                  EM206
1549  001722  065617                  EM3023
1550  001724  053316                  DT042
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1551  001726  054040                    DF042
1552                          ;         ERROR 44:  ATTEMPTING AN NPR READ OF ONE WORD
1553                          ;                    CS1 INCORRECT
1554  001730  060445                    EM207
1555  001732  064055                    EM3000
1556  001734  053262                    DT035
1557  001736  053770                    DF035
1558                          ;         ERROR 45:  ATTEMPTING AN NPR READ
1559                          ;                    CS2 INCORRECT
1560  001740  060445                    EM207
1561  001742  065400                    EM3018
1562  001744  053262                    DT035
1563  001746  053770                    DF035
1564                          ;         ERROR 46:  ATTEMPTING AN NPR READ
1565                          ;                    BUS ADDRESS INCORRECT
1566  001750  060445                    EM207
1567  001752  065444                    EM3019
1568  001754  053262                    DT035
1569  001756  053770                    DF035
1570                          ;         ERROR 47:  ATTEMPTING AN NPR READ
1571                          ;                    WORD COUNT INCORRECT
1572  001760  060445                    EM207
1573  001762  065472                    EM3020
1574  001764  053262                    DT035
1575  001766  053770                    DF035
1576                          ;         ERROR 50:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1577                          ;                    CS1 INCORRECT
1578  001770  060474                    EM208
1579  001772  064055                    EM3000
1580  001774  053262                    DT035
1581  001776  053770                    DF035
1582                          ;         ERROR 51:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1583                          ;                    CS2 INCORRECT
1584  002000  060474                    EM208
1585  002002  065400                    EM3018
1586  002004  053262                    DT035
1587  002006  053770                    DF035
1588                          ;         ERROR 52:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1589                          ;                    BUS ADDRESS INCORRECT
1590  002010  060474                    EM208
1591  002012  065444                    EM3019
1592  002014  053262                    DT035
1593  002016  053770                    DF035
1594                          ;         ERROR 53:  ATTEMPTING NPR READ CHECKING ZERO DETECT
1595                          ;                    WORD COUNT INCORRECT
1596  002020  060474                    EM208
1597  002022  065472                    EM3020
1598  002024  053262                    DT035
1599  002026  053770                    DF035
1600                          ;         ERROR 54:  ATTEMPTING NPR READ
1601                          ;                    DATA BUFFER INCORRECT
1602  002030  060445                    EM207
1603  002032  065523                    EM3021
1604  002034  053332                    DT054
1605  002036  054064                    DF054
1606                          ;         ERROR 55:  ATTEMPTING NPR READ
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1607                                    ;                       CS1 INCORRECT AFTER READING DATA BUFFER
1608  002040  060445                    ;       EM207
1609  002042  065547                    ;       EM3022
1610  002044  053344                    ;       DT055
1611  002046  054110                    ;       DF055
1612                                    ;       ERROR 56:  ATTEMPTING NPR READ
1613                                    ;                  CS2 INCORRECT AFTER READING DATA BUFFER
1614  002050  060445                    ;       EM207
1615  002052  065617                    ;       EM3023
1616  002054  053344                    ;       DT055
1617  002056  054110                    ;       DF055
1618                                    ;       ERROR 57:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1619                                    ;                  INHIBIT CS1 INCORRECT
1620  002060  060545                    ;       EM209
1621  002062  064055                    ;       EM3000
1622  002064  053262                    ;       DT035
1623  002066  053770                    ;       DF035
1624                                    ;       ERROR 60:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1625                                    ;                  INHIBIT CS2 INCORRECT
1626  002070  060545                    ;       EM209
1627  002072  065400                    ;       EM3018
1628  002074  053262                    ;       DT035
1629  002076  053770                    ;       DF035
1630                                    ;       ERROR 61:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1631                                    ;                  INHIBIT BUS ADDRESS INCORRECT
1632  002100  060545                    ;       EM209
1633  002102  065444                    ;       EM3019
1634  002104  053262                    ;       DT035
1635  002106  053770                    ;       DF035
1636                                    ;       ERROR 62:  ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT
1637                                    ;                  INHIBIT WORD COUNT INCORRECT
1638  002110  060545                    ;       EM209
1639  002112  065472                    ;       EM3020
1640  002114  053262                    ;       DT035
1641  002116  053770                    ;       DF035
1642                                    ;       ERROR 63:  ATTEMPTING NPR READ WITH IBA TO CHECK ZERO
1643                                    ;                  DETECT-CS1 INCORRECT
1644  002120  060634                    ;       EM210
1645  002122  064055                    ;       EM3000
1646  002124  053262                    ;       DT035
1647  002126  053770                    ;       DF035
1648                                    ;       ERROR 64:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1649                                    ;                  DETECT-CS2 INCORRECT
1650  002130  060634                    ;       EM210
1651  002132  065400                    ;       EM3018
1652  002134  053262                    ;       DT035
1653  002136  053770                    ;       DF035
1654                                    ;       ERROR 65:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1655                                    ;                  DETECT-BUS ADDRESS INCORRECT
1656  002140  060634                    ;       EM210
1657  002142  065444                    ;       EM3019
1658  002144  053262                    ;       DT035
1659  002146  053770                    ;       DF035
1660                                    ;       ERROR 66:  ATTEMPTING NPR READ WITH BAI TO CHECK ZERO
1661                                    ;                  DETECT-WORD COUNT INCORRECT
1662  002150  060634                    ;       EM210
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1663  002152  065472                    EM3020
1664  002154  053262                    DT035
1665  002156  053770                    DF035
1666                          ;         ERROR 67:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1667                          ;                    INCREMENT-DATA BUFFER INCORRECT
1668  002160  060545                    EM209
1669  002162  065523                    EM3021
1670  002164  053332                    DT054
1671  002166  054064                    DF054
1672                          ;         ERROR 70:  ATTEMPTING NPR READ WITH BUS ADDRESS INHIBIT
1673                          ;                    INCREMENT-CS1 INCORRECT AFTER READING DATA BUFFER
1674  002170  060545                    EM209
1675  002172  065547                    EM3022
1676  002174  053344                    DT055
1677  002176  054110                    DF055
1678                          ;         ERROR 71:  ATTEMPTING NPR READ WITH ADDRESS BUFFER INHIBIT
1679                          ;                    INCREMENT-CS2 INCORRECT AFTER READING DATA BUFFER
1680  002200  060545                    EM209
1681  002202  065617                    EM3023
1682  002204  053344                    DT055
1683  002206  054110                    DF055
1684                          ;         ERROR 72:  ATTEMPTING TO FORCE NON-EXISTANT MEMORY
1685                          ;                    CS1 INCORRECT
1686  002210  060750                    EM211
1687  002212  064055                    EM3000
1688  002214  053362                    DT072
1689  002216  054134                    DF072
1690                          ;         ERROR 73:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1691                          ;                    CS2 INCORRECT
1692  002220  060750                    EM211
1693  002222  065400                    EM3018
1694  002224  053362                    DT072
1695  002226  054134                    DF072
1696                          ;         ERROR 74:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1697                          ;                    ERROR REG INCORRECT
1698  002230  060750                    EM211
1699  002232  065667                    EM3024
1700  002234  053362                    DT072
1701  002236  054134                    DF072
1702                          ;         ERROR 75:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1703                          ;                    BUS ADDRESS INCORRECT
1704  002240  060750                    EM211
1705  002242  065444                    EM3019
1706  002244  053362                    DT072
1707  002246  054134                    DF072
1708                          ;         ERROR 76:  ATTEMPTING TO FORCE NON-EXISTENT MEMORY
1709                          ;                    WORD COUNT INCORRECT
1710  002250  060750                    EM211
1711  002252  065472                    EM3020
1712  002254  053362                    DT072
1713  002256  054134                    DF072
1714                          ;         ERROR 77:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1715                          ;                    CS1 INCORRECT
1716  002260  061020                    EM212
1717  002262  064055                    EM3000
1718  002264  053412                    DT077
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1719  002266  054170                    DF077
1720                          ;         ERROR 100:  ATTEMPTING TO CLEAR NON-EXISTENT MEMORY
1721                          ;                     CS2 INCORRECT
1722  002270  061020                    EM212
1723  002272  065400                    EM3018
1724  002274  053412                    DT077
1725  002276  054170                    DF077
1726                          ;         ERROR 101: TESTING EXTENDED MEMORY ADDRESSING BITS
1727                          ;                     CS1 INCORRECT
1728  002300  061070                    EM213
1729  002302  064055                    EM3000
1730  002304  053262                    DT035
1731  002306  053770                    DF035
1732                          ;         ERROR 102: TESTING EXTENDED MEMORY ADDRESSING BITS
1733                          ;                     CS2 INCORRECT
1734  002310  061070                    EM213
1735  002312  065400                    EM3018
1736  002314  053262                    DT035
1737  002316  053770                    DF035
1738                          ;         ERROR 103: TESTING EXTENDED MEMORY ADDRESSING BITS
1739                          ;                     BUS ADDRESS INCORRECT
1740  002320  061070                    EM213
1741  002322  065444                    EM3019
1742  002324  053262                    DT035
1743  002326  053770                    DF035
1744                          ;         ERROR 104: TESTING EXTEND MEMORY ADDRESSING BITS
1745                          ;                     WORD COUNT INCORRECT
1746  002330  061070                    EM213
1747  002332  065472                    EM3020
1748  002334  053262                    DT035
1749  002336  053770                    DF035
1750                          ;         ERROR 105: TESTING EXTENDED MEMORY ADDRESSING BITS
1751                          ;                     DATA BUFFER INCORRECT
1752  002340  061070                    EM213
1753  002342  065523                    EM3021
1754  002344  053306                    DT041
1755  002346  054014                    DF041
1756                          ;         ERROR 106: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1757                          ;                     CS1 INCORRECT
1758  002350  061140                    EM214
1759  002352  064055                    EM3000
1760  002354  053362                    DT072
1761  002356  054134                    DF072
1762                          ;         ERROR 107: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1763                          ;                     CS2 INCORRECT
1764  002360  061140                    EM214
1765  002362  065400                    EM3018
1766  002364  053362                    DT072
1767  002366  054134                    DF072
1768                          ;         ERROR 110: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1769                          ;                     BUS ADDRESS INCORRECT
1770  002370  061140                    EM214
1771  002372  065444                    EM3019
1772  002374  053362                    DT072
1773  002376  054134                    DF072
1774                          ;         ERROR 111: ATEMPTING TO FORCE UNIBUS PARITY ERROR
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1775                                    ;               WORD COUNT INCORRECT
1776  002400  061140                    ;       EM214
1777  002402  065472                    ;       EM3020
1778  002404  053362                    ;       DT072
1779  002406  054134                    ;       DF072
1780                                    ;       ERROR 112: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1781                                    ;               CS1 INCORRECT
1782  002410  061210                    ;       EM215
1783  002412  064055                    ;       EM3000
1784  002414  053262                    ;       DT035
1785  002416  053770                    ;       DF035
1786                                    ;       ERROR 113: ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY
1787                                    ;               CS2 INCORRECT
1788  002420  061210                    ;       EM215
1789  002422  065400                    ;       EM3018
1790  002424  053262                    ;       DT035
1791  002426  053770                    ;       DF035
1792                                    ;       ERROR 114: ATTEMPTING NPR READ OR LOCATION PRIOR TO BAD PARITY
1793                                    ;               BUS ADDRESS INCORRECT
1794  002430  061210                    ;       EM215
1795  002432  065444                    ;       EM3019
1796  002434  053262                    ;       DT035
1797  002436  053770                    ;       DF035
1798                                    ;       ERROR 115: ATTEMPTING NPR READ  OF LOCATION PRIOR TO BAD PARITY
1799                                    ;               WORD COUNT INCORRECT
1800  002440  061210                    ;       EM215
1801  002442  065400                    ;       EM3018
1802  002444  053262                    ;       DT035
1803  002446  053770                    ;       DF035
1804                                    ;       ERROR 116: ATTEMPTING TO FORCE UNIBUS PARITY ERROR
1805                                    ;               ERROR REG INCORRECT
1806  002450  061140                    ;       EM214
1807  002452  065667                    ;       EM3024
1808  002454  053362                    ;       DT072
1809  002456  054134                    ;       DF072
1810                                    ;       ERROR 117: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1811                                    ;               CS1 INCORRECT
1812  002460  061274                    ;       EM216
1813  002462  064055                    ;       EM3000
1814  002464  053412                    ;       DT077
1815  002466  054170                    ;       DF077
1816                                    ;       ERROR 120: ATTEMPTING TO CLEAR UNIBUS PARITY ERROR
1817                                    ;               CS2 INCORRECT
1818  002470  061274                    ;       EM216
1819  002472  065400                    ;       EM3018
1820  002474  053412                    ;       DT077
1821  002476  054170                    ;       DF077
1822                                    ;       ERROR 121: ATTEMPTING 18 BIT NPR READ
1823                                    ;               CS1 INCORRECT
1824  002500  061344                    ;       EM217
1825  002502  064055                    ;       EM3000
1826  002504  053262                    ;       DT035
1827  002506  053770                    ;       DF035
1828                                    ;       ERROR 122: ATTEMPTING 18 BIT NPR READ
1829                                    ;               CS2 INCORRECT
1830  002510  061344                    ;       EM217
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1831  002512  065400                    EM3018
1832  002514  053262                    DT035
1833  002516  053770                    DF035
1834                          ;         ERROR 123: ATTEMPTING 18 BIT NPR READ
1835                          ;                    BUS ADDRESS INCORRECT
1836  002520  061344                    EM217
1837  002522  065444                    EM3019
1838  002524  053262                    DT035
1839  002526  053770                    DF035
1840                          ;         ERROR 124: ATTEMPTING 18 BIT NPR READ
1841                          ;                    WORD COUNT INCORRECT
1842  002530  061344                    EM217
1843  002532  065472                    EM3020
1844  002534  053262                    DT035
1845  002536  053770                    DF035
1846                          ;         ERROR 125: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1847                          ;                    CS1 INCORRECT
1848  002540  061377                    EM218
1849  002542  064055                    EM3000
1850  002544  053262                    DT035
1851  002546  053770                    DF035
1852                          ;         ERROR 126: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1853                          ;                    CS2 INCORRECT
1854  002550  061377                    EM218
1855  002552  065400                    EM3018
1856  002554  053262                    DT035
1857  002556  053770                    DF035
1858                          ;         ERROR 127: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1859                          ;                    BUS ADDRESS INCORRECT
1860  002560  061377                    EM218
1861  002562  065444                    EM3019
1862  002564  053262                    DT035
1863  002566  053770                    DF035
1864                          ;         ERROR 130: ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT
1865                          ;                    WORD COUNT INCORRECT
1866  002570  061377                    EM218
1867  002572  065472                    EM3020
1868  002574  053262                    DT035
1869  002576  053770                    DF035
1870                          ;         ERROR 131: ATTEMPTING 18 BIT NPR READ
1871                          ;                    DATA BUFFER INCORRECT
1872  002600  061344                    EM217
1873  002602  065523                    EM3021
1874  002604  053316                    DT042
1875  002606  054040                    DF042
1876                          ;         ERROR 132: ATTEMPTING 18 BIT NPR READ
1877                          ;                    CS1 INCORRECT AFTER READING DATA BUFFER
1878  002610  061344                    EM217
1879  002612  065547                    EM3022
1880  002614  053344                    DT055
1881  002616  054110                    DF055
1882                          ;         ERROR 133: ATTEMPTING 18 BIT NPR READ
1883                          ;                    CS2 INCORRECT AFTER READING DATA BUFFER
1884  002620  061344                    EM217
1885  002622  065617                    EM3023
1886  002624  053344                    DT055
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1887  002626  054110                    DF055
1888                            ;       ERROR 134: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1889                            ;                  CS1 INCORRECT
1890  002630  061457                    EM219
1891  002632  064055                    EM3000
1892  002634  053262                    DT035
1893  002636  053770                    DF035
1894                            ;       ERROR 135: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1895                            ;                  CS2 INCORRECT
1896  002640  061457                    EM219
1897  002642  065400                    EM3018
1898  002644  053262                    DT035
1899  002646  053770                    DF035
1900                            ;       ERROR 136: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1901                            ;                  BUS ADDRESS INCORRECT
1902  002650  061457                    EM219
1903  002652  065444                    EM3019
1904  002654  053262                    DT035
1905  002656  053770                    DF035
1906                            ;       ERROR 137: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1907                            ;                  WORD COUNT INCORRECT
1908  002660  061457                    EM219
1909  002662  065472                    EM3020
1910  002664  053262                    DT035
1911  002666  053770                    DF035
1912                            ;       ERROR 140: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1913                            ;                  CHECKING ZERO DETECT
1914                            ;                  CS1 INCORRECT
1915  002670  061537                    EM220
1916  002672  064055                    EM3000
1917  002674  053262                    DT035
1918  002676  053770                    DF035
1919                            ;       ERROR 141: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1920                            ;                  CHECKING ZERO DETECT
1921                            ;                  CS2 INCORRECT
1922  002700  061537                    EM220
1923  002702  065400                    EM3018
1924  002704  053262                    DT035
1925  002706  053770                    DF035
1926                            ;       ERROR 142: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1927                            ;                  CHECKING ZERO DETECT
1928                            ;                  BUS ADDRESS INCORRECT
1929  002710  061537                    EM220
1930  002712  065444                    EM3019
1931  002714  053262                    DT035
1932  002716  053770                    DF035
1933                            ;       ERROR 143: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1934                            ;                  CHECKING ZERO DETECT
1935                            ;                  WORD COUNT INCORRECT
1936  002720  061537                    EM220
1937  002722  065472                    EM3020
1938  002724  053262                    DT035
1939  002726  053770                    DF035
1940                            ;       ERROR 144: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1941                            ;                  DATA BUFFER INCORRECT
1942  002730  061457                    EM219
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1943  002732  065523                  EM3021
1944  002734  053306                  DT041
1945  002736  054314                  DF041
1946                          ;       ERROR 145: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1947                          ;            CS1 INCORRECT AFTER READING DATA BUFFER
1948  002740  061457                  EM219
1949  002742  065547                  EM3022
1950  002744  053412                  DT077
1951  002746  054170                  DF077
1952                          ;       ERROR 146: ATTEMPTING 18 BIT NPR READ WITH BIT 16(PA) SET
1953                          ;            CS2 INCORRECT AFTER READING DATA BUFFER
1954  002750  061457                  EM219
1955  002752  065617                  EM3023
1956  002754  053412                  DT077
1957  002756  054170                  DF077
1958                          ;       ERROR 147:  UNEXPECTED MEMORY PARITY ENABLE TRAP
1959  002760  057631                  EM000
1960  002762  055011                  DH000C
1961  002764  053132                  DT000
1962  002766  053574                  DF000
1963                          ;       ERROR 150: ATTEMPTING SIMULATION OF DATA IN READ HEADER
1964                          ;            CS1 INCORRECT
1965  002770  061616                  EM221
1966  002772  064055                  EM3000
1967  002774  053426                  DT150
1968  002776  054214                  DF150
1969                          ;       ERROR 151: ATTEMPTING READ HEADER IN MAINTANENCE MODE
1970                          ;            CS1 INCORRECT AFTER COMPLETION OF COMMAND
1971  003000  061673                  EM222
1972  003002  065763                  EM3026
1973  003004  053316                  DT042
1974  003006  054040                  DF042
1975                          ;       ERROR 152: ATTEMPTING READ HEADER IN MAINTANENCE MODE
1976                          ;            CS2 INCORRECT AFTER COMPLETION OF COMMAND
1977  003010  061673                  EM222
1978  003012  066032                  EM3027
1979  003014  053316                  DT042
1980  003016  054040                  DF042
1981                          ;       ERROR 153: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1982                          ;            CS1 INCORRECT AFTER UNLOADING DATA BUFFER
1983  003020  061746                  EM223
1984  003022  065547                  EM3022
1985  003024  053344                  DT055
1986  003026  054110                  DF055
1987                          ;       ERROR 154: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1988                          ;            CS2 INCORRECT AFTER UNLOADING DATA
1989  003030  061746                  EM223
1990  003032  065617                  EM3023
1991  003034  053344                  DT055
1992  003036  054110                  DF055
1993                          ;       ERROR 155: ATTEMPTING DATA BUFFER READ AFTER READ HEADER
1994                          ;            DATA READ INCORRECT
1995  003040  061746                  EM223
1996  003042  065523                  EM3021
1997  003044  053332                  DT054
1998  003046  054064                  DF054
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1999                                    ;       ERROR 156: ATTEMPTING SIMULATION OF DATA IN READ HEADER (20 BIT FORMAT,
2000                                    ;                  CS1 INCORRECT
2001  003050  062024                            EM224
2002  003052  064055                            EM3000
2003  003054  053426                            DT150
2004  003056  054214                            DF150
2005                                    ;       ERROR 157: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE/
2006                                    ;                  CS1 INCORRECT AFTER COMMAND COMPLETION
2007  003060  062121                            EM225
2008  003062  065763                            EM3026
2009  003064  053316                            DT042
2010  003066  054040                            DF042
2011                                    ;       ERROR 160: ATTEMPTING READ HEADER (20 BIT FORMAT) IN MAINT MODE
2012                                    ;                  CS2 INCORRECT AFTER COMPLETION OF COMMAND
2013  003070  062121                            EM225
2014  003072  066032                            EM3027
2015  003074  053316                            DT042
2016  003076  054040                            DF042
2017                                    ;       ERROR 161: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2018                                    ;                  CS1 INCORRECT AFTER UNLOADING DATA BUFFER
2019  003100  062206                            EM226
2020  003102  065547                            EM3022
2021  003104  053344                            DT055
2022  003106  054110                            DF055
2023                                    ;       ERROR 162: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2024                                    ;                  CS2 INCORRECT AFTER UNLOADING DATA BUFFER
2025  003110  062206                            EM226
2026  003112  065617                            EM3023
2027  003114  053344                            DT055
2028  003116  054110                            DF055
2029                                    ;       ERROR 163: ATTEMPTING DATA BUFFER READ AFTER 20 BIT READ HEADER
2030                                    ;                  DATA BUFFER INCORRECT
2031  003120  062206                            EM226
2032  003122  065523                            EM3021
2033  003124  053332                            DT054
2034  003126  054064                            DF054
2035                                    ;       ERROR 164: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2036                                    ;                  CS1 INCORRECT
2037  003130  062306                            EM227
2038  003132  064055                            EM3000
2039  003134  053442                            DT164
2040  003136  054240                            DF164
2041                                    ;       ERROR 165: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2042                                    ;                  CS2 INCORRECT
2043  003140  062306                            EM227
2044  003142  065400                            EM3018
2045  003144  053442                            DT164
2046  003146  054240                            DF164
2047                                    ;       ERROR 166: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2048                                    ;                  CS1 INCORRECT READING EMPTY SILO
2049  003150  062306                            EM227
2050  003152  066101                            EM3028
2051  003154  053442                            DT164
2052  003156  054240                            DF164
2053                                    ;       ERROR 167: ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER
2054                                    ;                  CS1 INCORRECT READING EMPTY SILO
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2055  003160  062306                          EM227
2056  003162  066153                          EM3029
2057  003164  053442                          DT164
2058  003166  054240                          DF164
2059                              ;           ERROR 170:  WRITE BIT ERRORS
2060  003170  000000              EMW:        0
2061  003172  000000                          0
2062  003174  053460                          DT170
2063  003176  054264                          DF170
2064                              ;           ERROR 171:  WRITE GATE NOT RESET WITH SECTOR PULSE
2065  003200  062522                          EM231
2066  003202  066217                          EM3030
2067  003204  053504                          DT171
2068  003206  054310                          DF171
2069                              ;           ERROR 172:  WRITE GATE NOT SET WITH SECTOR PULSE RESET
2070  003210  062644                          EM232
2071  003212  066217                          EM3030
2072  003214  053504                          DT171
2073  003216  054310                          DF171
2074                              ;           ERROR 173:  WRITE GATE NOT RESET WITH SECOND INDEX PULSE
2075  003220  063072                          EM235
2076  003222  066217                          EM3030
2077  003224  053504                          DT171
2078  003226  054310                          DF171
2079                              ;           ERROR 174:  CS1 INCORRECT AT END OF WRITE HEADER
2080  003230  063202                          EM236
2081  003232  064055                          EM3000
2082  003234  053156                          DT015
2083  003236  053624                          DF015
2084                              ;           ERROR 175: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2085                              ;           CS1 INCORRECT
2086  003240  063552                          EM241
2087  003242  064055                          EM3000
2088  003244  053514                          DT175
2089  003246  054334                          DF175
2090                              ;           ERROR 176: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2091                              ;           CS2 INCORRECT
2092  003250  063552                          EM241
2093  003252  065400                          EM3018
2094  003254  053514                          DT175
2095  003256  054334                          DF175
2096                              ;           ERROR 177: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2097                              ;           DRIVE STATUS REG INCORRECT
2098  003260  063552                          EM241
2099  003262  066245                          EM3031
2100  003264  053514                          DT175
2101  003266  054334                          DF175
2102                              ;           ERROR 200: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26)
2103                              ;           ERROR REG INCORRECT
2104  003270  063552                          EM241
2105  003272  066300                          EM3032
2106  003274  053514                          DT175
2107  003276  054334                          DF175
2108                              ;           ERROR 201: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
2109                              ;           CS1 INCORRECT
2110  003300  063636                          EM242
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002111  003302  064055                    EM3000
002112  003304  053514                    DT175
002113  003306  054334                    DF175
002114                          ;         ERROR 202: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
002115                          ;         CS2 INCORRECT
002116  003310  063636                    EM242
002117  003312  065400                    EM3018
002118  003314  053514                    DT175
002119  003316  054334                    DF175
002120                          ;         ERROR 203: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
002121                          ;         DRIVE STATUS REG INCORRECT
002122  003320  063636                    EM242
002123  003322  066245                    EM3031
002124  003324  053514                    DT175
002125  003326  054334                    DF175
002126                          ;         ERROR 204: ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24)
002127                          ;         ERROR REGISTER INCORRECT
002128  003330  063636                    EM242
002129  003332  066300                    EM3032
002130  003334  053514                    DT175
002131  003336  054334                    DF175
002132                          ;         ERROR 205:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
002133                          ;         CS1 INCORRECT
002134  003340  063722                    EM243
002135  003342  064055                    EM3000
002136  003344  053514                    DT175
002137  003346  054334                    DF175
002138                          ;         ERROR 206:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
002139                          ;         CS2 INCORRECT
002140  003350  063722                    EM243
002141  003352  065400                    EM3018
002142  003354  053514                    DT175
002143  003356  054334                    DF175
002144                          ;         ERROR 207:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
002145                          ;         DRIVE STATUS REG INCORRECT
002146  003360  063722                    EM243
002147  003362  066245                    EM3031
002148  003364  053514                    DT175
002149  003366  054334                    DF175
002150                          ;         ERROR 210:  ATTEMPTING TO CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS
002151                          ;         ERROR REG INCORRECT
002152  003370  063722                    EM243
002153  003372  066300                    EM3032
002154  003374  053514                    DT175
002155  003376  054334                    DF175
002156                          ;         ERROR 211:  ATTEMPTING TO CLEAR CONTROLLER ERROR
002157                          ;         CS1 INCORRECT
002158  003400  064023                    EM244
002159  003402  064055                    EM3000
002160  003404  053540                    DT211
002161  003406  054360                    DF211
002162                          ;         ERROR 212:  ATTEMPTING TO CLEAR CONTROLLER ERROR
002163                          ;         CS2 INCORRECT
002164  003410  064023                    EM244
002165  003412  065400                    EM3018
002166  003414  053540                    DT211
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2167  003416  054360                    DF211
2168                            ;       ERROR 213:  ATTEMPTING TO CLEAR CONTROLLER
2169                            ;       DRIVE STATUS REG INCORRECT
2170  003420  064023                    EM244
2171  003422  066245                    EM3031
2172  003424  053540                    DT211
2173  003426  054360                    DF211
2174                            ;       ERROR 214: ATTEMPTINT TO CLEAR CONTROLLER
2175                            ;       ERROR REG INCORRECT
2176  003430  064023                    EM244
2177  003432  066300                    EM3032
2178  003434  053540                    DT211
2179  003436  054360                    DF211
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                                .SBTTL  TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER

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

                                .SBTTL  EXPECTED RK611 CONTROLLER REGISTERS

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

                                .SBTTL  PREVIOUS RK611 CONTROLLER REGISTERS

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

```
                                .SBTTL  PROGRAM DEFINED VARIABLES

        003600  000210          RKVEC:  .WORD   210             ;RK611 VECTOR
        003602  000240          RKPRI:  .WORD   PR5             ;RK611 PRIORITY
        003604  000000          TRAPPC: .WORD   0               ;PC FOR MEMORY CHECK ENABLE TRAP
        003606  000000          SRTFLG: .WORD   0               ;START FLAG
                                                                ;  0 = 200
                                                                ;  1 = 214
                                                                ; -1 = 204
        003610  000000          ERRCNT: .WORD   0               ;ERROR COUNT FOR SWITCH 12 ABORT
        003612  000000          P1.BIT: .WORD   0               ;NEXT BIT IN DATA SIMULATION
        003614  000000          PR.BIT: .WORD   0               ;PRESENT BIT IN DATA SIMULATION
        003616  000000          M1.BIT: .WORD   0               ;PREVIOUS BIT IN DATA SIMULATION
        003620  000000          M2.BIT: .WORD   0               ;BIT BEFORE PREVIOUS BIT
        003622  000000          BITCNT: .WORD   0               ;BIT POSITION
        003624  000000          WRDCNT: .WORD   0               ;WORD COUNT FOR NPR TRANSFER
        003626  000000          SECCNT: .WORD   0               ;SECTOR COUNT
        003630  000000          MEMPAR: .WORD   0               ;MEMORY ENABLE ON FIRST 24K
        003632  000015          WAITIM: .WORD   15              ;WAIT TIME FOR CONTROLLER READY
        003634  000000          SAVSWR: .WORD   0               ;STORAGE FOR SWITCH REGISTER
```

```
                                        .SBTTL  PROGRAM SETUP

003636  012737  000001  003606  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
003644  000406                  RESTRT: BR      START1
                                        MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
003646  012737  177777  003606          BR      START1
003654  000402
                                START:  CLR     SRTFLG          ;CLEAR START FLAG
003656  005037  003606          START1: RESET                   ;RESET THE WHOLE SYSTEM
003662  000005                          MOV     #STACK,SP       ;INITIALIZE STACK POINTER
003664  012706  001100                  JSR     PC,$TKINT       ;INIT KEYBOARD
003670  004737  051224                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
003674  012746  000340                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
003700  012746  003706                  RTI                     ;LOAD PSW
003704  000002
                                1$:
003706                          .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
003706  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
003712  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
003714  022706  001140                  CMP     #SWR,R6 ;;DONE?
003720  001374                          BNE     .-6             ;;LOOP BACK IF NO
003722  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
003726  012737  046566  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
003734  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
003742  012737  047520  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
003750  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
003756  012737  053042  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
003764  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
003772  012737  052706  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
004000  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
004006  013737  044526  044520          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
004014  005037  001200                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
004020  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
004024  112737  000001  001115          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
004032  012737  004032  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
004040  012737  004040  001110          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                                ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                                ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
004046  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
004052  012737  004106  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
004060  012737  177570  001140          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
004066  012737  177570  001142          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
004074  022777  177777  175036          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
004102  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
004104  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
004106  012716  004114          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
004112  000002                          RTI
004114  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
004122  012737  000174  001142          MOV     #DISPREG,DISPLAY
004130  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

004134  005037  001222                  CLR     $PASS           ;;CLEAR PASS COUNT
```

```
2312  004140  132737  000200  001235          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
2313  004146  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
2314  004150  012737  001236  001140          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
2315  004156                          67$:
2316  004156  005037  003610                  CLR     ERRCNT          ;CLEAR ERROR COUNT FOR SWITCH 12 ABORT
2317                                  .SBTTL  TYPE PROGRAM NAME
2318                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
2319  004162  005227  177777                  INC     #-1             ;;FIRST TIME?
2320  004166  001063                          BNE     68$             ;;BRANCH IF NO
2321  004170  022737  044662  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
2322  004176  001457                          BEQ     68$             ;;BRANCH IF YES
2323  004200  104401  004246                  TYPE    ,69$            ;;TYPE ASCIZ STRING
2324                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
2325  004204  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
2326  004210  001012                          BNE     70$             ;;BRANCH IF YES
2327  004212  123727  001234  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
2328  004220  001406                          BEQ     70$             ;;BRANCH IF YES
2329  004222  023727  001140  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
2330  004230  001005                          BNE     71$             ;;BRANCH IF NO
2331  004232  104406                          GTSWR                   ;;GET SOFT-SWR SETTINGS
2332  004234  000403                          BR      71$
2333  004236  112737  000001  001134  70$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
2334  004244                          71$:
2335  004244  000434                          BR      68$             ;;GET OVER THE ASCIZ
2336                                  ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 3  MAINDEC-11-DZR6CA/<CRLF>
2337  004336                          68$:
2338  004336  005227  177777                  INC     #-1             ;TEST IF FIRST PASS
2339  004342  001002                          BNE     6$              ;NO - SKIP
2340  004344  104401  054526                  TYPE    ,OPR006         ;TYPE RUN TIME MESSAGE
2341  004350  022737  000001  003606  6$:     CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
2342  004356  001122                          BNE     15$             ;NO, CONTINUE SETUP
2343  004360  104401  054414          5$:     TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (  ) ="
2344  004364  013746  001270                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
2345  004370  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2346  004372  104401  054446                  TYPE    ,OPR002
2347  004376  104412                          RDOCT                   ;GET VALUE
2348  004400  012637  001160                  MOV     (SP)+,$TMPO
2349  004404  001407                          BEQ     7$              ;CHECK IF <CR>
2350  004406  022737  160000  001160          CMP     #160000,$TMPO   ;CHECK IF IN I/O PAGE
2351  004414  101361                          BHI     5$
2352  004416  013737  001160  001270          MOV     $TMPO,$BASE     ;LOAD NEW BUS ADDRESS
2353  004424  104401  054454          7$:     TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (  ) ="
2354  004430  013746  001264                  MOV     $VECT1,-(SP)    ;TYPE OUT VECTOR ADDRESS
2355  004434  042716  160000                  BIC     #160000,(SP)
2356  004440  104402                          TYPOC
2357  004442  104401  054446                  TYPE    ,OPR002
2358  004446  104412                          RDOCT                   ;GET VALUE
2359  004450  012637  001160                  MOV     (SP)+,$TMPO
2360  004454  001412                          BEQ     10$             ;CHECK IF <CR>
2361  004456  022737  001000  001160          CMP     #1000,$TMPO     ;CHECK IF LEGAL
2362  004464  101757                          BLOS    7$
2363  004466  042737  017777  001264          BIC     #17777,$VECT1   ;LOAD NEW VECTOR ADDRESS
2364  004474  053737  001160  001264          BIS     $TMPO,$VECT1
2365  004502  104401  054504          10$:    TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (  ) ="
2366  004506  005046                          CLR     -(SP)
2367  004510  113716  001265                  MOVB    $VECT1+1,(SP)
```

```
2368  004514  006216                        ASR     (SP)            ;SHIFT 5 BITS RIGHT
2369  004516  006216                        ASR     (SP)
2370  004520  006216                        ASR     (SP)
2371  004522  006216                        ASR     (SP)
2372  004524  006216                        ASR     (SP)
2373  004526  104402                        TYPOC
2374  004530  104401  054446                TYPE    ,OPR002
2375  004534  104412                        RDOCT                   ;GET VALUE
2376  004536  012637  001160                MOV     (SP)+,$TMP0
2377  004542  001430                        BEQ     15$             ;CHECK FOR DEFAULT
2378  004544  022737  000007  001160        CMP     #7,$TMP0        ;CHECK IF LEGAL
2379  004552  103753                        BLO     10$
2380  004554  022737  000004  001160        CMP     #4,$TMP0
2381  004562  101347                        BHI     10$
2382  004564  006337  001160                ASL     $TMP0           ;SHIFT 5 BITS LEFT
2383  004570  006337  001160                ASL     $TMP0
2384  004574  006337  001160                ASL     $TMP0
2385  004600  006337  001160                ASL     $TMP0
2386  004604  006337  001160                ASL     $TMP0
2387  004610  042737  160000  001264        BIC     #160000,$VECT1  ;STORE NEW PRIORITY
2388  004616  153737  001160  001265        BISB    $TMP0,$VECT1+1
2389  004624  013737  001264  003600  15$:   MOV     $VECT1,RKVEC    ;STORE RK611 VECTOR
2390  004632  042737  160000  003600        BIC     #160000,RKVEC
2391  004640  113737  001265  003602        MOVB    $VECT1+1,RKPRI  ;STORE PRIORITY
2392  004646  004737  046260                JSR     PC,$SIZE        ;SIZE MEMORY
2393  004652  013702  001270                MOV     $BASE,R2        ;SET RK611 BASE
2394  004656  005037  001202                CLR     $ESCAPE         ;CLEAR ESCAPE
2395
2396  004662  004737  045002  NEWPAS: JSR     PC,PARCHK       ;CHECK OF MEMORY CHECK ENABLE
2397  004666  012746  000000                MOV     #PR0,-(SP)      ;ALLOW ALL INTERRUPTS
2398  004672  012746  004700                MOV     #TST1,-(SP)
2399  004676  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.
                                        ;*
                                        ;;*****************************************************************
004700  000004                          TST1:   SCOPE
004702  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
004710  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
004714  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
004722  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
004730  012762  001777  000020                  MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
004736  012762  003400  000006                  MOV     #3400,RKDA(R2)  ;LOAD TRACK
004744  012762  000007  000010                  MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
004752  012762  012025  000000                  MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE RDHEAD WITH CDT SET IN
                                                                        ;  24 SECTOR FORMAT
004760  012700  000016                          MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
004764  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
004772  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
005000  005300                                  DEC     R0
005002  001370                                  BNE     1$
005004  016237  000000  003440                  MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
005012  016237  000034  003466                  MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
005020  016237  000036  003470                  MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
005026  012737  012025  003500                  MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
005034  012737  071027  003526                  MOV     #S.SEEK!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
005042  012737  037760  003530                  MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
005050  023737  003500  003440                  CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
005056  001405                                  BEQ     2$              ;YES, CHECK MESSAGE A
005060  104001                                  ERROR   1               ;CS1 INCORRECT
005062  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005070  000412                                  BR      TST2            ;;GO TO NEXT TEST
005072  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
005100  001401                                  BEQ     3$              ;YES, CHECK MESSAGE B
005102  104002                                  ERROR   2               ;MESS A INCORRECT
005104  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
005112  001401                                  BEQ     TST2            ;;YES, GO ON TO NEXT TEST
005114  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,
```

```
2456                                    ;*      CYLINDER 1777, HEAD 7, DRIVE 7.
2457                                    ;*
2458                                    ;;*****************************************************************
2459  005116  000004                    TST2:   SCOPE
2460  005120  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2461  005126  013702  001270            .       MOV     $BASE,R2        ;LOAD RK611 BASE
2462  005132  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2463  005140  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2464  005146  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2465  005154  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2466  005162  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUM.
2467  005170  012762  012027  000000            MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE WRHEAD WITH CDT SET IN
2468                                                                    ;  24 SECTOR FORMAT
2469  005176  012700  000016                    MOV     #3*4+2,R0       ;CLOCK IN DRIVE MESSAGE
2470  005202  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)
2471  005210  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2472  005216  005300                            DEC     R0
2473  005220  001370                            BNE     1$
2474  005222  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
2475  005230  016237  000034  003466            MOV     RKMR2(R2),T.MR2 ;STORE MAINT REG. 2 (MESS A)
2476  005236  016237  000036  003470            MOV     RKMR3(R2),T.MR3 ;STORE MAINT REG. 3 (MESS B)
2477  005244  012737  012027  003500            MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2478  005252  012737  071227  003526            MOV     #S.SEEK!S.RTC!S.FMT!70007,E.MR2  ;LOAD EXPECTED MR2
2479  005260  012737  037760  003530            MOV     #37760,E.MR3    ;LOAD EXPECTED MR3
2480  005266  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2481  005274  001405                            BEQ     2$              ;YES, CHECK MESSAGE A
2482  005276  104004                            ERROR   4               ;CS1 INCORRECT
2483  005300  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2484  005306  000412                            BR      TST3            ;;GO TO NEXT TEST
2485  005310  023737  003526  003466  2$:      CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2486  005316  001401                            BEQ     3$              ;YES, CHECK MESSAGE B
2487  005320  104005                            ERROR   5               ;MESS A INCORRECT
2488  005322  023737  003530  003470  3$:      CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2489  005330  001401                            BEQ     TST3            ;;YES, GO ON TO NEXT TEST
2490  005332  104006                            ERROR   6               ;MESS B INCORRECT
2491
2492                                    ;;*****************************************************************
2493                                    ;*TEST 3        READ HEADER DRIVE CLEAR MESSAGE
2494                                    ;*
2495                                    ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2496                                    ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER WITH CDT SET
2497                                    ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2498                                    ;*      CLOCK SEEK MESSAGE AND MAKE SURE A DRIVE CLEAR IS
2499                                    ;*      GENERATED AND THE PROPER BITS ARE SET.
2500                                    ;*
2501                                    ;;*****************************************************************
2502  005334  000004                    TST3:   SCOPE
2503  005336  012737  000144  001200            MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2504  005344  013702  001270            .       MOV     $BASE,R2        ;LOAD RK611 BASE
2505  005350  012762  100000  000000            MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2506  005356  012762  000040  000026            MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2507  005364  012762  001777  000020            MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2508  005372  012762  003400  000006            MOV     #3400,RKDA(R2)  ;LOAD TRACK
2509  005400  012762  000007  000010            MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2510  005406  012762  012025  000000            MOV     #CDT!CFMT!RDHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2511                                                                    ;  24 SECTOR FORMAT
```

```
2512  005414  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2513  005420  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2514  005426  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2515  005434  005300                          DEC     R0
2516  005436  001370                          BNE     1$
2517  005440  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2518  005446  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2519  005454  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2520  005462  012737  012025  003500          MOV     #CDT!CFMT!RDHEAD,E.CS1  ;LOAD EXPECTED CS1
2521  005470  012737  071407  003526          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2522  005476  005037  003530                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2523  005502  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
2524  005510  001405                          BEQ     2$              ;YES, CHECK CS2
2525  005512  104007                          ERROR   7               ;CS1 INCORRECT
2526  005514  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2527  005522  000412                          BR      TST4            ;;GO TO NEXT TEST
2528  005524  023737  003526  003466  2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
2529  005532  001401                          BEQ     3$              ;YES, CHECK MESS B
2530  005534  104010                          ERROR   10              ;MESS A INCORRECT
2531  005536  023737  003530  003470  3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
2532  005544  001401                          BEQ     TST4            ;;YES, GO ON TO NEXT TEST
2533  005546  104011                          ERROR   11              ;MESS B INCORRECT
2534
2535                                  ;;*****************************************************************
2536                                  ;*TEST 4        WRITE HEADER DRIVE CLEAR MESSAGE
2537                                  ;*
2538                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR. PUT CONTROLLER
2539                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER WITH CDT SET
2540                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 1777, HEAD 7, DRIVE 7.
2541                                  ;*      CLOCK SEEK MESSAGE AND LOAD GENERATED DRIVE CLEAR
2542                                  ;*      INTO SHIFT REGISTER.  MAKE SURE THE DRIVE CLEAR IS
2543                                  ;*      GENERATED AND THE PROPER BITS ARE SET.
2544                                  ;*
2545                                  ;*****************************************************************
2546  005550  000004                  TST4:   SCOPE
2547  005552  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
2548  005560  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2549  005564  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2550  005572  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2551  005600  012762  001777  000020          MOV     #1777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS REG.
2552  005606  012762  003400  000006          MOV     #3400,RKDA(R2)  ;LOAD TRACK
2553  005614  012762  000007  000010          MOV     #7,RKCS2(R2)    ;LOAD DRIVE NUMBER
2554  005622  012762  012027  000000          MOV     #CDT!CFMT!WRHEAD,RKCS1(R2)  ;ISSUE COMMAND WITH CDT SET IN
2555                                                                  ;  24 SECTOR FORMAT
2556  005630  012700  000156                  MOV     #27.*4+2,R0     ;LOAD COUNT TO LOAD DRIVE CLEAR
2557  005634  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2558  005642  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2559  005650  005300                          DEC     R0
2560  005652  001370                          BNE     1$
2561  005654  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2562  005662  016237  000034  003466          MOV     RKMR2(R2),T.MR2 ;STORE MAINT. REG. 2 (MESS A)
2563  005670  016237  000036  003470          MOV     RKMR3(R2),T.MR3 ;STORE MAINT. REG. 3 (MESS B)
2564  005676  012737  012027  003500          MOV     #CDT!CFMT!WRHEAD,E.CS1  ;LOAD EXPECTED CS1
2565  005704  012737  071407  003526          MOV     #S.CLR!S.FMT!70007,E.MR2  ;LOAD EXPECTED MAINT REG. 2
2566  005712  005037  003530                  CLR     E.MR3           ;LOAD EXPECTED MAINT REG.
2567  005716  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
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                                BEQ     2$              ;YES, CHECK CS2
                                ERROR   12              ;CSI INCORRECT
                                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
                                BR      TST5            ;;GO TO NEXT TEST
                        2$:     CMP     E.MR2,T.MR2     ;CHECK MESS A CORRECT
                                BEQ     3$              ;YES, CHECK MESS B
                                ERROR   13              ;MESS A INCORRECT
                        3$:     CMP     E.MR3,T.MR3     ;CHECK MESS B CORRECT
                                BEQ     TST5            ;;YES, GO ON TO NEXT TEST
                                ERROR   14              ;MESS B INCORRECT


                        .SBTTL  **INDEX AND SECTOR PULSE DETECT ON

                        ;;*****************************************************************
                        ;*TEST 5        SECTOR PULSE DETECT IN READ HEADER (PART 1)
                        ;*
                        ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                        ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
                        ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
                        ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
                        ;*      SIMULATE SECTOR PULSE, 255 ZEROES AND A ONE.
                        ;*
                        ;*      MAKE SURE READ GATE DOES SET.
                        ;*
                        ;;*****************************************************************
005764  000004         TST5:   SCOPE
005766  012737  000012  001200        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
005774  013702  001270        MOV     $BASE,R2        ;LOAD RK611 BASE
006000  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006006  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
006014  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
006022  012762  000040  000026        MOV     #DMD,RKMR1(R2)
006030  012762  000025  000000        MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
006036  012700  000312        MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
006042  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
006050  012762  000040  000026        MOV     #DMD,RKMR1(R2)
006056  005300        DEC     R0
006060  001370        BNE     1$
006062  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
006070  012737  000025  003500        MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
006076  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
006104  001405        BEQ     2$              ;YES, CLOCK ZEROES
006106  104015        ERROR   15              ;CSI INCORRECT
006110  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006116  000553        BR      TST6            ;;GO ON TO NEXT TEST

006120  012762  000140  000026  2$:   MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
006126  012762  000040  000026        MOV     #DMD,RKMR1(R2)
006134  012737  022040  003524        MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECT MAINT REG. 1
006142  005037  003622        CLR     BITCNT          ;INITIALIZE BIT COUNT
006146  005037  003614        CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
006152  005037  003616        CLR     M1.BIT          ;  BITS TO GENERATE ZEROES
006156  012700  000200        MOV     #128.,R0        ;GENERATE 128 ZEROS UNTIL READ GATE
006162  004737  046106  5$:   JSR     PC,RDBIT        ;READ A ZERO
006166  016237  000026  003464        MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
```

```
2624  006174  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2625  006202  001405                          BEQ     6$              ;YES, SIMULATE NEXT BIT
2626  006204  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2627  006206  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2628  006214  000514                          BR      TST6            ;;GO ON TO NEXT TEST
2629
2630  006216  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2631  006222  005300                          DEC     R0              ;CHECK READY OF READ GATE
2632  006224  001356                          BNE     5$              ;NO, CONTINUE
2633  006226  012737  122040  003524          MOV     #DMD!MEWD!ECCW!RDGATE,E.MR1  ;LOAD EXPECTED MR1
2634  006234  012700  000177                  MOV     #127.,R0        ;GENERATE 127 ZEROS
2635  006240  004737  046106          10$:    JSR     PC,RDBIT        ;READ A ZERO
2636  006244  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2637  006252  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2638  006260  001405                          BEQ     11$             ;YES, SIMULATE NEXT BIT
2639  006262  104017                          ERROR   17              ;MAINT REG. 1 INCORRECT
2640  006264  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2641  006272  000465                          BR      TST6            ;;GO ON TO NEXT TEST
2642
2643  006274  005237  003622          11$:    INC     BITCNT          ;INCREMENT BIT COUNT
2644  006300  005300                          DEC     R0              ;CHECK IF ALL ZEROS ISSUED
2645  006302  001356                          BNE     10$             ;NO, CONTINUE
2646  006304  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2647  006312  004737  046106                  JSR     PC,RDBIT        ;READ A ONE
2648  006316  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2649  006324  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1
2650  006332  001405                          BEQ     12$             ;YES, CONTINUE
2651  006334  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2652  006336  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2653  006344  000440                          BR      TST6            ;;GO ON TO NEXT TEST
2654  006346  005237  003622          12$:    INC     BITCNT          ;INCREMENT BIT COUNT
2655  006352  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2656  006360  005037  003614                  CLR     PR.BIT
2657  006364  004737  046106                  JSR     PC,RDBIT        ;SIMULATE ZERO
2658  006370  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2659  006376  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2660  006404  001405                          BEQ     13$             ;CHECK CS1 CORRECT
2661  006406  104017                          ERROR   17              ;MAINTENANCE REG. 1 INCORRECT
2662  006410  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2663  006416  000413                          BR      TST6            ;;GO TO NEXT TEST
2664
2665  006420  016237  000000  003440  13$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2666  006426  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2667  006434  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2668  006442  001401                          BEQ     TST6            ;;YES, GO TO NEXT TEST
2669  006444  104016                          ERROR   16              ;CS1 INCORRECT
2670
2671                          ;;*****************************************************************
2672                          ;*TEST 6        SECTOR PULSE DETECT IN READ HEADER (PART 2)
2673                          ;*
2674                          ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2675                          ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2676                          ;*      IN 26 SECTOR MODE, CYLINDER 0, HEAD 0, DRIVE 0.
2677                          ;*      CLOCK BOTH SEEK ANY DRIVE CLEAR MESSAGES.
2678                          ;*      SIMULATE INDEX PULSE, 255 ZEROES AND A ONE.
2679                          ;*
```

```
                                                ;*      SECTOR PULSE DETECT IN READ HEADER (PART 2)
                                                ;*
                                                ;*      MAKE SURE READ GATE DOES NOT SET.
                                                ;*
                                                ;;*****************************************************************
006446  000004                                TSTE:   SCOPE
006450  012737  000012  001200                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
006456  013702  001270                                MOV     $BASE,R2        ;LOAD RK611 BASE
006462  012762  100000  000000                        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006470  012762  000040  000000                        MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
006476  012762  000140  000026                        MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
006504  012762  000040  000026                        MOV     #DMD,RKMR1(R2)
006512  012762  000025  000000                        MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
006520  012700  000312                                MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
006524  012762  000440  000026              1$:       MOV     #DMD!MCLK,RKMR1(R2)
006532  012762  000040  000026                        MOV     #DMD,RKMR1(R2)
006540  005300                                        DEC     R0
006542  001370                                        BNE     1$
006544  016237  000000  003440                        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
006552  012737  000025  003500                        MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
006560  023737  003500  003440                        CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 COPRECT
006566  001405                                        BEQ     2$              ;YES, CLOCK IN ZEROS
006570  104015                                        ERROR   15
006572  012762  100000  000000                        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006600  000535                                        BR      TST7            ;;GO ON TO NEXT TEST
006602                                        2$:
006602  012762  000240  000026                        MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDX PULSE
006610  012700  000004                                MOV     #4,R0
006614  012762  000640  000026              3$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
006622  012762  000240  000026                        MOV     #DMD!MIND,RKMR1(R2)
006630  005300                                        DEC     R0
006632  001370                                        BNE     3$
006634  012762  000040  000026                        MOV     #DMD,RKMR1(R2)
006642  005037  003622                                CLR     BITCNT          ;INITIALIZE BIT COUNT
006646  012737  022040  003524                        MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
006654  005037  003614                                CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
006660  005037  003616                                CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
006664  012700  000377                                MOV     #255.,R0        ;GENERATE 255 ZEROES
006670  004737  046106                    5$:         JSR     PC,RDBIT        ;READ A ZERO
006674  016237  000026  003464                        MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006702  023737  003524  003464                        CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006710  001405                                        BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
006712  104020                                        ERROR   20              ;MAINT REG. 1 INCORRECT
006714  012762  100000  000000                        MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006722  000464                                        BR      TST7            ;;GO ON TO NEXT TEST
                                                ;
006724  005237  003622                    6$:         INC     BITCNT          ;INCREMENT BIT COUNT
006730  005300                                        DEC     R0              ;CHECK IF ALL ZEROES ISSUED
006732  001356                                        BNE     5$              ;NO, CONTINUE
006734  012737  000001  003614                        MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
006742  004737  046106                                JSR     PC,RDBIT        ;READ A ONE
006746  016237  000026  003464                        MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
006754  023737  003524  003464                        CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
006762  001405                                        BEQ     7$              ;YES, CONTINUE
006764  104020                                        ERROR   20              ;MAINT REG. 1 INCORRECT
006766  012762  100000  000000                        MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
006774  000437                                        BR      TST7            ;;GO ON TO NEXT TEST
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2736  006776  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2737  007002  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2738  007010  005037  003614                  CLR     PR.BIT
2739  007014  004737  046106                  JSR     PC,RDBIT        ;SIMULATE ZERO
2740  007020  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2741  007026  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2742  007034  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2743  007036  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2744  007044  000413                          BR      TST7            ;;GO TO NEXT TEST
2745
2746  007046  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2747  007054  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2748  007062  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2749  007070  001401                          BEQ     TST7            ;;YES, GO TO NEXT TEST
2750  007072  104016                          ERROR   16              ;CS1 INCORRECT
2751
2752                                  ;;*****************************************************************
2753                                  ;*TEST 7         SECTOR PULSE DETECT IN READ HEADER (PART 3)
2754                                  ;*
2755                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
2756                                  ;*      DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
2757                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
2758                                  ;*      CLOCK BOTH SEEK AND DRIVE CHECK MESSAGES.
2759                                  ;*      SIMULATE 255 ZEROES AND A ONE.
2760                                  ;*
2761                                  ;*      MAKE SURE READ GATE DOES NOT SET.
2762                                  ;*
2763                                  ;;*****************************************************************
2764  007074  000004                  TST7:   SCOPE
2765  007076  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2766  007104  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2767  007110  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2768  007116  012762  000040  000000          MOV     #DMD,RKCS1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2769  007124  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIALIZE ROM ADDRESS
2770  007132  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2771  007140  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
2772  007146  012700  000312                  MOV     #50.*4+2,R0     ;CLOCK UNTIL READY FOR SECTOR PULSE
2773  007152  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2774  007160  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2775  007166  005300                          DEC     R0
2776  007170  001370                          BNE     1$
2777  007172  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2778  007200  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2779  007206  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2780  007214  001405                          BEQ     2$              ;YES, CLOCK IN ZEROS
2781  007216  104015                          ERROR   15
2782  007220  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2783  007226  000515                          BR      TST10           ;;GO ON TO NEXT TEST
2784  007230                          2$:
2785  007230  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2786  007234  012737  022040  003524          MOV     #DMD!MEWD!ECCW,E.MR1  ;LOAD EXPECTED MAINTENANCE REG. 1
2787  007242  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND PREVIOUS
2788  007246  005037  003616                  CLR     M1.BIT          ;  BITS TO GENERATE ZEROS
2789  007252  012700  000377                  MOV     #255.,R0        ;GENERATE 255 ZEROES
2790  007256  004737  046106          5$:     JSR     PC,RDBIT        ;READ A ZERO
2791  007262  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
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2792  007270  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2793  007276  001405                          BEQ     6$              ;READ GATE NOT SET SIMULATE NEXT BIT
2794  007300  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2795  007302  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2796  007310  000464                          BR      TST10           ;;GO ON TO NEXT TEST
2797
2798  007312  005237  003622          6$:     INC     BITCNT          ;INCREMENT BIT COUNT
2799  007316  005300                          DEC     R0              ;CHECK IF ALL ZEROES ISSUED
2800  007320  001356                          BNE     5$              ;NO, CONTINUE
2801  007322  012737  000001  003614          MOV     #1,PR.BIT       ;LOAD ONE FOR READING 1
2802  007330  004737  046106                  JSR     PC,RDBIT        ;READ A ONE
2803  007334  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2804  007342  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK READ GATE NOT SET
2805  007350  001405                          BEQ     7$              ;YES, CONTINUE
2806  007352  104021                          ERROR   21              ;MAINT REG. 1 INCORRECT
2807  007354  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;ISSUE CONTROLLER CLEAR
2808  007362  000437                          BR      TST10           ;;GO ON TO NEXT TEST
2809
2810  007364  005237  003622          7$:     INC     BITCNT          ;INCREMENT BIT COUNT
2811  007370  013737  003614  003616          MOV     PR.BIT,M1.BIT   ;LOAD ZERO FOR NEXT BIT
2812  007376  005037  003614                  CLR     PR.BIT
2813  007402  004737  046106                  JSR     PC,RDBIT        ;SIMULATE ZERO
2814  007406  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG. 1
2815  007414  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2816  007422  001404                          BEQ     9$              ;CHECK CS1 CORRECT
2817  007424  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2818  007432  000413                          BR      TST10           ;;GO TO NEXT TEST
2819
2820  007434  016237  000000  003440  9$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2821  007442  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
2822  007450  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2823  007456  001401                          BEQ     TST10           ;;YES, GO TO NEXT TEST
2824  007460  104016                          ERROR   16              ;CS1 INCORRECT
2825
2826                                  ;;*****************************************************************
2827                                  ;*TEST 10       INDEX PULSE DETECTION IN WRITE HEADER
2828                                  ;*
2829                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
2830                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
2831                                  ;*      TO AN RK06, IN 26 SECTOR FORMAT, TO CYLINDER 0, HEAD 0,
2832                                  ;*      DRIVE 0, WITH A ONE WORD TRANSFER.  CLOCK THROUGH THE
2833                                  ;*      SEEK AND THE DRIVE CLEAR MESSAGES.  ISSUE 200 CONTROLLER
2834                                  ;*      CLOCKS AND MAKE SURE WRITE GATE DOES NOT SET.  SIMULATE
2835                                  ;*      SECTOR PULSE AND 200 CONTROLLER CLOCKS MAKING SURE WRITE
2836                                  ;*      GATE DOES NOT SET.  SIMULATE INDEX PULSE AND MAKE SURE
2837                                  ;*      WRITE GATE SETS.
2838                                  ;*
2839                                  ;*****************************************************************
2840  007462  000004                  TST10:  SCOPE
2841  007464  012737  000012  001200          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2842  007472  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
2843  007476  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2844  007504  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
2845  007512  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;INITIAILZE ROM ADDRESS
2846  007520  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2847  007526  012762  067204  000004          MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
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2848  007534  012762  177777  000002          MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
2849  007542  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
2850  007550  012700  000312                  MOV     #50.*4+2,R0      ;CLOCK UNTIL READY FOR INDEX PULSE
2851  007554  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
2852  007562  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2853  007570  005300                          DEC     R0
2854  007572  001370                          BNE     1$
2855  007574  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2856  007602  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
2857  007610  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2858  007616  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
2859  007624  012737  067204  003504          MOV     #WRBUFF,E.BA    ;LOAD EXPECTED BUS ADDRESS
2860  007632  012737  177777  003502          MOV     #-1,E.WC        ;LOAD EXPECTED WORD COUNT
2861  007640  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
2862  007646  001403                          BEQ     2$              ;YES, CONTINUE
2863  007650  104022                          ERROR   22              ;CS1 INCORRECT
2864  007652  000137  010600                  JMP     60$             ;CLEAR CONTROLLER
2865
2866  007656  023737  003504  003444  2$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2867  007664  001403                          BEQ     3$              ;YES, CONTINUE
2868  007666  104023                          ERROR   23              ;BUS ADDRESS INCORRECT
2869  007670  000137  010600                  JMP     60$             ;CLEAR RK611
2870
2871  007674  023737  003502  003442  3$:     CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2872  007702  001403                          BEQ     4$              ;YES, CONTINUE
2873  007704  104024                          ERROR   24              ;WORD COUNT INCORRECT
2874  007706  000137  010600                  JMP     60$             ;CLEAR RK611
2875
2876  007712  012737  022040  003524  4$:     MOV     #ECCW!MEWD!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2877  007720  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
2878  007724  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2879  007730  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
2880  007736  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2881  007744  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2882  007752  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2883  007760  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2884  007766  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINTENANCE REG. 1 CORRECT
2885  007774  001403                          BEQ     6$              ;YES, CONTINUE
2886  007776  104025                          ERROR   25              ;MAINT REG 1 INCORRECT
2887  010000  000137  010600                  JMP     60$             ;CLEAR RK611
2888
2889  010004  005300                  6$:     DEC     R0              ;CHECK IF READY FOR SECTOR PULSE
2890  010006  001350                          BNE     5$              ;NO, GET NEXT BIT
2891  010010  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2892  010016  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
2893  010024  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG
2894  010032  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2895  010040  001403                          BEQ     10$             ;YES, CONTINUE
2896  010042  104026                          ERROR   26              ;CS1 INCORRECT
2897  010044  000137  010600                  JMP     60$             ;CLEAR RK611
2898
2899  010050  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2900  010056  001403                          BEQ     11$             ;YES, CONTINUE
2901  010060  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2902  010062  000137  010600                  JMP     60$             ;CLEAR RK611
2903
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```
2904  010066  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
2905  010074  001403                          BEQ     12$             ;YES, CONTINUE
2906  010076  104030                          ERROR   30              ;WORD COUNT INCORRECT
2907  010100  000137  010600                  JMP     60$             ;CLEAR RK611
2908
2909  010104  012700  000004          12$:    MOV     #4,R0           ;SIMULATE SECTOR PULSE
2910  010110  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2911  010116  012762  000540  000026  13$:    MOV     #DMD!MSP!MCLK,RKMR1(R2)
2912  010124  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)
2913  010132  005300                          DEC     R0
2914  010134  001370                          BNE     13$
2915  010136  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2916  010144  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2917  010152  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS AND REG.
2918  010160  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
2919  010166  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 INCORRECT
2920  010174  001402                          BEQ     15$             ;YES, CONTINUE
2921  010176  104026                          ERROR   26              ;CS1 INCORRECT
2922  010200  000577                          BR      60$             ;CLEAR RK611
2923
2924  010202  023737  003504  003444  15$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2925  010210  001402                          BEQ     16$             ;YES, CONTINUE
2926  010212  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2927  010214  000571                          BR      60$             ;CLEAR RK611
2928
2929  010216  023737  003502  003442  16$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2930  010224  001402                          BEQ     20$             ;YES, CONTINUE
2931  010226  104030                          ERROR   30              ;WORD COUNT INCORRECT
2932  010230  000563                          BR      60$             ;CLEAR RK611
2933
2934  010232  005037  003622          20$:    CLR     BITCNT          ;INITIALIZE BIT COUNT
2935  010236  012700  000310                  MOV     #200.,R0        ;ISSUE 200 MAINT BITS
2936  010242  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2)
2937  010250  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2938  010256  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
2939  010264  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2940  010272  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
2941  010300  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MAINT REG. 1 CORRECT
2942  010306  001402                          BEQ     22$             ;YES, CONTINUE
2943  010310  104025                          ERROR   25              ;MAINT REG. 1 INCORRECT
2944  010312  000532                          BR      60$             ;CLEAR RK611
2945
2946  010314  005300          22$:    DEC     R0              ;CHECK IF READY FOR INDEX PULSE
2947  010316  001351                          BNE     21$             ;NO, GET NEXT BIT
2948  010320  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
2949  010326  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2950  010334  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2951  010342  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2952  010350  001402                          BEQ     23$             ;YES, CONTINUE
2953  010352  104026                          ERROR   26              ;CS1 INCORRECT
2954  010354  000511                          BR      60$             ;CLEAR RK611
2955
2956  010356  023737  003504  003444  23$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2957  010364  001402                          BEQ     24$             ;YES, CONTINUE
2958  010366  104027                          ERROR   27              ;BUS ADDRESS INCORRECT
2959  010370  000503                          BR      60$             ;CLEAR RK611
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2960
2961  010372  023737  003502  003442  24$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2962  010400  001402                          BEQ     25$             ;YES, CONTINUE
2963  010402  104030                          ERROR   30              ;WORD COUNT INCORRECT
2964  010404  000475                          BR      60$             ;CLEAR RK611
2965
2966  010406  012762  000240  000026  25$:    MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE PULSE
2967  010414  012700  000004                  MOV     #4,R0
2968  010420  012762  000640  000026  26$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
2969  010426  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
2970  010434  005300                          DEC     R0
2971  010436  001370                          BNE     26$
2972  010440  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2973  010446  012700  000002                  MOV     #2,R0           ;SIMULATE TWO CLOCK PULSES FOR WRITE
2974                                                                  ;  GATE TO COME UP
2975  010452  012762  000440  000026  27$:    MOV     #DMD!MCLK,RKMR1(R2)
2976  010460  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2977  010466  005300                          DEC     R0
2978  010470  001370                          BNE     27$
2979  010472  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINTENANCE REG.
2980  010500  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
2981  010506  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
2982  010514  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
2983  010522  012737  062040  003524          MOV     #WRTGAT!MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MAINT REG. 1
2984  010530  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
2985  010536  001401                          BEQ     28$             ;YES, CONTINUE
2986  010540  104031                          ERROR   31              ;CS1 INCORRECT
2987  010542  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
2988  010550  001401                          BEQ     29$             ;YES, CONTINUE
2989  010552  104032                          ERROR   32              ;BUS ADDRESS INCORRECT
2990  010554  023737  003502  003442  29$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
2991  010562  001401                          BEQ     30$             ;YES, CONTINUE
2992  010564  104033                          ERROR   33              ;WORD COUNT INCORRECT
2993  010566  023737  003524  003464  30$:    CMP     E.MR1,T.MR1     ;CHECK MAINT REG 1 CORRECT
2994  010574  001401                          BEQ     60$             ;YES, CLEAR RK611
2995  010576  104034                          ERROR   34              ;MAINT REG. 1 INCORRECT
2996  010600  012762  100000  000000  60$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
2997
2998                                  .SBTTL  **NPR READING OF MEMORY
2999
3000                                  ;;*****************************************************************
3001                                  ;*TEST 11       NPR OUTPUT DATA TRANSFER
3002                                  ;*
3003                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3004                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3005                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 777, HEAD 7, DRIVE 7.
3006                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK BOTH SEEK
3007                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE INDEX PULSE.
3008                                  ;*      CLOCK IN FIRST WORD OF NPR TRANSFER.  CHECK INPUT READY,
3009                                  ;*      OUTPUT READY, BUS  ADDRESS, WORD COUNT, AND CONTENTS OF
3010                                  ;*      THE SILO.  REPEAT FOR 8 DIFFERENT DATA PATTERNS.
3011                                  ;*
3012                                  ;;*****************************************************************
3013  010606  000004                  TST11:  SCOPE
3014  010610  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3015  010616  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
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3016  010622  012703  066664                    MOV     #PATTERN,R3      ;LOAD PATTERN ADDRESS
3017  010626  012704  000010                    MOV     #8.,R4           ;LOAD PATTERN COUNT
3018  010632  012737  067206  003504           MOV     #WRBUFF+2,E.BA   ;LOAD EXPECTED BUS ADDRESS
3019  010640  012737  000027  003500           MOV     #WRHEAD,E.CS1    ;LOAD EXPECTED CS1
3020  010646  005037  003502                    CLR     E.WC             ;LOAD EXPECTED WORD COUNT
3021  010652  012737  010660  001110           MOV     #1$,$LPERR       ;LOAD LOOP ON ERROR LOCATION FOR
3022                                                                     ;  SUBTEST LOOP
3023
3024  010660                          1$:
3025  010660  012762  100000  000000           MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3026  010666  011337  067204                    MOV     (R3),WRBUFF      ;LOAD BUFFER FOR WRITE HEADER
3027  010672  012762  000040  000026           MOV     #DMD,RKMR1(R2)   ;PUT RK611 IN MAINT MODE
3028  010700  012762  000777  000020           MOV     #777,RKDCYL(R2)  ;LOAD CYLINDER ADDRESS
3029  010706  012762  003400  000006           MOV     #3400,RKDA(R2)   ;LOAD DISK ADDRESS
3030  010714  012762  067204  000004           MOV     #WRBUFF,RKBA(R2)  ;LOAD BUS ADDRESS
3031  010722  012762  000007  000010           MOV     #7,RKCS2(R2)     ;LOAD OTHER NUMBER
3032  010730  012762  177777  000002           MOV     #-1,RKWC(R2)     ;LOAD WORD COUNT
3033  010736  012762  000027  000000           MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3034  010744  012700  000312                    MOV     #50.*4+2,R0      ;ISSUE CLOCKS UNTIL READY FOR
3035                                                                     ;  INDEX PULSE
3036  010750  012762  000440  000026  2$:      MOV     #DMD!MCLK,RKMR1(R2)
3037  010756  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3038  010764  005300                           DEC     R0
3039  010766  001370                           BNE     2$
3040  010770  012700  000004                    MOV     #4,R0            ;SIMULATE INDEX PULSE
3041  010774  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3042  011002  012762  000640  000026  3$:      MOV     #DMD!MIND!MCLK,RKMR1(R2)
3043  011010  012762  000240  000026           MOV     #DMD!MIND,RKMR1(R2)
3044  011016  005300                           DEC     R0
3045  011020  001370                           BNE     3$
3046  011022  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3047  011030  012700  000045                    MOV     #37.,R0          ;SIMULATE 1 NPR TRANSFER
3048  011034  012762  000440  000026  4$:      MOV     #DMD!MCLK,RKMR1(R2)
3049  011042  012762  000040  000026           MOV     #DMD,RKMR1(R2)
3050  011050  005300                           DEC     R0
3051  011052  001370                           BNE     4$
3052  011054  016237  000000  003440           MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3053  011062  016237  000004  003444           MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3054  011070  016237  000002  003442           MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3055  011076  012700  000024                    MOV     #20.,R0          ;WAIT FOR OUTPUT READY
3056  011102  005300                  5$:      DEC     R0
3057  011104  001376                           BNE     5$
3058  011106  016237  000010  003450           MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3059  011114  012737  000307  003510           MOV     #OR!IR!7,E.CS2  ;LOAD EXPECTED CS2
3060  011122  023737  003500  003440           CMP     E.CS1,T.CS1      ;CHECK CS1 CORRECT
3061  011130  001401                           BEQ     6$               ;YES, CHECK CS2
3062  011132  104035                           ERROR   35               ;CS1 INCORRECT
3063  011134  023737  003510  003450  6$:      CMP     E.CS2,T.CS2      ;CHECK CS2 CORRECT
3064  011142  001401                           BEQ     7$               ;YES, CONTINUE
3065  011144  104036                           ERROR   36               ;CS2 INCORRECT
3066  011146  023737  003504  003444  7$:      CMP     E.BA,T.BA        ;CHECK IF BUS ADDRESS INCREMENT OCCURRED
3067  011154  001401                           BEQ     8$               ;YES, CONTINUE
3068  011156  104037                           ERROR   37               ;BUS ADDRESS INCORRECT
3069  011160  023737  003502  003442  8$:      CMP     E.WC,T.WC        ;CHECK WORD COUNT REG CORRECT
3070  011166  001401                           BEQ     9$               ;YES, CONTINUE
3071  011170  104040                           ERROR   40               ;WORD COUNT INCORRECT
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3072  011172  016237  000024  003462  9$:     MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3073  011200  011337  003522                  MOV     (R3),E.DB       ;LOAD EXPECTED DATA BUFFER
3074  011204  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3075  011212  001401                          BEQ     15$             ;YES,CONTINUE
3076  011214  104041                          ERROR   41              ;DATA BUFFER INCORRECT
3077  011216  016237  000000  003440  15$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3078  011224  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3079  011232  012737  000107  003510          MOV     #IR!7,E.CS2     ;LOAD EXPECTED CS2
3080  011240  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3081  011246  001401                          BEQ     17$             ;YES, CONTINUE
3082  011250  104042                          ERROR   42              ;CS1 INCORRECT
3083  011252  023737  003510  003450  17$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3084  011260  001401                          BEQ     20$             ;YES, CONTINUE
3085  011262  104043                          ERROR   43              ;CS2 INCORRECT
3086  011264  104415                  20$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3087  011266  005723                          TST     (R3)+           ;GENERATE ADDRESS OF NEXT CONFIG
3088  011270  005304                          DEC     R4              ;CHECK IF ALL 8 CONFIGS TRIED
3089  011272  001000                          BNE     TST12           ;;NO, TRY NEXT DATA PATTERN
3090
3091                                  ;;*****************************************************************
3092                                  ;*TEST 12       PARTIAL SILO FILLING
3093                                  ;*
3094                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3095                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3096                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3097                                  ;*      SPECIFY A ONE WORD DATA TRANSFER.  CLOCK IN ALL
3098                                  ;*      SPECIFIED WORDS INTO THE SILO.  CHECK WORD COUNT,
3099                                  ;*      BUS ADDRESS, INPUT READY, AND OUTPUT READY.  MAKE
3100                                  ;*      SURE NO MORE THAN SPECIFIED DATA LENGTH IS CLOCKED
3101                                  ;*      INTO THE SILO.  CHECK THE SILO FOR CORRECT DATA.
3102                                  ;*      REPEAT FOR WORD COUNTS 2-65.
3103                                  ;*
3104                                  ;*****************************************************************
3105  011274  000004                  TST12:  SCOPE
3106  011276  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3107  011304  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
3108  011310  012737  000001  001160          MOV     #1,$TMP0        ;LOAD NUMBER OF WORDS FOR DATA TRANSFER
3109  011316  012704  000065                  MOV     #65,R4          ;LOAD ITERATION COUNT
3110  011322  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
3111  011330  012737  011336  001110          MOV     #1$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3112                                                                  ;  SUBTEST LOOP
3113
3114  011336                          1$:
3115  011336  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3116  011344  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
3117  011352  012762  066762  000004          MOV     #NPRBUF,RKBA(R2)  ;LOAD BUS ADDRESS
3118  011360  012737  066762  003504          MOV     #NPRBUF,E.BA
3119  011366  013737  001160  003502          MOV     $TMP0,E.WC      ;LOAD WORD COUNT
3120  011374  005437  003502                  NEG     E.WC
3121  011400  013762  003502  000002          MOV     E.WC,RKWC(R2)
3122  011406  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
3123  011414  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
3124                                                                  ;  INDEX PULSE
3125  011420  012762  000440  000026  2$:     MOV     #DMD!MCLK,RKMR1(R2)
3126  011426  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3127  011434  005300                          DEC     R0
```

```
3128  011436  001370                        BNE     2$
3129  011440  012700  000004                MOV     #4,R0           ;SIMULATE INDEX PULSE
3130  011444  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3131  011452  012762  000640  000026  3$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
3132  011460  012762  000240  000026        MOV     #DMD!MIND,RKMR1(R2)
3133  011466  005300                        DEC     R0
3134  011470  001370                        BNE     3$
3135  011472  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3136  011500  012737  000300  003510        MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3137  011506  012700  000045          4$:   MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3138  011512  012762  000440  000026  5$:   MOV     #DMD!MCLK,RKMR1(R2)
3139  011520  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3140  011526  005300                        DEC     R0
3141  011530  001370                        BNE     5$
3142  011532  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3143  011540  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3144  011546  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3145  011554  022737  066762  003504        CMP     #NPRBUF,E.BA    ;CHECK IF FIRST WORD
3146  011562  001004                        BNE     7$              ;NO, STORE CS2
3147  011564  012700  000024                MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3148  011570  005300                  6$:   DEC     R0
3149  011572  001376                        BNE     6$
3150  011574  016237  000010  003450  7$:   MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3151  011602  062737  000002  003504        ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADD
3152  011610  005237  003502                INC     E.WC
3153  011614  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3154  011622  001401                        BEQ     8$              ;YES, CHECK CS2
3155  011624  104044                        ERROR   44              ;CS1 INCORRECT
3156  011626  023737  003510  003450  8$:   CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3157  011634  001401                        BEQ     9$              ;YES, CHECK BUSS ADDRESS REG.
3158  011636  104045                        ERROR   45              ;CS2 INCORRECT
3159  011640  023737  003504  003444  9$:   CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3160  011646  001401                        BEQ     10$             ;YES, CHECK WORD COUNT
3161  011650  104046                        ERROR   46              ;BUS ADDRESS INCORRECT
3162  011652  023737  003502  003442  10$:  CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3163  011660  001401                        BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3164  011662  104047                        ERROR   47              ;WORD COUNT INCORRECT
3165  011664  005737  003502          11$:  TST     E.WC            ;CHECK IF FINISHED
3166  011670  001306                        BNE     4$              ;NO, TRANSFER NEXT WORD
3167  011672  012700  000112                MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3168  011676  012762  000440  000026  15$:  MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3169  011704  012762  000040  000026        MOV     #DMD,RKMR1(R2)
3170  011712  005300                        DEC     R0
3171  011714  001370                        BNE     15$
3172  011716  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3173  011724  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3174  011732  016237  000004  003444        MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3175  011740  016237  000002  003442        MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3176  011746  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3177  011754  001401                        BEQ     16$             ;YES, CHECK CS2
3178  011756  104050                        ERROR   50              ;CS1 INCORRECT
3179  011760  023737  003510  003450  16$:  CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3180  011766  001401                        BEQ     17$             ;YES, CHECK BUS ADDRESS
3181  011770  104051                        ERROR   51              ;CS2 INCORRECT
3182  011772  023737  003504  003444  17$:  CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3183  012000  001401                        BEQ     18$             ;YES, CHECK WORD COUNT
```

```
012002  104052                              ERROR   52                 ;BUS ADDRESS INCORRECT
012004  023737  003502  003442  18$:        CMP     E.WC,T.WC          ;CHECK WORD COUNT CORRECT
012012  001401                              BEQ     19$                ;YES, CONTINUE
012014  104053                              ERROR   53                 ;WORD COUNT INCORRECT
012016  013701  001160          19$:        MOV     $TMPO,R1           ;LOAD NUMBER OF WORDS LOADED
012022  012703  066762                      MOV     #NPRBUFF,R3        ;LOAD START ADDRESS
012026  005037  003624                      CLR     WRDCNT             ;INITIALIZE WORD COUNT FOR PRINTOUT
012032  016237  000024  003462  25$:        MOV     RKDB(R2),T.DB      ;READ DATA BUFFER
012040  012337  003522                      MOV     (R3)+,E.DB         ;LOAD EXPECTED DATA BUFFER
012044  023737  003522  003462              CMP     E.DB,T.DB          ;CHECK IF DATA CORRECT
012052  001401                              BEQ     26$                ;YES, CONTINUE
012054  104054                              ERROR   54                 ;DATA BUFFER INCORRECT
012056  016237  000000  003440  26$:        MOV     RKCS1(R2),T.CS1    ;STORE COMMAND AND STATUS REG. 1
012064  016237  000010  003450              MOV     RKCS2(R2),T.CS2    ;STORE COMMAND AND STATUS REG. 2
012072  022701  000001                      CMP     #1,R1              ;CHECK IF LAST WORD IN SILO
012076  001003                              BNE     27$                ;NO, CONTINUE
012100  012737  000100  003510              MOV     #IR,E.CS2          ;LOAD EXPECTED CS2
012106  023737  003500  003440  27$:        CMP     E.CS1,T.CS1        ;CHECK COMMAND STATUS REG. 1 CORRECT
012114  001401                              BEQ     28$                ;YES, CONTINUE
012116  104055                              ERROR   55                 ;CS1 INCORRECT
012120  023737  003510  003450  28$:        CMP     E.CS2,T.CS2        ;CHECK COMMAND STATUS REG. 2 CORRECT
012126  001401                              BEQ     29$                ;YES, CONTINUE
012130  104056                              ERROR   56                 ;CS2 INCORRECT
012132  005237  003624          29$:        INC     WRDCNT             ;INCREMENT WORD COUNT
012136  005301                              DEC     R1                 ;DECREMENT WORDS READ
012140  001334                              BNE     25$                ;CHECK IF ALL WORDS READ
012142  104415                              SCOP1                      ;CHECK IF LOOP ON ERROR
012144  005237  001160                      INC     $TMPO              ;INCREMENT WORDS READ FROM MEM
012150  005304                              DEC     R4                 ;CHECK IF FINISHED
012152  001402                              BEQ     TST13              ;;YES, GO ON TO NEXT TEST
012154  000137  011336                      JMP     1$                 ;TRY NEXT WORD COUNT

                                ;;*****************************************************
                                ;*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.
                                ;*
                                ;;*****************************************************
012160  000004                  TST13:      SCOPE
012162  012737  000144  001200              MOV     #100.,$TIMES       ;;DO 100. ITERATIONS
012170  013702  001270                      MOV     $BASE,R2           ;LOAD RK611 BASE
012174  012737  000027  003500              MOV     #WRHEAD,E.CS1      ;LOAD EXPECTED CS1
012202  012762  100000  000000              MOV     #CCLR,RKCS1(R2)    ;CLEAR RK611
012210  012762  000040  000026              MOV     #DMD,RKMR1(R2)     ;PUT RK611 IN MAINT MODE
012216  012737  066764  003504              MOV     #NPRBUF+2,E.BA     ;LOAD BUS ADDRESS
012224  012762  066762  000004              MOV     #NPRBUF,RKBA(R2)
012232  012737  177677  003502              MOV     #-65.,E.WC         ;LOAD WORD COUNT
012240  012762  177676  000002              MOV     #-66.,RKWC(R2)
012246  012762  000027  000000              MOV     #WRHEAD,RKCS1(R2)   ;ISSUE WRITE HEADER
012254  012700  000312                      MOV     #50.*4+2,R0        ;ISSUE CLOCKS UNTIL READY FOR
                                                                       ;  INDEX PULSE
```

```
3240  012260  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
3241  012266  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3242  012274  005300                          DEC     R0
3243  012276  001370                          BNE     1$
3244  012300  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3245  012304  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3246  012312  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3247  012320  012762  000240  000026          MOV     #DMD!MIND,RkMR1(R2)
3248  012326  005300                          DEC     R0
3249  012330  001370                          BNE     2$
3250  012332  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3251  012340  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3252  012346  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
3253  012352  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
3254  012360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3255  012366  005300                          DEC     R0
3256  012370  001370                          BNE     5$
3257  012372  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3258  012400  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3259  012406  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
325C  012414  022737  066764  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
3261  012422  001004                          BNE     7$              ;NO, STORE CS2
3262  012424  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3263  012430  005300                  6$:     DEC     R0
3264  012432  001376                          BNE     6$
3265  012434  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3266  012442  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3267  012450  001401                          BEQ     8$              ;YES, CHECK CS2
3268  012452  104044                          ERROR   44              ;CS1 INCORRECT
3269  012454  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3270  012462  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
3271  012464  104045                          ERROR   45              ;CS2 INCORRECT
3272  012466  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3273  012474  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3274  012476  104046                          ERROR   46              ;BUS ADDRESS INCORRECT
3275  012500  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3276  012506  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3277  012510  104047                          ERROR   47              ;WORD COUNT INCORRECT
3278  012512  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT WORD COUNT AND BUS ADDRESS
3279  012520  005237  003502                  INC     E.WC            ;
3280  012524  100710                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3281  012526  001004                          BNE     12$             ;CHECK IF LAST WORD
3282  012530  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3283  012536  000703                          BR      4$              ;PROCESS LAST WORD
3284
3285  012540  005037  003502          12$:    CLR     E.WC            ;ADJUST EXPECTED WORD COUNT
3286  012544  162737  000002  003504          SUB     #2,E.BA         ;  AND BUS ADDRESS
3287  012552  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3288  012556  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3289  012564  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3290  012572  005300                          DEC     R0
3291  012574  001370                          BNE     15$
3292  012576  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3293  012604  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3294  012612  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3295  012620  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
```

