RK611

DISKLESS CONTROL PART 5
CZR6EB0

AH-9114B-MC

FICHE 1 OF 1

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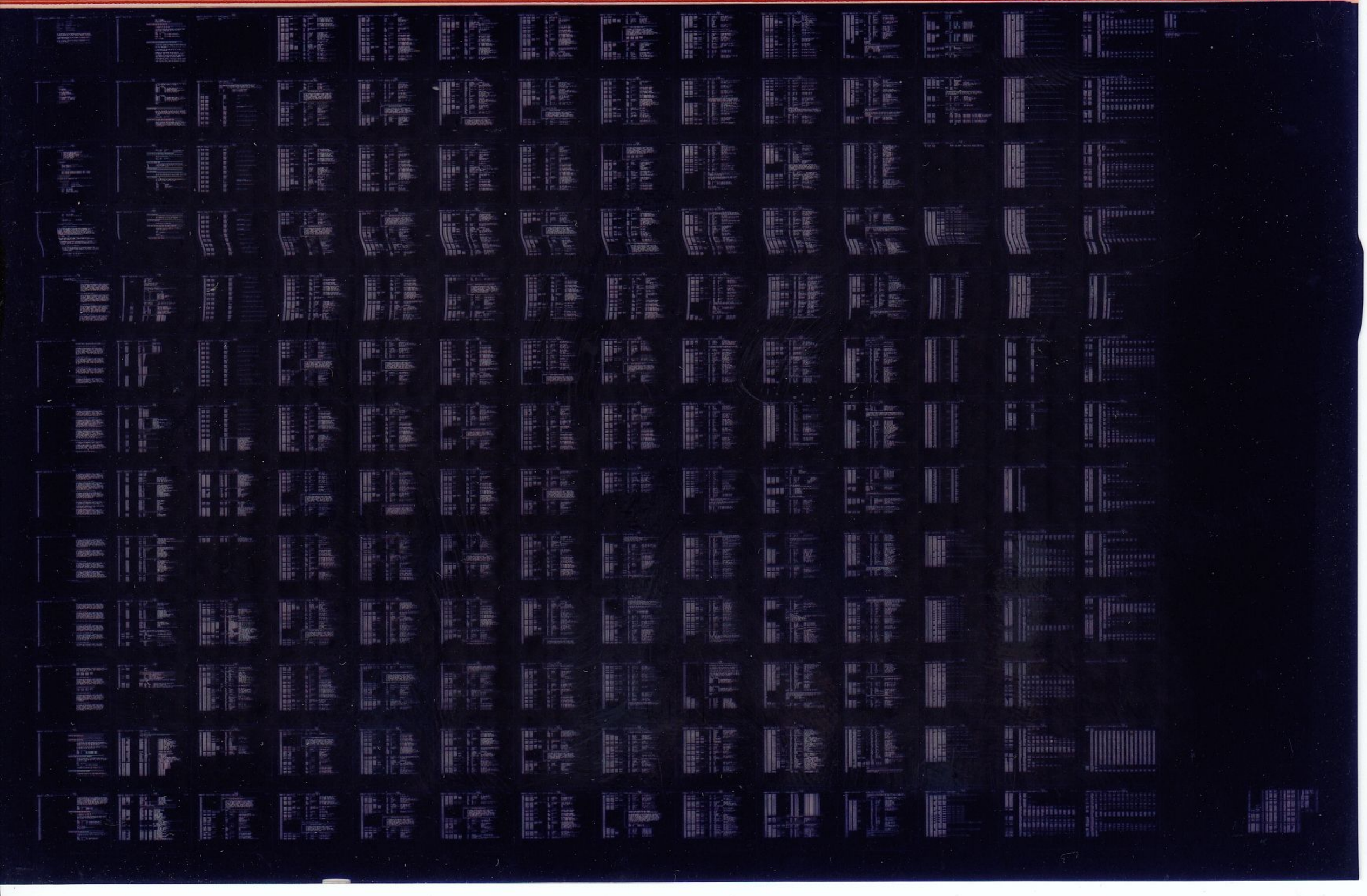
MADE IN USA



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                                IDENTIFICATION

                        PRODUCT CODE:   AC-S112B-MC

                        PRODUCT NAME:   CZR6EB0 RK611 DSKLS CTRL PRT 5

                        DATE:           FEB 1978

                        MAINTAINER:     DIAGNOSTIC GROUP

                        AUTHOR:         MARV TEGROTENHUIS


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TABLE OF CONTENTS

1.0 ABSTRACT

THE RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3

A. TESTS MULTI-SECTOR DATA TRANSFERS.
B. TESTS MID-TRANSFER SEEKS.
C. TESTS CYLINDER OVERFLOW CHECKING.
D. TESTS NPR TRANSFERS TO MEMORY.
E. TESTS ECC ERROR DETECTION AND CORRECTION, BOTH 16 AND 18 BIT MODE.
F. TESTS WRITE CHECK BOTH 16 AND 18 BIT MODES AND FORCES WRITE CHECK ERRORS.

NO RK06 DRIVE IS REQUIRED FOR PROGRAM EXECUTION.

2.0 REQUIREMENTS

2.1 EQUIPMENT

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

2 2 PRELIMINARY PROGRAMS

RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 1 (CZR6A)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 2 (CZR6B)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 3 (CZR6C)
RK611 DISKLESS CONTROLLER DIAGNOSTIC: PART 4 (CZR6D)

3.0 OPERATING PROCEDURES

3.1 LOADING PROCEDURE

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

3.2 STARTING PROCEDURE

LOCATION 200 - START PROGRAM

LOCATION 204 - RESTART PROGRAM

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

3.3 OPTIONAL SWITCH SETTINGS

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

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                        SW10 -  BELL ON ERROR
                        SW9  -  LOOP ON ERROR
                        SW8  -  LOOP ON TEST IN SWITCHES 0-7


3.5 RUN TIME

                        FIRST PASS              1:40 MINUTES
                        SUBSEQUENT PASSES       3:40 MINUTES


4.0     OPERATING PROCEDURES

THE PROGRAM IS EXECUTED BY STARTING AT THE APPROPIATE ADDRESS.


4.1     'SOFTWARE' SWITCH REGISTER

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

SWR = NNNNNN     NEW ='

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

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

4.2     CONTROL C (↑C) OPERATION

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

4.3     CONTROL S (↑S) OPERATION

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

4.4     CONTROL Q (↑Q) OPERATION
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IF A ↑S HAS BEEN TYPED, TYPING THE ↑Q CANCELS THE STALL
INITIATED BY THE ↑S.
5.0 PROGRAM DESCRIPTION
**MULTI-SECTOR WRITE OPERATIONS

TEST 1 MULTI-SECTOR WRITE (PART 1)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND A GOOD HEADER. CLOCK THROUGH 400 WORDS AND THE TWO ECC WORDS. MAKE SURE THE NEXT HEADER RECOGNITION CYCLE STARTS AND THE PROPER HEADER IS SEARCHED FOR. PROVIDE A SECOND GOOD HEADER AND CHECK RECOGNITION OF HEADER.

TEST 2 MULTI-SECTOR WRITE (PART 2)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, SECTOR 23. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND A GOOD HEADER, CLOCK THROUGH 400 WORDS AND THE TWO ECC WORDS. MAKE SURE THE NEXT HEADER RECOGNITION CYCLE STARTS AND THE PROPER HEADER IS SEARCHED FOR. PROVIDE A SECOND GOOD HEADER AND CHECK RECOGNITION OF HEADER.

TEST 3 MID-TRANSFER SEEK (PART 1)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 0, SECTOR 25. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND A GOOD HEADER. CLOCK THROUGH 400 WORDS AND THE TWO WORD ECC. MAKE SURE THE CONTROLLER ISSUES AN IMPLIED SEEK TO THE RIGHT HEAD AND CYLINDER. MAKE SURE THE NEXT HEADER RECOGNITION PROCEEDS PROPERLY.

TEST 4 MID-TRANSFER SEEK (PART 2)

CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR. PUT THE CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT, CYLINDER 0, HEAD 2, SECTOR 25. CLOCK THROUGH SEEK AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE AND A GOOD HEADER, CLOCK THROUGH 400 WORDS AND THE TWO WORD ECC. MAKE SURE THE CONTROLLER ISSUES

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                        AN IMPLIED SEEK TO THE RIGHT HEAD AND CYLINDER.
                        MAKE SURE THE NEXT HEADER RECOGNITION PROCEEDS PROPERLY.


                TEST 5  MID-TRANSFER SEEK AND 24 SECTOR FORMAT

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
                        DATA OF 401 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 23.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                        AND A GOOD HEADER.  CLOCK THROUGH 400 18 BIT WORDS
                        AND THE 32 BIT ECC.  CHECK THAT IMPLIED SEEK IS
                        ISSUE TO NEXT TRACK.  CHECK FOR PROPER HEADER RECOGNITIO
                        OCCURS.


                TEST 6  CYLINDER OVERFLOW (PART 1)

                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        DATA OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 632, HEAD 2, SECTOR 25.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                        AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND THE
                        TWO WORD ECC.  MAKE SURE CYLINDER OVERFLOW ERROR DOES
                        NOT SET.


                TEST 7  CYLINDER OVERFLOW (PART 2)

                        CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 632, HEAD 2, SECTOR 25.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                        AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND
                        TWO ECC WORDS. MAKE SURE CYLINDER OVERFLOW ERROR SETS.


        **NPR WRITING OF MEMORY

                TEST 10 NPR WRITING OF MEMORY

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 40 DATA WORDS.  VERIFY THAT THE WORDS
                        ARE WRITTEN PROPERLY IN MEMORY.


        **ECC ERROR DETECTION/CORRECTION TESTS
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TEST 11 READ DATA WITH NO ERROR

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
VERIFY THAT COMMAND COMPLETES WITHOUT ERROR.

TEST 12 READ DATA WITH ONE BIT BURST ERROR (PART 1)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
A ONE BIT BURST ERROR OF A 0 THAT SHOULD BE A 1.
VERIFY THE COUNTING OF THE POSITION
REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.

TEST 13 READ DATA WITH ONE BIT BURST ERROR (PART 2)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
A ONE BIT BURST ERROR OF A 1 THAT SHOULD BE A 0.
VERIFY THE COUNTING OF THE POSITION
REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.

TEST 14 READ DATA WITH 11 BIT BURST ERROR

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,

CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
AN 11 BIT BURST ERROR. VERIFY THE COUNING OF THE POSITI
REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.

TEST 15 READ DATA WITH 12 BIT BURST ERROR
CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.

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                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
                        GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
                        A 12 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
                        POSITION REGISTER.  MAKE SURE DATA CHECK, ECC HARD,
                        AND CONTROLLER ERROR SETS.


TEST 16 READ DATA WITH 23 BIT BURST ERROR

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
                        GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
                        A 23 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
                        POSITION REGISTER.  MAKE SURE DATA CHECK, ECC HARD,
                        AND CONTROLLER ERROR SETS.

TEST 17 READ DATA WITH 1 BIT ECC WORD ERROR

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
                        GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
                        A 1 BIT ERROR IN ECC WORD 2, BIT 6.  VERIFY THE
                        COUNTING OF THE POSITION REGISTER.  MAKE SURE DATA
                        CHECK AND CONTROLLER ERROR SETS.


TEST 20 18 BIT NPR WRITING OF MEMORY

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK

                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 40 DATA WORDS.  VERIFY THAT THE WORDS
                        ARE WRITTEN PROPERLY IN MEMORY.

TEST 21 18 BIT READ DATA WITH NO ERROR
                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
                        VERIFY THAT COMMAND COMPLETES WITHOUT ERROR.


TEST 22 18 BIT READ DATA WITH DCK
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                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEk
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
                        A ONE BIT BURST ERROR BEYOND THE 4128TH BIT OF THE SECTO
                        VERIFY THE COUNTING OF THE POSITION REGISTER AND THE
                        FINAL PATTERN AND POSITION.  MAKE SURE DATA CHECK AND
                        CONTROLLER ERROR SETS.


              TEST 23 18 BIT READ DATA WITH ECH

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 400 DATA WORDS AND AND ECC INDICATING
                        A 12 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
                        POSITION REGISTER.  MAKE SURE DATE CHECK, ECC HARD,
                        AND CONTROLLER ERROR SETS.


        **SPECIAL READ TESTS

              TEST 24 PARTIAL SECTOR READ

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 103 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
                        MAKE SURE ONLY 103 WORDS GOT TRANSFERRED TO MEMORY.


              TEST 25 SILO UNLOAD BEFORE HEADER ERROR

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                        OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
                        AFTER ECC SIMULATE A SECTOR PULSE AND A BAD SECTOR ERROR
                        MAKE SURE THE ENTIRE PREVIOUS SECTOR GETS LOADED INTO
                        MEMORY BEFORE BAD SECTOR ERROR AND CONTROLLER ERROR SETS


        **WRITE CHECK TESTS

              TEST 26 WRITE CHECK OF 400 WORDS
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                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK'
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
                        AND A GOOD 32'BIT ECC.  MAKE SURE NO ERRORS SET.'


TEST 27 WRITE CHECK WITH DCK

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK'
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
                        AND A 32 BIT ECC INDICATING A 1 BIT BURST ERROR.
                        VERIFY THAT THE POSITION REGISTER INCREMENTS PROPERLY
                        AND THAT THE FINAL PATTERN AND POSITION ARE CORRECT.


                        CHECK THAT DATA CHECK AND CONTROLLER ERROR ARE SET.


TEST 30 WRITE CHECK OF 18 BIT WORDS

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
                        CHECK OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
                        CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK'
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
                        AND A GOOD 32'BIT ECC.  MAKE SURE NO ERRORS SET.


TEST 31 WRITE CHECK OF A PARTIAL SECTOR

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
                        CYLINER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        A GOOD HEADER, TAKE ONE WORD TO BE WRITE-CHECKED, 377 WO
                        NOT TO BE WRITE CHECKED, AND A GOOD 32 BIT ECC.
                        MAKE SURE NO ERRORS SET.


TEST 32 WRITE CHECK ERROR (PART 1)

                        CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
                        CLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEk
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AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, AND ONE WORD OF DATA CONSISTING OF 000000
WRITE CHECKED DATA IS 000001. MAKE SURE WRITE CHECK ERR
REPEAT USING EACH OF THE FOLLOWING CONFIGURATIONS
AS WRITE CHECKED DATA:

000002	000040	001000	020000
000004	000100	002000	040000
000010	000200	004000	100000
000020	000400	010000	

TEST 33 WRITE CHECK ERROR (PART 2)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE
A GOOD HEADER, AND ONE WORD OF DATA CONSISTING OF 177777
WRITE CHECKED DATA IS 177776. MAKE SURE WRITE
CHECK ERROR SETS. REPEAT USING EACH OF THE FOLLOWING

CONFIGURATION AS WRITE CHECKED DATA:

177775	177737	176777	157777
177773	177677	175777	137777
177767	177577	173777	077777
177757	177377	167777	

TEST 34 WRITE CHECK ERROR (PART 3)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
A GOOD HEADER, AND ONE WORD OF DATA CONSISTING
OF 200000. WRITE CHECK DATA IS 000000. MAKE SURE
WRITE CHECK ERROR SETS. REPEAT USING 400000 AS
SIMULATED DATA.

TEST 35 WRITE CHECK ERROR (PART 4)

CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
AND DRIVE CLEAR MESSAGES SIMULATE A SECTOR PULSE,
A GOOD HEADER, 125 GOOD WORDS, AND A BAD WORD.
MAKE SURE WRITE CHECK ERROR SET. CHECK WORD COUNT
AND BUS ADDRESS.

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;**********************************************************************
;DIAGNOSTIC MODE SECTOR PULSE
;**********************************************************************

;               THE SECTOR PULSE IS PROVIDED BY THIS ROUTINE

;**********************************************************************
;DIAGNOSTIC MODE IMPLIED SEEK
;**********************************************************************

;               THE CONTROLLER IS CLOCKED THROUGH THE SEEK MESSAGES,
;               GETTING STATUS, AND CLEARING THE DRIVE. SINCE THIS REQUI
;               DIFFERENT COUNT FOR WRITE DATA AND READ DATA/WRITE CHECK
;               THE ROUTINE LOOKS AT THE COMMAND THAT WAS
;               STARTED (L.CS1) AND SETS THE CLOCK COUNT ACCORDINGLY.

;               AT THE END OF THE IMPLIED SEEK THE CONTENTS OF CS1, MR1,
;               AND MR3 ARE CHECKED TO VERIFY THE OPERATION. ALL DISCREP
;               ARE REPORTED IN THE ORDER LISTED.

;               CALL:
;               JSR     R4,DISEEK
;               ERROR   4       ;CS1 MISCOMPARE ERROR
;               ERROR   5       ;MR1 MISCOMPARE ERROR
;               ERROR   6       ;MR2 MISCOMPARE ERROR
;               ERROR   7       ;MR3 MISCOMPARE ERRON

;**********************************************************************
;DIAGNOSTIC MODE READ SYNC PATTERN (PREAMBLE)
;**********************************************************************

;               THE 255 "0" BITS AND 1 "1" BIT ARE CLOCKED THROUTH THE R
;               THE CONTENTS OF MR1 ARE MONITORED TO WATCH FOR AN ERROR.
;               AT THE END OF THE SYNC READ, CS1 IS CHECKED TO INSURE IT
;               DID NOT GET CHANGED.

;               CALL:
;               JSR     R4,DRSYNC
;               ERROR   10      ;MR1 CONTENTS IN ERROR

;               ERROR   11      ;CS1 CONTENTS IN ERROR

;               IF AN ERROR IS DETECTED, THE SUBROUTINE WILL SET UP TO A
;               THE PRESENT TEST UNLESS LOOP ON ERROR IS SET.


;**********************************************************************
;DIAGNOSTIC MODE HEADER READ AND COMPARE
;**********************************************************************

;               THIS ROUTINE SIMULATES THE THREE HEADER WORDS READ AND
;               COMPARE THAT IS PART OF ALL DATA TRANSFER OPERATIONS.

;               THE EXPECTED HEADER IS CALCULATED FROM THE CYLINDER, TRA
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                        AND SECTOR SPECIFIED IN THE "L" REGISTERS. THE READING O
                        3 WORDS IS DONE AND MR1 IS MONITORED TO INSURE IT DOES
                        NOT CHANGE. AT THE END OF THE READ/COMPARE, THE CONTENTS
                        OF RKCS1 IS CHECKED AND THE INCREMENT OF RKDCYL AND RKDA
                        VERIFIED. IF THE INCREMENT IS GOOD, THE "L" REGISTERS AR
                        UPDATED TO THE NEW PACK ADDRESS IN CASE OF MULTI-SECTOR
                        OPERATIONS. THE BAD SECTOR ERROR DESIRED (BSEDES) SWITCH
                        IS TESTED AND IF IT IS NON-ZERO, THE 2ND AND 3RD HEADER
                        WORDS ARE CHANGED ACCORDING TO BSEDES CONTENTS. THIS
                        CAN BE USED TO FORCE HEADER TYPE ERROR.

                        CALL:
                        JSR     R4,DHDCMP
                        ERROR   12      ;ERROR IN MR1
                        ERROR   13      ;ERROR IN CS1
                        ERROR   14      ;ERROR IN PACK ADDRESS

                ;*******************************************************************
                ;DIAGNOSTIC MODE GAP READ AND SYNC WRITE
                ;*******************************************************************

                        THE READING OF THE GAP AND WRITING OF THE SYNC (OR PREAM
                        IS HANDLED IN THIS ROUTINE.

                        THE FIRST GAP BITS ARE PROCESSED IN THE HEADER COMPARE
                        ROUTINE AND THE REMAINDER ARE PROCESSED HERE. THEN A
                        CHECK IS MADE THAT WRITE GATE CAME ON AND 255 "0" BITS
                        AND A SINGLE "1" BIT IS WRITTEN.

                        CALL:
                        JSR     R4,DWGPSN
                        ERROR   15      ;MR1 IN ERROR IN READ GAP
                        ERROR   16      ;CS1 IN ERROR AFTER READ GAP
                        ERROR   17      ;MR1 IN ERROR IN WRITE SYNC

                        ERROR   20      ;CS1 IN ERROR AFTER SYNC WRITE

                        ROUTINE CALLED:
                        JSR     PC,WRTBIT
                        RETURN POINT IF ERROR IN WRTBIT
                        NO ERROR RETURN

                ;*******************************************************************
                ;DIAGNOSTIC WRITE DATA AND ECC ROUTINE
                ;*******************************************************************

                        THE DATA IN THE OUPUT BUFFER IS WRITE SIMULATED, ECC IS
                        GENERATED AND WRITTEN, AND THE POSTAMBLE IS WRITTEN.

                        CALL:
                        JSR     R4,DWRITE
                        ERROR   17      ;MR1 IN ERROR IN WRITING
                        ERROR   21      ;ECC ERROR IN WRITING
                        ERROR   22      ;CS1 ERROR AFTER WRITE
                        NO ERROR RETURN
```

```
                        ROUTINE CALLED:
                        JSR     PC,WRTBIT
                        RETURN POINT IF ERROR IN WRTBIT
                        NO ERROR RETURN FROM WRTBIT

;*******************************************************************
;DIAGNOSTIC MODE READ GAP AND DATA SYNC
;*******************************************************************

                        THE READING OF THE GAP AND READING OF THE SYNC (OR PREAM
                        IS HANDLED IN THIS ROUTINE.

                        THE FIRST GAP BITS ARE PROCESSED IN THE HEADER COMPARE
                        ROUTINE AND THE REMAINING GAP BITS ARE PROCESSED HERE.
                        THEN A CHECK IS MADE THAT READ GATE CAME ON
                        AT THE 129TH BIT OF SYNC.;*
                        CALL:
                        JSR     R4,DRGPSN
                        ERROR   15      ;MR1 IN ERROR IN READ GAP
                        ERROR   16      ;CS1 IN ERROR AFTER READ GAP

                        ERROR   32      ;MR1 IN ERROR IN READ SYNC
                        ERROR   33      ;CS1 IN ERROR AFTER SYNC READ

                        ROUTINE CALLED:
                        JSR     PC,RDBIT


;*******************************************************************
;DIAGNOSTIC READ DATA OR DIAGNOSTIC WRITE CHECK ROUTINE
;*******************************************************************

                        THIS ROUTINE IS USED TO SIMULATE THE READ OR WRITE CHECK
                        OF DATA. THE ROUTINE WILL TRANSFER A FULL OR PARTIAL SEC

                        THE FIRST WORD AFTER THE CALL SPECIFIES HOW MANY WORDS
                        ARE TO BE TRANSFERRED.

                        IF LESS THAN A FULL SECTOR, THE ECC AT THE END
                        OF THE TRANSFER IS NOT CHECKED. THE ECC IS CHECKED AT TH
                        EACH BIT IS TRANSFERED.

                        EITHER 16 OR 18 BIT WORDS CAN BE SIMULATED
                        DEPENDING ON THE STATE OF CFMT BIT IN L.CS1. IF 18 BITS
                        ARE REQUIRED, BITS 16 AND 17 ARE ASSUMED TO BE ZERO.

                        THE CONTENTS OF LOCATION ECPOSX MUST BE LOADED WITH THE
                        COUNT EXPECTED AT THE END OF THE DATA TRANSFER. THIS
                        LOADING MUST OCCUR BEFORE THE ROUTINE IS CALLED.

                        ANOTHER LOCATION, ECPATX, IS SET TO 0 IF THE ECC IS EXPE
                        TO BE CORRECT AND SET TO 1 IF AN ERROR IS BEING FORCED.

                        A 3RD LOCATION, ECCSRC, SPECIFIES THE SOURCE OF THE ECC
                        WORDS TO BE USED IN CHECKING THE OPERATION. IF ECCSRC IS
```

```
                        1, THE ECC WORDS FED INTO THE DECODER ARE TAKEN FROM THE
                        LAST TWO LOCATIONS OF OBUFF, IF ECCSRC IS 0. THE COMPUTE
                        ECC WORDS FROM ECCHI AND ECCLO ARE USED.
                        CALL:
                        JSR     R4,DREAD
                        LENGTH OF TRANSFER
                        ERROR 34        ;MR1 IN ERROR READING DATA OR ECC
                        ERROR 35        ;ECC ERROR READING DATA
                        ERROR 36        ;CS1 ERROR AFTER READING DATA OR ECC
                        ERROR 41        ;ECC REGISTER INCORRECT AFTER READ ECC
                        ERROR 42        ;ERR IN ECC PAT CALCULATION
                        ERROR 43        ;ERR IN ECC POS COUNTING

                        OR

                        JSR     R4,DWRTCK
                        LENGTH OF TRANSFER
                        ERROR 53        ;MR1 IN ERROR WRITE CHK OR ECC READ
                        ERROR 54        ;ECC ERROR IN WRITE CHECK
                        ERROR 55        ;CS1 ERROR AFTER IN WRT CHK OR ECC READ
                        ERROR 41        ;ECC REGISTER INCORRECT AFTER READ ECC
                        ERROR 42        ;ERR IN ECC PAT CALCULATION
                        ERROR 43        ;ERR IN ECC POS COUNTING

                        ROUTINES CALLED:
                        RDBIT
                        ECCGEN

                        ;*****************************************************************
                        ;GENERATE ECC WORD
                        ;*****************************************************************

                                        EACH TIME THIS ROUTINE IS CALLED THE ECC IS CALCULATED F
                                        NEXT BIT TO BE READ OR WRITTEN AND THE BITS PREVIOUSLY
                                        READ OR WRITTEN (STORED IN ECCHI AND ECCLO). THE RESULTS
                                        THE CALCULATION ARE PLACED IN ECCHI AND ECCLO. THE LOW O
                                        11 BITS OF ECCHI ARE PLACED IN E.ECPT FOR EASY COMPARISO
                                        TO RKECPT.

                                        CALL:   JSR     PC,ECCGEN
                                        RETURN: RTS     R4

                        ;*****************************************************************
                        ;SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE
                        ;*****************************************************************

5835                                    ONE BIT OF DATA IS WRITE SIMULATED. THE CONTENTS OF
                                        RKMR1 IS COMPUTED (PRECOMP ADVANCE AND DELAY, MAINTENANC
                                        ENCODED WRITE DATA) FOR THE PROPER TRANSITION OF THE
                                        MAINTENANCE CLOCK AND CHECKED AT EACH TRANSITION. IF MR1
                                        IS INCORRECT AT ANY TRANSITION, AN ERROR IS SET UP TO
                                        CONTAIN A MESSAGE THAT IDENTIFIES THE TRANSITION WHEN TH
                                        ERROR OCCURRED.
```

```
                        CALL:   JSR     PC,WRTBIT
                        RETURN: RTS     PC+2            FOR NO ERROR RETURN
                                RTS     PC              FOR ERROR IN MR1

;*****************************************************************
;SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
;*****************************************************************

                        ONE BIT OF DATA IS READ SIMULATED. NO CHECKING IS
                        DONE BY THIS ROUTINE.

                        CALL:   JSR     PC,RDBIT
                        RETURN: RTS     PC

;*****************************************************************
;MEMORY CHECK ENABLE TRAP
;*****************************************************************

                        IF THE PROCESSOR IN USE HAS MEMORY PARITY OPTION
                        IT WILL BE ENABLED. THIS ROUTINE WILL PROCESS TRAPS CAUS
                        BY MEMORY PARITY ERRORS.

;*****************************************************************
;CLEAR INPUT BUFFER
;*****************************************************************

;*****************************************************************
;BUILD DATA BUFFER
;*****************************************************************

                        THE PATTERN SPECIFIED IN THE CALL IS LOADED INTO THE DAT
                        BUFFER. THE ENTIRE BUFFER IS ALWAYS LOADED (400(8) WORDS

;*****************************************************************
;LOAD "L" REGISTERS
;*****************************************************************

                        THE "L" REGISTERS ARE LOADED FORM THE PARAMETERS FOLLOWI
                        THE SUBROUTINE CALL. DIAGNOSTIC MODE IS SET IN L.MR1
                        AND L.CS1 IS LOADED WITH THE COMMAND.

                        CALL:
                        JSR     R4,LOADRK
                        .WORD           CYLINDER
                        .BYTE           ;SECTOR
                        .BYTE           ;TRACK
                        .WORD           ;BUFFER ADDRESS
                        .WORD           ;WORD COUNT
                        .WORD           ;COMMAND,FORMAT,DRIVE TYPE,&UPPER BUS AD

                        RETURN:
                        RTS     R4
```

```
                        ;*****************************************************************
                        ;START THE OPERATION
                        ;*****************************************************************
                        ;
                        ;               THE INFORMATION IN THE "L" REGISTERS ARE LOADED INTO THE
                        ;               RK611 REGISTERS IN A STARAIGHT TRANSFER.
                        ;
                        ;*****************************************************************
                        ;GET THE RK611 REGISTERS
                        ;*****************************************************************
                        ;
                        ;               ALL THE RK611 REGISTERS EXCEPT THE DATA BUFFER ARE
                        ;               STORED IN THE "T" REGISTERS.
                        ;
                        ;*****************************************************************
                        ;"FIRST SHALL BE LAST, LAST SHALL BE FIRST" SUBROUTINE
                        ;*****************************************************************
                        ;
                        ;               THE CONTENTS OF R3 IS SWAPPED END FOR END, I.E. BIT 15
                        ;               BECOMES BIT 0 AND VICE VERSA,BIT 14 BECOMES BIT
                        ;               1 AND VICE VERSA, ETC.
                        ;
                        ;               CALL:
                        ;               JSR     R4,FSBLVV
                        ;               WITH R3 LOADED WITH THE WORD TO BE SWAPPED
                        ;
                        ;               RETURN:
                        ;               RTS     R4
                        ;               WITH R3 SWAPPED.
                        ;
                        ;*****************************************************************
                        ;CHECK FOR MEMORY CHECK ENABLE
                        ;*****************************************************************
```

```
                        ; *** REV 004 ***
                        .NLIST  CND,MD,MC
                        .LIST   ME
                        .ENABL  ABS,AMA
167400                  $SWR=   167400
000001                  $TN=    1
                        .TITLE  CZR6EB0 RK611 DSKLS CTRL PRT5
                        ;*COPYRIGHT (C) 1976,1977
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY MARV TEGROTENHUIS
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC    .
                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                        ;*
                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH                  USE
                        ;*      ------          --------------------
                        ;*        15            HALT ON ERROR
                        ;*        14            LOOP ON TEST
                        ;*        13            INHIBIT ERROR TYPEOUTS
                        ;*        12            ABORT PROGRAM AFTER 20 ERRORS
                        ;*        11            INHIBIT ITERATIONS
                        ;*        10            BELL ON ERROR
                        ;*         9            LOOP ON ERROR
                        ;*         8            LOOP ON TEST IN SWR<7:0>
                        .SBTTL  BASIC DEFINITIONS

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

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

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

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

                        ;*PRIORITY LEVEL DEFINITIONS
                        PR0=    0               ;;PRIORITY LEVEL 0
                        PR1=    40              ;;PRIORITY LEVEL 1
                        PR2=    100             ;;PRIORITY LEVEL 2
                        PR3=    140             ;;PRIORITY LEVEL 3
                        PR4=    200             ;;PRIORITY LEVEL 4
                        PR5=    240             ;;PRIORITY LEVEL 5
                        PR6=    300             ;;PRIORITY LEVEL 6
                        PR7=    340             ;;PRIORITY LEVEL 7

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

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

```
000002          BIT01=  2
000001          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

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

                        .SBTTL  RK611 CONTROLLER REGISTER DEFINITION

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

                        .SBTTL  DRIVE COMMANDS

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

                        .SBTTL  CONTROL AND STATUS REGISTER 1 BITS

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

```
1098            002000                  CDT=    BIT10                   ;CONTROLLER DRIVE TYPE (0=RK06)
1099            004000                  CTO=    BIT11                   ;CONTROLLER TIMED OUT WAITING FOR
1100                                                                    ;   DRIVE RESPONSE
1101            010000                  CFMT=   BIT12                   ;CONTROLLER DRIVE FORMAT (0=26 SECTOR, 1=24 SECTOR)
1102            020000                  SPAR=   BIT13                   ;DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER
1103            040000                  DI=     BIT14                   ;DRIVE INTERRUPT
1104            100000                  CERR=   BIT15                   ;CONTROLLER ERROR
1105            100000                  CCLR=   BIT15                   ;CONTROLLER CLEAR
1106
1107                                    .SBTTL  CONTROL AND STATUS REGISTER 2 BITS
1108
1109            000007                  DRVMSK= 7                       ;MASK FOR DRIVE SELECTION CODE
1110            000010                  RLS=    BIT3                    ;DESELECT OR RELEASE DRIVE IN BITS 0-2
1111            000020                  BAI=    BIT4                    ;BUS ADDRESS INCREMENT INHIBIT
1112            000040                  SCLR=   BIT5                    ;CLEAR CONTROLLER AND ALL DRIVES
1113            000100                  IR=     BIT6                    ;INPUT READY
1114            000200                  OR=     BIT7                    ;OUTPUT READY
1115            000400                  UFE=    BIT8                    ;UNIT FIELD ERROR
1116            001000                  MDS=    BIT9                    ;MULTIPLE DRIVE SELECT
1117            002000                  PGE=    BIT10                   ;PROGRAMMING ERROR
1118            004000                  NEM=    BIT11                   ;NON-EXISTENT MEMORY
1119            010000                  NED=    BIT12                   ;NON-EXISTENT DRIVE
1120            020000                  UPE=    BIT13                   ;UNIBUS PARITY ERROR
1121            040000                  WCE=    BIT14                   ;WRITE CHECK ERROR
1122            100000                  DLT=    BIT15                   ;DATA LATE ERROR
1123
1124                                    .SBTTL  ERROR REGISTER BIT DEFINITION
1125
1126            000001                  ILF=    BIT0                    ;ILLEGAL FUNCTION CODE
1127            000002                  SKI=    BIT1                    ;SEEK INCOMPLETE
1128            000004                  NXF=    BIT2                    ;NON-EXECUTABLE DRIVE FUNCTION
1129            000010                  DRPAR=  BIT3                    ;DRIVE DETECTED DRIVE BUS PARITY ERROR
1130            000020                  FMTE=   BIT4                    ;FORMAT ERROR
1131            000040                  DTYE=   BIT5                    ;DRIVE TYPE ERROR
1132            000100                  ECH=    BIT6                    ;ECC HARD
1133            000200                  BSE=    BIT7                    ;BAD SECTOR ERROR
1134            000400                  HVRC=   BIT8                    ;HEADER VRC ERRROR
1135            001000                  COE=    BIT9                    ;CYLINDER ADDRESS OVERFLOW ERROR
1136            002000                  IDAE=   BIT10                   ;INVALID DISK ADDRESS ERROR
1137            004000                  WLE=    BIT11                   ;WRITE LOCK ERROR
1138            010000                  DTE=    BIT12                   ;DRIVE TIMING ERROR
1139            020000                  OPI=    BIT13                   ;OPERATION (SEARCH) INCOMPLETE
1140            040000                  UNS=    BIT14                   ;DRIVE UNSAFE
1141            100000                  DCK=    BIT15                   ;DATA CHECK
1142
1143                                    .SBTTL  STATUS REGISTER BIT DEFINITION
1144
1145            000001                  DRA=    BIT0                    ;DRIVE AVAILABLE (CONTROLLER IS SET IF
1146                                                                    ;   THIS BIT IS RESET)
1147            000004                  OFST=   BIT2                    ;DRIVE OFFSET
1148            000010                  ACLO=   BIT3                    ;AC LOW
1149            000020                  SPDLSS= BIT4                    ;SPEED LOSS
1150            000040                  DROT=   BIT5                    ;DRIVE OFF TRACK
1151            000100                  VV=     BIT6                    ;VOLUME VALID
1152            000200                  DRDY=   BIT7                    ;DRIVE READY
1153            000400                  DDT=    BIT8                    ;DRIVE TYPE (0=RK06)
```

```
1154            004000                  WRL=    BIT11                   ;WRITE LOCK
1155            020000                  PIP=    BIT13                   ;POSITIONING IN PROGRESS
1156            040000                  DSC=    BIT14                   ;DRIVE STATUS CHANGE
1157            100000                  SVAL=   BIT15                   ;STATUS VALID
1158
1159                                    .SBTTL  MAINTENANCE REGISTER 1 BIT DEFINITION
1160
1161            000017                  MESMSK= 17                      ;MESSAGE MASK
1162
1163            000020                  PAT=    BIT4                    ;FORCE EVEN PARITY ON DRIVE MESSAGE LINES
1164            000040                  DMD=    BIT5                    ;DIAGNOSTIC MODE
1165            000100                  MSP=    BIT6                    ;MAINTENANCE SECTOR PULSE
1166            000200                  MIND=   BIT7                    ;MAINTENANCE INDEX
1167            000400                  MCLK=   BIT8                    ;MAINTENANCE CLOCK
1168            001000                  MERD=   BIT9                    ;MAINTENANCE ENCODED READ DATA
1169            002000                  MEWD=   BIT10                   ;MAINTENACNE ENCODED WRITE DATA
1170            004000                  PCA=    BIT11                   ;PRECOMPENSATION ADVANCE
1171            010000                  PCD=    BIT12                   ;PRECOMPENSATION DELAY
1172            020000                  ECCW=   BIT13                   ;ECC WORD IS BEING READ OR WRITTEN
1173            040000                  WRTGAT= BIT14                   ;WRITE GATE
1174            100000                  RDGATE= BIT15                   ;READ GATE
1175
1176                                    .SBTTL  TRANSMITTED MESSAGE A
1177
1178            000020                  S.SEEK= BIT4                    ;SEEK COMMAND
1179            000040                  S.RECL= BIT5                    ;RECALIBRATE COMMAND
1180            000100                  S.STSP= BIT6                    ;START SPINDLE COMMAND
1181            000200                  S.RTC=  BIT7                    ;DRIVE RETURN TO CENTERLINE COMMAND
1182            000400                  S.CLR=  BIT8                    ;CLEAR ERROR AND DSC
1183            001000                  S.FMT=  BIT9                    ;FORMAT
1184            002000                  S.UNLD= BIT10                   ;UNLOAD
1185            004000                  S.PACK= BIT11                   ;SET VOLUME VALID (PACK ACKNOWNLEDGE)
1186                                    .SBTTL  TRAP CATCHER
1187
1188            000000                          .=0
1189                                    ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1190                                    ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1191                                    ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
1192            000174                          .=174
1193    000174  000000                  DISPREG: .WORD  0                ;;SOFTWARE DISPLAY REGISTER
1194    000176  000000                  SWREG:   .WORD  0                ;;SOFTWARE SWITCH REGISTER
1195                                    .SBTTL  STARTING ADDRESS(ES)
1196    000200  000137  002400                  JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
1197    000204  000137  002370                  JMP     RESTRT          ;JUMP TO RESTART ROUTINE
1198            000214                          .=214
1199    000214  000137  002360                  JMP     PARM            ;JUMP TO OPERATOR ASSIGNED PARMETERS
1200                                    .SBTTL  ACT11 HOOKS
1201
1202                                    ;;*****************************************************************
1203                                    ;HOOKS REQUIRED BY ACT11
1204            000220                          $SVPC=.                 ;SAVE PC
1205            000046                          .=46
1206    000046  023276                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1207            000052                          .=52
1208    000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
1209            000220                          .=$SVPC                 ;; RESTORE PC
```