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3296  012626  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3297  012634  001401                          BEQ     16$             ;YES, CHECK CS2
3298  012636  104050                          ERROR   50              ;CS1 INCORRECT
3299  012640  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3300  012646  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3301  012650  104051                          ERROR   51              ;CS2 INCORRECT
3302  012652  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3303  012660  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3304  012662  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3305  012664  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3306  012672  001401                          BEQ     19$             ;YES, CHECK DATA
3307  012674  104053                          ERROR   53              ;WORD COUNT INCORRECT
3308  012676  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBER OF WORDS LOADED
3309  012702  012703  066762                  MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3310  012706  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR  PRINT OUT
3311  012712  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3312  012720  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3313  012726  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3314  012732  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3315  012740  001401                          BEQ     26$             ;YES, CONTINUE
3316  012742  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3317  012744  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
3318  012752  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3319  012756  001015                          BNE     28$             ;NO, GET CS2
3320  012760  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3321  012764  005300                  27$:    DEC     R0
3322  012766  001376                          BNE     27$
3323  012770  016237  000C10  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3324  012776  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD IN SILO
3325  013002  001003                          BNE     29$             ;NO, CONTINUE
3326  013004  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3327  013012  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3328  013020  001401                          BEQ     29$             ;YES, CHECK CS2
3329  013022  104055                          ERROR   55              ;CS1 INCORRECT
3330  013024  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3331  013032  001401                          BEQ     30$             ;YES, GET NEXT WORD
3332  013034  104056                          ERROR   56              ;CS2 INCORRECT
3333  013036  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3334  013042  005301                          DEC     R1              ;DECREMENT WORDS READ
3335  013044  001325                          BNE     25$             ;CHECK IF ALL WORDS READ
3336
3337                                  ;;*****************************************************************
3338                                  ;*TEST 14       SILO CAPICITY WITH NPR TRANSFERS
3339                                  ;*
3340                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3341                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3342                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
3343                                  ;*      SPECIFY A 68 WORD DATA TRANSFER.  CLOCK IN 66
3344                                  ;*      WORDS INTO THE SILO.  MAKE SURE THAT SILO WILL STOP
3345                                  ;*      FILLING AT 66 WORDS.  TAKE ONE WORD FROM SILO AND
3346                                  ;*      CHECK IT.  CLOCK IN NEXT WORD.  MAKE SURE NO MORE
3347                                  ;*      THAN  ONE WORD IS CLOCKED IN THE SILO.  TAKE ONE
3348                                  ;*      WORD FROM SILO AND CHECK IT.  CLOCK IN NEXT WORD.
3349                                  ;*      CLOCK IN NEXT WORD.  MAKE SURE NO MORE THAN ONE WORD IS
3350                                  ;*      CLOCKED IN THE SILO.  TAKE ONE WORD FROM SILO AND
3351                                  ;*      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.
                                        ;*
                                        ;;*****************************************************************
013046  000004                        ST14:   SCOPE
013050  012737  000144  001200                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
013056  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
013062  012737  000027  003500                MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
013070  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
013076  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
013104  012737  066764  003504                MOV     #NPRBUFF+2,E.BA ;LOAD BUS ADDRESS
013112  012762  066762  000004                MOV     #NPRBUF,RKBA(R2)
013120  012737  177675  003502                MOV     #-67.,E.WC      ;LOAD WORD COUNT
013126  012762  177674  000002                MOV     #-68.,RKWC(R2)
013134  012762  000027  000000                MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
013142  012700  000312                        MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                        ;  INDEX PULSE
013146  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
013154  012762  000040  000026                MOV     #DMD,RKMR1(R2)
013162  005300                                DEC     R0
013164  001370                                BNE     1$
013166  012700  000004                        MOV     #4,R0           ;SIMULATE INDEX PULSE
013172  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
013200  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
013206  012762  000240  000026                MOV     #DMD!MIND,RKMR1(R2)
013214  005300                                DEC     R0
013216  001370                                BNE     2$
013220  012737  000040  000026                MOV     #DMD,RKMR1
013226  012737  000300  003510                MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
013234  012700  000045              4$:       MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
013240  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
013246  012762  000040  000026                MOV     #DMD,RKMR1(R2)
013254  005300                                DEC     R0
013256  001370                                BNE     5$
013260  016237  000000  003440                MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND REG. 1
013266  016237  000004  003444                MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
013274  016237  000002  003442                MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
013302  022737  066764  003504                CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
013310  001004                                BNE     7$              ;NO, STORE CS2
013312  012700  000024                        MOV     #20.,R0         ;WAIT FOR OUTPUT READY
013316  005300                        6$:     DEC     R0
013320  001376                                BNE     6$
013322  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
013330  023737  003500  003440                CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
013336  001401                                BEQ     8$              ;YES, CHECK CS2
013340  104044                                ERROR   44              ;CS1 INCORRECT
013342  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
013350  001401                                BEQ     9$              ;YES, CHECK BUS ADDRESS
013352  104045                                ERROR   45              ;CS2 INCORRECT
013354  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
013362  001401                                BEQ     10$             ;YES, CHECK WORD COUNT
013364  104046                                ERROR   46              ;BUS ADDRESS INCORRECT
013366  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
013374  001401                                BEQ     11$             ;YES, CHECK IF 1ST 65 WORDS TRANSFERRED
013376  104047                                ERROR   47              ;WORD COUNT INCORRECT
013400  062737  000002  003504  11$:    ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
```

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3408  013406  005237  003502                  INC     E.WC
3409  013412  022737  177776  003502          CMP     #-2,E.WC        ;CHECK IF 65 WORDS IN SILO
3410  013420  101305                          BHI     4$              ;NO, GET NEXT WORD
3411  013422  001004                          BNE     12$             ;CHECK IF ALL 65 WORDS IN SILO
3412  013424  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3413  013432  000700                          BR      4$              ;PROCESS 66TH WORD
3414
3415  013434  005337  003502          12$:    DEC     E.WC            ;ADJUST WORD COUNT AND
3416  013440  162737  000002  003504          SUB     #2,E.BA         ;  BUS ADDRESS
3417  013446  012701  000003                  MOV     #3,R1
3418  013452  005037  003624                  CLR     WRDCNT
3419  013456  012703  066762                  MOV     #NPRBUF,R3      ;LOAD START ADDRESS
3420  013462  012700  000112          13$:    MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3421  013466  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3422  013474  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3423  013502  005300                          DEC     R0
3424  013504  001370                          BNE     15$
3425  013506  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3426  013514  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3427  013522  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG
3428  013530  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3429  013536  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1
3430  013544  001401                          BEQ     16$             ;YES, CHECK CS2
3431  013546  104050                          ERROR   50              ;CS1 INCORRECT
3432  013550  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3433  013556  001401                          BEQ     17$             ;YES,CHECK BUS ADDRESS
3434  013560  104051                          ERROR   51              ;CS2 INCORRECT
3435  013562  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3436  013570  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3437  013572  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
3438  013574  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3439  013602  001401                          BEQ     19$             ;YES, READ 1 WORD FROM SILO
3440  013604  104053                          ERROR   53              ;WORD COUNT INCORRECT
3441  013606  012737  000300  003510  19$:    MOV     #IR!OR,E.CS2    ;LOAD EXPECT CS2
3442  013614  016237  000024  003462          MOV     RKDB(R2),T.DB   ;STORE DATA BUFFER
3443  013622  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3444  013626  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3445  013634  001401                          BEQ     25$             ;YES, CONTINUE
3446  013636  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3447  013640  016237  000000  003440  25$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3448  013646  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3449  013652  005300                  26$:    DEC     R0
3450  013654  001376                          BNE     26$
3451  013656  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3452  013664  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF COMMAND STATUS REG. 1 CORRECT
3453  013672  001401                          BEQ     27$             ;YES, CHECK CS2
3454  013674  104055                          ERROR   55              ;CS1 INCORRECT
3455  013676  023737  003510  003450  27$:    CMP     E.CS2,T.CS2     ;CHECK IF COMMAND STATUS REG. 2 CORRECT
3456  013704  001401                          BEQ     30$             ;YES, DO NPR TRANSFER
3457  013706  104056                          ERROR   56              ;CS2 INCORRECT
3458  013710  012700  000045          30$:    MOV     #37.,R0         ;CLOCK IN ONE WORD (NPR TRANSFER)
3459  013714  012762  000440  000026  31$:    MOV     #DMD!MCLK,RKMR1(R2)
3460  013722  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3461  013730  005300                          DEC     R0
3462  013732  001370                          BNE     31$
3463  013734  022701  000001                  CMP     #1,R1           ;CHECK IF 68TH WORD READ
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3464  013740  001410                          BEQ     32$             ;YES, NO NPR WILL TAKE PLACE
3465  013742  062737  000002  003504          ADD     #2,E.BA         ;INCREMENT BUS ADD AND WORD COUNT
3466  013750  005237  003502                  INC     E.WC
3467  013754  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
3468  013762  016237  000000  003440  32$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3469  013770  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3470  013776  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3471  014004  016237  000002  003442          MOV     RKWC,R2),T.WC   ;STORE WORD COUNT
3472  014012  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3473  014020  001401                          BEQ     33$             ;YES, CHECK CS2
3474  014022  104044                          ERROR   44              ;CS1 INCORRECT
3475  014024  023737  003510  003450  33$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3476  014032  001401                          BEQ     34$             ;YES, CHECK BUS ADD
3477  014034  104045                          ERROR   45              ;CS2 INCORRECT
3478  014036  023737  003504  003444  34$:    CMP     E.BA,T.BA       ;CHECK BUS ADD CORRECT
3479  014044  001401                          BEQ     35$             ;YES, CHECK WORD COUNT
3480  014046  104046                          ERROR   46              ;BUS ADD INCORRECT
3481  014050  023737  003502  003442  35$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3482  014056  001401                          BEQ     36$             ;YES, CONTINUE
3483  014060  104047                          ERROR   47              ;WORD COUNT INCORRECT
3484  014062  005237  003624          36$:    INC     WRDCNT
3485  014066  005301                          DEC     R1              ;CHECK IF READ TO UNLOAD SILO
3486  014070  001402                          BEQ     39$             ;YES, READ DATA; BUFFER
3487  014072  000137  013462                  JMP     13$             ;NO, INPUT NEXT WORD
3488
3489  014076  162737  000002  003504  39$:    SUB     #2,E.BA         ;ADJUST WORD COUNT AND BUS ADDRESS
3490  014104  005037  003502                  CLR     E.WC
3491  014110  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3492  014116  012701  000101                  MOV     #65.,R1         ;LOAD NUMBER OF WORDS LEFT
3493  014122  016237  000024  003462  40$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3494  014130  012337  003522                  MOV     (R3)+,E.DB      ;LOAD EXPECTED DATA BUFFER
3495  014134  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3496  014142  001401                          BEQ     41$             ;YES, CHECK CS1
3497  014144  104054                          ERROR   54              ;DATA BUFFER INCORRECT
3498  014146  016237  000000  003440  41$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3499  014154  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF FIRST WORDS
3500  014162  001004                          BNE     43$             ;NO, DO NOT WAIT FOR INPUT READY
3501  014164  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY
3502  014170  005300                  42$:    DEC     R0
3503  014172  001376                          BNE     42$
3504  014174  016237  000010  003450  43$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3505  014202  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3506  014206  001003                          BNE     44$             ;NO, CONTINUE
3507  014210  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
3508  014216  023737  003500  003440  44$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
3509  014224  001401                          BEQ     45$             ;YES,CHECK CS2
3510  014226  104055                          ERROR   55              ;CS1 INCORRECT
3511  014230  023737  003510  003450  45$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATUS REG. 2 CORRECT
3512  014236  001401                          BEQ     46$             ;YES, READ NEXT WORD ON SILO
3513  014240  104056                          ERROR   56              ;CS2 INCORRECT
3514  014242  005237  003624          46$:    INC     WRDCNT          ;INCREMENT WORD COUNT
3515  014246  005301                          DEC     R1              ;CHECK IF ALL WORDS READ
3516  014250  001324                          BNE     40$             ;NO, READ NEXT WORD
3517
3518                                  ;;**************************************************************
3519                                  ;*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.
                                        ;*
                                        ;;*****************************************************************
014252  000004                  TST15:  SCOPE
014254  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
014262  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
014266  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
014274  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
014302  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
014310  012737  066762  003504          MOV     #NPRBUF,E.BA    ;LOAD BUS ADDRESS
014316  012762  066762  000004          MOV     #NPRBUF,RKBA(R2)
014324  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
014332  012762  177676  000002          MOV     #-66.,RKWC(R2)
014340  012762  000020  000010          MOV     #BAI,RKCS2(R2)  ;SET BUS ADDRESS INCREMENT INHIBIT
014346  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
014354  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
                                                                ;  INDEX PULSE
014360  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
014366  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014374  005300                          DEC     R0
014376  001370                          BNE     1$
014400  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
014404  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014412  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
014420  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
014426  005300                          DEC     R0
014430  001370                          BNE     2$
014432  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014440  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
014446  012700  000045          4$:     MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
014452  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
014460  012762  000040  000026          MOV     #DMD,RKMR1(R2)
014466  005300                          DEC     R0
014470  001370                          BNE     5$
014472  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
014500  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
014506  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
014514  022737  000101  003502          CMP     #65.,E.WC       ;CHECK IF FIRST WORD
014522  001004                          BNE     7$              ;NO, STORE CS2
014524  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
014530  005300                  6$:     DEC     R0
014532  001376                          BNE     6$
014534  016237  000010  003450  7$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
014542  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
014550  001401                          BEQ     8$              ;YES, CHECK CS2
014552  104057                          ERROR   57              ;CS1 INCORRECT
014554  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
014562  001401                          BEQ     9$              ;YES, CHECK BUS ADDRESS
014564  104060                          ERROR   60              ;CS2 INCORRECT
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3576  014566  023737  003504  003444  9$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS
3577  014574  001401                          BEQ     10$             ;YES, CHECK WORD COUNT
3578  014576  104061                          ERROR   61              ;BUS ADDRESS INCORRECT
3579  014600  023737  003502  003442  10$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3580  014606  001401                          BEQ     11$             ;YES, CHECK IF ALL WORDS TRANSFERRED
3581  014610  104062                          ERROR   62              ;WORD COUNT INCORRECT
3582  014612  005237  003502          11$:    INC     E.WC            ;INCREMENT WORD COUNT
3583  014616  100713                          BMI     4$              ;CHECK IF FINISHED (NO, BRANCH)
3584  014620  001004                          BNE     12$             ;CHECK IF LAST WORD
3585  014622  012737  000220  003510          MOV     #OR!BAI,E.CS2   ;LOAD EXPECTED COMMAND STATUS REG. 2
3586  014630  000706                          BR      4$              ;PROCESS THE LAST WORD
3587
3588  014632  005037  003502          12$:    CLR     E.WC            ;ADJUST WORD COUNT
3589  014636  012700  000112                  MOV     #2*37.,R0       ;ISSUE ENOUGH CLOCKS FOR
3590  014642  012762  000440  000026  15$:    MOV     #DMD!MCLK,RKMR1(R2)  ;  2 NPR TRANSFERS
3591  014650  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3592  014656  005300                          DEC     R0
3593  014660  001370                          BNE     15$
3594  014662  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3595  014670  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3596  014676  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3597  014704  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT REG.
3598  014712  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3599  014720  001401                          BEQ     16$             ;YES, CHECK CS2
3600  014722  104063                          ERROR   63              ;CS1 INCORRECT
3601  014724  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
3602  014732  001401                          BEQ     17$             ;YES, CHECK BUS ADDRESS
3603  014734  104064                          ERROR   64              ;CS2 INCORRECT
3604  014736  023737  003504  003444  17$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3605  014744  001401                          BEQ     18$             ;YES, CHECK WORD COUNT
3606  014746  104065                          ERROR   65              ;BUS ADDRESS INCORRECT
3607  014750  023737  003502  003442  18$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3608  014756  001401                          BEQ     19$             ;YES, CHECK DATA
3609  014760  104066                          ERROR   66              ;WORD COUNT INCORRECT
3610  014762  012701  000102          19$:    MOV     #66.,R1         ;LOAD NUMBERS OF WORDS LOADED
3611  014766  013737  066762  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3612  014774  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT FOR PRINT OUT
3613  015000  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3614  015006  012737  000320  003510          MOV     #IR!OR!BAI,E.CS2 ;LOAD EXPECTED CS2
3615  015014  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3616  015022  001401                          BEQ     26$             ;YES, CONTINUE
3617  015024  104067                          ERROR   67              ;DATA BUFFER INCORRECT
3618  015026  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3619  015034  005737  003624                  TST     WRDCNT          ;CHECK IF FIRST WORD
3620  015040  001015                          BNE     28$             ;NO, GET CS2
3621  015042  012700  000024                  MOV     #20.,R0         ;WAIT FOR INPUT READY TO SET
3622  015046  005300                  27$:    DEC     R0
3623  015050  001376                          BNE     27$
3624  015052  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3625  015060  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
3626  015064  001003                          BNE     28$             ;NO, CONTINUE
3627  015066  012737  000120  003510          MOV     #IR!BAI,E.CS2   ;LOAD EXPECTED CS2
3628  015074  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1 CORRECT
3629  015102  001401                          BEQ     29$             ;YES, CHECK CS2
3630  015104  104070                          ERROR   70              ;CS1 INCORRECT
3631  015106  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
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 3632  015114  001401                          BEQ     30$             ;YES, GET NEXT WORD
 3633  015116  104071                          ERROR   71              ;CS2 INCORRECT
 3634  015120  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
 3635  015124  005301                          DEC     R1              ;DECREMENT WORDS READ
 3636  015126  001324                          BNE     25$             ;CHECK IF ALL WORDS READ
 3637
 3638                                  ;;*****************************************************************
 3639                                  ;*TEST 16       NON-EXISTENT MEMORY
 3640                                  ;*
 3641                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR,  PUT CONTROLLER
 3642                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 3643                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 3644                                  ;*      SPECIFY A ONE WORD DATA TO A NON-EXISTENT ADDRESS
 3645                                  ;*      (760000) AND MAKE SURE THE NON-EXISTENT  MEMORY ERROR
 3646                                  ;*      OCCURS IN THE RK611 CONTROLLER.
 3647                                  ;*
 3648                                  ;;*****************************************************************
 3649  015130  000004                  ST16:   SCOPE
 3650  015132  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 3651  015140  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 3652  015144  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3653  015152  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
 3654  015160  012737  160002  003504          MOV     #160002,E.BA    ;LOAD BUS ADDRESS
 3655  015166  012762  160000  000004          MOV     #160000,RKBA(R2)
 3656  015174  012737  177677  003502          MOV     #-65.,E.WC      ;LOAD WORD COUNT
 3657  015202  012762  177676  000002          MOV     #-66.,RKWC(R2)
 3658  015210  012737  101626  003503          MOV     #CERR!RDY!BA16!BA17!WRHEAD&<^C<GO>>,E.CS1
 3659  015216  012762  001427  000000          MOV     #BA17!BA16!WRHEAD,RKCS1(R2)  ;ISSUE WRITE HEADER
 3660  015224  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY FOR
 3661                                                                  ;  INDEX PULSE
 3662  015230  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 3663  015236  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3664  015244  005300                          DEC     R0
 3665  015246  001370                          BNE     1$
 3666  015250  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 3667  015254  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3668  015262  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 3669  015270  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 3670  015276  005300                          DEC     R0
 3671  015300  001370                          BNE     2$
 3672  015302  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3673  015310  012700  000045                  MOV     #37.,R0         ;SIMULATE 1 NPR TRANSFER
 3674  015314  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
 3675  015322  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 3676  015330  005300                          DEC     R0
 3677  015332  001370                          BNE     5$
 3678  015334  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3679  015342  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 3680  015350  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
 3681  015356  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 3682  015364  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG.
 3683  015372  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG.
 3684  015376  012737  004100  003510          MOV     #IR!NEM,E.CS2   ;LOAD EXPECTED CS2
 3685  015404  032737  000200  003450          BIT     #OR,T.CS2
 3686  015412  001403                          BEQ     7$
 3687  015414  052737  000200  003510          BIS     #OR,E.CS2
```

```
 3688  015422  023737  003500  003440  7$:     CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
 3689  015430  001401                          BEQ     8$              ;YES, CHECK CS2
 3690  015432  104072                          ERROR   72              ;CS1 INCORRECT
 3691  015434  023737  003510  003450  8$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG. 2 CORRECT
 3692  015442  001401                          BEQ     9$              ;YES, CHECK ERROR REG.
 3693  015444  104073                          ERROR   73              ;CS2 INCORRECT
 3694  015446  023737  003514  003454  9$:     CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 3695  015454  001401                          BEQ     10$             ;CHECK BUS ADDRESS
 3696  015456  104074                          ERROR   74              ;ERROR REG INCORRECT
 3697  015460  023737  003504  003444  10$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 3698  015466  001401                          BEQ     11$             ;YES, CHECK WORD COUNT
 3699  015470  104075                          ERROR   75              ;BUS ADDRESS INCORRECT
 3700  015472  023737  003502  003442  11$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG.
 3701  015500  001401                          BEQ     12$             ;YES, CLEAR RK611
 3702  015502  104076                          ERROR   76              ;WORD COUNT INCORRECT
 3703  015504  012762  100000  000000  12$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 3704  015512  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 3705  015520  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 3706  015526  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 3707  015534  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 3708  015542  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG. 1
 3709  015550  001401                          BEQ     15$             ;YES, CHECK CS2
 3710  015552  104077                          ERROR   77              ;CS1 INCORRECT
 3711  015554  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF NEM CLEARED
 3712  015562  001401                          BEQ     TST17           ;YES, GO ON TO NEXT TEST
 3713  015564  104100                          ERROR   100             ;CS2 INCORRECT
 3714
 3715                                  ;;*****************************************************************
 3716                                  ;*TEST 17       BUS ADDRESS BIT 16
 3717                                  ;*
 3718                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 3719                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO  AN RK06
 3720                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 3721                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 200000.
 3722                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
 3723                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 177776.
 3724                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
 3725                                  ;*
 3726                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 32K
 3727                                  ;*             OF MEMORY IS ON THE SYSTEM.
 3728                                  ;*
 3729                                  ;;*****************************************************************
 3730  015566  000004                  TST17:  SCOPE
 3731  015570  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 3732  015576  005737  046316                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
 3733  015602  100004                          BPL     1$              ;NO, BYPASS TEST
 3734  015604  022737  002000  046564          CMP     #2000,$LSTBK    ;CHECK IF ENOUGH MEMORY
 3735  015612  103417                          BLO     2$              ;YES, DO TEST
 3736  015614                          1$:
 3737  015614  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
 3738  015622  005227  177777                  INC     #-1             ;ONLY DO ONCE
 3739  015626  001007                          BNE     64$             ;NO, GO TO NEXT TEST
 3740  015630  104401  054734                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
 3741  015634  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
 3742  015640  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 3743  015642  104401  054744                  TYPE    ,TSTBY2
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3744  015646  000137  016702          64$:    JMP     TST20           ;GO TO NEXT TEST
3745
3746  015652  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3747  015656  012737  002000  172354          MOV     #2000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3748  015664  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3749  015670  013737  066762  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3750  015676  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3751  015702  012737  015710  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3752                                                                  ;  SUBTEST LOOP
3753
3754  015710                          3$:
3755  015710  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3756  015716  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3757  015724  012762  177777  000002          MOV     #-1,RKWC(R2)
3758  015732  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3759  015740  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3760  015746  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3761  015752  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3762  015760  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3763  015766  005300                          DEC     R0
3764  015770  001370                          BNE     5$
3765  015772  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3766  015776  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3767  016004  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3768  016012  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3769  016020  005300                          DEC     R0
3770  016022  001370                          BNE     6$
3771  016024  012762  000C40  000026          MOV     #DMD,RKMR1(R2)
3772  016032  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3773  016036  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3774  016044  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3775  016052  005300                          DEC     R0
3776  016054  001370                          BNE     7$
3777  016056  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3778  016064  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3779  016072  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3780  016100  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3781  016104  005300                  8$:     DEC     R0
3782  016106  001376                          BNE     8$
3783  016110  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3784  016116  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3785  016124  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3786  016132  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3787  016136  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3788  016144  001401                          BEQ     10$             ;YES, CHECK CS2
3789  016146  104101                          ERROR   101             ;CS1 INCORRECT
3790  016150  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3791  016156  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3792  016160  104102                          ERROR   102             ;CS2 INCORRECT
3793  016162  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3794  016170  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3795  016172  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3796  016174  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3797  016202  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3798  016204  104104                          ERROR   104             ;WORD COUNT INCORRECT
3799  016206  016237  000024  003462  13$:    MOV     RkDB(R2),T.DB   ;READ DATA BUFFER
```

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3800  016214  013737  066762  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3801  016222  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3802  016230  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3803  016232  104105                          ERROR   105             ;DATA INCORRECT
3804  016234  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
3805  016236  012737  001777  172354          MOV     #2000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
3806  016244  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3807  016250  013737  066762  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
3808  016256  013737  066764  140100          MOV     NPRBUF+2,140100
3809  016264  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3810  016270  012737  016276  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
3811                                                                  ;  SUBTEST LOOP
3812
3813  016276                          20$:
3814  016276  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3815  016304  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3816  016312  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
3817  016320  012762  177776  000002          MOV     #-2,RKWC(R2)
3818  016326  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
3819  016332  012762  177776  000004          MOV     #177776,RKBA(R2)
3820  016340  012737  000427  003500          MOV     #BA16!WRHEAD,E.CS1 ;LOAD COMMAND
3821  016346  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
3822  016354  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3823  016360  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
3824  016366  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3825  016374  005300                          DEC     R0
3826  016376  001370                          BNE     21$
3827  016400  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3828  016404  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3829  016412  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
3830  016420  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3831  016426  005300                          DEC     R0
3832  016430  001370                          BNE     22$
3833  016432  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3834  016440  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
3835  016444  012700  000045          23$:    MOV     #37.,R0
3836  016450  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
3837  016456  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3838  016464  005300                          DEC     R0
3839  016466  001370                          BNE     24$
3840  016470  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3841  016476  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
3842  016504  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
3843  016512  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
3844  016516  001404                          BEQ     26$             ;NO, GET CS2
3845  016520  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3846  016524  005300                  25$:    DEC     R0
3847  016526  001376                          BNE     25$
3848  016530  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
3849  016536  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3850  016544  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
3851  016552  001401                          BEQ     28$             ;YES, CHECK CS2
3852  016554  104101                          ERROR   101             ;CS1 INCORRECT
3853  016556  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
3854  016564  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
3855  016566  104102                          ERROR   102             ;CS2 INCORRECT
```

```
3856  016570  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
3857  016576  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
3858  016600  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3859  016602  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
3860  016610  001401                          BEQ     31$             ;YES, GET TEXT WORD
3861  016612  104104                          ERROR   104             ;WORD COUNT INCORRECT
3862  016614  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
3863  016622  005237  003502                  INC     E.WC            ;  WORD COUNT
3864  016626  005301                          DEC     R1              ;CHECK IF FINISHED
3865  016630  001305                          BNE     23$             ;NO, GET SECOND WORD
3866  016632  012700  000002                  MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
3867  016636  012703  066762                  MOV     #NPRBUF,R3      ;  DATA COMPARE
3868  016642  016237  000024  003462  35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3869  016650  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
3870  016654  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF CORRECT
3871  016662  001401                          BEQ     36$             ;YES, CHECK IF FINISHED
3872  016664  104105                          ERROR   105             ;DATA BUFFER INCORRECT
3873  016666  005300                  36$:    DEC     R0              ;CHECK IF FINISHED
3874  016670  001364                          BNE     35$             ;NO READ SECOND WORD
3875  016672  104415                          SCOPI                   ;CHECK IF LOOP ON ERROR
3876  016674  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3877
3878                                  ;;*****************************************************************
3879                                  ;*TEST 20       BUS ADDRESS BIT 17
3880                                  ;*
3881                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
3882                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
3883                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
3884                                  ;*      SPECIFY A ONE WORD DATA TRANSFER FROM 400000.
3885                                  ;*      READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
3886                                  ;*      REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 377776.
3887                                  ;*      CHECK BUS ADDRESS AND WORD COUNT.
3888                                  ;*
3889                                  ;*      NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 64K
3890                                  ;*             OF MEMORY IS ON THE SYSTEM.
3891                                  ;*
3892                                  ;*****************************************************************
3893  016702  000004          TST20:  SCOPE
3894  016704  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
3895  016712  005737  046316                  TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
3896  016716  100004                          BPL     1$              ;NO, BYPASS TEST
3897  016720  022737  004000  046564          CMP     #4000,$LSTBK    ;CHECK IF ENOUGH MEMORY
3898  016726  103417                          BLO     2$              ;YES, DO TEST
3899  016730                          1$:
3900  016736  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
3901  016736  005227  177777                  INC     #-1             ;ONLY DO ONCE
3902  016742  001007                          BNE     64$             ;NO, GO TO NEXT TEST
3903  016744  104401  054734                  TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
3904  016750  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
3905  016754  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3906  016756  104401  054744                  TYPE    ,TSTBY2
3907  016762  000137  020016          64$:    JMP     TST21           ;GO TO NEXT TEST
3908
3909  016766  013702  001270          2$:     MOV     $BASE,R2        ;LOAD K611 BASE
3910  016772  012737  004000  172354          MOV     #4000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
3911  017000  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
```

```
3912  017004  013737  066762  140000          MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
3913  017012  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3914  017016  012737  017024  001110          MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
3915                                                                  ;  SUBTEST LOOP
3916
3917  017024                          3$:
3918  017024  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3919  017032  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3920  017040  012762  177777  000002          MOV     #-1,RKWC(R2)
3921  017046  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
3922  017054  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
3923  017062  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3924  017066  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
3925  017074  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3926  017102  005300                          DEC     R0
3927  017104  001370                          BNE     5$
3928  017106  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3929  017112  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3930  017120  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
3931  017126  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3932  017134  005300                          DEC     R0
3933  017136  001370                          BNE     6$
3934  017140  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3935  017146  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
3936  017152  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
3937  017160  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3938  017166  005300                          DEC     R0
3939  017170  001370                          BNE     7$
3940  017172  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
3941  017200  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
3942  017206  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
3943  017214  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
3944  017220  005300                  8$:     DEC     R0
3945  017222  001376                          BNE     8$
3946  017224  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
3947  017232  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
3948  017240  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
3949  017246  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
3950  017252  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
3951  017260  001401                          BEQ     10$             ;YES, CHECK CS2
3952  017262  104101                          ERROR   101             ;CS1 INCORRECT
3953  017264  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
3954  017272  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
3955  017274  104102                          ERROR   102             ;CS2 INCORRECT
3956  017276  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
3957  017304  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
3958  017306  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
3959  017310  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
3960  017316  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
3961  017320  104104                          ERROR   104             ;WORD COUNT INCORRECT
3962  017322  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
3963  017330  013737  066762  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
3964  017336  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
3965  017344  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
3966  017346  104105                          ERROR   105             ;DATA INCORRECT
3967  017350  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
```

```
3968  017352  012737  003777  172354          MOV     #4000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
3969  017360  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
3970  017364  013737  066762  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
3971  017372  013737  066764  140100          MOV     NPRBUF+2,140100
3972  017400  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
3973  017404  012737  017412  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
3974                                                                  ;  SUBTEST LOOP
3975
3976  017412                          20$:
3977  017412  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
3978  017420  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
3979  017426  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
3980  017434  012762  177776  000002          MOV     #-2,RKWC(R2)
3981  017442  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
3982  017446  012762  177776  000004          MOV     #177776,RKBA(R2)
3983  017454  012737  001027  003500          MOV     #BA17!WRHEAD,E.CS1 ;LOAD COMMAND
3984  017462  012762  000427  000000          MOV     #BA16!WRHEAD,RKCS1(R2)
3985  017470  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
3986  017474  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
3987  017502  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3988  017510  005300                          DEC     R0
3989  017512  001370                          BNE     21$
3990  017514  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
3991  017520  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3992  017526  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
3993  017534  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
3994  017542  005300                          DEC     R0
3995  017544  001370                          BNE     22$
3996  017546  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3997  017554  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
3998  017560  012700  000045          23$:    MOV     #37.,R0
3999  017564  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
4000  017572  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4001  017600  005300                          DEC     R0
4002  017602  001370                          BNE     24$
4003  017604  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4004  017612  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4005  017620  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4006  017626  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
4007  017632  001404                          BEQ     26$             ;NO, GET CS2
4008  017634  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4009  017640  005300                  25$:    DEC     R0
4010  017642  001376                          BNE     25$
4011  017644  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4012  017652  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4013  017660  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
4014  017666  001401                          BEQ     28$             ;YES, CHECK CS2
4015  017670  104101                          ERROR   101             ;CS1 INCORRECT
4016  017672  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
4017  017700  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
4018  017702  104102                          ERROR   102             ;CS2 INCORRECT
4019  017704  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4020  017712  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
4021  017714  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
4022  017716  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4023  017724  001401                          BEQ     31$             ;YES, GET TEXT WORD
```