```
  1210            000114                          .=MEMVEC
  1211  000114    031726                          MEMERR
  1212  000116    000340                          PR7
  1213            001000                          .=1000
  1214                                    .SBTTL  APT PARAMETER BLOCK
  1215
  1216                                    ;;*****************************************************************
  1217                                    ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
  1218                                    ;;*****************************************************************
  1219            001000                          .$X=.   ;;SAVE CURRENT LOCATION
  1220            000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
  1221  000024    000200                          200     ;;FOR APT START UP
  1222            000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
  1223  000044    001000                          $APTHDR ;;POINT TO APT HEADER BLOCK
  1224            001000                          .=.$X   ;;RESET LOCATION COUNTER
  1225                                    ;;*****************************************************************
  1226                                    ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
  1227                                    ;INTERFACE SPEC.
  1228
  1229  001000                            $APTHD:
  1230  001000    000000                  $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
  1231  001002    001250                  $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
  1232  001004    000132                  $TSTM:  .WORD   90.     ;;RUN TIM OF LONGEST TEST
  1233  001006    001604                  $PASTM: .WORD   900.    ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
  1234  001010    000144                  $UNITM: .WORD   100.    ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
  1235  001012    000030                          .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         $ISINM: .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      $REGAD: .WORD   0                    ;;CONTAINS THE ADDRESS FROM
                                                         ;;WHICH  ($REG0) WAS OBTAINED
001162  000000      $REG0:  .WORD   0                    ;;CONTAINS (($REGAD)+0)
001164  000000      $REG1:  .WORD   0                    ;;CONTAINS (($REGAD)+2)
001166  000000      $REG2:  .WORD   0                    ;;CONTAINS (($REGAD)+4)
001170  000000      $REG3:  .WORD   0                    ;;CONTAINS (($REGAD)+6)
001172  000000      $REG4:  .WORD   0                    ;;CONTAINS (($REGAD)+10)
001174  000000      $REG5:  .WORD   0                    ;;CONTAINS (($REGAD)+12)
001176  000000      $REG6:  .WORD   0                    ;;CONTAINS (($REGAD)+14)
001200  000000      $REG7:  .WORD   0                    ;;CONTAINS (($REGAD)+16)
001202  000000      $TMP0:  .WORD   0                    ;;USER DEFINED
001204  000000      $TMP1:  .WORD   0                    ;;USER DEFINED
001206  000000      $TMP2:  .WORD   0                    ;;USER DEFINED
001210  000000      $TMP3:  .WORD   0                    ;;USER DEFINED
001212  000000      $TMP4:  .WORD   0                    ;;USER DEFINED
001214  000000      $TMP5:  .WORD   0                    ;;USER DEFINED
001216  000000      $TMP6:  .WORD   0                    ;;USER DEFINED
001220  000000      $TMP7:  .WORD   0                    ;;USER DEFINED
001222  000000      $TMP10: .WORD   0                    ;;USER DEFINED
```

```
1292  001224  000000                  $TMP11: .WORD   0               ;;USER DEFINED
1293  001226  000000                  $TMP12: .WORD   0               ;;USER DEFINED
1294  001230  000000                  $TMP13: .WORD   0               ;;USER DEFINED
1295  001232  000000                  $TMP14: .WORD   0               ;;USER DEFINED
1296  001234  000000                  $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
1297  001236  000000                  $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
1298  001240  177607  000377          $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
1299  001244     077                  $QUES:  .ASCII  /?/             ;;QUESTION MARK
1300  001245     015                  $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
1301  001246  000012                  $LF:    .ASCIZ  <12>            ;;LINE FEED
1302                                  ;;*****************************************************************
1303                                  .SBTTL  APT MAILBOX-ETABLE
1304
1305                                  ;;*****************************************************************
1306                                  .EVEN
1307  001250                          $MAIL:                          ;;APT MAILBOX
1308  001250  000000                  $MSGTY: .WORD   AMSGTY           ;;MESSAGE TYPE CODE
1309  001252  000000                  $FATAL: .WORD   AFATAL           ;;FATAL ERROR NUMBER
1310  001254  000000                  $TESTN: .WORD   ATESTN           ;;TEST NUMBER
1311  001256  000000                  $PASS:  .WORD   APASS            ;;PASS COUNT
1312  001260  000000                  $DEVCT: .WORD   ADEVCT           ;;DEVICE COUNT
1313  001262  000000                  $UNIT:  .WORD   AUNIT            ;;I/O UNIT NUMBER
1314  001264  000000                  $MSGAD: .WORD   AMSGAD           ;;MESSAGE ADDRESS
1315  001266  000000                  $MSGLG: .WORD   AMSGLG           ;;MESSAGE LENGTH
1316  001270                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
1317  001270     000                  $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
1318  001271     000                  $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
1319  001272  000000                  $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
1320  001274  000000                  $USWR:  .WORD   AUSWR           ;;USER SWITCHES
1321  001276  000000                  $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
1322                                  ;*                              BITS 15-11=CPU TYPE
1323                                  ;*                                   11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1324                                  ;*                                   11/70=06,PDQ=07,Q=10
1325                                  ;*                              BIT 10=REAL TIME CLOCK
1326                                  ;*                              BIT  9=FLOATING POINT PROCESSOR
1327                                  ;*                              BIT  8=MEMORY MANAGEMENT
1328  001300     000                  $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
1329  001301     000                  $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
1330                                  ;*                              MEM.TYPE BYTE    --  (HIGH BYTE)
1331                                  ;*                                       900 NSEC CORE=001
1332                                  ;*                                       300 NSEC BIPOLAR=002
1333                                  ;*                                       500 NSEC MOS=003
1334  001302  000000                  $MADR1: .WORD   AMADR1           ;;HIGH ADDRESS,BLK#1
1335                                  ;*                               MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
1336  001304     000                  $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
1337  001305     000                  $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
1338  001306  000000                  $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
1339  001310     000                  $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
1340  001311     000                  $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
1341  001312  000000                  $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
1342  001314     000                  $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
1343  001315     000                  $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
1344  001316  000000                  $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
1345  001320  120210                  $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1346  001322  000000                  $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1347  001324  177440                  $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
```

```
  1348  001326  000000                  $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
  1349  001330                          $ETEND:
  1350                                  .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


001330                                  $ERRTB:
                                        ;       ERROR 1
001330  042704                                  EM000                   ;UNEXPECTED PARITY ERROR
001332  041263                                  DH000C
001334  037510                                  DT000
001336  040026                                  DF000
                                        ;       ERROR 2                 ;UNUSED
001340  000000                                  0
001342  000000                                  0
001344  000000                                  0
001346  000000                                  0
                                        ;       ERROR 3                 ;UNUSED
001350  000000                                  0
001352  000000                                  0
001354  000000                                  0
001356  000000                                  0
                                        ;       ERROR 4                 ;ERROR ATTEMPTING IMPLIED SEEK
001360  042751                                  EM5004                  ;CS1 IN ERROR
001362  043015                                  E5004A
001364  037514                                  DT0004
001366  040032                                  DF0004
                                        ;       ERROR 5                 ;MR1 IN ERROR ATTEMPTING IMPLIED SEEK
001370  042751                                  EM5004
001372  043034                                  E5004B
001374  037532                                  DT0005
001376  040062                                  DF0005
                                        ;       ERROR 6                 ;MR2 IN ERROR ATTEMPTING IMPLIED SEEK
001400  042751                                  EM5004
001402  043053                                  E5004C
001404  037542                                  DT0006
001406  040106                                  DF0006
                                        ;       ERROR 7                 ;MR3 IN ERROR ATTEMPTING IMPLIED SEEK
001410  042751                                  EM5004
001412  043072                                  E5004D
001414  037552                                  DT0007
001416  040132                                  DF0007
                                        ;       ERROR 10                ;MR1 ERROR READING PREAMBLE
001420  043163                                  EM5010
```

```
1407  001422  043034                    E50048
1408  001424  037562                    DT0010
1409  001426  040156                    DF0010
1410
1411                          ;         ERROR 11          ;CS1 ERROR READING PREAMBLE
1412  001430  043163                    EM5010
1413  001432  043015                    E50048
1414  001434  037600                    DT0011
1415  001436  040202                    DF0011
1416
1417                          ;         ERROR 12          ;MR1 IN ERROR HEADER READ/COMPARE
1418  001440  043243                    EM5011
1419  001442  043034                    E50048
1420  001444  037562                    DT0010
1421  001446  040156                    DF0010
1422
1423                          ;         ERROR 13          ;CS1 IN ERROR HEADER READ/COMPARE
1424  001450  043243                    EM5011
1425  001452  043015                    E50048
1426  001454  037600                    DT0011
1427  001456  040202                    DF0011
1428
1429                          ;         ERROR 14          ;PACK ADDRESS ERROR HDR READ/COMPARE
1430  001460  043243                    EM5011
1431  001462  043316                    E5011A
1432  001464  037624                    DT0014
1433  001466  040232                    DF0014
1434
1435                          ;         ERROR 15          ;MR1 ERROR READING GAP
1436  001470  043346                    EM5015
1437  001472  043034                    E50048
1438  001474  037562                    DT0010
1439  001476  040156                    DF0010
1440
1441                          ;         ERROR 16          ;CS1 ERROR AFTER READING GAP
1442  001500  043163                    EM5010
1443  001502  043015                    E50048
1444  001504  037600                    DT0011
1445  001506  040202                    DF0011
1446
1447                          ;         ERROR 17          ;ERROR IN WRITING
1448  001510  000000            EMW:    0                 ;REGISTER IN ERROR AND CLOCK
1449  001512  000000                    0                 ;TRANSITION IS IDENTIFIED
1450  001514  037640                    DT0017
1451  001516  040256                    DF0017
1452
1453                          ;         ERROR 20          ;ERROR IN CS1 AFTER WRITING SYNC
1454  001520  043403                    EM5020
1455  001522  043015                    E50048
1456  001524  037600                    DT0011
1457  001526  040202                    DF0011
1458
1459                          ;         ERROR 21          ;ERROR IN ECC WORDS
1460  001530  043462                    EM5021
1461  001532  043530                    E5021A
1462  001534  037662                    DT0021
```

```
1463  001536  040302                        DF0021
1464
1465                              ;         ERROR 22              ;ERR IN CS1 AFTER WRITE DATA
1466  001540  043462                        EM5021
1467  001542  043015                        E5004A
1468  001544  037600                        DT0011
1469  001546  040202                        DF0011
1470
1471                              ;         ERROR 23              ;ERROR IN MR2
1472  001550  043560                        EM5023                ;DOING MULTI-SECTOR WRITE
1473  001552  043053                        E5004C
1474  001554  037542                        DT0006
1475  001556  040106                        DF0006
1476
1477                              ;         ERROR 24              ;MR3 IN ERROR
1478  001560  043560                        EM5023                ;DOING MULTI-SECTOR WRITE
1479  001562  043072                        E5004D
1480  001564  037552                        DT0007
1481  001566  040132                        DF0007
1482
1483                              ;         ERROR 25              ;CS1 IN ERROR
1484  001570  043560                        EM5023                ;AFTER MULTI-SECTOR WRITE
1485  001572  043015                        E5004A
1486  001574  037514                        DT0004
1487  001576  040032                        DF0004
1488
1489                              ;         ERROR 26
1490  001600  044200                        EM5026                ;NO COE ERROR
1491  001602  000000              EH026:    .WORD   0
1492  001604  037674                        DT0026
1493  001606  040326                        DF0026
1494
1495                              ;         ERROR 27
1496  001610  044340                        EM5027                ;OTHER ERROR WHILE FORCING COE
1497  001612  041232                        DH000A
1498  001614  037674                        DT0026
1499  001616  040326                        DF0026
1500
1501                              ;         ERROR 30
1502  001620  044512                        EM5030                ;UNEXPECTED CYL OVERFLOW
1503  001622  000000              EH030:    .WORD   0
1504  001624  037674                        DT0026
1505  001626  040326                        DF0026
1506
1507                              ;         ERROR 31
1508  001630  044605                        EM5031                ;UNEXPECTED ERROR TESTING COE
1509  001632  000000              EH031:    .WORD   0
1510  001634  037674                        DT0026
1511  001636  040326                        DF0026
1512
1513                              ;         ERROR 32              ;MR1 ERROR READING DATA SYNC
1514  001640  044672                        EM5032
1515  001642  043034                        E5004B
1516  001644  037562                        DT0010
1517  001646  040156                        DF0010
1518
```

```
1519                                    ;       ERROR 33                ;CS1 ERROR AFTER READING SYNC
1520  001650  044672                            EM5032
1521  001652  043015                            E5004A
1522  001654  037600                            DT0011
1523  001656  040202                            DF0011
1524
1525                                    ;       ERROR 34                ;MR1 IN ERROR READING DATA OR ECC
1526  001660  044750                            EM5034
1527  001662  043034                            E5004B
1528  001664  037562                            DT0010
1529  001666  040156                            DF0010
1530
1531                                    ;       ERROR 35                ;ECC ERROR READING DATA
1532  001670  045015                            EM5035
1533  001672  043530                            E5021A
1534  001674  037662                            DT0021
1535  001676  040302                            DF0021
1536
1537                                    ;       ERROR 36                ;CS1 ERROR AFTER READING DATA OR ECC
1538  001700  044750                            EM5034
1539  001702  043015                            E5004A
1540  001704  037600                            DT0011
1541  001706  040202                            DF0011
1542
1543                                    ;       ERROR 37                ;DATA COMPARE ERROR (1ST MESSAGE)
1544  001710  045056                            EM5037
1545  001712  041232                            DH000A
1546  001714  037716                            DT0037
1547  001716  040362                            DF0037
1548
1549                                    ;       ERROR 40                ;DATA COMPARE ERROR (2ND THRU 10TH ERR)
1550  001720  000000                            0
1551  001722  000000                            0
1552  001724  037722                            DT0040
1553  001726  040402                            DF0040
1554
1555                                    ;       ERROR 41
1556  001730  045132                            EM5041                  ;ECC REGISTER INCORRECT AFTER ECC READ
1557  001732  041232                            DH000A
1558  001734  037730                            DT0041
1559  001736  040406                            DF0041
1560
1561                                    ;       ERROR 42
1562  001740  045217                            EM5042                  ;ERROR IN ECC PAT CALCULATION AFTER ECC ERROR
1563  001742  041232                            DH000A
1564  001744  037662                            DT0021
1565  001746  040426                            DF0042
1566
1567                                    ;       ERROR 43
1568  001750  045300                            EM5043                  ;ERROR IN ECC POSITION COUNTING AFTER ECC ERROR
1569  001752  041232                            DH000A
1570  001754  037746                            DT0043
1571  001756  040446                            DF0043
1572
1573                                    ;       ERROR 44
1574  001760  045357                            EM5044                  ;ERROR AFTER PROCESSING DATA CHECK ERR
```

```
1575  001762  043015                    E5004A
1576  001764  037514                    DT0004
1577  001766  040032                    DF0004
1578
1579                          ;         ERROR 45
1580  001770  045357                    EM5044          ;ERROR AFTER PROCESSING DATA CHECK ERR
1581  001772  043111                    E5004E
1582  001774  037760                    DT0045
1583  001776  040466                    DF0045
1584
1585                          ;         ERROR 46
1586  002000  042751                    EM50046         ;TRANSFER LENGTH ERROR PARTIAL SEC READ
1587  002002  041232                    DH000A
1588  002004  037770                    DT0046
1589  002006  040512                    DF0046
1590
1591                          ;         ERROR 47
1592  002010  045521                    EM5047          ;BSE DID NOT PREVENT DA OR DC INCREMENT
1593  002012  043316                    E5011A
1594  002014  037624                    DT0014
1595  002016  040232                    DF0014
1596
1597                          ;         ERROR 50
1598  002020  045614                    EM5050          ;BSE DID NOT CAUSE CERR
1599  002022  043015                    E5004A
1600  002024  037514                    DT0004
1601  002026  040532                    DF0050
1602
1603                          ;         ERROR 51
1604  002030  045667                    EM5051          ;BSE FAILED TO SET WHEN EXPECTED
1605  002032  043111                    E5004E
1606  002034  037760                    DT0045
1607  002036  040466                    DF0045
1608
1609                          ;         ERROR 52
1610  002040  045744                    EM5052          ;DATA XFER ABORT TO SOON
1611  002042  041232                    DH000A
1612  002044  037770                    DT0046
1613  002046  040512                    DF0046
1614
1615                          ;         ERROR 53
1616  002050  046064                    EM5053          ;MR1 ERROR IN WRT CHK OR ECC READ AFTER WRT CHK
1617  002052  043034                    E5004B
1618  002054  037562                    DT0010
1619  002056  040156                    DF0010
1620
1621                          ;         ERROR 54
1622  002060  046153                    EM5054          ;ECC ERROR IN WRITE CHECK OP
1623  002062  043530                    E5021A
1624  002064  037662                    DT0021
1625  002066  040302                    DF0021
1626
1627                          ;         ERROR 55
1628  002070  046064                    EM5053          ;CS1 ERROR AFTER WRT CHK OR ECC READ IN WRT CHK
1629  002072  043015                    E5004A
1630  002074  037600                    DT0011
```

```
1631  002076  040202                        DF0011
1632
1633                                ;       ERROR 56
1634  002100  044750                        EM5034          ;CS1 ERROR AFTER READ DATA OR ECC
1635  002102  043015                        ES004A
1636  002104  037514                        DT0004
1637  002106  040032                        DF0004
1638
1639                                ;       ERROR 57
1640  002110  046064                        EM5053          ;CS1 ERROR AFTER WRITE CHECK OR ECC READ
1641  002112  043015                        ES004A
1642  002114  037514                        DT0004
1643  002116  040032                        DF0004
1644
1645                                ;       ERROR 60
1646  002120  046216                        EM5060          ;WCE FAILED TO SET IN 16 BIT MODE
1647  002122  041232                        DH000A
1648  002124  037716                        DT0037
1649  002126  040556                        DF0060
1650
1651                                ;       ERROR 61
1652  002130  046275                        EM5061          ;TRANSFER LENGTH PROBLEM - RKBA
1653  002132  043127                        ES004F
1654  002134  037770                        DT0046
1655  002136  040576                        DF0061
1656
1657                                ;       ERROR 62
1658  002140  046275                        EM5061          ;TRANSFER LENGTH PROBLEM - RKWC
1659  002142  043145                        ES004G
1660  002144  040000                        DT0062
1661  002146  040622                        DF0062
1662
1663                                ;       ERROR 63
1664  002150  046352                        EM5063          ;WCE FAILED TO SET IN 18 BIT MODE
1665  002152  043145                        ES004G
1666  002154  040010                        DT0063
1667  002156  040646                        DF0063
1668
1669                                .SBTTL  TEMPORARY STORAGE FOR RK611 CONTROLLER REGISTER
1670  002160  000000                T.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
1671  002162  000000                T.WC:   .WORD   0               ;WORD COUNT REGISTER
1672  002164  000000                T.BA:   .WORD   0               ;BUS ADDRESS REGISTER
1673  002166  000000                T.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
1674  002170  000000                T.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
1675  002172  000000                T.DS:   .WORD   0               ;DRIVE STATUS REGISTER
1676  002174  000000                T.ER:   .WORD   0               ;ERROR REGISTER
1677  002176  000000                T.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
1678  002200  000000                T.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
1679  002202  000000                T.DB:   .WORD   0               ;DATA BUFFER
1680  002204  000000                T.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
1681  002206  000000                T.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
1682  002210  000000                T.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
1683  002212  000000                T.ECPS: .WORD   0               ;ECC POSITION INFORMATION
1684  002214  000000                T.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
1685  002216  000000                T.SPAR: .WORD   0               ;SPARE REGISTER
1686
```

```
                                        .SBTTL  EXPECTED RK611 CONTROLLER REGISTERS

002220  000000                E.CS1:  .WORD   0               ;CONTROL AND STATUS REGISTER 1
002222  000000                E.WC:   .WORD   0               ;WORD COUNT REGISTER
002224  000000                E.BA:   .WORD   0               ;BUS ADDRESS REGISTER
002226  000000                E.DA:   .WORD   0               ;DESIRED TRACK SECTOR REGISTER
002230  000000                E.CS2:  .WORD   0               ;CONTROL AND STATUS REGISTER 2
002232  000000                E.DS:   .WORD   0               ;DRIVE STATUS REGISTER
002234  000000                E.ER:   .WORD   0               ;ERROR REGISTER
002236  000000                E.ASOF: .WORD   0               ;ATTENTION SUMMARY AND OFFSET REGISTER
002240  000000                E.DCYL: .WORD   0               ;DESIRED CYLINDER REGISTER
002242  000000                E.DB:   .WORD   0               ;DATA BUFFER
002244  000000                E.MR1:  .WORD   0               ;MAINTENANCE REGISTER 1
002246  000000                E.MR2:  .WORD   0               ;MAINTENANCE REGISTER 2
002250  000000                E.MR3:  .WORD   0               ;MAINTENANCE REGISTER 3
002252  000000                E.ECPS: .WORD   0               ;ECC POSITION INFORMATION
002254  000000                E.ECPT: .WORD   0               ;ECC PATTERN INFORMATION
002256  000000                E.SPAR: .WORD   0               ;SPARE REGISTER

                                        .SBTTL  "L" REGISTERS FOR COMMAND START
002260  000000                L.CS1:  .WORD   0               ;CONTROL AND STATUS 1
002262  000000                L.WC:   .WORD   0               ;WORD COUNT
002264  000000                L.BA:   .WORD   0               ;BUFER ADDRESS
002266                          L.DA:                         ;DESIRED
002266     000                  L.DS:   .BYTE   0               ;SECTOR
002267     000                  L.DT:   .BYTE   0               ;TRACK
002270  000000                L.CS2:  .WORD   0               ;CONTROL AND STATUS
002272  000000                L.ASOF: .WORD   0               ;ATTENTION AND OFFSET
002274  000000                L.DCYL: .WORD   0               ;DESIRED CYLINDER
002276  000000                L.MR1:  .WORD   0               ;MAINT. REG 1
002300  000000                L.MR2:  .WORD   0               ;MAINT. REG 2
002302  000000                L.MR3:  .WORD   0               ;MAINT. REG 3


                                        .SBTTL  PROGRAM DEFINED VARIABLES

002304  000210                RKVEC:  .WORD   ^10             ;RK611 VECTOR
002306  000240                RKPRI:  .WORD   PR5             ;RK611 PRIORITY
002310  000000                TRAPPC: .WORD   0               ;PC FOR MEMORY CHFCK ENABLE TRAP
002312  000000                SRTFLG: .WORD   0               ;START FLAG
                                                            ;   0 = 200
                                                            ;   1 = 214
                                                            ;  -1 = 204
002314  000000                ERRCNT: .WORD   0               ;ERROR COUNT FOR SWITCH 12 ABORT
002316  000000                P1.BIT: .WORD   0               ;NEXT BIT IN DATA SIMULATION
002320  000000                PR.BIT: .WORD   0               ;PRESENT BIT IN DATA SIMULATION
002322  000000                M1.BIT: .WORD   0               ;PREVIOUS BIT IN DATA SIMULATION
002324  000000                M2.BIT: .WORD   0               ;BIT BEFORE PREVIOUS BIT
002326  000000                BITCNT: .WORD   0               ;BIT POSITION
002330  000000                WRDCNT: .WORD   0               ;WORD COUNT FOR NPR TRANSFER
002332  000000                MEMPAR: .WORD   0               ;MEMORY EMABLE ON FIRST 24K
002334  000000                BADPAR: .WORD   0               ;BAD PARITY FLAG
002336  000000                ECCXOR: .WORD   0               ;ECC XOR SWITCH
002340  000000                ECCHI:  .WORD   0               ;ECC HIGH STORAGE
002342  000000                ECCLO:  .WORD   0               ;ECC LOW STORAGE
```

```
  1743  002344  000000                ECCSRC: .WORD   0               ;ECC SOURCE FLAG
  1744  002346  000000                ECPATX: .WORD   0               ;EXPECTED PATTERN ON ERROR
  1745  002350  000000                ECPOSX: .WORD   0               ;EXPECTED POSITION ON ERROR
  1746  002352  000000                BSEDES: .WORD   0               ;BAD SECTOR DESIRED
  1747  002354  000000                HIBITS: .WORD   0               ;HI ORDER BITS FOR 18 BIT WORD XFER
  1748  002356  000000                SAVSWR: .WORD   0               ;STORAGE FOR SWITCH REGISTER
```

```
                                        .SBTTL  PROGRAM SETUP
                                
002360  012737  000001  002312  PARM:   MOV     #1,SRTFLG       ;LOAD START FLAG FOR PARMETER START
002366  000406                          BR      START1
                                
002370  012737  177777  002312  RESTRT: MOV     #-1,SRTFLG      ;LOAD START FLAG FOR RESTART
002376  000402                          BR      START1
                                
002400  005037  002312          START:  CLR     SRTFLG          ;CLEAR START FLAG
002404  000005                  START1: RESET                   ;RESET THE WHOLE SYSTEM
002406  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
002412  012706  001100                  MOV     #STACK,SP       ;INITIALIZE STACK POINTER
002416  012746  000340                  MOV     #PR7,-(SP)      ;LOAD STACK TO LOCK OUT ALL INTERRUPTS
002422  012746  002430                  MOV     #1$,-(SP)       ;LOAD START OF PROGRAM
002426  000002                          RTI                     ;LOAD PSW
                                
002430  004737  035602          1$:     JSR     PC,@#$TKINT     ;INIT KEYBOARD
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
002434  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
002440  005026                  1$:     CLR     (R6)+           ;;CLEAR MEMORY LOCATION
002442  022706  001140                  CMP     #SWR,R6 ;;DONE?
002446  001374                          BNE     .-6             ;;LOOP BACK IF NO
002450  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
002454  012737  033160  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
002462  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
002470  012737  034060  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
002476  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
002504  012737  037420  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
002512  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
002520  012737  037264  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
002526  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
002534  013737  023142  023134          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
002542  005037  001234                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
002546  005037  001236                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
002552  112737  000001  001115          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
002560  012737  002560  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
002566  012737  002566  001110          MOV     #.,$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.
002574  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
002600  012737  002634  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
002606  012737  177570  001140          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
002614  012737  177570  001142          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
002622  022777  177777  176310          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
002630  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
002632  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
002634  012716  002642          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
002640  000002                          RTI
002642  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
002650  012737  000174  001142          MOV     #DISPREG,DISPLAY
002656  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

002662  005037  001256                  CLR     $PASS           ;;CLEAR PASS COUNT
```

```
1805  002666  132737  000200  001271          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
1806  002674  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
1807  002676  012737  001272  001140          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
1808  002704                          67$:
1809  002704  005037  002314                  CLR     ERRCNT          ;CLEAR ERROR COUNT FOR SWITCH 12 ABORT
1810                                  .SBTTL  TYPE PROGPAM NAME
1811                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
1812  002710  005227  177777                  INC     #-1             ;;FIRST TIME?
1813  002714  001056                          BNE     68$             ;;BRANCH IF NO
1814  002716  022737  023276  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
1815  002724  001452                          BEQ     68$             ;;BRANCH IF YES
1816  002726  104401  002774                  TYPE    ,69$            ;;TYPE ASCIZ STRING
1817                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
1818  002732  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
1819  002736  001012                          BNE     70$             ;;BRANCH IF YES
1820  002740  123727  001270  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
1821  002746  001406                          BEQ     70$             ;;BRANCH IF YES
1822  002750  023727  001140  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
1823  002756  001005                          BNE     71$             ;;BRANCH IF NO
1824  002760  104406                          GTSWR                   ;;GET SOFT-SWR SETTINGS
1825  002762  000403                          BR      71$
1826  002764  112737  000001  001134  70$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
1827  002772                          71$:
1828  002772  000427                          BR      68$             ;;GET OVER THE ASCIZ
1829                                  ;;69$:  .ASCIZ  <CRLF>/RK611 DISKLESS DIAGNOSTIC: PART 5  CZR6EB0/<CRLF>
1830  003052                          68$:
1831  003052  005227  177777                  INC     #-1             ;TEST IF PASS 0
1832  003056  001002                          BNE     4$              ;NO - SKIP
1833  003060  104401  041004                  TYPE    ,OPR006         ;TYPE PASS TIME MESSAGE
1834  003064  022737  000001  002312  4$:     CMP     #1,SRTFLG       ;CHECK IF PARAMETER START
1835  003072  001121                          BNE     15$             ;NO, CONTINUE SETUP
1836  003074  104401  040672          5$:     TYPE    ,OPR001         ;TYPE "RK611 BUS ADDRESS (   ) ="
1837  003100  013746  001324                  MOV     $BASE,-(SP)     ;;SAVE $BASE FOR TYPEOUT
1838  003104  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1839  003106  104401  040724                  TYPE    ,OPR002
1840  003112  104412                          RDOCT                   ;GET VALUE
1841  003114  012637  001202                  MOV     (SP)+,$TMP0
1842  003120  001407                          BEQ     7$              ;CHECK IF <CR>
1843  003122  022737  160000  001202          CMP     #160000,$TMP0   ;CHECK IF IN I/O PAGE
1844  003130  101361                          BHI     5$
1845  003132  013737  001202  001324          MOV     $TMP0,$BASE     ;LOAD NEW BUS ADDRESS
1846  003140  104401  040732          7$:     TYPE    ,OPR003         ;TYPE "RK611 VECTOR ADDRESS (   ) ="
1847  003144  013746  001320                  MOV     $VECT1,-(SP)    ;TYPE OUT VECTOR ADDRESS
1848  003150  042716  160000                  BIC     #160000,(SP)
1849  003154  104401  040724                  TYPE    ,OPR002
1850  003160  104412                          RDOCT                   ;GET VALUE
1851  003162  012637  001202                  MOV     (SP)+,$TMP0
1852  003166  001412                          BEQ     10$             ;CHECK IF <CR>
1853  003170  022737  001000  001202          CMP     #1000,$TMP0     ;CHECK IF LEGAL
1854  003176  101760                          BLOS    7$
1855  003200  042737  017777  001320          BIC     #17777,$VECT1   ;LOAD NEW VECTOR ADDRESS
1856  003206  053737  001202  001320          BIS     $TMP0,$VECT1
1857  003214  104401  040762          10$:    TYPE    ,OPR004         ;TYPE "RK611 PRIORITY (   ) ="
1858  003220  005046                          CLR     -(SP)
1859  003222  113716  001321                  MOVB    $VECT1+1,(SP)
1860  003226  006216                          ASR     (SP)            ;SHIFT 5 BITS RIGHT
```

```
1861  003230  006216                          ASR     (SP)
1862  003232  006216                          ASR     (SP)
1863  003234  006216                          ASR     (SP)
1864  003236  006216                          ASR     (SP)
1865  003240  104402                          TYPOC
1866  003242  104401  040724                 TYPE    ,OPR002
1867  003246  104412                          RDOCT                   ;GET VALUE
1868  003250  012637  001202                 MOV     (SP)+,$TMP0
1869  003254  001430                          BEQ     15$             ;CHECK FOR DEFAULT
1870  003256  022737  000007  001202         CMP     #7,$TMP0        ;CHECK IF LEGAL
1871  003264  103753                          BLO     10$
1872  003266  022737  000004  001202         CMP     #4,$TMP0
1873  003274  101347                          BHI     10$
1874  003276  006337  001202                 ASL     $TMP0           ;SHIFT 5 BITS LEFT
1875  003302  006337  001202                 ASL     $TMP0
1876  003306  006337  001202                 ASL     $TMP0
1877  003312  006337  001202                 ASL     $TMP0
1878  003316  006337  001202                 ASL     $TMP0
1879  003322  042737  160000  001320         BIC     #160000,$VECT1  ;STORE NEW PRIORITY
1880  003330  153737  001202  001321         BISB    $TMP0,$VECT1+1
1881  003336  013737  001320  002304  15$:    MOV     $VECT1,RKVEC    ;STORE RK611 VECTOR
1882  003344  042737  160000  002304         BIC     #160000,RKVEC
1883  003352  113737  001321  002306         MOVB    $VECT1+1,RKPRI  ;STORE PRIORITY
1884  003360  004737  032652                 JSR     PC,$SIZE        ;SIZE MEMORY
1885
1886  003364  013702  001324         NEWPAS: MOV     $BASE,R2        ;SET RK POINTER
1887  003370  005037  001236                 CLR     $ESCAPE         ;CLEAR ESCAPE
1888  003374  004737  032516                 JSR     PC,PARCHK       ;CHECK OF MEMORY CHECK ENABLE
1889  003400  012746  000000                 MOV     #PR0,-(SP)      ;LOCK OUT INTERRUPTS
1890  003404  012746  003412                 MOV     #TST1,-(SP)
1891  003410  000002                          RTI
```

```
                                .SBTTL  **MULTI-SECTOR WRITE OPERATIONS

                                ;;*************************************************************
                                ;*TEST 1         MULTI-SECTOR WRITE (PART 1)
                                ;*
                                ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                                ;*      DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                                ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                                ;*      AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND THE
                                ;*      TWO ECC WORDS.  MAKE SURE THE NEXT HEADER RECOGNITION
                                ;*      CYCLE STARTS AND THE PROPER HEADER IS SEARCHED FOR.
                                ;*      PROVIDE A SECOND GOOD HEADER AND CHECK RECOGNITION
                                ;*      OF HEADER.
                                ;*
                                ;;*************************************************************
003412  000014                  TST1:   SCOPE
003414  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS

003422  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLR CONTROLLER

003430  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
003434  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE TO SET
                                                                ;ECCW IN RKMR1 FROM INIT POWER UP

003440  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
003444  000000                          0                       ;CYLINDER 0
003446     000                          .BYTE   0               ;SECTOR 0
003447     000                          .BYTE   0               ;TRACK 0
003450  047636                          OBUFF                   ;BUFFER ADDRESS OBUFF
003452  177377                          -401                    ;WORD COUNT -401
003454  000025                          WRDATA                  ;COMMAND WRDATA

003456  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
003462  000001                          1                       ;PATTERN 1

003464  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION

003470  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
003474  104004                          ERROR   4               ;CS1 MISCOMPARE
003476  104005                          ERROR   5               ;MR1     "
003500  104006                          ERROR   6               ;MR2     "
003502  104007                          ERROR   7               ;MR3     "

003504  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE

003510  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
003514  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
003516  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR

003520  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
003524  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
003526  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
003530  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
```

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1948  003532  012737  043403  001510          MOV     #EM5020,EMW     ;SET MESSAGE FOR WRITE FAILURE
1949  003540  004437  025204                  JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
1950  003544  104015                          ERROR   15              ;MR1 IN ERROR IN READ GAP
1951  003546  104016                          ERROR   16              ;CS1 IN ERROR AFTER READ GAP
1952  003550  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
1953  003552  104020                          ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
1954
1955  003554  012737  043462  001510          MOV     #EM5021,EMW     ;SET MESSAGE FOR WRITE FAILURE
1956  003562  004437  025604                  JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
1957  003566  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
1958  003570  104021                          ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
1959  003572  104022                          ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
1960
1961  003574  012700  000034                  MOV     #7*4,R0         ;ISSUE CLOCKS TO NEXT HDR COMPARE
1962  003600  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)     ;CLOCK LOOP
1963  003606  012762  000040  000026          MOV     #DMD,RKMR1(R2)
1964  003614  005300                          DEC     R0
1965  003616  001370                          BNE     1$
1966
1967  003620  013703  002274                  MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
1968  003624  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
1969  003630  010337  002246                  MOV     R3,E.MR2        ;STORE EXPECTED MR2
1970  003634  113703  002267                  MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
1971  003640  042703  177400                  BIC     #177400,R3      ;CLEAR UNUSED BITS
1972  003644  012700  000005                  MOV     #5,R0           ;SET COUNT FOR SHIFTING
1973  003650  006303                  5$:     ASL     R3              ;SHIFT TRACK FOR HEADER ALIGNMENT
1974  003652  005300                          DEC     R0              ;DEC COUNT
1975  003654  001375                          BNE     5$              ;LOOP UNTIL ZERO
1976  003656  153703  002266                  BISB    L.DS,R3         ;INSERT SECTOR  NUMBER
1977
1978  003662  032737  010000  002260          BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
1979  003670  001402                          BEQ     6$              ;NO - SKIP
1980  003672  052703  001000                  BIS     #BIT9,R3        ;SET FORMAT BIT FOR WORD TWO
1981  003676                          6$:
1982  003676  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
1983  003702  010337  002250                  MOV     R3,E.MR3        ;STORE EXPECTED MR3
1984  003706  016237  000034  002206          MOV     RKMR2(R2),T.MR2 ;GET MR2
1985  003714  016237  000036  002210          MOV     RKMR3(R2),T.MR3 ;GET MR3
1986  003722  016237  000000  002160          MOV     RKCS1(R2),T.CS1 ;GET CS1
1987  003730  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
1988  003736  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF OK
1989  003744  001402                          BEQ     3$              ;YES - SKIP
1990  003746  104025                          ERROR   25              ;CS1 IN ERROR AT MULTI-SECTOR TIME
1991  003750  000427                          BR      TST2            ;;GO TC NEXT TEST
1992
1993  003752  023737  002206  002246  3$:     CMP     T.MR2,E.MR2     ;CHECK IF MR2 OK
1994  003760  001402                          BEQ     2$              ;YES - SKIP
1995  003762  104023                          ERROR   23              ;MR2 IN ERROR AT MULTI-SECTOR TI 1E
1996  003764  000421                          BR      TST2            ;;GO TO NEXT TEST
1997
1998  003766  023737  002210  002250  2$:     CMP     T.MR3,E.MR3     ;CHECK IF MR3 OK
1999  003774  001402                          BEQ     4$              ;YES - SKIP
2000  003776  104024                          ERROR   24              ;MR3 IN ERROR AT MULTI-SECTOR TIME
2001  004000  000413                          BR      TST2            ;;GO TO NEXT TEST
2002
2003  004002  004437  023316          4$:     JSR     R4,DSECTR       ;SIMULATE 2ND SECTOR PULSE
```