```
 4024  017726  104104                        ERROR   104             ;WORD COUNT INCORRECT
 4025  017730  062737  000002  003504  31$:   ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
 4026  017736  005237  003502                INC     E.WC            ;  WORD COUNT
 4027  017742  005301                        DEC     R1              ;CHECK IF FINISHED
 4028  017744  001305                        BNE     23$             ;NO, GET SECOND WORD
 4029  017746  012700  000002                MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
 4030  017752  012703  066762                MOV     #NPRBUF,R3      ;  DATA COMPARE
 4031  017756  016237  000024  003462  35$:   MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
 4032  017764  012337  003522                MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4033  017770  023737  003522  003462        CMP     E.DB,T.DB       ;CHECK IF CORRECT
 4034  017776  001401                        BEQ     36$             ;YES, CHECK IF FINISHED
 4035  020000  104105                        ERROR   105             ;DATA BUFFER INCORRECT
 4036  020002  005300                36$:    DEC     R0              ;CHECK IF FINISHED
 4037  020004  001364                        BNE     35$             ;NO READ SECOND WORD
 4038  020006  104415                        SCOPE1                  ;CHECK IF LOOP ON ERROR
 4039  020010  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4040
 4041                          ;;**********************************************************************
 4042                          ;*TEST 21       ADDRESSING GREATER THAN 96K
 4043                          ;*
 4044                          ;*       CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4045                          ;*       IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 4046                          ;*       IN 26 SECTOR FORMAT, CYLINDER 0, HEADER 0, DRIVE 0.
 4047                          ;*       SPECIFY A ONE WORD DATA TRANSFER FROM 600000.
 4048                          ;*       READ THE SILO AND MAKE SURE RIGHT CONTENTS ARE READ.
 4049                          ;*       REPEAT FOR A TWO WORD TRANSFER FROM ADDRESS 577776.
 4050                          ;*       CHECK BUS ADDRESS AND WORD COUNT.
 4051                          ;*
 4052                          ;*       NOTE:  THIS TEST IS ONLY EXECUTED IF MORE THAN 96K
 4053                          ;*              OF MEMORY IS ON THE SYSTEM.
 4054                          ;*
 4055                          ;;**********************************************************************
 4056  020016  000004          TST21:  SCOPE
 4057  020020  012737  000144  001200        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4058  020026  005737  046316                TST     $KT11           ;CHECK FOR MEMORY MANAGEMENT
 4059  020032  100004                        BPL     1$              ;NO, BYPASS TEST
 4060  020034  022737  006000  046564        CMP     #6000,$LSTBK    ;CHECK IF ENOUGH MEMORY
 4061  020042  103417                        BLO     2$              ;YES, DO TEST
 4062  020044                          1$:
 4063  020044  012737  000001  001200        MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
 4064  020052  005227  177777                INC     #-1             ;ONLY DO ONCE
 4065  020056  001007                        BNE     64$             ;NO, GO TO NEXT TEST
 4066  020060  104401  054734                TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
 4067  020064  013746  001220                MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
 4068  020070  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 4069  020072  104401  054744                TYPE    ,TSTBY2
 4070  020076  000137  021132          64$:  JMP     $TST22          ;GO TO NEXT TEST
 4071
 4072  020102  013702  001270          2$:   MOV     $BASE,R2        ;LOAD K611 BASE
 4073  020106  012737  006000  172354        MOV     #6000,KIPAR6    ;LOAD PAGE ADDRESS 6 FOR DATA
 4074  020114  005237  177572                INC     SR0             ;TURN ON MEMORY MANAGEMENT
 4075  020120  013737  066762  140000        MOV     NPRBUF,140000   ;LOAD WORD IN MEMORY
 4076  020126  005037  177572                CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
 4077  020132  012737  020140  001110        MOV     #3$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
 4078                                                                ;  SUBTEST LOOP
 4079
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4080  020140                          3$:
4081  020140  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4082  020146  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4083  020154  012762  177777  000002          MOV     #-1,RKWC(R2)
4084  020162  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
4085  020170  012762  001427  000000          MOV     #BA16!BA17!WRHEAD,RKCS1(R2)
4086  020176  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4087  020202  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
4088  020210  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4089  020216  005300                          DEC     R0
4090  020220  001370                          BNE     5$
4091  020222  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4092  020226  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4093  020234  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
4094  020242  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4095  020250  005300                          DEC     R0
4096  020252  001370                          BNE     6$
4097  020254  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4098  020262  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
4099  020266  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
4100  020274  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4101  020302  005300                          DEC     R0
4102  020304  001370                          BNE     7$
4103  020306  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4104  020314  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4105  020322  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WOR
4106  020330  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4107  020334  005300                  8$:     DEC     R0
4108  020336  001377                          BNE     8$
4109  020340  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4110  020346  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4111  020354  012737  000002  003504          MOV     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
4112  020362  005037  003502                  CLR     E.WC            ;LOAD EXPECTED WORD COUNT
4113  020366  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG. 1 CORRECT
4114  020374  001401                          BEQ     10$             ;YES, CHECK CS2
4115  020376  104101                          ERROR   101             ;CS1 INCORRECT
4116  020400  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
4117  020406  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS CORRECT
4118  020410  104102                          ERROR   102             ;CS2 INCORRECT
4119  020412  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK IF BUS ADD INCORRECT
4120  020420  001401                          BEQ     12$             ;YES, CHECK WORD COUNT CORRECT
4121  020422  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
4122  020424  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK IF WORD COUNT CORRECT
4123  020432  001401                          BEQ     13$             ;YES, CHECK DATA BUFFER
4124  020434  104104                          ERROR   104             ;WORD COUNT INCORRECT
4125  020436  016237  000024  003462  13$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4126  020444  013737  066762  003522          MOV     NPRBUF,E.DB     ;LOAD EXPECTED DATA BUFFER
4127  020452  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4128  020460  001401                          BEQ     15$             ;YES, CHECK IF LOOP ON ERROR
4129  020462  104105                          ERROR   105             ;DATA INCORRECT
4130  020464  104415                  15$:    SCOP1                   ;CHECK IF LOOP ON ERROR
4131  020466  012737  005777  172354          MOV     #6000-1,KIPAR6  ;LOAD PAGE ADDRESS 6 FOR DATA
4132  020474  005237  177572                  INC     SR0             ;TURN ON MEMORY MANAGEMENT
4133  020500  013737  066762  140076          MOV     NPRBUF,140076   ;LOAD WORDS IN MEMORY
4134  020506  013737  066764  140100          MOV     NPRBUF+2,140100
4135  020514  005037  177572                  CLR     SR0             ;TURN OFF MEMORY MANAGEMENT
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 4136  020520  012737  020526  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
 4137                                                                  ;  SUBTEST LOOP
 4138
 4139  020526                                20$:
 4140  020526  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4141  020534  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 4142  020542  012737  177777  003502          MOV     #-1,E.WC        ;LOAD WORD COUNT REG.
 4143  020550  012762  177776  000002          MOV     #-2,RKWC(R2)
 4144  020556  005037  003504                  CLR     E.BA            ;LOAD BUS ADDRESS
 4145  020562  012762  177776  000004          MOV     #177776,RKBA(R2)
 4146  020570  012737  001427  003500          MOV     #BA16!BA17!WRHEAD,E.CS1 ;LOAD COMMAND
 4147  020576  012762  001027  000000          MOV     #BA17!WRHEAD,RKCS1(R2)
 4148  020604  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4149  020610  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ; INDEX PULSE
 4150  020616  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4151  020624  005300                          DEC     R0
 4152  020626  001370                          BNE     21$
 4153  020630  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4154  020634  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4155  020642  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4156  020650  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4157  020656  005300                          DEC     R0
 4158  020660  001370                          BNE     22$
 4159  020662  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4160  020670  012701  000002                  MOV     #2,R1           ;ISSUE 2 NPR TRANSFERS
 4161  020674  012700  000045          23$:    MOV     #37.,R0
 4162  020700  012762  000440  000026  24$:    MOV     #DMD!MCLK,RKMR1(R2)
 4163  020706  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4164  020714  005300                          DEC     R0
 4165  020716  001370                          BNE     24$
 4166  020720  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4167  020726  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
 4168  020734  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4169  020742  005737  003502                  TST     E.WC            ;CHECK IF FIRST WORD
 4170  020746  001404                          BEQ     26$             ;NO, GET CS2
 4171  020750  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4172  020754  005300                  25$:    DEC     R0
 4173  020756  001376                          BNE     25$
 4174  020760  016237  000010  003450  26$:    MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 4175  020766  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
 4176  020774  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND STATUS REG 1 CORRECT
 4177  021002  001401                          BEQ     28$             ;YES, CHECK CS2
 4178  021004  104101                          ERROR   101             ;CS1 INCORRECT
 4179  021006  023737  003510  003450  28$:    CMP     E.CS2,T.CS2     ;CHECK COMMAND STATUS REG 2 CORRECT
 4180  021014  001401                          BEQ     29$             ;YES, CHECK BUS ADDRESS
 4181  021016  104102                          ERROR   102             ;CS2 INCORRECT
 4182  021020  023737  003504  003444  29$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4183  021026  001401                          BEQ     30$             ;YES, CHECK WORD COUNT
 4184  021030  104103                          ERROR   103             ;BUS ADDRESS INCORRECT
 4185  021032  023737  003502  003442  30$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4186  021040  001401                          BEQ     31$             ;YES, GET TEXT WORD
 4187  021042  104104                          ERROR   104             ;WORD COUNT INCORRECT
 4188  021044  062737  000002  003504  31$:    ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
 4189  021052  005237  003502                  INC     E.WC            ;  WORD COUNT
 4190  021056  005301                          DEC     R1              ;CHECK IF FINISHED
 4191  021060  001305                          BNE     23$             ;NO, GET SECOND WORD
```

```
                                                MOV     #2,R0           ;LOAD COUNT AND ADDRESS WORD
                                                MOV     #NPRBUF,R3      ;  DATA COMPARE
                                        35$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
                                                MOV     (R3)+,E.DB      ;GET EXPECTED DATA
                                                CMP     E.DB,T.DB       ;CHECK IF CORRECT
                                                BEQ     36$             ;YES, CHECK IF FINISHED
                                                ERROR   105             ;DATA BUFFER INCORRECT
                                        36$:    DEC     R0              ;CHECK IF FINISHED
                                                BNE     35$             ;NO READ SECOND WORD
                                                SCOP1                   ;CHECK IF LOOP ON ERROR
                                                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611

                                        ;;**********************************************************************
                                        ;*TEST 22       UNIBUS PARITY ERROR
                                        ;*
                                        ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      SPECIFY A ONE WORD DATA TRANSFER FROM A LOCATION
                                        ;*      WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY ERROR
                                        ;*      OCCURS.
                                        ;*
                                        ;*      REPEAT FOR A ONE WORD DATA TRANSFER FROM THE
                                        ;*      LOCATION PRIOR TO THE LOCATION WITH BAD PARITY.
                                        ;*      MAKE SURE UNIBUS PARITY ERROR DOES NOT OCCUR.  REPEAT
                                        ;*      FOR A ONE WORD DATA TRANSFER FROM THE LOCATION AFTER
                                        ;*      THE LOCATION WITH BAD PARITY.  MAKE SURE UNIBUS PARITY
                                        ;*      ERROR DOES NOT OCCUR.
                                        ;*
                                        ;*      REPEAT FOR A TWO WORD DATA TRANSFER STARTING WITH
                                        ;*      THE ADDRESS PRIOR TO THE LOCATION WITH BAD PARITY.
                                        ;*      MAKE SURE UNIBUS PARITY ERROR DOES OCCUR.
                                        ;*
                                        ;*      NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
                                        ;*              EXISTS FOR SPECIFIED LOCATION.
                                        ;*
                                        ;;**********************************************************************
000004                                  TST22:  SCOPE
000144  001200                                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
003630                                          TST     MEMPAR          ;CHECK IF MEMORY PARITY AVAILABLE
001017                                          BNE     1$              ;YES, DO TEST
000001  001200                                  MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
177777                                          INC     #-1             ;ONLY DO ONCE
001007                                          BNE     64$             ;NO, GO TO NEXT TEST
054734                                          TYPE    ,TSTBY1         ;TYPE TEST N BYPASSED
001220                                          MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
                                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
054744                                          TYPE    ,TSTBY2
000137  022370                          64$:    JMP     @#ST23          ;GO TO NEXT TEST

001270                                  1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
044702                                          JSR     PC,WRTPAR       ;GENERATE BAD PARITY
021224  001110                                  MOV     #2$,$LPERR      ;LOAD LOOP ON ERROR LOCATION FOR
                                                                        ;  SUBTEST LOOP

021224                                  2$:
```

```
 4248  021224  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4249  021232  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4250  021240  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT NEG
 4251  021246  005037  003502                  CLR     E.WC
 4252  021252  012762  067220  000004          MOV     #BADPAR,RKBA(R2);LOAD BUS ADDRESS
 4253  021260  012737  067222  003504          MOV     #BADPAR+2,E.BA
 4254  021266  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
 4255  021274  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
 4256  021302  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 4257  021306  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
 4258  021314  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4259  021322  005300                          DEC     R0
 4260  021324  001370                          BNE     5$
 4261  021326  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
 4262  021332  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4263  021340  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4264  021346  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4265  021354  005300                          DEC     R0
 4266  021356  001370                          BNE     6$
 4267  021360  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4268  021366  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
 4269  021372  012762  000440  000026  7$:     MOV     #DMD!MCLK,RKMR1(R2)
 4270  021400  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4271  021406  005300                          DEC     R0
 4272  021410  001370                          BNE     7$
 4273  021412  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG.1
 4274  021420  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
 4275  021426  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4276  021434  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 4277  021442  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4278  021446  005300                  8$:     DEC     R0
 4279  021450  001376                          BNE     8$
 4280  021452  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG.2
 4281  021460  012737  020300  003510          MOV     #IR!OR!UPE,E.CS2 ;LOAD EXPECTED CS2
 4282  021466  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
 4283  021472  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4284  021500  001401                          BEQ     10$             ;YES CHECK CS2
 4285  021502  104106                          ERROR   106             ;CS1 INCORRECT
 4286  021504  023737  003510  003450  10$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4287  021512  001401                          BEQ     11$             ;YES, CHECK BUS ADDRESS
 4288  021514  104107                          ERROR   107             ;CS2 INCORRECT
 4289  021516  023737  003504  003444  11$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4290  021524  001401                          BEQ     12$             ;YES, CHECK WORD COUNT
 4291  021526  104110                          ERROR   110             ;BUS ADDRESS INCORRECT
 4292  021530  023737  003502  003442  12$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4293  021536  001401                          BEQ     13$             ;YES,CHECK ERROR REG.
 4294  021540  104111                          ERROR   111             ;WORD COUNT INCORRECT
 4295  021542  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4296  021550  001401                          BEQ     14$             ;YES,CLEAR ERROR
 4297  021552  104116                          ERROR   116             ;ERROR REG CORRECT
 4298  021554  012762  100000  000000  14$:    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4299  021562  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
 4300  021570  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND STATUS REG. 2
 4301  021576  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
 4302  021604  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
 4303  021612  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
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  4304  021620  001401                          BEQ     15$             ;YES, CHECK CS2
  4305  021622  104117                          ERROR   117             ;CS1 INCORRECT
  4306  021624  023737  003510  003450  15$:    CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
  4307  021632  001401                          BEQ     16$             ;YES, CONTINUE
  4308  021634  104120                          ERROR   120             ;CS2 INCORRECT
  4309  021636  104415                  16$:    SCOPI                   ;CHECK IF LOOP ON ERROR
  4310  021640  012737  021646  001110          MOV     #20$,$LPERR     ;LOAD LOOP ON ERROR LOCATION FOR
  4311                                                                  ;  SUBTEST LOOP
  4312
  4313  021646                          20$:
  4314  021646  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
  4315  021654  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611-IN-DIAGNOSTIC MODE
  4316  021662  012762  177776  000002          MOV     #-2,RKWC(R2)    ;LOAD WORD COUNT REG
  4317  021670  012737  177777  003502          MOV     #-1,E.WC
  4318  021676  012762  067216  000004          MOV     #BADPAR-2,RKBA(R2) ;LOAD BUS ADDRESS REG
  4319  021704  012737  067220  003504          MOV     #BADPAR,E.BA
  4320  021712  012737  000027  003500          MOV     #WRHEAD,E.CS1   ;LOAD EXPECTED CS1
  4321  021720  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;LOAD COMMAND
  4322  021726  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
  4323  021732  012762  000440  000026  21$:    MOV     #DMD!MCLK,RKMR1(R2) ;  INDEX PULSE
  4324  021740  012762  000040  000026          MOV     #DMD,RKMR1(R2)
  4325  021746  005300                          DEC     R0
  4326  021750  001370                          BNE     21$
  4327  021752  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
  4328  021756  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
  4329  021764  012762  000640  000026  22$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
  4330  021772  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
  4331  022000  005300                          DEC     R0
  4332  022002  001370                          BNE     22$
  4333  022004  012762  000040  000026          MOV     #DMD,RKMR1(R2)
  4334  022012  012700  000045                  MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
  4335  022016  012762  000440  000026  23$:    MOV     #DMD!MCLK,RKMR1(R2)
  4336  022024  012762  000040  000026          MOV     #DMD,RKMR1(R2)
  4337  022032  005300                          DEC     R0
  4338  022034  001370                          BNE     23$
  4339  022036  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
  4340  022044  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
  4341  022052  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
  4342  022060  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
  4343  022064  005300                  24$:    DEC     R0
  4344  022066  001376                          BNE     24$
  4345  022070  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
  4346  022076  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
  4347  022104  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
  4348  022112  001401                          BEQ     25$             ;YES,CHECK CS2
  4349  022114  104112                          ERROR   112             ;CS1 INCORRECT
  4350  022116  023737  003510  003450  25$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
  4351  022124  001401                          BEQ     26$             ;YES, CHECK BUS ADDRESS
  4352  022126  104113                          ERROR   113             ;CS2 INCORRECT
  4353  022130  023737  003504  003444  26$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
  4354  022136  001401                          BEQ     27$             ;YES, CHECK WORD COUNT
  4355  022140  104114                          ERROR   114             ;BUS ADDRESS INCORRECT
  4356  022142  023737  003502  003442  27$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
  4357  022150  001401                          BEQ     28$             ;YES, DO NEXT NPR TRANSFER
  4358  022152  104115                          ERROR   115             ;WORD COUNT INCORRECT
  4359  022154  012700  000045          28$:    MOV     #37.,R0         ;ISSUE 1 NPR TRANSFER
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 4360  022160  012762  000440  000026  30$:    MOV     #DMD!MCLK,RKMR1(R2)
 4361  022166  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4362  022174  005300                          DEC     R0
 4363  022176  001370                          BNE     30$
 4364  022200  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
 4365  022206  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
 4366  022214  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
 4367  022222  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4368  022230  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
 4369  022236  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 4370  022244  012737  020300  003510          MOV     #OR!IR!UPE,E.CS2;LOAD EXPECTED CS2
 4371  022252  005237  003502                  INC     E.WC            ;LOAD EXPECTED WORD COUNT
 4372  022256  062737  000002  003504          ADD     #2,E.BA         ;LOAD EXPECTED BUS ADDRESS
 4373  022264  005037  003514                  CLR     E.ER            ;LOAD EXPECTED WORD COUNT
 4374  022270  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4375  022276  001401                          BEQ     31$             ;YES, CHECK CS2
 4376  022300  104106                          ERROR   106             ;CS1 INCORRECT
 4377  022302  023737  003510  003450  31$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4378  022310  001401                          BEQ     32$             ;YES, CHECK BUS ADDRESS
 4379  022312  104107                          ERROR   107             ;CS2 INCORRECT
 4380  022314  023737  003504  003444  32$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4381  022322  001401                          BEQ     33$             ;YES, CHECK WORD COUNT
 4382  022324  104110                          ERROR   110             ;BUS ADDRESS INCORRECT
 4383  022326  023737  003502  003442  33$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
 4384  022334  001401                          BEQ     34$             ;YES, CHECK ERROR REG
 4385  022336  104111                          ERROR   111             ;WORD COUNT INCORRECT
 4386  022340  023737  003514  003454  34$:    CMP     E.ER,T.ER       ;CHECK ERROR REG CORRECT
 4387  022346  001401                          BEQ     35$             ;YES, CONTINUE
 4388  022350  104116                          ERROR   116             ;WORD COUNT INCORRECT
 4389  022352  104415                  35$:    SCOP1                   ;CHECK IF WORD ON ERROR
 4390  022354  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4391  022362  012737  000000  067220          MOV     #0,BADPAR       ;WRITE GOOD PARITY
 4392
 4393                                  ;;*****************************************************************
 4394                                  ;*TEST 23       SILO FILL IN 18 BIT MODE
 4395                                  ;*
 4396                                  ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
 4397                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 4398                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0. DRIVE 0,
 4399                                  ;*      SPECIFY 66  WORD DATA TRANSFER.  CLOCK
 4400                                  ;*      ALL 66 WORD INTO THE SILO.   CHECK THAT ALL 66
 4401                                  ;*      WORDS ARE CORRECT (16 LEAST SIGNIFICANT BITS).
 4402                                  ;*
 4403                                  ;;*****************************************************************
 4404  022370  000004                  TST23:  SCOPE
 4405  022372  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4406  022400  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 4407  022404  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4408  022412  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
 4409  022420  012762  177676  000002          MOV     #-66.,RKWC(R2)  ;LOAD WORD COUNT
 4410  022426  012737  177677  003502          MOV     #-65.,E.WC
 4411  022434  012762  066762  000004          MOV     #NPRBUF,RKBA(R2);LOAD BUS ADDRESS
 4412  022442  012737  066764  003504          MOV     #NPRBUF+2,E.BA
 4413  022450  012737  010027  003500          MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
 4414  022456  012762  010027  000000          MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
 4415  022464  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS DATA
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 4416                                                                   ;  INDEX PULSE
 4417  022470  012762  000440  000026  5$:     MOV     #DMD!MCLK,RkMR1(R2)
 4418  022476  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4419  022504  005300                          DEC     R0
 4420  022506  001370                          BNE     5$
 4421  022510  012700  000004                  MOV     #4,R0                   ;SIMULATE INDEX PULSE
 4422  022514  012762  000240  000026          MOV     #DMD!MIND,RkMR1(R2)
 4423  022522  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 4424  022530  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 4425  022536  005300                          DEC     R0
 4426  022540  001370                          BNE     6$
 4427  022542  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4428  022550  012737  000300  003510          MOV     #ER!OR.E.CS2            ;LOAD EXPECTED CS2
 4429  022556  012701  000102                  MOV     #66.,R1                 ;ISSUE 66 NPR TRANSFERS
 4430  022562  012700  000050          7$:     MOV     #40.,R0
 4431  022566  012762  000440  000026  8$:     MOV     #DMD!MCLK,RKMR1(R2)
 4432  022574  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4433  022602  005300                          DEC     R0
 4434  022604  001370                          BNE     8$
 4435  022606  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4436  022614  016237  000004  003444          MOV     RkBA(R2),T.BA   ;STORE BUS ADDRESS REG. 2
 4437  022622  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
 4438  022630  022737  066764  003504          CMP     #NPRBUF+2,E.BA  ;CHECK IF FIRST WORD
 4439  022636  001004                          BNE     10$             ;NO, CONTINUE
 4440  022640  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
 4441  022644  005300                  9$:     DEC     R0
 4442  022646  001376                          BNE     9$
 4443  022650  016237  000C10  003450  10$:     MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4444  022656  005737  003502                  TST     E.WC            ;CHECK IF LAST WORD
 4445  022662  001003                          BNE     11$             ;NO, CONTINUE
 4446  022664  012737  000200  003510          MOV     #OR,E.CS2       ;LOAD EXPECTED CS2
 4447  022672  023737  003500  003440  11$:     CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4448  022700  001401                          BEQ     12$             ;YES, CONTINUE
 4449  022702  104121                          ERROR   121             ;CS1 INCORRECT
 4450  022704  023737  003510  003450  12$:     CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4451  022712  001401                          BEQ     13$             ;YES, CONTINUE
 4452  022714  104122                          ERROR   122             ;CS2 INCORRECT
 4453  022716  023737  003504  003444  13$:     CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
 4454  022724  001401                          BEQ     14$             ;YES, CONTINUE
 4455  022726  104123                          ERROR   123             ;BUS ADDRESS INCORRECT
 4456  022730  023737  003502  003442  14$:     CMP     E.WC,T.WC       ;CHECK WORD COUNT REG CORRECT
 4457  022736  001401                          BEQ     15$             ;YES, CONTINUE
 4458  022740  104124                          ERROR   124             ;WORD COUNT INCORRECT
 4459  022742  062737  000002  003504  15$:     ADD     #2,E.BA         ;INCREMENT BUS ADDRESS AND
 4460  022750  005237  003502                  INC     E.WC            ;   WORD COUNT
 4461  022754  005301                          DEC     R1              ;CHECK IF SILO FULL
 4462  022756  001301                          BNE     7$              ;NO, GET NEXT WORD
 4463  022760  012700  000120                  MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
 4464  022764  012762  000440  000026  20$:     MOV     #DMD!MCLK,RKMR1(R2)
 4465  022772  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 4466  023000  005300                          DEC     R0
 4467  023002  001370                          BNE     20$
 4468  023004  162737  000002  003504          SUB     #2,E.BA         ;ADJUST BUS ADDRESS AND WORD COUNT
 4469  023012  005037  003502                  CLR     E.WC
 4470  023016  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4471  023024  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
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4472  023032  016237  000004  003444          MOV     RkBA(R2),T.BA   ;STORE BUS ADDRESS
4473  023040  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4474  023046  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4475  023054  001401                          BEQ     21$             ;YES, CONTINUE
4476  023056  104125                          ERROR   125             ;CS1 INCORRECT
4477  023060  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4478  023066  001401                          BEQ     22$             ;YES, CONTINUE
4479  023070  104126                          ERROR   126             ;CS2 INCORRECT
4480  023072  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS INCORRECT
4481  023100  001401                          BEQ     23$             ;YES, CONTINUE
4482  023102  104127                          ERROR   127             ;BUS ADDRESS INCORRECT
4483  023104  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4484  023112  001401                          BEQ     24$             ;YES, CONTINUE
4485  023114  104130                          ERROR   130             ;WORD COUNT INCORRECT
4486  023116  012703  066762          24$:    MOV     #NPRBUF,R3      ;LOAD BUFFER ADDRESS FOR COMPARE
4487  023122  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4488  023130  012701  000102                  MOV     #66.,R1         ;LOAD COUNT
4489  023134  005037  003624                  CLR     WRDCNT          ;INITIALIZE WORD COUNT
4490  023140  016237  000024  003462  25$:    MOV     RKDB(R2),T.DB   ;GET DATA BUFFER
4491  023146  012337  003522                  MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4492  023152  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4493  023160  001401                          BEQ     26$             ;YES, CONTINUE
4494  023162  104131                          ERROR   131             ;DATA READ INCORRECT
4495  023164  012700  000050          26$:    MOV     #40.,R0         ;SET STALL
4496  023170  005300                  27$:    DEC     R0              ;RUN STALL TO ZERO
4497  023172  001376                          BNE     27$
4498  023174  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4499  023202  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4500  023210  022701  000001                  CMP     #1,R1           ;CHECK IF LAST WORD
4501  023214  001003                          BNE     28$             ;NO, CONTINUE
4502  023216  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4503  023224  023737  003500  003440  28$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4504  023232  001401                          BEQ     29$             ;YES, CONTINUE
4505  023234  104132                          ERROR   132             ;CS1 INCORRECT
4506  023236  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4507  023244  001401                          BEQ     30$             ;YES, CONTINUE
4508  023246  104133                          ERROR   133             ;CS2 INCORRECT
4509  023250  005237  003624          30$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4510  023254  005301                          DEC     R1              ;CHECK IF FINISHED
4511  023256  001330                          BNE     25$             ;NO, CONTINUE
4512
4513                                  ;;*****************************************************************
4514                                  ;*TEST 24       BIT 16 AND 17 READING WITH NPR
4515                                  ;*
4516                                  ;*      CLEAR RK611 WITH CONTROLLER CLEAR.  PUT CONTROLLER
4517                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
4518                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4519                                  ;*      SPECIFY ONE WORD DATA TRANSFER FROM A LOCATION
4520                                  ;*      WITH BAD PARITY.  MAKE SURE A UNIBUS PARITY
4521                                  ;*      DOES NOT OCCUR.
4522                                  ;*
4523                                  ;*      NOTE:   THIS TEST IS EXECUTED ONLY IF MEMORY PARITY
4524                                  ;*              ENABLE EXISTS FOR SPECIFIED LOCATION.
4525                                  ;*
4526                                  ;;*****************************************************************
4527  023260  000004                  TST24:  SCOPE
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4528  023262  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4529  023270  005737  003630                  TST     MEMPAR          ;CHECK IF MEMORY PARITY AVAILABLE
4530  023274  001017                          BNE     1$              ;YES, DO TEST
4531  023276  012737  000001  001200          MOV     #1,$TIMES       ;FORCE INTERATION COUNT TO 1
4532  023304  005227  177777                  INC     #-1             ;ONLY DO ONCE
4533  023310  001007                          BNE     64$             ;NO, GO TO NEXT TEST
4534  023312  104401  054734                  TYPE    ,?STBY1         ;TYPE TEST N BYPASSED
4535  023316  013746  001220                  MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
4536  023322  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4537  023324  104401  054744                  TYPE    ,?STBY2
4538  023330  000137  024104          64$:    JMP     @#ST25          ;GO TO NEXT TEST
4539
4540  023334  013702  001270          1$:     MOV     $BASE,R2        ;LOAD RK611 BASE
4541  023340  004737  044702                  JSR     PC,WR@#PAR      ;GENERATE BAD PARITY
4542  023344  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4543  023352  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
4544  023360  012762  177777  000002          MOV     #-1,RKWC(R2)    ;LOAD WORD COUNT
4545  023366  005037  003502                  CLR     E.WC
4546  023372  012762  067220  000004          MOV     #BADPAR,RKBA(R2) ;LOAD BUS ADDRESS
4547  023400  012737  067222  003504          MOV     #BADPAR+2,E.BA
4548  023406  012737  012027  003500          MOV     #WRHEAD!CFMT,E.CS1 ;LOAD EXPECTED CS1
4549  023414  012762  012027  000000          MOV     #WRHEAD!CFMT,RKCS1(R2) ;ISSUE COMMAND
4550  023422  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
4551                                                                  ;  INDEX PULSE
4552  023426  012762  000440  000026  5$:     MOV     #DMD!MCLK,RKMR1(R2)
4553  023434  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4554  023442  005300                          DEC     R0
4555  023444  001370                          BNE     5$
4556  023446  012700  000004                  MOV     #4,R0           ;SIMULATE INDEX PULSE
4557  023452  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4558  023460  012762  000640  000026  6$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
4559  023466  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
4560  023474  005300                          DEC     R0
4561  023476  001370                          BNE     6$
4562  023500  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4563  023506  012737  000300  003510          MOV     #IR!OR,E.CS2    ;LOAD EXPECTED CS2
4564  023514  012700  000050                  MOV     #40.,R0         ;ISSUE NPR TRANSFER
4565  023520  012762  000440  000026  8$:     MOV     #DMD!MCLK,RKMR1(R2)
4566  023526  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4567  023534  005300                          DEC     R0
4568  023536  001370                          BNE     8$
4569  023540  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4570  023546  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS
4571  023554  016237  000002  003442          MOV     RKWC(R2),T.WC   ;STORE WORD COUNT
4572  023562  012700  000024                  MOV     #20.,R0         ;WAIT FOR OUTPUT READY
4573  023566  005300                  9$:     DEC     R0
4574  023570  001376                          BNE     9$
4575  023572  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4576  023600  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4577  023606  001401                          BEQ     12$             ;YES, CHECK CS2
4578  023610  104134                          ERROR   134             ;CS1 INCORRECT
4579  023612  023737  003510  003450  12$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4580  023620  001401                          BEQ     13$             ;YES, CHECK BUS ADDRESS
4581  023622  104135                          ERROR   135             ;CS2 INCORRECT
4582  023624  023737  003504  003444  13$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4583  023632  001401                          BEQ     14$             ;YES, CHECK WORD COUNT
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```
4584  023634  104136                          ERROR   136             ;BUS ADDRESS INCORRECT
4585  023636  023737  003502  003442  14$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT CORRECT
4586  023644  001401                          BEQ     15$             ;YES, CONTINUE
4587  023646  104137                          ERROR   137             ;WORD COUNT INCORRECT
4588  023650  012700  000120          15$:    MOV     #2*40.,R0       ;ISSUE CLOCKS FOR TWO NPR'S
4589  023654  012762  000440  000026  20$:    MOV     #DMD!MCLK,RKMR1(R2)
4590  023662  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4591  023670  005300                          DEC     R0
4592  023672  001370                          BNE     20$
4593  023674  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND STATUS REG. 1
4594  023702  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4595  023710  016237  000004  003444          MOV     RKBA(R2),T.BA   ;STORE BUS ADDRESS REG.
4596  023716  016237  000002  003442          MOV     RkWC(R2),T.WC   ;STORE WORD COUNT
4597  023724  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4598  023732  001401                          BEQ     21$             ;YES, CHECK CS2
4599  023734  104140                          ERROR   140             ;CS1 INCORRECT
4600  023736  023737  003510  003450  21$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4601  023744  001401                          BEQ     22$             ;YES, CHECK BUS ADDRESS
4602  023746  104141                          ERROR   141             ;CS2 INCORRECT
4603  023750  023737  003504  003444  22$:    CMP     E.BA,T.BA       ;CHECK BUS ADDRESS CORRECT
4604  023756  001401                          BEQ     23$             ;YES, CHECK WORD COUNT
4605  023760  104142                          ERROR   142             ;BUS ADDRESS INCORRECT
4606  023762  023737  003502  003442  23$:    CMP     E.WC,T.WC       ;CHECK WORD COUNT REG. CORRECT
4607  023770  001401                          BEQ     24$             ;YES, CHECK DATA
4608  023772  104143                          ERROR   143             ;WORD COUNT INCORRECT
4609  023774  016237  000024  003462  24$:    MOV     RKDB(R2),T.DB   ;READ DATA BUFFER
4610  024002  012737  000157  003522          MOV     #157,E.DB       ;LOAD EXPECT DATA
4611  024010  023737  003522  003462          CMP     E.DB,T.DB       ;CHECK TO MAKE SURE CORRECT
4612  024016  001401                          BEQ     26$             ;YES, CONTINUE
4613  024020  104144                          ERROR   144             ;DATA INCORRECT
4614  024022  016237  000000  003440  26$:    MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
4615  024030  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
4616  024036  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
4617  024044  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4618  024052  001401                          BEQ     29$             ;YES, CHECK SC2
4619  024054  104145                          ERROR   145             ;CS1 INCORRECT
4620  024056  023737  003510  003450  29$:    CMP     E.CS2,T.CS2     ;CHECK CS1 CORRECT
4621  024064  001401                          BEQ     30$             ;YES, CONTINUE
4622  024066  104146                          ERROR   146             ;CS2 INCORRECT
4623  024070  012737  000000  067220  30$:    MOV     #0,BADPAR       ;WRITE GOOD PARITY
4624  024076  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4625
4626                                  .SBTTL  **MFM READ LOOPBACK TESTS
4627
4628                                  ;;*****************************************************************
4629                                  ;*TEST 25       READ LOOPBACK (PART 1)
4630                                  ;*
4631                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR, PUT CONTROLLER
4632                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4633                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4634                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4635                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
4636                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4637                                  ;*      FOLLOWING WORDS:
4638                                  ;*
4639                                  ;*              177777
```

```
                                        ;*              000000
                                        ;*              177777
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;;*************************************************************
024104  000004                          TST25:  SCOPE
024106  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
024114  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
024120  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024126  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
024134  012762  000025  000000                  MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
024142  012700  000312                          MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
024146  012762  000440  000026  1$:             MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
024154  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
024162  005300                                  DEC     R0
024164  001370                                  BNE     1$
024166  012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
024174  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
024202  005037  003614                          CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
024206  005037  003616                          CLR     M1.BIT          ;  PREVIOUS BIT
024212  012700  000341                          MOV     #225.,R0
024216  004737  046106          2$:             JSR     PC,RDBIT        ;SIMULATE SYNCH
024222  005300                                  DEC     R0
024224  001374                                  BNE     2$
024226  012737  000001  003614                  MOV     #1,PR.BIT
024234  004737  046106                          JSR     PC,RDBIT
024240  012701  000003                          MOV     #3,R1           ;LOAD NUMBER OF WORDS
024244  012703  066702                          MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
024250  012737  000025  003500                  MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
024256  012304                  5$:             MOV     (R3)+,R4        ;GET DATA
024260  012700  000020                          MOV     #16.,R0         ;LOAD BIT COUNT
024264  013737  003614  003616  6$:             MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
024272  006004                                  ROR     R4              ;GET NEXT BIT
024274  103403                                  BCS     7$              ;CHECK IF 1
024276  005037  003614                          CLR     PR.BIT          ;NO, ZERO
024302  000403                                  BR      8$              ;SIMULATE READ DATA

024304  012737  000001  003614  7$:             MOV     #1,PR.BIT       ;ONE
024312  004737  046106          8$:             JSR     PC,RDBIT        ;SIMULATE READ DATA
024316  016237  000000  003440                  MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
024324  023737  003500  003440                  CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
024332  001417                                  BEQ     9$              ;YES, SIMULATE NEXT BIT
024334  012737  000003  003624                  MOV     #3,WRDCNT       ;LOAD WORD COUNT
024342  160137  003624                          SUB     R1,WRDCNT
024346  012737  000020  003622                  MOV     #16.,BITCNT     ;LOAD BIT COUNT
024354  160037  003622                          SUB     R0,BITCNT
024360  104150                                  ERROR   150             ;CS1 INCORRECT DURING HEADER
024362  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024370  000522                                  BR      TST26           ;;GO ON TO NEXT TEST

024372  005300                  9$:             DEC     R0              ;CHECK IF READY FOR NEXT WORD
024374  001333                                  BNE     6$              ;NO, GET NEXT BIT
024376  005301                                  DEC     R1              ;CHECK IF HEADER FINISHED
024400  001326                                  BNE     5$              ;NO, GET NEXT WORD
```

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4696  024402  012700  000004                MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4697  024406  013737  003614  003616  15$:   MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4698  024414  005037  003614                CLR     PR.BIT          ;LOAD NEXT BIT
4699  024420  004737  046106                JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
4700  024424  005300                        DEC     R0              ;CHECK IF TIME FOR READY
4701  024426  001367                        BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4702  024430  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4703  024436  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4704  024444  012737  000224  003500        MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
4705  024452  012737  000300  003510        MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4706  024460  023737  003500  003440        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4707  024466  001401                        BEQ     16$             ;YES, CHECK CS2
4708  024470  104151                        ERROR   151             ;CS1 INCORRECT
4709  024472  023737  003510  003450  16$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4710  024500  001401                        BEQ     17$             ;YES, CHECK DATA
4711  024502  104152                        ERROR   152             ;CS2 INCORRECT
4712  024504  005037  003624          17$:   CLR     WRDCNT          ;INITIALIZE WORD COUNT
4713  024510  012703  066702                MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
4714  024514  012337  003522          20$:   MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4715  024520  016237  000024  003462        MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4716  024526  016237  000000  003440        MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4717  024534  016237  000010  003450        MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4718  024542  022737  000002  003624        CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4719  024550  001003                        BNE     21$             ;NO, CHECK CS1
4720  024552  012737  000100  003510        MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4721  024560  023737  003500  003440  21$:   CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4722  024566  001402                        BEQ     22$             ;YES, CHECK CS2
4723  024570  104153                        ERROR   153             ;CS1 INCORRECT
4724  024572  000421                        BR      TST26           ;;GO ON TO NEXT TEST
4725
4726  024574  023737  003510  003450  22$:   CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4727  024602  001402                        BEQ     23$             ;YES, CHECK DATA
4728  024604  104154                        ERROR   154             ;CS2 INCORRECT
4729  024606  000413                        BR      TST26           ;;GO ON TO NEXT TEST
4730
4731  024610  023737  003522  003462  23$:   CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4732  024616  001401                        BEQ     24$             ;YES, GET NEXT HEADER WORD
4733  024620  104155                        ERROR   155             ;DATA INCORRECT
4734  024622  005237  003624          24$:   INC     WRDCNT          ;INCREMENT WORD COUNT
4735  024626  022737  000003  003624        CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4736  024634  001327                        BNE     20$             ;NO, GET NEXT WORD
4737
4738                                  ;;*****************************************************************
4739                                  ;*TEST 26       READ LOOPBACK (PART 2)
4740                                  ;*
4741                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4742                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4743                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4744                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4745                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A ONE,
4746                                  ;*      AND A HEADER CONSISTING OF THE THREE
4747                                  ;*      FOLLOWING WORDS:
4748                                  ;*
4749                                  ;*              000000
4750                                  ;*              177777
4751                                  ;*              000000
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                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
                                        ;*
                                        ;;**********************************************************************
024636  000004                  TST26:  SCOPE
024640  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
024646  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
024652  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
024660  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
024666  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
024674  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
024700  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
024706  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024714  005300                          DEC     R0
024716  001370                          BNE     1$
024720  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
024726  012762  000040  000026          MOV     #DMD,RKMR1(R2)
024734  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
024740  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
024744  012700  000341                  MOV     #225.,R0
024750  004737  046106          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
024754  005300                          DEC     R0
024756  001374                          BNE     2$
024760  012737  000001  003614          MOV     #1,PR.BIT
024766  004737  046106                  JSR     PC,RDBIT
024772  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
024776  012703  066710                  MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
025002  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
025010  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
025012  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
025016  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
025024  006004                          ROR     R4              ;GET NEXT BIT
025026  103403                          BCS     7$              ;CHECK IF 1
025030  005037  003614                  CLR     PR.BIT          ;NO, ZERO
025034  000403                          BR      8$              ;SIMULATE READ DATA

025036  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
025044  004737  046106          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
025050  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
025056  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
025064  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
025066  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
025074  160137  003624                  SUB     R1,WRDCNT
025100  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
025106  160037  003622                  SUB     R0,BITCNT
025112  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
025114  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
025122  000522                          BR      TST27           ;;GO ON TO NEXT TEST

025124  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
025126  001323                          BNE     6$              ;NO, GET NEXT BIT
025130  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
025132  001326                          BNE     5$              ;NO, GET NEXT WORD
025134  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
025140  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
```

```
 4808  025146  005037  003614                      CLR     PR.BIT          ;LOAD NEXT BIT
 4809  025152  004737  046106                      JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 4810  025156  005300                              DEC     R0              ;CHECK IF TIME FOR READY
 4811  025160  001367                              BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 4812  025162  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 4813  025170  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
 4814  025176  012737  000224  003500              MOV     #RDY!RDHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
 4815  025204  012737  000300  003510              MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
 4816  025212  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4817  025220  001401                              BEQ     16$             ;YES, CHECK CS2
 4818  025222  104151                              ERROR   151             ;CS1 INCORRECT
 4819  025224  023737  003510  003450  16$:        CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4820  025232  001401                              BEQ     17$             ;YES, CHECK DATA
 4821  025234  104152                              ERROR   152             ;CS2 INCORRECT
 4822  025236  005037  003624          17$:        CLR     WRDCNT          ;INITIALIZE WORD COUNT
 4823  025242  012703  066710                      MOV     #HEAD2,R3       ;GET ADDRESS OF DATA
 4824  025246  012337  003522          20$:        MOV     (R3)+,E.DB      ;GET EXPECTED DATA
 4825  025252  016237  000024  003462              MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
 4826  025260  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
 4827  025266  016237  000010  003450              MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
 4828  025274  022737  000002  003624              CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
 4829  025302  001003                              BNE     21$             ;NO, CHECK CS1
 4830  025304  012737  000100  003510              MOV     #IR,E.CS2       ;STORE EXPECTED CS2
 4831  025312  023737  003500  003440  21$:        CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
 4832  025320  001402                              BEQ     22$             ;YES, CHECK CS2
 4833  025322  104153                              ERROR   153             ;CS1 INCORRECT
 4834  025324  000421                              BR      TST27           ;;GO ON TO NEXT TEST
 4835
 4836  025326  023737  003510  003450  22$:        CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
 4837  025334  001402                              BEQ     23$             ;YES, CHECK DATA
 4838  025336  104154                              ERROR   154             ;CS2 INCORRECT
 4839  025340  000413                              BR      TST27           ;;GO ON TO NEXT TEST
 4840
 4841  025342  023737  003522  003462  23$:        CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
 4842  025350  001401                              BEQ     24$             ;YES, GET NEXT HEADER WORD
 4843  025352  104155                              ERROR   155             ;DATA INCORRECT
 4844  025354  005237  003624          24$:        INC     WRDCNT          ;INCREMENT WORD COUNT
 4845  025360  022737  000003  003624              CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
 4846  025366  001327                              BNE     20$             ;NO, GET NEXT WORD
 4847
 4848                                  ;;*****************************************************************
 4849                                  ;*TEST 27       READ LOOPBACK (PART 3)
 4850                                  ;*
 4851                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 4852                                  ;*      IN DIAGNOSTIC MOVE.  ISSUE A READ HEADER TO AN RK06
 4853                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 4854                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES
 4855                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
 4856                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
 4857                                  ;*      FOLLOWING WORDS:
 4858                                  ;*
 4859                                  ;*              125252
 4860                                  ;*              052525
 4861                                  ;*              125252
 4862                                  ;*
 4863                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
```

```
4864                                            ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4865                                            ;*
4866                                            ;;*****************************************************************
4867  025370  000004                            TST27:  SCOPE
4868  025372  012737  000144  001200                    MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
4869  025400  013702  001270                            MOV     $BASE,R2        ;LOAD RK611 BASE
4870  025404  012762  100000  000000                    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4871  025412  012762  000040  000026                    MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
4872  025420  012762  000025  000000                    MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
4873  025426  012700  000312                            MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
4874  025432  012762  000440  000026            1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
4875  025440  012762  000040  000026                    MOV     #DMD,RKMR1(R2)
4876  025446  005300                                    DEC     R0
4877  025450  001370                                    BNE     1$
4878  025452  012762  000140  000026                    MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
4879  025460  012762  000040  000026                    MOV     #DMD,RKMR1(R2)
4880  025466  005037  003614                            CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
4881  025472  005037  003616                            CLR     M1.BIT          ;  PREVIOUS BIT
4882  025476  012700  000341                            MOV     #225.,R0
4883  025502  004737  046106            2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
4884  025506  005300                                    DEC     R0
4885  025510  001374                                    BNE     2$
4886  025512  012737  000001  003614                    MOV     #1,PR.BIT
4887  025520  004737  046106                            JSR     PC,RDBIT
4888  025524  012701  000003                            MOV     #3,R1           ;LOAD NUMBER OF WORDS
4889  025530  012703  066716                            MOV     #HEAD3,R3       ;LOAD ADDRESS OF DATA
4890  025534  012737  000025  003500                    MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
4891  025542  012304                            5$:     MOV     (R3)+,R4        ;GET DATA
4892  025544  012700  000020                            MOV     #16.,R0         ;LOAD BIT COUNT
4893  025550  013737  003614  003616          6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
4894  025556  006004                                    ROR     R4              ;GET NEXT BIT
4895  025560  103403                                    BCS     7$              ;CHECK IF 1
4896  025562  005037  003614                            CLR     PR.BIT          ;NO, ZERO
4897  025566  000403                                    BR      8$              ;SIMULATE READ DATA
4898
4899  025570  012737  000001  003614          7$:     MOV     #1,PR.BIT       ;ONE
4900  025576  004737  046106                    8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
4901  025602  016237  000000  003440                    MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
4902  025610  023737  003500  003440                    CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
4903  025616  001417                                    BEQ     9$              ;YES, SIMULATE NEXT BIT
4904  025620  012737  000003  003624                    MOV     #3,WRDCNT       ;LOAD WORD COUNT
4905  025626  160137  003624                            SUB     R1,WRDCNT
4906  025632  012737  000020  003622                    MOV     #16.,BITCNT     ;LOAD BIT COUNT
4907  025640  160037  003622                            SUB     R0,BITCNT
4908  025644  104150                                    ERROR   150             ;CS1 INCORRECT DURING HEADER
4909  025646  012762  100000  000000                    MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
4910  025654  000522                                    BR      TST30           ;;GO ON TO NEXT TEST
4911
4912  025656  005300                            9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
4913  025660  001233                                    BNE     6$              ;NO, GET NEXT BIT
4914  025662  005301                                    DEC     R1              ;CHECK IF HEADER FINISHED
4915  025664  001326                                    BNE     5$              ;NO, GET NEXT WORD
4916  025666  012700  000004                            MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
4917  025672  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
4918  025700  005037  003614                            CLR     PR.BIT          ;LOAD NEXT BIT
4919  025704  004737  046106                            JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
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4920  025710  005300                          DEC     R0              ;CHECK IF TIME FOR READY
4921  025712  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
4922  025714  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
4923  025722  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
4924  025730  012737  000224  003500          MOV     #RDY!RDHEAD&^C<GO>),E.CS1 ;LOAD EXPECTED CS1
4925  025736  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
4926  025744  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4927  025752  001401                          BEQ     16$             ;YES, CHECK CS2
4928  025754  104151                          ERROR   151             ;CS1 INCORRECT
4929  025756  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4930  025764  001401                          BEQ     17$             ;YES, CHECK DATA
4931  025766  104152                          ERROR   152             ;CS2 INCORRECT
4932  025770  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
4933  025774  012703  066716                  MOV     #HEAD3,R3       ;GET ADDRESS OF DATA
4934  026000  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
4935  026004  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
4936  026012  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
4937  026020  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
4938  026026  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
4939  026034  001003                          BNE     21$             ;NO, CHECK CS1
4940  026036  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
4941  026044  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
4942  026052  001402                          BEQ     22$             ;YES, CHECK CS2
4943  026054  104153                          ERROR   153             ;CS1 INCORRECT
4944  026056  000421                          BR      TST30           ;;GO ON TO NEXT TEST
4945
4946  026060  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
4947  026066  001402                          BEQ     23$             ;YES, CHECK DATA
4948  026070  104154                          ERROR   154             ;CS2 INCORRECT
4949  026072  000413                          BR      TST30           ;;GO ON TO NEXT TEST
4950
4951  026074  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
4952  026102  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
4953  026104  104155                          ERROR   155             ;DATA INCORRECT
4954  026106  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
4955  026112  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
4956  026120  001327                          BNE     20$             ;NO, GET NEXT WORD
4957
4958                                  ;;*****************************************************************
4959                                  ;*TEST 30       READ LOOPBACK (PART 4)
4960                                  ;*
4961                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
4962                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
4963                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
4964                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
4965                                  ;*      SIMULATE SECTOR PULSE, 225 ZEROES, A
4966                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
4967                                  ;*      FOLLOWING WORDS:
4968                                  ;*
4969                                  ;*              044444
4970                                  ;*              022222
4971                                  ;*              111111
4972                                  ;*
4973                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
4974                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
4975                                  ;*
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 4976                                   ;;*****************************************************************
 4977  026122  000004                   TST30:  SCOPE
 4978  026124  012737  000144  001200           MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 4979  026132  013702  001270                   MOV     $BASE,R2        ;LOAD RK611 BASE
 4980  026136  012762  100000  000000           MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 4981  026144  012762  000040  000026           MOV     #DMD,RKMR1(R2)  ;PUT Rk611 IN DIAGNOSTIC MODE
 4982  026152  012762  000025  000000           MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
 4983  026160  012700  000312                   MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 4984  026164  012762  000440  000026  1$:      MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
 4985  026172  012762  000040  000026           MOV     #DMD,RKMR1(R2)
 4986  026200  005300                           DEC     R0
 4987  026202  001370                           BNE     1$
 4988  026204  012762  000140  000026           MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 4989  026212  012762  000040  000026           MOV     #DMD,RKMR1(R2)
 4990  026220  005037  003614                   CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 4991  026224  005037  003616                   CLR     M1.BIT          ;  PREVIOUS BIT
 4992  026230  012700  000341                   MOV     #225.,R0
 4993  026234  004737  046106           2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
 4994  026240  005300                           DEC     R0
 4995  026242  001374                           BNE     2$
 4996  026244  012737  000001  003614           MOV     #1,PR.BIT
 4997  026252  004737  046106                   JSR     PC,RDBIT
 4998  026256  012701  000003                   MOV     #3,R1           ;LOAD NUMBER OF WORDS
 4999  026262  012703  066732                   MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
 5000  026266  012737  000025  003500           MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 5001  026274  012304                   5$:     MOV     (R3)+,R4        ;GET DATA
 5002  026276  012700  000020                   MOV     #16.,R0         ;LOAD BIT COUNT
 5003  026302  013737  003614  003616   6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5004  026310  006004                           ROR     R4              ;GET NEXT BIT
 5005  026312  103403                           BCS     7$              ;CHECK IF 1
 5006  026314  005037  003614                   CLR     PR.BIT          ;NO, ZERO
 5007  026320  000403                           BR      8$              ;SIMULATE READ DATA
 5008
 5009  026322  012737  000001  003614   7$:     MOV     #1,PR.BIT       ;ONE
 5010  026330  004737  046106           8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 5011  026334  016237  000000  003440           MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 5012  026342  023737  003500  003440           CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 5013  026350  001417                           BEQ     9$              ;YES, SIMULATE NEXT BIT
 5014  026352  012737  000003  003624           MOV     #3,WRDCNT       ;LOAD WORD COUNT
 5015  026360  160137  003624                   SUB     R1,WRDCNT
 5016  026364  012737  000020  003622           MOV     #16.,BITCNT     ;LOAD BIT COUNT
 5017  026372  160037  003622                   SUB     R0,BITCNT
 5018  026376  104150                           ERROR   150             ;CS1 INCORRECT DURING HEADER
 5019  026400  012762  100000  000000           MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5020  026406  000522                           BR      TST31           ;;GO ON TO NEXT TEST
 5021
 5022  026410  005300                   9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
 5023  026412  001333                           BNE     6$              ;NO, GET NEXT BIT
 5024  026414  005301                           DEC     R1              ;CHECK IF HEADER FINISHED
 5025  026416  001326                           BNE     5$              ;NO, GET NEXT WORD
 5026  026420  012700  000004                   MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 5027  026424  013737  003614  003616  15$:     MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 5028  026432  005037  003614                   CLR     PR.BIT          ;LOAD NEXT BIT
 5029  026436  004737  046106                   JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 5030  026442  005300                           DEC     R0              ;CHECK IF TIME FOR READY
 5031  026444  001367                           BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
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5032  026446  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5033  026454  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5034  026462  012737  000224  003500          MOV     #RDY!RDHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
5035  026470  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5036  026476  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5037  026504  001401                          BEQ     16$             ;YES, CHECK CS2
5038  026506  104151                          ERROR   151             ;CS1 INCORRECT
5039  026510  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5040  026516  001401                          BEQ     17$             ;YES, CHECK DATA
5041  026520  104152                          ERROR   152             ;CS2 INCORRECT
5042  026522  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5043  026526  012703  066732                  MOV     #HEAD4,R3       ;GET ADDRESS OF DATA
5044  026532  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5045  026536  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5046  026544  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5047  026552  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5048  026560  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5049  026566  001003                          BNE     21$             ;NO, CHECK CS1
5050  026570  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5051  026576  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5052  026604  001402                          BEQ     22$             ;YES, CHECK CS2
5053  026606  104153                          ERROR   153             ;CS1 INCORRECT
5054  026610  000421                          BR      TST31           ;;GO ON TO NEXT TEST
5055
5056  026612  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5057  026620  001402                          BEQ     23$             ;YES, CHECK DATA
5058  026622  104154                          ERROR   154             ;CS2 INCORRECT
5059  026624  000413                          BR      TST31           ;;GO ON TO NEXT TEST
5060
5061  026626  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5062  026634  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5063  026636  104155                          ERROR   155             ;DATA INCORRECT
5064  026640  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5065  026644  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5066  026652  001327                          BNE     20$             ;NO, GET NEXT WORD
5067
5068                                  ;;*****************************************************************
5069                                  ;*TEST 31       READ LOOPBACK (PART 5)
5070                                  ;*
5071                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5072                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5073                                  ;*      26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5074                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5075                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
5076                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
5077                                  ;*      FOLLOWING WORDS.
5078                                  ;*
5079                                  ;*              052012
5080                                  ;*              100520
5081                                  ;*              052012
5082                                  ;*
5083                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
5084                                  ;*      IS TRANSRERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5085                                  ;*
5086                                  ;*****************************************************************
5087  026654  000004                  TST31:  SCOPE
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 5088  026656  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 5089  026664  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 5090  026670  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5091  026676  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 5092  026704  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
 5093  026712  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
 5094  026716  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
 5095  026724  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5096  026732  005300                          DEC     R0
 5097  026734  001370                          BNE     1$
 5098  026736  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
 5099  026744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5100  026752  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
 5101  026756  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
 5102  026762  012700  000341                  MOV     #225.,R0
 5103  026766  004737  046106          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
 5104  026772  005300                          DEC     R0
 5105  026774  001374                          BNE     2$
 5106  026776  012737  000001  003614          MOV     #1,PR.BIT
 5107  027004  004737  046106                  JSR     PC,RDBIT
 5108  027010  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
 5109  027014  012703  066740                  MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
 5110  027020  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
 5111  027026  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
 5112  027030  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
 5113  027034  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PREVIOUS BIT
 5114  027042  006004                          ROR     R4              ;GET NEXT BIT
 5115  027044  103403                          BCS     7$              ;CHECK IF 1
 5116  027046  005037  003614                  CLR     PR.BIT          ;NO, ZERO
 5117  027052  000403                          BR      8$              ;SIMULATE READ DATA
 5118
 5119  027054  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
 5120  027062  004737  046106          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
 5121  027066  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
 5122  027074  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 5123  027102  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
 5124  027104  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
 5125  027112  160137  003624                  SUB     R1,WRDCNT
 5126  027116  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
 5127  027124  160037  003622                  SUB     R0,BITCNT
 5128  027130  104150                          ERROR   150             ;CS1 INCORRECT DURING HEADER
 5129  027132  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 5130  027140  000522                          BR      TST32           ;;GO ON TO NEXT TEST
 5131
 5132  027142  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
 5133  027144  001333                          BNE     6$              ;NO, GET NEXT BIT
 5134  027146  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
 5135  027150  001326                          BNE     5$              ;NO, GET NEXT WORD
 5136  027152  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
 5137  027156  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
 5138  027164  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
 5139  027170  004737  046106                  JSR     PC,RDBIT        ;SIMULATE 1 BIT READ
 5140  027174  005300                          DEC     R0              ;CHECK IF TIME FOR READY
 5141  027176  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
 5142  027200  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
 5143  027206  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
```

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5144  027214  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5145  027222  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5146  027230  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5147  027236  001401                          BEQ     16$             ;YES, CHECK CS2
5148  027240  104151                          ERROR   151             ;CS1 INCORRECT
5149  027242  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5150  027250  001401                          BEQ     17$             ;YES, CHECK DATA
5151  027252  104152                          ERROR   152             ;CS2 INCORRECT
5152  027254  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5153  027260  012703  066740                  MOV     #HEAD5,R3       ;GET ADDRESS OF DATA
5154  027264  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5155  027270  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5156  027276  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5157  027304  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5158  027312  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5159  027320  001003                          BNE     21$             ;NO, CHECK CS1
5160  027322  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5161  027330  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5162  027336  001402                          BEQ     22$             ;YES, CHECK CS2
5163  027340  104153                          ERROR   153             ;CS1 INCORRECT
5164  027342  000421                          BR      TST32           ;;GO ON TO NEXT TEST
5165
5166  027344  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5167  027352  001402                          BEQ     23$             ;YES, CHECK DATA
5168  027354  104154                          ERROR   154             ;CS2 INCORRECT
5169  027356  000413                          BR      TST32           ;;GO ON TO NEXT TEST
5170
5171  027360  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5172  027366  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5173  027370  104155                          ERROR   155             ;DATA INCORRECT
5174  027372  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5175  027376  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5176  027404  001327                          BNE     20$             ;NO, GET NEXT WORD
5177
5178                                  ;;*****************************************************************
5179                                  ;*TEST 32       READ HEADER IN 18 BIT MODE
5180                                  ;*
5181                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5182                                  ;*      IN 24 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5183                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5184                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES, A
5185                                  ;*      ONE, AND A HEADER CONSISTING OF THE THREE
5186                                  ;*      FOLLOWING WORDS:
5187                                  ;*
5188                                  ;*              177777
5189                                  ;*              000000
5190                                  ;*              177777
5191                                  ;*
5192                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
5193                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5194                                  ;*
5195                                  ;;*****************************************************************
5196  027406  000004                  TST32:  SCOPE
5197  027410  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5198  027416  013702  001270                  MOV     $BASE,R2        ;LOAD RK611
5199  027422  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
```

```
5200  027430  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK6   IN DIAGNOSTIC MODE
5201  027436  012762  010025  000000          MOV     #CFMT!RDHEAD,RKCS1(R2) ;ISSUE READ HEADER (24 SECTOR FORMAT)
5202  027444  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5203  027450  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5204  027456  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5205  027464  005300                          DEC     R0
5206  027466  001370                          BNE     1$
5207  027470  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5208  027476  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5209  027504  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT BIT AND
521C  027510  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
5211  027514  012700  000377                  MOV     #255.,R0
5212  027520  004737  046106          2$:     JSR     PC,RDBIT        ;SIMULATE SYNCH
5213  027524  005300                          DEC     R0
5214  027526  001374                          BNE     2$
5215  027530  012737  000001  003614          MOV     #1,PR.BIT
5216  027536  004737  046106                  JSR     PC,RDBIT
5217  027542  012701  000003                  MOV     #3,R1           ;LOAD NUMBER OF WORDS
5218  027546  012703  066702                  MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5219  027552  012737  010025  003500          MOV     #CFMT!RDHEAD,E.CS1 ;LOAD EXPECTED CS1
5220  027560  012304                  5$:     MOV     (R3)+,R4        ;GET DATA
5221  027562  012700  000020                  MOV     #16.,R0         ;LOAD BIT COUNT
5222  027566  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT   ;STORE PRESENT BIT
5223  027574  006004                          ROR     R4              ;GET NEXT BIT
5224  027576  103403                          BCS     7$              ;CHECK IF 1
5225  027600  005037  003614                  CLR     PR.BIT          ;NO, ZERO
5226  027604  000403                          BR      8$              ;SIMULATE READ DATA
5227
5228  027606  012737  000001  003614  7$:     MOV     #1,PR.BIT       ;ONE
5229  027614  004737  046106          8$:     JSR     PC,RDBIT        ;SIMULATE READ DATA
5230  027620  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;READ COMMAND AND STATUS REG. 1
5231  027626  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5232  027634  001417                          BEQ     9$              ;YES, SIMULATE NEXT BIT
5233  027636  012737  000003  003624          MOV     #3,WRDCNT       ;LOAD WORD COUNT
5234  027644  160137  003624                  SUB     R1,WRDCNT
5235  027650  012737  000020  003622          MOV     #16.,BITCNT     ;LOAD BIT COUNT
5236  027656  160037  003622                  SUB     R0,BITCNT
5237  027662  104156                          ERROR   156             ;CS1 INCORRECT DURING HEADER
5238  027664  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5239  027672  000522                          BR      TST33           ;;GO ON TO NEXT TEST
5240
5241  027674  005300                  9$:     DEC     R0              ;CHECK IF READY FOR NEXT WORD
5242  027676  001333                          BNE     6$              ;NO, GET NEXT BIT
5243  027700  005301                          DEC     R1              ;CHECK IF HEADER FINISHED
5244  027702  001326                          BNE     5$              ;NO, GET NEXT WORD
5245  027704  012700  000004                  MOV     #4,R0           ;LOAD COUNT FOR POSTAMBLE
5246  027710  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT   ;STORE LAST BIT
5247  027716  005037  003614                  CLR     PR.BIT          ;LOAD NEXT BIT
5248  027722  004737  046106                  JSR     PC,RDBIT        ;READ BIT
5249  027726  005300                          DEC     R0              ;CHECK IF TIME FOR READY
5250  027730  001367                          BNE     15$             ;NO, CONTINUE WITH POSTAMBLE
5251  027732  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET CURRENT CS1
5252  027740  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;GET CURRENT CS2
5253  027746  012737  010224  003500          MOV     #CFMT!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5254  027754  012737  000300  003510          MOV     #OR!IR,E.CS2    ;LOAD EXPECTED CS2
5255  027762  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
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5256  027770  001401                          BEQ     16$             ;YES, CHECK CS2
5257  027772  104157                          ERROR   157             ;CS1 INCORRECT
5258  027774  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5259  030002  001401                          BEQ     17$             ;YES, CHECK DATA
5260  030004  104160                          ERROR   160             ;CS2 INCORRECT
5261  030006  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5262  030012  012703  066702                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
5263  030016  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5264  030022  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5265  030030  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5266  030036  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5267  030044  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5268  030052  001003                          BNE     21$             ;NO, CHECK CS1
5269  030054  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
5270  030062  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5271  030070  001402                          BEQ     22$             ;YES, CHECK CS2
5272  030072  104161                          ERROR   161             ;CS1 INCORRECT
5273  030074  000421                          BR      TST33           ;;GO ON TO NEXT TEST
5274
5275  030076  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5276  030104  001402                          BEQ     23$             ;YES, CHECK DATA BUFFER
5277  030106  104162                          ERROR   162             ;CS2 INCORRECT
5278  030110  000413                          BR      TST33           ;;GO ON TO NEXT TEST
5279
5280  030112  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK DATA BUFFER CORRECT
5281  030120  001401                          BEQ     24$             ;YES, GET NEXT WORD
5282  030122  104163                          ERROR   163             ;DATA BUFFER INCORRECT
5283  030124  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5284  030130  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF FINISHED
5285  030136  001327                          BNE     20$             ;NO READ NEXT WORD
5286
5287                                  ;;*****************************************************************
5288                                  ;*TEST 33       SYNCH DETECT IN READ HEADER
5289                                  ;*
5290                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5291                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN RK06
5292                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5293                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.
5294                                  ;*      SIMULATE SECTOR PULSE AND 350 ZEROES.  MAKE
5295                                  ;*      SURE READY REMAINS RESET AND THE SILO REMAINS
5296                                  ;*      EMPTY.
5297                                  ;*
5298                                  ;;*****************************************************************
5299  030140  000004                  TST33:  SCOPE
5300  030142  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5301  030150  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5302  030154  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5303  030162  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINT MODE
5304  030170  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEAD
5305  030176  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL READY
5306  030202  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;  FOR SECTOR PULSE
5307  030210  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5308  030216  005300                          DEC     R0
5309  030220  001370                          BNE     1$
5310  030222  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE TO SECTOR PULSE
5311  030230  012762  000040  000026          MOV     #DMD,RKMR1(R2)
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5312  030236  005037  003614                  CLR     PR.BIT          ;INITIALIZE PRESENT AND
5313  030242  005037  003616                  CLR     M1.BIT          ;  PREVIOUS BIT
5314  030246  012737  000025  003500          MOV     #RDHEAD,E.CS1   ;LOAD EXPECTED CS1
5315  030254  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
5316  030262  005037  003622                  CLR     BITCNT          ;SIMULATE 350 ZEROES
5317  030266  004737  046106          2$:     JSR     PC,RDBIT
5318  030272  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE CS1
5319  030300  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE CS2
5320  030306  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5321  030314  001402                          BEQ     3$              ;YES, CHECK CS2
5322  030316  104164                          ERROR   164                     ;CS1 INCORRECT
5323  030320  000447                          BR      TST34           ;;GO ON TO NEXT TEST
5324
5325  030322  023737  003510  003450  3$:     CMP     E.CS2,T.CS2     ;CHECK IF CS2 CORRECT
5326  030330  001402                          BEQ     4$              ;YES, CHECK IF SILO EMPTY
5327  030332  104165                          ERROR   165             ;CS2 INCORRECT
5328  030334  000441                          BR      TST34           ;;GO ON TO NEXT TEST
5329  030336  005237  003622          4$:     INC     BITCNT          ;INCREMENT BIT COUNT
5330  030342  022737  000536  003622          CMP     #350.,BITCNT    ;CHECK IF FINISHED
5331  030350  001346                          BNE     2$              ;NO, SIMULATE NEXT ZERO
5332  030352  005762  000024                  TST     RKDB(R2)        ;READ DATA BUFFER
5333  030356  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE CS1 AND CS2
5334  030364  016237  000010  003450          MOV     RKCS2(R2),T.CS2
5335  030372  012737  100224  003500          MOV     #CERR!RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECT CS1
5336  030400  012737  100100  003510          MOV     #DCK!IR,E.CS2   ;LOAD EXPECTED CS2
5337  030406  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK FOR CONTROLLER ERROR
5338  030414  001401                          BEQ     5$              ;YES, CHECK FOR DATA LATE
5339  030416  104166                          ERROR   166             ;CS1 INCORRECT
5340  030420  023737  003510  003450  5$:     CMP     E.CS2,T.CS2     ;CHECK FOR DATA LATE
5341  030426  001401                          BEQ     6$              ;YES, CHECK RK611
5342  030430  104167                          ERROR   167             ;CS2 INCORRECT
5343  030432  012762  100000  000000  6$:     MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5344
5345                                  ;;*****************************************************************
5346                                  ;*TEST 34       ZERO SYNCH ON READ
5347                                  ;*
5348                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5349                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5350                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES,
5351                                  ;*      SIMULATE SECTOR PULSE, 255 ZEROES SHIFTED BY A HALF
5352                                  ;*      BIT TIME, A ONE, AND A HEADER CONSISTING OF THE
5353                                  ;*      THREE FOLLOWING WORDS:
5354                                  ;*
5355                                  ;*              177777
5356                                  ;*              000000
5357                                  ;*              177777
5358                                  ;*
5359                                  ;*      MAKE SURE THAT READY COMES AFTER THE THIRD WORD
5360                                  ;*      IS TRANSFERRED.  CHECK THE SILO FOR CORRECT CONTENTS.
5361                                  ;*
5362                                  ;*****************************************************************
5363  030440  000004          TST34:  SCOPE
5364  030442  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5365  030450  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5366  030454  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5367  030462  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
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5368  030470  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2)  ;ISSUE READ HEADER
5369  030476  012700  000312                  MOV     #50.*4+2,R0        ;ISSUE ENOUGH CLOCKS UNTIL READY
5370  030502  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;  FOR SECTOR PULSE
5371  030510  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5372  030516  005300                          DEC     R0
5373  030520  001370                          BNE     1$
5374  030522  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2)  ;SIMULATE SECTOR PULSE
5375  030530  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5376  030536  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;SHIFT DATA ONE HALF BIT TIME
5377  030544  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5378  030552  005037  003614                  CLR     PR.BIT             ;INITIALIZE PRESENT BIT AND
5379  030556  005037  003616                  CLR     M1.BIT             ;  PREVIOUS BIT
5380  030562  012700  000341                  MOV     #225.,R0
5381  030566  004737  046106          2$:     JSR     PC,RDBIT           ;SIMULATE SYNCH
5382  030572  005300                          DEC     R0
5383  030574  001374                          BNE     2$
5384  030576  012737  000001  003614          MOV     #1,PR.BIT
5385  030604  004737  046106                  JSR     PC,RDBIT
5386  030610  012701  000003                  MOV     #3,R1              ;LOAD NUMBER OF WORDS
5387  030614  012703  066702                  MOV     #HEAD1,R3          ;LOAD ADDRESS OF DATA
5388  030620  012737  000025  003500          MOV     #RDHEAD,E.CS1      ;LOAD EXPECTED CS1
5389  030626  012304                  5$:     MOV     (R3)+,R4           ;GET DATA
5390  030630  012700  000020                  MOV     #16.,R0            ;LOAD BIT COUNT
5391  030634  013737  003614  003616  6$:     MOV     PR.BIT,M1.BIT      ;STORE PREVIOUS BIT
5392  030642  006004                          ROR     R4                 ;GET NEXT BIT
5393  030644  103403                          BCS     7$                 ;CHECK IF 1
5394  030646  005037  003614                  CLR     PR.BIT             ;NO, ZERO
5395  030652  000403                          BR      8$                 ;SIMULATE READ DATA
5396
5397  030654  012737  000001  003614  7$:     MOV     #1,PR.BIT          ;ONE
5398  030662  004737  046106          8$:     JSR     PC,RDBIT           ;SIMULATE READ DATA
5399  030666  016237  000000  003440          MOV     RKCS1(R2),T.CS1    ;READ COMMAND AND STATUS REG. 1
5400  030674  023737  003500  003440          CMP     E.CS1,T.CS1        ;CHECK IF CS1 CORRECT
5401  030702  001417                          BEQ     9$                 ;YES, SIMULATE NEXT BIT
5402  030704  012737  000003  003624          MOV     #3,WRDCNT          ;LOAD WORD COUNT
5403  030712  160137  003624                  SUB     R1,WRDCNT
5404  030716  012737  000020  003622          MOV     #16.,BITCNT        ;LOAD BIT COUNT
5405  030724  160037  003622                  SUB     R0,BITCNT
5406  030730  104150                          ERROR   150                ;CS1 INCORRECT DURING HEADER
5407  030732  012762  100000  000000          MOV     #CCLR,RKCS1(R2)    ;CLEAR RK611
5408  030740  000522                          BR      TST35              ;;GO ON TO NEXT TEST
5409
5410  030742  005300                  9$:     DEC     R0                 ;CHECK IF READY FOR NEXT WORD
5411  030744  001333                          BNE     6$                 ;NO, GET NEXT BIT
5412  030746  005301                          DEC     R1                 ;CHECK IF HEADER FINISHED
5413  030750  001326                          BNE     5$                 ;NO, GET NEXT WORD
5414  030752  012700  000004                  MOV     #4,R0              ;LOAD COUNT FOR POSTAMBLE
5415  030756  013737  003614  003616  15$:    MOV     PR.BIT,M1.BIT      ;STORE LAST BIT
5416  030764  005037  003614                  CLR     PR.BIT             ;LOAD NEXT BIT
5417  030770  004737  046106                  JSR     PC,RDBIT           ;SIMULATE 1 BIT READ
5418  030774  005300                          DEC     R0                 ;CHECK IF TIME FOR READY
5419  030776  001367                          BNE     15$                ;NO, CONTINUE WITH POSTAMBLE
5420  031000  016237  000000  003440          MOV     RKCS1(R2),T.CS1    ;GET CURRENT CS1
5421  031006  016237  000010  003450          MOV     RKCS2(R2),T.CS2    ;GET CURRENT CS2
5422  031014  012737  000224  003500          MOV     #RDY!RDHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5423  031022  012737  000300  003510          MOV     #OR!IR,E.CS2       ;LOAD EXPECTED CS2
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5424  031030  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5425  031036  001401                          BEQ     16$             ;YES, CHECK CS2
5426  031040  104151                          ERROR   151             ;CS1 INCORRECT
5427  031042  023737  003510  003450  16$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5428  031050  001401                          BEQ     17$             ;YES, CHECK DATA
5429  031052  104152                          ERROR   152             ;CS2 INCORRECT
5430  031054  005037  003624          17$:    CLR     WRDCNT          ;INITIALIZE WORD COUNT
5431  031060  012703  066702                  MOV     #HEAD1,R3       ;GET ADDRESS OF DATA
5432  031064  012337  003522          20$:    MOV     (R3)+,E.DB      ;GET EXPECTED DATA
5433  031070  016237  000024  003462          MOV     RKDB(R2),T.DB   ;GET ACTUAL DATA
5434  031076  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG. 1
5435  031104  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG. 2
5436  031112  022737  000002  003624          CMP     #2,WRDCNT       ;CHECK IF LAST WORD IN DATA BUFFER
5437  031120  001003                          BNE     21$             ;NO, CHECK CS1
5438  031122  012737  000100  003510          MOV     #IR,E.CS2       ;STORE EXPECTED CS2
5439  031130  023737  003500  003440  21$:    CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
5440  031136  001402                          BEQ     22$             ;YES, CHECK CS2
5441  031140  104153                          ERROR   153             ;CS1 INCORRECT
5442  031142  000421                          BR      TST35           ;;GO ON TO NEXT TEST
5443
5444  031144  023737  003510  003450  22$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
5445  031152  001402                          BEQ     23$             ;YES, CHECK DATA
5446  031154  104154                          ERROR   154             ;CS2 INCORRECT
5447  031156  000413                          BR      TST35           ;;GO ON TO NEXT TEST
5448
5449  031160  023737  003522  003462  23$:    CMP     E.DB,T.DB       ;CHECK IF DATA CORRECT
5450  031166  001401                          BEQ     24$             ;YES, GET NEXT HEADER WORD
5451  031170  104155                          ERROR   155             ;DATA INCORRECT
5452  031172  005237  003624          24$:    INC     WRDCNT          ;INCREMENT WORD COUNT
5453  031176  022737  000003  003624          CMP     #3,WRDCNT       ;CHECK IF ALL THREE WORDS CHECK
5454  031204  001327                          BNE     20$             ;NO, GET NEXT WORD
5455
5456                                  .SBTTL  **MFM WRITE LOOPBACK TESTS
5457
5458                                  ;;*****************************************************************
5459                                  ;*TEST 35       WRITE ZEROS UNTIL SECTOR PULSE WITH WRITE HEADER
5460                                  ;*
5461                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5462                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5463                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5464                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE
5465                                  ;*      INDEX PULSE AND 500 DATA BITS.  MAKE SURE THAT
5466                                  ;*      ZEROES ARE WRITTEN. SIMULATE SECTOR PULSE AND MAKE SURE
5467                                  ;*      WRITE GATE RESETS.
5468                                  ;*
5469                                  ;;*****************************************************************
5470  031206  000004                  TST35:  SCOPE
5471  031210  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5472  031216  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5473  031222  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5474  031230  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5475  031236  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;INITIALIZE ROM
5476  031244  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5477  031252  012762  067204  000004          MOV     #WRBUFF,RKBA(R2) ;ISSUE WRITE HEADER
5478  031260  012762  177777  000002          MOV     #-1,RKWC(R2)
5479  031266  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
```

```
                031274  012700  002364          MOV     #(256.+48.+64.+256.+10.)*2,R0 ;ISSUE ENOUGH CLOCKS
                                                        ;  UNTIL READY FOR INDEX PULSE
                031300  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)
                031306  012762  000040  000026        MOV     #DMD,RKMR1,R2)
                031314  005300                        DEC     R0
                031316  001370                        BNE     1$
                031320  012700  000004                MOV     #4.,R0          ;SIMULATE INDEX PULSE
                031324  012762  002240  000026        MOV     #MIND!DMD,RKMR1(R2)
                031332  012762  002640  000026  2$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
                031340  012762  002240  000026        MOV     #DMD!MINC,RKMR1(R2)
                031346  005300                        DEC     R0
                031350  001370                        BNE     2$
                031352  012762  000040  000026        MOV     #DMD,RKMR1(R2)
                031360  012737  062240  003524        MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                        ;  MAINT. REG
                031366  012700  000002                MOV     #2,R0           ;WAIT FOR WRITE GATE
                031372  012762  000440  000026  3$:   MOV     #DMD!MCLK,RKMR1(R2)
                031400  012762  000040  000026        MOV     #DMD,RKMR1(R2)
                031406  005300                        DEC     R0
                031410  001370                        BNE     3$
                031412  005037  003626                CLR     SECCNT          ;CLEAR SECTOR COUNT
                031416  005037  003612                CLR     P1.BIT          ;INITIALIZE BIT GENERATION
                031422  005037  003614                CLR     PR.BIT
                031426  005037  003616                CLR     M1.BIT
                031432  005037  003620                CLR     M2.BIT
                031436  012700  000764                MOV     #500.,R0        ;LOAD COUNT FOR 500 BITS
                031442  012737  062414  003170        MOV     #EM230,EMW      ;LOAD ERROR MESSAGE
                031450  005037  003622                CLR     BITCNT          ;CLEAR BIT COUNT
                031454  004737  045136          5$:   JSR     PC,WRTBIT       ;WRITE ONE BIT
                031460  104170                        ERROR   170             ;ERROR IN WRITE
                031462  005237  003622                INC     BITCNT          ;INCREMENT NUMBER OF BITS WRITTEN
                031466  005300                        DEC     R0              ;CHECK IF FINISHED
                031470  001371                        BNE     5$              ;NO, CONTINUE
                031472  042737  040000  003524        BIC     #WRTGAT,E.MR1   ;GENERATE EXPECTED MR1
                031500  052737  000100  003524        BIS     #MSP,E.MR1
                031506  012762  000140  000026        MOV     #DMD!MSP,RKMR1(R2) ;RAISE SECTOR PULSE
                031514  016237  000026  003464        MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
                031522  023737  003524  003464        CMP     E.MR1,T.MR1     ;STORE MAINT REG 1
                031530  001401                        BEQ     10$             ;YES, LOWER SECTOR PULSE
                031532  104171                        ERROR   171             ;WRITE GATE DID NOT RESET
                031534  042737  000100  003524  10$:   BIC     #MSP,E.MR1      ;GENERATE EXPECTED MR1
                031542  052737  040000  003524        BIS     #WRTGAT,E.MR1
                031550  012762  000040  000026        MOV     #DMD,RKMR1(R2)  ;RESET SECTOR PULSE
                031556  016237  000026  003464        MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
                031564  023737  003524  003464        CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT
                031572  001401                        BEQ     TST36           ;;YES, GO ON TO NEXT TEST
                031574  104172                        ERROR   172             ;WRITE GATE DID NOT SET

                                        ;;*************************************************************
                                        ;*TEST 36       WRITE LOOPBACK (PART 1)
                                        ;*
                                        ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE. ISSUE A WRITE HEADER TO AN RK06
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                                        ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
```

```
                                        ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
                                        ;*
                                        ;*              177777
                                        ;*              000000
                                        ;*              177777
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
                                        ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
                                        ;*
                                        ;;**************************************************************************
031576  000004                          T$T36:  SCOPE
031600  012737  000144  001200                  MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
031606  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
031612  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
031620  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
031626  012762  066702  000004                  MOV     #HEAD1,RK2A(R2) ;ISSUE WRITE HEADER
031634  012762  177775  000002                  MOV     #-3,RKWC(R2)
031642  012762  000027  000000                  MOV     #WRHEAD,RKCS1(R2)
031650  012700  000312                          MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                        ;  READY FOR INDEX PULSE
031654  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
031662  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
031670  005300                          DEC     R0
031672  001370                          BNE     1$
031674  012700  000004                          MOV     #4,R0           ;ISSUE INDEX PULSE
031700  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
031706  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
031714  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
031722  005300                          DEC     R0
031724  001370                          BNE     2$
031726  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
031734  012700  000010                          MOV     #8.,R0          ;WAIT FOR WRITE GATE
031740  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
031746  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
031754  005300                          DEC     R0
031756  001370                          BNE     3$
031760  012762  000140  000026                  MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
031766  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
031774  005037  003626                          CLR     SECCNT          ;INITIALIZE SECTOR COUNT
032000  012737  062766  003170                  MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
032006  012737  062040  003524                  MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                        ;  MAINT REG 1
032014  005037  003612                          CLR     P1.BIT          ;INITIALIZE BIT GENERATION
032020  005037  003614                          CLR     PR.BIT
032024  005037  003616                          CLR     M1.BIT
032030  005037  003620                          CLR     M2.BIT
032034  012700  000400                          MOV     #256.,R0        ;SIMULATE SYNCH
032040  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
032044  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
032050  104170                          ERROR   170             ;DATA INCORRECT
032052  005237  003622                          INC     BITCNT
032056  005300                          DEC     R0              ;CHECK IF READY FOR DATA
032060  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
032062  012737  000001  003612                  MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
032070  004737  045136                          JSR     PC,WRTBIT
032074  104170                          ERROR   170             ;DATA INCORRECT
```

```
5592  032076  005037  003622                    CLR     BITCNT          ;INITIALIZE BIT COUNT
5593  032102  012737  063032  003170            MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5594  032110  012703  066702                    MOV     #HEAD1,R3       ;LOAD ADDRESS OF DATA
5595  032114  012700  000003                    MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5596  032120  012304                    10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5597  032122  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT
5598  032126  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5599  032134  013737  003614  003616            MOV     PR.BIT,M1.BIT
5600  032142  013737  003612  003614            MOV     P1.BIT,PR.BIT
5601  032150  006004                            ROR     R4              ;SHIFT IN NEXT BIT
5602  032152  103403                            BCS     14$             ;CHECK IF ONE
5603  032154  005037  003612                    CLR     P1.BIT          ;ZERO
5604  032160  000403                            BR      15$             ;CLOCK IN BIT
5605
5606  032162  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
5607  032170  004737  045136            15$:    JSR     PC,WRTBIT       ;WRITE BIT
5608  032174  104170                            ERROR   170             ;BIT INCORRECT
5609  032176  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
5610  032202  005301                            DEC     R1              ;CHECK IF WORD FINISHED
5611  032204  001350                            BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5612  032206  005300                            DEC     R0              ;CHECK IF HEADER COMPLETE
5613  032210  001343                            BNE     10$             ;NO, GET NEXT WORD
5614  032212  012701  000020                    MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5615  032216  013737  003616  003620  19$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5616  032224  013737  003614  003616            MOV     PR.BIT,M1.BIT
5617  032232  013737  003612  003614            MOV     P1.BIT,PR.BIT
5618  032240  005037  003612                    CLR     P1.BIT
5619  032244  004737  045136                    JSR     PC,WRTBIT       ;WRITE ZERO
5620  032250  104170                            ERROR   170             ;BIT INCORRECT
5621  032252  005237  003622                    INC     BITCNT          ;INCREMENT BIT COUNT
5622  032256  005301                            DEC     R1              ;CHECK IF FINISHED
5623  032260  001356                            BNE     18$             ;NO, CLOCK NEXT BIT
5624  032262  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5625  032270  012700  000004                    MOV     #4,R0
5626  032274  012762  000640  000026  20$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5627  032302  012762  000240  000026            MOV     #DMD!MIND,RKMR1(R2)
5628  032310  005300                            DEC     R0
5629  032312  001370                            BNE     20$
5630  032314  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5631  032322  016237  000026  003464            MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5632  032330  012737  022040  003524            MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5633  032336  023737  003524  003464            CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5634  032344  001401                            BEQ     25$             ;YES, CHECK IF READY SET
5635  032346  104173                            ERROR   173             ;MAINT REG 1 INCORRECT
5636  032350  012700  000010            25$:    MOV     #8.,R0          ;FINISH COMMAND
5637  032354  012762  000440  000026  26$:     MOV     #DMD!MCLK,RKMR1(R2)
5638  032362  012762  000040  000026            MOV     #DMD,RKMR1(R2)
5639  032370  005300                            DEC     R0
5640  032372  001370                            BNE     26$
5641  032374  016237  000000  003440            MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5642  032402  012737  000226  003500            MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5643  032410  023737  003500  003440            CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5644  032416  001401                            BEQ     TST37           ;;YES, GO ON TO NEXT TEST
5645  032420  104174                            ERROR   174             ;CS1 INCORRECT
5646
5647                                    ;;*****************************************************************
```

```
                                        ;*TEST 37       WRITE LOOPBACK (PART 2)
                                        ;*
                                        ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                        ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                        ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
                                        ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
                                        ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
                                        ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
                                        ;*
                                        ;*              000000
                                        ;*              177777
                                        ;*              000000
                                        ;*
                                        ;*      MAKE SURE THAT READY COMES UP AFTER THE THIRD WORD
                                        ;*      IS TRANSFERRED.  CHECK FOR CORRECT WRITE ENCODED DATA
                                        ;*      AND PRECOMPENSATION.
                                        ;*
                                        ;*****************************************************************
032422  000004                  TST37:  SCOPE
032424  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
032432  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
032436  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
032444  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
032452  012762  066710  000004          MOV     #HEAD2,RKBA(R2) ;ISSUE WRITE HEADER
032460  012762  177775  000002          MOV     #-3,RKWC(R2)
032466  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
032474  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                        ;  READY FOR INDEX PULSE
032500  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
032506  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032514  005300                          DEC     R0
032516  001370                          BNE     1$
032520  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
032524  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
032532  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
032540  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
032546  005300                          DEC     R0
032550  001370                          BNE     2$
032552  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032560  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
032564  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
032572  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032600  005300                          DEC     R0
032602  001370                          BNE     3$
032604  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
032612  012762  000040  000026          MOV     #DMD,RKMR1(R2)
032620  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
032624  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
032632  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                        ;  MAINT REG 1
032640  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
032644  005037  003614                  CLR     PR.BIT
032650  005037  003616                  CLR     M1.BIT
032654  005037  003620                  CLR     M2.BIT
032660  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
032664  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
```

```
5704  032670  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5705  032674  104170                          ERROR   170             ;DATA INCORRECT
5706  032676  005237  003622                  INC     BITCNT
5707  032702  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5708  032704  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5709  032706  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5710  032714  004737  045136                  JSR     PC,WRTBIT
5711  032720  104170                          ERROR   170             ;DATA INCORRECT
5712  032722  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5713  032726  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5714  032734  012703  066710                  MOV     #HEAD2,R3       ;LOAD ADDRESS OF DATA
5715  032740  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5716  032744  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5717  032746  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5718  032752  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5719  032760  013737  003614  003616          MOV     PR.BIT,M1.BIT
5720  032766  013737  003612  003614          MOV     P1.BIT,PR.BIT
5721  032774  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5722  032776  103403                          BCS     14$             ;CHECK IF ONE
5723  033000  005037  003612                  CLR     P1.BIT          ;ZERO
5724  033004  000403                          BR      15$             ;CLOCK IN BIT
5725
5726  033006  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5727  033014  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5728  033020  104170                          ERROR   170             ;BIT INCORRECT
5729  033022  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5730  033026  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5731  033030  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5732  033032  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5733  033034  001343                          BNE     10$             ;NO, GET NEXT WORD
5734  033036  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5735  033042  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5736  033050  013737  003614  003616          MOV     PR.BIT,M1.BIT
5737  033056  013737  003612  003614          MOV     P1.BIT,PR.BIT
5738  033064  005037  003612                  CLR     P1.BIT
5739  033070  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
5740  033074  104170                          ERROR   170             ;BIT INCORRECT
5741  033076  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5742  033102  005301                          DEC     R1              ;CHECK IF FINISHED
5743  033104  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5744  033106  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5745  033114  012700  000004                  MOV     #4,R0
5746  033120  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
5747  033126  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5748  033134  005300                          DEC     R0
5749  033136  001370                          BNE     20$
5750  033140  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5751  033146  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
5752  033154  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
5753  033162  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5754  033170  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5755  033172  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5756  033174  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5757  033200  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5758  033206  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5759  033214  005300                          DEC     R0
```

```
005760  033216  001370                          BNE     26$
005761  033220  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
005762  033226  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
005763  033234  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
005764  033242  001401                          BEQ     TST40           ;;YES, GO ON TO NEXT TEST
005765  033244  104174                          ERROR   174             ;CS1 INCORRECT
005766
005767                                  ;;*****************************************************************
005768                                  ;*TEST 40       WRITE LOOPBACK (PART 3)
005769                                  ;*
005770                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
005771                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
005772                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
005773                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  STIMULATE
005774                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
005775                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AN INDEX PULSE:
005776                                  ;*
005777                                  ;*              125252
005778                                  ;*              052525
005779                                  ;*              125252
005780                                  ;*
005781                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
005782                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
005783                                  ;*
005784                                  ;*****************************************************************
005785  033246  000004                  TST40:  SCOPE
005786  033250  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
005787  033256  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
005788  033262  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
005789  033270  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
005790  033276  012762  066716  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE WRITE HEADER
005791  033304  012762  177775  000002          MOV     #-3,RKWC(R2)
005792  033312  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
005793  033320  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
005794                                                                  ;  READY FOR INDEX PULSE
005795  033324  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
005796  033332  012762  000040  000026          MOV     #DMD,RKMR1(R2)
005797  033340  005300                          DEC     R0
005798  033342  001370                          BNE     1$
005799  033344  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
005800  033350  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
005801  033356  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
005802  033364  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
005803  033372  005300                          DEC     R0
005804  033374  001370                          BNE     2$
005805  033376  012762  000040  000026          MOV     #DMD,RKMR1(R2)
005806  033404  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
005807  033410  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
005808  033416  012762  000040  000026          MOV     #DMD,RKMR1(R2)
005809  033424  005300                          DEC     R0
005810  033426  001370                          BNE     3$
005811  033430  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
005812  033436  012762  000040  000026          MOV     #DMD,RKMR1(R2)
005813  033444  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
005814  033450  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
005815  033456  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
```

```
 5816                                                          ;  MAINT REG 1
 5817  033464  005037  003612                 CLR     P1.BIT         ;INITIALIZE BIT GENERATION
 5818  033470  005037  003614                 CLR     PR.BIT
 5819  033474  005037  003616                 CLR     M1.BIT
 5820  033500  005037  003620                 CLR     M2.BIT
 5821  033504  012700  000400                 MOV     #256.,R0       ;SIMULATE SYNCH
 5822  033510  005037  003622                 CLR     BITCNT         ;INITIALIZE BIT COUNT
 5823  033514  004737  045136          5$:    JSR     PC,WRTBIT      ;WRITE ONE BIT
 5824  033520  104170                         ERROR   170            ;DATA INCORRECT
 5825  033522  005237  003622                 INC     BITCNT
 5826  033526  005300                         DEC     R0             ;CHECK IF READY FOR DATA
 5827  033530  001371                         BNE     5$             ;NO, GENERATE NEXT BIT
 5828  033532  012737  000001  003612         MOV     #1,P1.BIT      ;PUT IN SYNCH BIT
 5829  033540  004737  045136                 JSR     PC,WRTBIT
 5830  033544  104170                         ERROR   170            ;DATA INCORRECT
 5831  033546  005037  003622                 CLR     BITCNT         ;INITIALIZE BIT COUNT
 5832  033552  012737  063032  003170         MOV     #EM234,EMW     ;LOAD ERROR MESSAGE
 5833  033560  012703  066716                 MOV     #HEAD3,R3      ;LOAD ADDRESS OF DATA
 5834  033564  012700  000003                 MOV     #3,R0          ;LOAD NUMBER WORDS IN HEADER
 5835  033570  012304                  10$:   MOV     (R3)+,R4       ;GET NEXT WORD
 5836  033572  012701  000020                 MOV     #16.,R1        ;LOAD BIT COUNT
 5837  033576  013737  003616  003620  12$:   MOV     M1.BIT,M2.BIT  ;SHIFT BITS
 5838  033604  013737  003614  003616         MOV     PR.BIT,M1.BIT
 5839  033612  013737  003612  003614         MOV     P1.BIT,PR.BIT
 5840  033620  006004                         ROR     R4             ;SHIFT IN NEXT BIT
 5841  033622  103403                         BCS     14$            ;CHECK IF ONE
 5842  033624  005037  003612                 CLR     P1.BIT         ;ZERO
 5843  033630  000403                         BR      15$            ;CLOCK IN BIT
 5844
 5845  033632  012737  000001  003612  14$:   MOV     #1,P1.BIT      ;ONE
 5846  033640  004737  045136          15$:   JSR     PC,WRTBIT      ;WRITE BIT
 5847  033644  104170                         ERROR   170            ;BIT INCORRECT
 5848  033646  005237  003622                 INC     BITCNT         ;INCREMENT BIT COUNT
 5849  033652  005301                         DEC     R1             ;CHECK IF WORD FINISHED
 5850  033654  001350                         BNE     12$            ;NO, CONTINUE WITH NEXT BIT
 5851  033656  005300                         DEC     R0             ;CHECK IF HEADER COMPLETE
 5852  033660  001343                         BNE     10$            ;NO, GET NEXT WORD
 5853  033662  012701  000020                 MOV     #16.,R1        ;LOAD BIT COUNT FOR NEXT WORD
 5854  033666  013737  003616  003620  18$:   MOV     M1.BIT,M2.BIT  ;SHIFT BITS
 5855  033674  013737  003614  003616         MOV     PR.BIT,M1.BIT
 5856  033702  013737  003612  003614         MOV     P1.BIT,PR.BIT
 5857  033710  005037  003612                 CLR     P1.BIT
 5858  033714  004737  045136                 JSR     PC,WRTBIT      ;WRITE ZERO
 5859  033720  104170                         ERROR   170            ;BIT INCORRECT
 5860  033722  005237  003622                 INC     BITCNT         ;INCREMENT BIT COUNT
 5861  033726  005301                         DEC     R1             ;CHECK IF FINISHED
 5862  033730  001356                         BNE     18$            ;NO, CLOCK NEXT BIT
 5863  033732  012762  000240  000026         MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
 5864  033740  012700  000004                 MOV     #4,R0
 5865  033744  012762  000640  000026  20$:   MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5866  033752  012762  000240  000026         MOV     #DMD!MIND,RKMR1(R2)
 5867  033760  005300                         DEC     R0
 5868  033762  001370                         BNE     20$
 5869  033764  012762  000040  000026         MOV     #DMD,RKMR1(R2)
 5870  033772  016237  000026  003464         MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 5871  034000  012737  022040  003524         MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
```

```
5872  034006  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
5873  034014  001401                          BEQ     25$             ;YES, CHECK IF READY SET
5874  034016  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
5875  034020  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
5876  034024  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
5877  034032  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5878  034040  005300                          DEC     R0
5879  034042  001370                          BNE     26$
5880  034044  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
5881  034052  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
5882  034060  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
5883  034066  001401                          BEQ     TST41           ;YES, GO ON TO NEXT TEST
5884  034070  104174                          ERROR   174             ;CS1 INCORRECT
5885
5886                                  ;;*****************************************************************
5887                                  ;*TEST 41        WRITE LOOPBACK (PART 4)
5888                                  ;*
5889                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
5890                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
5891                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
5892                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
5893                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
5894                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND AND INDEX PULSE:
5895                                  ;*
5896                                  ;*              044444
5897                                  ;*              022222
5898                                  ;*              111111
5899                                  ;*
5900                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX MODE.
5901                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
5902                                  ;*
5903                                  ;;*****************************************************************
5904  034072  000004                  TST41:  SCOPE
5905  034074  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
5906  034102  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
5907  034106  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
5908  034114  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
5909  034122  012762  066732  000004          MOV     #HEAD4,RKBA(R2) ;ISSUE WRITE HEADER
5910  034130  012762  177775  000002          MOV     #-3,RKWC(R2)
5911  034136  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
5912  034144  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
5913                                                                  ;  READY FOR INDEX PULSE
5914  034150  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
5915  034156  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5916  034164  005300                          DEC     R0
5917  034166  001370                          BNE     1$
5918  034170  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
5919  034174  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5920  034202  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
5921  034210  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
5922  034216  005300                          DEC     R0
5923  034220  001370                          BNE     2$
5924  034222  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5925  034230  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
5926  034234  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
5927  034242  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