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2004
2005  004006  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE PREAMBLE
2006  004012  104010                          ERROR   10              ;MR1 ERROR
2007  004014  104011                          ERROR   11              ;CS1 ERROR
2008
2009  004016  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2010  004022  104012                          ERROR   12              ;MR1 ERROR
2011  004024  104013                          ERROR   13              ;CS1 ERROR
2012  004026  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR
2013
2014                                  ;;*****************************************************************
2015                                  ;*TEST 2        MULTI-SECTOR WRITE (PART 2)
2016                                  ;*
2017                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2018                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2019                                  ;*      DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2020                                  ;*      CYLINDER 0, HEAD 0, SECTOR 23.  CLOCK THROUGH SEEK
2021                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2022                                  ;*      AND A GOOD HEADER, CLOCK THROUGH 400 WORDS AND THE
2023                                  ;*      TWO ECC WORDS.  MAKE SURE THE NEXT HEADER RECOGNITION
2024                                  ;*      CYCLE STARTS AND THE PROPER HEADER IS SEARCHED FOR.
2025                                  ;*      PROVIDE A SECOND GOOD HEADER AND CHECK RECOGNITION
2026                                  ;*      OF HEADER.
2027                                  ;*
2028                                  ;*****************************************************************
2029  004030  000004                  TST2:   SCOPE
2030  004032  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2031
2032  004040  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2033
2034  004046  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2035
2036  004052  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2037  004056  000000                          0                       ;CYLINDER 0
2038  004060     023                          .BYTE   23              ;SECTOR 23
2039  004061     000                          .BYTE   0               ;TRACK 0
2040  004062  047636                          OBUFF                   ;BUFFER ADDRESS OBUFF
2041  004064  177377                          -401                    ;WORD COUNT -401
2042  004066  000023                          WRDATA                  ;COMMAND WRDATA
2043
2044  004070  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
2045  004074  000002                          2                       ;PATTERN 2
2046
2047  004076  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
2048
2049  004102  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2050  004106  104004                          ERROR   4               ;CS1 MISCOMPARE
2051  004110  104005                          ERROR   5               ;MR1     "
2052  004112  104006                          ERROR   6               ;MR2     "
2053  004114  104007                          ERROR   7               ;MR3     "
2054
2055  004116  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2056
2057  004122  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2058  004126  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2059  004130  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
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2060
2061  004132  004437  024276                    JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2062  004136  104012                            ERROR   12              ;MR1 CONTENTS IN ERROR
2063  004140  104013                            ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2064  004142  104014                            ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2065
2066  004144  012737  043403  001510            MOV     #EMS020,EMW     ;SET MESSAGE FOR WRITE FAILURE
2067  004152  004437  025204                    JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2068  004156  104015                            ERROR   15              ;MR1 IN ERROR IN READ GAP
2069  004160  104016                            ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2070  004162  104017                            ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2071  004164  104020                            ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2072
2073  004166  012737  043462  001510            MOV     #EMS021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2074  004174  004437  025604                    JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2075  004200  104017                            ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2076  004202  104021                            ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2077  004204  104022                            ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2078
2079  004206  012700  000034                    MOV     #7*4,R0         ;ISSUE CLOCKS TO NEXT HDR COMPARE
2080  004212  012762  000440  000026  1$:       MOV     #DMD!MCLK,RKMR1(R2)     ;CLOCK LOOP
2081  004220  012762  000040  000026            MOV     #DMD,RKMR1(R2)
2082  004226  005300                            DEC     R0
2083  004230  001370                            BNE     1$
2084
2085  004232  013703  002274                    MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
2086  004236  004437  032444                    JSR     R4,FSBLVV       ;INVERT WORD
2087  004242  010337  002246                    MOV     R3,E.MR2        ;STORE EXPECTED MR2
2088  004246  113703  002267                    MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
2089  004252  042703  177400                    BIC     #177400,R3      ;CLEAR UNUSED BITS
2090  004256  012700  000005                    MOV     #5,R0           ;SET COUNT FOR SHIFTING
2091  004262  006303                    5$:     ASL     R3              ;SHIFT TRACK FOR HEADER ALIGNMENT
2092  004264  005300                            DEC     R0              ;DEC COUNT
2093  004266  001375                            BNE     5$              ;LOOP UNTIL ZERO
2094  004270  153703  002266                    BISB    L.DS,R3         ;INSERT SECTOR  NUMBER
2095
2096  004274  032737  010000  002260            BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
2097  004302  001402                            BEQ     6$              ;NO - SKIP
2098  004304  052703  001000                    BIS     #BIT9,R3        ;SET FORMAT BIT FOR WORD TWO
2099  004310                            6$:
2100  004310  004437  032444                    JSR     R4,FSBLVV       ;INVERT WORD
2101  004314  010337  002250                    MOV     R3,E.MR3        ;STORE EXPECTED MR3
2102  004320  016237  000034  002206            MOV     RKMR2(R2),T.MR2 ;GET MR2
2103  004326  016237  000036  002210            MOV     RKMR3(R2),T.MR3 ;GET MR3
2104  004334  016237  000000  002160            MOV     RKCS1(R2),T.CS1 ;GET CS1
2105  004342  013737  002260  002220            MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
2106  004350  023737  002160  002220            CMP     T.CS1,E.CS1     ;CHECK IF OK
2107  004356  001402                            BEQ     3$              ;YES - SKIP
2108  004360  104025                            ERROR   25              ;CS1 IN ERROR AT MULTI-SECTOR TIME
2109  004362  000427                            BR      TST3            ;;GO TO NEXT TEST
2110
2111  004364  023737  002206  002246  3$:       CMP     T.MR2,E.MR2     ;CHECK IF MR2 OK
2112  004372  001402                            BEQ     2$              ;YES - SKIP
2113  004374  104023                            ERROR   23              ;MR2 IN ERROR AT MULTI-SECTOR TIME
2114  004376  000421                            BR      TST3            ;;GO TO NEXT TEST
2115
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2116  004400  023737  002210  002250  2$:     CMP     T.MR3,E.MR3     ;CHECK IF MR3 OK
2117  004406  001402                          BEQ     4$              ;YES - SKIP
2118  004410  104024                          ERROR   24              ;MR3 IN ERROR AT MULTI-SECTOR TIME
2119  004412  000413                          BR      TST3            ;;GO TO NEXT TEST
2120
2121  004414  004437  023316          4$:     JSR     R4,DSECTR       ;SIMULATE 2ND SECTOR PULSE
2122
2123  004420  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE PREAMBLE
2124  004424  104010                          ERROR   10              ;MR1 ERROR
2125  004426  104011                          ERROR   11              ;CS1 ERROR
2126
2127  004430  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2128  004434  104012                          ERROR   12              ;MR1 ERROR
2129  004436  104013                          ERROR   13              ;CS1 ERROR
2130  004440  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR
2131
2132                                  ;;**********************************************************************
2133                                  ;*TEST 3         MID-TRANSFER SEEK (PART 1)
2134                                  ;*
2135                                  ;*       CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2136                                  ;*       PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2137                                  ;*       DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2138                                  ;*       CYLINDER 0, HEAD 0, SECTOR 25.  CLOCK THROUGH SEEK
2139                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2140                                  ;*       AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND THE
2141                                  ;*       TWO WORD ECC.  MAKE SURE THE CONTROLLER ISSUES
2142                                  ;*       AN IMPLIED SEEK TO THE RIGHT HEAD AND CYLINDER.
2143                                  ;*       MAKE SURE THE NEXT HEADER RECOGNITION PROCEEDS PROPERLY.
2144                                  ;*
2145                                  ;;**********************************************************************
2146  004442  000004          TST3:   SCOPE
2147  004444  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2148
2149  004452  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2150
2151  004460  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2152
2153  004464  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2154  004470  000000                          0                       ;CYLINDER 0
2155  004472      025                         .BYTE   25              ;SECTOR 25
2156  004473      000                         .BYTE   0               ;TRACK 0
2157  004474  047636                          OBUFF                   ;BUFFER ADDRESS OBUFF
2158  004476  177377                          -401                    ;WORD COUNT -401
2159  004500  000023                          WRDATA                  ;COMMAND WRDATA
2160
2161  004502  004437  032614                  JSR     R4,BLDDAT       ;GO BUILD DATA
2162  004506  000003                          3                       ;PATTERN 3
2163
2164  004510  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
2165
2166  004514  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2167  004520  104004                          ERROR   4               ;CS1 MISCOMPARE
2168  004522  104005                          ERROR   5               ;MR1     "
2169  004524  104006                          ERROR   6               ;MR2     "
2170  004526  104007                          ERROR   7               ;MR3     "
2171
```

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2172  004530  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2173
2174  004534  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2175  004540  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2176  004542  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
2177
2178  004544  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2179  004550  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
2180  004552  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2181  004554  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2182
2183  004556  012737  043403  001510          MOV     #EM5020,EMW     ;SET MESSAGE FOR WRITE FAILURE
2184  004564  004437  025204                  JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2185  004570  104015                          ERROR   15              ;MR1 IN ERROR IN READ GAP
2186  004572  104016                          ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2187  004574  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2188  004576  104020                          ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2189
2190  004600  012737  043462  001510          MOV     #EM5021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2191  004606  004437  025604                  JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2192  004612  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2193  004614  104021                          ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2194  004616  104022                          ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2195
2196  004620  012700  000324                  MOV     #53.*4,R0               ;ISSUE CLOCKS TO NEXT HDR COMPARE
2197  004624  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)     ;CLOCK LOOP
2198  004632  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2199  004640  005300                          DEC     R0
2200  004642  001370                          BNE     1$
2201
2202  004644  013703  002274                  MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
2203  004650  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
2204  004654  010337  002246                  MOV     R3,E.MR2        ;STORE EXPECTED MR2
2205  004660  113703  002267                  MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
2206  004664  042703  177400                  BIC     #177400,R3      ;CLEAR UNUSED BITS
2207  004670  012700  000005                  MOV     #5,R0           ;SET COUNT FOR SHIFTING
2208  004674  006303                  5$:     ASL     R3              ;SHIFT TRACK FOR HEADER ALIGNMENT
2209  004676  005300                          DEC     R0              ;DEC COUNT
2210  004700  001375                          BNE     5$              ;LOOP UNTIL ZERO
2211  004702  153703  002266                  BISB    L.DS,R3         ;INSERT SECTOR  NUMBER
2212
2213  004706  032737  010000  002260          BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
2214  004714  001402                          BEQ     6$              ;NO - SKIP
2215  004716  052703  001000                  BIS     #BIT9,R3        ;SET FORMAT BIT FOR WORD TWO
2216  004722                          6$:
2217  004722  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
2218  004726  010337  002250                  MOV     R3,E.MR3        ;STORE EXPECTED MR3
2219  004732  016237  000034  002206          MOV     RKMR2(R2),T.MR2 ;GET MR2
2220  004740  016237  000036  002210          MOV     RKMR3(R2),T.MR3 ;GET MR3
2221  004746  016237  000000  002160          MOV     RKCS1(R2),T.CS1 ;GET CS1
2222  004754  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
2223  004762  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF OK
2224  004770  001402                          BEQ     3$              ;YES - SKIP
2225  004772  104025                          ERROR   25              ;CS1 IN ERROR AT MULTI-SECTOR TIME
2226  004774  000427                          BR      TST4            ;;GO TO NEXT TEST
2227
```

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2228  004776  023737  002206  002246  3$:   CMP     T.MR2,E.MR2     ;CHECK IF MR2 OK
2229  005004  001402                        BEQ     2$              ;YES - SKIP
2230  005006  104023                        ERROR   23              ;MR2 IN ERROR AT MULTI-SECTOR TIME
2231  005010  000421                        BR      TST4            ;;GO TO NEXT TEST
2232
2233  005012  023737  002210  002250  2$:   CMP     T.MR3,E.MR3     ;CHECK IF MR3 OK
2234  005020  001402                        BEQ     4$              ;YES - SKIP
2235  005022  104024                        ERROR   24              ;MR3 IN ERROR AT MULTI-SECTOR TIME
2236  005024  000413                        BR      TST4            ;;GO TO NEXT TEST
2237
2238  005026  004437  023316          4$:   JSR     R4,DSECTR       ;SIMULATE 2ND SECTOR PULSE
2239
2240  005032  004437  023740                JSR     R4,DRSYNC       ;SIMULATE PREAMBLE
2241  005036  104010                        ERROR   10              ;MR1 ERROR
2242  005040  104011                        ERROR   11              ;CS1 ERROR
2243
2244  005042  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2245  005046  104012                        ERROR   12              ;MR1 ERROR
2246  005050  104013                        ERROR   13              ;CS1 ERROR
2247  005052  104014                        ERROR   14              ;RKDCYL OR RKDA IN ERROR
2248
2249                                ;;*****************************************************************
2250                                ;*TEST 4        MID-TRANSFER SEEK (PART 2)
2251                                ;*
2252                                ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2253                                ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2254                                ;*      DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2255                                ;*      CYLINDER 0, HEAD 2, SECTOR 25.  CLOCK THROUGH SEEK
2256                                ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2257                                ;*      AND A GOOD HEADER, CLOCK THROUGH 400 WORDS AND THE
2258                                ;*      TWO WORD ECC.  MAKE SURE THE CONTROLLER ISSUES
2259                                ;*      AN IMPLIED SEEK TO THE RIGHT HEAD AND CYLINDER.
2260                                ;*      MAKE SURE THE NEXT HEADER RECOGNITION PROCEEDS PROPERLY.
2261                                ;*
2262                                ;;*****************************************************************
2263  005054  000004                TST4:   SCOPE
2264  005056  012737  000012  001234        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2265
2266  005064  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2267
2268  005072  005037  002352                CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2269
2270  005076  004437  032230                JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2271  005102  000000                        0                       ;CYLINDER 0
2272  005104      025                       .BYTE   25              ;SECTOR 25
2273  005105      002                       .BYTE   2               ;TRACK 2
2274  005106  047636                        OBUFF                   ;BUFFER ADDRESS OBUFF
2275  005110  177377                        -401                    ;WORD COUNT -401
2276  005112  000023                        WRDATA                  ;COMMAND WRDATA
2277
2278  005114  004437  032014                JSR     R4,BLDDAT       ;GO BUILD DATA
2279  005120  000004                        4                       ;PATTERN 4
2280
2281  005122  004437  032274                JSR     R4,OPSTRT       ;START THE OPERATION
2282
2283  005126  004437  023334                JSR     R4.DISEEK       ;SIMULATE IMPLIED SEEK
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2284  005132  104004                          ERROR   4               ;CS1 MISCOMPARE
2285  005134  104005                          ERROR   5               ;MR1     "
2286  005136  104006                          ERROR   6               ;MR2     "
2287  005140  104007                          ERROR   7               ;MR3     "
2288
2289  005142  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2290
2291  005146  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2292  005152  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2293  005154  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
2294
2295  005156  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2296  005162  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
2297  005164  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2298  005166  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2299
2300  005170  012737  043403  001510          MOV     #EM5020,EMW     ;SET MESSAGE FOR WRITE FAILURE
2301  005176  004437  025204                  JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2302  005202  104015                          ERROR   15              ;MR1 IN ERROR IN READ GAP
2303  005204  104016                          ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2304  005206  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2305  005210  104020                          ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2306
2307  005212  012737  043462  001510          MOV     #EM5021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2308  005220  004437  025604                  JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2309  005224  104017                          ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2310  005226  104021                          ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2311  005230  104022                          ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2312
2313  005232  012700  000324                  MOV     #53.*4,R0               ;ISSUE CLOCKS TO NEXT HDR COMPARE
2314  005236  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)     ;CLOCK LOOP
2315  005244  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2316  005252  005300                          DEC     R0
2317  005254  001370                          BNE     1$
2318
2319  005256  013703  002274                  MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
2320  005262  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
2321  005266  010337  002246                  MOV     R3,E.MR2        ;STORE EXPECTED MR2
2322  005272  113703  002267                  MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
2323  005276  042703  177400                  BIC     #177400,R3      ;CLEAR UNUSED BITS
2324  005302  012700  000005                  MOV     #5,R0           ;SET COUNT FOR SHIFTING
2325  005306  006303                  5$:     ASL     R3              ;SHIFT TRACK FOR HEADER ALIGNMENT
2326  005310  005300                          DEC     R0              ;DEC COUNT
2327  005312  001375                          BNE     5$              ;LOOP UNTIL ZERO
2328  005314  153703  002266                  BISB    L.DS,R3         ;INSERT SECTOR  NUMBER
2329
2330  005320  032737  010000  002260          BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
2331  005326  001402                          BEQ     6$              ;NO - SKIP
2332  005330  052703  001000                  BIS     #BIT9,R3        ;SET FORMAT BIT FOR WORD TWO
2333  005334                          6$:
2334  005334  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
2335  005340  010337  002250                  MOV     R3,E.MR3        ;STORE EXPECTED MR3
2336  005344  016237  000034  002206          MOV     RKMR2(R2),T.MR2 ;GET MR2
2337  005352  016237  000036  002210          MOV     RKMR3(R2),T.MR3 ;GET MR3
2338  005360  016237  000000  002160          MOV     RKCS1(R2),T.CS1 ;GET CS1
2339  005366  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
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2340  005374  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF OK
2341  005402  001402                          BEQ     3$              ;YES - SKIP
2342  005404  104025                          ERROR   25              ;CS1 IN ERROR AT MULTI-SECTOR TIME
2343  005406  000427                          BR      TST5            ;;GO TO NEXT TEST
2344
2345  005410  023737  002206  002246  3$:     CMP     T.MR2,E.MR2     ;CHECK IF MR2 OK
2346  005416  001402                          BEQ     2$              ;YES - SKIP
2347  005420  104023                          ERROR   23              ;MR2 IN ERROR AT MULTI-SECTOR TIME
2348  005422  000421                          BR      TST5            ;;GO TO NEXT TEST
2349
2350  005424  023737  002210  002250  2$:     CMP     T.MR3,E.MR3     ;CHECK IF MR3 OK
2351  005432  001402                          BEQ     4$              ;YES - SKIP
2352  005434  104024                          ERROR   24              ;MR3 IN ERROR AT MULTI-SECTOR TIME
2353  005436  000413                          BR      TST5            ;;GO TO NEXT TEST
2354
2355  005440  004437  023316          4$:     JSR     R4,DSECTR       ;SIMULATE 2ND SECTOR PULSE
2356
2357  005444  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE PREAMBLE
2358  005450  104010                          ERROR   10              ;MR1 ERROR
2359  005452  104011                          ERROR   11              ;CS1 ERROR
2360
2361  005454  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2362  005460  104012                          ERROR   12              ;MR1 ERROR
2363  005462  104013                          ERROR   13              ;CS1 ERROR
2364  005464  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR
2365
2366
2367                          ;;**************************************************************
2368                          ;*TEST 5        MID-TRANSFER SEEK AND 24 SECTOR FORMAT
2369                          ;*
2370                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2371                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE DATA
2372                          ;*      DATA OF 401 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
2373                          ;*      CYLINDER 0, HEAD 0, SECTOR 23.  CLOCK THROUGH SEEK
2374                          ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2375                          ;*      AND A GOOD HEADER.  CLOCK THROUGH 400 18 BIT WORDS
2376                          ;*      AND THE 32 BIT ECC.  CHECK THAT IMPLIED SEEK IS
2377                          ;*      ISSUE TO NEXT TRACK.  CHECK FOR PROPER HEADER RECOGNITION
2378                          ;*      OCCURS.
2379                          ;*
2380                          ;**************************************************************
2381  005466  000004          TST5:   SCOPE
2382  005470  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2383
2384  005476  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2385
2386  005504  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2387  005510  012700  002000                  MOV     #2000,R0        ;SET A COUNT TO DELAY FOR CLEAR
2388  005514  005300                  20$:     DEC     R0
2389  005516  001376                          BNE     20$             ;LOOP UNTIL ZERO
2390
2391  005520  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2392  005524  000000                          0                       ;CYLINDER 0
2393  005526     023                          .BYTE   23              ;SECTOR 23
2394  005527     000                          .BYTE   0               ;TRACK 0
2395  005530  047636                          OBUFF                   ;BUFFER ADDRESS OBUFF
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2396  005532  177377                        -401                    ;WORD COUNT -401
2397  005534  010023                        WRDATA!CFMT                     ;COMMAND WRDATA!CFMT
2398
2399  005536  004437  032014                JSR     R4,BLDDAT       ;GO BUILD DATA
2400  005542  000007                        7                       ;PATTERN 7
2401
2402  005544  004437  032274                JSR     R4,GPSTRT       ;START THE OPERATION
2403
2404  005550  004437  023334                JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2405  005554  104004                        ERROR   4               ;CS1 MISCOMPARE
2406  005556  104005                        ERROR   5               ;MR1     "
2407  005560  104006                        ERROR   6               ;MR2     "
2408  005562  104007                        ERROR   7               ;MR3     "
2409
2410  005564  004437  023316                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2411
2412  005570  004437  023740                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2413  005574  104010                        ERROR   10              ;MR1 CONTENTS IN ERROR
2414  005576  104011                        ERROR   11              ;CS1 CONTENTS IN ERROR
2415
2416  005600  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2417  005604  104012                        ERROR   12              ;MR1 CONTENTS IN ERROR
2418  005606  104013                        ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2419  005610  104014                        ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2420
2421  005612  012737  043403  001510        MOV     #EMS020,EMW     ;SET MESSAGE FOR WRITE FAILURE
2422  005620  004437  025204                JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2423  005624  104015                        ERROR   15              ;MR1 IN ERROR IN READ GAP
2424  005626  104016                        ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2425  005630  104017                        ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2426  005632  104020                        ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2427
2428  005634  012737  043462  001510        MOV     #EMS021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2429  005642  004437  025604                JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2430  005646  104017                        ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2431  005650  104021                        ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2432  005652  104022                        ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2433
2434  005654  012700  000324                MOV     #53.*4,R0               ;ISSUE CLOCKS TO NEXT HDR COMPARE
2435  005660  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)     ;CLOCK LOOP
2436  005666  012762  000040  000026        MOV     #DMD,RKMR1(R2)
2437  005674  005300                        DEC     R0
2438  005676  001370                        BNE     1$
2439
2440  005700  013703  002274                MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
2441  005704  004437  032444                JSR     R4,FSBLVV       ;INVERT WORD
2442  005710  010337  002246                MOV     R3,E.MR2        ;STORE EXPECTED MR2
2443  005714  113703  002267                MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
2444  005720  042703  177400                BIC     #177400,R3      ;CLEAR UNUSED BITS
2445  005724  012700  000005                MOV     #5,R0           ;SET COUNT FOR SHIFTING
2446  005730  006303                5$:     ASL     R3              ;SHIFT TRACK FOR HEADER ALIGNMENT
2447  005732  005300                        DEC     R0              ;DEC COUNT
2448  005734  001375                        BNE     5$              ;LOOP UNTIL ZERO
2449  005736  153703  002266                BISB    L.DS,R3         ;INSERT SECTOR  NUMBER
2450
2451  005742  032737  010000  002260        BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
```

```
2452  005750  001402                          BEQ     6$              ;NO - SKIP
2453  005752  052703  001000                  BIS     #BIT9,R3        ;SET FORMAT BIT FOR WORD TWO
2454  005756                          6$:
2455  005756  004437  032444                  JSR     R4,FSBLVV       ;INVERT WORD
2456  005762  010337  002250                  MOV     R3,E.MR3        ;STORE EXPECTED MR3
2457  005766  016237  000034  002206          MOV     RKMR2(R2),T.MR2 ;GET MR2
2458  005774  016237  000036  002210          MOV     RKMR3(R2),T.MR3 ;GET MR3
2459  006002  016237  000000  002160          MOV     RKCS1(R2),T.CS1 ;GET CS1
2460  006010  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
2461  006016  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF OK
2462  006024  001402                          BEQ     3$              ;YES - SKIP
2463  006026  104025                          ERROR   25              ;CS1 IN ERROR AT MULTI-SECTOR TIME
2464  006030  000427                          BR      TST6            ;;GO TO NEXT TEST
2465
2466  006032  023737  002206  002246  3$:     CMP     T.MR2,E.MR2     ;CHECK IF MR2 OK
2467  006040  001402                          BEQ     2$              ;YES - SKIP
2468  006042  104023                          ERROR   23              ;MR2 IN ERROR AT MULTI-SECTOR TIME
2469  006044  000421                          BR      TST6            ;;GO TO NEXT TEST
2470
2471  006046  023737  002210  002250  2$:     CMP     T.MR3,E.MR3     ;CHECK IF MR3 OK
2472  006054  001402                          BEQ     4$              ;YES - SKIP
2473  006056  104024                          ERROR   24              ;MR3 IN ERROR AT MULTI-SECTOR TIME
2474  006060  000413                          BR      TST6            ;;GO TO NEXT TEST
2475
2476  006062  004437  023316          4$:     JSR     R4,DSECTR       ;SIMULATE 2ND SECTOR PULSE
2477
2478  006066  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE PREAMBLE
2479  006072  104010                          ERROR   10              ;MR1 ERROR
2480  006074  104011                          ERROR   11              ;CS1 ERROR
2481
2482  006076  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2483  006102  104012                          ERROR   12              ;MR1 ERROR
2484  006104  104013                          ERROR   13              ;CS1 ERROR
2485  006106  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR
2486
2487                                  ;;*****************************************************************
2488                                  ;*TEST 6        CYLINDER OVERFLOW (PART 1)
2489                                  ;*
2490                                  ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2491                                  ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2492                                  ;*      DATA OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2493                                  ;*      CYLINDER 632, HEAD 2, SECTOR 25.  CLOCK THROUGH SEEK
2494                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2495                                  ;*      AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND THE
2496                                  ;*      TWO WORD ECC.  MAKE SURE CYLINDER OVERFLOW ERROR DOES
2497                                  ;*      NOT SET.
2498                                  ;*
2499                                  ;*****************************************************************
2500  006110  000004          TST6:   SCOPE
2501  006112  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2502
2503  006120  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2504  006124  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2505
2506  006132  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2507  006136  000632                          632                     ;CYLINDER 632
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2508  006140  000025                    .BYTE   25              ;SECTOR 25
2509  006141  000002                    .BYTE   2               ;TRACK 2
2510  006142  047636                    OBUFF                   ;BUFFER ADDRESS OBUFF
2511  006144  177400                    -400                    ;WORD COUNT -400
2512  006146  000023                    WRDATA                  ;COMMAND WRDATA
2513
2514  006150  004437  032014            JSR     R4,GLDDAT       ;GO BUILD DATA
2515  006154  000001                    1                       ;PATTERN 1
2516
2517  006156  004437  032274            JSR     R4,OPSTRT       ;START THE OPERATION
2518
2519  006162  004437  023334            JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2520  006166  104004                    ERROR   4               ;CS1 MISCOMPARE
2521  006170  104005                    ERROR   5               ;MR1     "
2522  006172  104006                    ERROR   6               ;MR2     "
2523  006174  104007                    ERROR   7               ;MR3     "
2524
2525  006176  004437  023316            JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2526
2527  006202  004437  023740            JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2528  006206  104010                    ERROR   10              ;MR1 CONTENTS IN ERROR
2529  006210  104011                    ERROR   11              ;CS1 CONTENTS IN ERROR
2530
2531  006212  004437  024276            JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2532  006216  104012                    ERROR   12              ;MR1 CONTENTS IN ERROR
2533  006220  104013                    ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2534  006222  104014                    ERROR   14              ;DMDCYL OR RKDA IN ERROR AFTER SEARCH
2535
2536  006224  012737  043403  001510    MOV     #EM5020,EMW     ;SET MESSAGE FOR WRITE FAILURE
2537  006232  004437  025204            JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2538  006236  104015                    ERROR   15              ;MR1 IN ERROR IN READ GAP
2539  006240  104016                    ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2540  006242  104017                    ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2541  006244  104020                    ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2542
2543  006246  012737  043462  001510    MOV     #EM5021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2544  006254  004437  025604            JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2545  006260  104017                    ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2546  006262  104021                    ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2547  006264  104022                    ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2548
2549
2550  006266  012700  000016            MOV     #3*4+2,R0       ;SET COUNT TO END OPERATION
2551  006272  012762  000440  000026  1$: MOV     #DMD!MCLK,RKMR1(R2) ;SET CLOCK
2552  006300  012762  000040  000026    MOV     #DMD,RKMR1(R2)  ;CLEAR CLOCK
2553  006306  005300                    DEC     R0              ;DEC COUNT
2554  006310  001370                    BNE     1$              ;LOOP UNTIL 0
2555
2556  006312  004437  032356            JSR     R4,GETREG       ;GET RK611 REGISTERS
2557  006316  032737  100000  002160    BIT     #CERR,T.CS1     ;TEST IF ANY ERROR SET
2558  006324  001415                    BEQ     3$              ;NO - SKIP TO EXIT
2559
2560  006326  032737  001000  002174    BIT     #COE,T.ER       ;TEST IF IT IS COE
2561  006334  001405                    BEQ     2$              ;NO - SKIP
2562  006336  012737  044253  001622    MOV     #E5026A,EH030   ;SET MESSAGE HEADER
2563  006344  104030                    ERROR   30              ;"UNEXPECTED COE ERROR"
```

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2564  006346  000404                          BR      3$              ;EXIT
2565
2566  006350  012737  044253  001632  2$:     MOV     #E5026A,EH031   ;SET HEADER
2567  006356  104031                          ERROR   31              ;"UNEXPECTED ERROR TESTING COE"
2568
2569  006360                                  3$:
2570
2571                                          ;;*************************************************************
2572                                          ;*TEST 7         CYLINDER OVERFLOW (PART 2)
2573                                          ;*
2574                                          ;*      CLEAR THE RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2575                                          ;*      PUT THE CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
2576                                          ;*      DATA OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2577                                          ;*      CYLINDER 632, HEAD 2, SECTOR 25.  CLOCK THROUGH SEEK
2578                                          ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
2579                                          ;*      AND A GOOD HEADER.  CLOCK THROUGH 400 WORDS AND
2580                                          ;*      TWO ECC WORDS. MAKE SURE CYLINDER OVERFLOW ERROR SETS.
2581                                          ;*
2582                                          ;;*************************************************************
2583  006360  000004                          TST7:   SCOPE
2584  006362  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2585
2586  006370  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2587  006374  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2588
2589  006402  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2590  006406  000632                          632                     ;CYLINDER 632
2591  006410     025                          .BYTE   25              ;SECTOR 25
2592  006411     002                          .BYTE   2               ;TRACK 2
2593  006412  047636                          OBUFF                   ;BUFFER ADDRESS OBUFF
2594  006414  177377                          -401                    ;WORD COUNT -401
2595  006416  000023                          WRDATA                  ;COMMAND WRDATA
2596
2597  006420  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
2598  006424  000002                          2                       ;PATTERN 2
2599
2600  006426  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
2601
2602  006432  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2603  006436  104004                          ERROR   4               ;CS1 MISCOMPARE
2604  006440  104005                          ERROR   5               ;MR1     "
2605  006442  104006                          ERROR   6               ;MR2     "
2606  006444  104007                          ERROR   7               ;MR3     "
2607
2608  006446  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2609
2610  006452  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2611  006456  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2612  006460  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
2613
2614  006462  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2615  006466  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
2616  006470  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2617  006472  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2618
2619  006474  012737  043403  001510          MOV     #EM5020,EMW     ;SET MESSAGE FOR WRITE FAILURE
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2620  006502  004437  025204          JSR     R4,DWGPSN       ;SIMULATE GAP AND SYNC FOR WRITE
2621  006506  104015                  ERROR   15              ;MR1 IN ERROR IN READ GAP
2622  006510  104016                  ERROR   16              ;CS1 IN ERROR AFTER READ GAP
2623  006512  104017                  ERROR   17              ;MR1 IN ERROR IN WRITING SYNC
2624  006514  104020                  ERROR   20              ;CS1 IN ERROR AFTER WRITING SYNC
2625
2626  006516  012737  043462  001510  MOV     #EM5021,EMW     ;SET MESSAGE FOR WRITE FAILURE
2627  006524  004437  025604          JSR     R4,DWRITE       ;SIMULATE WRITE DATA AND ECC
2628  006530  104017                  ERROR   17              ;MR1 IN ERROR IN WRITING DATA OR ECC
2629  006532  104021                  ERROR   21              ;ECC IN ERROR WHILE WRITING DATA
2630  006534  104022                  ERROR   22              ;CS1 IN ERROR AFTER WRITING DATA AND ECC
2631
2632
2633  006536  012700  000016          MOV     #3*4+2,R0       ;SET COUNT TO COMPLETE OPERATION
2634  006542  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2)  ;RUN THE CLOCK
2635  006550  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2636  006556  005300                  DEC     R0              ;DEC COUNT
2637  006560  001370                  BNE     1$              ;LOOP UNTIL 0
2638
2639  006562  004437  032356          JSR     R4,GETREG       ;GET RK611 REGS
2640  006566  032737  001000  002174  BIT     #COE,T.ER       ;TEST IF COE SET
2641  006574  001012                  BNE     3$              ;YES - EXIT TEST
2642
2643  006576  032737  100000  002160  BIT     #CERR,T.CS1     ;TEST IF ANY OTHER ERROR SET
2644  006604  001402                  BEQ     2$              ;NO - SKIP
2645  006606  104027                  ERROR   27              ;"NO COE WHEN EXPECTED"
2646  006610  000404                  BR      3$              ;   TO EXIT
2647
2648  006612  012737  044253  001602  2$:     MOV     #E5026A,EH026   ;SET HEADER
2649  006620  104026                  ERROR   26              ;"UNEXPECTED ERROR WHEN FORCING COE"
2650
2651  006622                          3$:
2652
2653                                  .SBTTL  **NPR WRITING OF MEMORY
2654
2655                                  ;;*****************************************************************
2656                                  ;*TEST 10       NPR WRITING OF MEMORY
2657                                  ;*
2658                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2659                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
2660                                  ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2661                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
2662                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
2663                                  ;*      A GOOD HEADER, 40 DATA WORDS.  VERIFY THAT THE WORDS
2664                                  ;*      ARE WRITTEN PROPERLY IN MEMORY.
2665                                  ;*
2666                                  ;;*****************************************************************
2667  006622  000004                  ST10:   SCOPE
2668  006624  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
2669
2670  006632  005037  002352          CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2671  006636  012762  100000  000000  MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2672
2673  006644  005037  002344          CLR     ECCSRC          ;CLEAR ECC SOURCE
2674  006650  005037  002354          CLR     HIBITS          ;CLEAR HI ORDER BITS
2675  006654  004437  032230          JSR     R4,LOADRK       ;LOAD "L" REGISTERS
```

```
2676  006660  000000                          0                       ;CYLINDER 0
2677  006662     000                          .BYTE   0               ;SECTOR 0
2678  006663     000                          .BYTE   0               ;TRACK 0
2679  006664  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
2680  006666  177400                          -400                    ;WORD COUNT -400
2681  006670  000021                          RDDATA                  ;COMMAND RDDATA
2682
2683  006672  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
2684
2685  006676  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
2686  006702  000003                          3                       ;PATTERN 3
2687
2688
2689  006704  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
2690  006710  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2691  006714  104004                          ERROR   4               ;CS1 MISCOMPARE
2692  006716  104005                          ERROR   5               ;MR1     "
2693  006720  104006                          ERROR   6               ;MR2     "
2694  006722  104007                          ERROR   7               ;MR3     "
2695
2696  006724  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2697
2698  006730  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2699  006734  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2700  006736  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
2701
2702  006740  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2703  006744  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
2704  006746  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2705  006750  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2706
2707  006752  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
2708  006756  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
2709  006760  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
2710  006762  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
2711  006764  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
2712
2713  006766  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
2714  006774  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
2715  007002  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
2716  007006  000060                          60                      ;NUMBER OF WORDS TO SIMULATE
2717  007010  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
2718  007012  104035                          ERROR   35              ;ECC ERROR READING DATA
2719  007014  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
2720  007016  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
2721  007020  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
2722  007022  104043                          ERROR   43              ;ERR IN ECC POS COUNT
2723
2724
2725  007024  012700  047636                  MOV     #OBUFF,R0       ;SET POINTER TO GOOD DATA
2726  007030  012701  046632                  MOV     #IBUFF,R1       ;SET POINTER TO INPUT DATA
2727
2728  007034  012704  000012                  MOV     #10.,R4         ;SET ERROR LIMIT COUNT
2729  007040  005037  001236                  CLR     $ESCAPE         ;CLEAR ESCAPE
2730  007044  005037  001220                  CLR     $TMP7           ;CLEAR ERROR REPORT SWITCH
2731  007050  012703  000040                  MOV     #40.,R3         ;SET COMPARE LIMIT
```

```
2732  007054  005005                          CLR     R5              ;CLEAR WORD COUNTER
2733
2734  007056  021011                  1$:     CMP     (R0),(R1)       ;COMPARE DATA
2735  007060  001005                          BNE     2$              ;SKIP IF NOT EQUAL
2736  007062  005303                  4$:     DEC     R3              ;ELSE DEC WORD COUNT LIMIT
2737  007064  001424                          BEQ     5$              ;IF 0 - SKIP TO EXIT
2738  007066  005205                          INC     R5              ;BUMP WORD COUNT
2739  007070  022021                          CMP     (R0)+,(R1)+     ;BUMP DATA POINTERS
2740  007072  000771                          BR      1$              ;LOOP
2741
2742  007074  005304                  2$:     DEC     R4              ;DEC ERROR LIMIT
2743  007076  001417                          BEQ     5$              ;IF 0 - SKIP
2744
2745  007100  011037  001162                  MOV     (R0),$REG0      ;GET GOOD WORD FOR REPORT
2746  007104  011137  001164                  MOV     (R1),$REG1      ;GET BAD WORD
2747  007110  010537  001166                  MOV     R5,$REG2        ;GET WORD NUMBER
2748
2749  007114  005737  001220                  TST     $TMP7           ;DECIDE WHICH ERROR REPORT TO USE
2750  007120  001004                          BNE     3$              ;SKIP IF NOT 0
2751  007122  005237  001220                  INC     $TMP7           ;ELSE BUMP $TMP7
2752  007126  104037                          ERROR   37              ;REPORT FIRST ERROR LINE
2753  007130  000754                          BR      4$              ;SKIP
2754
2755  007132  104040                  3$:     ERROR 40                ;REPORT ALL OTHER LINES
2756  007134  000752                          BR      4$              ;SKIP
2757
2758  007136                          5$:
2759
2760                                  .SBTTL  **ECC ERROR DETECTION/CORRECTION TESTS
2761
2762                                  ;;*****************************************************************
2763                                  ;*TEST 11       READ DATA WITH NO ERROR
2764                                  ;*
2765                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
2766                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
2767                                  ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
2768                                  ;*      CLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
2769                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
2770                                  ;*      A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
2771                                  ;*      VERIFY THAT COMMAND COMPLETES WITHOUT ERROR.
2772                                  ;*
2773                                  ;*****************************************************************
2774  007136  000004                  TST11:  SCOPE
2775  007140  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
2776
2777  007146  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
2778  007152  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
2779  007160  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE FLAG
2780  007164  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
2781  007170  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
2782  007174  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
2783  007200  000000                          0                       ;CYLINDER 0
2784  007202     000                          .BYTE   0               ;SECTOR 0
2785  007203     000                          .BYTE   0               ;TRACK 0
2786  007204  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
2787  007206  177400                          -400                    ;WORD COUNT -400
```

```
2788  007210  000021                          RDDATA                  ;COMMAND RDDATA
2789
2790  007212  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
2791
2792  007216  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
2793  007222  000004                          4                       ;PATTERN 4
2794
2795
2796  007224  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
2797  007230  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
2798  007234  104004                          ERROR   4               ;CS1 MISCOMPARE
2799  007236  104005                          ERROR   5               ;MR1     "
2800  007240  104006                          ERROR   6               ;MR2     "
2801  007242  104007                          ERROR   7               ;MR3     "
2802
2803  007244  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2804
2805  007250  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2806  007254  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
2807  007256  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
2808
2809  007260  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2810  007264  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
2811  007266  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2812  007270  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2813
2814  007272  004437  026500                  JSR     R4.DRGPSN       ;GO READ GAP AND SYNC
2815  007276  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
2816  007300  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
2817  007302  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
2818  007304  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
2819
2820  007306  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
2821  007314  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
2822  007322  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
2823  007326  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
2824  007330  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
2825  007332  104035                          ERROR   35              ;ECC ERROR READING DATA
2826  007334  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
2827  007336  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
2828  007340  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
2829  007342  104043                          ERROR   43              ;ERR IN ECC POS COUNT
2830
2831
2832  007344  012700  002710                  MOV     #40.*37.,R0     ;SET COUNT TO EMPTY SILO
2833
2834  007350  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK CONTROLLER
2835  007356  012762  000040  000026          MOV     #DMD,RKMR1(R2)
2836  007364  005300                          DEC     R0              ;DEC COUNT
2837  007366  001370                          BNE     1$              ;LOOP UNTIL 0
2838
2839  007370  016237  000000  002160          MOV     RKCS1(R2),T.CS1 ;GET CS1
2840  007376  004437  032356                  JSR     R4,GETREG       ;GET 611 REGS
2841  007402  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO BIT
2842  007410  052737  000200  002220          BIS     #RDY,E.CS1      ;SET READY BIT
2843  007416  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
```

```
                                        BEQ     2$              ;YES - SKIP
                                        ERROR   56              ;"CS1 IN ERROR AFTER READ DATA"
                                2$:
                                ;;*****************************************************************
                                ;*TEST 12       READ DATA WITH ONE BIT BURST ERROR (PART 1)
                                ;*
                                ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                                ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                                ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                                ;*      A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
                                ;*      A ONE BIT BURST ERROR OF A 0 THAT SHOULD BE A 1.
                                ;*      VERIFY THE COUNTING OF THE POSITION
                                ;*      REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
                                ;*      MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.
                                ;*
                                ;;*****************************************************************
007430  000004                  TST12:  SCOPE
007432  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION

007440  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
007444  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER

007452  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
007456  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
007462  000000                          0                       ;CYLINDER 0
007464     000                          .BYTE   0               ;SECTOR 0
007465     000                          .BYTE   0               ;TRACK 0
007466  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
007470  177400                          -400                    ;WORD COUNT -400
007472  000021                          RDDATA                  ;COMMAND RDDATA

007474  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

007500  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
007504  000007                          7                       ;PATTERN 7

007506  012700  000530                  MOV     #530,R0         ;SET INDEX INTO BUFFER

007512  012737  177446  050636          MOV     #177446,OBUFF+1000      ;STORE ECC WORDS
007520  012737  015457  050640          MOV     #15457,OBUFF+1002
007526  012737  000001  002344          MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
007534  032760  000100  047636          BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
007542  001004                          BNE     100$            ;YES - SKIP
007544  052760  000100  047636          BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
007552  000403                          BR      101$
007554  042760  000100  047636  100$:   BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
007562                          101$:

007562  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
007566  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
007572  104004                          ERROR   4               ;CS1 MISCOMPARE
007574  104005                          ERROR   5               ;MR1     "
007576  104006                          ERROR   6               ;MR2     "
007600  104007                          ERROR   7               ;MR3     "
```

```
2900
2901  007602  004437  023316                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
2902
2903  007606  004437  023740                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
2904  007612  104010                        ERROR   10              ;MR1 CONTENTS IN ERROR
2905  007614  104011                        ERROR   11              ;CS1 CONTENTS IN ERROR
2906
2907  007616  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
2908  007622  104012                        ERROR   12              ;MR1 CONTENTS IN ERROR
2909  007624  104013                        ERROR   13              ;CS1 IN ERROR AFTER SEARCH
2910  007626  104014                        ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
2911
2912  007630  004437  026500                JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
2913  007634  104015                        ERROR   15              ;MR1 IN ERROR READING GAP
2914  007636  104016                        ERROR   16              ;CS1 IN ERROR AFTER READING GAP
2915  007640  104032                        ERROR   32              ;MR1 IN ERROR READING SYNC
2916  007642  104033                        ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
2917
2918  007644  012737  000001  002346        MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
2919  007652  012737  004066  002350        MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
2920  007660  004437  027176                JSR     R4,DREAD        ;GO SIMULATE DATA READ
2921  007664  000400                        400                     ;NUMBER OF WORDS TO SIMULATE
2922  007666  104034                        ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
2923  007670  104035                        ERROR   35              ;ECC ERROR READING DATA
2924  007672  104036                        ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
2925  007674  104041                        ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
2926  007676  104042                        ERROR   42              ;ERR IN ECC PAT CALC.
2927  007700  104043                        ERROR   43              ;ERR IN ECC POS COUNT
2928
2929
2930  007702  012737  000020  002326        MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
2931  007710  012700  000005                MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
2932  007714  012701  013672                MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
2933  007720  005037  001214                CLR     $TMPS           ;CLEAR SWITCH
2934
2935  007724  004737  031616        3$:     JSR     PC,RDBIT        ;GO READ BIT
2936  007730  004737  030462                JSR     PC,ECCGEN       ;GENERATE ECC
2937  007734  016237  000032  002214        MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
2938  007742  016237  000030  002212        MOV     RKECPS(R2),T.ECPS       ;GET POSITION
2939  007750  005237  002350                INC     ECPOSX          ;BUMP POSITION EXPECTED
2940  007754  013737  002350  002252        MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
2941  007762  023737  002254  002214        CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
2942  007770  001401                        BEQ     1$              ;YES - SKIP
2943  007772  104042                        ERROR   42
2944  007774  023737  002252  002212  1$:   CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
2945  010002  001401                        BEQ     2$              ;YES - SKIP
2946  010004  104043                        ERROR   43
2947  010006  005237  002326        2$:     INC     BITCNT          ;BUMP BIT COUNT
2948  010012  005301                        DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
2949  010014  001343                        BNE     3$              ;NOT YET ZERO - LOOP
2950  010016  005300                        DEC     R0              ;DEC PASS THRU 0 COUNT
2951  010020  001406                        BEQ     4$              ;IF 0 - SKIP
2952  010022  012737  177777  002350        MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
2953  010030  012701  020000                MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
2954  010034  000733                        BR      3$              ;GO DO LOOP AGAIN
2955
```

```
 2956  010036  005737  001214          4$:     TST     $TMP5           ;TEST SWITCH
 2957  010042  001012                          BNE     5$              ;ALREADY SET - SKIP
 2958  010044  012701  005276                  MOV     #5276,R1        ;SET COUNT TO FINAL POSITION
 2959  010050  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
 2960  010054  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
 2961  010062  005237  001214                  INC     $TMP5           ;BUMP SWITCH
 2962  010066  000716                          BR      3$              ;GO DO LOOP AGAIN
 2963
 2964  010070  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
 2965  010074  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
 2966  010100  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
 2967  010106  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
 2968  010114  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
 2969  010122  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
 2970  010130  001402                          BEQ     6$              ;YES - SKIP
 2971  010132  104044                          ERROR   44
 2972  010134  000410                          BR      7$
 2973  010136  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
 2974  010144  001404                          BEQ     7$              ;NO - SKIP
 2975  010146  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
 2976  010154  104045                          ERROR   45
 2977  010156                          7$:
 2978
 2979                                  ;;*****************************************************************
 2980                                  ;*TEST 13       READ DATA WITH 11 BIT BURST ERROR
 2981                                  ;*
 2982                                  ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
 2983                                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A READ DATA
 2984                                  ;*       OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
 2985                                  ;*       CYLINDER 0, HEAD 0, SECTOR 0. CLOCK THROUGH SEEK
 2986                                  ;*       AND DRIVE CLEAR MESSAGES. SIMULATE A SECTOR PULSE,
 2987                                  ;*       A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
 2988                                  ;*       AN 11 BIT BURST ERROR. VERIFY THE COUNTING OF THE POSITION
 2989                                  ;*       REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
 2990                                  ;*       MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.
 2991                                  ;*
 2992                                  ;;*****************************************************************
 2993  010156  000004          ST13:   SCOPE
 2994  010160  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
 2995  010166  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
 2996  010172  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 2997
 2998  010200  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
 2999  010204  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
 3000  010210  000000                          0                       ;CYLINDER 0
 3001  010212     000                          .BYTE   0               ;SECTOR 0
 3002  010213     000                          .BYTE   0               ;TRACK 0
 3003  010214  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
 3004  010216  177400                          -400                    ;WORD COUNT -400
 3005  010220  000021                          RDDATA                  ;COMMAND RDDATA
 3006
 3007  010222  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
 3008
 3009  010226  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
 3010  010232  000007                          7                       ;PATTERN 7
 3011
```

```
3012  010234  012700  000530                    MOV     #530,R0          ;SET INDEX INTO BUFFER
3013
3014  010240  012737  177446  050636            MOV     #177446,OBUFF+1000      ;STORE ECC WORDS
3015  010246  012737  015457  050640            MOV     #15457,OBUFF+1002
3016  010254  012737  000001  002344            MOV     #1,ECCSRC        ;SET SOURCE TO INDICATE ECC IN BUFFER
3017  010262  032760  000100  047636            BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
3018  010270  001004                            BNE     100$            ;YES - SKIP
3019  010272  052760  000100  047636            BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
3020  010300  000403                            BR      101$
3021  010302  042760  000100  047636  100$:     BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
3022  010310                          101$:
3023
3024  010310  004437  032274                    JSR     R4,OPSTRT        ;START THE OPERATION
3025  010314  004437  023334                    JSR     R4,DISEEK        ;SIMULATE IMPLIED SEEK
3026  010320  104004                            ERROR   4                ;CS1 MISCOMPARE
3027  010322  104005                            ERROR   5                ;MR1     "
3028  010324  104006                            ERROR   6                ;MR2     "
3029  010326  104007                            ERROR   7                ;MR3     "
3030
3031  010330          023316                    JSR     R4,DSECTR        ;SIMULATE SECTOR PULSE
3032
3033  010334  004437  023740                    JSR     R4,DRSYNC        ;SIMULATE HEADER PREAMBLE
3034  010340  104010                            ERROR   10               ;MR1 CONTENTS IN ERROR
3035  010342  104011                            ERROR   11               ;CS1 CONTENTS IN ERROR
3036
3037  010344  004437  024276                    JSR     R4,DHDCMP        ;SIMULATE HEADER SEARCH
3038  010350  104012                            ERROR   12               ;MR1 CONTENTS IN ERROR
3039  010352  104013                            ERROR   13               ;CS1 IN ERROR AFTER SEARCH
3040  010354  104014                            ERROR   14               ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3041
3042  010356  004437  026500                    JSR     R4,DRGPSN        ;GO READ GAP AND SYNC
3043  010362  104015                            ERROR   15               ;MR1 IN ERROR READING GAP
3044  010364  104016                            ERROR   16               ;CS1 IN ERROR AFTER READING GAP
3045  010366  104032                            ERROR   32               ;MR1 IN ERROR READING SYNC
3046  010370  104033                            ERROR   33               ;CS1 IN ERROR AFTER READING SYNC
3047
3048  010372  012737  000001  002346            MOV     #1,ECPATX        ;LOAD EXPECTED PATTERN
3049  010400  012737  004066  002350            MOV     #4066,ECPOSX     ;LOAD EXPECTED POSITION
3050  010406  004437  027176                    JSR     R4,DREAD         ;GO SIMULATE DATA READ
3051  010412  000400                            400                      ;NUMBER OF WORDS TO SIMULATE
3052  010414  104034                            ERROR   34               ;MR1 IN ERROR READING DATA OR ECC
3053  010416  104035                            ERROR   35               ;ECC ERROR READING DATA
3054  010420  104036                            ERROR   36               ;CS1 ERROR AFTER READING DATA OR ECC
3055  010422  104041                            ERROR   41               ;ECC REG INCORRECT AFTER ECC READ
3056  010424  104042                            ERROR   42               ;ERR IN ECC PAT CALC.
3057  010426  104043                            ERROR   43               ;ERR IN ECC POS COUNT
3058
3059
3060  010430  012737  000020  002326            MOV     #20,BITCNT       ;SET BIT COUNT FOR CORRECTION COUNT
3061  010436  012700  000005                    MOV     #5,R0            ;SET COUNT FOR ECCPOS PASS THRU 0
3062  010442  012701  013672                    MOV     #13672,R1        ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3063  010446  005037  001214                    CLR     $TMPS            ;CLEAR SWITCH
3064
3065  010452  004737  031616          3$:       JSR     PC,RDBIT         ;GO READ BIT
3066  010456  004737  030462                    JSR     PC,ECCGEN        ;GENERATE ECC
3067  010462  016237  000032  002214            MOV     RKECPT(R2),T.ECPT        ;GET PATTERN
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3068  010470  C16237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3069  010476  005237  002350                  INC     ECPOSX                  ;BUMP POSITION EXPECTED
3070  010502  013737  002350  002252          MOV     ECPOSX,E.ECPS           ;SET FOR COMPARE AND REPORT
3071  010510  023737  002254  002214          CMP     E.ECPT,T.ECPT           ;CHECK IF PATTERN CORRECT
3072  010516  001401                          BEQ     1$                      ;YES - SKIP
3073  010520  104042                          ERROR   42
3074  010522  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS           ;CHECK IF POSITION CORRECT
3075  010530  001401                          BEQ     2$                      ;YES - SKIP
3076  010532  104043                          ERROR   43
3077  010534  005237  002326          2$:     INC     BITCNT                  ;BUMP BIT COUNT
3078  010540  005301                          DEC     R1                      ;DEC COUNT TO ZERO IN ECCPOS
3079  010542  001343                          BNE     3$                      ;NOT YET ZERO - LOOP
3080  010544  005300                          DEC     R0                      ;DEC PASS THRU 0 COUNT
3081  010546  001406                          BEQ     4$                      ;IF 0 - SKIP
3082  010550  012737  177777  002350          MOV     #-1,ECPOSX              ;PRESET EXPECTED POS TO GO TO ZERO
3083  010556  012701  020000                  MOV     #20000,R1               ;SET COUNT TO NEXT 0 IN ECC POS
3084  010562  000733                          BR      3$                      ;GO DO LOOP AGAIN
3085
3086  010564  005737  001214          4$:     TST     $TMP5                   ;TEST SWITCH
3087  010570  001012                          BNE     5$                      ;ALREADY SET - SKIP
3088  010572  012701  005276                  MOV     #5276,R1                ;SET COUNT TO FINAL POSITION
3089  010576  012700  000001                  MOV     #1,R0                   ;SET R0 TO RETURN AFTER ONE PASS
3090  010602  012737  177777  002350          MOV     #-1,ECPOSX              ;SET EXP POS TO GO TO 0 ON NEXT BIT
3091  010610  005237  001214                  INC     $TMP5                   ;BUMP SWITCH
3092  010614  000716                          BR      3$                      ;GO DO LOOP AGAIN
3093
3094  010616  004737  031616          5$:     JSR     PC,RDBIT                ;ONE MORE BIT TO SET READY
3095  010622  004437  032356                  JSR     R4,GETREG               ;GET '611 REGISTERS
3096  010626  013737  002260  002220          MOV     L.CS1,E.CS1             ;GET EXPECTED CS1
3097  010634  052737  100200  002220          BIS     #RDY!CERR,E.CS1         ;SET READY AND ERROR
3098  010642  042737  000001  002220          BIC     #GO,E.CS1               ;CLEAR GO
3099  010650  023737  002160  002220          CMP     T.CS1,F.CS1             ;CHECK IF CS1 CORRECT
3100  010656  001402                          BEQ     6$                      ;YES - SKIP
3101  010660  104044                          ERROR   44
3102  010662  000410                          BR      7$
3103  010664  032737  000100  002174  6$:     BIT     #ECH,T.ER               ;TEST IF ECC HARD ERROR SET
3104  010672  001404                          BEQ     7$                      ;NO SKIP
3105  010674  012737  100000  002234          MOV     #DCK,E.ER               ;SET EXPECTED ERROR REG
3106  C10702  104045                          ERROR   45
3107
3108  010704                          7$:

3109
3110                                    ;;*****************************************************************
3111                                    ;*TEST 14       READ DATA WITH ONE BIT BURST ERROR (PART 2)
3112                                    ;*
3113                                    ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3114                                    ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3115                                    ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
3116                                    ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3117                                    ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
3118                                    ;*      A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
3119                                    ;*      A ONE BIT BURST ERROR OF A 1 THAT SHOULD BE A 0.
3120                                    ;*      VERIFY THE COUNTING OF THE POSITION
3121                                    ;*      REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
3122                                    ;*      MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.
3123                                    ;*
```

```
                                        ;;*****************************************************************
                                TST14:  SCOPE
011704  000004
011706  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
011714  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
011720  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
011726  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
011732  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
011736  000000                          0                       ;CYLINDER 0
011740     000                          .BYTE   0               ;SECTOR 0
011741     000                          .BYTE   0               ;TRACK 0
011742  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
011744  177400                          -400                    ;WORD COUNT -400
011746  000021                          RDDATA                  ;COMMAND RDDATA
011750  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
011754  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
011760  000005                          5                       ;PATTERN 5
011762  012700  000530                  MOV     #530,R0         ;SET INDEX INTO BUFFER
011766  012737  126073  050636          MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
011774  012737  151052  050640          MOV     #151052,OBUFF+1002
011002  012737  000001  002344          MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
011010  032760  000100  047636          BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
011016  001004                          BNE     100$            ;YES - SKIP
011020  052760  000100  047636          BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
011026  000403                          BR      101$
011030  042760  000100  047636  100$:   BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
011036                          101$:
011036  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
011042  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
011046  104004                          ERROR   4               ;CS1 MISCOMPARE
011050  104005                          ERROR   5               ;MR1     "
011052  104006                          ERROR   6               ;MR2     "
011054  104007                          ERROR   7               ;MR3     "
011056  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
011062  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
011066  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
011070  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
011072  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
011076  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
011100  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
011102  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
011104  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
011110  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
011112  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
011114  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
011116  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
```

```
3180
3181  011120  012737  000001  002346        MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
3182  011126  012737  004066  002350        MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
3183  011134  004437  027176                JSR     R4,DREAD        ;GO SIMULATE DATA READ
3184  011140  000400                        400                     ;NUMBER OF WORDS TO SIMULATE
3185  011142  104034                        ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3186  011144  104035                        ERROR   35              ;ECC ERROR READING DATA
3187  011146  104036                        ERROR   36              ;CS1 ERROR AFTER READ  , DATA OR ECC
3188  011150  104041                        ERROR   41              ;ECC REG INCORRECT AF    ECC READ
3189  011152  104042                        ERROR   42              ;ERR IN ECC PAT CALC.
3190  011154  104043                        ERROR   43              ;ERR IN ECC POS COUNT
3191
3192
3193  011156  012737  000020  002326        MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
3194  011164  012700  000005                MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
3195  011170  012701  013672                MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3196  011174  005037  001214                CLR     $TMP5           ;CLEAR SWITCH
3197
3198  011200  004737  031616        3$:     JSR     PC,RDBIT        ;GO READ BIT
3199  011204  004737  030462                JSR     PC,ECCGEN       ;GENERATE ECC
3200  011210  016237  000032  002214        MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
3201  011216  016237  000030  002212        MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3202  011224  005237  002350                INC     ECPOSX          ;BUMP POSITION EXPECTED
3203  011230  013737  002350  002252        MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
3204  011236  023737  002254  002214        CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
3205  011244  001401                        BEQ     1$              ;YES - SKIP
3206  011246  104042                        ERROR   42
3207  011250  023737  002252  002212  1$:   CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
3208  011256  001401                        BEQ     2$              ;YES - SKIP
3209  011260  104043                        ERROR   43
3210  011262  005237  002326        2$:     INC     BITCNT          ;BUMP BIT COUNT
3211  011266  005301                        DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
3212  011270  001343                        BNE     3$              ;NOT YET ZERO - LOOP
3213  011272  005300                        DEC     R0              ;DEC PASS THRU 0 COUNT
3214  011274  001406                        BEQ     4$              ;IF 0 - SKIP
3215  011276  012737  177777  002350        MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
3216  011304  012701  020000                MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
3217  011310  000733                        BR      3$              ;GO DO LOOP AGAIN
3218
3219  011312  005737  001214        4$:     TST     $TMP5           ;TEST SWITCH
3220  011316  001012                        BNE     5$              ;ALREADY SET - SKIP
3221  011320  012701  005276                MOV     #5276,R1        ;SET COUNT TO FINAL POSITION
3222  011324  012700  000001                MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
3223  011330  012737  177777  002350        MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
3224  011336  005237  001214                INC     $TMP5           ;BUMP SWITCH
3225  011342  000716                        BR      3$              ;GO DO LOOP AGAIN
3226
3227  011344  004737  031616        5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
3228  011350  004437  032356                JSR     R4,GETREG       ;GET '611 REGISTERS
3229  011354  013737  002260  002220        MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
3230  011362  052737  100200  002220        BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
3231  011370  042737  000001  002220        BIC     #GO,E.CS1       ;CLEAR GO
3232  011376  023737  002160  002220        CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
3233  011404  001402                        BEQ     6$              ;YES - SKIP
3234  011406  104044                        ERROR   44
3235  011410  000410                        BR      7$
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3236  011412  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
3237  011420  001404                          BEQ     7$              ;NO SKIP
3238  011422  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
3239  011430  104045                          ERROR   45
3240
3241  011432                                  7$:
3242
3243                                          ;;*****************************************************************
3244                                          ;*TEST 15       READ DATA WITH 11 BIT BURST ERROR
3245                                          ;*
3246                                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3247                                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3248                                          ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
3249                                          ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3250                                          ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
3251                                          ;*      A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
3252                                          ;*      AN 11 BIT BURST ERROR.  VERIFY THE COUNING OF THE POSITION
3253                                          ;*      REGISTER AND THE FINAL PATTERN AND POSITION INFORMATION.
3254                                          ;*      MAKE SURE DATA CHECK AND CONTROLLER ERROR SETS.
3255                                          ;*
3256                                          ;*****************************************************************
3257  011432  000004                  TST15:  SCOPE
3258  011434  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
3259
3260  011442  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
3261
3262  011446  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3263
3264  011454  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
3265  011460  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3266  011464  000000                          0                       ;CYLINDER 0
3267  011466     000                          .BYTE   0               ;SECTOR 0
3268  011467     000                          .BYTE   0               ;TRACK 0
3269  011470  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
3270  011472  177400                          -400                    ;WORD COUNT -400
3271  011474  000021                          RDDATA                  ;COMMAND RDDATA
3272
3273  011476  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
3274
3275  011502  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
3276  011506  000005                          5                       ;PATTERN 5
3277
3278  011510  012700  000530                  MOV     #530,R0         ;SET INDEX INTO BUFFER
3279
3280  011514  012737  126073  050636          MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
3281  011522  012737  151052  050640          MOV     #151052,OBUFF+1002
3282  011530  012737  000001  002344          MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
3283  011536  042760  005000  047636          BIC     #BIT9!BIT11,OBUFF(R0)   ;CREATE 11 BIT BURST ERROR
3284  011544  052760  050100  047636          BIS     #BIT6!BIT12!BIT14,OBUFF(R0)
3285  011552  062700  000002                  ADD     #2,R0           ;BUMP TO NEXT WORD
3286  011556  052760  000001  047636          BIS     #BIT0,OBUFF(R0)
3287
3288  011564  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
3289  011570  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
3290  011574  104004                          ERROR   4               ;CS1 MISCOMPARE
3291  011576  104005                          ERROR   5               ;MR1    "
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3292  011600  104006                          ERROR   6               ;MR2     "
3293  011602  104007                          ERROR   7               ;MR3     "
3294
3295  011604  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3296
3297  011610  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3298  011614  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
3299  011616  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
3300
3301  011620  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3302  011624  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
3303  011626  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3304  011630  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3305
3306  011632  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3307  011636  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
3308  011640  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3309  011642  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
3310  011644  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3311
3312  011646  012737  000001  002346          MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
3313  011654  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
3314  011662  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
3315  011666  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
3316  011670  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3317  011672  104035                          ERROR   35              ;ECC ERROR READING DATA
3318  011674  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3319  011676  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3320  011700  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
3321  011702  104043                          ERROR   43              ;ERR IN ECC POS COUNT
3322
3323
3324  011704  012737  000020  002326          MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
3325  011712  012700  000005                  MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
3326  011716  012701  013672                  MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3327  011722  005037  001214                  CLR     $TMPS           ;CLEAR SWITCH
3328
3329  011726  004737  031616          3$:     JSR     PC,RDBIT        ;GO READ BIT
3330  011732  004737  030462                  JSR     PC,ECCGEN       ;GENERATE ECC
3331  011736  016237  000032  002214          MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
3332  011744  016237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3333  011752  005237  002350                  INC     ECPOSX          ;BUMP POSITION EXPECTED
3334  011756  013737  002350  002252          MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
3335  011764  023737  002254  002214          CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
3336  011772  001401                          BEQ     1$              ;YES - SKIP
3337  011774  104042                          ERROR   42
3338  011776  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
3339  012004  001401                          BEQ     2$              ;YES - SKIP
3340  012006  104043                          ERROR   43
3341  012010  005237  002326          2$:     INC     BITCNT          ;BUMP BIT COUNT
3342  012014  005301                          DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
3343  012016  001343                          BNE     3$              ;NOT YET ZERO - LOOP
3344  012020  005300                          DEC     R0              ;DEC PASS THRU 0 COUNT
3345  012022  001406                          BEQ     4$              ;IF 0 - SKIP
3346  012024  012737  177777  002350          MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
3347  012032  012701  020000                  MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
```

```
3348  012036  000733                          BR      3$              ;GO DO LOOP AGAIN
3349
3350  012040  005737  001214          4$:     TST     $TMPS           ;TEST SWITCH
3351  012044  001012                          BNE     5$              ;ALREADY SET - SKIP
3352  012046  012701  005310                  MOV     #5310,R1        ;SET COUNT TO FINAL POSITION
3353  012052  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
3354  012056  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
3355  012064  005237  001214                  INC     $TMPS           ;BUMP SWITCH
3356  012070  000716                          BR      3$              ;GO DO LOOP AGAIN
3357
3358  012072  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
3359  012076  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
3360  012102  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
3361  012110  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
3362  012116  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
3363  012124  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
3364  012132  001402                          BEQ     6$              ;YES - SKIP
3365  012134  104044                          ERROR   44
3366  012136  000410                          BR      7$
3367  012140  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
3368  012146  001404                          BEQ     7$              ;NO SKIP
3369  012150  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
3370  012156  104045                          ERROR   45
3371
3372  012160                          7$:
3373
3374                                  ;;*****************************************************************
3375                                  ;*TEST 16       READ DATA WITH 12 BIT BURST ERROR
3376                                  ;*
3377                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3378                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3379                                  ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
3380                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3381                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
3382                                  ;*      GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
3383                                  ;*      A 12 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
3384                                  ;*      POSITION REGISTER.  MAKE SURE DATA CHECK, ECC HARD,
3385                                  ;*      AND CONTROLLER ERROR SETS.
3386                                  ;*
3387                                  ;*****************************************************************
3388  012160  000004          TST16:  SCOPE
3389  012162  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
3390
3391  012170  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
3392  012174  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3393
3394  012202  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
3395  012206  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3396  012212  000000                          0                       ;CYLINDER 0
3397  012214     000                          .BYTE   0               ;SECTOR 0
3398  012215     000                          .BYTE   0               ;TRACK 0
3399  012216  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
3400  012220  177400                          -400                    ;WORD COUNT -400
3401  012222  000021                          RDDATA                  ;COMMAND RDDATA
3402
3403  012224  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
```

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3404
3405  012230  004437  032014          JSR     R4,BLDDAT       ;GO BUILD DATA
3406  012234  000005                  5                       ;PATTERN 5
3407
3408  012236  012700  000530          MOV     #530,R0         ;SET INDEX INTO BUFFER
3409
3410  012242  012737  126073  050636  MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
3411  012250  012737  151052  050640  MOV     #151052,OBUFF+1002
3412  012256  012737  000001  002344  MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
3413  012264  042760  005000  047636  BIC     #BIT9!BIT11,OBUFF(R0)   ;CREATE 11 BIT BURST ERROR
3414  012272  052760  050100  047636  BIS     #BIT6!BIT12!BIT14,OBUFF(R0)
3415  012300  062700  000002          ADD     #2,R0           ;BUMP TO NEXT WORD
3416  012304  052760  000001  047636  BIS     #BIT0,OBUFF(R0)
3417  012312  042760  000002  047636  BIC     #BIT1,OBUFF(R0) ;MAKE IT A 12 BIT BURST ERROR
3418
3419  012320  004437  032274          JSR     R4,OPSTRT       ;START THE OPERATION
3420  012324  004437  023334          JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
3421  012330  104004                  ERROR   4               ;CS1 MISCOMPARE
3422  012332  104005                  ERROR   5               ;MR1     "
3423  012334  104006                  ERROR   6               ;MR2     "
3424  012336  104007                  ERROR   7               ;MR3     "
3425
3426  012340  004437  023316          JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3427
3428  012344  004437  023740          JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3429  012350  104010                  ERROR   10              ;MR1 CONTENTS IN ERROR
3430  012352  104011                  ERROR   11              ;CS1 CONTENTS IN ERROR
3431
3432  012354  004437  024276          JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3433  012360  104012                  ERROR   12              ;MR1 CONTENTS IN ERROR
3434  012362  104013                  ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3435  012364  104014                  ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3436
3437  012366  004437  026500          JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3438  012372  104015                  ERROR   15              ;MR1 IN ERROR READING GAP
3439  012374  104016                  ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3440  012376  104032                  ERROR   32              ;MR1 IN ERROR READING SYNC
3441  012400  104033                  ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3442
3443  012402  012737  000001  002346  MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
3444  012410  012737  004066  002350  MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
3445  012416  004437  027176          JSR     R4,DREAD        ;GO SIMULATE DATA READ
3446  012422  000400                  400                     ;NUMBER OF WORDS TO SIMULATE
3447  012424  104034                  ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3448  012426  104035                  ERROR   35              ;ECC ERROR READING DATA
3449  012430  104036                  ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3450  012432  104041                  ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3451  012434  104042                  ERROR   42              ;ERR IN ECC PAT CALC.
3452  012436  104043                  ERROR   43              ;ERR IN ECC POS COUNT
3453
3454
3455  012440  012737  000020  002326  MOV     #20,BITCNT      ;  BIT COUNT FOR CORRECTION COUNT
3456  012446  012700  000005          MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
3457  012452  012701  013672          MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3458  012456  005037  001214          CLR     $TMP5           ;CLEAR SWITCH
3459
```

```
3460  012462  004737  031616          3$:   JSR     PC,RDBIT          ;GO READ BIT
3461  012466  004737  030462                JSR     PC,ECCGEN         ;GENERATE ECC
3462  012472  016237  000032  002214        MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
3463  012500  016237  000030  002212        MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3464  012506  005237  002350                INC     ECPOSX            ;BUMP POSITION EXPECTED
3465  012512  013737  002350  002252        MOV     ECPOSX,E.ECPS     ;SET FOR COMPARE AND REPORT
3466  012520  023737  002254  002214        CMP     E.ECPT,T.ECPT     ;CHECK IF PATTERN CORRECT
3467  012526  001401                        BEQ     1$                ;YES - SKIP
3468  012530  104042                        ERROR   42
3469  012532  023737  002252  002212  1$:   CMP     E.ECPS,T.ECPS     ;CHECK IF POSITION CORRECT
3470  012540  001401                        BEQ     2$                ;YES - SKIP
3471  012542  104043                        ERROR   43
3472  012544  005237  002326          2$:   INC     BITCNT            ;BUMP BIT COUNT
3473  012550  005301                        DEC     R1                ;DEC COUNT TO ZERO IN ECCPOS
3474  012552  001343                        BNE     3$                ;NOT YET ZERO - LOOP
3475  012554  005300                        DEC     R0                ;DEC PASS THRU 0 COUNT
3476  012556  001406                        BEQ     4$                ;IF 0 - SKIP
3477  012560  012737  177777  002350        MOV     #-1,ECPOSX        ;PRESET EXPECTED POS TO GO TO ZERO
3478  012566  012701  020000                MOV     #20000,R1         ;SET COUNT TO NEXT 0 IN ECC POS
3479  012[   000733                        BR      3$                ;GO DO LOOP AGAIN
3480
3481  012574  005737  001214          4$:   TST     $TMP5             ;TEST SWITCH
3482  [12600  001012                        BNE     5$                ;ALREADY SET - SKIP
3483  012602  012701  010041                MOV     #10041,R1         ;SET COUNT TO FINAL POSITION
3484  012606  012700  000001                MOV     #1,R0             ;SET R0 TO RETURN AFTER ONE PASS
3485  012612  012737  177777  002350        MOV     #-1,ECPOSX        ;SET EXP POS TO GO TO 0 ON NEXT BIT
3486  012620  005237  001214                INC     $TMP5             ;BUMP SWITCH
3487  012624  000716                        BR      3$                ;GO DO LOOP AGAIN
3488
3489  012626  004737  031616          5$:   JSR     PC,RDBIT          ;ONE MORE BIT TO SET READY
3490  012632  004437  032356                JSR     R4,GETREG         ;GET '611 REGISTERS
3491  012636  013737  002260  002220        MOV     L.CS1,E.CS1       ;GET EXPECTED CS1
3492  012644  052737  100200  002220        BIS     #RDY!CERR,E.CS1   ;SET READY AND ERROR
3493  012652  042737  000001  002220        BIC     #GO,E.CS1         ;CLEAR GO
3494  012660  023737  002160  002220        CMP     T.CS1,E.CS1       ;CHECK IF CS1 CORRECT
3495  012666  001402                        BEQ     6$                ;YES - SKIP
3496  012670  104044                        ERROR   44
3497  012672  000410                        BR      7$
3498  012674  032737  000100  002174  6$:   BIT     #ECH,T.ER         ;TEST IF ECC HARD ERROR SET
3499  012702  001004                        BNE     7$                ;YES -  SKIP
3500  012704  012737  100100  002234        MOV     #DCK!ECH,E ER     ;SET EXPECTED ERROR REG
3501  012712  104045                        ERROR   45
3502
3503  012714                          7$:
3504
3505                                  ;;*****************************************************************
3506                                  ;*TEST 17       READ DATA WITH 23 BIT BURST ERROR
3507                                  ;*
3508                                  ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3509                                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3510                                  ;*       OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
3511                                  ;*       CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3512                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
3513                                  ;*       GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
3514                                  ;*       A 23 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
3515                                  ;*       POSITION REGISTER.  MAKE SURE DATA CHECK, ECC HARD,
```