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5928  034250  005300                          DEC     R0
5929  034252  001370                          BNE     3$
5930  034254  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
5931  034262  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5932  034270  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
5933  034274  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
5934  034302  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
5935                                                                  ;  MAINT REG 1
5936  034310  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
5937  034314  005037  003614                  CLR     PR.BIT
5938  034320  005037  003616                  CLR     M1.BIT
5939  034324  005037  003620                  CLR     M2.BIT
5940  034330  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
5941  034334  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5942  034340  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
5943  034344  104170                          ERROR   170             ;DATA INCORRECT
5944  034346  005237  003622                  INC     BITCNT
5945  034352  005300                          DEC     R0              ;CHECK IF READY FOR DATA
5946  034354  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
5947  034356  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
5948  034364  004737  045136                  JSR     PC,WRTBIT
5949  034370  104170                          ERROR   170             ;DATA INCORRECT
5950  034372  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
5951  034376  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
5952  034404  012703  066732                  MOV     #HEAD4,R3       ;LOAD ADDRESS OF DATA
5953  034410  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
5954  034414  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
5955  034416  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
5956  034422  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5957  034430  013737  003614  003616          MOV     PR.BIT,M1.BIT
5958  034436  013737  003612  003614          MOV     P1.BIT,PR.BIT
5959  034444  006004                          ROR     R4              ;SHIFT IN NEXT BIT
5960  034446  103403                          BCS     14$             ;CHECK IF ONE
5961  034450  005037  003612                  CLR     P1.BIT          ;ZERO
5962  034454  000403                          BR      15$             ;CLOCK IN BIT
5963
5964  034456  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
5965  034464  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
5966  034470  104170                          ERROR   170             ;BIT INCORRECT
5967  034472  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5968  034476  005301                          DEC     R1              ;CHECK IF WORD FINISHED
5969  034500  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
5970  034502  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
5971  034504  001343                          BNE     10$             ;NO, GET NEXT WORD
5972  034506  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
5973  034512  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
5974  034520  013737  003614  003616          MOV     PR.BIT,M1.BIT
5975  034526  013737  003612  003614          MOV     P1.BIT,PR.BIT
5976  034534  005037  003612                  CLR     P1.BIT
5977  034540  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
5978  034544  104170                          ERROR   170             ;BIT INCORRECT
5979  034546  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
5980  034552  005301                          DEC     R1              ;CHECK IF FINISHED
5981  034554  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
5982  034556  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
5983  034564  012700  000004                  MOV     #4,R0
```

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 5984  034570  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 5985  034576  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 5986  034604  005300                          DEC     R0
 5987  034606  001370                          BNE     20$
 5988  034610  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5989  034616  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 5990  034624  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 5991  034632  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 5992  034640  001401                          BEQ     25$             ;YES, CHECK IF READY SET
 5993  034642  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
 5994  034644  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
 5995  034650  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 5996  034656  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 5997  034664  005300                          DEC     R0
 5998  034666  001370                          BNE     26$
 5999  034670  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6000  034676  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6001  034704  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6002  034712  001401                          BEQ     TST42           ;;YES, GO ON TO NEXT TEST
 6003  034714  104174                          ERROR   174             ;CS1 INCORRECT
 6004
 6005                                  ;;*****************************************************************
 6006                                  ;*TEST 42       WRITE LOOPBACK (PART 5)
 6007                                  ;*
 6008                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6009                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6010                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 6011                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 6012                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
 6013                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
 6014                                  ;*
 6015                                  ;*              052012
 6016                                  ;*              100520
 6017                                  ;*              052012
 6018                                  ;*
 6019                                  ;*      MAKE SURE THAT READY COMES UP AFTER THE SECOND INDEX PULSE.
 6020                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
 6021                                  ;*
 6022                                  ;*****************************************************************
 6023  034716  000004                  TST42:  SCOPE
 6024  034720  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6025  034726  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6026  034732  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6027  034740  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 6028  034746  012762  066740  000004          MOV     #HEAD5,RKBA(R2) ;ISSUE WRITE HEADER
 6029  034754  012762  177775  000002          MOV     #-3,RKWC(R2)
 6030  034762  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
 6031  034770  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6032                                                                  ;  READY FOR INDEX PULSE
 6033  034774  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6034  035002  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6035  035010  005300                          DEC     R0
 6036  035012  001370                          BNE     1$
 6037  035014  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
 6038  035020  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6039  035026  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
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6040  035034  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6041  035042  005300                          DEC     R0
6042  035044  001370                          BNE     2$
6043  035046  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6044  035054  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6045  035060  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6046  035066  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6047  035074  005300                          DEC     R0
6048  035076  001370                          BNE     3$
6049  035100  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6050  035106  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6051  035114  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6052  035120  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6053  035126  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6054                                                                  ;  MAINT REG 1
6055  035134  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6056  035140  005037  003614                  CLR     PR.BIT
6057  035144  005037  003616                  CLR     M1.BIT
6058  035150  005037  003620                  CLR     M2.BIT
6059  035154  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6060  035160  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6061  035164  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6062  035170  104170                          ERROR   170             ;DATA INCORRECT
6063  035172  005237  003622                  INC     BITCNT
6064  035176  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6065  035200  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6066  035202  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6067  035210  004737  045136                  JSR     PC,WRTBIT
6068  035214  104170                          ERROR   170             ;DATA INCORRECT
6069  035216  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6070  035222  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6071  035230  012703  066740                  MOV     #HEAD5,R3       ;LOAD ADDRESS OF DATA
6072  035234  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6073  035240  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
6074  035242  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6075  035246  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6076  035254  013737  003614  003616          MOV     PR.BIT,M1.BIT
6077  035262  013737  003612  003614          MOV     P1.BIT,PR.BIT
6078  035270  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6079  035272  103403                          BCS     14$             ;CHECK IF ONE
6080  035274  005037  003612                  CLR     P1.BIT          ;ZERO
6081  035300  000403                          BR      15$             ;CLOCK IN BIT
6082
6083  035302  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
6084  035310  004737  045136          15$:     JSR     PC,WRTBIT       ;WRITE BIT
6085  035314  104170                          ERROR   170             ;BIT INCORRECT
6086  035316  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6087  035322  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6088  035324  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6089  035326  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6090  035330  001343                          BNE     10$             ;NO, GET NEXT WORD
6091  035332  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6092  035336  013737  003616  003620  18$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6093  035344  013737  003614  003616          MOV     PR.BIT,M1.BIT
6094  035352  013737  003612  003614          MOV     P1.BIT,PR.BIT
6095  035360  005037  003612                  CLR     P1.BIT
```

```
 6096  035364  004737  045136                      JSR     PC,WRTBIT       ;WRITE ZERO
 6097  035370  104170                              ERROR   170             ;BIT INCORRECT
 6098  035372  005237  003622                      INC     BITCNT          ;INCREMENT BIT COUNT
 6099  035376  005301                              DEC     R1              ;CHECK IF FINISHED
 6100  035400  001356                              BNE     18$             ;NO, CLOCK NEXT BIT
 6101  035402  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
 6102  035410  012700  000004                      MOV     #4,R0
 6103  035414  012762  000640  000026  20$:       MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6104  035422  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)
 6105  035430  005300                              DEC     R0
 6106  035432  001370                              BNE     20$
 6107  035434  012762  000040  000026              MOV     #DMD,RKMR1(R2)
 6108  035442  016237  000026  003464              MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6109  035450  012737  022040  003524              MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
 6110  035456  023737  003524  003464              CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
 6111  035464  001401                              BEQ     25$             ;YES, CHECK IF READY SET
 6112  035466  104173                              ERROR   173             ;MAINT REG 1 INCORRECT
 6113  035470  012700  000010              25$:    MOV     #8.,R0          ;FINISH COMMAND
 6114  035474  012762  000440  000026  26$:       MOV     #DMD!MCLK,RKMR1(R2)
 6115  035502  012762  000040  000026              MOV     #DMD,RKMR1(R2)
 6116  035510  005300                              DEC     R0
 6117  035512  001370                              BNE     26$
 6118  035514  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6119  035522  012737  000226  003500              MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6120  035530  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6121  035536  001401                              BEQ     TST43           ;;YES, GO ON TO NEXT TEST
 6122  035540  104174                              ERROR   174             ;CS1 INCORRECT
 6123
 6124                                      ;;*****************************************************************
 6125                                      ;*TEST 43       WRITE LOOPBACK (PART 6)
 6126                                      ;*
 6127                                      ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
 6128                                      ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
 6129                                      ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
 6130                                      ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
 6131                                      ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
 6132                                      ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
 6133                                      ;*
 6134                                      ;*              155555
 6135                                      ;*              066666
 6136                                      ;*              155555
 6137                                      ;*
 6138                                      ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
 6139                                      ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
 6140                                      ;*
 6141                                      ;*****************************************************************
 6142  035542  000004                      TST43:  SCOPE
 6143  035544  012737  000144  001200              MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6144  035552  013702  001270                      MOV     $BASE,R2        ;LOAD RK611 BASE
 6145  035556  012762  100000  000000              MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
 6146  035564  012762  000040  000026              MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
 6147  035572  012762  066746  000004              MOV     #HEAD6,RKBA(R2) ;ISSUE WRITE HEADER
 6148  035600  012762  177775  000002              MOV     #-3,RKWC(R2)
 6149  035606  012762  000027  000000              MOV     #WRHEAD,RKCS1(R2)
 6150  035614  012700  000312                      MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
 6151                                                                      ;  READY FOR INDEX PULSE
```

```
 6152  035620  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6153  035626  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6154  035634  005300                          DEC     R0
 6155  035636  001370                          BNE     1$
 6156  035640  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
 6157  035644  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6158  035652  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6159  035660  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6160  035666  005300                          DEC     R0
 6161  035670  001370                          BNE     2$
 6162  035672  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6163  035700  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6164  035704  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 6165  035712  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6166  035720  005300                          DEC     R0
 6167  035722  001370                          BNE     3$
 6168  035724  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6169  035732  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6170  035740  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
 6171  035744  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
 6172  035752  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6173                                                                  ;  MAINT REG 1
 6174  035760  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
 6175  035764  005037  003614                  CLR     PR.BIT
 6176  035770  005037  003616                  CLR     M1.BIT
 6177  035774  005037  003620                  CLR     M2.BIT
 6178  036000  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 6179  036004  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6180  036010  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 6181  036014  104170                          ERROR   170             ;DATA INCORRECT
 6182  036016  005237  003622                  INC     BITCNT
 6183  036022  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 6184  036024  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
 6185  036026  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6186  036034  004737  045136                  JSR     PC,WRTBIT
 6187  036040  104170                          ERROR   170             ;DATA INCORRECT
 6188  036042  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6189  036046  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
 6190  036054  012703  066746                  MOV     #HEAD6,R3       ;LOAD ADDRESS OF DATA
 6191  036060  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
 6192  036064  012304                  10$:     MOV     (R3)+,R4        ;GET NEXT WORD
 6193  036066  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 6194  036072  013737  003616  003620  12$:     MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6195  036100  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6196  036106  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6197  036114  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 6198  036116  103403                          BCS     14$             ;CHECK IF ONE
 6199  036120  005037  003612                  CLR     P1.BIT          ;ZERO
 6200  036124  000403                          BR      15$             ;CLOCK IN BIT
 6201
 6202  036126  012737  000001  003612  14$:     MOV     #1,P1.BIT       ;ONE
 6203  036134  004737  045136          15$:     JSR     PC,WRTBIT       ;WRITE BIT
 6204  036140  104170                          ERROR   170             ;BIT INCORRECT
 6205  036142  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6206  036146  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 6207  036150  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
```

```
6208  036152  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6209  036154  001343                          BNE     10$             ;NO, GET NEXT WORD
6210  036156  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6211  036162  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6212  036170  013737  003614  003616          MOV     PR.BIT,M1.BIT
6213  036176  013737  003612  003614          MOV     P1.BIT,PR.BIT
6214  036204  005037  003612                  CLR     P1.BIT
6215  036210  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
6216  036214  104170                          ERROR   170             ;BIT INCORRECT
6217  036216  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6218  036222  005301                          DEC     R1              ;CHECK IF FINISHED
6219  036224  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6220  036226  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6221  036234  012700  000004                  MOV     #4,R0
6222  036240  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6223  036246  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6224  036254  005300                          DEC     R0
6225  036256  001370                          BNE     20$
6226  036260  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6227  036266  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6228  036274  012737  022040  003524          MOV     #MEMD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6229  036302  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6230  036310  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6231  036312  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6232  036314  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6233  036320  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6234  036326  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6235  036334  005300                          DEC     R0
6236  036336  001370                          BNE     26$
6237  036340  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6238  036346  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
6239  036354  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6240  036362  001401                          BEQ     TST44           ;;YES, GO ON TO NEXT TEST
6241  036364  104174                          ERROR   174             ;CS1 INCORRECT
6242
6243                                  ;;*****************************************************************
6244                                  ;*TEST 44       WRITE LOOPBACK (PART 7)
6245                                  ;*
6246                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6247                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6248                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6249                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6250                                  ;*      INDEX PULSE, SECTOR PULSE, ONE THREE WORD HEADER
6251                                  ;*      CONSISTING OF THE FOLLOWING DATA, AND INDEX PULSE:
6252                                  ;*
6253                                  ;*              104210
6254                                  ;*              104210
6255                                  ;*              104210
6256                                  ;*
6257                                  ;*      MAKE SURE READY COMES UP AFTER SECOND INDEX PULSE.
6258                                  ;*      CHECK FOR CORRECT WRITE ENCODED DATA AND PRECOMPENSATION.
6259                                  ;*
6260                                  ;*****************************************************************
6261  036366  000004                  TST44:  SCOPE
6262  036370  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6263  036376  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
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```
6264  036402  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6265  036410  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
6266  036416  012762  066754  000034          MOV     #HEAD7,RKBA(R2) ;ISSUE WRITE HEADER
6267  036424  012762  177775  000002          MOV     #-3,RKWC(R2)
6268  036432  012762  000021  000000          MOV     #WRHEAD,RKCS1(R2)
6269  036440  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6270                                                                  ;  READY FOR INDEX PULSE
6271  036444  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6272  036452  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6273  036460  005300                          DEC     R0
6274  036462  001370                          BNE     1$
6275  036464  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
6276  036470  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6277  036476  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
6278  036504  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6279  036512  005300                          DEC     R0
6280  036514  001370                          BNE     2$
6281  036516  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6282  036524  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
6283  036530  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
6284  036536  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6285  036544  005300                          DEC     R0
6286  036546  001370                          BNE     3$
6287  036550  012762  000140  000026          MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
6288  036556  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6289  036564  005037  003626                  CLR     SECCNT          ;INITIALIZE SECTOR COUNT
6290  036570  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
6291  036576  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6292                                                                  ;  MAINT REG 1
6293  036604  005037  003612                  CLR     P1.BIT          ;INITIALIZE BIT GENERATION
6294  036610  005037  003614                  CLR     PR.BIT
6295  036614  005037  003616                  CLR     M1.BIT
6296  036620  005037  003620                  CLR     M2.BIT
6297  036624  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6298  036630  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6299  036634  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6300  036640  104170                          ERROR   170             ;DATA INCORRECT
6301  036642  005237  003622                  INC     BITCNT
6302  036646  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6303  036650  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6304  036652  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6305  036660  004737  045136                  JSR     PC,WRTBIT
6306  036664  104170                          ERROR   170             ;DATA INCORRECT
6307  036666  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6308  036672  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6309  036700  012703  066754                  MOV     #HEAD7,R3       ;LOAD ADDRESS OF DATA
6310  036704  012700  000003                  MOV     #3,R0           ;LOAD NUMBER WORDS IN HEADER
6311  036710  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6312  036712  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6313  036716  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6314  036724  013737  003614  003616          MOV     PR.BIT,M1.BIT
6315  036732  013737  003612  003614          MOV     P1.BIT,PR.BIT
6316  036740  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6317  036742  103403                          BCS     14$             ;CHECK IF ONE
6318  036744  005037  003612                  CLR     P1.BIT          ;ZERO
6319  036750  000403                          BR      15$             ;CLOCK IN BIT
```

```
6320
6321  036752  012737  000001  003612  14$:    MOV     #1.P1.BIT       ;ONE
6322  036760  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6323  036764  104170                  ERROR   170                     ;BIT INCORRECT
6324  036766  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6325  036772  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6326  036774  001350                          BNE     12$             ;NO, CONTINUE WITH NEXT BIT
6327  036776  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6328  037000  001343                          BNE     10$             ;NO, GET NEXT WORD
6329  037002  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6330  037006  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6331  037014  013737  003614  003616          MOV     PR.BIT,M1.BIT
6332  037022  013737  003612  003614          MOV     P1.BIT,PR.BIT
6333  037030  005037  003612                  CLR     P1.BIT
6334  037034  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
6335  037040  104170                          ERROR   170             ;BIT INCORRECT
6336  037042  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6337  037046  005301                          DEC     R1              ;CHECK IF FINISHED
6338  037050  001356                          BNE     18$             ;NO, CLOCK NEXT BIT
6339  037052  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)  ;SIMULATE INDEX
6340  037060  012700  000004                  MOV     #4,R0
6341  037064  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6342  037072  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6343  037100  005300                          DEC     R0
6344  037102  001370                          BNE     20$
6345  037104  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6346  037112  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6347  037120  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6348  037126  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET)
6349  037134  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6350  037136  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6351  037140  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6352  037144  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6353  037152  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6354  037160  005300                          DEC     R0
6355  037162  001370                          BNE     26$
6356  037164  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6357  037172  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6358  037200  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6359  037206  001401                          BEQ     TST45           ;;YES, GO ON TO NEXT TEST
6360  037210  104174                          ERROR   174             ;CS1 INCORRECT
6361
6362                                  ;;*****************************************************************
6363                                  ;*TEST 45       WRITE TWO HEADERS
6364                                  ;*
6365                                  ;*      CLEAR RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6366                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6367                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0.
6368                                  ;*      CLOCK BOTH SEEK AND DRIVE CLEAR MESSAGES.  SIMULATE
6369                                  ;*      INDEX PULSE, SECTOR PULSE, THREE WORD HEADER
6370                                  ;*      CONSISTING OF THE FOLLOWING DATA:
6371                                  ;*
6372                                  ;*              177777
6373                                  ;*              000000
6374                                  ;*              177777
6375                                  ;*
```

```
                                        ;*      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.
                                        ;*
                                        ;;*****************************************************************
037212  000004                  $T45:   SCOPE
037214  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
037222  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
037226  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
037234  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
037242  012762  066702  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
037250  012703  066702                  MOV     #HEAD1,R3
037254  012762  177772  000002          MOV     #-6,RKWC(R2)
037262  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
037270  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
                                                                ;  READY FOR INDEX PULSE
037274  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
037302  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037310  005300                          DEC     R0
037312  001370                          BNE     1$
037314  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
037320  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037326  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
037334  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
037342  005300                          DEC     R0
037344  001370                          BNE     2$
037346  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
037352  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037360  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
037364  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
037370  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
037376  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037404  005300                          DEC     R0
037406  001370                          BNE     3$
037410  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
037416  012762  000040  000026          MOV     #DMD,RKMR1(R2)
037424  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
037432  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                ;  MAINT REG 1
037440  005037  003612                  CLR     P1.BIT
037444  005037  003614                  CLR     PR.BIT
037450  005037  003616                  CLR     M1.BIT
037454  005037  003620                  CLR     M2.BIT
037460  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
037464  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
037470  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
037474  104170                          ERROR   170             ;DATA INCORRECT
037476  005237  003622                  INC     BITCNT
037502  005300                          DEC     R0              ;CHECK IF READY FOR DATA
037504  001371                          BNE     5$              ;NO,GENERATE NEXT BIT
```

```
6432  037506  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6433  037514  004737  045136                  JSR     PC,WRTBIT
6434  037520  104170                          ERROR   170             ;DATA INCORRECT
6435  037522  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6436  037526  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6437  037534  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6438  037540  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6439  037542  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6440  037546  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6441  037554  013737  003614  003616          MOV     PR.BIT,M1.BIT
6442  037562  013737  003612  003614          MOV     P1.BIT,PR.BIT
6443  037570  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6444  037572  103403                          BCS     14$             ;CHECK IF ONE
6445  037574  005037  003612                  CLR     P1.BIT          ;ZERO
6446  037600  000403                          BR      15$             ;CLOCK IN BIT
6447
6448  037602  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6449  037610  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6450  037614  104170                          ERROR   170             ;BIT INCORRECT
6451  037616  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6452  037622  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6453  037624  001350                          BNE     12$             ;NO, CONTINUE
6454  037626  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6455  037630  001343                          BNE     10$             ;NO, GET NEXT WORD
6456  037632  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
6457  037636  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6458  037644  013737  003614  003616          MOV     PR.BIT,M1.BIT
6459  037652  013737  003612  003614          MOV     P1.BIT,PR.BIT
6460  037660  005037  003612                  CLR     P1.BIT
6461  037664  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
6462  037670  104170                          ERROR   170             ;BIT INCORRECT
6463  037672  005237  003622                  INC     BITCNT          ;INCREMENT
6464  037676  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6465  037700  001356                          BNE     18$             ;NO, CONTINUE
6466  037702  005237  003626                  INC     SECCNT          ;INCREMENT
6467  037706  005305                          DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
6468  037710  001237                          BNE     4$              ;NO, DO SECOND HEADER
6469  037712  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6470  037720  012700  000004                  MOV     #4,R0
6471  037724  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6472  037732  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6473  037740  005300                          DEC     R0
6474  037742  001370                          BNE     20$
6475  037744  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6476  037752  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6477  037760  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
6478  037766  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
6479  037774  001401                          BEQ     25$             ;YES, CHECK IF READY SET
6480  037776  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
6481  040000  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
6482  040004  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
6483  040012  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6484  040020  005300                          DEC     R0
6485  040022  001370                          BNE     26$
6486  040024  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6487  040032  012737  000226  003500          MOV     #RDY!WRHEAD&^C<GO>,E.CS1 ;LOAD EXPECTED CS1
```

```
040040  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
040046  001401                          BEQ     TST46           ;;YES, GO ON TO NEXT TEST
040050  104174                          ERROR   174

                                ;;*****************************************************************
                                ;*TEST 46       DATA FIELD FILLING ON WRITE HEADER
                                ;*
                                ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
                                ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
                                ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, AND
                                ;*      SPECIFY TWO 3 WORD HEADERS CONSISTING OF THE
                                ;*      FOLLOWING DATA:
                                ;*
                                ;*              125252
                                ;*              052525
                                ;*              125252
                                ;*              052525
                                ;*              125252
                                ;*              052525
                                ;*
                                ;*      MAKE SURE THE DATA SYNCH ANY OTHER BITS OF DATA AND
                                ;*      ECC FIELD ARE WRITTEN CORRECTLY.
                                ;*
                                ;;*****************************************************************
040052  000004                  TST46:  SCOPE
040054  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
040062  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
040066  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
040074  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
040102  012762  066716  000004          MOV     #HEAD3,RKBA(R2) ;ISSUE READ HEADER
040110  012703  066716                  MOV     #HEAD3,R3
040114  012762  177772  000002          MOV     #-2*3,RKWC(R2)
040122  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2)
040130  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
                                                                ;  FOR INDEX PULSE
040134  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
040142  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040150  005300                          DEC     R0
040152  001370                          BNE     1$
040154  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
040160  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
040166  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
040174  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
040202  005300                          DEC     R0
040204  001370                          BNE     2$
040206  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040214  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
040220  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
040226  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040234  005300                          DEC     R0
040236  001370                          BNE     3$
040240  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
040244  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
040250  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
040256  012762  000040  000026          MOV     #DMD,RKMR1(R2)
040264  012737  062766  003170          MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
```

```
6544  040272  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
6545                                                    ;  MAINT REG 1
6546  040300  005037  003612                  CLR     P1.BIT
6547  040304  005037  003614                  CLR     PR.BIT
6548  040310  005037  003616                  CLR     M1.BIT
6549  040314  005037  003620                  CLR     M2.BIT
6550  040320  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
6551  040324  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6552  040330  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
6553  040334  104170                          ERROR   170             ;DATA INCORRECT
6554  040336  005237  003622                  INC     BITCNT
6555  040342  005300                          DEC     R0              ;CHECK IF READY FOR DATA
6556  040344  001371                          BNE     5$              ;NO, GENERATE NEXT BIT
6557  040346  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
6558  040354  004737  045136                  JSR     PC,WRTBIT
6559  040360  104170                          ERROR   170             ;DATA INCORRECT
6560  040362  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
6561  040366  012737  063032  003170          MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
6562  040374  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
6563  040400  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
6564  040402  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
6565  040406  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6566  040414  013737  003614  003616          MOV     PR.BIT,M1.BIT
6567  040422  013737  003612  003614          MOV     P1.BIT,PR.BIT
6568  040430  006004                          ROR     R4              ;SHIFT IN NEXT BIT
6569  040432  103403                          BCS     14$             ;CHECK IF ONE
6570  040434  005037  003612                  CLR     P1.BIT          ;ZERO
6571  040440  000403                          BR      15$             ;CLOCK IN BIT
6572
6573  040442  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
6574  040450  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
6575  040454  104170                          ERROR   170             ;BIT INCORRECT
6576  040456  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
6577  040462  005301                          DEC     R1              ;CHECK IF WORD FINISHED
6578  040464  001350                          BNE     12$             ;NO, CONTINUE
6579  040466  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
6580  040470  001343                          BNE     10$             ;NO, GET NEXT WORD
6581  040472  012737  063264  003170          MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
6582  040500  012701  000477                  MOV     #64.+255.,R1    ;LOAD COUNT
6583  040504  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6584  040512  013737  003614  003616          MOV     PR.BIT,M1.BIT
6585  040520  013737  003612  003614          MOV     P1.BIT,PR.BIT
6586  040526  005037  003612                  CLR     P1.BIT
6587  040532  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
6588  040536  104170                          ERROR   170             ;BIT INCORRECT
6589  040540  005301                          DEC     R1              ;CHECK IF READY FOR DATA
6590  040542  001360                          BNE     18$             ;NO, CONTINUE
6591  040544  012737  000001  003612          MOV     #1,P1.BIT       ;SET SYNCH BIT
6592  040552  004737  045136                  JSR     PC,WRTBIT       ;WRITE SYNCH BIT
6593  040556  104170                          ERROR   170             ;SYNCH BIT INCORRECT
6594  040560  012737  063332  003170          MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
6595  040566  005037  003622                  CLR     BITCNT          ;CLEAR BIT COUNT
6596  040572  012701  007777                  MOV     #256.*16.-1,R1  ;LOAD COUNT
6597  040576  013737  003616  003620  20$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
6598  040604  013737  003614  003616          MOV     PR.BIT,M1.BIT
6599  040612  013737  003612  003614          MOV     P1.BIT,PR.BIT
```

```
6600  040620  005037  003612                      CLR     P1.BIT
6601  040624  004737  045136                      JSR     PC,WRTBIT       ;WRITE ZEROS
6602  040630  104170                              ERROR   170             ;BIT INCORRECT
6603  040632  005237  003622                      INC     BITCNT          ;INCREMENT BIT COUNT
6604  040636  005301                              DEC     R1              ;CHECK IF READY FOR ECC
6605  040640  001356                              BNE     20$             ;NO, CONTINUE
6606  040642  012701  000040                      MOV     #32.,R1         ;LOAD COUNT
6607  040646  042737  020000  003524              BIC     #ECCW,E.MR1     ;RESET ECCW BIT
6608  040654  004737  045136          21$:        JSR     PC,WRTBIT       ;WRITE ECC FIELD
6609  040660  104170                              ERROR   170             ;BIT INCORRECT
6610  040662  005237  003622                      INC     BITCNT          ;INCREMENT COUNT
6611  040666  005301                              DEC     R1              ;CHECK IF READY FOR POST AMBLE
6612  040670  001371                              BNE     21$             ;NO CONTINUE
6613  040672  052737  020000  003524              BIS     #ECCW,E.MR1     ;SET ECCW
6614  040700  012701  000012                      MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
6615  040704  004737  045136          22$:        JSR     PC,WRTBIT       ;WRITE POSTAMBLE
6616  040710  104170                              ERROR   170             ;BIT INCORRECT
6617  040712  005237  003622                      INC     BITCNT          ;INCREMENT COUNT
6618  040716  005301                              DEC     R1              ;CHECK IF READY FOR NEXT HEADER
6619  040720  001371                              BNE     22$             ;NO, COMPLETE POSTAMBLE
6620  040722  005237  003626                      INC     SECCNT          ;INCREMENT COUNT
6621  040726  005305                              DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
6622  040730  001402                              BEQ     23$             ;YES, SIMULATE INDEX
6623  040732  000137  040250                      JMP     4$              ;NO GET NEXT HEADER
6624
6625  040736  012762  000240  000026  23$:        MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6626  040744  012700  000004                      MOV     #4,R0
6627  040750  012762  000640  000026  25$:        MOV     #DMD!MIND!MCLK,RKMR1(R2)
6628  040756  012762  000240  000026              MOV     #DMD!MIND,RKMR1(R2)
6629  040764  005300                              DEC     R0
6630  040766  001370                              BNE     25$
6631  040770  012762  000040  000026              MOV     #DMD,RKMR1(R2)
6632  040776  016237  000026  003464              MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6633  041004  012737  022040  003524              MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6634  041012  023737  003524  003464              CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6635                                                                      ;  (WRITE GATE RESET)
6636  041020  001401                              BEQ     28$             ;YES, CHECK IF READY SET
6637  041022  104173                              ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6638  041024  012700  000010          28$:        MOV     #8.,R0          ;FINISH COMMAND
6639  041030  012762  000440  000026  29$:        MOV     #DMD!MCLK,RKMR1(R2)
6640  041036  012762  000040  000026              MOV     #DMD,RKMR1(R2)
6641  041044  005300                              DEC     R0
6642  041046  001370                              BNE     29$
6643  041050  016237  000000  003440              MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6644  041056  012737  000226  003500              MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6645  041064  023737  003500  003440              CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6646  041072  001401                              BEQ     TST47           ;;YES, GO TO NEXT TEST
6647  041074  104174                              ERROR   174             ;CS1 INCORRECT
6648
6649                                  ;;*****************************************************************
6650                                  ;*TEST 47       WRITE HEADER FOR 26 SECTORS
6651                                  ;*
6652                                  ;*      CLEAR THE RK611 WITH A CONTROLLER CLEAR.  PUT CONTROLLER
6653                                  ;*      IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO AN RK06
6654                                  ;*      IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, DRIVE 0, SPECIFYING
6655                                  ;*      66 WORDS.  MAKE SURE ALL 26 SECTORS ARE WRITTEN CORRECTLY.
```

```
                                        ;*
                                        ;;*************************************************************
041076  000004                          TST47:  SCOPE
041100  012737  000010  001200                  MOV     #10,$TIMES      ;;DO 10 ITERATIONS
041106  013702  001270                          MOV     $BASE,R2        ;LOAD RK611 BASE
041112  012762  100000  000000                  MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
041120  012762  000040  000026                  MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN DIAGNOSTIC MODE
041126  012762  066762  000004                  MOV     #NPRBUF,RKBA(R2)        ;ISSUE READ HEADER
041134  012703  066762                          MOV     #NPRBUF,R3
041140  012762  177676  000002                  MOV     #-22.*3,RKWC(R2)
041146  012762  000027  000000                  MOV     #WRHEAD,RKCS1(R2)
041154  012700  000312                          MOV     #50.*4+2,R0     ;ISSUE CLOCKS UNTIL READY
                                                                        ;  FOR INDEX PULSE
041160  012762  000440  000026          1$:     MOV     #DMD!MCLK,RKMR1(R2)
041166  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
041174  005300                                  DEC     R0
041176  001370                                  BNE     1$
041200  012700  000004                          MOV     #4,R0           ;ISSUE INDEX PULSE
041204  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
041212  012762  000640  000026          2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
041220  012762  000240  000026                  MOV     #DMD!MIND,RKMR1(R2)
041226  005300                                  DEC     R0
041230  001370                                  BNE     2$
041232  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
041240  012700  000010                          MOV     #8.,R0          ;WAIT FOR WRITE GATE
041244  012762  000440  000026          3$:     MOV     #DMD!MCLK,RKMR1(R2)
041252  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
041260  005300                                  DEC     R0
041262  001370                                  BNE     3$
041264  005037  003626                          CLR     SECCNT          ;CLEAR SECTOR COUNT
041270  012705  000026                          MOV     #22.,R5         ;LOAD NUMBER OF HEADERS
041274  012762  000140  000026          4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
041302  012762  000040  000026                  MOV     #DMD,RKMR1(R2)
041310  012737  062766  003170                  MOV     #EM233,EMW      ;LOAD ERROR MESSAGE
041316  012737  062040  003524                  MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
                                                                        ;  MAINT REG 1
041324  005037  003612                          CLR     P1.BIT
041330  005037  003614                          CLR     PR.BIT
041334  005037  003616                          CLR     M1.BIT
041340  005037  003620                          CLR     M2.BIT
041344  012700  000400                          MOV     #256.,R0        ;SIMULATE SYNCH
041350  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
041354  004737  045136                  5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
041360  104170                                  ERROR   170             ;DATA INCORRECT
041362  005237  003622                          INC     BITCNT
041366  005300                                  DEC     R0              ;CHECK IF READY FOR DATA
041370  001371                                  BNE     5$              ;NO, GENERATE NEXT BIT
041372  012737  000001  003612                  MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
041400  004737  045136                          JSR     PC,WRTBIT
041404  104170                                  ERROR   170             ;DATA INCORRECT
041406  005037  003622                          CLR     BITCNT          ;INITIALIZE BIT COUNT
041412  012737  063032  003170                  MOV     #EM234,EMW      ;LOAD ERROR MESSAGE
041420  012700  000003                          MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
041424  012304                          10$:    MOV     (R3)+,R4        ;GET NEXT WORD
041426  012701  000020                          MOV     #16.,R1         ;LOAD BIT COUNT
041432  013737  003616  003620          12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
```

```
 6712  041440  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6713  041446  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6714  041454  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 6715  041456  103403                          BCS     14$             ;CHECK IF ONE
 6716  041460  005037  003612                  CLR     P1.BIT          ;ZERO
 6717  041464  000403                          BR      15$             ;CLOCK IN BIT
 6718
 6719  041466  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
 6720  041474  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
 6721  041500  104170                          ERROR   170             ;BIT INCORRECT
 6722  041502  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6723  041506  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 6724  041510  001350                          BNE     12$             ;NO, CONTINUE
 6725  041512  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 6726  041514  001343                          BNE     10$             ;NO, GET NEXT WORD
 6727  041516  012737  063264  003170          MOV     #EM237,EMW      ;LOAD ERROR MESSAGE
 6728  041524  012701  000477                  MOV     #64.+255.,R1    ;LOAD COUNT
 6729  041530  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6730  041536  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6731  041544  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6732  041552  005037  003612                  CLR     P1.BIT
 6733  041556  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZERO
 6734  041562  104170                          ERROR   170             ;BIT INCORRECT
 6735  041564  005301                          DEC     R1              ;CHECK IF READY FOR DATA
 6736  041566  001360                          BNE     18$             ;NO, CONTINUE
 6737  041570  012737  000001  003612          MOV     #1,P1.BIT       ;SET SYNCH BIT
 6738  041576  004737  045136                  JSR     PC,WRTBIT       ;WRITE SYNCH BIT
 6739  041602  104170                          ERROR   170             ;SYNCH BIT INCORRECT
 6740  041604  012737  063332  003170          MOV     #EM238,EMW      ;LOAD ERROR MESSAGE
 6741  041612  005037  003622                  CLR     BITCNT          ;CLEAR BIT COUNT
 6742  041616  012701  007777                  MOV     #256.*16.-1,R1  ;LOAD COUNT
 6743  041622  013737  003616  003620  20$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6744  041630  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6745  041636  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6746  041644  005037  003612                  CLR     P1.BIT
 6747  041650  004737  045136                  JSR     PC,WRTBIT       ;WRITE ZEROS
 6748  041654  104170                          ERROR   170             ;BIT INCORRECT
 6749  041656  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6750  041662  005301                          DEC     R1              ;CHECK IF READY FOR ECC
 6751  041664  001356                          BNE     20$             ;NO, CONTINUE
 6752  041666  012701  000040                  MOV     #32.,R1         ;LOAD COUNT
 6753  041672  042737  020000  003524          BIC     #ECCW.E.MR1     ;RESET ECCW BIT
 6754  041700  004737  045136          21$:    JSR     PC,WRTBIT       ;WRITE ECC FIELD
 6755  041704  104170                          ERROR   170             ;BIT INCORRECT
 6756  041706  005237  003622                  INC     BITCNT          ;INCREMENT COUNT
 6757  041712  005301                          DEC     R1              ;CHECK IF READY FOR POST AMBLE
 6758  041714  001371                          BNE     21$             ;NO CONTINUE
 6759  041716  052737  020000  003524          BIS     #ECCW.E.MR1     ;SET ECCW
 6760  041724  012701  000012                  MOV     #10.,R1         ;CHECK IF READY FOR NEXT HEADER
 6761  041730  004737  045136          22$:    JSR     PC,WRTBIT       ;WRITE POSTAMBLE
 6762  041734  104170                          ERROR   170             ;BIT INCORRECT
 6763  041736  005237  003622                  INC     BITCNT          ;INCREMENT COUNT
 6764  041742  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
 6765  041744  001371                          BNE     22$             ;NO, COMPLETE POSTAMBLE
 6766  041746  005237  003626                  INC     SECCNT          ;INCREMENT COUNT
 6767  041752  005305                          DEC     R5              ;CHECK IF ALL HEADERS RECEIVED
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6768  041754  001402                          BEQ     23$             ;YES, SIMULATE INDEX
6769  041756  000137  041274                  JMP     4$              ;NO GET NEXT HEADER
6770
6771  041762  012762  000240  000026  23$:    MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
6772  041770  012700  000004                  MOV     #4,R0
6773  041774  012762  000640  000026  25$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
6774  042002  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
6775  042010  005300                          DEC     R0
6776  042012  001370                          BNE     25$
6777  042014  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6778  042022  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
6779  042030  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1 ;LOAD EXPECTED MR1
6780  042036  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MR1 CORRECT
6781                                                                  ;  (WRITE GATE RESET)
6782  042044  001401                          BEQ     28$             ;YES, CHECK IF READY SET
6783  042046  104173                          ERROR   173             ;MAINTENANCE REG 1 INCORRECT
6784  042050  012700  000010          28$:    MOV     #8.,R0          ;FINISH COMMAND
6785  042054  012762  000440  000026  29$:    MOV     #DMD!MCLK,RKMR1(R2)
6786  042062  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6787  042070  005300                          DEC     R0
6788  042072  001370                          BNE     29$
6789  042074  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
6790  042102  012737  000226  003500          MOV     #RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
6791  042110  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
6792  042116  001401                          BEQ     TST50           ;YES, GO TO NEXT TEST
6793  042120  104174                          ERROR   174             ;CS1 INCORRECT
6794
6795                                  ;;*****************************************************************
6796                                  ;*TEST 50       WRITE HEADER IN 24 SECTOR FORMAT
6797                                  ;*
6798                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.  PUT
6799                                  ;*      THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER
6800                                  ;*      OF SIX WORDS IN 24 SECTOR FORMAT TO AN RK06, CYLINDER 0,
6801                                  ;*      HEAD 0, DRIVE 0.  CLOCK THROUGH THE SEEK AND DRIVE CLEAR
6802                                  ;*      MESSAGES, SIMULATE INDEX PULSE, SECTOR PULSE, 3 HEADER
6803                                  ;*      WORDS, SYNCH AND DATA, ANOTHER SECTOR PULSE, 3 HEADER
6804                                  ;*      WORDS, AND AN INDEX PULSE.  CHECK DATA WRITTEN TO MAKE
6805                                  ;*      SURE ONLY LOW 16 BITS OF SILO ARE USED.
6806                                  ;*
6807                                  ;;*****************************************************************
6808  042122  000004                  TST50:  SCOPE
6809  042124  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
6810  042132  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
6811  042136  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
6812  042144  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 TO DIAGNOSTIC MODE
6813  042152  012762  066702  000004          MOV     #HEAD1,RKBA(R2) ;ISSUE WRITE HEADER
6814  042160  012703  066702                  MOV     #HEAD1,R3
6815  042164  012762  177772  000002          MOV     #-6,RKWC(R2)
6816  042172  012762  010027  000000          MOV     #CFMT!WRHEAD,RKCS1(R2)
6817  042200  012700  000312                  MOV     #50.*4+2,R0     ;ISSUE ENOUGH CLOCKS UNTIL
6818                                                                  ;  READY FOR INDEX PULSE
6819  042204  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
6820  042212  012762  000040  000026          MOV     #DMD,RKMR1(R2)
6821  042220  005300                          DEC     R0
6822  042222  001370                          BNE     1$
6823  042224  012700  000004                  MOV     #4,R0           ;ISSUE INDEX PULSE
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 6824  042230  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6825  042236  012762  000640  000026  2$:     MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6826  042244  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6827  042252  005300                          DEC     R0
 6828  042254  001370                          BNE     2$
 6829  042256  005037  003626                  CLR     SECCNT          ;CLEAR SECTOR COUNT
 6830  042262  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6831  042270  012705  000002                  MOV     #2,R5           ;LOAD NUMBER OF HEADERS
 6832  042274  012700  000010                  MOV     #8.,R0          ;WAIT FOR WRITE GATE
 6833  042300  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2)
 6834  042306  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6835  042314  005300                          DEC     R0
 6836  042316  001370                          BNE     3$
 6837  042320  012762  000140  000026  4$:     MOV     #DMD!MSP,RKMR1(R2) ;SIMULATE SECTOR PULSE
 6838  042326  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6839  042334  012737  063371  003170          MOV     #EM239,EMW      ;LOAD ERROR MESSAGE
 6840  042342  012737  062040  003524          MOV     #DMD!MEWD!ECCW!WRTGAT,E.MR1 ;INITIALIZE EXPECTED
 6841                                                                  ;  MAINT REG 1
 6842  042350  005037  003612                  CLR     P1.BIT
 6843  042354  005037  003614                  CLR     PR.BIT
 6844  042360  005037  003616                  CLR     M1.BIT
 6845  042364  005037  003620                  CLR     M2.BIT
 6846  042370  012700  000400                  MOV     #256.,R0        ;SIMULATE SYNCH
 6847  042374  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6848  042400  004737  045136          5$:     JSR     PC,WRTBIT       ;WRITE ONE BIT
 6849  042404  104170                          ERROR   170             ;DATA INCORRECT
 6850  042406  005237  003622                  INC     BITCNT
 6851  042412  005300                          DEC     R0              ;CHECK IF READY FOR DATA
 6852  042414  001371                          BNE     5$              ;NO,GENERATE NEXT BIT
 6853  042416  012737  000001  003612          MOV     #1,P1.BIT       ;PUT IN SYNCH BIT
 6854  042424  004737  045136                  JSR     PC,WRTBIT
 6855  042430  104170                          ERROR   170             ;DATA INCORRECT
 6856  042432  005037  003622                  CLR     BITCNT          ;INITIALIZE BIT COUNT
 6857  042436  012737  063463  003170          MOV     #EM240,EMW      ;LOAD ERROR MESSAGE
 6858  042444  012700  000003                  MOV     #3,R0           ;LOAD NUMBER OF WORDS IN HEADER
 6859  042450  012304                  10$:    MOV     (R3)+,R4        ;GET NEXT WORD
 6860  042452  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT
 6861  042456  013737  003616  003620  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6862  042464  013737  003614  003616          MOV     PR.BIT,M1.BIT
 6863  042472  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6864  042500  006004                          ROR     R4              ;SHIFT IN NEXT BIT
 6865  042502  103403                          BCS     14$             ;CHECK IF ONE
 6866  042504  005037  003612                  CLR     P1.BIT          ;ZERO
 6867  042510  000403                          BR      15$             ;CLOCK IN BIT
 6868
 6869  042512  012737  000001  003612  14$:    MOV     #1,P1.BIT       ;ONE
 6870  042520  004737  045136          15$:    JSR     PC,WRTBIT       ;WRITE BIT
 6871  042524  104170                          ERROR   170             ;BIT INCORRECT
 6872  042526  005237  003622                  INC     BITCNT          ;INCREMENT BIT COUNT
 6873  042532  005301                          DEC     R1              ;CHECK IF WORD FINISHED
 6874  042534  001350                          BNE     12$             ;NO, CONTINUE
 6875  042536  005300                          DEC     R0              ;CHECK IF HEADER COMPLETE
 6876  042540  001343                          BNE     10$             ;NO, GET NEXT WORD
 6877  042542  012701  000020                  MOV     #16.,R1         ;LOAD BIT COUNT FOR NEXT WORD
 6878  042546  013737  003616  003620  18$:    MOV     M1.BIT,M2.BIT   ;SHIFT BITS
 6879  042554  013737  003614  003616          MOV     PR.BIT,M1.BIT
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 6880  042562  013737  003612  003614          MOV     P1.BIT,PR.BIT
 6881  042570  005037  003612                  CLR     P1.BIT
 6882  042574  004737  045136                  ISR     PC,WRTBIT       ;WRITE ZERO
 6883  042600  104170                          ERROR   170             ;BIT INCORRECT
 6884  042602  005237  003622                  INC     BITCNT          ;INCREMENT
 6885  042606  005301                          DEC     R1              ;CHECK IF READY FOR NEXT HEADER
 6886  042610  001356                          BNE     18$             ;NO, CONTINUE
 6887  042612  005237  003626                  INC     SECCNT          ;INCREMENT
 6888  042616  005305                          DEC     R5              ;CHECK IF SECOND HEADER WRITTEN
 6889  042620  001237                          BNE     4$              ;NO, DO SECOND HEADER
 6890  042622  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2) ;SIMULATE INDEX PULSE
 6891  042630  012700  000004                  MOV     #4,R0
 6892  042634  012762  000640  000026  20$:    MOV     #DMD!MIND!MCLK,RKMR1(R2)
 6893  042642  012762  000240  000026          MOV     #DMD!MIND,RKMR1(R2)
 6894  042650  005300                          DEC     R0
 6895  042652  001370                          BNE     20$
 6896  042654  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6897  042662  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;GET MAINT REG 1
 6898  042670  012737  022040  003524          MOV     #MEWD!ECCW!DMD,E.MR1  ;LOAD EXPECTED MR1
 6899  042676  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK MR1 CORRECT (WRITE GATE RESET
 6900  042704  001401                          BEQ     25$             ;YES, CHECK IF READY SET
 6901  042706  104173                          ERROR   173             ;MAINT REG 1 INCORRECT
 6902  042710  012700  000010          25$:    MOV     #8.,R0          ;FINISH COMMAND
 6903  042714  012762  000440  000026  26$:    MOV     #DMD!MCLK,RKMR1(R2)
 6904  042722  012762  000040  000026          MOV     #DMD,RKMR1(R2)
 6905  042730  005300                          DEC     R0
 6906  042732  001370                          BNE     26$
 6907  042734  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;GET COMMAND AND STATUS REG 1
 6908  042742  012737  010226  003500          MOV     #RDY!CFMT!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
 6909  042750  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK IF CS1 CORRECT
 6910  042756  001401                          BEQ     TST51           ;;YES, GO ON TO NEXT TEST
 6911  042760  104174                          ERROR   174
 6912
 6913                                  .SBTTL  **TYPE B INSTRUCTION ERRORS
 6914
 6915                                  ;;*****************************************************************
 6916                                  ;*TEST 51       FORMAT ERROR (PART 1)
 6917                                  ;*
 6918                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
 6919                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
 6920                                  ;*      RK06, IN 26 SECTOR FORMAT, CYLINDER 43, HEAD 0, DRIVE 0.
 6921                                  ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
 6922                                  ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
 6923                                  ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
 6924                                  ;*
 6925                                  ;;*****************************************************************
 6926  042762  000004                  TST51:  SCOPE
 6927  042764  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
 6928  042772  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
 6929  042776  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
 6930  043004  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
 6931  043012  012762  000043  000020          MOV     #43,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
 6932  043020  012762  000025  000000          MOV     #RDHEAD,RKCS1(R2) ;ISSUE READ HEADER
 6933  043026  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 5
 6934  043032  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
 6935  043040  012762  000040  000026          MOV     #DMD,RKMR1(R2)
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006936  043046  005300                          DEC     R0
006937  043050  001370                          BNE     1$
006938  043052  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
006939  043056  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
006940  043062  105762  000000          2$:     TSTB    RKCS1(R2)
006941  043066  100402                          BMI     3$
006942  043070  005300                          DEC     R0
006943  043072  001373                          BNE     2$
006944  043074  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
006945  043102  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
006946  043110  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
006947  043116  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
006948  043124  012737  100224  003500          MOV     #CERR!RDY!RDHEAD$(^C<GO>),E.CS1 ;LOAD EXPECTED CS1
006949  043132  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
006950  043140  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
006951  043146  012737  000020  003514          MOV     #FMTE,E.ER      ;LOAD EXPECTED ERROR REG
006952  043154  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
006953  043162  001401                          BEQ     4$              ;YES, CONTINUE
006954  043164  104175                          ERROR   175
006955  043166  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
006956  043174  001401                          BEQ     5$              ;YES, CONTINUE
006957  043176  104176                          ERROR   176
006958  043200  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
006959  043206  001401                          BEQ     6$              ;YES, CONTINUE
006960  043210  104177                          ERROR   177
006961  043212  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
006962  043220  001401                          BEQ     7$              ;YES, CONTINUE
006963  043222  104200                          ERROR   200
006964  043224  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
006965  043232  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
006966  043240  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
006967  043246  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
006968                                                                  ;  AND ERROR REG
006969  043254  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
006970  043262  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
006971  043270  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
006972  043276  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
006973  043304  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
006974  043312  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
006975  043320  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
006976  043326  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
006977  043332  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
006978  043336  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
006979  043344  001401                          BEQ     11$             ;YES, CONTINUE
006980  043346  104211                          ERROR   211             ;CS1 INCORRECT
006981  043350  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
006982  043356  001401                          BEQ     12$             ;YES, CONTINUE
006983  043360  104212                          ERROR   212             ;CS2 INCORRECT
006984  043362  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
006985  043370  001401                          BEQ     13$             ;YES, CONTINUE
006986  043372  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
006987  043374  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
006988  043402  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
006989  043404  104214                          ERROR   214             ;ERROR REG INCORRECT
006990  043406                          14$:
006991
```

```
                                        ;;*****************************************************************
                                        ;*TEST 52       FORMAT ERROR (PART 2)
                                        ;*
                                        ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
                                        ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ HEADER TO AN
                                        ;*      RK06, IN 24 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE 0.
                                        ;*      CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.  TURN OFF
                                        ;*      MAINTENANCE MODE.  MAKE SURE FORMAT ERROR,
                                        ;*      DRIVE AVAILABLE AND CONTROLLER ERROR SET.
                                        ;*
                                        ;;*****************************************************************
043406  000004                        T52:    SCOPE
043410  012737  000144  001200                MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
043416  013702  001270                        MOV     $BASE,R2        ;LOAD RK611 BASE
043422  012762  000040  000010                MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
043430  012762  000040  000026                MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
043436  012762  000003  000020                MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
043444  012762  010025  000000                MOV     #RDHEAD!CFMT,RKCS1(R2) ;ISSUE READ HEADER
043452  012700  000132                        MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
043456  012762  000440  000026        1$:     MOV     #DMD!MCLK,RKMR1(R2)
043464  012762  000040  000026                MOV     #DMD,RKMR1(R2)
043472  005300                                DEC     R0
043474  001370                                BNE     1$
043476  005062  000026                        CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
043502  013700  003632                        MOV     WAITIM,R0       ;WAIT FOR READY
043506  105762  000000                2$:     TSTB    RKCS1(R2)
043512  100402                                BMI     3$
043514  005300                                DEC     R0
043516  001373                                BNE     2$
043520  016237  000000  003440        3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
043526  016237  000010  003450                MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
043534  016237  000012  003452                MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
043542  016237  000014  003454                MOV     RKER(R2),T.ER   ;STORE ERROR REG
043550  012737  110224  003500                MOV     #CERR!RDY!RDHEAD!CFMT&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
043556  012737  000100  003510                MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
043564  012737  100001  003512                MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
043572  012737  000030  003514                MOV     #FMTE!DRPAR,E.ER        ;LOAD EXPECTED ERROR REG
043600  023737  003500  003440                CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
043606  001401                                BEQ     4$              ;YES, CONTINUE
043610  104201                                ERROR   201
043612  023737  003510  003450        4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
043620  001401                                BEQ     5$              ;YES, CONTINUE
043622  104202                                ERROR   202
043624  023737  003512  003452        5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
043632  001401                                BEQ     6$              ;YES, CONTINUE
043634  104203                                ERROR   203
043636  023737  003514  003454        6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
043644  001401                                BEQ     7$              ;YES, CONTINUE
043646  104204                                ERROR   204
043650  013737  003440  003540        7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
043656  013737  003450  003550                MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
043664  013737  003452  003552                MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
043672  013737  003454  003554                MOV     T.ER,P.ER       ;  DRIVE STATUS REG
                                                                      ;  AND ERROR REG
043700  012762  100000  000000                MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
043706  016237  000000  003440                MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
```

```
7048  043714  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7049  043722  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7050  043730  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7051  043736  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7052  043744  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7053  043752  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7054  043756  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
7055  043762  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7056  043770  001401                          BEQ     11$             ;YES, CONTINUE
7057  043772  104211                          ERROR   211             ;CS1 INCORRECT
7058  043774  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
7059  044002  001401                          BEQ     12$             ;YES, CONTINUE
7060  044004  104212                          ERROR   212             ;CS2 INCORRECT
7061  044006  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7062  044014  001401                          BEQ     13$             ;YES, CONTINUE
7063  044016  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7064  044020  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7065  044026  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7066  044030  104214                          ERROR   214             ;ERROR REG INCORRECT
7067  044032                          14$:
7068
7069                                  ;;**********************************************************************
7070                                  ;*TEST 53       FAULT SETTING CONTROLLER ERROR
7071                                  ;*
7072                                  ;*      CLEAR THE RK06 SUBSYSTEM WITH A SUBSYSTEM CLEAR.  PUT THE
7073                                  ;*      CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE HEADER TO
7074                                  ;*      AN RK06, IN 26 SECTOR FORMAT, CYLINDER 3, HEAD 0, DRIVE
7075                                  ;*      0.  CLOCK IN MAINTENANCE MODE UNTIL PHASE ADDRESS 6.
7076                                  ;*      TURN OFF MAINTENANCE MODE.  MAKE SURE DRIVE
7077                                  ;*      AVAILABLE AND CONTROLLER ERROR SET.
7078                                  ;*
7079                                  ;;**********************************************************************
7080  044032  000004                  TST53:  SCOPE
7081  044034  012737  000144  001200          MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
7082  044042  013702  001270                  MOV     $BASE,R2        ;LOAD RK611 BASE
7083  044046  012762  000040  000010          MOV     #SCLR,RKCS2(R2) ;CLEAR RK611 SUBSYSTEM
7084  044054  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;PUT RK611 IN MAINTENANCE MODE
7085  044062  012762  000003  000020          MOV     #3,RKDCYL(R2) ;LOAD CYLINDER ADDRESS REG
7086  044070  012762  177775  000002          MOV     #-3,RKWC(R2)    ;LOAD WORD COUNT
7087  044076  012762  067204  000004          MOV     #WRBUFF,RKBA(R2) ;LOAD BUS ADDRESS
7088  044104  012762  000027  000000          MOV     #WRHEAD,RKCS1(R2) ;ISSUE WRITE HEADER
7089  044112  012700  000132                  MOV     #22.*4+2,R0     ;ISSUE CLOCKS UNTIL PHASE ADDRESS 6
7090  044116  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)
7091  044124  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7092  044132  005300                          DEC     R0
7093  044134  001370                          BNE     1$
7094  044136  005062  000026                  CLR     RKMR1(R2)       ;FINISH COMMAND IN NORMAL MODE
7095  044142  013700  003632                  MOV     WAITIM,R0       ;WAIT FOR READY
7096  044146  105762  000000          2$:     TSTB    RKCS1(R2)
7097  044152  100402                          BMI     3$
7098  044154  005300                          DEC     R0
7099  044156  001373                          BNE     2$
7100  044160  016237  000000  003440  3$:     MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7101  044166  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7102  044174  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7103  044202  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
```

```
7104  044210  012737  100226  003500          MOV     #CERR!RDY!WRHEAD&<^C<GO>>,E.CS1 ;LOAD EXPECTED CS1
7105  044216  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7106  044224  012737  100001  003512          MOV     #SVAL!DRA,E.DS ;LOAD EXPECTED DRIVE STATUS REG
7107  044232  012737  000000  003514          MOV     #0,E.ER ;LOAD EXPECTED ERROR REG
7108  044240  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK COMMAND AND STATUS REG 1 CORRECT
7109  044246  001401                          BEQ     4$              ;YES, CONTINUE
7110  044250  104205                          ERROR   205
7111  044252  023737  003510  003450  4$:     CMP     E.CS2,T.CS2     ;CHECK COMMAND AND STATU REG 2 CORRECT
7112  044260  001401                          BEQ     5$              ;YES, CONTINUE
7113  044262  104206                          ERROR   206
7114  044264  023737  003512  003452  5$:     CMP     E.DS,T.DS       ;CHECK IF DRIVE STRATUS REG CORRECT
7115  044272  001401                          BEQ     6$              ;YES, CONTINUE
7116  044274  104207                          ERROR   207
7117  044276  023737  003514  003454  6$:     CMP     E.ER,T.ER       ;CHECK IF ERR REG CORRECT
7118  044304  001401                          BEQ     7$              ;YES, CONTINUE
7119  044306  104210                          ERROR   210
7120  044310  013737  003440  003540  7$:     MOV     T.CS1,P.CS1     ;STORE PREVIOUS CONTENTS OF
7121  044316  013737  003450  003550          MOV     T.CS2,P.CS2     ;  COMMAND AND STATUS REG 1
7122  044324  013737  003452  003552          MOV     T.DS,P.DS       ;  COMMAND AND STATUS REG 2
7123  044332  013737  003454  003554          MOV     T.ER,P.ER       ;  DRIVE STATUS REG
7124                                                                  ;  AND ERROR REG
7125  044340  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR RK611
7126  044346  016237  000000  003440          MOV     RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REG 1
7127  044354  016237  000010  003450          MOV     RKCS2(R2),T.CS2 ;STORE COMMAND AND STATUS REG 2
7128  044362  016237  000012  003452          MOV     RKDS(R2),T.DS   ;STORE DRIVE STATUS REG
7129  044370  016237  000014  003454          MOV     RKER(R2),T.ER   ;STORE ERROR REG
7130  044376  012737  000200  003500          MOV     #RDY,E.CS1      ;LOAD EXPECTED CS1
7131  044404  012737  000100  003510          MOV     #IR,E.CS2       ;LOAD EXPECTED CS2
7132  044412  005037  003512                  CLR     E.DS            ;LOAD EXPECTED DRIVE STATUS REG
7133  044416  005037  003514                  CLR     E.ER            ;LOAD EXPECTED ERROR REG
7134  044422  023737  003500  003440          CMP     E.CS1,T.CS1     ;CHECK CS1 CORRECT
7135  044430  001401                          BEQ     11$             ;YES, CONTINUE
7136  044432  104211                          ERROR   211             ;CS1 INCORRECT
7137  044434  023737  003510  003450  11$:    CMP     E.CS2,T.CS2     ;CHECK CS2 CORRECT
7138  044442  001401                          BEQ     12$             ;YES, CONTINUE
7139  044444  104212                          ERROR   212             ;CS2 INCORRECT
7140  044446  023737  003512  003452  12$:    CMP     E.DS,T.DS       ;CHECK DRIVE STATUS CORRECT
7141  044454  001401                          BEQ     13$             ;YES, CONTINUE
7142  044456  104213                          ERROR   213             ;DRIVE STATUS REG INCORRECT
7143  044460  023737  003514  003454  13$:    CMP     E.ER,T.ER       ;CHECK IF ERROR REG CORRECT
7144  044466  001401                          BEQ     14$             ;YES, GO ON TO NEXT TEST
7145  044470  104214                          ERROR   214             ;ERROR REG INCORRECT
7146  044472                          14$:
7147
```

```
                                        .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

044472                                  $EOP:
044472  000004                                  SCOPE
044474  005037  001102                         CLR     $TSTNM          ;;ZERO THE TEST NUMBER
044500  005037  001200                         CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
044504  005237  001222                         INC     $PASS           ;;INCREMENT THE PASS NUMBER
044510  042737  100000  001222                BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
044516  005327                                DEC     (PC)+           ;;LOOP?
044520  000001                          $EOPCT: .WORD   1
044522  003063                                  BGT     $DOAGN          ;;YES
044524  012737                                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
044526  000001                          $ENDCT: .WORD   1
044530  044520                                  $EOPCT
044532  104401  044540                         TYPE    ,65$            ;;TYPE ASCIZ STRING
044536  000407                                  BR      64$             ;;GET OVER THE ASCIZ
                                        ;;65$:  .ASCIZ  <12><15>/END PASS #/
044556                                  64$:
044556  013746  001222                         MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                        ;;TYPE PASS NUMBER
044562  104405                                  TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044564  104401  044572                         TYPE    ,67$            ;;TYPE ASCIZ STRING
044570  000421                                  BR      66$             ;;GET OVER THE ASCIZ
                                        ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
044634                                  66$:
044634  013746  001112                         MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                        ;;TOTAL NUMBER OF ERRORS
044640  104405                                  TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
044642  104401  001211                         TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
044646  005037  001112                         CLR     $ERTTL          ;;CLEAR ERROR TOTAL
044652  013700  000042                  $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
044656  001405                                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
044660  000005                                  RESET                   ;;CLEAR THE WORLD
044662  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
044664  000240                                  NOP                     ;;SAVE ROOM
044666  000240                                  NOP                     ;;FOR
044670  000240                                  NOP                     ;;ACT11
044672                                  $DOAGN:
044672  000137                                  JMP     @(PC)+          ;;RETURN
044674  004662                          $RTNAD: .WORD   NEWPAS
044676     377     377     000          $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
044702                                          .EVEN

                                        .SBTTL  GENERATE BAD PARITY IN MEMORY

044702  012703  172100                WRTPAR: MOV     #MEMBAS,R3      ;GET BASE OF VECTOR AREA
044706  013704  003630                        MOV     MEMPAR,R4       ;STORE FLAGS
044712  012705  000020                        MOV     #16.,R5         ;GET NUMBER OF REGISTERS
044716  006004                          5$:     ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
```

```
                        ;GENERATE BAD PARITY IN MEMORY

7204  044720  103002                        BCC     7$              ;NO, TRY NEXT BANK
7205  044722  012713  000004                MOV     #WR.PAR,(R3)    ;ALLOW SETTING OF BAD PARITY
7206  044726  062703  000002        7$:     ADD     #2,R3           ;CALCULATE NEXT ADDRESS
7207  044732  005305                        DEC     R5              ;CHECK IF FINISHED
7208  044734  001370                        BNE     5$              ;NO, GET NEXT PARITY MEMORY ADDRESS
7209  044736  012737  000157  067220        MOV     #157,BADPAR     ;WRITE BAD PARITY
7210  044744  012703  172100                MOV     #MEMBAS,R3      ;GET BASE VECTOR ADDRESS
7211  044750  013704  003630                MOV     MEMPAR,R4       ;LOAD FLAGS
7212  044754  012705  000020                MOV     #16.,R5         ;GET NUMBER OF REGISTERS
7213  044760  006004                15$:    ROR     R4              ;CHECK IF PARITY ENABLE ON THIS BANK
7214  044762  103002                        BCC     17$             ;NO, CHECK NEXT BANK
7215  044764  012713  000001                MOV     #PAR.EN,(R3)    ;ALLOW PARITY DETECTION
7216  044770  062703  000002        17$:    ADD     #2,R3           ;CALCULATE NEXT ADDRESS
7217  044774  005305                        DEC     R5              ;CHECK IF FINISHED
7218  044776  001370                        BNE     15$             ;NO, GET NEXT PARITY MEMORY ADDRESS
7219  045000  000207                        RTS     PC              ;RETURN
7220
7221                            .SBTTL  CHECK FOR MEMORY CHECK ENABLE
7222
7223  045002  012737  045066  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
7224  045010  012737  000340  000006          MOV     #PR7,ERRVEC+2
7225  045016  012737  000000  067220          MOV     #0,BADPAR       ;LOAD GOOD PARITY
7226  045024  005037  003630                  CLR     MEMPAR          ;CLEAR FLAG
7227  045030  012703  172100                  MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
7228                                                                  ;  MEMORY CHECK ENABLE AVAILIBLE
7229  045034  012704  000001                  MOV     #1,R4           ;INITIALIZE MASK
7230  045040  012713  000001          16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
7231  045044  005713                          TST     (R3)
7232  045046  062703  000002                  ADD     #2,R3
7233  045052  050437  003630                  BIS     R4,MEMPAR       ;SET FLAG
7234  045056  000241                          CLC
7235  045060  006104                          ROL     R4              ;CHECK IF FINISHED
7236  045062  001366                          BNE     16$             ;NO, SET UP NEXT MEMORY PARITY MODULE
7237  045064  000406                          BR      22$             ;RESTORE TRAP VECTOR
7238
7239  045066  022626                  20$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
7240  045070  062703  000002                  ADD     #2,R3
7241  045074  000241                          CLC
7242  045076  006104                          ROL     R4              ;CHECK IF FINISHED
7243  045100  001357                          BNE     16$             ;NO, GET NEXT LOCATION
7244  045102  012737  000006  000004  22$:    MOV     #ERRVEC+2,ERRVEC ;RESTORE TRAP CATCHER
7245  045110  005037  000006                  CLR     ERRVEC+2
7246  045114  005737  003630                  TST     MEMPAR          ;CHECK IF MEMORY CHECK ENABLE AVAILIABLE
7247  045120  001005                          BNE     25$             ;YES, RETURN
7248  045122  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC ;RESTORE TRAP CATCHER
7249  045130  005037  000116                  CLR     MEMVEC+2
7250  045134  000207                  25$:    RTS     PC              ;RETURN
7251
7252                            .SBTTL  SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE
7253
7254  045136  052737  002400  003524  WRTBIT: BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT. REG. 1
7255  045144  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIED 1ST UPWARD TRANSITION
7256  045152  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
7257  045160  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
7258  045166  001416                          BEQ     3$              ;YES, PROVIDE DOWNWARD TRANSISTION
7259  045170  012737  045210  001202          MOV     #1$,$ESCAPE     ;LOAD ESCAPE FOR LOOP ON ERROR
```