```
3516                                    ;*      AND CONTROLLER ERROR SETS.
3517                                    ;*
3518                                    ;*********************************************************************
3519  012714  000004                    TST17:  SCOPE
3520  012716  012737  000001  001234            MOV     #1,$TIMES       ;;DO 1 ITERATION
3521
3522  012724  005037  002352            CLR     BSECES          ;CLEAR BAD SEC DESIRED
3523  012730  012762  100000  000000    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3524
3525  012736  005037  002354            CLR     HIBITS          ;CLEAR HI ORDER BITS
3526  012742  004437  032230            JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3527  012746  000000                    0                       ;CYLINDER 0
3528  012750     000                    .BYTE   0               ;SECTOR 0
3529  012751     000                    .BYTE   0               ;TRACK 0
3530  012752  046632                    IBUFF                   ;BUFFER ADDRESS IBUFF
3531  012754  177400                    -400                    ;WORD COUNT -400
3532  012756  000021                    RDDATA                  ;COMMAND RDDATA
3533
3534  012760  004437  031770            JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
3535
3536  012764  004437  032014            JSR     R4,BLDDAT       ;GO BUILD DATA
3537  012770  000005                    5                       ;PATTERN 5
3538
3539  012772  012700  000530            MOV     #530,R0         ;SET INDEX INTO BUFFER
3540
3541  012776  012737  126073  050636    MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
3542  013004  012737  151052  050640    MOV     #151052,OBUFF+1002
3543  013012  012737  000001  002344    MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
3544  013020  042760  005000  047636    BIC     #BIT9!BIT11,OBUFF(R0)   ;CREATE 11 BIT BURST ERROR
3545  013026  052760  050100  047636    BIS     #BIT6!BIT12!BIT14,OBUFF(R0)
3546  013034  062700  000002            ADD     #2,R0           ;BUMP TO NEXT WORD
3547  013040  052760  000001  047636    BIS     #BIT0,OBUFF(R0)
3548  013046  052760  010000  047636    BIS     #BIT12,OBUFF(R0) ;MAKE IT A 23 BIT BURST ERROR
3549
3550  013054  004437  032274            JSR     R4,OPSTRT       ;START THE OPERATION
3551  013060  004437  023334            JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
3552  013064  104004                    ERROR   4               ;CS1 MISCOMPARE
3553  013066  104005                    ERROR   5               ;MR1     "
3554  013070  104006                    ERROR   6               ;MR2     "
3555  013072  104007                    ERROR   7               ;MR3     "
3556
3557  013074  004437  023316            JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3558
3559  013100  004437  023740            JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3560  013104  104010                    ERROR   10              ;MR1 CONTENTS IN ERROR
3561  013106  104011                    ERROR   11              ;CS1 CONTENTS IN ERROR
3562
3563  013110  004437  024276            JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3564  013114  104012                    ERROR   12              ;MR1 CONTENTS IN ERROR
3565  013116  104013                    ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3566  013120  104014                    ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3567
3568  013122  004437  026500            JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3569  013126  104015                    ERROR   15              ;MR1 IN ERROR READING GAP
3570  013130  104016                    ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3571  013132  104032                    ERROR   32              ;MR1 IN ERROR READING SYNC
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3572  013134  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3573
3574  013136  012737  000001  002346          MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
3575  013144  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
3576  013152  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
3577  013156  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
3578  013160  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3579  013162  104035                          ERROR   35              ;ECC ERROR READING DATA
3580  013164  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3581  013166  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3582  013170  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
3583  013172  104043                          ERROR   43              ;ERR IN ECC POS COUNT
3584
3585
3586  013174  012737  000020  002326          MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
3587  013202  012700  000005                  MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
3588  013206  012701  013672                  MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3589  013212  005037  001214                  CLR     $TMP5           ;CLEAR SWITCH
3590
3591  013216  004737  031616          3$:     JSR     PC,RDBIT        ;GO READ BIT
3592  013222  004737  030462                  JSR     PC,ECCGEN       ;GENERATE ECC
3593  013226  016237  000032  002214          MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
3594  013234  016237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3595  013242  005237  002350                  INC     ECPOSX          ;BUMP POSITION EXPECTED
3596  013246  013737  002350  002252          MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
3597  013254  023737  002254  002214          CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
3598  013262  001401                          BEQ     1$              ;YES - SKIP
3599  013264  104042                          ERROR   42
3600  013266  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
3601  013274  001401                          BEQ     2$              ;YES - SKIP
3602  013276  104043                          ERROR   43
3603  013300  005237  002326          2$:     INC     BITCNT          ;BUMP BIT COUNT
3604  013304  005301                          DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
3605  013306  001343                          BNE     3$              ;NOT YET ZERO - LOOP
3606  013310  005300                          DEC     R0              ;DEC PASS THRU 0 COUNT
3607  013312  001406                          BEQ     4$              ;IF 0 - SKIP
3608  013314  012737  177777  002350          MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
3609  013322  012701  020000                  MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
3610  013326  000733                          BR      3$              ;GO DO LOOP AGAIN
3611
3612  013330  005737  001214          4$:     TST     $TMP5           ;TEST SWITCH
3613  013334  001012                          BNE     5$              ;ALREADY SET - SKIP
3614  013336  012701  010041                  MOV     #10041,R1       ;SET COUNT TO FINAL POSITION
3615  013342  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
3616  013346  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
3617  013354  005237  001214                  INC     $TMP5           ;BUMP SWITCH
3618  013360  000716                          BR      3$              ;GO DO LOOP AGAIN
3619
3620  013362  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
3621  013366  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
3622  013372  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
3623  013400  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
3624  013406  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
3625  013414  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
3626  013422  001402                          BEQ     6$              ;YES - SKIP
3627  013424  104044                          ERROR   44
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3628  013426  000410                          BR      7$
3629  013430  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
3630  013436  001004                          BNE     7$              ;YES - SKIP
3631  013440  012737  100100  002234          MOV     #DCK!ECH,E.ER   ;SET EXPECTED ERROR REG
3632  013446  104045                          ERROR   45
3633
3634  013450                          7$:
3635
3636                                  ;;*****************************************************************
3637                                  ;*TEST 20       READ DATA WITH 1 BIT ECC WORD ERROR
3638                                  ;*
3639                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3640                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3641                                  ;*      OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
3642                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3643                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE, A
3644                                  ;*      GOOD HEADER, 400 DATA WORDS AND AN ECC INDICATING
3645                                  ;*      A 1 BIT ERROR IN ECC WORD 2, BIT 6.  VERIFY THE
3646                                  ;*      COUNTING OF THE POSITION REGISTER.  MAKE SURE DATA
3647                                  ;*      CHECK AND CONTROLLER ERROR SETS.
3648                                  ;*
3649                                  ;*****************************************************************
3650  013450  000004                  TST20:  SCOPE
3651  013452  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
3652
3653  013460  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
3654  013464  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3655
3656  013472  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
3657  013476  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3658  013502  000000                          0                       ;CYLINDER 0
3659  013504     000                          .BYTE   0               ;SECTOR 0
3660  013505     000                          .BYTE   0               ;TRACK 0
3661  013506  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
3662  013510  177400                          -400                    ;WORD COUNT -400
3663  013512  000021                          RDDATA                  ;COMMAND RDDATA
3664
3665  013514  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
3666
3667  013520  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
3668  013524  000005                          5                       ;PATTERN 5
3669
3670
3671  013526  012700  001002                  MOV     #1002,R0        ;SET INDEX INTO BUFFER
3672  013532  012737  126073  050636          MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
3673  013540  012737  151052  050640          MOV     #151052,OBUFF+1002
3674  013546  012737  000001  002344          MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
3675  013554  032760  000100  047636          BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
3676  013562  001004                          BNE     100$            ;YES - SKIP
3677  013564  052760  000100  047636          BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
3678  013572  000403                          BR      101$
3679  013574  042760  000100  047636  100$:   BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
3680  013602                          101$:
3681
3682  013602  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
3683  013606  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
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3684  013612  104004                        ERROR   4               ;CS1 MISCOMPARE
3685  013614  104005                        ERROR   5               ;MR1      "
3686  013616  104006                        ERROR   6               ;MR2      "
3687  013620  104007                        ERROR   7               ;MR3      "
3688
3689  013622  004437  023316                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3690
3691  013626  004437  023740                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3692  013632  104010                        ERROR   10              ;MR1 CONTENTS IN ERROR
3693  013634  104011                        ERROR   11              ;CS1 CONTENTS IN ERROR
3694
3695  013636  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3696  013642  104012                        ERROR   12              ;MR1 CONTENTS IN ERROR
3697  013644  104013                        ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3698  013646  104014                        ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3699
3700  013650  004437  026500                JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3701  013654  104015                        ERROR   15              ;MR1 IN ERROR READING GAP
3702  013656  104016                        ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3703  013660  104032                        ERROR   32              ;MR1 IN ERROR READING SYNC
3704  013662  104033                        ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3705
3706  013664  012737  000001  002346        MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
3707  013672  012737  004066  002350        MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
3708  013700  004437  027176                JSR     R4,DREAD        ;GO SIMULATE DATA READ
3709  013704  000400                        400                     ;NUMBER OF WORDS TO SIMULATE
3710  013706  104034                        ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3711  013710  104035                        ERROR   35              ;ECC ERROR READING DATA
3712  013712  104036                        ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3713  013714  104041                        ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3714  013716  104042                        ERROR   42              ;ERR IN ECC PAT CALC.
3715  013720  104043                        ERROR   43              ;ERR IN ECC POS COUNT
3716
3717
3718  013722  012737  000020  002326        MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
3719  013730  012700  000005                MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
3720  013734  012701  013672                MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
3721  013740  005037  001214                CLR     $TMPS           ;CLEAR SWITCH
3722
3723  013744  004737  031616        3$:     JSR     PC,RDBIT        ;GO READ BIT
3724  013750  004737  030462                JSR     PC,ECCGEN       ;GENERATE ECC
3725  013754  016237  000032  002214        MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
3726  013762  016237  000030  002212        MOV     RKECPS(R2),T.ECPS       ;GET POSITION
3727  013770  005237  002350                INC     ECPOSX          ;BUMP POSITION EXPECTED
3728  013774  013737  002350  002252        MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
3729  014002  023737  002254  002214        CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
3730  014010  001401                        BEQ     1$              ;YES - SKIP
3731  014012  104042                        ERROR   42
3732  014014  023737  002252  002212  1$:   CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
3733  014022  001401                        BEQ     2$              ;YES - SKIP
3734  014024  104043                        ERROR   43
3735  014026  005237  002326        2$:     INC     BITCNT          ;BUMP BIT COUNT
3736  014032  005301                        DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
3737  014034  001343                        BNE     3$              ;NOT YET ZERO - LOOP
3738  014036  005300                        DEC     R0              ;DEC PASS THRU 0 COUNT
3739  014040  001406                        BEQ     4$              ;IF 0 - SKIP
```

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3740  014042  012737  177777  002350          MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
3741  014050  012701  020000                  MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
3742  014054  000733                          BR      3$              ;GO DO LOOP AGAIN
3743
3744  014056  005737  001214          4$:     TST     $TMP5           ;TEST SWITCH
3745  014062  001012                          BNE     5$              ;ALREADY SET - SKIP
3746  014064  012701  010016                  MOV     #10016,R1       ;SET COUNT TO FINAL POSITION
3747  014070  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
3748  014074  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
3749  014102  005237  001214                  INC     $TMP5           ;BUMP SWITCH
3750  014106  000716                          BR      3$              ;GO DO LOOP AGAIN
3751
3752  014110  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
3753  014114  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
3754  014120  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
3755  014126  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
3756  014134  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
3757  014142  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
3758  014150  001402                          BEQ     6$              ;YES - SKIP
3759  014152  104044                          ERROR   44
3760  014154  000410                          BR      7$
3761  014156  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
3762  014164  001404                          BEQ     7$              ;YES - SKIP
3763  014166  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
3764  014174  104045                          ERROR   45
3765
3766  014176                          7$:
3767
3768                                  ;;**********************************************************************
3769                                  ;*TEST 21        18 BIT NPR WRITING OF MEMORY
3770                                  ;*
3771                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3772                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3773                                  ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
3774                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3775                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
3776                                  ;*      A GOOD HEADER, 40 DATA WORDS.  VERIFY THAT THE WORDS
3777                                  ;*      ARE WRITTEN PROPERLY IN MEMORY.
3778                                  ;*
3779                                  ;**********************************************************************
3780  014176  000004          TST21:  SCOPE
3781  014200  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
3782
3783  014206  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
3784  014212  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3785
3786  014220  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
3787  014224  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
3788  014230  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3789  014234  000000                          0                       ;CYLINDER 0
3790  014236     000                          .BYTE   0               ;SECTOR 0
3791  014237     000                          .BYTE   0               ;TRACK 0
3792  014240  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
3793  014242  177400                          -400                    ;WORD COUNT -400
3794  014244  010021                          RDDATA!CFMT                     ;COMMAND RDDATA!CFMT
3795
```

```
3796  014246  004437  031770                JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
3797
3798  014252  004437  032014                JSR     R4,BLDDPT       ;GO BUILD DATA
3799  014256  000003                         3                       ;PATTERN 3
3800
3801
3802  014260  004437  032274                JSR     R4,GPSTRT       ;START THE OPERATION
3803  014264  004437  023334                JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
3804  014270  104004                         ERROR   4               ;CS1 MISCOMPARE
3805  014272  104005                         ERROR   5               ;MR1     "
3806  014274  104006                         ERROR   6               ;MR2     "
3807  014276  104007                         ERROR   7               ;MR3     "
3808
3809  014300  004437  023316                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3810
3811  014304  004437  023740                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3812  014310  104010                         ERROR   10              ;MR1 CONTENTS IN ERROR
3813  014312  104011                         ERROR   11              ;CS1 CONTENTS IN ERROR
3814
3815  014314  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3816  014320  104012                         ERROR   12              ;MR1 CONTENTS IN ERROR
3817  014322  104013                         ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3818  014324  104014                         ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3819
3820  014326  004437  026500                JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3821  014332  104015                         ERROR   15              ;MR1 IN ERROR READING GAP
3822  014334  104016                         ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3823  014336  104032                         ERROR   32              ;MR1 IN ERROR READING SYNC
3824  014340  104033                         ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3825
3826  014342  012737  000000  002346        MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
3827  014350  012737  005066  002350        MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
3828  014356  004437  027176                JSR     R4,DREAD        ;GO SIMULATE DATA READ
3829  014362  000060                         60                      ;NUMBER OF WORDS TO SIMULATE
3830  014364  104034                         ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3831  014366  104035                         ERROR   35              ;ECC ERROR READING DATA
3832  014370  104036                         ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3833  014372  104041                         ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3834  014374  104042                         ERROR   42              ;ERR IN ECC PAT CALC.
3835  014376  104043                         ERROR   43              ;ERR IN ECC POS COUNT
3836
3837
3838  014400  012700  047636                MOV     #OBUFF,R0       ;SET POINTER TO GOOD DATA
3839  014404  012701  046632                MOV     #IBUFF,R1       ;SET POINTER TO INPUT DATA
3840
3841  014410  012704  000012                MOV     #10.,R4         ;SET ERROR LIMIT COUNT
3842  014414  005037  001236                CLR     $ESCAPE         ;CLEAR ESCAPE
3843  014420  005037  001220                CLR     $TMP7           ;CLEAR ERROR REPORT SWITCH
3844  014424  012703  000040                MOV     #40,R3          ;SET COMPARE LIMIT
3845  014430  005005                        CLR     R5              ;CLEAR WORD COUNTER
3846
3847  014432  021011                1$:     CMP     (R0),(R1)       ;COMPARE DATA
3848  014434  001005                        BNE     2$              ;SKIP IF NOT EQUAL
3849  014436  005303                4$:     DEC     R3              ;ELSE DEC WORD COUNT LIMIT
3850  014440  001424                        BEQ     5$              ;IF 0 - SKIP TO EXIT
3851  014442  005205                        INC     R5              ;BUMP WORD COUNT
```

```
3852  014444  022021                          CMP     (R0)+,(R1)+     ;BUMP DATA POINTERS
3853  014446  000771                          BR      1$              ;LOOP
3854
3855  014450  005304                  2$:     DEC     R4              ;DEC ERROR LIMIT
3856  014452  001417                          BEQ     5$              ;IF 0 - SKIP
3857
3858  014454  011037  001162                  MOV     (R0),$REG0      ;GET GOOD WORD FOR REPORT
3859  014460  011137  001164                  MOV     (R1),$REG1      ;GET BAD WORD
3860  014464  010537  001166                  MOV     R5,$REG2        ;GET WORD NUMBER
3861
3862  014470  005737  001220                  TST     $TMP7           ;DECIDE WHICH ERROR REPORT TO USE
3863  014474  001004                          BNE     3$              ;SKIP IF NOT 0
3864  014476  005237  001220                  INC     $TMP7           ;ELSE BUMP $TMP7
3865  014502  104037                          ERROR   37              ;REPORT FIRST ERROR LINE
3866  014504  000754                          BR      4$              ;SKIP
3867
3868  014506  104040                  3$:     ERROR 40                ;REPORT ALL OTHER LINES
3869  014510  000752                          BR      4$              ;SKIP
3870
3871  014512                          5$:
3872
3873                                  ;*****************************************************************
3874                                  ;*TEST 22       18 BIT READ DATA WITH NO ERROR
3875                                  ;*
3876                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3877                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3878                                  ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
3879                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
3880                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
3881                                  ;*      A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
3882                                  ;*      VERIFY THAT COMMAND COMPLETES WITHOUT ERROR.
3883                                  ;*
3884                                  ;*****************************************************************
3885  014512  000004                  TST22:  SCOPE
3886  014514  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
3887
3888  014522  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
3889  014526  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3890  014534  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE REG
3891  014540  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
3892  014544  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
3893  014550  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
3894  014554  000000                          0                       ;CYLINDER 0
3895  014556     000                          .BYTE   0               ;SECTOR 0
3896  014557     000                          .BYTE   0               ;TRACK 0
3897  014560  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
3898  014562  177400                          -400                    ;WORD COUNT -400
3899  014564  010021                          RDDATA!CFMT                     ;COMMAND RDDATA!CFMT
3900
3901  014566  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
3902
3903  014572  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
3904  014576  000004                          4                       ;PATTERN 4
3905
3906
3907  014600  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
```

```
3908  014604  004437  023334          JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
3909  014610  104004                  ERROR   4               ;CS1 MISCOMPARE
3910  014612  104005                  ERROR   5               ;MR1      "
3911  014614  104006                  ERROR   6               ;MR2      "
3912  014616  104007                  ERROR   7               ;MR3      "
3913
3914  014620  004437  023316          JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
3915
3916  014624  004437  023740          JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
3917  014630  104010                  ERROR   10              ;MR1 CONTENTS IN ERROR
3918  014632  104011                  ERROR   11              ;CS1 CONTENTS IN ERROR
3919
3920  014634  004437  024276          JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
3921  014640  104012                  ERROR   12              ;MR1 CONTENTS IN ERROR
3922  014642  104013                  ERROR   13              ;CS1 IN ERROR AFTER SEARCH
3923  014644  104014                  ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
3924
3925  014646  004437  026500          JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
3926  014652  104015                  ERROR   15              ;MR1 IN ERROR READING GAP
3927  014654  104016                  ERROR   16              ;CS1 IN ERROR AFTER READING GAP
3928  014656  104032                  ERROR   32              ;MR1 IN ERROR READING SYNC
3929  014660  104033                  ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
3930
3931  014662  012737  000000  002346  MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
3932  014670  012737  005066  002350  MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
3933  014676  004437  027176          JSR     R4,DREAD        ;GO SIMULATE DATA READ
3934  014702  000400                  400                     ;NUMBER OF WORDS TO SIMULATE
3935  014704  104034                  ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
3936  014706  104035                  ERROR   35              ;ECC ERROR READING DATA
3937  014710  104036                  ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
3938  014712  104041                  ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
3939  014714  104042                  ERROR   42              ;ERR IN ECC PAT CALC.
3940  014716  104043                  ERROR   43              ;ERR IN ECC POS COUNT
3941
3942
3943  014720  012700  003100          MOV     #40.*40.,R0     ;SET COUNT TO EMPTY SILO
3944
3945  014724  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK CONTROLLER
3946  014732  012762  000040  000026          MOV     #DMD,RKMR1(R2)
3947  014740  005300                          DEC     R0              ;DEC COUNT
3948  014742  001370                          BNE     1$              ;LOOP UNTIL 0
3949
3950  014744  004437  032356          JSR     R4,GETREG       ;GE  611 REGS
3951  014750  013737  002260  002220  MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
3952  014756  042737  000001  002220  BIC     #GO,E.CS1       ;CLEAR GO BIT
3953  014764  052737  000200  002220  BIS     #RDY,E.CS1      ;SET READY BIT
3954  014772  023737  002160  002220  CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
3955  015000  001401                  BEQ     2$              ;YES - SKIP
3956  015002  104056                  ERROR   56              ;"CS1 IN ERROR AFTER READ DATA"
3957  015004                  2$:
3958                          ;;**************************************************************
3959                          ;*TEST 23        18 BIT READ DATA WITH DCK
3960                          ;*
3961                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
3962                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
3963                          ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
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```
                                        ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                                        ;*      A GOOD HEADER, 400 DATA WORDS, AND AN ECC INDICATING
                                        ;*      A ONE BIT BURST ERROR BEYOND THE 4128TH BIT OF THE SECTOR.
                                        ;*      VERIFY THE COUNTING OF THE POSITION REGISTER AND THE
                                        ;*      FINAL PATTERN AND POSITION.  MAKE SURE DATA CHECK AND
                                        ;*      CONTROLLER ERROR SETS.
                                        ;*
                                        ;;*****************************************************************
015004  000004                TST23:  SCOPE
015006  012737  000001  001234        MOV     #1,$TIMES       ;;DO 1 ITERATION

015014  005037  002352                CLR     BSEDES          ;CLEAR BAD SEC DESIRED
015020  012762  100000  000000        MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER

015026  005037  002354                CLR     HIBITS          ;CLEAR HI ORDER BITS
015032  004437  032230                JSR     R4,LOADRK       ;LOAD "L" REGISTERS
015036  000000                        0                       ;CYLINDER 0
015040     000                      .BYTE   0               ;SECTOR 0
015041     000                      .BYTE   0               ;TRACK 0
015042  046632                      IBUFF                   ;BUFFER ADDRESS IBUFF
015044  177400                      -400                    ;WORD COUNT -400
015046  010021                      RDDATA!CFMT                     ;COMMAND RDDATA!CFMT

015050  004437  031770                JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

015054  004437  032014                JSR     R4,BLDDAT       ;GO BUILD DATA
015060  000007                        7                       ;PATTERN 7


015062  012700  000734                MOV     #734,R0         ;SET INDEX INTO BUFFER
015066  012737  006030  050636        MOV     #6030,OBUFF+1000        ;STORE ECC WORDS
015074  012737  045070  050640        MOV     #45070,OBUFF+1002
015102  012737  000001  002344        MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
015110  032760  000100  047636        BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
015116  001004                        BNE     100$            ;YES - SKIP
015120  052760  000100  047636        BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
015126  000403                        BR      101$
015130  042760  000100  047636  100$:  BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
015136                        101$:

015136  004437  032274                JSR     R4,OPSTRT       ;START THE OPERATION
015142  004437  023334                JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
015146  104004                        ERROR   4               ;CS1 MISCOMPARE
015150  104005                        ERROR   5               ;MR1     "
015152  104006                        ERROR   6               ;MR2     "
015154  104007                        ERROR   7               ;MR3     "

015156  004437  023316                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE

015162  004437  023740                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
015166  104010                        ERROR   10              ;MR1 CONTENTS IN ERROR
015170  104011                        ERROR   11              ;CS1 CONTENTS IN ERROR

015172  004437  024276                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
015176  104012                        ERROR   12              ;MR1 CONTENTS IN ERROR
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 4020  015200  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
 4021  015202  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
 4022
 4023  015204  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
 4024  015210  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
 4025  015212  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
 4026  015214  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
 4027  015216  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
 4028
 4029  015220  012737  000001  002346          MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
  030  015226  012737  005066  002350          MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
 4031  015234  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
 4032  015240  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
 4033  015242  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
 4034  015244  104035                          ERROR   35              ;ECC ERROR READING DATA
 4035  015246  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
 4036  015250  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
 4037  015252  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
 4038  015254  104043                          ERROR   43              ;ERR IN ECC POS COUNT
 4039
 4040
 4041  015256  012737  000022  002326          MOV     #22,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
 4042  015264  012700  000005                  MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
 4043  015270  012701  012672                  MOV     #12672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
 4044  015274  005037  001214                  CLR     $TMP5           ;CLEAR SWITCH
 4045
 4046  015300  004737  031616          3$:     JSR     PC,RDBIT        ;GO READ BIT
 4047  015304  004737  030462                  JSR     PC,ECCGEN       ;GENERATE ECC
 4048  015310  016237  000032  002214          MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
 4049  015316  016237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
 4050  015324  005237  002350                  INC     ECPOSX          ;BUMP POSITION EXPECTED
 4051  015330  013737  002350  002252          MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
 4052  015336  023737  002254  002214          CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
 4053  015344  001401                          BEQ     1$              ;YES - SKIP
 4054  015346  104042                          ERROR   42
 4055  015350  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
 4056  015356  001401                          BEQ     2$              ;YES - SKIP
 4057  015360  104043                          ERROR   43
 4058  015362  005237  002326          2$:     INC     BITCNT          ;BUMP BIT COUNT
 4059  015366  005301                          DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
 4060  015370  001343                          BNE     3$              ;NOT YET ZERO - LOOP
 4061  015372  005300                          DEC     R0              ;DEC PASS THRU 0 COUNT
 4062  015374  001406                          BEQ     4$              ;IF 0 - SKIP
 4063  015376  012737  177777  002350          MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
 4064  015404  012701  020000                  MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
 4065  015410  000733                          BR      3$              ;GO DO LOOP AGAIN
 4066
 4067  015412  005737  001214          4$:     TST     $TMP5           ;TEST SWITCH
 4068  015416  001012                          BNE     5$              ;ALREADY SET - SKIP
 4069  015420  012701  010272                  MOV     #10272,R1       ;SET COUNT TO FINAL POSITION
 4070  015424  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
 4071  015430  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
 4072  015436  005237  001214                  INC     $TMP5           ;BUMP SWITCH
 4073  015442  000716                          BR      3$              ;GO DO LOOP AGAIN
 4074
 4075  015444  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
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4076  015450  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
4077  015454  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
4078  015462  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
4079  015470  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
4080  015476  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
4081  015504  001402                          BEQ     6$              ;YES - SKIP
4082  015506  104044                          ERROR   44
4083  015510  000410                          BR      7$
4084  015512  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
4085  015520  001404                          BEQ     7$              ;NO SKIP
4086  015522  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
4087  015530  104045                          ERROR   45
4088
4089  015532                          7$:
4090
4091                                          ;;*****************************************************************
4092                                          ;*TEST 24       18 BIT READ DATA WITH ECH
4093                                          ;*
4094                                          ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4095                                          ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
4096                                          ;*      OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
4097                                          ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4098                                          ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
4099                                          ;*      A GOOD HEADER, 400 DATA WORDS AND AND ECC INDICATING
4100                                          ;*      A 12 BIT BURST ERROR.  VERIFY THE COUNTING OF THE
4101                                          ;*      POSITION REGISTER.  MAKE SURE DATE CHECK, ECC HARD,
4102                                          ;*      AND CONTROLLER ERROR SETS.
4103                                          ;*
4104                                          ;;*****************************************************************
4105  015532  000004                  TST24:  SCOPE
4106  015534  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
4107
4108  015542  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
4109  015546  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4110
4111  015554  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
4112  015560  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
4113  015564  000000                          0                       ;CYLINDER 0
4114  015566     000                          .BYTE   0               ;SECTOR 0
4115  015567     000                          .BYTE   0               ;TRACK 0
4116  015570  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
4117  015572  177400                          -400                    ;WORD COUNT -400
4118  015574  010021                          RDDATA!CFMT                     ;COMMAND RDDATA!CFMT
4119
4120  015576  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
4121
4122  015602  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
4123  015606  000005                          5                       ;PATTERN 5
4124
4125
4126  015610  012700  000734                  MOV     #734,R0         ;SET INDEX INTO BUFFER
4127  015614  012737  004020  050636          MOV     #4020,OBUFF+1000        ;STORE ECC WORDS
4128  015622  012737  071720  050640          MOV     #71720,OBUFF+1002
4129  015630  012737  000001  002344          MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
4130  015636  042760  005000  047636          BIC     #BIT9!BIT11,OBUFF(R0)   ;CREATE 11 BIT BURST ERROR
4131  015644  052760  050100  047636          BIS     #BIT6!BIT12!BIT14,OBUFF(R0)
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4132  015652  062700  000002                  ADD     #2,R0           ;BUMP TO NEXT WORD
4133  015656  052760  000001  047636          BIS     #BIT0,OBUFF(R0)
4134  015664  042760  000002  047636          BIC     #BIT1,OBUFF(R0) ;MAKE IT A 12 BIT BURST ERROR
4135
4136  015672  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
4137  015676  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
4138  015702  104004                          ERROR   4               ;CS1 MISCOMPARE
4139  015704  104005                          ERROR   5               ;MR1      "
4140  015706  104006                          ERROR   6               ;MR2      "
4141  015710  104007                          ERROR   7               ;MR3      "
4142
4143  015712  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
4144
4145  015716  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
4146  015722  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
4147  015724  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
4148
4149  015726  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
4150  015732  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
4151  015734  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4152  015736  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
4153
4154  015740  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
4155  015744  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
4156  015746  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
4157  015750  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
4158  015752  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
4159
4160  015754  012737  000001  002346          MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
4161  015762  012737  005066  002350          MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
4162  015770  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
4163  015774  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
4164  015776  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
4165  016000  104035                          ERROR   35              ;ECC ERROR READING DATA
4166  016002  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
4167  016004  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4168  016006  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
4169  016010  104043                          ERROR   43              ;ERR IN ECC POS COUNT
4170
4171
4172  016012  012737  000022  002326          MOV     #22,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
4173  016020  012700  000005                  MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
4174  016024  012701  012672                  MOV     #12672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
4175  016030  005037  001214                  CLR     $TMP5           ;CLEAR SWITCH
4176
4177  016034  004737  031616          3$:     JSR     PC,RDBIT        ;GO READ BIT
4178  016040  004737  030462                  JSR     PC,ECCGEN       ;GENERATE ECC
4179  016044  016237  000032  002214          MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
4180  016052  016237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
4181  016060  005237  002350                  INC     ECPOSX          ;BUMP POSITION EXPECTED
4182  016064  013737  002350  002252          MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
4183  016072  023737  002254  002214          CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
4184  016100  001401                          BEQ     1$              ;YES - SKIP
4185  016102  104042                          ERROR   42
4186  016104  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
4187  016112  001401                          BEQ     2$              ;YES - SKIP
```

```
4188  016114  104043                        ERROR   43
4189  016116  005237  002326          2$:   INC     BITCNT          ;BUMP BIT COUNT
4190  016122  005301                        DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
4191  016124  001343                        BNE     3$              ;NOT YET ZERO - LOOP
4192  016126  005300                        DEC     R0              ;DEC PASS THRU 0 COUNT
4193  016130  001406                        BEQ     4$              ;IF 0 - SKIP
4194  016132  012737  177777  002350        MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
4195  016140  012701  020000                MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
4196  016144  000733                        BR      3$              ;GO DO LOOP AGAIN
4197
4198  016146  005737  001214          4$:   TST     $TMP5           ;TEST SWITCH
4199  016152  001012                        BNE     5$              ;ALREADY SET - SKIP
4200  016154  012701  011041                MOV     #11041,R1       ;SET COUNT TO FINAL POSITION
4201  016160  012700  000001                MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
4202  016164  012737  177777  002350        MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
4203  016172  005237  001214                INC     $TMP5           ;BUMP SWITCH
4204  016176  000716                        BR      3$              ;GO DO LOOP AGAIN
4205
4206  016200  004737  031616          5$:   JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
4207  016204  004437  032356                JSR     R4,GETREG       ;GET '611 REGISTERS
4208  016210  013737  002260  002220        MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
4209  016216  052737  100200  002220        BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
4210  016224  042737  000001  002220        BIC     #GO,E.CS1       ;CLEAR GO
4211  016232  023737  002160  002220        CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
4212  016240  001402                        BEQ     6$              ;YES - SKIP
4213  016242  104044                        ERROR   44
4214  016244  000410                        BR      7$
4215  016246  032737  000100  002174  6$:   BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
4216  016254  001004                        BNE     7$              ;YES -  SKIP
4217  016256  012737  100100  002234        MOV     #DCK!ECH,E.ER   ;SET EXPECTED ERROR REG
4218  016264  104045                        ERROR   45
4219
4220  016266                          7$:
4221
4222                                  .SBTTL  **SPECIAL READ TESTS
4223
4224                                  ;;*****************************************************************
4225                                  ;*TEST 25       PARTIAL SECTOR READ
4226                                  ;*
4227                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4228                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
4229                                  ;*      OF 103 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
4230                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4231                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
4232                                  ;*      A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
4233                                  ;*      MAKE SURE ONLY 103 WORDS GOT TRANSFERRED TO MEMORY.
4234                                  ;*
4235                                  ;;*****************************************************************
4236  016266  000004                  TST25:  SCOPE
4237  016270  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
4238
4239  016276  005037  002352                  CLR     BSEDES          ;CLEAR BAD SEC DESIRED
4240  016302  012762  100000  000000          MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4241
4242  016310  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
4243  016314  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
```

```
4244  016320  004437  032230              JSR     R4,LOADRK       ;LOAD "L" REGISTERS
4245  016324  000000                      0                       ;CYLINDER 0
4246  016326     000                      .BYTE   0               ;SECTOR 0
4247  016327     000                      .BYTE   0               ;TRACK 0
4248  016330  046632                      IBUFF                   ;BUFFER ADDRESS IBUFF
4249  016332  177675                      -103                    ;WORD COUNT -103
4250  016334  000021                      RDDATA                  ;COMMAND RDDATA
4251
4252  016336  004437  031770              JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
4253
4254  016342  004437  032014              JSR     R4,BLDDAT       ;GO BUILD DATA
4255  016346  000006                      6                       ;PATTERN 6
4256
4257
4258  016350  004437  032274              JSR     R4,OPSTRT       ;START THE OPERATION
4259  016354  004437  023334              JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
4260  016360  104004                      ERROR   4               ;CS1 MISCOMPARE
4261  016362  104005                      ERROR   5               ;MR1     "
4262  016364  104006                      ERROR   6               ;MR2     "
4263  016366  104007                      ERROR   7               ;MR3     "
4264
4265  016370  004437  023316              JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
4266
4267  016374  004437  023740              JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
4268  016400  104010                      ERROR   10              ;MR1 CONTENTS IN ERROR
4269  016402  104011                      ERROR   11              ;CS1 CONTENTS IN ERROR
4270
4271  016404  004437  024276              JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
4272  016410  104012                      ERROR   12              ;MR1 CONTENTS IN ERROR
4273  016412  104013                      ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4274  016414  104014                      ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
4275
4276  016416  004437  026500              JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
4277  016422  104015                      ERROR   15              ;MR1 IN ERROR READING GAP
4278  016424  104016                      ERROR   16              ;CS1 IN ERROR AFTER READING GAP
4279  016426  104032                      ERROR   32              ;MR1 IN ERROR READING SYNC
4280  016430  104033                      ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
4281
4282  016432  012737  000000  002346      MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
4283  016440  012737  004066  002350      MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
4284  016446  004437  027176              JSR     R4,DREAD        ;GO SIMULATE DATA READ
4285  016452  000400                      400                     ;NUMBER OF WORDS TO SIMULATE
4286  016454  104034                      ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
4287  016456  104035                      ERROR   35              ;ECC ERROR READING DATA
4288  016460  104036                      ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
4289  016462  104041                      ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4290  016464  104042                      ERROR   42              ;ERR IN ECC PAT CALC.
4291  016466  104043                      ERROR   43              ;ERR IN ECC POS COUNT
4292
4293
4294  016470  013700  002164              MOV     T.BA,R0         ;GET ACTUAL BA
4295  016474  162700  046632              SUB     #IBUFF,R0       ;SUB START VALUE OF BA
4296  016500  022700  000206              CMP     #206,R0         ;TEST IF CORRECT NUM OF WORDS XFER
4297  016504  001404                      BEQ     4$              ;YES - SKIP
4298  016506  012737  047040  002224      MOV     #IBUFF+206,E.BA ;SET EXPECTED BA
4299  016514  104046                      ERROR   46              ;REPORT XFER LENGTH ERROR
```

```
                                4$:     MOV     #3.*4.,R1       ;SET COUNT TO END OF OPERATION
016516  012701  000014         3$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN THE CLOCK
016522  012762  000440  000026
016530  012762  000040  000026         MOV     #DMD,RKMR1(R2)
016536  005301                       DEC     R1              ;DEC THE COUNT
016540  001370                       BNE     3$              ;LOOP UNTIL ZERO

016542  004437  032356         1$:     JSR     R4,GETREG       ;GET 611 REGS
016546  013737  002260  002220       MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
016554  042737  000001  002220       BIC     #GO,E.CS1       ;CLEAR GO BIT
016562  052737  000200  002220       BIS     #RDY,E.CS1      ;SET READY BIT
016570  023737  002160  002220       CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
016576  001401                       BEQ     2$              ;YES - SKIP
016600  104056                       ERROR   56              ;"CS1 IN ERROR AFTER READ DATA"
016602                          2$:

                                ;;*****************************************************************
                                ;*TEST 26       SILO UNLOAD BEFORE HEADER ERROR
                                ;*
                                ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A READ DATA
                                ;*      OF 401 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                                ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                                ;*      A GOOD HEADER, 400 DATA WORDS, AND A GOOD 32 BIT ECC.
                                ;*      AFTER ECC SIMULATE A SECTOR PULSE AND A BAD SECTOR ERROR.
                                ;*      MAKE SURE THE ENTIRE PREVIOUS SECTOR GETS LOADED INTO
                                ;*      MEMORY BEFORE BAD SECTOR ERROR AND CONTROLLER ERROR SETS.
                                ;*
                                ;;*****************************************************************
016602  000004                 TST26:  SCOPE
016604  012737  000001  001234       MOV     #1,$TIMES       ;;DO 1 ITERATION

016612  012762  100000  000000       MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER

016620  005037  002352               CLR     BSEDES          ;CLEAR BSE DESIRED
016624  005037  002344               CLR     ECCSRC          ;CLEAR ECC SOURCE
016630  005037  002354               CLR     HIBITS          ;CLEAR HI ORDER BITS
016634  004437  032230               JSR     R4,LOADRK       ;LOAD "L" REGISTERS
016640  000000                       0                       ;CYLINDER 0
016642     000                       .BYTE   0               ;SECTOR 0
016643     000                       .BYTE   0               ;TRACK 0
016644  046632                       IBUFF                   ;BUFFER ADDRESS IBUFF
016646  177377                       -401                    ;WORD COUNT -401
016650  000021                       RDDATA                  ;COMMAND RDDATA

016652  004437  031770               JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

016656  004437  032014               JSR     R4,BLDDAT       ;GO BUILD DATA
016662  000002                       2                       ;PATTERN 2

016664  004437  032274               JSR     R4,OPSTRT       ;START THE OPERATION
016670  004437  023334               JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
016674  104004                       ERROR   4               ;CS1 MISCOMPARE
```

```
4356  016676  104005                          ERROR   5               ;MR1     "
4357  016700  104006                          ERROR   6               ;MR2     "
4358  016702  104007                          ERROR   7               ;MR3     "
4359
4360  016704  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
4361
4362  016710  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
4363  016714  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
4364  016716  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
4365
4366  016720  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
4367  016724  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
4368  016726  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4369  016730  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
4370
4371  016732  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
4372  016736  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
4373  016740  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
4374  016742  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
4375  016744  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
4376
4377  016746  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
4378  016754  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
4379  016762  004437  027176                  JSR     R4,DREAD        ;GO SIMULATE DATA READ
4380  016766  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
4381  016770  104034                          ERROR   34              ;MR1 IN ERROR READING DATA OR ECC
4382  016772  104035                          ERROR   35              ;ECC ERROR READING DATA
4383  016774  104036                          ERROR   36              ;CS1 ERROR AFTER READING DATA OR ECC
4384  016776  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4385  017000  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
4386  017002  104043                          ERROR   43              ;ERR IN ECC POS COUNT
4387
4388
4389  017004  012701  000040                  MOV     #8.*4.,R1       ;SET COUNT TO END OF SECTOR
4390  017010  012762  000440  000026  6$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN THE CLOCK
4391  017016  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4392  017024  005301                          DEC     R1              ;DEC THE COUNT
4393  017026  001370                          BNE     6$              ;LOOP UNTIL ZERO
4394
4395  017030  052737  100000  002352          BIS     #BIT15,BSEDES   ;SET FOR BAD SECTOR ERROR
4396
4397  017036  004437  023316                  JSR     R4,DSECTR       ;ISSUE SECTOR PULSE
4398
4399  017042  004437  023740                  JSR     R4,DRSYNC       ;READ SYNC
4400  017046  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
4401  017050  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
4402
4403  017052  004437  024276                  JSR     R4,DHDCMP       ;DO HEADER COMPARE WITH BSE ERROR
4404  017056  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
4405  017060  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4406  017062  000411                          BR      1$              ;EXPECTED RETURN (NO DA INCREMENT)
4407
4408                                  ;       IF THIS CODE IS EXECUTED, THE CONTROLLER DID NOT INHIBIT
4409                                  ;       THE ADDRESS INCREMENT BECAUSE OF THE BSE ERROR.
4410
4411  017064  005037  002352                  CLR     BSEDES          ;CLEAR BSE DESIRED SWITCH
```

```
4412  017070  013737  002274  002240          MOV     L.DCYL,E.DCYL   ;SET EXPECTED CYL
4413  017076  013737  00226E  002226          MOV     L.DA,E.DA       ;SET EXPECTED SEC/TRACK
4414  017104  104047                          ERROR   47              ;UNEXPECTED ADDRESS INCREMENT
4415
4416  017106  016237  000014  002174  1$:     MOV     RKER(R2),T.ER   ;GET ERROR REG
4417  017114  032737  000200  002174          BIT     #BSE,T.ER       ;TEST IF BSE SET
4418  017122  001005                          BNE     2$              ;YES - SKIP
4419  017124  012737  000200  002234          MOV     #BSE,E.ER       ;SET EXPECTED ERROR REG
4420  017132  104051                          ERROR   51              ;"BSE DID NOT SET"
4421  017134  000453                          BR      TST27           ;;GO TO NEXT TEST
4422
4423  017136  004437  032356          2$:     JSR     R4,GETREG       ;GET 611 REGS
4424  017142  013737  002260  002220          MOV     L.CS1,E.CS1     ;SET EXPECTED CS1
4425  017150  023737  002220  002160          CMP     E.CS1,T.CS1     ;CHECK IF CS1 OK
4426  017156  001402                          BEQ     3$              ;YES - SKIP
4427  017160  104056                          ERROR   56              ;"CS1 ERROR AFTER WRITE CHECK"
4428  017162  000440                          BR      TST27           ;;GO TO NEXT TEST
4429
4430  017164  012701  010540          3$:     MOV     #278.*16.,R1    ;SET COUNT TO NEXT ECC FIELD
4431  017170  005037  002320                  CLR     PR.BIT          ;CLEAR PRESENT AND PREVIOUS BITS
4432  017174  005037  002322                  CLR     M1.BIT
4433  017200  004737  031616          4$:     JSR     PC,RDBIT        ;SIMULATE READ BIT
4434  017204  005301                          DEC     R1              ;DEC COUNT
4435  017206  001374                          BNE     4$              ;LOOP UNTIL ZERO
4436
4437  017210  004437  032356                  JSR     R4,GETREG       ;GET 611 REGS
4438  017214  042737  000001  002220          BIC     #GO,E.CS1       ;SET UP EXPECTED CS1
4439  017222  052737  100200  002220          BIS     #RDY!CERR,E.CS1
4440  017230  023737  002220  002160          CMP     E.CS1,T.CS1     ;CHECK IF CS1 OK
4441  017236  001402                          BEQ     7$              ;YES - SKIP
4442  017240  104056                          ERROR   56              ;"CS1 ERROR AFTER READ DATA"
4443  017242  000410                          BR      TST27           ;;GO TO NEXT TEST
4444
4445  017244  012737  047632  002224  7$:     MOV     #IBUFF+1000,E.BA ;SET EXPECTED BA
4446  017252  023737  002224  002164          CMP     E.BA,T.BA       ;TEST IF BA CORRECT
4447  017260  001401                          BEQ     5$              ;YES - SKIP
4448  017262  104052                          ERROR   52              ;BUS ADDRESS INCORRECT
4449
4450  017264                          5$:
4451
4452                                  .SBTTL  **WRITE CHECK TESTS
4453
4454                                  ;;*****************************************************************
4455                                  ;*TEST 27       WRITE CHECK OF 400 WORDS
4456                                  ;*
4457                                  ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4458                                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4459                                  ;*       CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
4460                                  ;*       CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4461                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
4462                                  ;*       A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
4463                                  ;*       AND A GOOD 32 BIT ECC.  MAKE SURE NO ERRORS SET.
4464                                  ;*
4465                                  ;*****************************************************************
4466  017264  000004          TST27   SCOPE
4467  017266  012737  000012  001234          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
```

```
                                                CLR     HIBITS          ;CLEAR HI ORDER BITS
                                                CLR     BSEDES          ;CLEAR BSE DESIRED

                                                CLR     ECCSRC          ;CLEAR ECC SOURCE FLAG
                                                CLR     ECCSRC          ;CLEAR ECC SOURCE
                                                JSR     R4,LOADRK       ;LOAD "L" REGISTERS
                                                0                       ;CYLINDER 0
                                                .BYTE   0               ;SECTOR 0
                                                .BYTE   0               ;TRACK 0
                                                IBUFF                   ;BUFFER ADDRESS IBUFF
                                                -400                    ;WORD COUNT -400
                                                WRTCHK                  ;COMMAND WRTCHK

                                                JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

                                                JSR     R4,BLDDAT       ;GO BUILD DATA
                                                4                       ;PATTERN 4

                                                MOV     #400,R0         ;SET A COUNT FOR BUFFER SIZE
                                                MOV     #IBUFF,R1       ;SET ADDRESS OF IBUFF
                                                MOV     #OBUFF,R3       ;SET ADDRESS OF OBUFF
                                        75$:    MOV     (R3)+,(R1)+     ;MOV PATTERN TO IBUFF
                                                DEC     R0              ;DEC COUNT
                                                BNE     75$             ;LOOP UNTIL PATTERN IS MOVED

                                        110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
                                                JSR     R4,OPSTRT       ;START THE OPERATION
                                                JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
                                                ERROR   4               ;CS1 MISCOMPARE
                                                ERROR   5               ;MR1     "
                                                ERROR   6               ;MR2     "
                                                ERROR   7               ;MR3     "

                                                JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE

                                                JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
                                                ERROR   10              ;MR1 CONTENTS IN ERROR
                                                ERROR   11              ;CS1 CONTENTS IN ERROR

                                                JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
                                                ERROR   12              ;MR1 CONTENTS IN ERROR
                                                ERROR   13              ;CS1 IN ERROR AFTER SEARCH
                                                ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH

                                                JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
                                                ERROR   15              ;MR1 IN ERROR READING GAP
                                                ERROR   16              ;CS1 IN ERROR AFTER READING GAP
                                                ERROR   32              ;MR1 IN ERROR READING SYNC
                                                ERROR   33              ;CS1 IN ERROR AFTER READING SYNC

                                                MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
                                                MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
                                                JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
                                                400                     ;NUMBER OF WORDS TO SIMULATE
                                                ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
                                                ERROR   54              ;ECC ERROR IN WRITE CHECK OP
```

```
                                        ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
                                        ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
                                        ERROR   42              ;ERR IN ECC PAT CALC.
                                        ERROR   43              ;ERR IN ECC POS COUNT

017514  012700  002710                  MOV     #40.*37.,R0     ;SET COUNT TO EMPTY SILO

017520  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK CONTROLLER
017526  012762  000040  000026          MOV     #DMD,RKMR1(R2)
017534  005300                          DEC     R0              ;DEC COUNT
017536  001370                          BNE     1$              ;LOOP UNTIL 0

017540  004437  032356                  JSR     R4,GETREG       ;GET 611 REGS
017544  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
017552  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO BIT
017560  052737  000200  002220          BIS     #RDY,E.CS1      ;SET READY BIT
017566  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
017574  001401                          BEQ     2$              ;YES - SKIP
017576  104057                          ERROR   57              ;"CS1 IN ERROR AFTER WRITE CHECK"
017600                          2$:

                        ;;*****************************************************************
                        ;*TEST 30       WRITE CHECK WITH DCK
                        ;*
                        ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                        ;*      CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT,
                        ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
                        ;*      A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
                        ;*      AND A 32 BIT ECC INDICATING A 1 BIT BURST ERROR.
                        ;*      VERIFY THAT THE POSITION REGISTER INCREMENTS PROPERLY
                        ;*      AND THAT THE FINAL PATTERN AND POSITION ARE CORRECT.
                        ;*      CHECK THAT DATA CHECK AND CONTROLLER ERROR ARE SET.
                        ;*
                        ;;*****************************************************************
017600  000004          TST30:  SCOPE
017602  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION

017610  005037  002352                  CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
017614  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
017620  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
017624  000000                          0                       ;CYLINDER 0
017626     000                          .BYTE   0               ;SECTOR 0
017627     000                          .BYTE   0               ;TRACK 0
017630  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
017632  177400                          -400                    ;WORD COUNT -400
017634  000031                          WRTCHK                  ;COMMAND WRTCHK

017636  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

017642  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
017646  000005                          5                       ;PATTERN 5

017650  012700  000400                  MOV     #400,R0         ;SET A COUNT FOR BUFFER SIZE
```

```
 4580  017654  012701  046632                    MOV     #IBUFF,R1       ;SET ADDRESS OF IBUFF
 4581  017660  012703  047636                    MOV     #OBUFF,R3       ;SET ADDRESS OF OBUFF
 4582  017664  012321                    75$:    MOV     (R3)+,(P1)+     ;MOV PATTERN TO IBUFF
 4583  017666  005300                            DEC     R0              ;DEC COUNT
 4584  017670  001375                            BNE     75$             ;LOOP UNTIL PATTERN IS MOVED
 4585
 4586  017672  012700  001002                    MOV     #1002,R0        ;SET INDEX INTO BUFFER
 4587  017676  012737  126073  050636            MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
 4588  017704  012737  151052  050640            MOV     #151052,OBUFF+1002
 4589  017712  012737  000001  002344            MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
 4590  017720  032760  000100  047636            BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
 4591  017726  001004                            BNE     100$            ;YES - SKIP
 4592  017730  052760  000100  047636            BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
 4593  017736  000403                            BR      101$
 4594  017740  042760  000100  047636  100$:    BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
 4595  017746                    101$:
 4596
 4597  017746  012762  100000  000000  110$:    MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
 4598  017754  004437  022274                    JSR     R4,OPSTRT       ;START THE OPERATION
 4599  017760  004437  023334                    JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
 4600  017764  104004                            ERROR   4               ;CS1 MISCOMPARE
 4601  017766  104005                            ERROR   5               ;MR1     "
 4602  017770  104006                            ERROR   6               ;MR2     "
 4603  017772  104007                            ERROR   7               ;MR3     "
 4604
 4605  017774  004437  023316                    JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
 4606
 4607  020000  004437  023740                    JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
 4608  020004  104010                            ERROR   10              ;MR1 CONTENTS IN ERROR
 4609  020006  104011                            ERROR   11              ;CS1 CONTENTS IN ERROR
 4610
 4611  020010  004437  024276                    JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
 4612  020014  104012                            ERROR   12              ;MR1 CONTENTS IN ERROR
 4613  020016  104013                            ERROR   13              ;CS1 IN ERROR AFTER SEARCH
 4614  020020  104014                            ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
 4615
 4616  020022  004437  026500                    JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
 4617  020026  104015                            ERROR   15              ;MR1 IN ERROR READING GAP
 4618  020030  104016                            ERROR   16              ;CS1 IN ERROR AFTER READING GAP
 4619  020032  104032                            ERROR   32              ;MR1 IN ERROR READING SYNC
 4620  020034  104033                            ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
 4621
 4622  020036  012737  000001  002346            MOV     #1,ECPATX       ;LOAD EXPECTED PATTERN
 4623  020044  012737  004066  002350            MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
 4624  020052  004437  027176                    JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
 4625  020056  000400                            400                     ;NUMBER OF WORDS TO SIMULATE
 4626  020060  104053                            ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
 4627  020062  104054                            ERROR   54              ;ECC ERROR IN WRITE CHECK OP
 4628  020064  104055                            ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
 4629  020066  104041                            ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
 4630  020070  104042                            ERROR   42              ;ERR IN ECC PAT CALC.
 4631  020072  104043                            ERROR   43              ;ERR IN ECC POS COUNT
 4632
 4633
 4634  020074  012737  000020  002326            MOV     #20,BITCNT      ;SET BIT COUNT FOR CORRECTION COUNT
 4635  020102  012700  000005                    MOV     #5,R0           ;SET COUNT FOR ECCPOS PASS THRU 0
```

```
4636  020106  012701  013672                  MOV     #13672,R1       ;SET COUNT FOR ECCPOS TO 0 FIRST PASS
4637  020112  005037  001214                  CLR     $TMP5           ;CLEAR SWITCH
4638
4639  020116  004737  031616          3$:     JSR     PC,RDBIT        ;GO READ BIT
4640  020122  004737  030462                  JSR     PC,ECCGEN       ;GENERATE ECC
4641  020126  016237  000032  002214          MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
4642  020134  016237  000030  002212          MOV     RKECPS(R2),T.ECPS       ;GET POSITION
4643  020142  005237  002350                  INC     ECPOSX          ;BUMP POSITION EXPECTED
4644  020146  013737  002350  002252          MOV     ECPOSX,E.ECPS   ;SET FOR COMPARE AND REPORT
4645  020154  023737  002254  002214          CMP     E.ECPT,T.ECPT   ;CHECK IF PATTERN CORRECT
4646  020162  001401                          BEQ     1$              ;YES - SKIP
4647  020164  104042                          ERROR   42
4648  020166  023737  002252  002212  1$:     CMP     E.ECPS,T.ECPS   ;CHECK IF POSITION CORRECT
4649  020174  001401                          BEQ     2$              ;YES - SKIP
4650  020176  104043                          ERROR   43
4651  020200  005237  002326          2$:     INC     BITCNT          ;BUMP BIT COUNT
4652  020204  005301                          DEC     R1              ;DEC COUNT TO ZERO IN ECCPOS
4653  020206  001343                          BNE     3$              ;NOT YET ZERO - LOOP
4654  020210  005300                          DEC     R0              ;DEC PASS THRU 0 COUNT
4655  020212  001406                          BEQ     4$              ;IF 0 - SKIP
4656  020214  012737  177777  002350          MOV     #-1,ECPOSX      ;PRESET EXPECTED POS TO GO TO ZERO
4657  020222  012701  020000                  MOV     #20000,R1       ;SET COUNT TO NEXT 0 IN ECC POS
4658  020226  000733                          BR      3$              ;GO DO LOOP AGAIN
4659
4660  020230  005737  001214          4$:     TST     $TMP5           ;TEST SWITCH
4661  020234  001012                          BNE     5$              ;ALREADY SET - SKIP
4662  020236  012701  010016                  MOV     #10016,R1       ;SET COUNT TO FINAL POSITION
4663  020242  012700  000001                  MOV     #1,R0           ;SET R0 TO RETURN AFTER ONE PASS
4664  020246  012737  177777  002350          MOV     #-1,ECPOSX      ;SET EXP POS TO GO TO 0 ON NEXT BIT
4665  020254  005237  001214                  INC     $TMP5           ;BUMP SWITCH
4666  020260  000716                          BR      3$              ;GO DO LOOP AGAIN
4667
4668  020262  004737  031616          5$:     JSR     PC,RDBIT        ;ONE MORE BIT TO SET READY
4669  020266  004437  032356                  JSR     R4,GETREG       ;GET '611 REGISTERS
4670  020272  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
4671  020300  052737  100200  002220          BIS     #RDY!CERR,E.CS1 ;SET READY AND ERROR
4672  020306  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO
4673  020314  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
4674  020322  001402                          BEQ     6$              ;YES - SKIP
4675  020324  104044                          ERROR   44
4676  020326  000410                          BR      7$
4677  020330  032737  000100  002174  6$:     BIT     #ECH,T.ER       ;TEST IF ECC HARD ERROR SET
4678  020336  001404                          BEQ     7$              ;YES - SKIP
4679  020340  012737  100000  002234          MOV     #DCK,E.ER       ;SET EXPECTED ERROR REG
4680  020346  104045                          ERROR   45
4681
4682  020350                          7$:
4683
4684                                  ;;*****************************************************************
4685                                  ;*TEST 31        WRITE CHECK OF 18 BIT WORDS
4686                                  ;*
4687                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4688                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE. ISSUE A WRITE
4689                                  ;*      CHECK OF 400 WORDS TO AN RK06 IN 24 SECTOR FORMAT,
4690                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4691                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
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                                ;*      A GOOD HEADER, THE 400 WORDS TO BE WRITE CHECKED,
                                ;*      AND A GOOD 32 BIT ECC.  MAKE SURE NO ERRORS SET.
                                ;*
                                ;*************************************************************
020350  000004                  TST31:  SCOPE
020352  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION

020360  005037  002352          CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
020364  005037  002354          CLR     HIBITS          ;CLEAR HI ORDER BITS
020370  005037  002344          CLR     ECCSRC          ;CLEAR ECC SOURCE
020374  004437  032230          JSR     R4,LOADRK       ;LOAD "L" REGISTERS
020400  000000                  0                       ;CYLINDER 0
020402     000                  .BYTE   0               ;SECTOR 0
020403     000                  .BYTE   0               ;TRACK 0
020404  046632                  IBUFF                   ;BUFFER ADDRESS IBUFF
020406  177400                  -400                    ;WORD COUNT -400
020410  010031                  WRTCHK!CFMT                     ;COMMAND WRTCHK!CFMT

020412  004437  031770          JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER

020416  004437  032014          JSR     R4,BLDDAT       ;GO BUILD DATA
020422  000004                  4                       ;PATTERN 4

020424  012700  000400          MOV     #400,R0         ;SET A COUNT FOR BUFFER SIZE
020430  012701  046632          MOV     #IBUFF,R1       ;SET ADDRESS OF IBUFF
020434  012703  047636          MOV     #OBUFF,R3       ;SET ADDRESS OF OBUFF
020440  012321          75$:    MOV     (R3)+,(R1)+     ;MOV PATTERN TO IBUFF
020442  005300                  DEC     R0              ;DEC COUNT
020444  001375                  BNE     75$             ;LOOP UNTIL PATTERN IS MOVED

020446  012762  100000  000000  110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
020454  004437  032274          JSR     R4,OPSTRT       ;START THE OPERATION
020460  004437  023334          JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
020464  104004                  ERROR   4               ;CS1 MISCOMPARE
020466  104005                  ERROR   5               ;MR1     "
020470  104006                  ERROR   6               ;MR2     "
020472  104007                  ERROR   7               ;MR3     "

020474  004437  023316          JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE

020500  004437  023740          JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
020504  104010                  ERROR   10              ;MR1 CONTENTS IN ERROR
020506  104011                  ERROR   11              ;CS1 CONTENTS IN ERROR

020510  004437  024276          JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
020514  104012                  ERROR   12              ;MR1 CONTENTS IN ERROR
020516  104013                  ERROR   13              ;CS1 IN ERROR AFTER SEARCH
020520  104014                  ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH

020522  004437  026500          JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
020526  104015                  ERROR   15              ;MR1 IN ERROR READING GAP
020530  104016                  ERROR   16              ;CS1 IN ERROR AFTER READING GAP
020532  104032                  ERROR   32              ;MR1 IN ERROR READING SYNC
020534  104033                  ERROR   33              ;CS1 IN ERROR AFTER READING SYNC

020536  012737  000000  002346  MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
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4748  020544  012737  005066  002350          MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
4749  020552  004437  027176                  JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
4750  020556  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
4751  020560  104053                          ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
4752  020562  104054                          ERROR   54              ;ECC ERROR IN WRITE CHECK OP
4753  020564  104055                          ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
4754  020566  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4755  020570  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
4756  020572  104043                          ERROR   43              ;ERR IN ECC POS COUNT
4757
4758
4759  020574  012700  003100                  MOV     #40.*40.,R0     ;SET COUNT TO EMPTY SILO
4760
4761  020600  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;CLOCK CONTROLLER
4762  020606  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4763  020614  005300                          DEC     R0              ;DEC COUNT
4764  020616  001370                          BNE     1$              ;LOOP UNTIL 0
4765
4766  020620  004437  032356                  JSR     R4,GETREG       ;GET 611 REGS
4767  020624  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
4768  020632  042737  000001  002220          BIC     #GO,E.CS1       ;CLEAR GO BIT
4769  020640  052737  000200  002220          BIS     #RDY,E.CS1      ;SET READY BIT
4770  020646  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
4771  020654  001401                          BEQ     2$              ;YES - SKIP
4772  020656  104057                          ERROR   57              ;"CS1 IN ERROR AFTER WRITE CHECK"
4773  020660                          2$:
4774                                  ;;*****************************************************************
4775                                  ;*TEST 32       WRITE CHECK OF A PARTIAL SECTOR
4776                                  ;*
4777                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
4778                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
4779                                  ;*      CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
4780                                  ;*      CYLINER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
4781                                  ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
4782                                  ;*      A GOOD HEADER, TAKE ONE WORD TO BE WRITE-CHECKED, 377 WORDS
4783                                  ;*      NOT TO BE WRITE CHECKED, AND A GOOD 32 BIT ECC.
4784                                  ;*      MAKE SURE NO ERRORS SET.
4785                                  ;*
4786                                  ;;*****************************************************************
4787  020660  000004                  TST32:  SCOPE
4788  020662  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
4789
4790  020670  005037  002352                  CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
4791  020674  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
4792  020700  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
4793  020704  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
4794  020710  000000                          0                       ;CYLINDER 0
4795  020712     000                          .BYTE   0               ;SECTOR 0
4796  020713     000                          .BYTE   0               ;TRACK 0
4797  020714  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
4798  020716  177777                          -1                      ;WORD COUNT -1
4799  020720  000031                          WRTCHK                  ;COMMAND WRTCHK
4800
4801  020722  004437  031770                  JSR     R4,CLRIBF       ;GO CLEAR INPUT BUFFER
4802
4803  020726  004437  032014                  JSR     R4,BLDDAT       ;GO BUILD DATA
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4804  020732  000006                          6                       ;PATTERN 6
4805
4806  020734  012700  000400                  MOV     #400,R0         ;SET A COUNT FOR BUFFER SIZE
4807  020740  012701  046632                  MOV     #IBUFF,R1       ;SET ADDRESS OF IBUFF
4808  020744  012703  047636                  MOV     #OBUFF,R3       ;SET ADDRESS OF OBUFF
4809  020750  012321                  75$:    MOV     (P3)+,(R1)+     ;MOV PATTERN TO IBUFF
4810  020752  005300                          DEC     R0              ;DEC COUNT
4811  020754  001375                          BNE     75$             ;LOOP UNTIL PATTERN IS MOVED
4812
4813  020756  012762  100000  000000  110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
4814  020764  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
4815  020770  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
4816  020774  104004                          ERROR   4               ;CS1 MISCOMPARE
4817  020776  104005                          ERROR   5               ;MR1     "
4818  021000  104006                          ERROR   6               ;MR2     "
4819  021002  104007                          ERROR   7               ;MR3     "
4820
4821  021004  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
4822
4823  021010  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
4824  021014  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
4825  021016  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
4826
4827  021020  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
4828  021024  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
4829  021026  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4830  021030  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
4831
4832  021032  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
4833  021036  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
4834  021040  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
4835  021042  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
4836  021044  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
4837
4838  021046  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
4839  021054  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
4840  021062  004437  027176                  JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
4841  021066  000400                          400                     ;NUMBER OF WORDS TO SIMULATE
4842  021070  104053                          ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
4843  021072  104054                          ERROR   54              ;ECC ERROR IN WRITE CHECK OP
4844  021074  104055                          ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
4845  021076  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4846  021100  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
4847  021102  104043                          ERROR   43              ;ERR IN ECC POS COUNT
4848
4849
4850  021104  013700  002164                  MOV     T.BA,R0         ;GET ACTUAL BA
4851  021110  162700  046632                  SUB     #IBUFF,R0       ;SUB START VALUE OF BA
4852  021114  022700  000002                  CMP     #2,R0           ;TEST IF CORRECT NUM OF WORDS XFER
4853  021120  001404                          BEQ     4$              ;YES - SKIP
4854  021122  012737  046634  002224          MOV     #IBUFF+2,E.BA   ;SET EXPECTED BA
4855  021130  104046                          ERROR   46              ;REPORT XFER LENGTH ERROR
4856
4857  021132  012701  000040          4$:     MOV     #8.*4.,R1       ;SET COUNT TO END OF OPERATION
4858  021136  012762  000440  000026  3$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN CLOCK
4859  021144  012762  000040  000026          MOV     #DMD,RKMR1(R2)
```

```
                                        DEC     R1              ;DEC COUNT
                                        BNE     3$              ;LOOP UNTIL ZERO

                                1$:     JSR     R4,GETREG       ;GET 611 REGS
                                        MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
                                        BIC     #GO,E.CS1       ;CLEAR GO BIT
                                        BIS     #RDY,E.CS1      ;SET READY BIT
                                        CMP     T.CS1,E.CS1     ;CHECK IF CS1 CORRECT
                                        BEQ     2$              ;YES - SKIP
                                        ERROR   57              ;"CS1 IN ERROR AFTER WRITE CHECK"
                                2$:

;;*********************************************************************
;*TEST 33        WRITE CHECK ERROR (PART 1)
;*
;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
;*      CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
;*      CLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
;*      A GOOD HEADER, AND ONE WORD OF DATA CONSISTING OF 000000.
;*      WRITE CHECKED DATA IS 000001.  MAKE SURE WRITE CHECK ERROR SETS.
;*      REPEAT USING EACH OF THE FOLLOWING CONFIGURATIONS
;*      AS WRITE CHECKED DATA:
;*
;*      000002  000040  001000  020000
;*      000004  000100  002000  040000
;*      000010  000200  004000  100000
;*      000020  000400  010000
;*
;;*********************************************************************
TST33:  SCOPE
        001234          MOV     #1,$TIMES       ;;DO 1 ITERATION

                        CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
                        CLR     HIBITS          ;CLEAR HI ORDER BITS
                        CLR     ECCSRC          ;CLEAR ECC SOURCE
                        JSR     R4,LOADRK       ;LOAD "L" REGISTERS
                        0                       ;CYLINDER 0
                        .BYTE   0               ;SECTOR 0
                        .BYTE   0               ;TRACK 0
                        IBUFF                   ;BUFFER ADDRESS IBUFF
                        -1                      ;WORD COUNT -1
                        WRTCHK                  ;COMMAND WRTCHK

                        MOV     #16.,R5         ;SET PATTERN COUNT
                        CLR     OBUFF           ;CLEAR FIRST WORD OF OBUFF
                        MOV     #1,IBUFF        ;SET IN FIRST PATTERN
                        BIT     #BIT0,IBUFF     ;IS BIT 0 SET
                        BNE     112$            ;YES - PATTERN SHOULD BE 0
                        MOV     #-1,OBUFF       ;ELSE PATTERN SHOULD BE ALL ONES
                112$:   MOV     #110$,$LPERR    ;SET LOCAL LOOP ON ERROR

                110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
                        JSR     R4,OPSTRT       ;START THE OPERATION
```

```
4916  021334  004437  023334          JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
4917  021340  104004                  ERROR   4               ;CS1 MISCOMPARE
4918  021342  104005                  ERROR   5               ;MR1     "
4919  021344  104006                  ERROR   6               ;MR2     "
4920  021346  104007                  ERROR   7               ;MR3     "
4921
4922  021350  004437  023316          JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
4923
4924  021354  004437  023740          JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
4925  021360  104010                  ERROR   10              ;MR1 CONTENTS IN ERROR
4926  021362  104011                  ERROR   11              ;CS1 CONTENTS IN ERROR
4927
4928  021364  004437  024276          JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
4929  021370  104012                  ERROR   12              ;MR1 CONTENTS IN ERROR
4930  021372  104013                  ERROR   13              ;CS1 IN ERROR AFTER SEARCH
4931  021374  104014                  ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
4932
4933  021376  004437  026500          JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
4934  021402  104015                  ERROR   15              ;MR1 IN ERROR READING GAP
4935  021404  104016                  ERROR   16              ;CS1 IN ERROR AFTER READING GAP
4936  021406  104032                  ERROR   32              ;MR1 IN ERROR READING SYNC
4937  021410  104033                  ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
4938
4939  021412  012737  000000  002346  MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
4940  021420  012737  004066  002350  MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
4941  021426  004437  027176          JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
4942  021432  000001                  1                       ;NUMBER OF WORDS TO SIMULATE
4943  021434  104053                  ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
4944  021436  104054                  ERROR   54              ;ECC ERROR IN WRITE CHECK OP
4945  021440  104055                  ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
4946  021442  104041                  ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
4947  021444  104042                  ERROR   42              ;ERR IN ECC PAT CALC.
4948  021446  104043                  ERROR   43              ;ERR IN ECC POS COUNT
4949
4950  021450  012701  000040          MOV     #8.*4.,R1       ;SET COUNT
4951  021454  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN CLOCK
4952  021462  012762  000040  000026          MOV     #DMD,RKMR1(R2)
4953  021470  005301                  DEC     R1              ;DEC COUNT
4954  021472  001370                  BNE     1$              ;LOOP UNTIL ZERO
4955
4956  021474  004437  032356          JSR     R4,GETREG       ;GET REGS
4957  021500  032737  040000  002170  BIT     #WCE,T.CS2      ;TEST IF WCE SET
4958  021506  001012                  BNE     2$              ;YES - SKIP
4959  021510  013737  002170  001162  MOV     T.CS2,$REG0     ;SET CS2 FOR REPORT
4960  021516  013737  046632  001164  MOV     IBUFF,$REG1     ;SET WORD READ
4961  021524  013737  047636  001166  MOV     OBUFF,$REG2     ;SET WORD FROM BUFFER
4962  021532  104060                  ERROR   60              ;"WCE FAILED TO SET"
4963
4964  021534  104415          2$:     SCOP1                   ;LOCAL LOOP ON ERROR
4965
4966  021536  006337  046632          ASL     IBUFF           ;SHIFT FOR NEXT TEST PATTERN
4967  021542  005305                  DEC     R5              ;DEC PATTERN COUNT
4968  021544  001266                  BNE     110$            ;LOOP UNTIL ALL PATTERNS TESTED
4969
4970                          ;;*****************************************************************
4971                          ;*TEST 34        WRITE CHECK ERROR (PART 2)
```

```
                                        ;*
                                        ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
                                        ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
                                        ;*      CHECK OF 1 WORD TO AN RK06 IN 26 SECTOR FORMAT,
                                        ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
                                        ;*      AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE
                                        ;*      A GOOD HEADER, AND ONE WORD OF DATA CONSISTING OF 177777.
                                        ;*      WRITE CHECKED DATA IS 177776.  MAKE SURE WRITE
                                        ;*      CHECK ERROR SETS.  REPEAT USING EACH OF THE FOLLOWING
                                        ;*      OCNFIGURATION AS WRITE CHECKED DATA:
                                        ;*
                                        ;*      177775  177737  176777  157777
                                        ;*      177773  177677  175777  137777
                                        ;*      177767  177577  173777  077777
                                        ;*      177757  177377  167777
                                        ;*
                                        ;**************************************************************
021546  000004                  ST34:   SCOPE
021550  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION

021556  005037  002352                  CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
021562  005037  002354                  CLR     HIBITS          ;CLEAR HI ORDER BITS
021566  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
021572  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
021576  000000                          0                       ;CYLINDER 0
021600     000                          .BYTE   0               ;SECTOR 0
021601     000                          .BYTE   0               ;TRACK 0
021602  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
021604  177777                          -1                      ;WORD COUNT -1
021606  000031                          WRTCHK                  ;COMMAND WRTCHK

021610  012705  000020                  MOV     #16.,R5         ;SET PATTERN COUNT
021614  005037  047636                  CLR     OBUFF           ;CLEAR FIRST WORD OF OBUFF
021620  012737  177776  046632          MOV     #177776,IBUFF   ;SET IN FIRST PATTERN
021626  032737  000001  046632          BIT     #BIT0,IBUFF     ;IS BIT 0 SET
021634  001003                          BNE     112$            ;YES - PATTERN SHOULD BE 0
021636  012737  177777  047636          MOV     #-1,OBUFF       ;ELSE PATTERN SHOULD BE ALL ONES
021644  012737  021652  001110  112$:   MOV     #110$,$LPERR    ;SET LOCAL LOOP ON ERROR

021652  012762  100000  000000  110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
021660  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
021664  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
021670  104004                          ERROR   4               ;CS1 MISCOMPARE
021672  104005                          ERROR   5               ;MR1     "
021674  104006                          ERROR   6               ;MR2     "
021676  104007                          ERROR   7               ;MR3     "

021700  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE

021704  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
021710  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
021712  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR

021714  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
021720  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
021722  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
```

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5028  021724  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
5029
5030  021726  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
5031  021732  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
5032  021734  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
5033  021736  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
5034  021740  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
5035
5036  021742  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
5037  021750  012737  004066  002350          MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
5038  021756  004437  027176                  JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
5039  021762  000001                          1                       ;NUMBER OF WORDS TO SIMULATE
5040  021764  104053                          ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
5041  021766  104054                          ERROR   54              ;ECC ERROR IN WRITE CHECK OP
5042  021770  104055                          ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
5043  021772  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
5044  021774  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
5045  021776  104043                          ERROR   43              ;ERR IN ECC POS COUNT
5046
5047  022000  012701  000040                  MOV     #8.*4.,R1       ;SET COUNT
5048  022004  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN CLOCK
5049  022012  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5050  022020  005301                          DEC     R1              ;DEC COUNT
5051  022022  001370                          BNE     1$              ;LOOP UNTIL ZERO
5052
5053  022024  004437  032356                  JSR     R4,GETREG       ;GET REGS
5054  022030  032737  040000  002170          BIT     #WCE,T.CS2      ;TEST IF WCE SET
5055  022036  001012                          BNE     2$              ;YES - SKIP
5056  022040  013737  002170  001162          MOV     T.CS2,$REG0     ;SET CS2 FOR REPORT
5057  022046  013737  046632  001164          MOV     IBUFF,$REG1     ;SET WORD READ
5058  022054  013737  047636  001166          MOV     OBUFF,$REG2     ;SET WORD FROM BUFFER
5059  022062  104060                          ERROR   60              ;"WCE FAILED TO SET"
5060
5061  022064  104415                  2$:     SCOPE1                  ;LOCAL LOOP ON ERROR
5062
5063  022066  006337  046632                  ASL     IBUFF           ;SHIFT FOR NEXT TEST PATTERN
5064  022072  005537  046632                  ADC     IBUFF           ;PUT CARRY BACK IN
5065  022076  005305                          DEC     R5              ;DEC PATTERN COUNT
5066  022100  001264                          BNE     110$            ;LOOP UNTIL ALL PATTERNS TESTED
5067
5068                                  ;;*****************************************************************
5069                                  ;*TEST 35       WRITE CHECK ERROR (PART 3)
5070                                  ;*
5071                                  ;*       CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5072                                  ;*       PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5073                                  ;*       CHECK OF 1 WORD TO AN RK06 IN 24 SECTOR FORMAT,
5074                                  ;*       CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5075                                  ;*       AND DRIVE CLEAR MESSAGES.  SIMULATE A SECTOR PULSE,
5076                                  ;*       A GOOD HEADER, AND ONE WORD OF DATA CONSISTING
5077                                  ;*       OF 200000.  WRITE CHECK DATA IS 000000.  MAKE SURE
5078                                  ;*       WRITE CHECK ERROR SETS.  REPEAT USING 400000 AS
5079                                  ;*       SIMULATED DATA.
5080                                  ;*
5081                                  ;*****************************************************************
5082  022102  000004                  ST35:   SCOPE
5083  022104  012737  000001  001234          MOV     #1,$TIMES       ;;DO 1 ITERATION
```

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5084
5085  022112  005037  002352                  CLR     BSEDES          ;CLEAR BAD SECTOR DESIRED
5086  022116  005037  002344                  CLR     ECCSRC          ;CLEAR ECC SOURCE
5087  022122  004437  032230                  JSR     R4,LOADRK       ;LOAD "L" REGISTERS
5088  022126  000000                          0                       ;CYLINDER 0
5089  022130     000                          .BYTE   0               ;SECTOR 0
5090  022131     000                          .BYTE   0               ;TRACK 0
5091  022132  046632                          IBUFF                   ;BUFFER ADDRESS IBUFF
5092  022134  177777                          -1                      ;WORD COUNT -1
5093  022136  010031                          WRTCHK!CFMT                     ;COMMAND WRTCHK!CFMT
5094
5095  022140  012737  040000  002354          MOV     #40000,HIBITS   ;SET HIBITS FOR PATTERN OF 200000
5096  022146  005037  046632                  CLR     IBUFF           ;SET LOW BITS FOR READ
5097  022152  005037  047636                  CLR     OBUFF           ;SET 0 IN BUFFER
5098  022156  012737  022164  001110  112$:   MOV     #110$,$LPERR    ;SET LOCAL LOOP ON ERROR
5099  022164  012762  100000  000000  110$:   MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
5100
5101  022172  012700  004000                  MOV     #4000,R0        ;SET STALL COUNT
5102  022176  005300                  4$:     DEC     R0              ;DEC COUNT
5103  022200  001376                          BNE     4$              ;LOOP UNTIL ZERO
5104
5105  022202  004437  032274                  JSR     R4,OPSTRT       ;START THE OPERATION
5106  022206  004437  023334                  JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
5107  022212  104004                          ERROR   4               ;CS1 MISCOMPARE
5108  022214  104005                          ERROR   5               ;MR1     "
5109  022216  104006                          ERROR   6               ;MR2     "
5110  022220  104007                          ERROR   7               ;MR3     "
5111
5112  022222  004437  023316                  JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
5113
5114  022226  004437  023740                  JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
5115  022232  104010                          ERROR   10              ;MR1 CONTENTS IN ERROR
5116  022234  104011                          ERROR   11              ;CS1 CONTENTS IN ERROR
5117
5118  022236  004437  024276                  JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
5119  022242  104012                          ERROR   12              ;MR1 CONTENTS IN ERROR
5120  022244  104013                          ERROR   13              ;CS1 IN ERROR AFTER SEARCH
5121  022246  104014                          ERROR   14              ;RKDCYL OR RKDA IN ERROR OFTER SEARCH
5122
5123  022250  004437  026500                  JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
5124  022254  104015                          ERROR   15              ;MR1 IN ERROR READING GAP
5125  022256  104016                          ERROR   16              ;CS1 IN ERROR AFTER READING GAP
5126  022260  104032                          ERROR   32              ;MR1 IN ERROR READING SYNC
5127  022262  104033                          ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
5128
5129  022264  012737  000000  002346          MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
5130  022272  012737  005066  002350          MOV     #5066,ECPOSX    ;LOAD EXPECTED POSITION
5131  022300  004437  027176                  JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
5132  022304  000001                          1                       ;NUMBER OF WORDS TO SIMULATE
5133  022306  104053                          ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
5134  022310  104054                          ERROR   54              ;ECC ERROR IN WRITE CHECK OP
5135  022312  104055                          ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
5136  022314  104041                          ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
5137  022316  104042                          ERROR   42              ;ERR IN ECC PAT CALC.
5138  022320  104043                          ERROR   43              ;ERR IN ECC POS COUNT
5139
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5140  022322  012701  000040                  MOV     #8.*4.,R1          ;SET COUNT
5141  022326  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;RUN CLOCK
5142  022334  012762  000040  000026          MOV     #DMD,RKMR1(R2)
5143  022342  005301                          DEC     R1                 ;DEC COUNT
5144  022344  001370                          BNE     1$                 ;LOOP UNTIL ZERO
5145
5146  022346  004437  032356                  JSR     R4,GETREG          ;GET REGS
5147  022352  032737  040000  002170          BIT     #WCE,T.CS2         ;TEST IF WCE SET
5148  022360  001025                          BNE     2$                 ;YES - SKIP
5149  022362  013737  002170  001162          MOV     T.CS2,$REG0        ;SET CS2 FOR REPORT
5150  022370  013737  046632  001164          MOV     IBUFF,$REG1        ;SET WORD READ
5151  022376  013737  047636  001166          MOV     OBUFF,$REG2        ;SET WORD FROM BUFFER
5152  022404  005037  001170                  CLR     $REG3              ;SET UP FOR REPORT
5153  022410  013737  002354  001172          MOV     HIBITS,$REG4
5154  022416  012700  000016                  MOV     #14.,R0
5155  022422  006037  001172          3$:     ROR     $REG4
5156  022426  005300                          DEC     R0
5157  022430  001374                          BNE     3$
5158  022432  104063                          ERROR   63                 ;"WCE FAILED TO SET"
5159
5160  022434  104415                  2$:     SCOP1                      ;LOCAL LOOP ON ERROR
5161
5162  022436  023727  002354  100000          CMP     HIBITS,#100000     ;TEST IF SECOND PATTERN DONE
5163  022444  001404                          BEQ     5$                 ;YES - EXIT
5164  022446  012737  100000  002354          MOV     #100000,HIBITS     ;SET FOR PATTERN 400000
5165  022454  000643                          BR      110$               ;LOOP UNTIL ALL PATTERNS TESTED
5166  022456                          5$:
5167
5168                                  ;;*****************************************************************
5169                                  ;*TEST 36       WRITE CHECK ERROR (PART 4)
5170                                  ;*
5171                                  ;*      CLEAR RK611 CONTROLLER WITH A CONTROLLER CLEAR.
5172                                  ;*      PUT CONTROLLER IN DIAGNOSTIC MODE.  ISSUE A WRITE
5173                                  ;*      CHECK OF 400 WORDS TO AN RK06 IN 26 SECTOR FORMAT.
5174                                  ;*      CYLINDER 0, HEAD 0, SECTOR 0.  CLOCK THROUGH SEEK
5175                                  ;*      AND DRIVE CLEAR MESSAGES SIMULATE A SECTOR PULSE,
5176                                  ;*      A GOOD HEADER, 125 GOOD WORDS, AND A BAD WORD.
5177                                  ;*      MAKE SURE WRITE CHECK ERROR SET.  CHECK WORD COUNT
5178                                  ;*      AND BUS ADDRESS.
5179                                  ;*
5180                                  ;*****************************************************************
5181  022456  000004                  TST36:  SCOPE
5182  022460  012737  000001  001234          MOV     #1,$TIMES          ;;DO 1 ITERATION
5183
5184  022466  005037  002354                  CLR     HIBITS             ;CLEAR HI BITS
5185  022472  005037  002352                  CLR     BSEDES             ;CLEAR BAD SECTOR DESIRED
5186  022476  004437  032230                  JSR     R4,LOADRK          ;LOAD "L" REGISTERS
5187  022502  000000                          0                          ;CYLINDER 0
5188  022504     000                          .BYTE   0                  ;SECTOR 0
5189  022505     000                          .BYTE   0                  ;TRACK 0
5190  022506  046632                          IBUFF                      ;BUFFER ADDRESS IBUFF
5191  022510  177400                          -400                       ;WORD COUNT -400
5192  022512  000031                          WRTCHK                     ;COMMAND WRTCHK
5193
5194  022514  004437  031770                  JSR     R4,CLRIBF          ;GO CLEAR INPUT BUFFER
5195
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5196  022520  004437  032014                    JSR     R4,BLDDAT       ;GO BUILD DATA
5197  022524  000005                            5                       ;PATTERN 5
5198
5199  022526  012700  000400                    MOV     #400,R0         ;SET A COUNT FOR BUFFER SIZE
5200  022532  012701  046632                    MOV     #IBUFF,R1       ;SET ADDRESS OF IBUFF
5201  022536  012703  047636                    MOV     #OBUFF,R3       ;SET ADDRESS OF OBUFF
5202  022542  012321                  75$:      MOV     (R3)+,(R1)+     ;MOV PATTERN TO IBUFF
5203  022544  005300                            DEC     R0              ;DEC COUNT
5204  022546  001375                            BNE     75$             ;LOOP UNTIL PATTERN IS MOVED
5205  022550  012700  000530                    MOV     #530,R0         ;SET INDEX INTO BUFFER
5206
5207  022554  012737  126073  050636            MOV     #126073,OBUFF+1000      ;STORE ECC WORDS
5208  022562  012737  151052  050640            MOV     #151052,OBUFF+1002
5209  022570  012737  000001  002344            MOV     #1,ECCSRC       ;SET SOURCE TO INDICATE ECC IN BUFFER
5210  022576  032760  000100  047636            BIT     #BIT6,OBUFF(R0) ;TEST IF BIT SET
5211  022604  001004                            BNE     100$            ;YES - SKIP
5212  022606  052760  000100  047636            BIS     #BIT6,OBUFF(R0) ;ELSE SET BIT
5213  022614  000403                            BR      101$
5214  022616  042760  000100  047636  100$:     BIC     #BIT6,OBUFF(R0) ;CLEAR BIT
5215  022624                    101$:
5216
5217  022624  012762  100000  000000  110$:     MOV     #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
5218  022632  004437  032274                    JSR     R4,OPSTRT       ;START THE OPERATION
5219  022636  004437  023334                    JSR     R4,DISEEK       ;SIMULATE IMPLIED SEEK
5220  022642  104004                            ERROR   4               ;CS1 MISCOMPARE
5221  022644  104005                            ERROR   5               ;MR1     "
5222  022646  104006                            ERROR   6               ;MR2     "
5223  022650  104007                            ERROR   7               ;MR3     "
5224
5225  022652  004437  023316                    JSR     R4,DSECTR       ;SIMULATE SECTOR PULSE
5226
5227  022656  004437  023740                    JSR     R4,DRSYNC       ;SIMULATE HEADER PREAMBLE
5228  022662  104010                            ERROR   10              ;MR1 CONTENTS IN ERROR
5229  022664  104011                            ERROR   11              ;CS1 CONTENTS IN ERROR
5230
5231  022666  004437  024276                    JSR     R4,DHDCMP       ;SIMULATE HEADER SEARCH
5232  022672  104012                            ERROR   12              ;MR1 CONTENTS IN ERROR
5233  022674  104013                            ERROR   13              ;CS1 IN ERROR AFTER SEARCH
5234  022676  104014                            ERROR   14              ;RKDCYL OR RKDA IN ERROR AFTER SEARCH
5235
5236  022700  004437  026500                    JSR     R4,DRGPSN       ;GO READ GAP AND SYNC
5237  022704  104015                            ERROR   15              ;MR1 IN ERROR READING GAP
5238  022706  104016                            ERROR   16              ;CS1 IN ERROR AFTER READING GAP
5239  022710  104032                            ERROR   32              ;MR1 IN ERROR READING SYNC
5240  022712  104033                            ERROR   33              ;CS1 IN ERROR AFTER READING SYNC
5241
5242  022714  012737  000000  002346            MOV     #0,ECPATX       ;LOAD EXPECTED PATTERN
5243  022722  012737  004066  002350            MOV     #4066,ECPOSX    ;LOAD EXPECTED POSITION
5244  022730  004437  027176                    JSR     R4,DWRTCK       ;GO SIMULATE WRITE CHECK
5245  022734  000310                            310                     ;NUMBER OF WORDS TO SIMULATE
5246  022736  104053                            ERROR   53              ;MR1 IN ERROR ON WRT CK OR ECC READ
5247  022740  104054                            ERROR   54              ;ECC ERROR IN WRITE CHECK OP
5248  022742  104055                            ERROR   55              ;CS1 ERROR AFTER WRT CHK OR ECC READ
5249  022744  104041                            ERROR   41              ;ECC REG INCORRECT AFTER ECC READ
5250  022746  104042                            ERROR   42              ;ERR IN ECC PAT CALC.
5251  022750  104043                            ERROR   43              ;ERR IN ECC POS COUNT
```

```
5252
5253
5254  022752  012701  000020                MOV     #4.*4.,P1       ;SET COUNT TO END OF OPERATION
5255  022756  012762  000440  000026  1$:   MOV     #DMD!MCLK,RKMR1(R2)     ;RUN CLOCK
5256  022764  012762  000040  000026        MOV     #DMD,RKMR1(R2)
5257  022772  005301                        DEC     R1              ;DEC COUNT
5258  022774  001370                        BNE     1$              ;LOOP UNTIL ZERO
5259
5260  022776  004437  032356                JSR     R4,GETREG       ;GET '611 REGS
5261  023002  032737  040000  002170        BIT     #WCE,T.CS2      ;TEST IF WRITE CHECK SET
5262  023010  001013                        BNE     2$              ;YES - SKIP
5263  023012  013737  002170  001162        MOV     T.CS2,$REG0     ;SET UP FOR REPORT
5264  023020  016037  046632  001164        MOV     IBUFF(R0),$REG1 ;BUFFER WORD
5265  023026  016037  047636  001166        MOV     OBUFF(R0),$REG2 ;SIMULATED WORD
5266  023034  104060                        ERROR   60              ;WCE NOT SET ERROR
5267  023036  000423                        BR      4$              ;EXIT
5268
5269  023040  012737  046634  002224  2$:   MOV     #IBUFF+2,E.BA   ;SET UP EXPECTED BA
5270  023046  060037  002224                ADD     R0,E.BA         ;ADD IN THE NUMBER OF WORDS TO THE ERROR
5271  023052  023737  002224  002164        CMP     E.BA,T.BA       ;CHECK IF CORRECT
5272  023060  001402                        BEQ     3$              ;YES - SKIP
5273  023062  104061                        ERROR   61              ;BUS ADDRESS ERROR
5274  023064  000410                        BR      4$              ;EXIT
5275
5276  023066  012737  177655  002222  3$:   MOV     #-123,E.WC      ;SET EXPECTED WORD COUNT
5277  023074  023737  002162  002222        CMP     T.WC,E.WC       ;CHECK IF CORRECT
5278  023102  001401                        BEQ     4$              ;YES - SKIP
5279  023104  104062                        ERROR   62              ;WORD COUNT ERROR
5280
5281  023106                          4$:
5282
```

```
                                .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

023106                          $EOP:
023106  000004                          SCOPE
023110  005037  001102                   CLR     $TSTNM          ;;ZERO THE TEST NUMBER
023114  005037  001234                   CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
023120  005237  001256                   INC     $PASS           ;;INCREMENT THE PASS NUMBER
023124  042737  100000  001256           BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
023132  005327                   $EOPCT: DEC     (PC)+           ;;LOOP?
023134  000001                           .WORD   1
023136  003063                   $DOAGN  BGT     $DOAGN          ;;YES
023140  012737                           MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
023142  000001                   $ENDCT: .WORD   1
023144  023134                           $EOPCT
023146  104401  023154                   TYPE    ,65$            ;;TYPE ASCIZ STRING
023152  000407                           BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <12><15>/END PASS #/
023172                          64$:
023172  013746  001256                   MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                 ;;TYPE PASS NUMBER
023176  104405                           TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
023200  104401  023206                   TYPE    ,67$            ;;TYPE ASCIZ STRING
023204  000421                           BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
023250                          66$:
023250  013746  001112                   MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                 ;;TOTAL NUMBER OF ERRORS
023254  104405                           TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
023256  104401  001245                   TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
023262  005037  001112                   CLR     $ERTTL          ;;CLEAR ERROR TOTAL
023266  013700  000042           $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
023272  001405                           BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
023274  000005                           RESET                   ;;CLEAR THE WORLD
023276  004710                   $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
023300  000240                           NOP                     ;;SAVE ROOM
023302  000240                           NOP                     ;;FOR
023304  000240                           NOP                     ;;ACT11
023306                          $DOAGN:
023306  000137                           JMP     @(PC)+          ;;RETURN
023310  003364                   $RTNAD: .WORD   NEWPAS
023312     377     377     000   $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
        023316                           .EVEN

                                .SBTTL  DIAGNOSTIC MODE SECTOR PULSE
                                ;*      THE SECTOR PULSE IS PROVIDED BY THIS ROUTINE
023316  012762  000140  000026   $SECTR: MOV     #DMD!MSP,RKMR1(R2)      ;SET SECTOR PULE
023324  012762  000040  000026           MOV     #DMD,RKMR1(R2)  ;RESET SECTOR PULSE
023332  000204                           RTS     R4
```

```
                                        .SBTTL  DIAGNOSTIC MODE IMPLIED SEEK
                                        ;*      THE CONTROLLER IS CLOCKED THROUGH THE SEEK MESSAGES,
                                        ;*      GETTING STATUS, AND CLEARING THE DRIVE. SINCE THIS REQUIRES A
                                        ;*      DIFFERENT COUNT FOR WRITE DATA AND READ DATA/WRITE CHECK,
                                        ;*      THE ROUTINE LOOKS AT THE COMMAND THAT WAS
                                        ;*      STARTED (L.CS1) AND SETS THE CLOCK COUNT ACCORDINGLY.
                                        ;*
                                        ;*      AT THE END OF THE IMPLIED SEEK THE CONTENTS OF CS1, MR1, MR2
                                        ;*      AND MR3 ARE CHECKED TO VERIFY THE OPERATION. ALL DISCREPENCIES
                                        ;*      ARE REPORTED IN THE ORDER LISTED.
                                        ;*
                                        ;*      CALL:
                                        ;*      JSR     R4,DISEEK
                                        ;*      ERROR   4       ;CS1 MISCOMPARE ERROR
                                        ;*      ERROR   5       ;MR1 MISCOMPARE ERROR
                                        ;*      ERROR   6       ;MR2 MISCOMPARE ERROR
                                        ;*      ERROR   7       ;MR3 MISCOMPARE ERRON

023334                                  DISEEK:
023334  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
023336  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
023340  032737  000002  002260          BIT     #BIT1,L.CS1     ;CHECK IF WRITE DATA
023346  001003                          BNE     10$             ;YES - SKIP
023350  012700  000316                  MOV     #51.*4+2,R0     ;SET COUNT FOR READ OR WRITE CHECK
023354  000412                          BR      1$

023356  012700  004612          10$:    MOV     #66.*37.,R0     ;COUNT FOR CLOCK THROUGH SILO LOAD
023362  032737  010000  002260          BIT     #CFMT,L.CS1     ;TEST IF 22 SECTOR MODE
023370  001402                          BEQ     11$             ;NO - SKIP
023372  012700  005222                  MOV     #66.*41.,R0     ;ELSE CHANGE FOR 18 BIT WORDS
023376  062700  000016          11$:    ADD     #4*3+2,R0       ;AND SHIFT REGISTER LOAD

023402  012762  000440  000026  1$:     MOV     #DMD!MCLK,RKMR1(R2) ;SET CLOCK
023410  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLEAR CLOCK
023416  005300                          DEC     R0              ;LOOP UNTIL R0 IS ZERO
023420  001370                          BNE     1$

023422  013703  002274                  MOV     L.DCYL,R3       ;GET DESIRED CYLINDER
023426  004437  032444                  JSR     R4,FSBLVV       ;REVERSE ORDER OF BITS
023432  010337  002246                  MOV     R3,E.MR2        ;STORE AS EXPECTED MR2
023436  113703  002267                  MOVB    L.DT,R3         ;GET DESIRED TRACK/SECTOR
023442  042703  177400                  BIC     #177400,R3      ;CLEAR UNUSED BITS
023446  012700  000005                  MOV     #5,R0           ;SET SHIFT COUNT
023452  006303                  15$:    ASL     R3              ;SHIFT FOR TRACK ALIGNMENT
023454  005300                          DEC     R0              ;DEC COUNT
023456  001375                          BNE     15$             ;LOOP UNTIL ZERO
023460  153703  002266                  BISB    L.DS,R3         ;INSERT SECTOR NUMBER
023464  032737  010000  002260          BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
023472  001402                          BEQ     16$             ;NO - SKIP
023474  052703  001000                  BIS     #BIT9,R3        ;ELSE SET FORMAT BIT IN HDR WRD
023500  004437  032444          16$:    JSR     R4,FSBLVV       ;REVERSE BIT ORDER
023504  010337  002250                  MOV     R3,E.MR3        ;STORE AS EXPECTED MR3

023510  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
023516  012737  022040  002244          MOV     #DMD!ECCW!MEWD,E.MR1 ;SET UP EXPECTED MR1
023524  004437  032356                  JSR     R4,GETREG       ;GET RK REGS
```

```
5395
5396  023530  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK CS1
5397  023536  001411                          BEQ     2$              ; OK - SKIP
5398  023540  012737  023562  001236          MOV     #2$,$ESCAPE     ;SET ESCAPE TO RETURN FOR
5399                                                                  ;REMAINING TESTS
5400  023546  032777  001000  155364          BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
5401  023554  001056                          BNE     9$              ;YES - SKIP
5402
5403  023556  010446                  4$:     MOV     R4,-(SP)        ;SET STACK FOR RETURN TO SUB-ROUTINE
5404  023560  000204                          RTS     R4
5405
5406  023562  005724                  2$:     TST     (R4)+           ;BUMP TO NEXT ERROR CALL
5407  023564  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK MR1
5408  023572  001410                          BEQ     3$              ;OK - SKIP
5409  023574  032777  001000  155336          BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
5410  023602  001043                          BNE     9$              ;YES - SKIP
5411  023604  012737  023614  001236          MOV     #3$,$ESCAPE     ;SET ESCAPE FOR RETURN TO SUB-ROUTINE
5412  023612  000761                          BR      4$
5413
5414  023614  005724                  3$:     TST     (R4)+           ;SAME OPERATION AS ABOVE TO
5415  023616  023737  002246  002206          CMP     E.MR2,T.MR2     ;CHECK MR2
5416  023624  001410                          BEQ     5$
5417  023626  032777  001000  155304          BIT     #BIT9,@SWR
5418  023634  001026                          BNE     9$
5419  023636  012737  023646  001236          MOV     #5$,$ESCAPE
5420  023644  000744                          BR      4$
5421
5422  023646  005724                  5$:     TST     (R4)+            SAME OPERATION AS ABOVE TO
5423  023650  023737  002250  002210          CMP     E.MR3,T.MR3     ;CHECK MR3
5424  023656  001414                          BEQ     8$
5425  023660  032777  001000  155252          BIT     #BIT9,@SWR
5426  023666  001011                          BNE     9$
5427  023670  012737  023700  001236          MOV     #6$,$ESCAPE
5428  023676  000727                          BR      4$
5429
5430  023700  032777  001000  155232  6$:     BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
5431  023706  001001                          BNE     9$              ;YES - SKIP
5432  023710  005724                  8$:     TST     (R4)+           ;BUMP TO NO ERROR RETURN
5433  023712  005037  001236          9$:     CLR     $ESCAPE         ;CLEAR ESCAPE
5434  023716  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
5435  023720  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
5436  023722  000204                          RTS     R4
5437
5438  023724  005037  001236          7$:     CLR     $ESCAPE         ;CLEAR ESCAPE
5439  023730  012706  001100                  MOV     #STACK,SP       ;CLEAN OFF STACK
5440  023734  000177  155150                  JMP     @$LPERR         ;GO TO LOOP START
5441
5442                                  .SBTTL  DIAGNOSTIC MODE READ SYNC PATTERN (PREAMBLE)
5443                                  ;*      THE 255 "0" BITS AND 1 "1" BIT ARE CLOCKED THROUTH THE READ.
5444                                  ;*      THE CONTENTS OF MR1 ARE MONITORED TO WATCH FOR AN ERROR.
5445                                  ;*      AT THE END OF THE SYNC READ, CS1 IS CHECKED TO INSURE IT
5446                                  ;*      DID NOT GET CHANGED.
5447                                  ;*
5448                                  ;*      CALL:
5449                                  ;*      JSR     R4,DRSYNC
5450                                  ;*      ERROR   10      ;MR1 CONTENTS IN ERROR
```