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7260  045176  012737  066324  003172          MOV     #EMW1,EMW+2     ;LOAD ERROR MESSAGE
7261  045204  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7262  045206  000207                          RTS     PC              ;MR1 INCORRECT ON UPWARD TRANSITION
7263
7264  045210  032777  001000  133722  1$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7265  045216  001402                          BEQ     3$              ;NO, CONTINUE
7266  045220  000137  046072                  JMP     63$             ;YES, LOOP ON ERROR
7267
7268  045224  042737  014400  003524  3$:     BIC     #MCLK!PCA!PCD,E.MR1 ;INITIALIZE MAINTENANCE REG. 1
7269  045232  052737  042000  003524          BIS     #MEWD!WRTGAT,E.MR1
7270  045240  005737  003614                  TST     PR.BIT          ;CHECK IF ONE
7271  045244  001152                          BNE     20$             ;YES, SIMULATE ONE
7272  045246  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7273  045252  001023                          BNE     10$             ;YES, NO TRANSISTION
7274  045254  042737  002000  003524          BIC     #MEWD,E.MR1     ;INDICATE TRANSISTION
7275  045262  005737  003612                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
7276  045266  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
7277  045270  005737  003620                  TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7278  045274  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
7279  045276  052737  010000  003524          BIS     #PCD,E.MR1      ;SET PRECOMP. DELAY
7280  045304  000406                          BR      10$             ;CLOCK IN ZERO
7281
7282  045306  005737  003620          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
7283  045312  001003                          BNE     10$             ;CLOCK IN ZERO
7284  045314  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
7285  045322  012762  000040  000026  10$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
7286  045330  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7287  045336  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7288  045344  001416                          BEQ     12$             ;YES, CONTINUE
7289  045346  012737  045366  001202          MOV     #11$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7290  045354  012737  066413  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
7291  045362  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7292  045364  000207                          RTS     PC              ;MR1 INCORRECT
7293
7294  045366  032777  001000  133544  11$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7295  045374  001402                          BEQ     12$             ;NO, CONTINUE
7296  045376  000137  046072                  JMP     63$             ;YES, LOOP ON ERROR
7297
7298  045402  052737  002400  003524  12$:     BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT REG 1
7299  045410  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSISITION
7300  045416  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
7301  045424  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG. 1 CORRECT
7302  045432  001416                          BEQ     15$             ;YES, CONTINUE
7303  045434  012737  045454  001202          MOV     #13$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7304  045442  012737  066504  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
7305  045450  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7306  045452  000207                          RTS     PC              ;MR1 INCORRECT
7307
7308  045454  032777  001000  133456  13$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7309  045462  001402                          BEQ     15$             ;NO, CONTINUE
7310  045464  000137  046072                  JMP     63$             ;YES, LOOP ON ERROR
7311
7312  045470  052737  002000  003524  15$:     BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
7313  045476  042737  000400  003524          BIC     #MCLK,E.MR1
7314  045504  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SUPPLY LAST PART OF DATA
7315  045512  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
```

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7316  045520  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7317  045526  001414                          BEQ     18$             ;YES, RETURN
7318  045530  012737  045550  001202          MOV     #17$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7319  045536  012737  066573  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
7320  045544  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7321  045546  000207                          RTS     PC              ;MR1 INCORRECT
7322
7323  045550  032777  001000  133362  17$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7324  045556  001145                          BNE     63$             ;YES, LOOP ON ERROR
7325  045560  005037  001202          18$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7326  045564  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
7327  045570  000207                          RTS     PC              ;RETURN
7328
7329  045572  005737  003612          20$:    TST     P1.BIT          ;CHECK IN NEXT BIT A ONE
7330  045576  001007                          BNE     30$             ;YES, CHECK IF PRECOMP DELAY
7331  045600  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP ADVANCE
7332  045604  001415                          BEQ     40$             ;NO, CLOCK IN DATA BIT
7333  045606  052737  004000  003524          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
7334  045614  000411                          BR      40$             ;CHECK MR1
7335
7336  045616  042737  000400  003524  30$:    BIC     #MCLK,E.MR1     ;RESET MAINT CLOCK IN EXPECTED MR1
7337  045624  005737  003616                  TST     M1.BIT          ;CHECK FOR PRECOMP DELAY
7338  045630  001003                          BNE     40$             ;NO, CHECK MR1
7339  045632  052737  010000  003524          BIS     #PCD,E.MR1      ;SET SET PRECOMP DELAY
7340  045640  012762  000040  000026  40$:    MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
7341  045646  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7342  045654  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK MR1 CORRECT
7343  045662  001414                          BEQ     42$             ;YES, CLOCK IN REST OF BIT
7344  045664  012737  045704  001202          MOV     #41$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7345  045672  012737  066413  003172          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
7346  045700  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7347  045702  000207                          RTS     PC              ;MR1 INCORRECT
7348
7349  045704  032777  001000  133226  41$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7350  045712  001067                          BNE     63$             ;YES, LOOP ON ERROR
7351  045714  052737  000400  003524  42$:    BIS     #MCLK,E.MR1     ;CHREATE EXPECTED MAINT. REG. 1
7352  045722  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSITION
7353  045730  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
7354  045736  023737  003524  003464          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
7355  045744  001414                          BEQ     45$             ;YES, CONTINUE
7356  045746  012737  045766  001202          MOV     #43$,$ESCAPE    ;LOAD ESCAPE
7357  045754  012737  066504  003172          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
7358  045762  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7359  045764  000207                          RTS     PC              ;MR1 INCORRECT
7360
7361  045766  032777  001000  133144  43$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7362  045774  001036                          BNE     63$             ;YES, LOOP ON ERROR
7363  045776  042737  002400  003524  45$:    BIC     #MEWD!MCLK,E.MR1 ;SET TRANSISTION
7364  046004  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLOCK TRANSISTION
7365  046012  016237  000026  003464          MOV     RKMR1(R2),T.MR1 ;STORE MR1
7366  046020  023737  003464  003524          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
7367  046026  001414                          BEQ     50$             ;YES, RETURN
7368  046030  012737  046050  001202          MOV     #47$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
7369  046036  012737  066573  003172          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
7370  046044  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
7371  046046  000207                          RTS     PC              ;MR1 INCORRECT
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7372
7373  046050  032777  001000  133062  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7374  046056  001005                          BNE     63$             ;YES, LOOP ON ERROR
7375  046060  005037  001202          50$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7376  046064  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
7377  046070  000207                          RTS     PC              ;RETURN
7378
7379  046072  005037  001202          63$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7380  046076  012706  001100                  MOV     #STACK,SP       ;FORCE STACK
7381  046102  000177  133002                  JMP     @$LPERR         ;LOOP ON ERROR
7382
7383                                  .SBTTL  SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
7384
7385  046106  005737  003614          RDBIT:  TST     PR.BIT          ;CHECK IF ONE
7386  046112  001024                          BNE     10$             ;YES, SIMULATE ONE
7387  046114  005737  003616                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
7388  046120  001404                          BEQ     4$              ;NO, INSERT TRANSITION
7389  046122  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)  ;YES, DO NOT INSERT TRANSITION
7390  046130  000403                          BR      5$              ;CLOCK IN ZERO
7391
7392  046132  012762  001440  000026  4$:     MOV     #DMD!MCLK!MERD,RKMR1(R2)  ;INSERT TRANSITION
7393  046140  012762  000040  000026  5$:     MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
7394  046146  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2)
7395  046154  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7396  046162  000207                          RTS     PC              ;RETURN
7397
7398  046164  012762  000440  000026  10$:    MOV     #DMD!MCLK,RKMR1(R2)  ;CLOCK IN ONE
7399  046172  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7400  046200  012762  001440  000026          MOV     #DMD!MCLK!MERD,RKMR1(R2)
7401  046206  012762  000040  000026          MOV     #DMD,RKMR1(R2)
7402  046214  000207                          RTS     PC              ;RETURN
7403
7404                                  .SBTTL  MEMORY CHECK ENABLE TRAP
7405
7406  046216  012737  046232  001202  MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
7407  046224  011637  003604                  MOV     (SP),TRAPPC     ;STORE PC
7408  046230  104147                          ERROR   147             ;REPORT MEM PARITY ERROR
7409  046232  005037  001202          10$:    CLR     $ESCAPE         ;CLEAR ESCAPE
7410  046236  032777  001000  132674          BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
7411  046244  001001                          BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
7412  046246  000002                          RTI                     ;NO, RETURN
7413
7414  046250  012706  001100          15$:    MOV     #STACK,SP       ;INITIALIZE STACK
7415  046254  000177  132630                  JMP     @$LPERR         ;LOOP ON ERROR
7416
7417                                  .SBTTL  ROUTINE TO SIZE MEMORY
7418
7419                                  ;;*****************************************************************
7420                                  ;*CALL:
7421                                  ;*      JSR     PC,$SIZE
7422                                  ;*      RETURN
7423                                  ;*$LSTAD WILL CONTAIN:
7424                                  ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
7425                                  ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
7426                                  ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
7427                                  ;*$KT11 IS THE MEMORY MANAGEMENT KEY
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                                        ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
                                        ;*      MUST BE SETUP BEFORE THE CALL
                                        ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
                                        ;*      DETERMINED BY ROUTINE

046260  010046                  $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
046262  010146                          MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
046264  010246                          MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
046266  010346                          MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
046270  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
046274  013746  000006                  MOV     @#ERRVEC+2,-(SP)
046300  010600                          MOV     SP,R0           ;;SAVE THE STACK POINTER
                                        ;;SET THE ERRVEC PS TO THE PRESENT PS
046302  104400                          TRAP                    ;;PUSH OLD PSW AND PC ON STACK
046304  012637  000006                  MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
046310  012701  003776                  MOV     #3776,R1        ;;SETUP ADDRESS
046314  105727                          TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
046316  000200                  $KT11:  .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
046320  100062                          BPL     $CORE           ;;BR IF NO
046322  012737  046460  000004          MOV     #$KTNEX,@#ERRVEC ;;SET FOR TIMEOUT
046330  005737  177572                  TST     @#SR0           ;;KT11 ARE YOU THERE?
046334  052737  100000  046316          BIS     #100000,$KT11   ;;YES--SET KT11 KEY
046342  005046                          CLR     -(SP)           ;;INITIALIZE FOR "PAR" LOADING
046344  012702  172340                  MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
046350  012703  000010                  MOV     #^D8,R3         ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
046354  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
046362  011622                          MOV     (SP),(R2)+      ;;LOAD "PAR"
046364  062716  000200                  ADD     #200,(SP)       ;;UPDATE FOR NEXT "PAR"
046370  077307                          SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
046372  012742  177600                  MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
046376  005042                          CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
046400  012737  046416  000004          MOV     #2$,@#ERRVEC    ;;CATCH TIMEOUT IF NO SR3
046406  012737  000020  172516          MOV     #20,@#SR3       ;;ENABLE 22 BIT MODE
046414  000401                          BR      3$              ;;THIS PDP-11 HAS A SR3 REGISTER
046416  022626                  2$:     CMP     (SP)+,(SP)+     ;;CLEAN OFF THE STACK--NO SR3
046420  005237  177572          3$:     INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
046424  012737  046450  000004          MOV     #$KTOUT,@#ERRVEC ;;SET FOR TIME OUT
046432  005737  143776          4$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
046436  062712  000040                  ADD     #40,(R2)        ;;MAKE A 1K STEP
046442  023712  172356                  CMP     @#KIPAR7,(R2)   ;;LAST ONE?
046446  101371                          BHI     4$              ;;NO--TRY IT
046450  011202                  $KTOUT: MOV     (R2),R2         ;;GET LAST BANK+1
046452  005037  177572                  CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
046456  000421                          BR      $SIZEX
046460  042737  100000  046316  $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
046466  012737  046516  000004  $CORE:  MOV     #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
046474  005002                          CLR     R2              ;;SET UP BANK
046476  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
046502  062702  000040                  ADD     #40,R2          ;;1K STEP
046506  005711                          TST     (R1)            ;;TRAP ON TIME OUT
046510  022701  177776                  CMP     #177776,R1      ;;LAST ONE
046514  001370                          BNE     1$              ;;NO--TRY AGAIN
046516  162701  004000          $CROUT: SUB     #4000,R1
046522  162702  000040          $SIZEX: SUB     #40,R2          ;;DROP BACK
046526  010006                          MOV     R0,SP           ;;RESTORE THE STACK
046530  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
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 7484  046534  012637  000004                  MOV     (SP)+,@#ERRVEC
 7485  046540  010137  046562                  MOV     R1,$LSTAD       ;;LAST ADDRESS
 7486  046544  010237  046564                  MOV     R2,$LSTBK       ;;LAST BANK
 7487  046550  012603                          MOV     (SP)+,R3        ;;RESTORE R3
 7488  046552  012602                          MOV     (SP)+,R2        ;;RESTORE R2
 7489  046554  012601                          MOV     (SP)+,R1        ;;RESTORE R1
 7490  046556  012600                          MOV     (SP)+,R0        ;;RESTORE R0
 7491  046560  000207                          RTS     PC
 7492  046562  000000                $LSTAD: .WORD   0               ;;CONTAINS THE LAST ADDRESS
 7493  046564  000000                $LSTBK: .WORD   0               ;;CONTAINS THE LAST BANK
 7494                                .SBTTL  SCOPE HANDLER ROUTINE
 7495
 7496                                ;;**************************************************************
 7497                                ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
 7498                                ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
 7499                                ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
 7500                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 7501                                ;*SW14=1        LOOP ON TEST
 7502                                ;*SW11=1        INHIBIT ITERATIONS
 7503                                ;*SW09=1        LOOP ON ERROR
 7504                                ;*SW08=1        LOOP ON TEST IN SWR<7:0>
 7505                                ;*CALL
 7506                                ;*      SCOPE           ;;SCOPE=IOT
 7507
 7508  046566                        $SCOPE:
 7509  046566  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
 7510  046570  032777  040000  132342  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
 7511  046576  001131                          BNE     $OVER           ;;YES IF SW14=1
 7512                                ;*****START OF CODE FOR THE XOR TESTER*****
 7513  046600  000416                $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
 7514                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
 7515  046602  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
 7516  046606  012737  046626  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
 7517  046614  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
 7518  046620  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 7519  046624  000500                          BR      $SVLAD          ;;GO TO THE NEXT TEST
 7520  046626  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
 7521  046630  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 7522  046634  000440                          BR      7$              ;;LOOP ON THE PRESENT TEST
 7523  046636                        6$:;*****END OF CODE FOR THE XOR TESTER*****
 7524  046636  032777  000400  132274          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
 7525  046644  001421                          BEQ     2$              ;;BR IF NO
 7526  046646  005046                          CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
 7527  046650  117716  132264                  MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
 7528  046654  001414                          BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
 7529  046656  022716  000053                  CMP     #53,(SP)        ;;CHECK THE NUMBER IN THE SWR
 7530  046662  002411                          BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
 7531  046664  011637  001102                  MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
 7532  046670  005316                          DEC     (SP)            ;;BACKUP BY ONE
 7533  046672  006316                          ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
 7534  046674  062716  047100                  ADD     #$SWOBTBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
 7535  046700  013637  001106                  MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
 7536  046704  000466                          BR      $OVER           ;;GO LOOP ON THE TEST
 7537  046706  005726                  8$:     TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
 7538  046710  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
 7539  046714  001421                          BEQ     3$              ;;BR IF NO
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7540  046716  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
7541  046724  101015                          BHI     3$              ;;BR IF NO
7542  046726  032777  001000  132204          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
7543  046734  001404                          BEQ     4$              ;;BR IF NO
7544  046736  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
7545  046744  000446                          BR      $OVER
7546  046746  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
7547  046752  005037  001200                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
7548  046756  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
7549  046760  032777  004000  132152  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
7550  046766  001011                          BNE     1$              ;;BR IF YES
7551  046770  005737  001222                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
7552  046774  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
7553  046776  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
7554  047002  023737  001200  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
7555  047010  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
7556  047012  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
7557  047020  013737  047076  001200          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
7558  047026  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
7559  047032  113737  001102  001220          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
7560  047040  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
7561  047044  011637  001110                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
7562  047050  005037  001202                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
7563  047054  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
7564  047062  013777  001102  132052  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
7565  047070  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
7566  047074  000002                          RTI                     ;;FIXES PS
7567  047076  003720          $MXCNT: 2000.                           ;;MAX. NUMBER OF ITERATIONS
7568  047100                  $SW08TBL:
7569  047100  004702                  .WORD   TST1+2                  ;;STARTING ADDRESS OF TEST 1
7570  047102  005120                  .WORD   TST2+2                  ;;STARTING ADDRESS OF TEST 2
7571  047104  005336                  .WORD   TST3+2                  ;;STARTING ADDRESS OF TEST 3
7572  047106  005552                  .WORD   TST4+2                  ;;STARTING ADDRESS OF TEST 4
7573  047110  005766                  .WORD   TST5+2                  ;;STARTING ADDRESS OF TEST 5
7574  047112  006450                  .WORD   TST6+2                  ;;STARTING ADDRESS OF TEST 6
7575  047114  007076                  .WORD   TST7+2                  ;;STARTING ADDRESS OF TEST 7
7576  047116  007464                  .WORD   TST10+2                 ;;STARTING ADDRESS OF TEST 10
7577  047120  010610                  .WORD   TST11+2                 ;;STARTING ADDRESS OF TEST 11
7578  047122  011276                  .WORD   TST12+2                 ;;STARTING ADDRESS OF TEST 12
7579  047124  012162                  .WORD   TST13+2                 ;;STARTING ADDRESS OF TEST 13
7580  047126  013050                  .WORD   TST14+2                 ;;STARTING ADDRESS OF TEST 14
7581  047130  014254                  .WORD   TST15+2                 ;;STARTING ADDRESS OF TEST 15
7582  047132  015132                  .WORD   TST16+2                 ;;STARTING ADDRESS OF TEST 16
7583  047134  015570                  .WORD   TST17+2                 ;;STARTING ADDRESS OF TEST 17
7584  047136  016704                  .WORD   TST20+2                 ;;STARTING ADDRESS OF TEST 20
7585  047140  020020                  .WORD   TST21+2                 ;;STARTING ADDRESS OF TEST 21
7586  047142  021134                  .WORD   TST22+2                 ;;STARTING ADDRESS OF TEST 22
7587  047144  022372                  .WORD   TST23+2                 ;;STARTING ADDRESS OF TEST 23
7588  047146  023262                  .WORD   TST24+2                 ;;STARTING ADDRESS OF TEST 24
7589  047150  024106                  .WORD   TST25+2                 ;;STARTING ADDRESS OF TEST 25
7590  047152  024640                  .WORD   TST26+2                 ;;STARTING ADDRESS OF TEST 26
7591  047154  025372                  .WORD   TST27+2                 ;;STARTING ADDRESS OF TEST 27
7592  047156  026124                  .WORD   TST30+2                 ;;STARTING ADDRESS OF TEST 30
7593  047160  026656                  .WORD   TST31+2                 ;;STARTING ADDRESS OF TEST 31
7594  047162  027410                  .WORD   TST32+2                 ;;STARTING ADDRESS OF TEST 32
7595  047164  030142                  .WORD   TST33+2                 ;;STARTING ADDRESS OF TEST 33
```

```
 7596  047166  030442                          .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
 7597  047170  031210                          .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
 7598  047172  031600                          .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
 7599  047174  032424                          .WORD   TST37+2         ;;STARTING ADDRESS OF TEST 37
 7600  047176  033250                          .WORD   TST40+2         ;;STARTING ADDRESS OF TEST 40
 7601  047200  034074                          .WORD   TST41+2         ;;STARTING ADDRESS OF TEST 41
 7602  047202  034720                          .WORD   TST42+2         ;;STARTING ADDRESS OF TEST 42
 7603  047204  035544                          .WORD   TST43+2         ;;STARTING ADDRESS OF TEST 43
 7604  047206  036370                          .WORD   TST44+2         ;;STARTING ADDRESS OF TEST 44
 7605  047210  037214                          .WORD   TST45+2         ;;STARTING ADDRESS OF TEST 45
 7606  047212  040054                          .WORD   TST46+2         ;;STARTING ADDRESS OF TEST 46
 7607  047214  041100                          .WORD   TST47+2         ;;STARTING ADDRESS OF TEST 47
 7608  047216  042124                          .WORD   TST50+2         ;;STARTING ADDRESS OF TEST 50
 7609  047220  042764                          .WORD   TST51+2         ;;STARTING ADDRESS OF TEST 51
 7610  047222  043410                          .WORD   TST52+2         ;;STARTING ADDRESS OF TEST 52
 7611  047224  044034                          .WORD   TST53+2         ;;STARTING ADDRESS OF TEST 53
 7612                          ;;*****************************************************************
 7613                          .SBTTL  LOOP ON INTERNAL ERROR
 7614
 7615  047226  032777  001000  131704  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 7616  047234  001405                          BEQ     5$              ;NO RETURN
 7617  047236  105737  001103                  TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
 7618  047242  001402                          BEQ     5$              ;NO, RETURN
 7619  047244  013716  001110                  MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
 7620  047250  000002                  5$:     RTI                     ;RETURN
 7621                          .SBTTL  APT COMMUNICATIONS ROUTINE
 7622
 7623                          ;;*****************************************************************
 7624  047252  112737  000001  047516  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
 7625  047260  112737  000001  047514  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
 7626  047266  000403                          BR      $ATYC
 7627  047270  112737  000001  047516  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
 7628  047276                          $ATYC:
 7629  047276  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7630  047300  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 7631  047302  105737  047514                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
 7632  047306  001450                          BEQ     5$              ;;IF NOT:  BR
 7633  047310  122737  000001  001234          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
 7634  047316  001031                          BNE     3$              ;;IF NOT:  BR
 7635  047320  132737  000100  001235          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
 7636  047326  001425                          BEQ     3$              ;;IF NOT:  BR
 7637  047330  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
 7638  047334  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7639  047342  005737  001214          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
 7640  047346  001375                          BNE     1$              ;;IF NOT:  WAIT
 7641  047350  010037  001230                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
 7642  047354  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
 7643  047356  001376                          BNE     2$
 7644  047360  163700  001230                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
 7645  047364  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
 7646  047366  010037  001232                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
 7647  047372  012737  000004  001214          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
 7648  047400  000413                          BR      5$
 7649  047402  017637  000004  047426  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
 7650  047410  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
 7651  047416  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
```

```
 7652  047422  004737  050260                 JSR     PC,$TYPE        ;;CALL TYPE MACRO
 7653  047426  000000                 4$:     .WORD   0
 7654  047430                       5$:
 7655  047430  105737  047516       10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
 7656  047434  001416                         BEQ     12$             ;;IF NOT:  BR
 7657  047436  005737  001234                 TST     $ENV            ;;RUNNING UNDER APT?
 7658  047442  001413                         BEQ     12$             ;;IF NOT:  BR
 7659  047444  005737  001214       11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
 7660  047450  001375                         BNE     11$             ;;IF NOT:  WAIT
 7661  047452  011637  000004  001216         MOV     @4(SP),$FATAL   ;;GET ERROR #
 7662  047460  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7663  047466  005237  001214                 INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
 7664  047472  105037  047516       12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
 7665  047476  105037  047515               CLRB    $LFLG           ;;CLEAR LOG FLAG
 7666  047502  105037  047514               CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
 7667  047506  012601                       MOV     (SP)+,R1        ;;POP STACK INTO R1
 7668  047510  012600                       MOV     (SP)+,R0        ;;POP STACK INTO R0
 7669  047512  000207                       RTS     PC              ;;RETURN
 7670  047514  000                  $MFLG:  .BYTE   0               ;;MESSG. FLAG
 7671  047515  000                  $LFLG:  .BYTE   0               ;;LOG FLAG
 7672  047516  000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
 7673          047520                       .EVEN
 7674          000200               APTSIZE=200
 7675          000001               APTENV=001
 7676          000100               APTSPOOL=100
 7677          000040               APTCSUP=040
 7678                               .SBTTL  ERROR HANDLER ROUTINE
 7679
 7680                               ;;**********************************************************************
 7681                               ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 7682                               ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 7683                               ;*AND GO TO TYPERR ON ERROR
 7684                               ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 7685                               ;*SW15=1        HALT ON ERROR
 7686                               ;*SW13=1        INHIBIT ERROR TYPEOUTS
 7687                               ;*SW10=1        BELL ON ERROR
 7688                               ;*SW09=1        LOOP ON ERROR
 7689                               ;*CALL
 7690                               ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 7691
 7692  047520                       $ERROR:
 7693  047520  104407                         CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 7694  047522  105237  001103       7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 7695  047526  001775                         BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 7696  047530  013777  001102  131404         MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
 7697  047536  032777  002000  131374         BIT     #BIT10,@SWR     ;;BELL ON ERROR?
 7698  047544  001402                         BEQ     1$              ;;NO - SKIP
 7699  047546  104401  001204                 TYPE    ,$BELL          ;;RING BELL
 7700  047552  005237  001112       1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
 7701  047556  011637  001116               MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
 7702  047562  162737  000002  001116         SUB     #2,$ERRPC
 7703  047570  117737  131322  001114         MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
 7704  047576  032777  020000  131334         BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
 7705  047604  001004                         BNE     20$             ;;SKIP TYPEOUTS
 7706  047606  004737  047720                 JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
 7707  047612  104401  001211                 TYPE    ,$CRLF
```

```
                        20$:
047616                          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
047616  122737  000001  001234  BNE     2$              ;;NO,SKIP APT ERROR REPORT
047624  001007                  MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
047626  113737  001114  047640  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
047634  004737  047270          .BYTE   0
047640      000                 .BYTE   0
047641      000             22$:BR      22$             ;;APT ERROR LOOP
047642  000777              2$: TST     @SWR            ;;HALT ON ERROR
047644  005777  131270          BPL     3$              ;;SKIP IF CONTINUE
047650  100002                  HALT                    ;;HALT ON ERROR!
047652  000000                  CkSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
047654  104407              3$: BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
047656  032777  001000  131254  BEQ     4$              ;;BR IF NO
047664  001402                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
047666  013716  001110          TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
047672  005737  001202      4$: BEQ     5$              ;;BR IF NONE
047676  001402                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
047700  013716  001202      5$:
047704                          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
047704  022737  044662  000042  BNE     6$              ;;BRANCH IF NO
047712  001001                  HALT                    ;;YES
047714  000000              6$:
047716                          RTI                     ;;RETURN
047716  000002
```

```
                        ;;*****************************************************************
                        .SBTTL  TYPE ERROR ROUTINE
                        ;*ENTRY JSR PC,TYPERR
                        ;*RETURN RTS PC
                        ;*
                        ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
                        ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
                        ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
                        ;*THE ERROR.
                        ;;*****************************************************************
047720  104413          TYPERR: SAVREG
047722  113700  001114          MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
047726  042700  177400          BIC     #177400,R0      ;CLEAR UNUSED BITS
047732  005300              1$: DEC     R0              ;FORM INDEX FOR ERROR TABLE
047734  006300                  ASL     R0
047736  006300                  ASL     R0
047740  006300                  ASL     R0
047742  062700  001300          ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
047746  012037  047762          MOV     (R0)+,2$        ;GET EM POINTER
047752  001404                  BEQ     3$              ;BRANCH IF THERE ISN'T ONE
047754  104401  001211          TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
047760  104401                  TYPE                    ;TYPE ERROR MESSAGE (EM)
047762  000000              2$: .WORD   0               ;EM POINTER GOES HERE
047764  012037  050000      3$: MOV     (R0)+,4$        ;GET DH POINTER
047770  001404                  BEQ     5$              ;BRANCH IF THERE ISN'T ONE
047772  104401  001211          TYPE    ,$CRLF          ;TYPE CR-LF
047776  104401                  TYPE                    ;TYPE DATA HEADER
050000  000000              4$: .WORD   0               ;DH POINTER GOES HERE
050002  012001              5$: MOV     (R0)+,R1        ;GET DT POINTER
050004  001445                  BEQ     20$             ;BRANCH IF THERE ARE NONE
050006  005004                  CLR     R4              ;RESET INDENT SWITCH
```

```
7764  050010  012000                      MOV     (R0)+,R0        ;GET DF POINTER
7765  050012  012002                      MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
7766  050014  104401  001211              TYPE    ,$CRLF
7767  050020  112003              10$:    MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
7768  050022  105720                      TSTB    (R0)+           ;BUMP PAST FORMAT WORD
7769  050024  005703                      TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
7770  050026  001416                      BEQ     14$             ;NO - SKIP DATA PRINT
7771  050030  005704                      TST     R4              ;CHECK IF INDENT WORDS
7772  050032  001004                      BNE     12$             ;YES, GO INDENT
7773  050034  013146              11$:    MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
7774  050036  104402                      TYPOC                   ;TYPE IT
7775  050040  005303                      DEC     R3              ;MORE DATA WORDS
7776  050042  001403                      BEQ     13$             ;NO-BRANCH
7777  050044  104401  054644      12$:    TYPE    ,SPACE2         ;TYPE SEPARATORS
7778  050050  000771                      BR      11$             ;LOOP
7779  050052  104401  001211      13$:    TYPE    ,$CRLF          ;TYPE <CR><LF>
7780  050056  005710                      TST     (R0)            ;CHECK IF NEXT HEADER AVAILIBLE
7781  050060  001401                      BEQ     14$             ;NO, DO NOT CHANGE INDENT
7782  050062  005104                      COM     R4              ;CHANGE INDENT
7783  050064  005302              14$:    DEC     R2              ;MORE DH'S?
7784  050066  003414                      BLE     20$             ;NO-BRANCH
7785  050070  012037  050110      15$:    MOV     (R0)+,19$       ;GET NEXT DH POINTER
7786  050074  001751                      BEQ     10$             ;IF NO HEADER GET DATA
7787  050076  005704                      TST     R4              ;INDENT?
7788  050100  001402                      BEQ     17$             ;NO-BRANCH
7789  050102  104401  054644              TYPE    ,SPACE2         ;INDENT
7790  050106  104401              17$:    TYPE                    ;TYPE DH
7791  050110  000000              19$:    .WORD   0               ;DH POINTER GOES HERE
7792  050112  104401  001211              TYPE    ,$CRLF
7793  050116  000740                      BR      10$             ;LOOP
7794  050120  104414              20$:    RESREG
7795  050122  005237  003610              INC     ERRCNT          ;INCREMENT ERROR COUNT
7796  050126  032777  010000  131004      BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
7797  050134  001421                      BEQ     25$             ;NO, RETURN
7798  050136  022737  000024  003610      CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
7799  050144  103015                      BHIS    25$             ;NO, RETURN
7800  050146  104401  054647              TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
7801                                                              ;  ERROR THRESHOLD EXCEEDED"
7802  050152  005737  000042              TST     42              ;CHECK IF IN CHAIN MODE
7803  050156  001407                      BEQ     30$             ;NO, HALT
7804  050160  012737  000001  044520      MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
7805  050166  012706  001100              MOV     #STACK,SP       ;INITIALIZE STACK
7806  050172  000137  044472              JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
7807  050176  000000              30$:    HALT
7808  050200  000207              25$:    RTS     PC
7809
7810                                      .SBTTL  CONTROLLED PROGRAM HALT
7811  050202  013702  001270      CTRHLT: MOV     $BASE,R2        ;SET '61: BASE
7812  050206  012762  100000  000000      MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
7813  050214  012706  001100              MOV     #STACK,SP       ;CLEAR STACK
7814  050220  104401  054600              TYPE    ,OPR007         ;TYPE HALT MESSAGE
7815  050224  005737  000042              TST     42              ;TEST IF MONITOR PRESENT
7816  050230  001410                      BEQ     5$              ;NO - SKIP
7817  050232  105037  001103              CLRB    $ERFLG          ;CLEAR ERROR FLAG
7818  050236  005037  001202              CLR     $ESCAPE         ;CLEAR ESCAPE
7819  050242  005037  044520              CLR     $EOPCT          ;SET PASS COUNT TO 0
```

```
7820  050246  000137  044472                JMP     $EOP            ;GO TO END OF PASS
7821
7822  050252  000000                5$:     HALT                    ;HALT PROGRAM
7823  050254  000137  003662                JMP     START1          ;DO RESTART IF CONTINUE
7824
7825                                .SBTTL  TYPE ROUTINE
7826
7827                                ;;**********************************************************************
7828                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
7829                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
7830                                ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
7831                                ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
7832                                ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
7833                                ;*
7834                                ;*CALL:
7835                                ;*1) USING A TRAP INSTRUCTION
7836                                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
7837                                ;*OR
7838                                ;*      TYPE
7839                                ;*      MESADR
7840                                ;*
7841
7842  050260  105737  001157        $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
7843  050264  100002                        BPL     1$              ;;BR IF YES
7844  050266  000000                        HALT                    ;;HALT HERE IF NO TERMINAL
7845  050270  000430                        BR      3$              ;;LEAVE
7846  050272  010046                1$:     MOV     R0,-(SP)        ;;SAVE R0
7847  050274  017600  000002                MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
7848  050300  122737  000001  001234        CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7849  050306  001011                        BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
7850  050310  132737  000100  001235        BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
7851  050316  001405                        BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
7852  050320  010037  050330                MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
7853  050324  004737  047260                JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
7854  050330  000000                61$:    .WORD   0               ;;MESSAGE ADDRESS
7855  050332  132737  000040  001235  62$:  BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
7856  050340  001003                        BNE     60$             ;;YES,SKIP TYPE OUT
7857  050342  112046                2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
7858  050344  001005                        BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
7859  050346  005726                        TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
7860  050350  012600                60$:    MOV     (SP)+,R0        ;;RESTORE R0
7861  050352  062716  000002        3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
7862  050356  000002                        RTI                     ;;RETURN
7863  050360  122716  000011        4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
7864  050364  001430                        BEQ     8$
7865  050366  122716  000200                CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
7866  050372  001006                        BNE     5$
7867  050374  005726                        TST     (SP)+           ;;POP  <CR><LF> EQUIV
7868  050376  104401                        TYPE                    ;;TYPE A CR AND LF
7869  050400  001211                        $CRLF
7870  050402  105037  050536                CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
7871  050406  000755                        BR      2$              ;;GET NEXT CHARACTER
7872  050410  004737  050472        5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
7873  050414  123726  001156        6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
7874  050420  001350                        BNE     2$              ;;IF NO GO GET NEXT CHAR.
7875  050422  013746  001154                MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
```

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 7876
 7877  050426  105366  000001          7$:     DECB    1(SP)           ;;AND THE NULL CHAR.
 7878  050432  002770                          BLT     6$              ;;DOES A NULL NEED TO BE TYPED?
 7879  050434  004737  050472                  JSR     PC,$TYPEC       ;;BR IF NO--GO POP THE NULL OFF OF STACK
 7880  050440  105337  050536                  DECB    $CHARCNT        ;;GO TYPE A NULL
 7881  050444  000770                          BR      7$              ;;DO NOT COUNT AS A COUNT
 7882                                                                  ;;LOOP
 7883                                  ;HORIZONTAL TAB PROCESSOR
 7884
 7885  050446  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
 7886  050452  004737  050472          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
 7887  050456  132737  000007  050536          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
 7888  050464  001372                          BNE     9$              ;;TAB STOP
 7889  050466  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
 7890  050470  000724                          BR      2$              ;;GET NEXT CHARACTER
 7891  050472  105777  130452          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
 7892  050476  100375                          BPL     $TYPEC
 7893  050500  116677  000002  130444          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 7894  050506  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 7895  050514  001003                          BNE     1$              ;;BRANCH IF NO
 7896  050516  105037  050536                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 7897  050522  000406                          BR      $TYPEX          ;;EXIT
 7898  050524  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
 7899  050532  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
 7900  050534  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
 7901  050536  000000          $CHARCNT:.WORD  0                       ;;CHARACTER COUNT STORAGE
 7902  050540  000207          $TYPEX: RTS     PC
 7903
 7904                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
 7905
 7906                                  ;;**************************************************************
 7907                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
 7908                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
 7909                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
 7910                                  ;*CALL:
 7911                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 7912                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
 7913                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
 7914                                  ;*      .BYTE   M               ;;M=1 OR 0
 7915                                  ;*                                      ;;1=TYPE LEADING ZEROS
 7916                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
 7917                                  ;*
 7918                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
 7919                                  ;*$TYPOS OR $TYPOC
 7920                                  ;*CALL:
 7921                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 7922                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
 7923                                  ;*
 7924                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
 7925                                  ;*CALL:
 7926                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 7927                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
 7928
 7929  050542  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
 7930  050546  116637  000001  050765          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
 7931  050554  112637  050767                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
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 7932  050560  062716  000002                    ADD     #2,(SP)          ;;ADJUST RETURN ADDRESS
 7933  050564  000406                            BR      $TYPON
 7934  050566  112737  000001  050765  $TYPOC:   MOVB    #1,$OFILL        ;;SET THE ZERO FILL SWITCH
 7935  050574  112737  000006  050767            MOVB    #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
 7936  050602  112737  000005  050764  $TYPON:   MOVB    #5,$OCNT         ;;SET THE ITERATIO' COUNT
 7937  050610  010346                            MOV     R3,-(SP)         ;;SAVE R3
 7938  050612  010446                            MOV     R4,-(SP)         ;;SAVE R4
 7939  050614  010546                            MOV     R5,-(SP)         ;;SAVE R5
 7940  050616  113704  050767                    MOVB    $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
 7941  050622  005404                            NEG     R4
 7942  050624  062704  000006                    ADD     #6,R4            ;;SUBTRACT IT FOR MAX. ALLOWED
 7943  050630  110437  050766                    MOVB    R4,$OMODE        ;;SAVE IT FOR USE
 7944  050634  113704  050765                    MOVB    $OFILL,R4        ;;GET THE ZERO FILL SWITCH
 7945  050640  016605  000012                    MOV     12(SP),R5        ;;PICKUP THE INPUT NUMBER
 7946  050644  005003                            CLR     R3               ;;CLEAR THE OUTPUT WORD
 7947  050646  006105                  1$:       ROL     R5               ;;ROTATE MSB INTO "C"
 7948  050650  000404                            BR      3$               ;;GO DO MSB
 7949  050652  006105                  2$:       ROL     R5               ;;FORM THIS DIGIT
 7950  050654  006105                            ROL     R5
 7951  050656  006105                            ROL     R5
 7952  050660  010503                            MOV     R5,R3
 7953  050662  006103                  3$:       ROL     R3               ;;GET LSB OF THIS DIGIT
 7954  050664  105337  050766                    DECB    $OMODE           ;;TYPE THIS DIGIT?
 7955  050670  100016                            BPL     7$               ;;BR IF NO
 7956  050672  042703  177770                    BIC     #177770,R3       ;;GET RID OF JUNK
 7957  050676  001002                            BNE     4$               ;;TEST FOR 0
 7958  050700  005704                            TST     R4               ;;SUPPRESS THIS 0?
 7959  050702  001403                            BEQ     5$               ;;BR IF YES
 7960  050704  005204                  4$:       INC     R4               ;;DON'T SUPPRESS ANYMORE 0'S
 7961  050706  052703  000060                    BIS     #'0,R3           ;;MAKE THIS DIGIT ASCII
 7962  050712  052703  000040            5$:     BIS     #' ,R3           ;;MAKE ASCII IF NOT ALREADY
 7963  050716  110337  050762                    MOVB    R3,8$            ;;SAVE FOR TYPING
 7964  050722  104401  050762                    TYPE    ,8$              ;;GO TYPE THIS DIGIT
 7965  050726  105337  050764            7$:     DECB    $OCNT            ;;COUNT BY 1
 7966  050732  003347                            BGT     2$               ;;BR IF MORE TO DO
 7967  050734  002402                            BLT     6$               ;;BR IF DONE
 7968  050736  005204                            INC     R4               ;;INSURE LAST DIGIT ISN'T A BLANK
 7969  050740  000744                            BR      2$               ;;GO DO THE LAST DIGIT
 7970  050742  012605                  6$:       MOV     (SP)+,R5         ;;RESTORE R5
 7971  050744  012604                            MOV     (SP)+,R4         ;;RESTORE R4
 7972  050746  012603                            MOV     (SP)+,R3         ;;RESTORE R3
 7973  050750  016666  000002  000004            MOV     2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
 7974  050756  012616                            MOV     (SP)+,(SP)
 7975  050760  000002                            RTI                      ;;RETURN
 7976  050762     000                  8$:       .BYTE   0                ;;STORAGE FOR ASCII DIGIT
 7977  050763     000                            .BYTE   0                ;;TERMINATOR FOR TYPE ROUTINE
 7978  050764     000                  $OCNT:    .BYTE   0                ;;OCTAL DIGIT COUNTER
 7979  050765     000                  $OFILL:   .BYTE   0                ;;ZERO FILL SWITCH
 7980  050766  000000                  $OMODE:   .WORD   0                ;;NUMBER OF DIGITS TO TYPE
 7981                                  .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
 7982
 7983                                  ;;**************************************************************
 7984                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
 7985                                  ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
 7986                                  ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
 7987                                  ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
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                                        ;*REPLACED WITH SPACES.
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                                        ;*      TYPDS                   ;;GO TO THE ROUTINE
                                        $TYPDS:
050770                                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
050770  010046                                 MOV     R1,-(SP)        ;;PUSH R1 ON STACK
050772  010146                                 MOV     R2,-(SP)        ;;PUSH R2 ON STACK
050774  010246                                 MOV     R3,-(SP)        ;;PUSH R3 ON STACK
050776  010346                                 MOV     R5,-(SP)        ;;PUSH R5 ON STACK
051000  010546                                 MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
051002  012746  020200                        MOV     20(SP),R5       ;;GET THE INPUT NUMBER
051006  016605  000020                        BPL     1$              ;;BR IF INPUT IS POS.
051012  100004                                 NEG     R5              ;;MAKE THE BINARY NUMBER POS.
051014  005405                                 MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
051016  112766  000055  000001                 CLR     R0              ;;ZERO THE CONSTANTS INDEX
051024  005000                        1$:     MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
051026  012703  051204                        MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
051032  112723  000040                        CLR     R2              ;;CLEAR THE BCD NUMBER
051036  005002                        2$:     MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
051040  016001  051174                        SUB     R1,R5           ;;FORM THIS BCD DIGIT
051044  160105                        3$:     BLT     4$              ;;BR IF DONE
051046  002402                                INC     R2              ;;INCREASE THE BCD DIGIT BY 1
051050  005202                                BR      3$
051052  000774                                ADD     R1,R5           ;;ADD BACK THE CONSTANT
051054  060105                        4$:     TST     R2              ;;CHECK IF BCD DIGIT=0
051056  005702                                BNE     5$              ;;FALL THROUGH IF 0
051060  001002                                TSTB    (SP)            ;;STILL DOING LEADING 0'S?
051062  105716                                BMI     7$              ;;BR IF YES
051064  100407                        5$:     ASLB    (SP)            ;;MSD?
051066  106316                                BCC     6$              ;;BR IF NO
051070  103003                                MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
051072  116663  000001  177777                BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
051100  052702  000060                6$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
051104  052702  000040                7$:     MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
051110  110223                                TST     (R0)+           ;;JUST INCREMENTING
051112  005720                                CMP     R0,#10          ;;CHECK THE TABLE INDEX
051114  020027  000010                        BLT     2$              ;;GO DO THE NEXT DIGIT
051120  002746                                BGT     8$              ;;GO TO EXIT
051122  003002                                MOV     R5,R2           ;;GET THE LSD
051124  010502                                BR      6$              ;;GO CHANGE TO ASCII
051126  000764                        8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
051130  105726                                BPL     9$              ;;BR IF NO
051132  100003                                MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
051134  116663  177777  177776                CLRB    (R3)            ;;SET THE TERMINATOR
051142  105013                        9$:     MOV     (SP)+,R5        ;;POP STACK INTO R5
051144  012605                                MOV     (SP)+,R3        ;;POP STACK INTO R3
051146  012603                                MOV     (SP)+,R2        ;;POP STACK INTO R2
051150  012602                                MOV     (SP)+,R1        ;;POP STACK INTO R1
051152  012601                                MOV     (SP)+,R0        ;;POP STACK INTO R0
051154  012600                                TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
051156  104401  051204                        MOV     2(SP),4(SP)     ;;ADJUST THE STACK
051162  016666  000002  000004                MOV     (SP)+,(SP)
051170  012616                                RTI                     ;;RETURN TO USER
051172  000002
051174  023420                        $DTBL:  10000.
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 8044  051176  001750                        1000.
 8045  051200  000144                        100.
 8046  051202  000012                        10.
 8047  051204  000004              $DBLK:    .BLKW   4
 8048                              .SBTTL    TTY INPUT ROUTINE
 8049
 8050                              ;;*****************************************************************
 8051                              .ENABL    LSB
 8052  051214  000000              $TKCNT:   .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
 8053  051216  000000              $TKQIN:   .WORD   0               ;;INPUT POINTER
 8054  051220  000000              $TKQOUT:  .WORD   0               ;;OUTPUT POINTER
 8055  051222  000001              $TKQSRT:  .BLKB   1               ;;TTY KEYBOARD QUEUE
 8056          051223              $TKQEND=.
 8057          051224              .EVEN
 8058
 8059                              ;*TK INITIALIZE ROUTINE
 8060                              ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
 8061                              ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
 8062                              ;
 8063                              ;*CALL:
 8064                              ;*        JSR     PC,$TKINT
 8065                              ;*        RETURN
 8066                              ;
 8067  051224  005037  051214     $TKINT:   CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
 8068  051230  012737  051222  051216       MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
 8069  051236  013737  051216  051220       MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
 8070  051244  012737  051274  000060       MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
 8071  051252  012737  000200  000062       MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
 8072  051260  005777  127662              TST     @$TKB           ;;CLEAR DONE FLAG
 8073  051264  012777  000100  127652       MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
 8074  051272  000207                       RTS     PC              ;;RETURN TO CALLER
 8075
 8076                              ;*TK SERVICE ROUTINE
 8077                              ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
 8078                              ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
 8079                              ;*IT IN THE QUEUE.
 8080                              ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
 8081                              ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
 8082                              ;
 8083  051274  117746  127646     $TKSRV:   MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
 8084  051300  042716  177600              BIC     #↑C177,(SP)     ;;STRIP THE JUNK
 8085  051304  021627  000003              CMP     (SP),#3         ;;IS IT A CONTROL C?
 8086  051310  001007                       BNE     1$              ;;BRANCH IF NO
 8087  051312  104401  052410              TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (↑C)
 8088  051316  004737  051224              JSR     PC,$TKINT       ;;INIT THE KEYBOARD
 8089  051322  005726                       TST     (SP)+           ;;CLEAN UP STACK
 8090  051324  000137  050202              JMP     CTRHLT          ;;CONTROL C RESTART
 8091  051330  021627  000007     1$:      CMP     (SP),#7         ;;IS IT A CONTROL G?
 8092  051334  001004                       BNE     2$              ;;BRANCH IF NO
 8093  051336  022737  000176  001140      CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
 8094  051344  001500                       BEQ     6$              ;;GO TO SWR CHANGE
 8095
 8096  051346              2$:
 8097  051346  022737  000001  051214      CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
 8098  051354  001004                       BNE     3$              ;;BRANCH IF NO
 8099  051356  104401  001204              TYPE    ,$BELL          ;;RING THE TTY BELL
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8100  051362  005726                          TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
8101  051364  000451                          BR      5$              ;;EXIT
8102  051366  021627  000023          3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
8103  051372  001021                          BNE     32$             ;;BRANCH IF NO
8104  051374  005077  127544                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
8105  051400  005726                          TST     (SP)+           ;;CLEAN CHAR OFF STACK
8106  051402  105777  127536          31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
8107  051406  100375                          BPL     31$             ;;LOOP UNTIL ITS THERE
8108  051410  117746  127532                  MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
8109  051414  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
8110  051420  022627  000021                  CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
8111  051424  001366                          BNE     31$             ;;BRANCH IF NO
8112  051426  012777  000100  127510          MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
8113  051434  000002                          RTI                     ;;RETURN
8114  051436  005237  051214          32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
8115  051442  021627  000140                  CMP     (SP),#140       ;;IS IT UPPER CASE?
8116  051446  002405                          BLT     4$              ;;BRANCH IF YES
8117  051450  021627  000175                  CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
8118  051454  003002                          BGT     4$              ;;BRANCH IF YES
8119  051456  042716  000040                  BIC     #40,(SP)        ;;MAKE IT UPPER CASE
8120  051462  112677  177530          4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
8121  051466  005237  051216                  INC     $TKQIN          ;;UPDATE THE POINTER
8122  051472  023727  051216  051223          CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
8123  051500  001003                          BNE     5$              ;;BRANCH IF NO
8124  051502  012737  051222  051216          MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
8125  051510  000002                  5$:     RTI                     ;;RETURN
8126
8127                                          ;;**************************************************************
8128                                          ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
8129                                          ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
8130                                          ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
8131                                          ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
8132  051512  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
8133  051520  001124                          BNE     15$             ;;EXIT IF NOT
8134  051522  105777  127416                  TSTB    @$TKS           ;;IS A CHAR WAITING?
8135  051526  100121                          BPL     15$             ;;IF NOT, EXIT
8136  051530  117746  127412                  MOVB    @$TKB,-(SP)     ;;YES
8137  051534  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
8138  051540  021627  000007                  CMP     (SP),#7         ;;IS IT A CONTROL-G?
8139  051544  001300                          BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
8140                                                                  ;;AND EXIT
8141
8142                                          ;;**************************************************************
8143                                          ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
8144                                          ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
8145                                          ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
8146  051546  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
8147  051554  001674                          BEQ     2$              ;;BRANCH IF YES
8148  051556  005726                          TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
8149  051560  004737  051224                  JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
8150  051564  005077  127354                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
8151  051570  112737  000001  001135          MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
8152
8153  051576  104401  052422                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
8154  051602  104401  052427          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
8155  051606  013746  000176                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
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8156  051612  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
8157  051614  104401  052440                  TYPE    .$MNEW          ;;PROMPT FOR NEW SWR
8158  051620  005046                  19$:     CLR     -(SP)           ;;CLEAR COUNTER
8159  051622  005046                          CLR     -(SP)           ;;THE NEW SWR
8160  051624  105777  127314          7$:     TSTB    @$TKS           ;;CHAR THERE?
8161  051630  100375                          BPL     7$              ;;IF NOT TRY AGAIN
8162
8163  051632  117746  127310                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
8164  051636  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
8165
8166  051642  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL-C?
8167  051646  001015                          BNE     9$              ;;BRANCH IF NOT
8168  051650  104401  052410                  TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (^C)
8169  051654  062706  000006                  ADD     #6,SP           ;;CLEAN UP STACK
8170  051660  123727  001135  000001          CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
8171  051666  001003                          BNE     8$              ;;BRANCH IF NO
8172  051670  012777  000100  127246          MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
8173  051676  000137  050202          8$:     JMP     CTRHLT          ;;CONTROL-C RESTART
8174
8175
8176  051702  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
8177  051706  001005                          BNE     10$             ;;BRANCH IF NOT
8178  051710  104401  052415                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
8179  051714  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
8180  051720  000737                          BR      19$             ;;LET'S TRY IT AGAIN
8181
8182
8183  051722  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
8184  051726  001022                          BNE     16$             ;;BRANCH IF NO
8185  051730  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
8186  051734  001403                          BEQ     11$             ;;BRANCH IF YES
8187  051736  016677  000002  127174          MOV     2(SP),@SWR      ;;SAVE NEW SWR
8188  051744  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
8189  051750  104401  001211          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
8190  051754  123727  001135  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
8191  051762  001003                          BNE     15$             ;;BRANCH IF NOT
8192  051764  012777  000100  127152          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
8193  051772  000002                  15$:    RTI                     ;;RETURN
8194  051774  004737  050472          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
8195  052000  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
8196  052004  002420                          BLT     18$             ;;BRANCH IF YES
8197  052006  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
8198  052012  003015                          BGT     18$             ;;BRANCH IF YES
8199  052014  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
8200  052020  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
8201  052024  001403                          BEQ     17$             ;;BRANCH IF YES
8202  052026  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
8203  052030  006316                          ASL     (SP)            ;;   CHAR OVER TO MAKE
8204  052032  006316                          ASL     (SP)            ;;   ROOM FOR NEW ONE.
8205  052034  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
8206  052040  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
8207  052044  000667                          BR      7$              ;;GET THE NEXT ONE
8208  052046  104401  001210          18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
8209  052052  000720                          BR      20$             ;;SIMULATE CONTROL-U
8210                                  .DSABL  LSB
8211
```

```
 8212
 8213                                   ;;*****************************************************************
 8214                                   ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 8215                                   ;*CALL:
 8216                                   ;*      RDCHR                    ;;GET A CHARACTER FROM THE QUEUE
 8217                                   ;*      RETURN HERE              ;;CHARACTER IS ON THE STACK
 8218                                   ;*                               ;;WITH PARITY BIT STRIPPED OFF
 8219                                   :
 8220
 8221  052054  011646                  $RDCHR: MOV     (SP),-(SP)       ;;PUSH DOWN THE PC AND
 8222  052056  016666  000004  000002          MOV     4(SP),2(SP)      ;;THE PS
 8223  052064  005066  000004                  CLR     4(SP)            ;;GET READY FOR A CHARACTER
 8224  052070  005046                          CLR     -(SP)            ;;PUT NEW PS ON STACK
 8225  052072  012746  052100                  MOV     #64$,-(SP)       ;;PUT NEW PC ON  STACK
 8226  052076  000002                          RTI                      ;;POP NEW PC AND PS
 8227  052100                          64$:
 8228  052100  005737  051214          1$:     TST     $TKCNT           ;;WAIT ON A CHARACTER
 8229  052104  001775                          BEQ     1$
 8230  052106  005337  051214                  DEC     $TKCNT           ;;DECREMENT THE COUNTER
 8231  052112  117766  177102  000004          MOVB    @$TKQOUT,4(SP)   ;;GET ONE CHARACTER
 8232  052120  005237  051220                  INC     $TKQOUT          ;;UPDATE THE POINTER
 8233  052124  023727  051220  051223          CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
 8234  052132  001003                          BNE     2$               ;;BRANCH IF NO
 8235  052134  012737  051222  051220          MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
 8236  052142  000002                  2$:     RTI                      ;;RETURN
 8237                                   ;;*****************************************************************
 8238                                   ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 8239                                   ;*CALL:
 8240                                   ;*      RDLIN                    ;;INPUT A STRING FROM THE TTY
 8241                                   ;*      RETURN HERE              ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 8242                                   ;*                               ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 8243
 8244  052144  010346                  $RDLIN: MOV     R3,-(SP)         ;;SAVE R3
 8245  052146  005046                          CLR     -(SP)            ;;CLEAR THE RUBOUT KEY
 8246  052150  012703  052400          1$:     MOV     #$TTYIN,R3       ;;GET ADDRESS
 8247  052154  022703  052410          2$:     CMP     #$TTYIN+8.,R3    ;;BUFFER FULL?
 8248  052160  101456                          BLOS    4$               ;;BR IF YES
 8249  052162  104410                          RDCHR                    ;;GO READ ONE CHARACTER FROM THE TTY
 8250  052164  112613                          MOVB    (SP)+,(R3)       ;;GET CHARACTER
 8251  052166  122713  000177          10$:    CMPB    #177,(R3)        ;;IS IT A RUBOUT
 8252  052172  001022                          BNE     5$               ;;BR IF NO
 8253  052174  005716                          TST     (SP)             ;;IS THIS THE FIRST RUBOUT?
 8254  052176  001007                          BNE     6$               ;;BR IF NO
 8255  052200  112737  000134  052376          MOVB    #'\,9$           ;;TYPE A BACK SLASH
 8256  052206  104401  052376                  TYPE    ,9$
 8257  052212  012716  177777                  MOV     #-1,(SP)         ;;SET THE RUBOUT KEY
 8258  052216  005303                  6$:     DEC     R3               ;;BACKUP BY ONE
 8259  052220  020327  052400                  CMP     R3,#$TTYIN       ;;STACK EMPTY?
 8260  052224  103434                          BLO     4$               ;;BR IF YES
 8261  052226  111337  052376                  MOVB    (R3),9$          ;;SETUP TO TYPEOUT THE DELETED CHAR.
 8262  052232  104401  052376                  TYPE    ,9$              ;;GO TYPE
 8263  052236  000746                          BR      2$               ;;GO READ ANOTHER CHAR.
 8264  052240  005716                  5$:     TST     (SP)             ;;RUBOUT KEY SET?
 8265  052242  001406                          BEQ     7$               ;;BR IF NO
 8266  052244  112737  000134  052376          MOVB    #'\,9$           ;;TYPE A BACK SLASH
 8267  052252  104401  052376                  TYPE    ,9$
```

```
8268  052256  005016                          CLR     (SP)            ;;CLEAR THE RUBOUT KEY
8269  052260  122713  000025          7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
8270  052264  001003                          BNE     8$              ;;BR IF NO
8271  052266  104401  052415                  TYPE    ,$CNTLU         ;;TYPE A CONTROL "U"
8272  052272  000726                          BR      1$              ;;GO START OVER
8273  052274  122713  000022          8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
8274  052300  001011                          BNE     3$              ;;BRANCH IF NO
8275  052302  105013                          CLRB    (R3)            ;;CLEAR THE CHARACTER
8276  052304  104401  001211                  TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
8277  052310  104401  052400                  TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
8278  052314  000717                          BR      2$              ;;GO PICKUP ANOTHER CHACTER
8279  052316  104401  001210          4$:     TYPE    ,$QUES          ;;TYPE A '?'
8280  052322  000712                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
8281  052324  111337  052376          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
8282  052330  104401  052376                  TYPE    ,9$
8283  052334  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
8284  052340  001305                          BNE     2$              ;;LOOP IF NOT RETURN
8285  052342  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
8286  052346  104401  001212                  TYPE    ,$LF            ;;TYPE A LINE FEED
8287  052352  005726                          TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
8288  052354  012603                          MOV     (SP)+,R3        ;;RESTORE R3
8289  052356  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
8290  052360  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
8291  052366  012766  052400  000004          MOV     #$TTYIN,4(SP)
8292  052374  000002                          RTI                     ;;RETURN
8293  052376     000          9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
8294  052377     000                  .BYTE   0                       ;;TERMINATOR
8295  052400  000010          $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
8296  052410  041536  005015    000   $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
8297  052415     136  006525  000012 $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
8298  052422  043536  005015    000   $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
8299  052427     015  051412  051127 $MSWR:  .ASCIZ  <15><12>/SWR = /
8300  052434  036440  000040
8301  052440  020040  042516  020127 $MNEW:  .ASCIZ  /  NEW = /
8302  052446  020075     000
8303          052452                  .EVEN
8304                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
8305
8306                                  ;;*****************************************************************
8307                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
8308                                  ;*CHANGE IT TO BINARY.
8309                                  ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
8310                                  ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
8311                                  ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
8312                                  ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
8313                                  ;*CALL:
8314                                  ;*      RDOCT                   ;;READ AN OCTAL NUMBER
8315                                  ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
8316                                  ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
8317
8318  052452  011646          $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
8319  052454  016666  000004  000002          MOV     4(SP),2(SP)     ;;INPUT NUMBER
8320  052462  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
8321  052464  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
8322  052466  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
8323  052470  104411          1$:     RDLIN                   ;;READ AN ASCIZ LINE
```

```
8324  052472  012600                  MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
8325  052474  010037  052600          MOV     R0,5$           ;;AND SAVE IT
8326  052500  005301                  CLR     R1              ;;CLEAR DATA WORD
8327  052502  005302                  CLR     R2
8328  052504  112046          2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
8329  052506  001420                  BEQ     3$              ;;IF ZERO GET OUT
8330  052510  122716  000060          CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
8331  052514  003026                  BGT     4$              ;;IS AN OCTAL DIGIT
8332  052516  122716  000067          CMPB    #'7,(SP)
8333  052522  002423                  BLT     4$
8334  052524  006301                  ASL     R1              ;;*2
8335  052526  006102                  ROL     R2
8336  052530  006301                  ASL     R1              ;;*4
8337  052532  006102                  ROL     R2
8338  052534  006301                  ASL     R1              ;;*8
8339  052536  006102                  ROL     R2
8340  052540  042716  177770          BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
8341  052544  062601                  ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
8342  052546  000756                  BR      2$              ;;LOOP
8343  052550  005726          3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
8344  052552  010166  000012          MOV     R1,12(SP)       ;;SAVE THE RESULT
8345  052556  013237  052610          MOV     R2,$HIOCT
8346  052562  012602                  MOV     (SP)+,R2        ;;POP STACK INTO R2
8347  052564  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
8348  052566  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
8349  052570  000002                  RTI                     ;;RETURN
8350  052572  005726          4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
8351  052574  105010                  CLRB    (R0)            ;;SET A TERMINATOR
8352  052576  104401                  TYPE                    ;;TYPE UP THRU THE BAD CHAR.
8353  052600  000000          5$:     .WORD   0
8354  052602  104401  001210          TYPE    ,$QUES          ;;"?" "CR" & "LF"
8355  052606  000730                  BR      1$              ;;TRY AGAIN
8356  052610  000000          $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
8357                          .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
8358
8359                          ;;**************************************************************
8360                          ;*SAVE R0-R5
8361                          ;*CALL:
8362                          ;*      SAVREG
8363                          ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
8364                          ;*
8365                          ;*TOP---(+16)
8366                          ;* +2---(+18)
8367                          ;* +4---R5
8368                          ;* +6---R4
8369                          ;* +8---R3
8370                          ;*+10---R2
8371                          ;*+12---R1
8372                          ;*+14---R0
8373
8374  052612                  $SAVREG:
8375  052612  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
8376  052614  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
8377  052616  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
8378  052620  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
8379  052622  010446                  MOV     R4,-(SP)        ;;PUSH R4 ON STACK
```

```
 8380  052624  010546                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 8381  052626  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
 8382  052632  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
 8383  052636  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
 8384  052642  016646  000022                MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
 8385  052646  000002                        RTI
 8386
 8387                                  ;*RESTORE R0-R5
 8388                                  ;*CALL:
 8389                                  ;*      RESREG
 8390  052650                          $RESREG:
 8391  052650  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
 8392  052654  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
 8393  052660  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
 8394  052664  012666  000022                MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
 8395  052670  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
 8396  052672  012604                        MOV     (SP)+,R4        ;;POP STACK INTO R4
 8397  052674  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
 8398  052676  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
 8399  052700  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
 8400  052702  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
 8401  052704  000002                        RTI
 8402
 8403                                  .SBTTL  POWER DOWN AND UP ROUTINE
 8404
 8405                                  ;;**************************************************************************
 8406
 8407                                  ;POWER DOWN ROUTINE
 8408  052706  017737  126226  003634 $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
 8409  052714  012737  052734  000024        MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
 8410  052722  012737  000340  000026        MOV     #PR7,PWRVEC+2
 8411  052730  000000                        HALT
 8412  052732  000776                        BR      .-2     ;HANG UP
 8413
 8414                                  ;;**************************************************************************
 8415
 8416                                  ;POWER UP ROUTINE
 8417  052734  005037  053030        $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
 8418  052740  012737  000144  053032        MOV     #100.,$PWRCT+2
 8419  052746  005237  053030        1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
 8420  052752  001375                        BNE     1$
 8421  052754  005337  053032                DEC     $PWRCT+2
 8422  052760  001372                        BNE     1$
 8423  052762  012737  052706  000024        MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
 8424  052770  012737  000340  000026        MOV     #PR7,PWRVEC+2
 8425  052776  012706  001100                MOV     #STACK,SP       ;FORCE STACK
 8426  053002  104401  053034                TYPE    ,$POWER         ;TYPE POWER
 8427  053006  004737  045002                JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
 8428  053012  013777  003634  126120        MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
 8429  053020  013702  001270                MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
 8430  053024  000177  126056                JMP     @SLPADR ;GO BACK TO LAST TEST
 8431
 8432  053030  000000  000000        $PWRCT: .WORD   0,0             ;TELETYPE TIME OUT
 8433  053034  047520  042527  000122 $POWER: .ASCIZ  /POWER/
 8434                                        .EVEN
 8435                                  .SBTTL  TRAP DECODER
```

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

 053042  010046                 $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
 053044  016600  000002                 MOV     2(SP),R0        ;;GET TRAP ADDRESS
 053050  005740                         TST     -(R0)           ;;BACKUP BY 2
 053052  111000                         MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
 053054  006300                         ASL     R0              ;;POSITION FOR INDEXING
 053056  016000  053076                 MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
 053062  000200                         RTS     R0              ;;GO TO ROUTINE


                                ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

 053064  011646                 $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
 053066  016666  000004  000002         MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
 053074  000002                         RTI                     ;;RESTORE THE PSW

                                .SBTTL  TRAP TABLE

                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                ;*BY THE "TRAP" INSTRUCTION.

                                ;       ROUTINE
                                ;       -------
 053076  053064                 $TRPAD: .WORD   $TRAP2
 053100  050260                         $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
 053102  050566                         $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
 053104  050542                         $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
 053106  050602                         $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
 053110  050770                         $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)

 053112  051602                         $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING

 053114  051512                         $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
 053116  052054                         $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
 053120  052144                         $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
 053122  052452                         $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
 053124  052612                         $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
 053126  052650                         $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
 053130  047226                         SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
                                        .SBTTL  DATA TABLE FOR PRINT OUT
                                
003604                          DTO00:  .WORD   STESTN,TRAPPC
001116  003500                 DTO01:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.MR2,T.MR2,E.MR3,T.MR3
003526  003466
003470
001116  003500                 DTO15:  .WORD   STESTN,SERRPC,E.CS1,T.CS1
001116  003524                 DTO17:  .WORD   STESTN,SERRPC,E.MR1,T.MR1,PR.BIT,M1.BIT,BITCNT
003614  003616
001116  003500                 DTO22:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC
003504  003444
003442
001116  003524                 DTO25:  .WORD   STESTN,SERRPC,E.MR1,T.MR1,BITCNT
003622
001116  003500                 DTO31:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.BA,T.BA,E.WC,T.WC,E.MR1,T.MR1
003504  003444
003442  003524
003464
001116  003500                 DTO35:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.BA,T.BA
003510  003450
003444
003442                                  .WORD   E.WC,T.WC
001116  003522                 DTO41:  .WORD   STESTN,SERRPC,E.DB,T.DB
003462
001116  003500                 DTO42:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2
003510  003450
001116  003522                 DTO54:  .WORD   STESTN,SERRPC,E.DB,T.DB,WRDCNT
003462  003624
001116  003500                 DTO55:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2,WRDCNT
003510  003450
003624
001116  003500                 DTO72:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.ER,T.ER
003510  003450
003514  003454
003504  003444  003502                .WORD   E.BA,T.BA,E.WC,T.WC
003442
001116  003500                 DTO77:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2
003510  003450
001116  003500                 DT150:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,WRDCNT,BITCNT
003624  003622
001116  003500                 DT164:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS1,BITCNT
003510  003440
003622
001116  003524                 DT170:  .WORD   STESTN,SERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT,SECCNT
003612  003614
003620  003622
003626
001116  003524                 DT171:  .WORD   STESTN,SERRPC,E.MR1,T.MR1
003464
001116  003500                 DT175:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
003510  003450
003512  003452  003514
003454
001116  003500                 DT211:  .WORD   STESTN,SERRPC,E.CS1,T.CS1,E.CS2,T.CS2,E.DS,T.DS,E.ER,T.ER
```

```
 9537  053546  003440  003510  003450
 9538  053554  003512  003452  003514
 9539  053562  003454
 9540  053564  003540  003550  003552          .WORD   P.CS1,P.CS2,P.DS,P.ER
 9541  053572  003554
```

```
                                    .SBTTL  DATA FORMAT FOR PRINT OUT

053574  000001                      DF000:  .WORD   1
053576     002      000                     .BYTE   2,0
053600  000005                      DF001:  .WORD   5                ;ERRORS 1-14
053602     000      000                     .BYTE   0,0
053604  054760                              .WORD   DH000A
053606     000      000                     .BYTE   0,0
053610  054776                              .WORD   DH000B
053612     002      000                     .BYTE   2,0
053614  055042                              .WORD   DH001A
053616     000      000                     .BYTE   0,0
053620  055121                              .WORD   DH001B
053622     006      000                     .BYTE   6,0
053624  000005                      DF015:  .WORD   5                ;ERRORS 15-16
053626     000      000                     .BYTE   0,0
053630  054760                              .WORD   DH000A
053632     000      000                     .BYTE   0,0
053634  054776                              .WORD   DH000B
053636     002      000                     .BYTE   2,0
053640  055200                              .WORD   DH015A
053642     000      000                     .BYTE   0,0
053644  055217                              .WORD   DH015B
053646     002      000                     .BYTE   2,0
053650  000005                      DF017:  .WORD   5                ;ERROR 17-21
053652     000      000                     .BYTE   0,0
053654  054760                              .WORD   DH000A
053656     000      000                     .BYTE   0,0
053660  054776                              .WORD   DH000B
053662     002      000                     .BYTE   2,0
053664  055235                              .WORD   DH017A
053666     000      000                     .BYTE   0,0
053670  055301                              .WORD   DH017B
053672     005      000                     .BYTE   5,0
053674  000005                      DF022:  .WORD   5                ;ERROR 22-24
053676     000      000                     .BYTE   0,0
053700  054760                              .WORD   DH000A
053702     000      000                     .BYTE   0,0
053704  054776                              .WORD   DH000B
053706     002      000                     .BYTE   2,0
053710  055347                              .WORD   DH022A
053712     000      000                     .BYTE   0,0
053714  055426                              .WORD   DH022B
053716     006      000                     .BYTE   6,0
053720  000005                      DF025:  .WORD   5                ;ERROR 25
053722     000      000                     .BYTE   0,0
053724  054760                              .WORD   DH000A
053726     000      000                     .BYTE   0,0
053730  054776                              .WORD   DH000B
053732     002      000                     .BYTE   2,0
053734  055503                              .WORD   DH025A
053736     000      000                     .BYTE   0,0
053740  055527                              .WORD   DH025B
053742     003      000                     .BYTE   3,0
053744  000005                      DF031:  .WORD   5                ;ERROR 31-34
053746     000      000                     .BYTE   0,0
```

```
8598 053750 054760                 .WORD   DH000A
8599 053752    000      000        .BYTE   0,0
8600 053754 054776                 .WORD   DH000B
8601 053756    002      000        .BYTE   2,0
8602 053760 055555                 .WORD   DH031A
8603 053762    000      000        .BYTE   0,0
8604 053764 055654                 .WORD   DH031B
8605 053766    010      000        .BYTE   8.,0
8606 053770 000005         DF035:  .WORD   5               ;ERRORS 35-40
8607 053772    000      000        .BYTE   0,0
8608 053774 054760                 .WORD   DH000A
8609 053776    000      000        .BYTE   0,0
8610 054000 054776                 .WORD   DH000B
8611 054002    002      000        .BYTE   2,0
8612 054004 055752                 .WORD   DH035A
8613 054006    000      000        .BYTE   0,0
8614 054010 056051                 .WORD   DH035B
8615 054012    010      000        .BYTE   8.,0
8616 054014 000005         DF041:  .WORD   5               ;ERROR 41
8617 054016    000      000        .BYTE   0,0
8618 054020 054760                 .WORD   DH000A
8619 054022    000      000        .BYTE   0,0
8620 054024 054776                 .WORD   DH000B
8621 054026    002      000        .BYTE   2,0
8622 054030 056146                 .WORD   DH041A
8623 054032    000      000        .BYTE   0,0
8624 054034 056163                 .WORD   DH041B
8625 054036    002      000        .BYTE   2,0
8626 054040 000005         DF042:  .WORD   5               ;ERRORS 42-43
8627 054042    000      000        .BYTE   0,0
8628 054044 054760                 .WORD   DH000A
8629 054046    000      000        .BYTE   0,0
8630 054050 054776                 .WORD   DH000B
8631 054052    002      000        .BYTE   2,0
8632 054054 056200                 .WORD   DH042A
8633 054056    000      000        .BYTE   0,0
8634 054060 056237                 .WORD   DH042B
8635 054062    004      000        .BYTE   4,0
8636 054064 000005         DF054:  .WORD   5               ;ERROR 54
8637 054066    000      000        .BYTE   0,0
8638 054070 054760                 .WORD   DH000A
8639 054072    000      000        .BYTE   0,0
8640 054074 054776                 .WORD   DH000B
8641 054076    002      000        .BYTE   2,0
8642 054100 056275                 .WORD   DH054A
8643 054102    000      000        .BYTE   0,0
8644 054104 056322                 .WORD   DH054B
8645 054106    003      000        .BYTE   3.0
8646 054110 000005         DF055:  .WORD   5               ;ERROR 55
8647 054112    000      000        .BYTE   0,0
8648 054114 054760                 .WORD   DH000A
8649 054116    000      000        .BYTE   0,0
8650 054120 054776                 .WORD   DH000B
8651 054122    002      000        .BYTE   2,0
8652 054124 056350                 .WORD   DH055A
8653 054126    000      000        .BYTE   0,0
```