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                                        ;*      ERROR   11      ;CS1 CONTENTS IN ERROR
                                        ;*
                                        ;*      IF AN ERROR IS DETECTED, THE SUBROUTINE WILL SET UP TO ABORT
                                        ;*      THE PRESENT TEST UNLESS LOOP ON ERROR IS SET.

023740                                  DRSYNC:
023740  010046                                MOV     R0,-(SP)        ;;PUSH R0 ON STACK
023742  005037  002326                        CLR     BITCNT          ;CLEAR BIT COUNT
023746  005037  001236                        CLR     $ESCAPE         ;CLEAR ESCAPE
023752  012700  000200                        MOV     #128.,R0        ;SET COUNT TO CLOCK TO READ GATE
023756  005037  002320                        CLR     PR.BIT          ;CLEAR PRESENT BIT
023762  005037  002322                        CLR     M1.BIT          ;CLEAR PREVIOUS BIT
023766  012737  022040  002244                MOV     #DMD!MEWD!ECCW,E.MR1 ;SET UP EXPECTED MR1

023774  004737  031616              3$:       JSR     PC,RDBIT        ;GO READ A BIT
024000  016237  000026  002204                MOV     RKMR1(R2),T.MR1 ;GET MR1
024006  023737  002204  002244                CMP     T.MR1,E.MR1     ;CHECK IF IT IS CORRECT
024014  001424                                BEQ     2$              ;YES - SKIP

024016  012737  024066  001236                MOV     #2$,$ESCAPE     ;SET ESCAPE FOR CONTINUE TEST

024024  005037  001236              4$:       CLR     $ESCAPE         ;CLEAR ESCAPE
024030  032777  001000  155102                BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
024036  001011                                BNE     1$              ;YES SKIP
024040  013700  001254                        MOV     $TESTN,R0       ;ELSE SET UP TO SKIP TO NEXT TEST
024044  006300                                ASL     R0
024046  016037  033472  001236                MOV     $SWOBTB(R0),$ESCAPE
024054  162737  000002  001236                SUB     #2,$ESCAPE
024062                              1$:
024062  012600                                MOV     (SP)+,R0        ;;POP STACK INTO R0
024064  000204                                RTS     R4

024066  005237  002326              2$:       INC     BITCNT          ;INCREMENT THE BIT COUNT
024072  005300                                DEC     R0              ;LOOP UNTIL READY FOR READ GATE
024074  001337                                BNE     3$

024076  012700  000177                        MOV     #127.,R0        ;SET COUNT FOR REST OF SYNC
024102  012737  122040  002244                MOV     #DMD!MEWD!ECCW!RDGATE,E.MR1 ;SET NEW EXPECTED MR1

024110  004737  031616              5$:       JSR     PC,RDBIT        ;GO READ BIT
024114  016237  000026  002204                MOV     RKMR1(R2),T.MR1 ;GET MR1
024122  023737  002204  002244                CMP     T.MR1,E.MR1     ;CHECK IF CORRECT
024130  001404                                BEQ     6$              ;YES - SKIP
024132  012737  024142  001236                MOV     #6$,$ESCAPE     ;SET FOR CONTINUE TESTING
024140  000445                                BR      50$             ;GO TO ERROR EXIT
024142  005237  002326              6$:       INC     BITCNT          ;BUMP BIT COUNTER
024146  005300                                DEC     R0              ;LOOP UNTIL READY FOR SYNC 1
024150  001357                                BNE     5$

024152  013737  002320  002322                MOV     PR.BIT,M1.BIT   ;MOV PRESENT TO PREVIOUS
024160  012737  000001  002320                MOV     #1,PR.BIT       ;SET SYNC 1 BIT
024166  004737  031616                        JSR     PC,RDBIT        ;GO READ BIT
024172  016237  000026  002204                MOV     RKMR1(R2),T.MR1 ;GET MR1
024200  023737  002204  002244                CMP     T.MR1,E.MR1     ;CHECK IF CORRECT
024206  001404                                BEQ     7$              ;YES - SKIP
```

```
5507  024210  012737  024220  001236          MOV     #7$,$ESCAPE     ;SET RETURN FOR CONTINUE TEST
5508  024216  000416                          BR      50$             ;GO TO ERROR EXIT
5509
5510  024220  004437  032356          7$:     JSR     R4,GETREG       ;GO GET RK611 REGISTERS
5511  024224  005237  002326                  INC     BITCNT          ;BUMP BIT COUNTER
5512  024230  005724                          TST     (P4)+           ;BUMP TO NEXT ERROR CALL
5513  024232  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
5514  024240  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
5515  024246  001266                          BNE     4$              ;NO - SKIP
5516
5517  024250  005724                          TST     (R4)+           ;BUMP TO NO ERROR RETURN
5518  024252  000703                          BR      1$              ;SKIP TO RETURN
5519
5520  024254  032777  001000  154656  50$:    BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
5521  024262  001403                          BEQ     51$             ;NO - SKIP
5522  024264  005037  001236                  CLR     $ESCAPE         ;CLEAR FOR SKIP TO NEXT TEST
5523  024270  000674                          BR      1$
5524  024272  010446                  51$:    MOV     R4,-(SP)        ;SET UP STACK FOR RETURN
5525  024274  000204                          RTS     R4
5526
5527                                  .SBTTL  DIAGNOSTIC MODE HEADER READ AND COMPARE
5528                                  ;*      THIS ROUTINE SIMULATES THE THREE HEADER WORDS READ AND
5529                                  ;*      COMPARE THAT IS PART OF ALL DATA TRANSFER OPERATIONS.
5530                                  ;*
5531                                  ;*      THE EXPECTED HEADER IS CALCULATED FROM THE CYLINDER, TRACK,
5532                                  ;*      AND SECTOR SPECIFIED IN THE "L" REGISTERS. THE READING OF THE
5533                                  ;*      3 WORDS IS DONE AND MR1 IS MONITORED TO INSURE IT DOES
5534                                  ;*      NOT CHANGE. AT THE END OF THE READ/COMPARE, THE CONTENTS
5535                                  ;*      OF RKCS1 IS CHECKED AND THE INCREMENT OF RKDCYL AND RKDA IS
5536                                  ;*      VERIFIED. IF THE INCREMENT IS GOOD, THE "L" REGISTERS ARE
5537                                  ;*      UPDATED TO THE NEW PACK ADDRESS IN CASE OF MULTI-SECTOR
5538                                  ;*      OPERATIONS. THE BAD SECTOR ERROR DESIRED (BSEDES) SWITCH
5539                                  ;*      IS TESTED AND IF IT IS NON-ZERO, THE 2ND AND 3RD HEADER
5540                                  ;*      WORDS ARE CHANGED ACCORDING TO BSEDES CONTENTS. THIS
5541                                  ;*      CAN BE USED TO FORCE HEADER TYPE ERROR.
5542                                  ;*
5543                                  ;*      CALL:
5544                                  ;*      JSR     R4,DHDCMP
5545                                  ;*      ERROR   12      ;ERROR IN MR1
5546                                  ;*      ERROR   13      ;ERROR IN CS1
5547                                  ;*      ERROR   14      ;ERROR IN PACK ADDRESS
5548
5549  024276                  DHDCMP:
5550  024276  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
5551  024300  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK.
5552  024302  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
5553  024304  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
5554  024306  005037  002326                  CLR     BITCNT          ;CLEAR BIT COUNTER
5555  024312  012700  000005                  MOV     #5,R0           ;SET A SHIFT COUNT
5556  024316  113701  002267                  MOVB    L.DT,R1         ;GET DESIRED TRACK
5557  024322  042701  177400                  BIC     #177400,R1      ;CLEAR UNUSED BITS
5558
5559  024326  006301                  1$:     ASL     R1              ;SHIFT TRACK TO ALIGN TO
5560  024330  005300                          DEC     R0              ;HEADER WORD FORMAT
5561  024332  001375                          BNE     1$
5562
```

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5563  024334  153701  002266                  BISB    L.DS,R1          ;INSERT DESIRED SECTOR
5564  024340  052701  140000                  BIS     #BIT15!BIT14,R1  ;SET BS BITS
5565  024344  013700  002274                  MOV     L.DCYL,R0        ;GET DESIRED CYLINDER
5566  024350  032737  010000  002260          BIT     #CFMT,L.CS1      ;TEST IF 22 SECTOR FORMAT
5567  024356  001402                          BEQ     2$               ;NO - SKIP
5568  024360  052701  001000                  BIS     #BIT9,R1         ;ELSE SET FORMAT BIT
5569  024364  010003                  2$:     MOV     R0,R3            ;COMPUTE VRC
5570  024366  010105                          MOV     R1,R5
5571  024370  040005                          BIC     R0,R5
5572  024372  040103                          BIC     R1,R3
5573  024374  050503                          BIS     R5,R3
5574  024376  005737  002352                  TST     BSEDES           ;TEST IF BSE DESIRED
5575  024402  001404                          BEQ     23$              ;NO - SKIP
5576  024404  043701  002352                  BIC     BSEDES,R1        ;CLEAR BIT IN WORD 2
5577  024410  043703  002352                  BIC     BSEDES,R3        ;CORRECT HVRC
5578  024414                          23$:
5579
5580                                  ;       R0, R1, AND R3 HAVE THE EXPECTED HEADERS
5581
5582  024414  005037  001204                  CLR     $TMP1            ;CLEAR A PASS COUNTER
5583  024420  012737  122040  002244          MOV     #DMD!MEWD!ECCW!RDGATE,E.MR1  ;SET EXPECTED MR1
5584
5585  024426  012705  000001          11$:    MOV     #BIT0,R5         ;ESTABLISH BEGINNING OF DATA WORD
5586  024432  013737  002320  002322  7$:     MOV     PR.BIT,M1.BIT    ;STORE PREVIOUS BIT
5587  024440  005037  002320                  CLR     PR.BIT           ;PRESET FOR PRESENT BIT 0
5588  024444  030500                          BIT     R5,R0            ;TEST IF BIT TO BE A ONE
5589  024446  001403                          BEQ     3$               ;NO - SKIP
5590  024450  012737  000001  002320          MOV     #BIT0,PR.BIT     ;ELSE CHANGE TO ONE
5591  024456  004737  031616          3$:     JSR     PC,RDBIT         ;GO READ A BIT
5592  024462  016237  000026  002204          MOV     RKMR1(R2),T.MR1  ;GET MR1 FOR TESTING
5593  024470  023737  002204  002244          CMP     T.MR1,E.MR1      ;CHECK IF CORRECT
5594  024476  001431                          BEQ     6$               ;YES - SKIP
5595  024500  012737  024562  001236          MOV     #6$,$ESCAPE      ;SET RETURN TO CONTINUE TEST
5596  024506  000137  025160                  JMP     50$
5597
5598  024512  005037  001236          4$:     CLR     $ESCAPE          ;CLEAR TO JUMP TO NEXT TEST
5599  024516  032777  001000  154414          BIT     #BIT9,@SWR       ;CHECK IF LOOP ON ERROR
5600  024524  001011                          BNE     5$               ;YES - SKIP
5601  024526  013705  001254                  MOV     $TESTN,R5        ;GET CURRENT TEST NUMBER
5602  024532  006305                          ASL     R5               ;AND SET UP TO ESCAPE TO NEXT TEST
5603  024534  016537  033472  001236          MOV     $SW08TB(R5),$ESCAPE
5604  024542  162737  000002  001236          SUB     #2,$ESCAPE
5605
5606  024550                          5$:
5607  024550  012605                          MOV     (SP)+,R5         ;;POP STACK INTO R5
5608  024552  012603                          MOV     (SP)+,R3         ;;POP STACK INTO R3
5609  024554  012601                          MOV     (SP)+,R1         ;;POP STACK INTO R1
5610  024556  012600                          MOV     (SP)+,R0         ;;POP STACK INTO R0
5611  024560  000204                          RTS     R4
5612
5613  024562  005237  002326          6$:     INC     BITCNT           ;BUMP BIT COUNT
5614  024566  005705                          TST     R5               ;CHECK IF LAST BIT OF THIS WORD
5615  024570  100402                          BMI     8$               ;HAS BEEN SIMULATED - YES - SKIP
5616  024572  006305                          ASL     R5               ;SHIFT TO NEXT BIT
5617  024574  000716                          BR      7$               ;GO DO THIS BIT
5618
```

```
5619  024576  005737  001204          8$:     TST     $TMP1           ;TEST IF PASS FOR 1ST WORD JUST DONE
5620  024602  001004                          BNE     9$              ;NO - SKIP
5621  024604  010100                          MOV     R1,R0           ;PUT WORD 2 IN R0 FOR SIMULATION
5622  024606  005237  001204                  INC     $TMP1           ;BUMP PASS COUNT
5623  024612  000705                          BR      1.3
5624
5625  024614  023727  001204  000002  9$:     CMP     $TMP1,#2        ;JUST DONE WITH WORD 2?
5626  024622  002004                          BGE     10$             ;NO SKIP
5627  024624  010300                          MOV     R3,R0           ;PUT 3RD WORD IN R0
5628  024626  005237  001204                  INC     $TMP1           ;BUMP PASS COUNT
5629  024632  000675                          BR      11$
5630
5631  024634  023727  001204  000003  10$:    CMP     $TMP1,#3        ;JUST DONE WITH WORD 3?
5632  024642  002006                          BGE     16$             ;NO - SKIP
5633  024644  005000                          CLR     R0              ;PUT IN WORD 0 OF GAP
5634  024646  012705  100000                  MOV     #BIT15,R5       ;SET TO GIVE IT 1ST GAP BIT
5635  024652  005237  001204                  INC     $TMP1           ;BUMP PASS COUNT
5636  024656  000665                          BR      7$
5637
5638  024660  023727  001204  000004  16$:    CMP     $TMP1,#4        ;TEST IF READY FOR GAP
5639  024666  001436                          BEQ     12$             ;YES - SKIP
5640
5641                                  ;       THE FOLLOWING BLOCK OF CODE COMPUTES THE NUMBER OF CLOCK
5642                                  ;       PULSES (WHICH ARE ACTUALLY CALLS TO RDBIT) THE OPERATION
5643                                  ;       BEING PERFORMED REQUIRES TO UPDATE THE ADDRESS COUNTERS
5644                                  ;       (RKDC AND RKDA). THIS CALCULATION IS BASED ON THE WHAT WAS
5645                                  ;       IN THESE COUNTERS WHEN THE OPERATION STARTED (L.DC AND L.DA).
5646
5647  024670  012701  000025                  MOV     #25,R1          ;PRESET R1 FOR 24 SECTOR MODE
5648  024674  032737  010000  002260          BIT     #CFMT,L.CS1     ;IS IT 24 SECTOR MODE OPERATION?
5649  024702  001402                          BEQ     21$             ;YES - SKIP
5650  024704  012701  000023                  MOV     #23,R1          ;ELSE CHANGE FOR 22 SECTOR MODE
5651  024710  052701  001000          21$:    BIS     #BIT9,R1        ;SET FOR MAX HEAD OF 2
5652  024714  023701  002266                  CMP     L.DS,R1         ;TEST IF TRACK/SECTOR ADDRESS WAS MAX
5653  024720  001003                          BNE     17$             ;NO - SKIP
5654  024722  012705  000100                  MOV     #BIT6,R5        ;SET FOR 8 BITS OF GAP TO UPDATE
5655  024726  000410                          BR      19$
5656  024730  123701  002266          17$:    CMPB    L.DS,R1         ;TEST IF SECTOR WAS MAX
5657  024734  001003                          BNE     18$             ;NO - SKIP
5658  024736  012705  000400                  MOV     #BIT8,R5        ;SET FOR 6 BITS OF GAP TO UPDATE
5659  024742  000402                          BR      19$
5660  024744  012705  010000          18$:    MOV     #BIT12,R5       ;SET TO GIVE 1ST 4 BITS OF GAP
5661  024750  005237  001204          19$:    INC     $TMP1           ;BUMP PASS COUNT
5662  024754  042737  100000  002244          BIC     #RDGATE,E.MR1   ;CLEAR READ GATE
5663  024762  000623                          BR      7$
5664                                  ;       END OF BLOCK
5665
5666  024764  004437  032356          12$:    JSR     R4,GETREG       ;GET RK611 REGISTERS
5667  024770  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
5668  024772  013737  002260  002220          MOV     L.CS1,E.CS1     ;SET EXPECTED CS1
5669  025000  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
5670  025006  001241                          BNE     4$              ;NO SKIP
5671
5672  025010  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
5673  025012  013737  002274  002240          MOV     L.DCYL,E.DCYL   ;GET STARTING CYLINDER
5674  025020  013737  002266  002226          MOV     L.DA,E.DA       ;               TRACK/SECTOR
```

```
5675  025026  105237  002226                    INCB    E.DA            ;BUMP SECTOR
5676  025032  012700  000026                    MOV     #26,R0          ;PRESET FOR 26 SEC/TRACK
5677  025036  032737  010000  002260            BIT     #CFMT,L.CS1     ;TEST IF IN 26 SECTOR MODE
5678  025044  001402                            BEQ     13$             ;YES - SKIP
5679  025046  012700  000024                    MOV     #24,R0          ;ELSE CHANGE FOR 24 SECTOR MODE
5680  025052  120037  002226          13$:      CMPB    R0,E.DA         ;CHECK IF SECTOR TO LARGE
5681  025056  001015                            BNE     15$             ;NO - SKIP
5682  025060  105037  002226                    CLRB    E.DA            ;SET SECTOR TO 0
5683  025064  105237  002227                    INCB    E.DA+1          ;BUMP TRACK
5684  025070  012700  000003                    MOV     #3,R0           ;PRESET FOR 3 TRACKS (RK06)
5685  025074  123700  002227                    CMPB    E.DA+1,R0       ;CHECK IF TRACK INC TO LARGE
5686  025100  001004                            BNE     15$             ;NO - SKIP
5687
5688  025102  105037  002227                    CLRB    E.DA+1          ;CLEAR TRACK TO 0
5689  025106  005237  002240                    INC     E.DCYL          ;BUMP CYLINDER
5690
5691  025112  023737  002240  002200  15$:      CMP     E.DCYL,T.DCYL   ;CHECK IF CYL OK
5692  025120  001004                            BNE     25$             ;NO - SKIP
5693  025122  023737  002226  002166            CMP     E.DA,T.DA       ;CHECK IF DA OK
5694  025130  001402                            BEQ     26$
5695  025132  000137  024512          25$:      JMP     4$
5696
5697  025136  013737  002240  002274  26$:      MOV     E.DCYL,L.DCYL   ;STORE COMPUTED NEXT CYL
5698  025144  013737  002226  002266            MOV     E.DA,L.DA       ;AND NEXT DA
5699
5700  025152  005724                            TST     (R4)+           ;BUMP TO NO ERROR RETURN
5701  025154  000137  024550                    JMP     5$              ;GO TO GOOD EXIT
5702
5703  025160  032777  001000  153752  50$:      BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
5704  025166  001404                            BEQ     51$             ;NO - SKIP
5705  025170  005037  001236                    CLR     $ESCAPE         ;CLEAR TO LOOP ON ERROR
5706  025174  000137  024550                    JMP     5$
5707
5708  025200  010446                  51$:      MOV     R4,-(SP)        ;SET STACK TO CONTINUE TEST
5709  025202  000204                            RTS     R4
5710                                    .SBTTL  DIAGNOSTIC MODE GAP READ AND SYNC WRITE
5711                                    ;*      THE READING OF THE GAP AND WRITING OF THE SYNC (OR PREAMBLE)
5712                                    ;*      IS HANDLED IN THIS ROUTINE.
5713                                    ;*
5714                                    ;*      THE FIRST GAP BITS ARE PROCESSED IN THE HEADER COMPARE
5715                                    ;*      ROUTINE AND THE REMAINDER ARE PROCESSED HERE.  THEN A
5716                                    ;*      CHECK IS MADE THAT WRITE GATE CAME ON AND 255 "0" BITS
5717                                    ;*      AND A SINGLE "1" BIT IS WRITTEN.
5718                                    ;*
5719                                    ;*      CALL:
5720                                    ;*      JSR     R4,DWGPSN
5721                                    ;*      ERROR   15      ;MR1 IN ERROR IN READ GAP
5722                                    ;*      ERROR   16      ;CS1 IN ERROR AFTER READ GAP
5723                                    ;*      ERROR   17      ;MR1 IN ERROR IN WRITE SYNC
5724                                    ;*      ERROR   20      ;CS1 IN ERROR AFTER SYNC WRITE
5725                                    ;*
5726                                    ;*      ROUTINE CALLED:
5727                                    ;*      JSR     PC,WRTBIT
5728                                    ;*      RETURN POINT IF ERROR IN WRTBIT
5729                                    ;*      NO ERROR RETURN
5730
```

```
5731  025204                          DWGPSN:
5732  025204  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
5733                                  ;       THE FOLLOWING CODE ADJUST THE COUNT FOR THE REMAINDER OF
5734                                  ;       THE GAP.  THE ADJUSTMENT DEPENDS ON HOW MANY GAP BITS WERE
5735                                  ;       READ IN THE HEADER COMPARE ROUTINE FOR ADDRESS REGISTER UPDATE.
5736  025206  005737  002266                  TST     L.DA            ;TEST IF DESIRED TRACK/SECTOR NOW 0
5737  025212  001006                          BNE     8$              ;NO - SKIP
5738  025214  012700  000066                  MOV     #54.,R0         ;ELSE ADJUST COUNT FOR CYL CHANGE
5739  025220  012737  000011  002326          MOV     #11,BITCNT      ;PRESET BIT COUNT FOR REST OF GAP
5740  025226  000416                          BR      10$
5741  025230  105737  002266          8$:     TSTB    L.DS            ;TEST IF NEW SECTOR IS 0
5742  025234  001006                          BNE     9$              ;NO - SKIP
5743  025236  012700  000070                  MOV     #56.,R0         ;ELSE ADJUST COUNT FOR TRACK CHANGE
5744  025242  012737  000007  002326          MOV     #7,BITCNT       ;PRESET BIT COUNT FOR REST OF GAP
5745  025250  000405                          BR      10$
5746  025252  012737  000005  002326  9$:     MOV     #5,BITCNT       ;PRESET BIT COUNTER FOR REST OF GAP
5747  025260  012700  000074                  MOV     #60.,R0         ;SET COUNT FOR 60 BITS
5748                                  ;       END OF BLOCK
5749
5750  025264  012737  022040  002244  10$:     MOV     #DMD!ECCW!MEWD,E.MR1 ;SET EXPECTED MR1
5751  025272  005037  002320                  CLR     PR.BIT          ;CLEAR PRESENT BIT
5752  025276  005037  002322                  CLR     M1.BIT          ;CLEAR PREVIOUS BIT
5753  025302  004737  031616          1$:     JSR     PC,RDBIT        ;GO READ BIT
5754  025306  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;GET MR1
5755  025314  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK IF CORRECT
5756  025322  001404                          BEQ     11$             ;YES - SKIP
5757  025324  012737  025346  001236          MOV     #2$,$ESCAPE     ;SET RETURN TO CONT TEST
5758  025332  000513                          BR      50$
5759  025334  005237  002326          11$:    INC     BITCNT          ;BUMP BIT COUNT
5760  025340  005300                          DEC     R0              ;DEC LOOP COUNT
5761  025342  001357                          BNE     1$              ;LOOP IF NOT ZERO
5762  025344  000421                          BR      4$              ;ELSE SKIP
5763
5764  025346  005037  001236          2$:     CLR     $ESCAPE         ;CLEAR TO EXIT OR LOOP
5765  025352  022777  001000  153560          CMP     #BIT9,@SWR      ;ERROR RETURN: CHECK IF LOOP ON ERROR
5766  025360  001011                          BNE     3$              ;YES - SKIP
5767  025362  013700  001254                  MOV     $TESTN,R0       ;GET NUMBER OF NEXT TEST
5768  025366  006300                          ASL     R0              ;SHIFT FOR INDEXING
5769  025370  016037  033472  001236          MOV     $SW08TB(R0),$ESCAPE  ;SET ESCAPE FOR GOT TO NEXT TEST
5770  025376  162737  000002  001236          SUB     #2,$ESCAPE      ;SET TO FIRST INST (SCOPE)
5771  025404                          3$:
5772  025404  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
5773  025406  000204                          RTS     R4
5774
5775  025410  004437  032356          4$:     JSR     R4,GETREG       ;GET RK611 REGS
5776  025414  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
5777  025416  013737  002260  002220          MOV     L.CS1,E.CS1     ;SET EXPECTED CS1
5778  025424  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CS1 OK
5779  025432  001345                          BNE     2$              ;NO - SKIP
5780
5781  025434  005724                          TST     (R4)+           ;BUMP RETURN POINTER
5782
5783  025436  005037  002326                  CLR     BITCNT          ;CLEAR BIT COUNTER
5784  025442  005037  002322                  CLR     M1.BIT          ;CLEAR ALL WRITE BIT INDICATORS
5785  025446  005037  002324                  CLR     M2.BIT
5786  025452  005037  002316                  CLR     P1.BIT
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5787  025456  005037  002320                  CLR     PR.BIT
5788  025462  012737  062040  002244          MOV     #DMD!ECCW!MEWD!WRTGATE,E.MR1 ;SET EXPECTED MR1
5789  025470  012700  000400                  MOV     #256.,R0        ;SET COUNT TO WRITE 256 "0"
5790
5791  025474  004737  030652          5$:     JSR     PC,WRTBIT       ;CALL WRITE BIT
5792  025500  000405                  BR      6$              ;ERROR RETURN - SKIP TO HANDLER
5793  025502  005237  002326                  INC     BITCNT          ;BUMP BIT COUNT
5794  025506  005300                  DEC     R0              ;LOOP UNTIL ALL 256
5795  025510  001371                  BNE     5$              ;BITS ARE WRITTEN
5796  025512  000402                  BR      7$
5797
5798  025514  010446          6$:     MOV     R4,-(SP)        ;WRITE ERROR HANDLER-SET
5799  025516  000204                  RTS     R4              ;STACK FOR REPORTING SUBSEQUENT ERRORS
5800
5801  025520  012737  000001  002316  7$:     MOV     #1,P1.BIT       ;SET SYNC BIT OF 1 AS NEXT BIT
5802  025526  004737  030652                  JSR     PC,WRTBIT       ;GO WRITE IT
5803  025532  000770                  BR      6$              ;ERROR RETURN
5804  025534  005237  002326                  INC     BITCNT          ;BUMP BIT COUNT
5805
5806  025540  004437  032356                  JSR     R4,GETREG       ;GET RK611 REGS
5807  025544  005724                  TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
5808  025546  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
5809  025554  001274                  BNE     2$              ;NO - SKIP
5810
5811  025556  005724                  TST     (R4)+           ;BUMP PAST ERROR RETURNS
5812  025560  000711                  BR      3$              ;GO TO EXIT
5813
5814  025562  032777  001000  153350  50$:    BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
5815  025570  001403                  BEQ     51$             ;YES - SKIP
5816  025572  005037  001236                  CLR     $ESCAPE         ;ELSE SET TO LOOP
5817  025576  000702                  BR      3$
5818  025600  010446          51$:    MOV     R4,-(SP)        ;PRESET STACK FOR RETURN
5819  025602  000204                  RTS     R4
5820                                  .SBTTL  DIAGNOSTIC WRITE DATA AND ECC ROUTINE
5821                                  ;*      THE DATA IN THE OUPUT BUFFER IS WRITE SIMULATED, ECC IS
5822                                  ;*      GENERATED AND WRITTEN, AND THE POSTAMBLE IS WRITTEN.
5823                                  ;*
5824                                  ;*      CALL:
5825                                  ;*      JSR     R4,DWRITE
5826                                  ;*      ERROR   17      ;MR1 IN ERROR IN WRITING
5827                                  ;*      ERROR   21      ;ECC ERROR IN WRITING
5828                                  ;*      ERROR   22      ;CS1 ERROR AFTER WRITE
5829                                  ;*      NO ERROR RETURN
5830                                  ;*
5831                                  ;*      ROUTINE CALLED:
5832                                  ;*      JSR     PC,WRTBIT
5833                                  ;*      RETURN POINT IF ERROR IN WRTBIT
5834                                  ;*      NO ERROR RETURN FROM WRTBIT
5835
5836  025604                  DWRITE:
5837  025604  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
5838  025606  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
5839  025610  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
5840  025612  010546                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
5841  025614  005037  002326          CLR     BITCNT          ;CLEAR BIT COUNTER
5842  025620  005037  002342          CLR     ECCLO           ;CLEAR ECC LOW
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5843  025624  005037  002340                    CLR     ECCHI           ;CLEAR ECC HI
5844  025630  012700  000400                    MOV     #400,R0         ;SET WORD COUNT FOR ONE SECTOR
5845  025634  012703  047636                    MOV     #OBUFF,P3       ;GET POINTER TO OUTPUT DATA
5846  025640  010437  001216                    MOV     R4,$TMP6        ;STORE MR1 ERROR RETURN
5847  025644  005724                            TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
5848  025646  010437  001220                    MOV     R4,$TMP7        ;STORE ECC ERROR RETURN
5849
5850                                    ;       THE FOLLOWING CODE SIMULATES THE WRITING OF 400 WORDS.
5851                                    ;       THE PROCEDURE IS TO LOAD THE CURRENT WORD INTO R5 AND
5852                                    ;       TO SHIFT A BIT FROM RIGHT TO LEFT TO POINT TO THE CURRENT BIT.
5853
5854  025652  005037  001214                    CLR     $TMP5           ;CLEAR SWITCH
5855  025656  012701  000001            3$:     MOV     #BIT0,R1        ;LOAD BIT POINTER
5856  025662  012305                            MOV     (R3)+,R5        ;GET A WORD FOR WRITING
5857
5858  025664  013737  002322  002324    4$:     MOV     M1.BIT,M2.BIT   ;SHIFT CURRENT-1 TO CURRENT-2
5859  025672  013737  002320  002322            MOV     PR.BIT,M1.BIT   ;PRESENT TO CURRENT-1
5860  025700  013737  002316  002320            MOV     P1.BIT,PR.BIT   ;NEXT TO PRESENT
5861  025706  005037  002316                    CLR     P1.BIT          ;CLEAR NEXT BIT
5862  025712  030105                            BIT     R1,R5           ;TEST IF NEXT BIT IS ONE
5863  025714  001403                            BEQ     5$              ;NO - SKIP
5864  025716  012737  000001  002316            MOV     #1,P1.BIT       ;ELSE SET NEXT BIT
5865  025724  004737  030652            5$:     JSR     PC,WRTBIT       ;GO WRITE BIT
5866  025730  000441                            BR      33$             ;ERROR RETURN - SKIP
5867  025732  004737  030462            43$:    JSR     PC,ECCGEN       ;GO GENERATE ECC FOR THIS BIT
5868  025736  016237  000032  002214            MOV     RKECPT(R2),T.ECPT ;GET PATTERN
5869  025744  023737  002254  002214            CMP     E.ECPT,T.ECPT   ;CHECK IF ECC CORRECT
5870  025752  001402                            BEQ     40$             ;YES - SKIP
5871  025754  000137  026352                    JMP     13$             ;JUMP TO ERROR EXIT
5872
5873  025760  005237  002326            40$:    INC     BITCNT          ;BUMP BIT COUNT
5874  025764  005701                            TST     R1              ;TEST BIT POINTER
5875  025766  100424                            BMI     7$              ;IF NEGATIVE - SKIP
5876  025770  006301                            ASL     R1              ;ELSE SHIFT LEFT AND LOOP
5877  025772  020027  000001                    CMP     R0,#1           ;TEST IF WRITING LAST WORD
5878  025776  001332                            BNE     4$              ;NO - GO TO LOOP
5879  026000  032737  010000  002260            BIT     #CFMT,L.CS1     ;TEST IF 22 SECTOR MODE
5880  026006  001404                            BEQ     32$             ;NO - SKIP
5881  026010  005737  001214                    TST     $TMP5           ;TEST IF 18 BIT SWITCH SET
5882  026014  001001                            BNE     32$             ;YES - SKIP
5883  026016  000722                            BR      4$              ;ELSE LOOP
5884  026020  005701                    32$:    TST     R1              ;ELSE TEST IF LAST BIT OF LAST WORD
5885  026022  100320                            BPL     4$              ;NO - GO TO LOOP
5886  026024  042737  020000  002244            BIC     #ECCW,E.MR1     ;ELSE SET MR1 FOR ECC WRITE
5887  026032  000714                            BR      4$
5888  026034  000137  026374            33$:    JMP     20$
5889
5890  026040  032737  010000  002260    7$:     BIT     #CFMT,L.CS1     ;TEST IF 22 SECTOR MODE
5891  026046  001413                            BEQ     31$             ;NO - SKIP
5892  026050  005737  001214                    TST     $TMP5           ;TEST IF 18 BIT SWITCH SET
5893  026054  001006                            BNE     30$             ;YES - SKIP
5894  026056  012701  040000                    MOV     #BIT14,R1       ;SET TO SUPPLY 2 MORE BITS (16 & 17)
5895  026062  005005                            CLR     R5              ;MAKE SURE THEY ARE 0'S
5896  026064  005137  001214                    COM     $TMP5           ;SET THE 18 BIT SWITCH
5897  026070  000675                            BR      4$              ;GO WRITE THE BITS
5898
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5899  026072  005037  001214          30$:    CLR     $TMP5           ;CLEAR THE SWITCH
5900  026076  005300                  31$:    DEC     R0              ;DEC WORD COUNT
5901  026100  001266                          BNE     3$              ;IF NOT ZERO - GO GET NEXT WORD
5902  026102  005037  001214                  CLR     $TMP5           ;CLEAR FOR PASS CONTROL
5903  026106  013705  002340                  MOV     ECCHI,R5        ;GET FIRST ECC WORD
5904  026112  012701  000001                  MOV     #BIT0,R1        ;SET BIT POINTER
5905
5906  026116  013737  002322  002324  8$:     MOV     M1.BIT,M2.BIT   ;SHIFT BIT INDICATORS AGAIN
5907  026124  013737  002320  002322          MOV     PR.BIT,M1.BIT
5908  026132  013737  002316  002320          MOV     P1.BIT,PR.BIT
5909  026140  005037  002316                  CLR     P1.BIT          ;CLEAR NEXT BIT
5910  026144  030105                          BIT     R1,R5           ;TEST IF BIT IS ZERO
5911  026146  001403                          BEQ     9$              ;YES - SKIP
5912  026150  012737  000001  002316          MOV     #1,P1.BIT       ;ELSE CHANGE TO ONE
5913  026156  004737  030652          9$:     JSR     PC,WRTBIT       ;GO WRITE BIT
5914  026162  000501                          BR      14$             ;WRTBIT ERROR - SKIP
5915
5916  026164  005237  002326          41$:    INC     BITCNT          ;BUMP BIT COUNT
5917  026170  005701                          TST     R1              ;TEST BIT POINTER
5918  026172  100413                          BMI     10$             ;IF NEGATIVE - SKIP
5919  026174  006301                          ASL     R1              ;ELSE SHIFT AND LOOP
5920  026176  023727  001214  000001          CMP     $TMP5,#1        ;TEST IF WRITING LAST ECC WORD
5921  026204  001344                          BNE     8$              ;NO - SKIP TO LOOP
5922  026206  005701                          TST     R1              ;ELSE TEST IF WRITING LAST BIT OF LAST ECC
5923  026210  100342                          BPL     8$              ;NO - SKIP TO LOOP
5924  026212  052737  020000  002244          BIS     #ECCW,E.MR1     ;ELSE SET ECCW IN MR1
5925  026220  000736                          BR      8$
5926
5927  026222  005737  001214          10$:    TST     $TMP5           ;TEST PASS  0 JUST DONE
5928  026226  001007                          BNE     11$             ;NO - SKIP
5929  026230  005237  001214                  INC     $TMP5           ;BUMP PASS COUNT
5930  026234  012701  000001                  MOV     #BIT0,R1        ;PRESET BIT POINTER
5931  026240  013705  002342                  MOV     ECCLO,R5        ;GET SECOND ECC WORD
5932  026244  000724                          BR      8$              ;LOOP
5933
5934  026246  012701  000017          11$:    MOV     #15.,R1         ;SET A BIT COUNT
5935
5936  026252  013737  002322  002324  12$:    MOV     M1.BIT,M2.BIT   ;SHIFT BIT INDICATORS
5937  026260  013737  002320  002322          MOV     PR.BIT,M1.BIT
5938  026266  013737  002316  002320          MOV     P1.BIT,PR.BIT
5939  026274  005037  002316                  CLR     P1.BIT          ;SET ZERO FOR WRITE POSTAMBLE
5940  026300  004737  030652                  JSR     PC,WRTBIT       ;GO WRITE BIT
5941  026304  000436                          BR      15$             ;WRITE BIT ERROR - SKIP
5942  026306  005237  002326          42$:    INC     BITCNT          ;BUMP BIT COUNT
5943  026312  005301                          DEC     R1              ;DEC BIT COUNT
5944  026314  001356                          BNE     12$             ;LOOP UNTTIL BIT COUNT 0
5945
5946  026316  004437  032356                  JSR     R4,GETREG       ;GET RK611 REGS
5947  026322  013704  001220                  MOV     $TMP7,R4        ;SET R4 FOR ECC ERROR RETURN
5948  026326  005724                          TST     (R4)+           ;BUMP TO CS1 ERROR RETURN
5949  026330  013737  002260  002220          MOV     L.CS1,E.CS1     ;GET EXPECTED CS1
5950
5951  026336  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
5952  026344  001031                          BNE     18$             ;NO - SKIP
5953  026346  005724                          TST     (R4)+           ;BUMP TO GOOD RETURN
5954  026350  000446                          BR      19$             ;GO TO RETURN
```

```
5955
5956  026352  013704  001220          13$:    MOV     $TMP7,R4        ;SET FOR ECC ERROR RETURN
5957  026356  012737  025760  001236          MOV     #40$,$ESCAPE    ;STORE RETURN POINT FOR NO LOOP ON ERROR
5958  026364  000410                          BR      16$
5959
5960  026366  013704  001216          14$:    MOV     $TMP6,R4        ;SET FOR MR1 ERROR RETURN
5961  026372  000405                          BR      16$
5962
5963  026374  013704  001216          20$:    MOV     $TMP6,R4        ;SET FOR MR1 ERROR RETURN
5964  026400  000402                          BR      16$
5965
5966  026402  013704  001216          15$:    MOV     $TMP6,R4        ;SET FOR MR1 ERROR RETURN
5967
5968  026406  032777  001000  152524  16$:    BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
5969  026414  001403                          BEQ     17$             ;NO - SKIP
5970
5971  026416  005037  001236                  CLR     $ESCAPE         ;CLEAR ESCAPE
5972  026422  000421                          BR      19$             ;SKIP TO EXIT
5973
5974  026424  010446          17$:    MOV     R4,-(SP)        ;CONDITION STACK
5975  026426  000204                          RTS     R4              ;GO REPORT ERROR
5976
5977  026430  005037  001236          18$:    CLR     $ESCAPE         ;CLEAR FOR LOOP OR EXIT
5978  026434  032777  001000  152476          BIT     #BIT9,@SWR      ;CHECK IF LOOP ON ERROR
5979  026442  001011                          BNE     19$             ;YES - SKIP
5980  026444  013700  001254                  MOV     $TESTN,R0       ;SET UP TO SKIP TO NEXT TEST
5981  026450  006300                          ASL     R0
5982  026452  016037  033472  001236          MOV     $SW08TB(R0),$ESCAPE
5983  026460  162737  000002  001236          SUB     #2,$ESCAPE
5984  026466                          19$:
5985  026466  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
5986  026470  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
5987  026472  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
5988  026474  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
5989  026476  000204                          RTS     R4
5990
5991                          .SBTTL  DIAGNOSTIC MODE READ GAP AND DATA SYNC
5992                          ;*      THE READING OF THE GAP AND READING OF THE SYNC (OR PREAMBLE)
5993                          ;*      IS HANDLED IN THIS ROUTINE.
5994                          ;*
5995                          ;*      THE FIRST GAP BITS ARE PROCESSED IN THE HEADER COMPARE
5996                          ;*      ROUTINE AND THE REMAINING GAP BITS ARE PROCESSED HERE.
5997                          ;*      THEN A CHECK IS MADE THAT READ GATE CAME ON
5998                          ;*      AT THE 129TH BIT OF SYNC.;*
5999                          ;*      CALL:
6000                          ;*      JSR     R4,DRGPSN
6001                          ;*      ERROR   15      ;MR1 IN ERROR IN READ GAP
6002                          ;*      ERROR   16      ;CS1 IN ERROR AFTER READ GAP
6003                          ;*      ERROR   32      ;MR1 IN ERROR IN READ SYNC
6004                          ;*      ERROR   33      ;CS1 IN ERROR AFTER SYNC READ
6005                          ;*
6006                          ;*      ROUTINE CALLED:
6007                          ;*      JSR     PC,RDBIT
6008
6009  026500                  DRGPSN:
6010  026500  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
```

```
6011                                    ;       THE FOLLOWING CODE ADJUST THE COUNT FOR THE REMAINDER OF
6012                                    ;       THE GAP. THE ADJUSTMENT DEPENDS ON HOW MANY GAP BITS WERE
6013                                    ;       READ IN THE HEADER COMPARE ROUTINE FOR ADDRESS REGISTER UPDATE.
6014  026502  005737  002266            ;       TST     L.DA            ;TEST IF DESIRED TRACK/SECTOR NOW 0
6015  026506  001006                    ;       BNE     8$              ;NO - SKIP
6016  026510  012700  000066            ;       MOV     #54.,R0         ;ELSE ADJUST COUNT FOR CYL CHANGE
6017  026514  012737  000011  002326    ;       MOV     #11,BITCNT      ;PRESET BIT COUNT FOR REST OF GAP
6018  026522  000416                    ;       BR      10$
6019  026524  105737  002266    8$:     ;       TSTB    L.DS            ;TEST IF NEW SECTOR IS 0
6020  026530  001006                    ;       BNE     9$              ;NO - SKIP
6021  026532  012700  000070            ;       MOV     #56.,R0         ;ELSE ADJUST COUNT FOR TRACK CHANGE
6022  026536  012737  000007  002326    ;       MOV     #7,BITCNT       ;PRESET BIT COUNT FOR REST OF GAP
6023  026544  000405                    ;       BR      10$
6024  026546  012737  000005  002326    9$:     MOV     #5,BITCNT       ;PRESET BIT COUNTER FOR REST OF GAP
6025  026554  012700  000074            ;       MOV     #60.,R0         ;SET COUNT FOR 60 BITS
6026                                    ;       END OF BLOCK
6027
6028  026560  012737  022040  002244    10$:    MOV     #DMD!ECCW!MEWD,E.MR1 ;SET EXPECTED MR1
6029  026566  005037  002320            ;       CLR     PR.BIT          ;CLEAR PRESENT BIT
6030  026572  005037  002322            ;       CLR     M1.BIT          ;CLEAR PREVIOUS BIT
6031  026576  004737  031616    1$:     ;       JSR     PC,RDBIT        ;GO READ BIT
6032  026602  016237  000026  002204    ;       MOV     RKMR1(R2),T.MR1 ;GET MR1
6033  026610  023737  002244  002204    ;       CMP     E.MR1,T.MR1     ;CHECK IF CORRECT
6034  026616  001404                    ;       BEQ     11$             ;YES - SKIP
6035  026620  012737  026642  001236    ;       MOV     #2$,$ESCAPE     ;SET RETURN TO CONT TEST
6036  026626  000552                    ;       BR      50$
6037  026630  005237  002326    11$:    ;       INC     BITCNT          ;BUMP BIT COUNT
6038  026634  005300                    ;       DEC     R0              ;DEC LOOP COUNT
6039  026636  001357                    ;       BNE     1$              ;LOOP IF NOT ZERO
6040  026640  000421                    ;       BR      4$              ;ELSE SKIP
6041
6042  026642  005037  001236    2$:     ;       CLR     $ESCAPE         ;CLEAR TO EXIT OR LOOP
6043  026646  022777  001000  152264    ;       CMP     #BIT9,@SWR      ;ERROR RETURN: CHECK IF LOOP ON ERROR
6044  026654  001011                    ;       BNE     3$              ;YES - SKIP
6045  026656  013700  001254            ;       MOV     $TESTN,R0       ;GET NUMBER OF NEXT TEST
6046  026662  006300                    ;       ASL     R0              ;SHIFT FOR INDEXING
6047  026664  016037  033472  001236    ;       MOV     $SW08TB(R0),$ESCAPE  ;SET ESCAPE FOR GOT TO NEXT TEST
6048  026672  162737  000002  001236    ;       SUB     #2,$ESCAPE      ;SET TO FIRST INST (SCOPE)
6049  026700                    3$:
6050  026700  012600                    ;       MOV     (SP)+,R0        ;;POP STACK INTO R0
6051  026702  000204                    ;       RTS     R4
6052
6053  026704  004437  032356    4$:     ;       JSR     R4,GETREG       ;GET RK611 REGS
6054  026710  005724                    ;       TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
6055  026712  013737  002260  002220    ;       MOV     L.CS1,E.CS1     ;SET EXPECTED CS1
6056  026720  023737  002160  002220    ;       CMP     T.CS1,E.CS1     ;CHECK IF CS1 OK
6057  026726  001345                    ;       BNE     2$              ;NO - SKIP
6058
6059  026730  005724                    ;       TST     (R4)+           ;BUMP RETURN POINTER
6060
6061  026732  005037  002326            ;       CLR     BITCNT          ;CLEAR BIT COUNTER
6062  026736  012737  022040  002244    ;       MOV     #DMD!ECCW!MEWD,E.MR1 ;SET EXPECTED MR1
6063  026744  012700  000200            ;       MOV     #128.,R0        ;SET COUNT TO READ 128 "0"
6064
6065  026750  004737  031616    5$:     ;       JSR     PC,RDBIT        ;CALL READ BIT
6066  026754  016237  000026  002204    ;       MOV     RKMR1(R2),T.MR1 ;GET MR1 FOR TESTING
```

```
6067  026762  023737  002244  002204          CMP     E.MR1,T.MR1     ;TEST IF CORRECT
6068  026770  001404                          BEQ     22$             ;YES - SKIP
6069
6070  026772  012737  027002  001236          MOV     #22$,$ESCAPE    ;SET RETURN FOR CONTINUE TEST
6071  027000  000465                          BR      50$             ;GO TO ERROR EXIT
6072  027002  005237  002326          22$:    INC     BITCNT          ;BUMP BIT COUNT
6073  027006  005300                          DEC     R0              ;LOOP UNTIL ALL 128
6074  027010  001357                          BNE     5$              ;BITS ARE READ
6075  027012  012700  000177                  MOV     #127.,R0        ;SET COUNT FOR REST OF SYNC
6076  027016  052737  100000  002244          BIS     #RDGATE,E.MR1   ;SET EXPECTED MR1
6077  027024  004737  031616          6$:     JSR     PC,RDBIT        ;GO CALL READ BIT
6078  027030  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;GET MR1 FOR TESTING
6079  027036  023737  002244  002204          CMP     E.MR1,T.MR1     ;TEST IF CORRECT
6080  027044  001404                          BEQ     23$             ;YES - SKIP
6081  027046  012737  027056  001236          MOV     #23$,$ESCAPE    ;ELSE SET ESCAPE
6082  027054  000437                          BR      50$             ;GO TO ERROR REPORT EXIT
6083
6084  027056  005237  002326          23$:    INC     BITCNT          ;BUMP BIT COUNTER
6085  027062  005300                          DEC     R0              ;DEC BIT COUNT
6086  027064  001357                          BNE     6$              ;LOOP UNTIL ALL 127 READ
6087
6088  027066  012737  000001  002320          MOV     #1,PR.BIT       ;SET SYNC BIT OF 1 AS NEXT BIT
6089  027074  004737  031616                  JSR     PC,RDBIT        ;GO READ IT
6090  027100  016237  000026  002244          MOV     RKMR1(R2),E.MR1 ;GET MR1 FOR TESTING
6091  027106  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK IF CORRECT
6092  027114  001404                          BEQ     24$             ;YES - SKIP
6093  027116  012737  027126  001236          MOV     #24$,$ESCAPE    ;ELSE SET RETURN FOR CONTINUE TEST
6094  027124  000413                          BR      50$
6095
6096  027126  005237  002326          24$:    INC     BITCNT          ;BUMP BIT COUNT
6097
6098  027132  004437  032356                  JSR     R4,GETREG       ;GET RK611 REGS
6099  027136  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
6100  027140  023737  002160  002220          CMP     T.CS1,E.CS1     ;CHECK IF CORRECT
6101  027146  001235                          BNE     2$              ;NO - SKIP
6102
6103  027150  005724                          TST     (R4)+           ;BUMP PAST ERROR RETURNS
6104  027152  000652                          BR      3$              ;GO TO EXIT
6105
6106  027154  032777  001000  151756  50$:    BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
6107  027162  001403                          BEQ     51$             ;YES - SKIP
6108  027164  005037  001236                  CLR     $ESCAPE         ;ELSE SET TO LOOP
6109  027170  000643                          BR      3$
6110  027172  010446                  51$:    MOV     R4,-(SP)        ;PRESET STACK FOR RETURN
6111  027174  000204                          RTS     R4
6112                                  .SBTTL  DIAGNOSTIC READ DATA OR DIAGNOSTIC WRITE CHECK ROUTINE
6113                                  ;*      THIS ROUTINE IS USED TO SIMULATE THE READ OR WRITE CHECK
6114                                  ;*      OF DATA. THE ROUTINE WILL TRANSFER A FULL OR PARTIAL SECTOR.
6115                                  ;*      THE FIRST WORD AFTER THE CALL SPECIFIES HOW MANY WORDS
6116                                  ;*      ARE TO BE TRANSFERRED.
6117                                  ;*
6118                                  ;*      IF LESS THAN A FULL SECTOR, THE ECC AT THE END
6119                                  ;*      OF THE TRANSFER IS NOT CHECKED. THE ECC IS CHECKED AT THE TIME
6120                                  ;*      EACH BIT IS TRANSFERED.
6121                                  ;*
6122                                  ;*      EITHER 16 OR 18 BIT WORDS CAN BE SIMULATED
```

```
                                ;*      DEPENDING ON THE STATE OF CFMT BIT IN L.CS1. IF 18 BITS
                                ;*      ARE REQUIRED, BITS 16 AND 17 ARE ASSUMED TO BE ZERO.
                                ;*
                                ;*      THE CONTENTS OF LOCATION ECPOSX MUST BE LOADED WITH THE ECC
                                ;*      COUNT EXPECTED AT THE END OF THE DATA TRANSFER. THIS
                                ;*      LOADING MUST OCCUR BEFORE THE ROUTINE IS CALLED.
                                ;*
                                ;*      ANOTHER LOCATION, ECFATX, IS SET TO 0 IF THE ECC IS EXPECTED
                                ;*      TO BE CORRECT AND SET TO 1 IF AN ERROR IS BEING FORCED.
                                ;*
                                ;*      A 3RD LOCATION, ECCSRC, SPECIFIES THE SOURCE OF THE ECC
                                ;*      WORDS TO BE USED IN CHECKING THE OPERATION. IF ECCSRC IS A
                                ;*      1, THE ECC WORDS FED INTO THE DECODER ARE TAKEN FROM THE
                                ;*      LAST TWO LOCATIONS OF OBUFF, IF ECCSRC IS 0, THE COMPUTED
                                ;*      ECC WORDS FROM ECCHI AND ECCLO ARE USED.
                                ;*      CALL:
                                ;*      JSR     R4,DREAD
                                ;*      LENGTH OF TRANSFER
                                ;*      ERROR 34        ;MR1 IN ERROR READING DATA OR ECC
                                ;*      ERROR 35        ;ECC ERROR READING DATA
                                ;*      ERROR 36        ;CS1 ERROR AFTER READING DATA OR ECC
                                ;*      ERROR 41        ;ECC REGISTER INCORRECT AFTER READ ECC
                                ;*      ERROR 42        ;ERR IN ECC PAT CALCULATION
                                ;*      ERROR 43        ;ERR IN ECC POS COUNTING
                                ;*
                                ;*      OR
                                ;*
                                ;*      JSR     R4,DWRTCK
                                ;*      LENGTH OF TRANSFER
                                ;*      ERROR 53        ;MR1 IN ERROR WRITE CHK OR ECC READ
                                ;*      ERROR 54        ;ECC ERROR IN WRITE CHECK
                                ;*      ERROR 55        ;CS1 ERROR AFTER IN WRT CHK OR ECC READ
                                ;*      ERROR 41        ;ECC REGISTER INCORRECT AFTER READ ECC
                                ;*      ERROR 42        ;ERR IN ECC PAT CALCULATION
                                ;*      ERROR 43        ;ERR IN ECC POS COUNTING
                                ;*
                                ;*      ROUTINES CALLED:
                                ;*      RDBIT
                                ;*      ECCGEN
                                ;*
                                DWRTCK:
027176                          DREAD:
027176  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
027200  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
027202  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
027204  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
027206  012400                          MOV     (R4)+,R0        ;STORE WORD COUNT
027210  010437  001216                  MOV     R4,$TMP6        ;STORE MR1 ERROR RETURN
027214  005724                          TST     (R4)+           ;BUMP TO NEXT RETURN
027216  010437  001220                  MOV     R4,$TMP7        ;STORE ECC ERROR RETURN
027222  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
027224  010437  001210                  MOV     R4,$TMP3        ;STORE CS1 ERROR RETURN
027230  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
027232  010437  001212                  MOV     R4,$TMP4        ;STORE ECC REG ERROR RETURN
027236  005724                          TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
```