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 8654  054130  056415                        .WORD   DH055B
 8655  054132     005  000                   .BYTE   5,0
 8656  054134  000007                DF072:  .WORD   7
 8657  054136     000  000                   .BYTE   0,0
 8658  054140  054760                        .WORD   DH000A
 8659  054142     000  000                   .BYTE   0,0
 8660  054144  054776                        .WORD   DH000B
 8661  054146     002  000                   .BYTE   2,0
 8662  054150  056463                        .WORD   DH072A
 8663  054152     000  000                   .BYTE   0,0
 8664  054154  056522                        .WORD   DH072B
 8665  054156     004  000                   .BYTE   4,0
 8666  054160  056560                        .WORD   DH072C
 8667  054162     000  000                   .BYTE   0,0
 8668  054164  056637                        .WORD   DH072D
 8669  054166     006  000                   .BYTE   6,0
 8670  054170  000007                DF077:  .WORD   7
 8671  054172     000  000                   .BYTE   0,0
 8672  054174  054760                        .WORD   DH000A
 8673  054176     000  000                   .BYTE   0,0
 8674  054200  054776                        .WORD   DH000B
 8675  054202     002  000                   .BYTE   2,0
 8676  054204  056463                        .WORD   DH072A
 8677  054206     000  000                   .BYTE   0,0
 8678  054210  056522                        .WORD   DH072B
 8679  054212     004  000                   .BYTE   4,0
 8680  054214  000005                DF150:  .WORD   5                       ;ERROR 150
 8681  054216     000  000                   .BYTE   0,0
 8682  054220  054760                        .WORD   DH000A
 8683  054222     000  000                   .BYTE   0,0
 8684  054224  054776                        .WORD   DH000B
 8685  054226     002  000                   .BYTE   2,0
 8686  054230  056714                        .WORD   DH150A
 8687  054232     000  000                   .BYTE   0,0
 8688  054234  056750                        .WORD   DH150B
 8689  054236     004  000                   .BYTE   4,0
 8690  054240  000005                DF164:  .WORD   5                       ;ERROR 164
 8691  054242     000  000                   .BYTE   0,0
 8692  054244  054760                        .WORD   DH000A
 8693  054246     000  000                   .BYTE   0,0
 8694  054250  054776                        .WORD   DH000B
 8695  054252     002  000                   .BYTE   2,0
 8696  054254  057006                        .WORD   DH164A
 8697  054256     000  000                   .BYTE   0,0
 8698  054260  057052                        .WORD   DH164B
 8699  054262     005  000                   .BYTE   5,0
 8700  054264  000005                DF170:  .WORD   5       ;ERROR 170
 8701  054266     000  000                   .BYTE   0,0
 8702  054270  054760                        .WORD   DH000A
 8703  054272     000  000                   .BYTE   0,0
 8704  054274  054776                        .WORD   DH000B
 8705  054276     002  000                   .BYTE   2,0
 8706  054300  057120                        .WORD   DH170A
 8707  054302     000  000                   .BYTE   0,0
 8708  054304  057217                        .WORD   DH170B
 8709  054306     010  000                   .BYTE   8.,0
```

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 8710  054310  000005          DF171:  .WORD   5               ;ERRORS 171-174
 8711  054312     000  000             .BYTE   0,0
 8712  054314  054760                  .WORD   DH000A
 8713  054316     000  000             .BYTE   0,0
 8714  054320  054776                  .WORD   DH000B
 8715  054322     002  000             .BYTE   2,0
 8716  054324  057315                  .WORD   DH171A
 8717  054326     000  000             .BYTE   0,0
 8718  054330  057334                  .WORD   DH171B
 8719  054332     002  000             .BYTE   2,0
 8720  054334  000005          DF175:  .WORD   5               ;ERRORS 175-210
 8721  054336     000  000             .BYTE   0,0
 8722  054340  054760                  .WORD   DH000A
 8723  054342     000  000             .BYTE   0,0
 8724  054344  054776                  .WORD   DH000B
 8725  054346     002  000             .BYTE   2,0
 8726  054350  057352                  .WORD   DH175A
 8727  054352     000  000             .BYTE   0,0
 8728  054354  057451                  .WORD   DH175B
 8729  054356     010  000             .BYTE   8.,0
 8730  054360  000007          DF211:  .WORD   7               ;ERRORS 211-214
 8731  054362     000  000             .BYTE   0,0
 8732  054364  054760                  .WORD   DH000A
 8733  054366     000  000             .BYTE   0,0
 8734  054370  054776                  .WORD   DH000B
 8735  054372     002  000             .BYTE   2,0
 8736  054374  057352                  .WORD   DH175A
 8737  054376     000  000             .BYTE   0,0
 8738  054400  057451                  .WORD   DH175B
 8739  054402     010  000             .BYTE   8.,0
 8740  054404  057546                  .WORD   DH211A
 8741  054406     000  000             .BYTE   0,0
 8742  054410  057574                  .WORD   DH211B
 8743  054412     004  000             .BYTE   4,0
```

```
                                        .SBTTL  ASCII MESSAGES

054414  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 VECTOR ADDRESS ( /
054422  020061  042526  052103
054430  051117  040440  042104
054436  042522  051523  024040
054444  000040
054446  024440  036440  000040  OPR002: .ASCIZ  / ) = /
054454  045522  030466  020061  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
054462  042526  052103  051117
054470  040440  042104  042522
054476  051523  024040  000040
054504  045522  030466  020061  OPR004: .ASCIZ  /RK611 PRIORITY ( /
054512  051120  047511  044522
054520  054524  024040  000040
054526  005015  047062  020104  OPR006: .ASCIZ  <15><12>/2ND PASS RUN TIME IS APPROX 8 MINUTES/<15><12>
054534  040520  051523  051040
054542  047125  052040  046511
054550  020105  051511  040440
054556  050120  047522  020130
054564  020070  044515  052516
054572  042524  006523  000012
054600  005015  025052  025052  OPR007: .ASCIZ  <15><12>/*****   PROGRAM HALTED   ******/<15><12>
054606  020052  020040  051120
054614  043517  040522  020115
054622  040510  052114  042105
054630  020040  025040  025052
054636  025052  006452  000012
054644  020040     000          SPACE2: .ASCIZ  /  /
054647     015  050012  047522  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
054654  051107  046501  040440
054662  047502  052122  042105
054670  041040  041505  052501
054676  042523  042440  051122
054704  051117  052040  051110
054712  051505  047510  042114
054720  042440  041530  042505
054726  042504  006504  000012
054734  005015  042524  052123  TSTBY1: .ASCIZ  <15><12>/TEST /
054742  000040
054744  041040  050131  051501  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
054752  042523  006504  000012
```

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                                        .SBTTL  DATA HEADERS

054760  042524  052123  020040  DH000A: .ASCIZ  /TEST    ERROR/
054766  020040  051105  047522
054774  000122
054776  052516  020115  020040  DH000B: .ASCIZ  /NUM     PC/
055004  020040  041520     000
055011     124  051505  020124  DH000C: .ASCII  /TEST    TRAP/<15><12>
055016  020040  052040  040522
055024  006520     012
055027     116  046525  020040          .ASCIZ  /NUM     PC/
055034  020040  050040  000103
055042  054105  042520  052103  DHCC1A: .ASCIZ  /EXPECT  ACUTAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
055050  020040  041501  052125
055056  046101  020040  054105
055064  042520  052103  020040
055072  041501  052524  046101
055100  020040  054105  042520
055106  052103  020040  041501
055114  052524  046101  000
055121     122  041513  030523  DH001B: .ASCIZ  /RKCS1   RKCS1   MESS A  MESS A  MESS B  MESS B/
055126  020040  051040  041513
055134  030523  020040  046440
055142  051505  020123  020101
055150  046440  051505  020123
055156  020101  046440  051505
055164  020123  020102  046440
055172  051505  020123  000102
055200  054105  042520  052103  DH015A: .ASCIZ  /EXPECT  ACTUAL/
055206  020040  041501  052524
055214  046101     000
055217     122  041513  030523  DH015B: .ASCIZ  /RKCS1   RKCS1/
055224  020040  051040  041513
055232  030523     000
055235     105  050130  041505  DH017A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PREVOUS BIT/
055242  020124  040440  052103
055250  040525  020114  050040
055256  042522  042523  052116
055264  050040  042522  047526
055272  051525  041040  052111
055300     000
055301     122  046513  030522  DH017B: .ASCIZ  /RKMR1   RKMR1   BIT     BIT     COUNT/
055306  020040  051040  046513
055314  030522  020040  041040
055322  052111  020040  020040
055330  041040  052111  020040
055336  020040  041440  052517
055344  052116     000
055347     105  050130  041505  DH022A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
055354  020124  040440  052103
055362  040525  020114  042440
055370  050130  041505  020124
055376  040440  052103  040525
055404  020114  042440  050130
055412  041505  020124  040440
055420  052103  040525  000114
```

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 8842  055426  045522  051503  020061  DH022B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC/
 8843  055434  020040  045522  051503
 8844  055442  020061  020040  045522
 8845  055450  040502  020040  020040
 8846  055456  045522  040502  020040
 8847  055464  020040  045522  041527
 8848  055472  020040  020040  045522
 8849  055500  041527     000
 8850  055503     105  050130  041505  DH025A: .ASCIZ  /EXPECT  ACTUAL  BIT/
 8851  055510  020124  040440  052103
 8852  055516  040525  020114  041040
 8853  055524  052111     000
 8854  055527     122  046513  030522  DH025B: .ASCIZ  /RKMR1   RKMR1   COUNT/
 8855  055534  020040  051040  046513
 8856  055542  030522  020040  041440
 8857  055550  052517  052116     000
 8858  055555     105  050130  041505  DH031A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8859  055562  020124  040440  052103
 8860  055570  040525  020114  042440
 8861  055576  050130  041505  020124
 8862  055604  040440  052103  040525
 8863  055612  020114  042440  050130
 8864  055620  041505  020124  040440
 8865  055626  052103  040525  020114
 8866  055634  042440  050130  041505
 8867  055642  020124  040440  052103
 8868  055650  040525  000114
 8869  055654  045522  051503  020061  DH031B: .ASCIZ  /RKCS1   RKCS1   RKBA    RKBA    RKWC    RKWC    RKMR1   RKMR1/
 8870  055662  020040  045522  051503
 8871  055670  020061  020040  045522
 8872  055676  040502  020040  020040
 8873  055704  045522  040502  020040
 8874  055712  020040  045522  041527
 8875  055720  020040  020040  045522
 8876  055726  041527  020040  020040
 8877  055734  045522  051115  020061
 8878  055742  020040  045522  051115
 8879  055750  000061
 8880  055752  054105  042520  052103  DH035A: .ASCII  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 8881  055760  020040  041501  052524
 8882  055766  046101  020040  054105
 8883  055774  042520  052103  020040
 8884  056002  041501  052524  046101
 8885  056010  020040  054105  042520
 8886  056016  052103  020040  041501
 8887  056024  052524  046101
 8888  056030  020040  054105  042520          .ASCIZ  /  EXPECT  ACTUAL/
 8889  056036  052103  020040  041501
 8890  056044  052524  046101     000
 8891  056051     122  041513  030523  DH035B: .ASCII  /RKCS1   RKCS1   RKCS2   RKCS2   RKBA    RKBA/
 8892  056056  020040  051040  041513
 8893  056064  030523  020040  051040
 8894  056072  041513  031123  020040
 8895  056100  051040  041513  031123
 8896  056106  020040  051040  041113
 8897  056114  020101  020040  051040
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8898  056122  041113    101
8899  056125     040  020040  051040          .ASCIZ  /    RKWC    RKWC/
8900  056132  053513  020103  020040
8901  056140  051040  053513  000103
8902  056146  054105  042520  052103  DH041A: .ASCIZ  /EXPECT  WORD/
8903  056154  020040  047527  042122
8904  056162     000
8905  056163     127  051117  020104  DH041B: .ASCIZ  /WORD    READ/
8906  056170  020040  051040  040505
8907  056176  000104
8908  056200  054105  042520  052103  DH042A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
8909  056206  020040  041501  052524
8910  056214  046101  020040  054105
8911  056222  042520  052103  020040
8912  056230  041501  052524  046101
8913  056236     000
8914  056237     122  041513  030523  DH042B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
8915  056244  020040  051040  041513
8916  056252  030523  020040  051040
8917  056260  041513  031123  020040
8918  056266  051040  041513  031123
8919  056274     000
8920  056275     105  050130  041505  DH054A: .ASCIZ  /EXPECT  WORD    WORD/
8921  056302  020124  053440  051117
8922  056310  020104  020040  053440
8923  056316  051117  000104
8924  056322  047527  042122  020040  DH054B: .ASCIZ  /WORD    READ    COUNT/
8925  056330  020040  042522  042101
8926  056336  020040  020040  047503
8927  056344  047125  000124
8928  056350  054105  042520  052103  DH055A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  WORD/
8929  056356  020040  041501  052524
8930  056364  046101  020040  054105
8931  056372  042520  052103  020040
8932  056400  041501  052524  046101
8933  056406  020040  047527  042122
8934  056414     000
8935  056415     122  041513  030523  DH055B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
8936  056422  020040  051040  041513
8937  056430  030523  020040  051040
8938  056436  041513  031123  020040
8939  056444  051040  041513  031123
8940  056452  020040  041440  052517
8941  056460  052116     000
8942  056463     105  050130  041505  DH072A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
8943  056470  020124  040440  052103
8944  056476  040525  020114  042440
8945  056504  050130  041505  020124
8946  056512  040440  052103  040525
8947  056520  000114
8948  056522  045522  051503  020061  DH072B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2/
8949  056530  020040  045522  051503
8950  056536  020061  020040  045522
8951  056544  051503  020062  020040
8952  056552  045522  051503  000062
8953  056560  054105  042520  052103  DH072C: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
```

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8954  056566  020040  041501  052524
8955  056574  046101  020040  054105
8956  056602  042520  052103  020040
8957  056610  041501  052524  046101
8958  056616  020040  054105  042520
8959  056624  052103  020040  041501
8960  056632  052524  046101     000
8961  056637     122  042513  020122  DH072D: .ASCIZ  /RKER    RKER    RKBA    RKBA    RKWC    RKWC/
8962  056644  020040  051040  042513
8963  056652  020122  020040  051040
8964  056660  041113  020101  020040
8965  056666  051040  041113  020101
8966  056674  020040  051040  053513
8967  056702  020103  020040  051040
8968  056710  053513  000103
8969  056714  054105  042520  052103  DH150A: .ASCIZ  /EXPECT  ACTUAL  WORD    BIT/
8970  056722  020040  041501  052524
8971  056730  046101  020040  047527
8972  056736  042122  020040  020040
8973  056744  044502  000124
8974  056750  045522  051503  020061  DH150B: .ASCIZ  /RKCS1   RKCS1   COUNT   COUNT/
8975  056756  020040  045522  051503
8976  056764  020061  020040  047503
8977  056772  047125  020124  020040
8978  057000  047503  047125  000124
8979  057006  054105  042520  052103  DH164A: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  BIT/
8980  057014  020040  041501  052524
8981  057022  046101  020040  054105
8982  057030  042520  052103  020040
8983  057036  041501  052524  046101
8984  057044  020040  044502  000124
8985  057052  045522  051503  020061  DH164B: .ASCIZ  /RKCS1   RKCS1   RKCS2   RKCS2   COUNT/
8986  057060  020040  045522  051503
8987  057066  020061  020040  045522
8988  057074  051503  020062  020040
8989  057102  045522  051503  020062
8990  057110  020040  047503  047125
8991  057116  000124
8992  057120  054105  042520  052103  DH170A: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT     SECTOR/
8993  057126  020040  041501  052524
8994  057134  046101  020040  051120
8995  057142  051505  047105  020124
8996  057150  051120  051505  047105
8997  057156  020124  051120  051505
8998  057164  047105  020124  051120
8999  057172  051505  047105  020124
9000  057200  044502  020124  020040
9001  057206  020040  042523  052103
9002  057214  051117     000
9003  057217     122  046513  030522  DH170B: .ASCIZ  /RKMR1   RKMR1   BIT+1   BIT     BIT-1   BIT-2   COUNT   COUNT/
9004  057224  020040  051040  046513
9005  057232  030522  020040  041040
9006  057240  052111  030453  020040
9007  057246  041040  052111  020040
9008  057254  020040  041040  052111
9009  057262  030455  020040  041040
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 0010  057270  052111  031055  020040
 0011  057276  041440  052517  052116
 0012  057304  020040  041440  052517
 0013  057312  052116     000
 0014  057315     105  050130  041505  DH171A: .ASCIZ  EXPECT  ACTUAL/
 0015  057322  020124  040440  052103
 0016  057330  040525  000114
 0017  057334  045522  051115  020061  DH171B: .ASCIZ /RKMR1   RKMR1/
 0018  057342  020040  045522  051115
 0019  057350  000061
 0020  057352  054105  042520  052103  DH175A: .ASCIZ /EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL  EXPECT  ACTUAL/
 0021  057360  020040  041501  052524
 0022  057366  046101  020040  054105
 0023  057374  042520  052103  020040
 0024  057402  041501  052524  046101
 0025  057410  020040  054105  042520
 0026  057416  052103  020040  041501
 0027  057424  052524  046101  020040
 0028  057432  054105  042520  052103
 0029  057440  020040  041501  052524
 0030  057446  046101     000
 0031  057451     122  041513  030523  DH175B: .ASCIZ /RKCS1   RKCS1   RKCS2   RKCS2   RKDS    RKDS    RKER    RKER/
 0032  057456  020040  051040  041513
 0033  057464  030523  020040  051040
 0034  057472  041513  031123  020040
 0035  057500  051040  041513  031123
 0036  057506  020040  051040  042113
 0037  057514  020123  020040  051040
 0038  057522  042113  020123  020040
 0039  057530  051040  042513  020122
 0040  057536  020040  051040  042513
 0041  057544  000122
 0042  057546  051120  053105  047511  DH211A: .ASCIZ  /PREVIOUS REG CONTENTS/
 0043  057554  051525  051040  043505
 0044  057562  041440  047117  042524
 0045  057570  052116  000123
 0046  057574  045522  051503  020061  DH211B: .ASCIZ  /RKCS1   RKCS2   RKDS    RKER
 0047  057602  020040  045522  051503
 0048  057610  020062  020040  045522
 0049  057616  051504  020040  020040
 0050  057624  045522  051105     000
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                                                .SBTTL  ERROR MESSAGES

057631     125  042516  050130  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
057636  041505  042524  020104
057644  042515  047515  054522
057652  050040  051101  052111
057660  020131  047105  041101
057666  042514  052040  040522
057674  000120
057676  052101  042524  050115  EM200:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM READ HEADER/
057704  044524  043516  052040
057712  020117  044103  041505
057720  020113  042523  045505
057726  046440  051505  040523
057734  042507  043040  047522
057742  020115  042522  042101
057750  044040  040505  042504
057756  000122
057760  052101  042524  050115  EM201:  .ASCIZ  /ATTEMPTING TO CHECK SEEK MESSAGE FROM WRITE HEADER/
057766  044524  043516  052040
057774  020117  044103  041505
060002  020113  042523  045505
060010  046440  051505  040523
060016  042507  043040  047522
060024  020115  051127  052111
060032  020105  042510  042101
060040  051105     000
060043     101  052124  046505  EM202:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM READ HEADER/
060050  052120  047111  020107
060056  047524  041440  042510
060064  045503  041440  042514
060072  051101  042040  044522
060100  042526  046440  051505
060106  040523  042507  043040
060114  047522  020115  042522
060122  042101  044040  040505
060130  042504  000122
060134  052101  042524  050115  EM203:  .ASCIZ  /ATTEMPTING TO CHECK CLEAR DRIVE MESSAGE FROM WRITE HEADER/
060142  044524  043516  052040
060150  020117  044103  041505
060156  020113  046103  040505
060164  020122  051104  053111
060172  020105  042515  051523
060200  043501  020105  051106
060206  046517  053440  044522
060214  042524  044040  040505
060222  042504  000122
060226  052101  042524  050115  EM204:  .ASCIZ  /ATTEMPTING A READ HEADER TO CHECK SECTOR PULSE DETECT/
060234  044524  043516  040440
060242  051040  040505  020104
060250  042510  042101  051105
060256  052040  020117  044103
060264  041505  020113  042523
060272  052103  051117  050040
060300  046125  042523  042040
060306  052105  041505  000124
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 9107  060314  052101  042524  050115  EM205:  .ASCIZ  /ATTEMPTING A WRITE HEADER TO CHECK INDEX PULSE DETECT/
 9108  060322  044524  043516  040440
 9109  060330  053440  044522  042524
 9110  060336  044040  040505  042504
 9111  060344  020122  047524  041440
 9112  060352  042510  045503  044440
 9113  060360  042116  054105  050040
 9114  060366  046125  042523  042040
 9115  060374  052105  041505  000124
 9116  060402  052101  042524  050115  EM206:  .ASCIZ  /ATTEMPTING AN NPR READ OF ONE WORD/
 9117  060410  044524  043516  040440
 9118  060416  020116  050116  020122
 9119  060424  042522  042101  047440
 9120  060432  020106  047117  020105
 9121  060440  047527  042122     000
 9122  060445     101  052124  046505  EM207:  .ASCIZ  /ATTEMPTING AN NPR READ/
 9123  060452  052120  047111  020107
 9124  060460  047101  047040  051120
 9125  060466  051040  040505  000104
 9126  060474  052101  042524  050115  EM208:  .ASCIZ   ATTEMPTING NPR READ CHECKING ZERO DETECT/
 9127  060502  044524  043516  047040
 9128  060510  051120  051040  040505
 9129  060516  020104  044103  041505
 9130  060524  044513  043516  055040
 9131  060532  051105  020117  042504
 9132  060540  042524  052103     000
 9133  060545     101  052124  046505  EM209:  .ASCIZ  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 9134  060552  052120  047111  020107
 9135  060560  050116  020122  042522
 9136  060566  042101  053440  052111
 9137  060574  020110  052502  020123
 9138  060602  042101  051104  051505
 9139  060610  020123  047111  051103
 9140  060616  046505  047105  020124
 9141  060624  047111  044510  044502
 9142  060632  000124
 9143  060634  052101  042524  050115  EM210:  .ASCII  /ATTEMPTING NPR READ WITH BUS ADDRESS INCREMENT INHIBIT/
 9144  060642  044524  043516  047040
 9145  060650  051120  051040  040505
 9146  060656  020104  044527  044124
 9147  060664  041040  051525  040440
 9148  060672  042104  042522  051523
 9149  060700  044440  041516  042522
 9150  060706  042515  052116  044440
 9151  060714  044116  041111  052111
 9152  060722  041440  042510  045503          .ASCIZ  / CHECKING ZERO DETECT/
 9153  060730  047111  020107  042532
 9154  060736  047522  042040  052105
 9155  060744  041505  000124
 9156  060750  052101  042524  050115  EM211:  .ASCIZ  /ATTEMPTING TO FORCE NON-EXISTENT MEMORY/
 9157  060756  044524  043516  052040
 9158  060764  020117  047506  041522
 9159  060772  020105  047516  026516
 9160  061000  054105  051511  042524
 9161  061006  052116  046440  046505
 9162  061014  051117  000131
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 9163  061020  052101  042524  050115  EM212:  .ASCIZ  /ATTEMPTING TO CLEAR NON-EXISTENT MEMORY/
 9164  061026  044524  043516  052040
 9165  061034  020117  046103  040505
 9166  061042  020122  047516  026516
 9167  061050  054105  051511  042524
 9168  061056  052116  046440  046505
 9169  061064  051117  000131
 9170  061070  042524  052123  047111  EM213:  .ASCIZ  /TESTING EXTENDED MEMORY ADDRESSING BITS/
 9171  061076  020107  054105  042524
 9172  061104  042116  042105  046440
 9173  061112  046505  051117  020131
 9174  061120  042101  051104  051505
 9175  061126  044523  043516  041040
 9176  061134  052111  000123
 9177  061140  052101  042524  050115  EM214:  .ASCIZ   ATTEMPTING TO FORCE UNIBUS PARITY ERROR/
 9178  061146  044524  043516  052040
 9179  061154  020117  047506  041522
 9180  061162  020105  047125  041111
 9181  061170  051525  050040  051101
 9182  061176  052111  020131  051105
 9183  061204  047522  000122
 9184  061210  052101  042524  050115  EM215:  .ASCIZ  /ATTEMPTING NPR READ OF LOCATION PRIOR TO BAD PARITY/
 9185  061216  044524  043516  047040
 9186  061224  051120  051040  040505
 9187  061232  020104  043117  046040
 9188  061240  041517  052101  047511
 9189  061246  020116  051120  047511
 9190  061254  020122  047524  041040
 9191  061262  042101  050040  051101
 9192  061270  052111  000131
 9193  061274  052101  042524  050115  EM216:  .ASCIZ  /ATTEMPTING TO CLEAR UNIBUS PARITY ERROR/
 9194  061302  044524  043516  052040
 9195  061310  020117  046103  040505
 9196  061316  020122  047125  041111
 9197  061324  051525  050040  051101
 9198  061332  052111  020131  051105
 9199  061340  047522  000122
 9200  061344  052101  042524  050115  EM217:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ/
 9201  061352  044524  043516  030440
 9202  061360  020070  044502  020124
 9203  061366  050116  020122  042522
 9204  061374  042101     000
 9205  061377     101  052124  046505  EM218:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ CHECKING ZERO DETECT/
 9206  061404  052120  047111  020107
 9207  061412  034061  041040  052111
 9208  061420  047040  051120  051040
 9209  061426  040505  020104  044103
 9210  061434  041505  044513  043516
 9211  061442  055040  051105  020117
 9212  061450  042504  042524  052103
 9213  061456     000
 9214  061457     101  052124  046505  EM219:  .ASCIZ  /ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET/
 9215  061464  052120  047111  020107
 9216  061472  034061  041040  052111
 9217  061500  047040  051120  051040
 9218  061506  040505  020104  044527
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 9219  061514  044124  041040  052111
 9220  061522  030440  020066  050050
 9221  061530  024501  051440  052105
 9222  061536     000
 9223  061537     101  052124  046505  EM220:  .ASCII  'ATTEMPTING 18 BIT NPR READ WITH BIT 16 (PA) SET'
 9224  061544  052120  047111  020107
 9225  061552  034061  041040  052111
 9226  061560  047040  051120  051040
 9227  061566  040505  020104  044527
 9228  061574  044124  041040  052111
 9229  061602  030440  020066  050050
 9230  061610  024501  051440  052105
 9231  061616  052101  042524  050115  EM221:  .ASCIZ  'ATTEMPTING SIMULATION OF DATA IN READ HEADER'
 9232  061624  044524  043516  051440
 9233  061632  046511  046125  052101
 9234  061640  047511  020116  043117
 9235  061646  042040  052101  020101
 9236  061654  047111  051040  040505
 9237  061662  020104  042510  042101
 9238  061670  051105     000
 9239  061673     101  052124  046505  EM222:  .ASCIZ  'ATTEMPTING READ HEADER IN MAINTANENCE MODE'
 9240  061700  052120  047111  020107
 9241  061706  042522  042101  044040
 9242  061714  040505  042504  020122
 9243  061722  047111  046440  044501
 9244  061730  052116  047101  047105
 9245  061736  042503  046440  042117
 9246  061744  000105
 9247  061746  052101  042524  050115  EM223:  .ASCIZ  'ATTEMPTING DATA BUFFER READ AFTER READ HEADER'
 9248  061754  044524  043516  042040
 9249  061762  052101  020101  052502
 9250  061770  043106  051105  051040
 9251  061776  040505  020104  043101
 9252  062004  042524  020122  042522
 9253  062012  042101  044040  040505
 9254  062020  042504  000122
 9255  062024  052101  042524  050115  EM224:  .ASCIZ  'ATTEMPTING SIMULATION OF DATA IN READ HEADER (18 BIT FORMAT)'
 9256  062032  044524  043516  051440
 9257  062040  046511  046125  052101
 9258  062046  047511  020116  043117
 9259  062054  042040  052101  020101
 9260  062062  047111  051040  040505
 9261  062070  020104  042510  042101
 9262  062076  051105  024040  034061
 9263  062104  041040  052111  043040
 9264  062112  051117  040515  024524
 9265  062120     000
 9266  062121     101  052124  046505  EM225:  .ASCIZ  'ATTEMPTING READ HEADER (18 BIT FORMAT) IN MAINT MODE'
 9267  062126  052120  047111  020107
 9268  062134  042522  042101  044040
 9269  062142  040505  042504  020122
 9270  062150  030450  020070  044502
 9271  062156  020124  047506  046522
 9272  062164  052101  020051  047111
 9273  062172  046440  044501  052116
 9274  062200  046440  042117  000105
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9275  062206  052101  042524  050115  EM226:  .ASCII  /ATTEMPTING DATA BUFFER READ AFTER/<12><15>
9276  062214  044524  043516  042040
9277  062222  052101  020101  052502
9278  062230  043106  051105  051040
9279  062236  040505  020104  043101
9280  062244  042524  005122     015
9281  062251     122  040505  020104          .ASCIZ  /READ HEADER IN 18 BIT FORMAT/
9282  062256  042510  042101  051105
9283  062264  044440  020116  034061
9284  062272  041040  052111  043040
9285  062300  051117  040515  000124
9286  062306  052101  042524  050115  EM227:  .ASCII  /ATTEMPTING TO CHECK SYNCH DETECT ON READ HEADER/<15><12>
9287  062314  044524  043516  052040
9288  062322  020117  044103  041505
9289  062330  020113  054523  041516
9290  062336  020110  042504  042524
9291  062344  052103  047440  020116
9292  062352  042522  042101  044040
9293  062360  040505  042504  006522
9294  062366     012
9295  062367     103  042510  045503          .ASCIZ  /CHECKING ZERO DETECT/
9296  062374  047111  020107  042532
9297  062402  047522  042040  052105
9298  062410  041505  000124
9299  062414  052101  042524  050115  EM230:  .ASCII  /ATTEMPTING TO CHECK WRITING OF ZEROES BETWEEN INDEX/<15><12>
9300  062422  044524  043516  052040
9301  062430  020117  044103  041505
9302  062436  020113  051127  052111
9303  062444  047111  020107  043117
9304  062452  055040  051105  042517
9305  062460  020123  042502  053524
9306  062466  042505  020116  047111
9307  062474  042504  006530     012
9308  062501     101  042116  051440          .ASCIZ  /AND SECTOR PULSE/
9309  062506  041505  047524  020122
9310  062514  052520  051514  000105
9311  062522  052101  042524  050115  EM231:  .ASCII  /ATTEMPTING TO RESET WRITE GATE BY SETTING/<15><12>
9312  062530  044524  043516  052040
9313  062536  020117  042522  042523
9314  062544  020124  051127  052111
9315  062552  020105  040507  042524
9316  062560  041040  020131  042523
9317  062566  052124  047111  006507
9318  062574     012
9319  062575     123  041505  047524          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
9320  062602  020122  052520  051514
9321  062610  020105  047111  040440
9322  062616  053440  044522  042524
9323  062624  044040  040505  042504
9324  062632  020122  047503  046515
9325  062640  047101  000104
9326  062644  052101  042524  050115  EM232:  .ASCII  /ATTEMPTING TO SET WRITE GATE BY RESETTING/<15><12>
9327  062652  044524  043516  052040
9328  062660  020117  042523  020124
9329  062666  051127  052111  020105
9330  062674  040507  042524  041040
```

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 9331  062702  020131  042522  042523
 9332  062710  052124  047111  006507
 9333  062716     012
 9334  062717     123  041505  047524          .ASCIZ  /SECTOR PULSE IN A WRITE HEADER COMMAND/
 9335  062724  020122  052520  051514
 9336  062732  020105  047111  040440
 9337  062740  053440  044522  042524
 9338  062746  044040  040505  042504
 9339  062754  020122  047503  046515
 9340  062762  047101  000104
 9341  062766  052101  042524  050115  EM233:  .ASCIZ  /ATTEMPTING TO WRITE SYNCH OF HEADER/
 9342  062774  044524  043516  052040
 9343  063002  020117  051127  052111
 9344  063010  020105  054523  041516
 9345  063016  020110  043117  044040
 9346  063024  040505  042504  000122
 9347  063032  052101  042524  050115  EM234:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA/
 9348  063040  044524  043516  052040
 9349  063046  020117  051127  052111
 9350  063054  020105  042510  042101
 9351  063062  051105  042040  052101
 9352  063070  000101
 9353  063072  052101  042524  050115  EM235:  .ASCII  /ATTEMPTING TO RESET WRITE GATE WITH SECOND/<15><12>
 9354  063100  044524  043516  052040
 9355  063106  020117  042522  042523
 9356  063114  020124  051127  052111
 9357  063122  020105  040507  042524
 9358  063130  053440  052111  020110
 9359  063136  042523  047503  042116
 9360  063144  005015
 9361  063146  047111  042504  020130          .ASCIZ  /INDEX PULSE OF WRITE HEADER/
 9362  063154  052520  051514  020105
 9363  063162  043117  053440  044522
 9364  063170  042524  044040  040505
 9365  063176  042504  000122
 9366  063202  052101  042524  050115  EM236:  .ASCIZ  /ATTEMPTING TO COMPLETE WRITE HEADER IN MAINT MODE/
 9367  063210  044524  043516  052040
 9368  063216  020117  047503  050115
 9369  063224  042514  042524  053440
 9370  063232  044522  042524  044040
 9371  063240  040505  042504  020122
 9372  063246  047111  046440  044501
 9373  063254  052116  046440  042117
 9374  063262  000105
 9375  063264  052101  042524  050115  EM237:  .ASCIZ  /ATTEMPTING TO WRITE GAP OR DATA SYNCH/
 9376  063272  044524  043516  052040
 9377  063300  020117  051127  052111
 9378  063306  020105  040507  020120
 9379  063314  051117  042040  052101
 9380  063322  020101  054523  041516
 9381  063330  000110
 9382  063332  052101  042524  050115  EM238:  .ASCIZ /ATTEMPTING TO WRITE DATA FIELD/
 9383  063340  044524  043516  052040
 9384  063346  020117  051127  052111
 9385  063354  020105  040504  040524
 9386  063362  043040  042511  042114
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 9387  063370      000
 9388  063371      101  052124  046505  EM239:  .ASCIZ  /ATTEMPING TO WRITE SYNCH OF HEADER USING 24 SECTOR FORMAT/
 9389  063376  044520  043516  052040
 9390  063404  020117  051127  052111
 9391  063412  020105  054523  041516
 9392  063420  020110  043117  044040
 9393  063426  040505  042504  020122
 9394  063434  051525  047111  020107
 9395  063442  032062  051440  041505
 9396  063450  047524  020122  047506
 9397  063456  046522  052101      000
 9398  063463      101  052124  046505  EM240:  .ASCIZ  /ATTEMPTING TO WRITE HEADER DATA USING 24 SECTOR FORMAT/
 9399  063470  052120  047111  020107
 9400  063476  047524  053440  044522
 9401  063504  042524  044040  040505
 9402  063512  042504  020122  040504
 9403  063520  040524  052440  044523
 9404  063526  043516  031040  020064
 9405  063534  042523  052103  051117
 9406  063542  043040  051117  040515
 9407  063550  000124
 9408  063552  052101  042524  050115  EM241:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 26 SECTOR)/
 9409  063560  044524  043516  052040
 9410  063566  020117  047506  041522
 9411  063574  020105  047506  046522
 9412  063602  052101  042440  051122
 9413  063610  051117  024040  043103
 9414  063616  052115  036440  031040
 9415  063624  020066  042523  052103
 9416  063632  051117  000051
 9417  063636  052101  042524  050115  EM242:  .ASCIZ  /ATTEMPTING TO FORCE FORMAT ERROR (CFMT = 24 SECTOR)/
 9418  063644  044524  043516  052040
 9419  063652  020117  047506  041522
 9420  063660  020105  047506  046522
 9421  063666  052101  042440  051122
 9422  063674  051117  024040  043103
 9423  063702  052115  036440  031040
 9424  063710  020064  042523  052103
 9425  063716  051117  000051
 9426  063722  052101  042524  050115  EM243:  .ASCIZ  /ATTEMPING TO FORCE CONTROLLER ERROR WITH FAULT BIT IN DRIVE MESS/
 9427  063730  047111  020107  047524
 9428  063736  043040  051117  042503
 9429  063744  041440  047117  051124
 9430  063752  046117  042514  020122
 9431  063760  051105  047522  020122
 9432  063766  044527  044124  043040
 9433  063774  052501  052114  041040
 9434  064002  052111  044440  020116
 9435  064010  051104  053111  020105
 9436  064016  042515  051523      000
 9437  064023      101  052124  046505  EM244:  .ASCIZ  /ATTEMPTING TO CLEAR ERROR/
 9438  064030  052120  047111  020107
 9439  064036  047524  041440  042514
 9440  064044  051101  042440  051122
 9441  064052  051117      000
 9442  064055      103  046517  040515  EM3000: .ASCIZ  /COMMAND AND STATUS REG 1 INCORRECT/
```

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 9443  064062  042116  040440  042116
 9444  064070  051440  040524  052524
 9445  064076  020123  042522  020107
 9446  064104  020061  047111  047503
 9447  064112  051122  041505  000124
 9448  064120  042515  051523  043501  EM3001: .ASCIZ  /MESSAGE A INCORRECT/
 9449  064126  020105  020101  047111
 9450  064134  047503  051122  041505
 9451  064142  000124
 9452  064144  042515  051523  043501  EM3002: .ASCIZ  /MESSAGE B INCORRECT/
 9453  064152  020105  020102  047111
 9454  064160  047503  051122  041505
 9455  064166  000124
 9456  064170  051503  020061  047111  EM3003: .ASCIZ  /CS1 INCORRECT AFTER SENDING DRIVE CLEAR/
 9457  064176  047503  051122  041505
 9458  064204  020124  043101  042524
 9459  064212  020122  042523  042116
 9460  064220  047111  020107  051104
 9461  064226  053111  020105  046103
 9462  064234  040505  000122
 9463  064240  051503  020061  047111  EM3004: .ASCIZ  /CS1 INCORRECT AFTER AFTER DATA SIMULATION/
 9464  064246  047503  051122  041505
 9465  064254  020124  043101  042524
 9466  064262  020122  043101  042524
 9467  064270  020122  040504  040524
 9468  064276  051440  046511  046125
 9469  064304  052101  047511  000116
 9470  064312  040515  047111  020124  EM3005: .ASCII   /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9471  064320  042522  027107  030440
 9472  064326  044440  041516  051117
 9473  064334  042522  052103  042040
 9474  064342  051125  047111  020107
 9475  064350  040504  040524  051440
 9476  064356  046511  046125  052101
 9477  064364  047511     116
 9478  064367     015  040412  052106          .ASCIZ  <15><12>/AFTER SECTOR PULSE·
 9479  064374  051105  051440  041505
 9480  064402  047524  020122  052520
 9481  064410  051514  000105
 9482  064414  040515  047111  020124  EM3006: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9483  064422  042522  027107  030440
 9484  064430  044440  041516  051117
 9485  064436  042522  052103  042040
 9486  064444  051125  047111  020107
 9487  064452  040504  040524  051440
 9488  064460  046511  046125  052101
 9489  064466  047511     116
 9490  064471     015  040412  052106          .ASCIZ  <15><12>/AFTER INDEX PULSE/
 9491  064476  051105  044440  042116
 9492  064504  054105  050040  046125
 9493  064512  042523     000
 9494  064515     115  044501  052116  EM3007: .ASCII  /MAINT REG. 1 INCORRECT DURING DATA SIMULATION/
 9495  064522  051040  043505  020056
 9496  064530  020061  047111  047503
 9497  064536  051122  041505  020124
 9498  064544  052504  044522  043516
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 9499  064552  042040  052101  020101
 9500  064560  044523  052515  040514
 9501  064566  044524  047117
 9502  064572  005015  047516  051440          .ASCIZ  <15><12>/NO SECTOR OR INDEX PULSE SUPPLIED/
 9503  064600  041505  047524  020122
 9504  064606  051117  044440  042116
 9505  064614  054105  050040  046125
 9506  064622  042523  051440  050125
 9507  064630  046120  042511  000104
 9508  064636  052502  020123  042101  EM3008: .ASCIZ  /BUS ADDRESS INCORRECT AFTER SENDING DRIVE CLEAR/
 9509  064644  051104  051505  020123
 9510  064652  047111  047503  051122
 9511  064660  041505  020124  043101
 9512  064666  042524  020122  042523
 9513  064674  042116  047111  020107
 9514  064702  051104  053111  020105
 9515  064710  046103  040505  000122
 9516  064716  047527  042122  041440  EM3009: .ASCIZ  /WORD COUNT INCORRECT AFTER SENDING DRIVE CLEAR/
 9517  064724  052517  052116  044440
 9518  064732  041516  051117  042522
 9519  064740  052103  040440  052106
 9520  064746  051105  051440  047105
 9521  064754  044504  043516  042040
 9522  064762  044522  042526  041440
 9523  064770  042514  051101     000
 9524  064775     103  030523  041440  EM3010: .ASCIZ  /CS1 CHANGED DURING COMMAND EXECUTION/
 9525  065002  040510  043516  042105
 9526  065010  042040  051125  047111
 9527  065016  020107  047503  046515
 9528  065024  047101  020104  054105
 9529  065032  041505  052125  047511
 9530  065040  000116
 9531  065042  052502  020123  042101  EM3011: .ASCIZ  /BUS ADDRESS CHANGED BEFORE INDEX PULSE/
 9532  065050  051104  051505  020123
 9533  065056  044103  047101  042507
 9534  065064  020104  042502  047506
 9535  065072  042522  044440  042116
 9536  065100  054105  050040  046125
 9537  065106  042523     000
 9538  065111     127  051117  020104  EM3012: .ASCIZ  /WORD COUNT CHANGED BEFORE INDEX PULSE/
 9539  065116  047503  047125  020124
 9540  065124  044103  047101  042507
 9541  065132  020104  042502  047506
 9542  065140  042522  044440  042116
 9543  065146  054105  050040  046125
 9544  065154  042523     000
 9545  065157     103  030523  041440  EM3013: .ASCIZ  /CS1 CHANGE AFTER INDEX PULSE/
 9546  065164  040510  043516  020105
 9547  065172  043101  042524  020122
 9548  065200  047111  042504  020130
 9549  065206  052520  051514  000105
 9550  065214  040515  047111  020124  EM3014: .ASCIZ  /MAINT REG 1 INCORRECT BEFORE INDEX PULSE/
 9551  065222  042522  020107  020061
 9552  065230  047111  047503  051122
 9553  065236  041505  020124  042502
 9554  065244  047506  042522  044440
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 9555  065252  042116  054105  050040
 9556  065260  046125  042523     000
 9557  065265     102  051525  040440  EM3015: .ASCIZ  /BUS ADDRESS CHANGED AFTER INDEX PULSE/
 9558  065272  042104  042522  051523
 9559  065300  041440  040510  043516
 9560  065306  042105  040440  052106
 9561  065314  051105  044440  042116
 9562  065322  054105  050040  046125
 9563  065330  042523     000
 9564  065333     127  051117  020104  EM3016: .ASCIZ  /WORD COUNT CHANGED AFTER INDEX PULSE/
 9565  065340  047503  047125  020124
 9566  065346  044103  047101  042507
 9567  065354  020104  043101  042524
 9568  065362  020122  047111  042504
 9569  065370  020130  052520  051514
 9570  065376  000105
 9571  065400  047503  046515  047101  EM3018: .ASCIZ  /COMMAND AND STATUS REG. 2 INCORRECT/
 9572  065406  020104  047101  020104
 9573  065414  052123  052101  051525
 9574  065422  051040  043505  020056
 9575  065430  020062  047111  047503
 9576  065436  051122  041505  000124
 9577  065444  052502  020123  042101  EM3019: .ASCIZ  /BUS ADD REG INCORRECT/
 9578  065452  020104  042522  020107
 9579  065460  047111  047503  051122
 9580  065466  041505  000124
 9581  065472  047527  042122  041440  EM3020: .ASCIZ  /WORD COUNT REG INCORRECT/
 9582  065500  052517  052116  051040
 9583  065506  043505  044440  041516
 9584  065514  051117  042522  052103
 9585  065522     000
 9586  065523     104  052101  020101  EM3021: .ASCIZ  /DATA READ INCORRECT/
 9587  065530  042522  042101  044440
 9588  065536  041516  051117  042522
 9589  065544  052103     000
 9590  065547     103  020523  044440  EM3022: .ASCIZ  /CS1 INCORRECT AFTER READING DATA BUFFER/
 9591  065554  041516  051117  042522
 9592  065562  052103  040440  052106
 9593  065570  051105  051040  040505
 9594  065576  044504  043516  042040
 9595  065604  052101  020101  052502
 9596  065612  043106  051105     000
 9597  065617     103  031123  044440  EM3023: .ASCIZ  /CS2 INCORRECT AFTER READING DATA BUFFER/
 9598  065624  041516  051117  042522
 9599  065632  052103  040440  052106
 9600  065640  051105  051040  040505
 9601  065646  044504  043516  042040
 9602  065654  052101  020101  052502
 9603  065662  043106  051105     000
 9604  065667     105  051122  051117  EM3024: .ASCIZ  /ERROR REG INCORRECT/
 9605  065674  051040  043505  044440
 9606  065702  041516  051117  042522
 9607  065710  052103     000
 9608  065713     115  044501  052116  EM3025: .ASCIZ  /MAINT REG 1 INCORRECT AFTER INDEX PULSE/
 9609  065720  051040  043505  030440
 9610  065726  044440  041516  051117
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 9611  065734  042522  052103  040440
 9612  065742  052106  051105  044440
 9613  065750  042116  054105  050040
 9614  065756  046125  042523     000
 9615  065763     103  030523  044440  EM3026: .ASCIZ  /CS1 INCORRECT AFTER COMMAND COMPLETION/
 9616  065770  041516  051117  042522
 9617  065776  052103  040440  052106
 9618  066004  051105  041440  046517
 9619  066012  040515  042116  041440
 9620  066020  046517  046120  052105
 9621  066026  047511  000116
 9622  066032  051503  020062  047111  EM3027: .ASCIZ  /CS2 INCORRECT AFTER COMMAND COMPLETION/
 9623  066040  047503  051122  041505
 9624  066046  020124  043101  042524
 9625  066054  020122  047503  046515
 9626  066062  047101  020104  047503
 9627  066070  050115  042514  044524
 9628  066076  047117     000
 9629  066101     103  030523  044440  EM3028: .ASCIZ  /CS1 INCORRECT AFTER READING EMPTY SILO/
 9630  066106  041516  051117  042522
 9631  066114  052103  040440  052106
 9632  066122  051105  051040  040505
 9633  066130  044504  043516  042440
 9634  066136  050115  054524  051440
 9635  066144  046111  000117
 9636  066150  051503  020062  047111  EM3029: .ASCIZ  /CS2 INCORRECT AFTER READING EMPTY SILO/
 9637  066156  047503  051122  041505
 9638  066164  020124  043101  042524
 9639  066172  020122  042522  042101
 9640  066200  047111  020107  046505
 9641  066206  052120  020131  044523
 9642  066214  047514     000
 9643  066217     115  044501  052116  EM3030: .ASCIZ  /MAINT REG 1 INCORRECT/
 9644  066224  051040  043505  030440
 9645  066232  044440  041516  051117
 9646  066240  042522  052103     000
 9647  066245     104  044522  042526  EM3031: .ASCIZ  /DRIVE STATUS REG INCORRECT/
 9648  066252  051440  040524  052524
 9649  066260  020123  042522  020107
 9650  066266  047111  047503  051122
 9651  066274  041505  000124
 9652  066300  051105  047522  020122  EM3032: .ASCIZ  /ERROR REG INCORRECT/
 9653  066306  042522  020107  047111
 9654  066314  047503  051122  041505
 9655  066322  000124
 9656  066324  051115  020061  047111  EMW1:   .ASCIZ  /MR1 INCORRECT ON 1ST UPWARD TRANSISTION OF MAINT CLOCK/
 9657  066332  047503  051122  041505
 9658  066340  020124  047117  030440
 9659  066346  052123  052440  053520
 9660  066354  051101  020104  051124
 9661  066362  047101  044523  052123
 9662  066370  047511  020116  043117
 9663  066376  046440  044501  052116
 9664  066404  041440  047514  045503
 9665  066412     000
 9666  066413     115  030522  044440  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSISTION OF MAINT CLOCK/
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 9667  066420  041516  051117  042522
 9668  066426  052103  047440  020116
 9669  066434  051461  020124  047504
 9670  066442  047127  040527  042122
 9671  066450  052040  040522  051516
 9672  066456  051511  044524  047117
 9673  066464  047440  020106  040515
 9674  066472  047111  020124  046103
 9675  066500  041517  000113
 9676  066504  051115  020061  047111  EMW3:   .ASCIZ  /MR1 INCORRECT ON 2ND UPWARD TRANSISTION OF MAINT CLOCK/
 9677  066512  047503  051122  041505
 9678  066520  020124  047117  031040
 9679  066526  042116  052440  053520
 9680  066534  051101  020104  051124
 9681  066542  047101  044523  052123
 9682  066550  047511  020116  043117
 9683  066556  046440  044501  052116
 9684  066564  041440  047514  045503
 9685  066572     000
 9686  066573     115  030522  044440  EMW4:   .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSISTION OF MAINT CLOCK/
 9687  066600  041516  051117  042522
 9688  066606  052103  047440  020116
 9689  066614  047062  020104  047504
 9690  066622  047127  040527  042122
 9691  066630  052040  040522  051516
 9692  066636  051511  044524  047117
 9693  066644  047440  020106  040515
 9694  066652  047111  020124  046103
 9695  066660  041517  000113
```

```
                        .SBTTL  DATA PATTERNS

                        .EVEN
                PATTERN: .WORD  000000
                         .WORD  177777
                         .WORD  125252
                         .WORD  052515
                         .WORD  101706
                         .WORD  060422
                         .WORD  130715
                HEAD1:   .WORD  177777
                         .WORD  000000
                         .WORD  177777
                HEAD2:   .WORD  000000
                         .WORD  177777
                         .WORD  000000
                HEAD3:   .WORD  125252
                         .WORD  052525
                         .WORD  125252
                         .WORD  052525
                         .WORD  125252
                         .WORD  052525
                HEAD4:   .WORD  044444
                         .WORD  022222
                         .WORD  111111
                HEAD5:   .WORD  052012
                         .WORD  100520
                         .WORD  052012
                HEAD6:   .WORD  155555
                         .WORD  066666
                         .WORD  155555
                HEAD7:   .WORD  104210
                         .WORD  104210
                         .WORD  104210
                NPRBUF:  .BYTE  100,100
                         .BYTE  101,101
                         .BYTE  102,102
                         .BYTE  103,103
                         .BYTE  104,104
                         .BYTE  105,105
                         .BYTE  106,106
                         .BYTE  107,107
                         .BYTE  110,110
                         .BYTE  111,111
                         .BYTE  112,112
                         .BYTE  113,113
                         .BYTE  114,114
                         .BYTE  115,115
                         .BYTE  116,116
                         .BYTE  117,117
                         .BYTE  120,120
                         .BYTE  121,121
                         .BYTE  122,122
                         .BYTE  123,123
                         .BYTE  124,124
                         .BYTE  125,125
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 9752  067036      126     126                .BYTE   126,126
 9753  067040      127     127                .BYTE   127,127
 9754  067042      130     130                .BYTE   130,130
 9755  067044      131     131                .BYTE   131,131
 9756  067046      132     132                .BYTE   132,132
 9757  067050      133     133                .BYTE   133,133
 9758  067052      134     134                .BYTE   134,134
 9759  067054      135     135                .BYTE   135,135
 9760  067056      136     136                .BYTE   136,136
 9761  067060      137     137                .BYTE   137,137
 9762  067062      140     140                .BYTE   140,140
 9763  067064      141     141                .BYTE   141,141
 9764  067066      142     142                .BYTE   142,142
 9765  067070      143     143                .BYTE   143,143
 9766  067072      144     144                .BYTE   144,144
 9767  067074      145     145                .BYTE   145,145
 9768  067076      146     146                .BYTE   146,146
 9769  067100      147     147                .BYTE   147,147
 9770  067102      150     150                .BYTE   150,150
 9771  067104      151     151                .BYTE   151,151
 9772  067106      152     152                .BYTE   152,152
 9773  067110      153     153                .BYTE   153,153
 9774  067112      154     154                .BYTE   154,154
 9775  067114      155     155                .BYTE   155,155
 9776  067116      156     156                .BYTE   156,156
 9777  067120      157     157                .BYTE   157,157
 9778  067122      160     160                .BYTE   160,160
 9779  067124      161     161                .BYTE   161,161
 9780  067126      162     162                .BYTE   162,162
 9781  067130      163     163                .BYTE   163,163
 9782  067132      164     164                .BYTE   164,164
 9783  067134      165     165                .BYTE   165,165
 9784  067136      166     166                .BYTE   166,166
 9785  067140      167     167                .BYTE   167,167
 9786  067142      170     170                .BYTE   170,170
 9787  067144      171     171                .BYTE   171,171
 9788  067146      172     172                .BYTE   172,172
 9789  067150      173     173                .BYTE   173,173
 9790  067152      174     174                .BYTE   174,174
 9791  067154      175     175                .BYTE   175,175
 9792  067156      176     176                .BYTE   176,176
 9793  067160      177     177                .BYTE   177,177
 9794  067162      200     200                .BYTE   200,200
 9795  067164      201     201                .BYTE   201,201
 9796  067166      202     202                .BYTE   202,202
 9797  067170      203     203                .BYTE   203,203
 9798  067172      204     204                .BYTE   204,204
 9799  067174      205     205                .BYTE   205,205
 9800  067176      206     206                .BYTE   206,206
 9801  067200      207     207                .BYTE   207,207
 9802  067202      210     210                .BYTE   210,210
 9803  067204  000102              WRBUFF: .BLKW   66.
 9804          067220              BADPAR= WRBUFF+14
 9805          000001              .END
```

```
ABASE = 177440          1042#   1280    1321
ABORT   054647          7800    8773#
ACDW1 = 000000          1280    1323
ACDW2 = 000000          1280    1324
ACLO  = 000010          1137#
ACPUOP= 000000          1280    1295
ADDW0 = 000000          1280
ADDW1 = 000000          1280
ADDW10= 000000          1280
ADDW11= 000000          1280
ADDW12= 000000          1280
ADDW13= 000000          1280
ADDW14= 000000          1280
ADDW15= 000000          1280
ADDW2 = 000000          1280
ADDW3 = 000000          1280
ADDW4 = 000000          1280
ADDW5 = 000000          1280
ADDW6 = 000000          1280
ADDW7 = 000000          1280
ADDW8 = 000000          1280
ADDW9 = 000000          1280
ADEVCT= 000000          1280    1286
ADEVM = 000000          1280    1322
AENV  = 000000          1280    1291
AENVM = 000000          1280    1292
AFATAL= 000000          1280    1283
AMADR1= 000000          1280    1308
AMADR2= 000000          1280    1312
AMADR3= 000000          1280    1315
AMADR4= 000000          1280    1318
AMAMS1= 000000          1280    1302
AMAMS2= 000000          1280    1310
AMAMS3= 000000          1280    1313
AMAMS4= 000000          1280    1316
AMSGAD= 000000          1280    1288
AMSGLG= 000000          1280    1289
AMSGTY= 000000          1280    1282
AMTYP1= 000000          1280    1303
AMTYP2= 000000          1280    1311
AMTYP3= 000000          1280    1314
AMTYP4= 000000          1280    1317
APASS = 000000          1280    1285
APRIOR= 000005          1041#   1280
APTCSU= 000040          7677#   7855
APTENV= 000001          7633    7675#   7709    7848
APTSIZ= 000200          2312    7674#
APTSPO= 000100          7635    7676#   7850
ASWREG= 000000          1280    1293
ATESTN= 000000          1280    1284
AUNIT = 000000          1280    1287
AUSWR = 000000          1280    1294
AVECT1= 120210          1040#   1280    1319
AVECT2= 000000          1280    1320
BADPAR= 067220          4252    4253    4318    4319    4391#   4546    4547    4623#   7209#   7225#   9804#
BA:   = 000020          1100#   3540    3555    3585    3614    3627
```

DZR6CA.P11 05-OCT-76 10:06 CROSS REFERENCE TABLE -- USER SYMBOLS

```
BA16  = 000400  1085#  3658  3659  3758  3759  3820  3984  4084  4085  4146
BA17  = 001000  1086#  3658  3659  3921  3922  3983  4084  4085  4146  4147
BITCNT  003622  2250#  2618*  2630*  2643*  2654*  2711*  2724*  2736*  2785*  2798*  2810*  2877*  2934*
                4686*  4687*  4796*  4797*  4906*  4907*  5016*  5017*  5126*  5127*  5235*  5236*  5316*
                5329*  5330  5404*  5405*  5507*  5510*  5583*  5586*  5592*  5609*  5621*  5703*  5706*
                5712*  5729*  5741*  5822*  5825*  5831*  5848*  5860*  5941*  5944*  5950*  5967*  5979*
                6060*  6063*  6069*  6086*  6098*  6179*  6182*  6188*  6205*  6217*  6298*  6301*  6307*
                6324*  6336*  6426*  6429*  6435*  6451*  6463*  6551*  6554*  6560*  6576*  6595*  6603*
                6610*  6617*  6697*  6700*  6706*  6722*  6741*  6749*  6756*  6763*  6847*  6850*  6856*
                6872*  6884*  8489  8495  8521  8523  8526
BIT0  = 000001  986#  1082  1115  1134
BIT00 = 000001  976#  986
BIT01 = 000002  975#  985
BIT02 = 000004  974#  984
BIT03 = 000010  973#  983
BIT04 = 000020  972#  982
BIT05 = 000040  971#  981
BIT06 = 000100  970#  980
BIT07 = 000200  969#  979
BIT08 = 000400  968#  978  7524
BIT09 = 001000  967#  977  7542  7720
BIT1  = 000002  985#  1116
BIT10 = 002000  966#  1087  1106  1125  1158  1173  7697
BIT11 = 004000  965#  1088  1107  1126  1143  1159  1174  7549
BIT12 = 010000  964#  1090  1108  1127  1160
BIT13 = 020000  963#  1091  1109  1128  1144  1161  7704
BIT14 = 040000  962#  1092  1110  1129  1145  1162  7510
BIT15 = 100000  961#  1093  1094  1111  1130  1146  1163
BIT2  = 000004  984#  1117  1136
BIT3  = 000010  983#  1099  1118  1137
BIT4  = 000020  982#  1100  1119  1138  1152  1167
BIT5  = 000040  981#  1101  1120  1139  1153  1168
BIT6  = 000100  980#  1083  1102  1121  1140  1154  1169
BIT7  = 000200  979#  1084  1103  1122  1141  1155  1170
BIT8  = 000400  978#  1085  1104  1123  1142  1156  1171
BIT9  = 001000  977#  1086  1105  1124  1157  1172
BPTVEC= 000014  993#
BSE   = 000200  1122#
CCLR  = 100000  1094#  2417  2438  2462  2483  2505  2526  2549  2570  2597  2612  2627  2640
                2652  2662  2686  2701  2721  2733  2743  2767  2782  2795  2807  2817  2843
                2996  3025  3115  3231  3360  3534  3652  3703  3755  3814  3876  3918  3977
                4039  4081  4140  4202  4248  4298  4314  4390  4407  4542  4624  4650  4689
                4760  4799  4870  4909  4980  5019  5090  5129  5199  5238  5302  5343  5366
                5407  5473  5549  5669  5788  5907  6026  6145  6264  6390  6515  6661  6811
                6969  7046  7125  7812
CDT   = 002000  1087#  2422  2432  2467  2477  2510  2520  2554  2564
CERR  = 100000  1093#  3658  4254  4369  5335  6948  7025  7104
CFMT  = 010000  1090#  2422  2432  2467  2477  2510  2520  2554  2564  4413  4414  4548  4549
                5201  5219  5253  6816  6908  7009  7025
CKSWR = 104407  7509  7693  7719  8474#
CLEAR = 000005  1067#
COE   = 001000  1124#
CR    = 000015  901#  7894  7904
CRLF  = 000200  902#  2337  7865  7904
CTC   = 004000  1088#
CTRHLT  050202  7811#  8090  8173
```

DZR6CA.P11 05-OCT-76 10:06 CROSS REFERENCE TABLE -- USER SYMBOLS

```
DCK    = 100000          1130*   5336
DDISP  = 177570           908*   1253    2300
DDT    = 000400          1142*
DF000    053574          1962    8544*
DF001    053600          1347    1353    1359    1365    1371    1377    1383    1389    1395    1401    1407    1413    8546*
DF015    053624          1419    1425    2083    8556*
DF017    053650          1431    1437    1443    8566*
DF022    053674          1449    1455    1461    1473    1479    1485    8576*
DF025    053720          1467    8586*
DF031    053744          1491    1497    1503    1509    8596*
DF035    053770          1515    1521    1527    1533    1557    1563    1569    1575    1581    1587    1593    1599    1623
                         1629    1635    1641    1647    1653    1659    1665    1731    1737    1743    1749    1785    1791
                         1797    1803    1827    1833    1839    1845    1851    1857    1863    1869    1893    1899    1905
                         1911    1918    1925    1932    1939    8606*
DF041    054014          1539    1755    1945    8616*
DF042    054040          1545    1551    1875    1974    1980    2010    2016    8626*
DF054    054064          1605    1671    1998    2034    8636*
DF055    054110          1611    1617    1677    1683    1881    1887    1986    1992    2022    2028    8646*
DF072    054134          1689    1695    1701    1707    1713    1761    1767    1773    1779    1809    8656*
DF077    054170          1719    1725    1815    1821    1951    1957    8670*
DF150    054214          1968    2004    8680*
DF164    054240          2040    2046    2052    2058    8690*
DF170    054264          2063    8700*
DF171    054310          2068    2073    2078    8710*
DF175    054334          2089    2095    2101    2107    2113    2119    2125    2131    2137    2143    2149    2155    8720*
DF211    054360          2161    2167    2173    2179    8730*
DH000A   054760          8548    8558    8568    8578    8588    8598    8608    8618    8628    8638    8648    8658    8672
                         8682    8692    8702    8712    8722    8732    8798*
DH000B   054776          8550    8560    8570    8580    8590    8600    8610    8620    8630    8640    8650    8660    8674
                         8684    8694    8704    8714    8724    8734    8791*
DH000C   055011          1960    8793*
DH001A   055042          8552    8798*
DH001B   055121          8554    8806*
DH015A   055200          8562    8814*
DH015B   055217          8564    8817*
DH017A   055235          8572    8820*
DH017B   055301          8574    8827*
DH022A   055347          8582    8834*
DH022B   055426          8584    8842*
DH025A   055503          8592    8850*
DH025B   055527          8594    8854*
DH031A   055555          8602    8858*
DH031B   055654          8604    8869*
DH035A   055752          8612    8880*
DH035B   056051          8614    8891*
DH041A   056146          8622    8902*
DH041B   056163          8624    8905*
DH042A   056200          8632    8908*
DH042B   056237          8634    8914*
DH054A   056275          8642    8920*
DH054B   056322          8644    8924*
DH055A   056350          8652    8928*
DH055B   056415          8654    8935*
DH072A   056463          8662    8676    8942*
DH072B   056522          8664    8678    8948*
DH072C   056560          8666    8953*
```

DZR6CA.P11 05-OCT-76 10:06 CROSS REFERENCE TABLE -- USER SYMBOLS

```
DH0720  056637          8668    8961#
DH150A  056714          8686    8969#
DH150B  056750          8689    8974#
DH164A  057006          8696    8979#
DH164B  057052          8698    8985#
DH170A  057120          8706    8992#
DH170B  057217          8708    9003#
DH171A  057315          8716    9014#
DH171B  057334          8718    9017#
DH175A  057352          8726    8736    9020#
DH175B  057451          8728    8738    9031#
DH211A  057546          8740    9042#
DH211B  057574          8742    9046#
DI    = 040000          1092#
DISPLA  001142          1253#   2300*   2308*   7564*   7696*
DISPRE  000174          1182#   2308
DLT   = 100000          1111#
DMC   = 000040          1153#   2418    2425    2426    2463    2470    2471    2506    2513    2514    2550    2557    2558
                        2598    2599    2600    2603    2604    2615    2616    2617    2633    2687    2688    2689    2692
                        2693    2704    2706    2707    2710    2712    2768    2769    2770    2773    2774    2786    2844
                        2845    2846    2851    2852    2876    2879    2880    2881    2882    2910    2911    2912    2915
                        2936    2937    2938    2939    2966    2968    2969    2972    2975    2976    2983    3027    3036
                        3037    3041    3042    3043    3046    3048    3049    3116    3125    3126    3130    3131    3132
                        3135    3138    3139    3168    3169    3232    3240    3241    3245    3246    3247    3250    3253
                        3254    3288    3289    3361    3369    3370    3374    3375    3376    3379    3382    3383    3421
                        3422    3459    3460    3535    3544    3545    3549    3550    3551    3554    3557    3558    3590
                        3591    3653    3662    3663    3667    3668    3669    3672    3674    3675    3756    3761    3762
                        3766    3767    3768    3771    3773    3774    3815    3823    3824    3828    3829    3830    3833
                        3836    3837    3919    3924    3925    3929    3930    3931    3934    3936    3937    3978    3986
                        3987    3991    3992    3993    3996    3999    4000    4082    4087    4088    4092    4093    4094
                        4097    4099    4100    4141    4149    4150    4154    4155    4156    4159    4162    4163    4249
                        4257    4258    4262    4263    4264    4267    4269    4270    4315    4323    4324    4328    4329
                        4330    4333    4335    4336    4360    4361    4408    4417    4418    4422    4423    4424    4427
                        4431    4432    4464    4465    4543    4552    4553    4557    4558    4559    4562    4565    4566
                        4589    4590    4651    4654    4655    4658    4659    4761    4764    4765    4768    4769    4871
                        4874    4875    4878    4879    4981    4984    4985    4988    4989    5091    5094    5095    5098
                        5099    5200    5203    5204    5207    5208    5303    5306    5307    5310    5311    5367    5370
                        5371    5374    5375    5376    5377    5474    5475    5476    5482    5483    5487    5488    5489
                        5492    5493    5496    5497    5515    5522    5550    5556    5557    5561    5562    5563    5566
                        5568    5569    5572    5573    5576    5624    5626    5627    5630    5632    5637    5638    5670
                        5676    5677    5681    5682    5683    5686    5688    5689    5692    5693    5696    5744    5746
                        5747    5750    5752    5757    5758    5789    5795    5796    5800    5801    5802    5805    5807
                        5808    5811    5812    5815    5863    5865    5866    5869    5871    5876    5877    5908    5914
                        5915    5919    5920    5921    5924    5926    5927    5930    5931    5934    5982    5984    5985
                        5988    5990    5995    5996    6027    6033    6034    6038    6039    6040    6043    6045    6046
                        6049    6050    6053    6101    6103    6104    6107    6109    6114    6115    6146    6152    6153
                        6157    6158    6159    6162    6164    6165    6168    6169    6172    6220    6222    6223    6226
                        6228    6233    6234    6265    6271    6272    6276    6277    6278    6281    6283    6284    6287
                        6288    6291    6339    6341    6342    6345    6347    6352    6353    6391    6398    6399    6403
                        6404    6405    6409    6412    6413    6416    6417    6419    6469    6471    6472    6475    6477
                        6482    6483    6516    6523    6524    6528    6529    6530    6533    6535    6536    6541    6542
                        6544    6625    6627    6628    6631    6633    6639    6640    6662    6669    6670    6674    6675
                        6676    6679    6681    6682    6687    6688    6690    6771    6773    6774    6777    6779    6785
                        6786    6812    6819    6820    6824    6825    6826    6830    6833    6834    6837    6838    6840
                        6890    6892    6893    6896    6898    6903    6904    6930    6934    6935    7007    7011    7012
                        7084    7090    7091    7255    7285    7299    7314    7340    7352    7364    7389    7392    7393
```

```
                        7394    7395    7398    7399    7400    7401
DRA     = 000001        1134#   6950    7027    7106
DRDY    = 000200        1141#
DROT    = 000040        1139#
DRPAR   = 000010        1118#   7028
DRVMSK= 000007          1098#
DSC     = 040000        1145#
DSWR    = 177570         907#   1252    2299
DTE     = 010000        1127#
DTYE    = 000040        1120#
DT000   053132          1961    8483#
DT001   053136          1346    1352    1358    1364    1370    1376    1382    1388    1394    1400    1406    1412    8484#
DT015   053156          1418    1424    2082    8487#
DT017   053166          1430    1436    1442    8489#
DT022   053204          1448    1454    1460    1472    1478    1484    8492#
DT025   053224          1466    8495#
DT031   053236          1490    1496    1502    1508    8497#
DT035   053262          1514    1520    1526    1532    1556    1562    1568    1574    1580    1586    1592    1598    1622
                        1628    1634    1640    1646    1652    1658    1664    1730    1736    1742    1748    1784    1790
                        1796    1802    1826    1832    1838    1844    1850    1856    1862    1868    1892    1898    1904
                        1910    1917    1924    1931    1938    8501#
DT041   053306          1538    1754    1944    8505#
DT042   053316          1544    1550    1874    1973    1979    2009    2015    8507#
DT054   053332          1604    1670    1997    2033    8509#
DT055   053344          1610    1616    1676    1682    1880    1886    1985    1991    2021    2027    8511#
DT072   053362          1698    1694    1700    1706    1712    1760    1766    1772    1778    1808    8514#
DT077   053412          1718    1724    1814    1820    1950    1956    8519#
DT150   053426          1967    2003    8521#
DT164   053442          2039    2045    2051    2057    8523#
DT170   053460          2062    8526#
DT171   053504          2067    2072    2077    8530#
DT175   053514          2088    2094    2100    2106    2112    2118    2124    2130    2136    2142    2148    2154    8532#
DT211   053540          2160    2166    2172    2178    8536#
ECCW    = 020000        1161#   2617    2633    2712    2786    2876    2983    5493    5576    5632    5696    5752    5815
                        5871    5934    5990    6053    6109    6172    6228    6291    6347    6419    6477    6544    5607
                        6613    6633    6690    6753    6759    6779    6840    6898
ECH     = 000100        1121#
EMTVEC= 000030           996#   2283#   2284#
EMW     003170          2060#   5506#   5575#   5593#   5695#   5713#   5814#   5832#   5933#   5951#   6052#   6070#   6171#
                        6189#   6290#   6308#   6418#   6436#   6543#   6561#   6581#   6594#   6689#   6707#   6727#   6740#
                        6839#   6857#   7260#   7290#   7304#   7319#   7345#   7357#   7369#
EMW1    066324          7260    9656#
EMW2    066413          7290    7345    9666#
EMW3    066504          7304    7357    9676#
EMW4    066573          7319    7369    9686#
EM000   057631          1959    9053#
EM200   057676          1344    1350    1356    9060#
EM201   057760          1362    1368    1374    9069#
EM202   060043          1380    1386    1392    9078#
EM203   060134          1398    1404    1410    9088#
EM204   060226          1416    1422    1428    1434    1440    9098#
EM205   060314          1446    1452    1458    1464    1470    1476    1482    1488    1494    1500    1506    9107#
EM206   060402          1512    1518    1524    1530    1536    1542    1548    9116#
EM207   060445          1554    1560    1566    1572    1602    1608    1614    9122#
EM208   060474          1578    1584    1590    1596    9126#
EM209   060545          1620    1626    1632    1638    1668    1674    1680    9133#
```

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EM210   060634          1644    1650    1656    1662    9143#
EM211   060750          1686    1692    1698    1704    1710    9156#
EM212   061020          1716    1722    9163#
EM213   061070          1728    1734    1740    1746    1752    9170#
EM214   061140          1758    1764    1770    1776    1806    9177#
EM215   061210          1782    1788    1794    1800    9184#
EM216   061274          1812    1818    9193#
EM217   061344          1824    1830    1836    1842    1872    1878    1884    9200#
EM218   061377          1848    1854    1860    1866    9205#
EM219   061457          1890    1896    1902    1908    1942    1948    1954    9214#
EM220   061537          1915    1922    1929    1936    9223#
EM221   061616          1965    9231#
EM222   061673          1971    1977    9239#
EM223   061746          1983    1989    1995    9247#
EM224   062024          2001    9255#
EM225   062121          2007    2013    9266#
EM226   062206          2019    2025    2031    9275#
EM227   062306          2037    2043    2049    2055    9286#
EM230   062414          5506    9299#
EM231   062522          2065    9311#
EM232   062644          2070    9326#
EM233   062766          5575    5695    5814    5933    6052    6171    6290    6418    6543    6689    9341#
EM234   063032          5593    5713    5832    5951    6070    6189    6308    6436    6561    6707    9347#
EM235   063072          2075    9353#
EM236   063202          2080    9366#
EM237   063264          6581    6727    9375#
EM238   063332          6594    6740    9382#
EM239   063371          6839    9388#
EM240   063463          6857    9398#
EM241   063552          2086    2092    2098    2104    9408#
EM242   063636          2110    2116    2122    2128    9417#
EM243   063722          2134    2140    2146    2152    9426#
EM244   064023          2158    2164    2170    2176    9437#
EM3000  064055          1345    1363    1381    1399    1513    1555    1579    1621    1645    1687    1717    1729    1759
                        1783    1813    1825    1849    1891    1916    1966    2002    2038    2081    2087    2111    2135
                        2159    9442#
EM3001  064120          1351    1369    1387    1405    9448#
EM3002  064144          1357    1375    1393    1411    9452#
EM3003  064170          1417    1447    9456#
EM3004  064240          1423    9463#
EM3005  064312          1429    9470#
EM3006  064414          1435    9482#
EM3007  064515          1441    9494#
EM3008  064636          1453    9508#
EM3009  064716          1459    9516#
EM3010  064775          1471    9524#
EM3011  065042          1477    9531#
EM3012  065111          1483    9538#
EM3013  065157          1489    9545#
EM3014  065214          1465    9550#
EM3015  065265          1495    9557#
EM3016  065333          1501    9564#
EM3018  065400          1519    1561    1585    1627    1651    1693    1723    1735    1765    1789    1801    1819    1831
                        1855    1897    1923    2044    2093    2117    2141    2165    9571#
EM3019  065444          1525    1567    1591    1633    1657    1705    1741    1771    1795    1837    1861    1903    1930
                        9577#
```

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EM3020  065472          1531    1573    1597    1639    1663    1711    1747    1777    1843    1867    1909    1937    9581#
EM3021  065523          1537    1603    1669    1753    1873    1943    1996    2032    9586#
EM3022  065547          1543    1609    1675    1879    1949    1984    2020    9590#
EM3023  065617          1549    1615    1681    1885    1955    1990    2026    9597#
EM3024  065667          1699    1807    9604#
EM3025  065713          1507    9608#
EM3026  065763          1972    2008    9615#
EM3027  066032          1978    2014    9622#
EM3028  066101          2050    9629#
EM3029  066150          2056    9636#
EM3030  066217          2066    2071    2076    9643#
EM3031  066245          2099    2123    2147    2171    9647#
EM3032  066300          2105    2129    2153    2177    9652#
ERRCNT  003610          2245#   2316*   7795*   7798
ERRVEC= 000004           989#   2297    2298*   2309*   7223*   7224*   7244*   7245*   7437    7438    7442*   7447*   7459*
                        7464*   7473*   7483*   7484*   7515    7516*   7518*   7521*
E.ASOF  003516          2208#
E.BA    003504          2203#   2859*   2866    2899    2924    2956    2987    3018*   3066    3118*   3145    3151*   3159
                        3182    3233*   3260    3272    3278*   3286*   3302    3362*   3389    3401    3407*   3416*   3435
                        3465*   3478    3489*   3536*   3576    3604    3654*   3697    3785*   3793    3818*   3856    3862*
                        3948*   3956    3981*   4019    4025*   4111*   4119    4144*   4182    4188*   4253*   4289    4319*
                        4353    4372*   4380    4412*   4438    4453    4459*   4468*   4480    4547*   4582    4603    8492
                        8497    8501    8517
E.CS1   003500          2201#   2432*   2435    2477*   2480    2520*   2523    2564*   2567    2608*   2609    2666*   2667
                        2697*   2698    2747*   2748    2778*   2779    2821*   2822    2858*   2861    2894    2919    2951
                        2984    3019*   3060    3080    3110*   3153    3176    3201    3230*   3266    3296    3327    3359*
                        3395    3429    3452    3472    3508    3533*   3570    3598    3628    3658*   3688    3706*   3708
                        3758*   3787    3820*   3850    3921*   3950    3983*   4013    4084*   4113    4146*   4176    4254*
                        4283    4301*   4303    4320*   4347    4369*   4374    4413*   4447    4474    4503    4548*   4576
                        4597    4617    4670*   4682    4704*   4706    4721    4780*   4792    4814*   4816    4831    4890*
                        4902    4924*   4926    4941    5000*   5012    5034*   5036    5051    5110*   5122    5144*   5146
                        5161    5219*   5231    5253*   5255    5270    5314*   5320    5335*   5337    5388*   5400    5422*
                        5424    5439    5642*   5643    5762*   5763    5881*   5882    6000*   6001    6119*   6120    6238*
                        6239    6357*   6358    6487*   6488    6644*   6645    6790*   6791    6908*   6909    6948*   6952
                        6974*   6978    7025*   7029    7051*   7055    7104*   7108    7130*   7134    8484    8487    8492
                        8497    8501    8507    8511    8514    8519    8521    8523    8532    8536
E.CS2   003510          2205#   3059*   3063    3079*   3083    3136*   3156    3179    3200*   3204    3251*   3269    3282*
                        3299    3311*   3326*   3330    3380*   3398    3412*   3432    3441*   3455    3467*   3475    3491*
                        3507*   3511    3555*   3573    3585*   3601    3614*   3627*   3631    3684*   3687*   3691    3707*
                        3711    3784*   3790    3849*   3853    3947*   3953    4012*   4016    4110*   4116    4175*   4179
                        4281*   4286    4302*   4306    4346*   4350    4370*   4377    4428*   4446*   4450    4477    4487*
                        4502*   4506    4563*   4579    4600    4616*   4620    4705*   4709    4720*   4726    4815*   4819
                        4830*   4836    4925*   4929    4940*   4946    5035*   5039    5050*   5056    5145*   5149    5160*
                        5166    5254*   5258    5269*   5275    5315*   5325    5336*   5340    5423*   5427    5438*   5444
                        6949*   6955    6975*   6981    7026*   7032    7052*   7058    7105*   7111    7131*   7137    8501
                        8507    8511    8514    8519    8523    8532    8536
E.DA    003506          2204#
E.DB    003522          2210#   3073*   3074    3192*   3193    3313*   3314    3443*   3444    3494*   3495    3611*   3615
                        3800*   3801    3869*   3870    3963*   3964    4032*   4033    4126*   4127    4195*   4196    4491*
                        4492    4610*   4611    4714*   4731    4824*   4841    4934*   4951    5044*   5061    5154*   5171
                        5263*   5280    5432*   5449    8505    8509
E.DCYL  003520          2209#
E.DS    003512          2206#   6950*   6958    6976*   6984    7027*   7035    7053*   7061    7106*   7114    7132*   7140
                        8532    8536
E.ECPS  003532          2214#
E.ECP*  003534          2215#
```

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E.ER    003514          2207* 3683* 3694  4282* 4295  4373* 4386  6951* 6961  6977* 6987  7028* 7038
                        7054* 7064  7107* 7117  7133* 7143  8514  8532  8536
E.MR1   003524          2211* 2617* 2624  2633* 2637  2645  2659  2712* 2718  2730  2741  2786* 2792
                        2804  2815  2876* 2884  2941  2983* 2993  5493* 5513* 5514* 5517  5520* 5521*
                        5524  5576* 5632* 5633  5696* 5752* 5753  5815* 5871* 5872  5934* 5990* 5991
                        6053* 6109* 6110  6172* 6228* 6229  6291* 6347* 6348  6419* 6477* 6478  6544*
                        6607* 6613* 6633* 6634  6690* 6753* 6759* 6779* 6780  6840* 6898* 6899  7254*
                        7257  7268* 7269* 7274* 7279* 7284* 7287  7298* 7301  7312* 7313* 7316  7333*
                        7336* 7339* 7342  7351* 7354  7363* 7366  8489  8495  8497  8526  8530
E.MR2   003526          2212* 2433* 2440  2478* 2485  2521* 2528  2565* 2572  8484
E.MR3   003530          2213* 2434* 2443  2479* 2488  2522* 2531  2566* 2575  8484
E.SPAR  003536          2216*
E.WC    003502          2202* 2860* 2871  2904  2929  2961  2990  3020* 3069  3119* 3120* 3121  3152*
                        3162  3165  3185  3235* 3275  3279* 3285* 3305  3364* 3404  3408* 3409  3415*
                        3438  3466* 3481  3490* 3538* 3564  3579  3582* 3588* 3607  3656* 3700  3786*
                        3796  3816* 3843  3859  3863* 3949* 3959  3979* 4006  4022  4026* 4112* 4122
                        4142* 4169  4185  4189* 4251* 4292  4317* 4356  4371* 4383  4410* 4444  4456
                        4460* 4469* 4483  4545* 4585  4606  8492  8497  8504  8517
FMTE    = 000020        1119* 6951  7028
GNS     = ****** U      1181  2336  7171  7178  8466  8467  8468  8469  8470  8472  8474  8475  8476
                        8477  8478  8479  8480
GO      = 000001        1082* 3658  4254  4369  4704  4814  4924  5034  5144  5253  5335  5422  5642
                        5762  5881  6000  6119  6238  6357  6487  6644  6790  6908  6948  7025  7104
GTSWR   = 104406        2331  8472*
HEAD1   066702          4669  4713  5218  5262  5387  5431  5551  5594  6392  6393  6813  6814  9706*
HEAD2   066710          4779  4823  5671  5714  9709*
HEAD3   066716          4889  4933  5790  5833  6517  6518  9712*
HEAD4   066732          4999  5043  5909  5952  9718*
HEAD5   066740          5109  5153  6028  6071  9721*
HEAD6   066746          6147  6190  9724*
HEAD7   066754          6266  6309  9727*
HT      = 000011         899* 7863  7904
HVRC    = 000400        1123*
IDAE    = 002000        1125*
IE      = 000100        1083*
ILF     = 000001        1115*
INTR    = 000300        1078*
IOTVEC  = 000020         994* 2281* 2282*
IR      = 000100        1102* 3059  3079  3136  3200  3251  3311  3326  3380  3441  3491  3507  3555
                        3614  3627  3684  3707  3784  3849  3947  4012  4110  4175  4281  4302  4346
                        4370  4428  4487  4502  4563  4616  4705  4720  4815  4830  4925  4940  5035
                        5050  5145  5160  5254  5269  5315  5336  5423  5438  6949  6975  7026  7052
                        7105  7131
KIPAR0  = 172340        1027* 7423  7451
KIPAR1  = 172342        1028*
KIPAR2  = 172344        1029*
KIPAR3  = 172346        1030*
KIPAR4  = 172350        1031*
KIPAR5  = 172352        1032*
KIPAR6  = 172354        1033* 3747* 3805* 3910* 3968* 4073* 4131*
KIPAR7  = 172356        1034* 7467
KIPDR0  = 172300        1016*
KIPDR1  = 172302        1017*
KIPDR2  = 172304        1018*
KIPDR3  = 172306        1019*
KIPDR4  = 172310        1020*
```

DZR6CA.P11 05-OCT-76 10:06 CROSS REFERENCE TABLE -- USER SYMBOLS

```
KIPDR5= 172312          1021#
KIPDR6= 172314          1022#
KIPDR7= 172316          1023#
LF    = 000012           900#  7898  7904
MCLK  = 000400          1156#  2425  2470  2513  2557  2603  2692  2706  2773  2851  2879  2881  2911
                        2936   2938  2968  2975  3036  3042  3048  3125  3131  3138  3168  3240  3246
                        3253   3288  3369  3375  3382  3421  3459  3544  3550  3557  3590  3662  3668
                        3674   3761  3767  3773  3823  3829  3836  3924  3930  3936  3986  3992  3999
                        4087   4093  4099  4149  4155  4162  4257  4263  4269  4323  4329  4335  4360
                        4417   4423  4431  4464  4552  4558  4565  4589  4654  4764  4874  4984  5094
                        5203   5306  5370  5376  5482  5488  5496  5556  5562  5568  5626  5637  5676
                        5682   5688  5746  5757  5795  5801  5807  5865  5876  5914  5920  5926  5984
                        5995   6033  6039  6045  6103  6114  6152  6158  6164  6222  6233  6271  6277
                        6283   6341  6352  6398  6404  6412  6471  6482  6523  6529  6535  6627  6639
                        6669   6675  6681  6773  6785  6819  6825  6833  6892  6903  6934  7011  7090
                        7254   7255  7268  7298  7299  7313  7336  7351  7352  7363  7389  7392  7394
                        7398   7400
MDS   = 001000          1105#
MEMBAS= 172100          1037#  7200  7210  7227
MEMERR  046216          1200   7406#
MEMPAR  003630          2253#  4231  4529  7201  7211  7226*  7233*  7246
MEMVEC= 000114          1036#  1199  7248*  7249*
MERD  = 001000          1157#  7392  7400
MESMSK= 000017          1150#
MEWD  = 002000          1158#  2617  2633  2712  2786  2876  2983  5493  5576  5632  5696  5752  5815
                        5871   5934  5990  6053  6109  6172  6228  6291  6347  6419  6477  6544  6633
                        6690   6779  6840  6898  7254  7269  7274  7298  7312  7363
MIND  = 000200          1155#  2704  2706  2707  2966  2968  2969  3041  3042  3043  3130  3131  3132
                        3245   3246  3247  3374  3375  3376  3549  3550  3551  3667  3668  3669  3766
                        3767   3768  3828  3829  3830  3929  3930  3931  3991  3992  3993  4092  4093
                        4094   4154  4155  4156  4262  4263  4264  4328  4329  4330  4422  4423  4424
                        4557   4558  4559  5487  5488  5489  5561  5562  5563  5624  5626  5627  5681
                        5682   5683  5744  5746  5747  5800  5801  5802  5863  5865  5866  5919  5920
                        5921   5982  5984  5985  6038  6039  6040  6101  6103  6104  6157  6158  6159
                        6220   6222  6223  6276  6277  6278  6339  6341  6342  6403  6404  6405  6469
                        6471   6472  6528  6529  6530  6625  6627  6628  6674  6675  6676  6771  6773
                        6774   6824  6825  6826  6890  6892  6893
MMVEC = 000250          1005#
MSP   = 000100          1154#  2599  2615  2688  2769  2845  2910  2911  2912  4658  4768  4878  4988
                        5098   5207  5310  5374  5475  5514  5515  5520  5572  5692  5811  5930  6049
                        6168   6287  6416  6541  6687  6837
M1.BIT  003616          2248#  2620*  2655*  2714*  2737*  2788*  2811*  4661*  4673*  4697*  4771*  4783*  4807*
                        4881*  4893*  4917*  4991*  5003*  5027*  5101*  5113*  5137*  5210*  5222*  5246*  5313*
                        5379*  5391*  5415*  5503*  5580*  5598   5599*  5615   5616*  5700*  5718   5719*  5735
                        5736*  5819*  5837   5838*  5854   5855*  5938*  5956   5957*  5973   5974*  6057*  6075
                        6076*  6092   6093*  6176*  6194   6195*  6211   6212*  6295*  6313   6314*  6330   6331*
                        6423*  6440   6441*  6457   6458*  6548*  6565   6566*  6583   6584*  6597   6598*  6694*
                        6711   6712*  6729   6730*  6743   6744*  6844*  6861   6862*  6878   6879*  7272   7331
                        7337   7387   8489   8526
M2.BIT  003620          2249#  5504*  5581*  5598*  5615*  5701*  5718*  5735*  5820*  5837*  5854*  5939*  5956*
                        5973*  6058*  6075*  6092*  6177*  6194*  6211*  6296*  6313*  6330*  6424*  6440*  6457*
                        6549*  6565*  6583*  6597*  6695*  6711*  6729*  6743*  6845*  6861*  6878*  7277  7282
                        8526
NED   = 010000          1108#
NEM   = 004000          1107#  3684
NEWPAS  004662          2396#  7194
```

```
NPRBUF  066762          3117    3118    3145    3189    3233    3234    3260    3309    3362    3363    3389    3419    3536
                        3537    3611    3749    3800    3807    3808    3867    3912    3963    3970    3971    4030    4075
                        4126    4133    4134    4193    4411    4412    4438    4486    6663    6664    9730#
NXF     = 000004        1117#
OFFSET= 000015          1071#
OFST    = 000004        1136#
OPI     = 020000        1128#
OPR001  054414          2343    8746#
OPR002  054446          2346    2357    2374    8751#
OPR003  054454          2353    8752#
OPR004  054504          2365    8756#
OPR006  054526          2340    8759#
OPR007  054600          7814    8766#
OR      = 000200        1103#   3059    3136    3251    3282    3311    3380    3412    3441    3467    3491    3555    3595
                        3614    3685    3687    3784    3849    3947    4012    4110    4175    4281    4346    4370    4429
                        4446    4487    4563    4705    4815    4925    5035    5145    5254    5423
PACK    = 000003        1066#
PARCHK  045002          2396    7223#   8427
PARM    003636          1188    2258#
PAR.EN= 000001          1039#   7215    7230
PAT     = 000020        1152#
PATTER  066664          3016    9699#
PCA     = 004000        1159#   7268    7284    7333
PCD     = 010000        1160#   7268    7279    7339
PGE     = 002000        1106#
PIP     = 020000        1144#
PIRQ    = 177772         906#
PIRQVE= 000240          1000#
PR.BIT  003614          2247#   2619#   2646#   2655    2656#   2713#   2727#   2737    2738#   2787#   2801#   2811    2812#
                        4660#   4666#   4673    4676#   4679#   4697    4698#   4770#   4776#   4783    4786#   4789#   4807
                        4808#   4880#   4886#   4893    4896#   4899#   4917    4918#   4990#   4996#   5003    5006#   5009#
                        5027    5028#   5100#   5106    5113    5116#   5119#   5137    5138#   5209#   5215#   5222    5225#
                        5228#   5246    5247#   5312#   5378#   5384#   5391    5394#   5397#   5415    5416#   5502#   5579#
                        5599    5600#   5616    5617#   5699#   5719    5720#   5736    5737#   5818#   5838    5839#   5855
                        5856#   5937#   5957    5958#   5974    5975#   6056#   6076    6077#   6093    6094#   6175#   6195
                        6196#   6212    6213#   6294#   6314    6315#   6331    6332#   6422#   6441    6442#   6459    6459#
                        6547#   6566    6567#   6584    6585#   6598    6599#   6693#   6712    6713#   6730    6731#   6744
                        6745#   6843#   6862    6863#   6879    6880#   7270    7385    8439    8526
PR0     = 000000         923#   2397
PR1     = 000040         924#
PR2     = 000100         925#
PR3     = 000140         926#
PR4     = 000200         927#
PR5     = 000240         928#   2239
PR6     = 000300         929#
PR7     = 000340         930#   1201    2268    7224    8410    8424
PS      = 177776         903#    904
PSW     = 177776         904#
PWRVEC= 000024           995#   2287#   2288#   8409#   8410#   8423#   8424#
P.ASOF  003556          2227#
P.BA    003544          2222#
P.CS1   003540          2220#   6964#   7041#   7120#   8540
P.CS2   003550          2224#   6965#   7042#   7121#   8540
P.DA    003546          2223#
P.DB    003562          2229#
P.DCYL  003560          2228#
```

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P.DS    003552  2225# 6966* 7043* 7122* 8540
P.ECPS  003572  2233#
P.ECPT  003574  2234#
P.ER    003554  2226# 6967* 7044* 7123* 8540
P.MR1   003564  2230#
P.MR2   003566  2231#
P.MR3   003570  2232#
P.SPAR  003576  2235#
P.WC    003542  2221#
P1.BIT  003612  2246# 5501* 5579* 5589* 5600  5603* 5606* 5617  5618* 5698* 5709* 5720  5723*
                5726* 5737  5738* 5817* 5828* 5839  5842* 5945* 5856  5857* 5936* 5947* 5958
                5961* 5964* 5975  5976* 6055* 6066* 6077  6080* 6083* 6094  6095* 6174* 6185*
                6196  6199* 6202* 6213  6214* 6293* 6304* 6315  6318* 6321* 6332  6333* 6421*
                6432* 6442  6445* 6448* 6459  6460* 6546* 6557* 6567  6570* 6573* 6595  6596*
                6591* 6599  6600* 6692* 6703* 6713  6716* 6719* 6731  6732* 6737* 6745  6746*
                6842* 6853* 6863  6866* 6869* 6880  6881* 7275  7329  8526
RDBIT   046106  2622  2635  2647  2657  2716  2728  2739  2790  2802  2813  4663  4667  4680
                4699  4773  4777  4790  4809  4883  4887  4900  4919  4993  4997  5010  5029
                5103  5107  5120  5139  5212  5216  5229  5248  5317  5381  5385  5398  5417
                7385#
RDCHR = 104410  8249  8475#
RDDATA= 000021  1073#
RDGATE= 100000  1163# 2633
RDHEAD= 000025  1075# 2422  2432  2510  2520  2601  2608  2665  2690  2697  2747  2771  2778
                2821  4652  4670  4704  4762  4780  4814  4872  4890  4924  4982  5000  5034
                5092  5110  5144  5201  5219  5253  5304  5314  5335  5368  5388  5422  6932
                6948  7009  7025
RDLIN = 104411  8323  8476#
RDOCT = 104412  2347  2358  2375  8477#
RDY   = 000200  1084# 3658  3706  4254  4301  4369  4704  4814  4924  5034  5144  5253  5335
                5422  5642  5762  5881  6000  6113  6238  6357  6487  6644  6790  6908  6948
                6974  7025  7051  7104  7130
RECAL = 000013  1070#
RESREG= 104414  7794  8479#
RESTRT  003646  1186  2261#
RESVEC= 000010   990#
RKASOF= 000016  1053#
RKBA  = 000004  1048# 2847* 2856  2892  2917  2949  2981  3030* 3053  3117* 3143  3174  3234*
                3258  3294  3363* 3387  3427  3470  3537* 3562  3596  3655* 3680  3778  3819*
                3841  3941  3982* 4004  4104  4145* 4157  4252* 4274  4318* 4340  4366  4411*
                4436  4472  4546* 4570  4595  5477* 5551* 5671* 5790* 5909* 6028* 6147* 6266*
                6392* 6517* 6663* 6813* 7087*
RKCS1 = 000000  1046# 2417* 2422* 2429  2438* 2462* 2467* 2474  2483* 2505* 2510* 2517  2526*
                2549* 2554* 2561  2570* 2597* 2601* 2607  2612* 2627* 2640* 2652* 2662* 2665
                2686* 2687* 2690* 2696  2701* 2721* 2733* 2743* 2746  2767* 2768* 2771* 2777
                2782* 2795* 2807* 2817* 2820  2843* 2849* 2855  2891  2916  2948  2980  2996*
                3025* 3033* 3052  3077  3115* 3122* 3142  3172  3196  3231* 3237* 3257  3292
                3317  3360* 3366* 3386  3425  3447  3468  3498  3534* 3541* 3561  3594  3618
                3652* 3659* 3678  3703* 3704  3755* 3759* 3777  3814* 3821* 3840  3876* 3918*
                3922* 3940  3977* 3984* 4003  4039* 4081* 4085* 4103  4140* 4147* 4166  4202*
                4248* 4255* 4273  4298* 4299  4314* 4321* 4339  4364  4390* 4407* 4414* 4435
                4470  4498  4542* 4549* 4569  4593  4614  4624* 4650* 4652* 4681  4689* 4702
                4716  4760* 4762* 4791  4799* 4812  4826  4870* 4872* 4901  4909* 4922  4936
                4980* 4982* 5011  5019* 5032  5046  5090* 5092* 5121  5129* 5142  5156  5199*
                5201* 5230  5238* 5251  5265  5302* 5304* 5318  5333  5343* 5366* 5368* 5399
                5407* 5420  5434  5473* 5479* 5549* 5553* 5641  5669* 5673* 5761  5798* 5792*
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                    5880   5907*  5911*  5999   6026*  6030*  6118   6145*  6149*  6237   6264*  6268*  6356
                    6390*  6395*  6486   6515*  6520*  6643   6661*  6666*  6789   6811*  6816*  6907   6932*
                    6940   6944   6969*  6970   7009*  7017   7021   7046*  7047   7086*  7096   7100   7125*
                    7126   7812*
RKCS2  = 000010     1050#  2421*  2466*  2509*  2553*  3031*  3059   3078   3150   3173   3197   3265   3293
                    3323   3394   3426   3451   3469   3504   3540*  3569   3595   3624   3679   3705   3733
                    3842   3946   4011   4109   4174   4280   4300   4345   4365   4443   4471   4499   4575
                    4594   4615   4703   4717   4813   4827   4923   4937   5033   5047   5143   5157   5252
                    5266   5319   5334   5421   5435   6929*  6945   6971   7006*  7022   7049   7083*  7101
                    7127
RKDA   = 000006     1049#  2420*  2465*  2508*  2552*  3029*
RKDB   = 000024     1055#  3072   3191   3312   3442   3493   3613   3799   3869   3962   4031   4125   4134
                    4490   4609   4715   4825   4935   5045   5155   5264   5332   5433
RKDCYL = 000020     1054#  2419*  2464*  2507*  2551*  3028*  6931*  7008*  7085*
RKDS   = 000012     1051#  6946   6972   7023   7049   7102   7128
RKECPS = 000030     1059#
RKECPT = 000032     1060#
RKER   = 000014     1052#  3682   4276   4368   6947   6973   7024   7050   7103   7129
RKMR1  = 000026     1056#  2418*  2425*  2426*  2463*  2470*  2471*  2506*  2513*  2514*  2550*  2557*  2558*
                    2598*  2599*  2600*  2603*  2604*  2615*  2616*  2623   2636   2648   2658   2688*  2689*
                    2692*  2693*  2704*  2706*  2707*  2710*  2717   2729   2740   2769*  2770*  2773*  2774*
                    2791   2803   2814   2844*  2845*  2846*  2851*  2852*  2879*  2880*  2881*  2882*  2883
                    2910*  2911*  2912*  2915*  2936*  2937*  2938*  2939*  2940   2966*  2968*  2969*  2972*
                    2975*  2976*  2979   3027*  3036*  3037*  3041*  3042*  3043*  3046*  3048*  3049*  3116*
                    3125*  3126*  3130*  3131*  3132*  3135*  3138*  3139*  3168*  3169*  3232*  3240*  3241*
                    3245*  3246*  3247*  3250*  3253*  3254*  3288*  3289*  3361*  3369*  3370*  3374*  3375*
                    3376*  3379*  3382*  3383*  3421*  3422*  3459*  3460*  3535*  3544*  3545*  3549*  3550*
                    3551*  3554*  3557*  3558*  3590*  3591*  3653*  3662*  3663*  3667*  3668*  3669*  3672*
                    3674*  3675*  3756*  3761*  3762*  3766*  3767*  3768*  3771*  3773*  3774*  3815*  3823*
                    3824*  3828*  3829*  3830*  3833*  3836*  3837*  3919*  3924*  3925*  3929*  3930*  3931*
                    3934*  3936*  3937*  3978*  3986*  3987*  3991*  3992*  3993*  3996*  3999*  4000*  4082*
                    4087*  4088*  4092*  4093*  4094*  4097*  4099*  4100*  4141*  4149*  4150*  4154*  4155*
                    4156*  4159*  4162*  4163*  4249*  4257*  4258*  4262*  4263*  4264*  4267*  4269*  4270*
                    4315*  4323*  4324*  4328*  4329*  4330*  4333*  4335*  4336*  4360*  4361*  4408*  4417*
                    4418*  4422*  4423*  4424*  4427*  4431*  4432*  4464*  4465*  4543*  4552*  4553*  4557*
                    4558*  4559*  4562*  4565*  4566*  4589*  4590*  4651*  4654*  4655*  4658*  4659*  4761*
                    4764*  4765*  4768*  4769*  4871*  4874*  4875*  4978*  4979*  4981*  4994*  4985*  4998*
                    4989*  5091*  5094*  5095*  5098*  5099*  5200*  5203*  5204*  5207*  5208*  5303*  5306*
                    5307*  5310*  5311*  5367*  5370*  5371*  5374*  5375*  5376*  5377*  5474*  5475*  5476*
                    5482*  5483*  5487*  5488*  5489*  5492*  5496*  5497*  5515*  5516   5522*  5523   5550*
                    5556*  5557*  5561*  5562*  5563*  5566*  5568*  5569*  5572*  5573*  5624*  5626*  5627*
                    5630*  5631   5637*  5639*  5670*  5676*  5677*  5681*  5682*  5683*  5686*  5688*  5689*
                    5692*  5693*  5744*  5746*  5747*  5750*  5751   5757*  5758*  5789*  5795*  5796*  5800*
                    5801*  5802*  5805*  5807*  5808*  5811*  5812*  5863*  5865*  5866*  5869*  5870   5876*
                    5877*  5908*  5914*  5915*  5919*  5920*  5921*  5924*  5926*  5927*  5930*  5931*  5982*
                    5984*  5985*  5988*  5989   5995*  5996*  6027*  6033*  6034*  6038*  6039*  6040*  6043*
                    6045*  6046*  6049*  6050*  6101*  6103*  6104*  6107*  6108   6114*  6115*  6146*  6152*
                    6153*  6157*  6158*  6159*  6162*  6164*  6165*  6168*  6169*  6220*  6222*  6223*  6226*
                    6227   6233*  6234*  6265*  6271*  6272*  6276*  6277*  6278*  6281*  6283*  6284*  6287*
                    6288*  6339*  6341*  6342*  6345*  6346   6352*  6353*  6391*  6398*  6399*  6403*  6404*
                    6405*  6409*  6412*  6413*  6416*  6417*  6469*  6471*  6472*  6475*  6476   6482*  6483*
                    6516*  6523*  6524*  6528*  6529*  6530*  6533*  6535*  6536*  6541*  6542*  6625*  6627*
                    6628*  6631*  6632   6639*  6640*  6662*  6669*  6670*  6674*  6675*  6676*  6679*  6681*
                    6682*  6687*  6688*  6771*  6773*  6774*  6777*  6778   6785*  6786*  6912*  6819*  6820*
                    6824*  6825*  6826*  6830*  6833*  6834*  6837*  6838*  6890*  6892*  6893*  6896*  6897
                    6903*  6904*  6930*  6934*  6935*  6938*  7007*  7011*  7012*  7015*  7084*  7090*  7091*
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                          7094*  7255*  7256   7285*  7286   7299*  7300   7314*  7315   7340*  7341   7352*  7353
                          7364*  7365   7369*  7392*  7393*  7394*  7395*  7398*  7399*  7400*  7401*
RKMR2  = 000034           1057#  2430   2475   2518   2562
RKMR3  = 000036           1058#  2431   2476   2519   2563
RKPRI    003602           2239#  2391*
RKSPAR= 000022            1061#
RKVEC    003600           2238#  2389*  2390*
RKWC   = 000002           1047#  2848*  2857   2893   2918   2950   2982   3032*  3054   3121*  3144   3175   3236*
                          3259   3295   3365*  3388   3428   3471   3539*  3563   3597   3657*  3681   3757*  3779
                          3817*  3842   3920*  3942   3980*  4005   4083*  4105   4143*  4168   4250*  4275   4316*
                          4341   4367   4409*  4437   4473   4544*  4571   4596   5478*  5552*  5672*  5791*  5910*
                          6029*  6148*  6267*  6394*  6519*  6665*  6815*  7086*
RLS    = 000010           1099#
SAVREG= 104413            7743   8478#
SAVSWR   003634           2255#  8408*  8428
SCLR   = 000040           1101#  6929   7006   7083
SCOPI  = 104415           3086   3210   3804   3875   3967   4038   4130   4201   4309   4389   8480#
SCOPIS   047226           7615#  8480
SECONT   003626           2252#  5500*  5574*  5694*  5813*  5932*  6051*  6170*  6289*  6408*  6466*  6539*  6620*
                          6685*  6766*  6829*  6887*  8526
SEEK   = 000017           1072#
SELDRV= 000001            1065#
SKI    = 000002           1116#
SPACE2   054644           7777   7789   8772#
SPAR   = 020000           1091#
SPDLSS= 000020            1138#
SRTFLG   003606           2241#  2258*  2261*  2264*  2341
SRTSPL= 000011            1069#
SRC    = 177572           1009#  3748*  3750*  3806*  3809*  3911*  3913*  3969*  3972*  4074*  4076*  4132*  4135*
                          7448   7463*  7470*
SR1    = 177574           1010#
SR2    = 177576           1011#
SR3    = 172516           1012#  7460*
STACK  = 001100            894#  2266   2279   7380   7414   7805   7813   8425
START    003656           1185   2264#
START1   003662           2259   2262   2265#  7823
STKLMT= 177774             905#
SVAL   = 100000           1146#  6950   7027   7106
SWR      001140           1252#  2277   2299*  2301   2307*  2314*  2329   7264   7294   7308   7323   7349   7361
                          7373   7410   7510   7524   7527   7542   7549   7615   7697   7704   7716   7720   7796
                          8093   8132   8187*  8408   8428*
SWREG    000176           1183#  2307   2329   8093   8132   8155
SW0    = 000001            958#
SW00   = 000001            948#   958
SW01   = 000002            947#   957
SW02   = 000004            946#   956
SW03   = 000010            945#   955
SW04   = 000020            944#   954
SW05   = 000040            943#   953
SW06   = 000100            942#   952
SW07   = 000200            941#   951
SW08   = 000400            940#   950
SW09   = 001000            939#   949
SW1    = 000002            957#
SW10   = 002000            938#
SW11   = 004000            937#
```

D16


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SW12   = 010000       936#    7796
SW13   = 020000       935#
SW14   = 040000       934#
SW15   = 100000       933#
SW2    = 000004       956#
SW3    = 000010       955#
SW4    = 000020       954#
SW5    = 000040       953#
SW6    = 000100       952#
SW7    = 000200       951#
SW8    = 000400       950#
SW9    = 001000       949#    7264    7294    7308    7323    7349    7361    7373    7410    7615
S.CLR  = 000400      1171#    2521    2565
S.FMT  = 001000      1172#    2433    2478    2521    2565
S.PACK= 004000       1174#
S.RECL= 000040       1168#
S.RTC  = 000200      1170#    2478
S.SEEK= 000020       1167#    2433    2478
S.STSP= 000100       1169#
S.UNLD= 002000       1173#
TBITVE= 000014        991#
TKVEC  = 000060       998#    8070*   8071*
TPVEC  = 000064       999#
TRAPPC   003604      2240#    7407*   8483
TRAPVE= 000034        997#    2285*   2286*
TRTVEC= 000014        992#
TSTBY1   054734      3740     3903    4066    4236    4534    8782#
TSTBY2   054744      3743     3906    4069    4239    4537    8784#
TST1     004700      2398     2414#   7569
TST10    007462      2783     2796    2808    2818    2823    2840#   7576
TST11    010606      3013#    7577
TST12    011274      3089     3105#   7578
TST13    012160      3213     3227#   7579
TST14    013046      3356#    7580
TST15    014252      3530#    7581
TST16    015130      3649#    7582
TST17    015566      3712     3730#   7583
TST2     005116      2439     2444    2459#   7570
TST20    016702      3744     3893#   7584
TST21    020016      3907     4056#   7585
TST22    021132      4070     4229#   7586
TST23    022370      4240     4404#   7587
TST24    023260      4527#    7588
TST25    024104      4538     4647#   7589
TST26    024636      4690     4724    4729    4757#   7590
TST27    025370      4800     4834    4839    4867#   7591
TST3     005334      2484     2489    2502#   7571
TST30    026122      4910     4944    4949    4977#   7592
TST31    026654      5020     5054    5059    5087#   7593
TST32    027406      5130     5164    5169    5196#   7594
TST33    030140      5239     5273    5278    5299#   7595
TST34    030440      5323     5328    5363#   7596
TST35    031206      5408     5442    5447    5470#   7597
TST36    031576      5525     5546#   7598
TST37    032422      5644     5666#   7599
TST4     005550      2527     2532    2546#   7572
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TST40   033246          5764    5785#   7600
TST41   034072          5883    5904#   7601
TST42   034716          6002    6023#   7602
TST43   035542          6121    6142#   7603
TST44   036366          6240    6261#   7604
TST45   037212          6359    6387#   7605
TST46   040052          6489    6512#   7606
TST47   041076          6646    6658#   7607
TST5    005764          2571    2576    2594#   7573
TST50   042122          6792    6808#   7608
TST51   042762          6910    6926#   7609
TST52   043406          7003#   7610
TST53   044032          7080#   7611
TST6    006446          2613    2628    2641    2653    2663    2668    2683#   7574
TST7    007074          2702    2722    2734    2744    2749    2764#   7575
TYPOS = 104405          7175    7182    8470#
TYPE  = 104401          2323    2340    2343    2346    2353    2357    2365    2374    3740    3743    3903    3906    4066
                        4069    4236    4239    4534    4537    7169    7176    7183    7699    7707    7753    7754    7758
                        7759    7766    7777    7779    7789    7790    7792    7800    7814    7968    7964    8039    8097
                        8099    8153    8154    8157    8168    8178    8189    8208    8256    8262    8267    8271    8276
                        8277    8279    8282    8286    8352    8354    8426    8466#
TYPERR  047720          7706    7743#
TYPOC = 104402          2345    2356    2373    3742    3905    4068    4238    4536    7774    8156    8467#
TYPON = 104404          8469#
TYPOS = 104403          8468#
T.ASOF  003456          2189#
T.BA    003444          2184#   2856*   2866    2892*   2899    2917*   2924    2949*   2956    2981*   2987    3053*   3066
                        3143*   3159    3174*   3182    3258*   3272    3294*   3302    3387*   3401    3427*   3435    3470*
                        3478    3562*   3576    3596*   3604    3680*   3697    3778*   3793    3841*   3856    3941*   3956
                        4004*   4019    4104*   4119    4167*   4182    4274*   4289    4340*   4353    4366*   4380    4436*
                        4453    4472*   4480    4570*   4582    4595*   4603    8492    8497    8501    8517
T.CS1   00344C          2182#   2429*   2435    2474*   2480    2517*   2523    2561*   2567    2607*   2609    2665*   2667
                        2696*   2698    2746*   2748    2777*   2779    2820*   2822    2855*   2861    2891*   2894    2916*
                        2919    2948*   2951    2980*   2984    3052*   3060    3077*   3080    3142*   3153    3172*   3176
                        3196*   3201    3257*   3266    3292*   3296    3317*   3327    3386*   3395    3425*   3429    3447*
                        3452    3468*   3472    3498*   3508    3561*   3570    3594*   3598    3618*   3628    3679*   3688
                        3704*   3708    3777*   3787    3840*   3850    3940*   3950    4003*   4013    4103*   4113    4166*
                        4176    4273*   4283    4299*   4303    4339*   4347    4364*   4374    4435*   4447    4470*   4474
                        4498*   4503    4569*   4576    4593*   4597    4614*   4617    4681*   4682    4702*   4706    4716*
                        4721    4791*   4792    4812*   4816    4826*   4831    4901*   4902    4922*   4926    4936*   4941
                        5011*   5012    5032*   5036    5046*   5051    5121*   5122    5142*   5146    5156*   5161    5230*
                        5231    5251*   5255    5265*   5270    5318*   5320    5333*   5337    5399*   5400    5420*   5424
                        5434*   5439    5641*   5643    5761*   5763    5880*   5882    5999*   6001    6118*   6120    6237*
                        6239    6356*   6358    6486*   6488    6643*   6645    6789*   6791    6907*   6909    6944*   6952
                        6964    6970*   6978    7021*   7029    7041    7047*   7055    7100*   7108    7120    7126*   7134
                        8484    8487    8492    8497    8501    8507    8511    8514    8519    8521    8523    8532    8536
T.CS2   003450          2186#   3058*   3063    3078*   3083    3150*   3156    3173*   3179    3197*   3204    3265*   3269
                        3293*   3299    3323*   3330    3394*   3398    3426*   3432    3451*   3455    3469*   3475    3504*
                        3511    3569*   3573    3595*   3601    3624*   3631    3679*   3685    3691    3705*   3711    3783*
                        3790    3848*   3853    3946*   3953    4011*   4016    4109*   4116    4174*   4179    4280*   4286
                        4300*   4306    4345*   4350    4365*   4377    4443*   4450    4471*   4477    4499*   4506    4575*
                        4579    4594*   4600    4615*   4620    4703*   4709    4717*   4726    4813*   4819    4827*   4836
                        4923*   4929    4937*   4946    5033*   5039    5047*   5056    5143*   5149    5157*   5166    5252*
                        5258    5266*   5275    5319*   5325    5334*   5340    5421*   5427    5435*   5444    6945*   6955
                        6965    6971*   6981    7022*   7032    7042    7048*   7058    7101*   7111    7121    7127*   7137
                        8501    8507    8511    8514    8519    8532    8536
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
T.DA      003446  2185#
T.DB      003462  2191#  3072*  3074   3191*  3193   3312*  3314   3442*  3444   3493*  3495   3613*  3615
                  3799*  3801   3868*  3870   3962*  3964   4031*  4033   4125*  4127   4194*  4196   4490*
                  4492   4609*  4611   4715*  4731   4825*  4841   4935*  4951   5045*  5061   5155*  5171
                  5264*  5280   5433*  5449   8505   8509
T.DCYL    003460  2190#
T.DS      003452  2187#  6946*  6959   6366   6972*  6984   7023*  7035   7043   7049*  7061   7102*  7114
                  7122   7128*  7140   8532   8536
T.ECPS    003472  2195#
T.ECPT    003474  2196#
T.ER      003454  2188#  3682*  3694   4276*  4295   4368*  4386   6947*  6961   6967   6973*  6987   7024*
                  7038   7044   7050*  7064   7103*  7117   7123   7129*  7143   8514   8532   8536
T.MR1     003464  2192#  2623*  2624   2636*  2637   2648*  2649   2658*  2659   2717*  2718   2729*  2730
                  2740*  2741   2791*  2792   2803*  2804   2814*  2815   2883*  2884   2940*  2941   2979*
                  2993   5516*  5517   5523*  5524   5631*  5633   5751*  5753   5870*  5872   5989*  5991
                  6108*  6110   6227*  6229   6346*  6348   6476*  6478   6632*  6634   6778*  6780   6897*
                  6899   7256*  7257   7286*  7287   7300*  7301   7315*  7316   7341*  7342   7353*  7354
                  7365*  7366   8489   8495   8497   8526   8530
T.MR2     003466  2193#  2430*  2440   2475*  2485   2518*  2528   2562*  2572   8484
T.MR3     003470  2194#  2431*  2443   2476*  2488   2519*  2531   2563*  2575   8484
T.SPAR    003476  2197#
T.WC      003442  2183#  2857*  2871   2893*  2904   2918*  2929   2950*  2961   2982*  2990   3054*  3069
                  3144*  3162   3175*  3185   3259*  3275   3295*  3305   3388*  3404   3428*  3438   3471*
                  3481   3563*  3579   3597*  3607   3681*  3700   3779*  3796   3842*  3859   3942*  3959
                  4005*  4022   4105*  4122   4168*  4185   4275*  4292   4341*  4356   4367*  4383   4437*
                  4456   4473*  4483   4571*  4585   4596*  4606   8492   8497   8504   8517

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JNLOAD= 000007  1068#
JNS     = 040000  1129#
JPE     = 020000  1109#  4281   4370
VV      = 000100  1140#
WAITIM    003632  2254#  6939   7016   7095
WCE     = 040000  1110#
WLE     = 004000  1126#
WRBUFF    067204  2847   2859   3018   3026*  3030   5477   7087   9803#  9804
WRDATA= 000023  1074#
WRDCNT    003624  2251#  3190*  3207*  3310*  3318   3333*  3418*  3484*  3499   3514*  3612*  3619   3634*
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                  4845   4904*  4905*  4932*  4938   4954*  4955   5014*  5015*  5042*  5048   5064*  5065
                  5124*  5125*  5152*  5158   5174*  5175   5233*  5234*  5261*  5267   5283*  5284   5402*
                  5403*  5430*  5436   5452*  5453   8509   8511   8521
WRHEAD= 000027  1076#  2467   2477   2554   2564   2849   2858   3019   3033   3110   3122   3230   3237
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                  3984   4084   4085   4146   4147   4254   4255   4320   4321   4369   4413   4414   4548
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WRFBIT    045136  5508   5584   5590   5607   5619   5704   5710   5727   5739   5823   5829   5846   5858
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WRTCHK= 000031  1077#
WRTGAT= 040000  1162#  2983   5493   5513   5521   5576   5696   5815   5934   6053   6172   6291   6419
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WRTPAR    044702  4243   4541   7200#
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$BEL     001204          1272#   7699    7732    8099    8296
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$CORE    046466          7446    7473#
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                         3638#   3640    3715#   3717    3878#   3880    4041#   4043    4204#   4206    4393#   4395    4513#
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                        6262   6388   6513   6659   6809   6927   7004   7081   7154   7160   7187   7193   7195
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        2886  2896  2901  2906  2921  2926  2931  2943  2953  2958  2963  2986  2989  2992  2995
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        4505  4508  4578  4581  4584  4587  4599  4602  4605  4608  4613  4619  4622  4688  4708
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        7063  7066  7110  7113  7116  7119  7136  7139  7142  7145  7408
ESCAPE  1001#
FORERR  1225#  6928  7005  7082
GETPRI  1001#  7441
GETSWR  1001#  2324#
LDLPER  1225#  3021  3111  3751  3810  3914  3973  4077  4136  4244  4310
MSG     2402#  2404  2447#  2449  2492#  2494  2535#  2537  2582#  2584  2671#  2673  2752#  2754  2826#
        2828  3000#  3002  3091#  3093  3216#  3218  3337#  3339  3518#  3520  3638#  3640  3715#  3717
        3878#  3880  4041#  4043  4204#  4206  4393#  4395  4513#  4515  4628#  4630  4738#  4740  4848#
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MULT    1001#
NEWTST  1001#  2402  2447  2492  2535  2582  2671  2752  2826  3000  3091  3216  3337  3518  3638
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POP     1001#  7667  7668  8034  8346  8395
PUSH    1001#  7628  7630  7651  7993  8320  8375
RDLOOP  1225#  4649  4759  4869  4979  5089  5365
REPORT  1001#
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SEKMSG  1225#  2416  2461
SETPRI  1001#  8224
SETTRA  8458#  8467  8468  8469  8470  8472  8474  8475  8476  8477  8478  8479  8480
SETUP   1001#  2272
SKIP    1001#  2439  2444  2484  2489  2527  2532  2571  2576  2613  2628  2641  2653  2663  2668
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DZR6CA.P11 05-OCT-76 10:06 CROSS REFERENCE TABLE -- MACRO NAMES

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SPACE   1001#
SPREAD  1225#   2685    2766
STARS   1001#   1191    1205    1207    1214    1227    1276    1279    2402    2413    2447    2458    2492    2501    2535
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        3337    3355    3518    3529    3638    3648    3715    3729    3878    3892    4041    4055    4204    4228    4393
        4403    4513    4526    4628    4646    4738    4756    4848    4866    4958    4976    5068    5086    5178    5195
        5287    5298    5345    5362    5458    5469    5528    5545    5647    5665    5767    5784    5886    5903    6005
        6022    6124    6141    6243    6260    6362    6386    6492    6511    6649    6657    6795    6807    6915    6925
        6992    7002    7069    7079    7150    7419    7496    7612    7623    7680    7733    7742    7827    7906    7983
        8050    8127    8142    8213    8237    8306    8359    8405    8414    8437
SWRSU   1001#   2295#
TRMTRP  8458#
TSTMEM  1225#   3732    3895    4058
TYPBIN  1001#
TYPDEC  1001#   7173    7180
TYPNAM  1001#   2317
TYPNUM  1001#
TYPOCS  1001#
TYPOCT  1001#   2344    3741    3904    4067    4237    4535    8155
TYPTXT  1001#   7169    7176
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WRTRK1  1225#   6389    6810
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$SSET   8458#   8467    8468    8469    8470    8472    8474    8475    8476    8477    8478    8479    8480
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$SSKIP  1001#   2439    2444    2484    2489    2527    2532    2571    2576    2613    2628    2641    2653    2663    2668
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        5278    5323    5328    5408    5442    5447    5525    5644    5764    5883    6002    6121    6240    6359    6489
        6646    6792    6910
.EQUAT   867#    891
.HEADE   867#    869
.KTII    867#   1001
.SETUP   867#   2258
.SWRHI   867#    879
.SWRLO   867#    891#
.SACTI   867#   1189
.SAPTB  1277#
.SAPTH   867#   1203
.SAPTY   867#   7621
.SCATC   867#   1175
.SCMTA   867#   1225
.SEOP    867#   7148
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.SERRT   867#
.SPOWE   867#
.SRDOC   867#   8304
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.$SCOP    8678   7494
.$SIZE    8678   7417
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.$TYPD    8678   7981
.$TYPE    8678   7825
.$TYPO    8678   7904

. ABS.  067410     000

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

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 RUN-TIME:  93  94 10 SECONDS
 RUN-TIME RATIO: 673/199=3.3
 CORE USED:  36K  (71 PAGES)

 DOCUMENT PAGES:  207
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