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 6179  027240  010437  001222                    MOV     R4,$TMP10       ;STORE ECC PAT ERR RETURN
 6180  027244  005724                            TST     (R4)+           ;BUMP TO NEXT ERROR RETURN
 6181  027246  010437  001224                    MOV     R4,$TMP11       ;SOTER ECC POS ERROR RETURN
 6182  027252  012703  047636                    MOV     #OBUFF,R3       ;GET ADDRESS OF BUFFER
 6183  027256  005037  002326                    CLR     BITCNT          ;CLEAR BIT COUNTER
 6184  027262  005037  002340                    CLR     ECCHI           ;CLEAR ECC COMPUTED LOCATIONS
 6185  027266  005037  002342                    CLR     ECCLO
 6186  027272  005037  001214                    CLR     $TMP5           ;CLEAR FOR 18 BIT MODE SWITCH
 6187  027276  032737  010000  002260            BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
 6188  027304  001412                            BEQ     32$             ;NO - SKIP
 6189  027306  012737  011000  001226            MOV     #11000,$TMP12   ;ELSE SET UP BIT COUNTS FOR 18 BIT MODE
 6190  027314  012737  011001  001230            MOV     #11001,$TMP13
 6191  027322  012737  011041  001232            MOV     #11041,$TMP14
 6192  027330  000411                            BR      3$
 6193  027332  012737  010000  001226  32$:      MOV     #10000,$TMP12   ;SET BIT COUNTS FOR 16 BIT MODE
 6194  027340  012737  010001  001230            MOV     #10001,$TMP13
 6195  027346  012737  010041  001232            MOV     #10041,$TMP14
 6196
 6197  027354  012701  000001          3$:      MOV     #BIT0,R1        ;PRESET BIT POINTER
 6198  027360  012305                            MOV     (R3)+,R5        ;GET DATA WORD
 6199
 6200  027362  013737  002320  002322  4$:      MOV     PR.BIT,M1.BIT   ;SHIFT PRESENT INTO PREVIOUS
 6201  027370  005037  002320                    CLR     PR.BIT          ;CLEAR PRESENT
 6202  027374  030105                            BIT     R1,R5           ;TEST IF PRESENT BIT IS 0
 6203  027376  001403                            BEQ     1$              ;YES - SKIP
 6204  027400  012737  000001  002320            MOV     #1,PR.BIT       ;ELSE INSERT A 1
 6205
 6206  027406  004737  031616          1$:      JSR     PC,RDBIT        ;GO READ BIT
 6207  027412  016237  000026  002204            MOV     RKMR1(R2),T.MR1 ;GET MR1
 6208  027420  023737  002204  002244            CMP     T.MR1,E.MR1     ;CHECK IF CORRECT
 6209  027426  001402                            BEQ     43$             ;YES - SKIP
 6210  027430  000137  030262                    JMP     9$
 6211
 6212  027434  005737  002326          43$:     TST     BITCNT          ;TEST IF FIRST BIT OF DATA
 6213  027440  001413                            BEQ     44$             ;YES - SKIP ECC GEN
 6214  027442  004737  030462                    JSR     PC,ECCGEN       ;GO GENERATE ECC
 6215  027446  016237  000032  002214            MOV     RKECPT(R2),T.ECPT  ;TEST IF ECC CORRECT
 6216  027454  023737  002214  002254            CMP     T.ECPT,E.ECPT
 6217  027462  001402                            BEQ     44$
 6218  027464  000137  030276                    JMP     10$
 6219
 6220  027470  005237  002326          44$:     INC     BITCNT          ;BUMP BIT COUNTER
 6221  027474  005701                            TST     R1              ;TEST IF THIS WORD IS DONE
 6222  027476  100402                            BMI     2$              ;YES - SKIP
 6223  027500  006301                            ASL     R1              ;ELSE SHIFT BIT POINTER
 6224  027502  000727                            BR      4$
 6225
 6226  027504  032737  010000  002260  2$:      BIT     #CFMT,L.CS1     ;TEST IF 18 BIT MODE
 6227  027512  001412                            BEQ     30$             ;NO - SKIP
 6228  027514  005737  001214                    TST     $TMP5           ;TEST IF PROCESSING BIT 16 OR 17 DONE
 6229  027520  001007                            BNE     30$             ;YES - SKIP
 6230  027522  012701  040000                    MOV     #BIT14,R1       ;SET POINTER FOR 2 MORE BITS
 6231  027526  013705  002354                    MOV     HIBITS,R5       ;INSERT HI ORDER BITS
 6232  027532  005137  001214                    COM     $TMP5           ;SET 18 BIT SWITCH
 6233  027536  000[11                            BR      4$
 6234  027540  005037  001214          30$:     CLR     $TMP5           ;CLEAR 18 BIT SWITCH
```

```
6235
6236  027544  005300                    31$:    DEC     R0              ;DECREMENT WORD COUNT
6237  027546  001302                            BNE     3$              ;IF NOT ZERO - LOOP
6238
6239  027550  023737  002326  001226            CMP     BITCNT,$TMP12   ;ELSE TEST IF FULL SECTOR WAS READ
6240  027556  001402                            BEQ     33$             ;YES - SKIP
6241  027560  000137  030234                    JMP     8$              ;ELSE JUMP TO EXIT - DO NOT CHECK
6242                                                                    ;     ECC WORDS
6243
6244  027564  013737  002320  002322  33$:     MOV     PR.BIT,M1.BIT   ;MOVE LAST DATA BIT FOR ECC GEN
6245  027572  004737  030462                    JSR     PC,ECCGEN       ;GENERATE ECC
6246  027576  005037  001214                    CLR     $TMP5           ;CLEAR FOR PASS COUNTING
6247  027602  005737  002344                    TST     ECCSRC          ;TEST WHERE ECC WORDS ARE
6248  027606  001006                            BNE     36$             ;THEY ARE IN BUFFER - SKIP
6249  027610  013737  002340  050636            MOV     ECCHI,OBUFF+1000        ;ELSE MOVE THEM INTO BUFFER
6250  027616  013737  002342  050640            MOV     ECCLO,OBUFF+1002
6251
6252  027624  012305                    36$:    MOV     (R3)+,R5        ;GET ECC FROM BUFFER
6253  027626  012701  000001                    MOV     #BIT0,R1        ;SET BIT POINTER
6254
6255  027632  013737  002320  002322  5$:      MOV     PR.BIT,M1.BIT   ;SHIFT PRESENT TO PREVIOUS
6256  027640  005037  002320                    CLR     PR.BIT          ;AND SET UP PRESENT
6257  027644  030105                            BIT     R1,R5
6258  027646  001403                            BEQ     34$
6259  027650  012737  000001  002320            MOV     #1,PR.BIT
6260  027656  004737  031616            34$:    JSR     PC,RDBIT        ;GO READ BIT
6261  027662  016237  000026  002204            MOV     RKMR1(R2),T.MR1 ;GET MR1
6262  027670  023737  002204  002244            CMP     T.MR1,E.MR1     ;CHECK IF CORRECT
6263  027676  001402                            BEQ     38$             ;YES - SKIP
6264  027700  000137  030312                    JMP     11$             ;ELSE JUMP TO REPORT EXIT
6265  027704  023737  002326  001226  36$:     CMP     BITCNT,$TMP12   ;TEST IF FIRST ECC BIT
6266  027712  001402                            BEQ     49$             ;YES - SKIP ECC GEN (ALREADY DONE)
6267  027714  004737  030462                    JSR     PC,ECCGEN       ;GENERATE ECC FOR BIT
6268  027720  016237  000032  002214  49$:     MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
6269  027726  023737  002214  002254            CMP     T.ECPT,E.ECPT   ;TEST IF ECC PAT CORRECT
6270  027734  001402                            BEQ     45$             ;YES SKIP
6271  027736  000137  030276                    JMP     10$             ;ELSE GO REPORT ERROR
6272
6273  027742  005237  002326          45$:     INC     BITCNT          ;BUMP BIT COUNT
6274  027746  023737  002326  001230            CMP     BITCNT,$TMP13   ;TEST IF 1ST BIT OF ECC
6275  027754  001003                            BNE     46$             ;NO - SKIP
6276  027756  042737  020000  002244            BIC     #ECCW,E.MR1     ;ELSE CLR ECCW FOR ECC READ
6277  027764  023737  002326  001232  46$:     CMP     BITCNT,$TMP14   ;TEST IF 1ST BIT OF POSTAMBLE
6278  027772  001027                            BNE     47$             ;NO - SKIP
6279  027774  052737  020000  002244            BIS     #ECCW,E.MR1     ;ELSE SET ECCW FOR ECC DONE
6280  030002  042737  100000  002244            BIC     #RDGATE,E.MR1   ;CLEAR READ GATE
6281
6282  030010  016237  000032  002214            MOV     RKECPT(R2),T.ECPT ;STORE ACTUAL PATTERN
6283  030016  016237  000030  002212            MOV     RKECPS(R2),T.ECPS ;STORE ACTUAL POSITION
6284  030024  013737  002350  002252            MOV     ECPOSX,E.ECPS   ;GET EXPECTED POSITION FOR REPORT
6285  030032  023737  002214  002254            CMP     T.ECPT,E.ECPT   ;CHECK IF CORRECT
6286  030040  001163                            BNE     20$             ;NO SKIP
6287  030042  023737  002212  002252            CMP     T.ECPS,E.ECPS   ;CHECK IF POSITION CORRECT
6288  030050  001157                            BNE     20$             ;NO - SKIP
6289
6290  030052  023737  002326  001232  47$:     CMP     BITCNT,$TMP14   ;TEST IF ECC DONE
```

```
6291  030060  002436                        BLT     48$             ;NO - SKIP
6292  030062  005737  002346                TST     ECPATX          ;TEST IF EXPECTED ECC IS 0
6293                                                                  ;(NO ERROR)
6294  030066  001433                        BEQ     48$             ;YES - SKIP
6295  030070  023737  001232  002326        CMP     $TMP14,BITCNT   ;TEST IF FIRST POSTAMBLE BIT
6296  030076  001402                        BEQ     52$             ;YES - SKIP
6297  030100  005237  002350                INC     ECPOSX          ;ELSE BUMP POS COUNT EXPECTED
6298  030104  016237  000032  002214  52$:  MOV     RKECPT(R2),T.ECPT       ;GET PATTERN
6299  030112  016237  000030  002212        MOV     RKECPS(R2),T.ECPS       ;GET POSITION
6300  030120  013737  002350  002252        MOV     ECPOSX,E.ECPS   ;GET EXPECTED POSITION
6301  030126  023737  002214  002254        CMP     T.ECPT,E.ECPT   ;TEST IF PATTERN CORRECT
6302  030134  001402                        BEQ     51$             ;YES - SKIP
6303  030136  000137  030326                JMP     22$             ;ELSE GO REPORT
6304  030142  023737  002212  002252  51$:  CMP     T.ECPS,E.ECPS   ;CHECK IF POSITION CORRECT
6305  030150  001402                        BEQ     48$             ;YES - SKIP
6306  030152  000137  030342                JMP     23$             ;ELSE GO REPORT
6307
6308  030156  005701                  48$:  TST     R1              ;TEST IF WORD DONE
6309  030160  100403                        BMI     6$              ;YES SKIP
6310  030162  006301                        ASL     R1              ;ELSE SHIFT BIT POINTER
6311  030164  000137  027632                JMP     5$              ;AND LOOP
6312
6313  030170  005737  001214            6$: TST     $TMP5           ;TEST PASS COUNT. IF NOT 0
6314                                                                  ;(NOT THE FIRST ECC WORD JUST WRITTE)
6315  030174  001004                        BNE     7$              ; - SKIP
6316
6317  030176  005237  001214                INC     $TMP5           ;BUMP PASS COUNT
6318  030202  000137  027624                JMP     36$
6319
6320  030206  023727  001214  000001  7$:   CMP     $TMP5,#1        ;TEST PASS COUNT. IF NOT 1 (NOT THE
6321  030214  001007                        BNE     8$              ;2ND ECC WORD JUST READ) - SKIP
6322  030216  005005                        CLR     R5              ;CLEAR WORD (POSTAMBLE)
6323  030220  012701  000001                MOV     #BIT0,R1        ;SET BIT POINTER
6324  030224  005237  001214                INC     $TMP5           ;BUMP PASS COUNT
6325  030230  000137  027632                JMP     5$
6326
6327  030234  004437  032356            8$: JSR     R4,GETREG       ;GET RK611 REGS
6328  030240  013737  002260  002220        MOV     L.CS1,E.CS1     ;SET EXPECTED CS1
6329  030246  023737  002220  002160        CMP     E.CS1,T.CS1     ;CHECK IF CORRECT
6330  030254  001060                        BNE     21$             ;NO - SKIP
6331  030256  005724                        TST     (R4)+           ;ELSE BUMP RETURN POINTER TO NO ERR
6332  030260  000446                        BR      13$
6333
6334  030262  013704  001216            9$: MOV     $TMP6,R4        ;SET RETURN TOR MR1 ERR.
6335  030266  012737  027434  001236        MOV     #43$,$ESCAPE    ;SET RETURN TO CONTINUE TEST
6336  030274  000427                        BR      12$
6337
6338  030276  013704  001220           10$: MOV     $TMP7,R4        ;SET RETURN FOR ECC ERROR
6339  030302  012737  027470  001236        MOV     #44$,$ESCAPE    ;SET RETURN TO CONTINUE TEST
6340  030310  000421                        BR      12$
6341
6342  030312  013704  001216           11$: MOV     $TMP6,R4        ;SET RETURN FOR  MR1 ERROR
6343  030316  012737  027742  001236        MOV     #45$,$ESCAPE    ;SET RETURN TO CONTINUE TEST
6344  030324  000413                        BR      12$
6345
6346  030326  013704  001222           22$: MOV     $TMP10,R4       ;GET RETURN FOR PATTERN ERROR
```

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6347  030332  012737  030142  001236          MOV     #51$,$ESCAPE    ;SET RETURN TO CONTINUE TEST
6348  030340  000405                          BR      12$
6349
6350  030342  013704  001224          23$:    MOV     $TMP11,R4       ;RET RETURN FOR POSITION ERROR
6351  030346  012737  030156  001236          MOV     #48$,$ESCAPE    ;SET RETURN TO CONTINUE TEST
6352
6353
6354  030354  013746  001224          12$:    MOV     $TMP11,-(SP)    ;PREP STACK FOR RETURN
6355  030360  032777  001000  150552          BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
6356  030366  001407                          BEQ     14$             ;NO SKIP
6357
6358  030370  005726                          TST     (SP)+           ;REMOVE LAST ENTRY FROM STACK
6359  030372  005037  001236                  CLR     $ESCAPE         ;NO LOOP - SLEAR ESCAPE
6360
6361  030376                          13$:
6362  030376  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
6363  030400  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
6364  030402  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
6365  030404  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
6366  030406  000204                  14$:    RTS     R4
6367
6368  030410  013704  001212          20$:    MOV     $TMP4,R4        ;GET RETURN FOR ECC ERROR
6369  030414  000402                          BR      15$
6370  030416  013704  001210          21$:    MOV     $TMP3,R4        ;GET CS1 ERROR RETURN
6371  030422  005037  001236          15$:    CLR     $ESCAPE         ;TEST IF LOOP ON ERROR
6372  030426  032777  001000  150504          BIT     #BIT9,@SWR      ;TEST IF LOOP ON ERROR
6373  030434  001360                          BNE     13$             ;YES - SKIP
6374
6375  030436  013700  001254                  MOV     $TESTN,R0       ;SET REGISTERS TO LOOP ON ERROR OR
6376  030442  006300                          ASL     R0              ;ESCAPE TO NEXT TEST.
6377  030444  016037  033472  001236          MOV     $SW08TB(R0),$ESCAPE     ;SET UP TO ESCAPE TO NEXT TEST
6378
6379  030452  162737  000002  001236          SUB     #2,$ESCAPE      ;ADJUST RETURN
6380  030460  000746                          BR      13$             ;GO TO EXIT
6381
6382                                  .SBTTL  GENERATE ECC WORD
6383                                  ;*      EACH TIME THIS ROUTINE IS CALLED THE ECC IS CALCULATED FOR THE
6384                                  ;*      NEXT BIT TO BE READ OR WRITTEN AND THE BITS PREVIOUSLY
6385                                  ;*      READ OR WRITTEN (STORED IN ECCHI AND ECCLO). THE RESULTS OF
6386                                  ;*      THE CALCULATION ARE PLACED IN ECCHI AND ECCLO  THE LOW ORDER
6387                                  ;*      11 BITS OF ECCHI ARE PLACED IN E.ECPT FOR EASY COMPARISON
6388                                  ;*      TO RKECPT.
6389                                  ;*
6390                                  ;*      CALL:   JSR     PC,ECCGEN
6391                                  ;*      RETURN: RTS     R4
6392  030462  010046                  ECCGEN: MOV     R0,-(SP)        ;STORE R0
6393  030464  012700  002316                  MOV     #P1.BIT,R0      ;GET ADDRESS OF NEXT BIT
6394  030470  032737  000002  002260          BIT     #BIT1,L.CS1     ;CHECK IF WRITING
6395  030476  001002                          BNE     12$             ;YES - SKIP
6396  030500  012700  002322                  MOV     #M1.BIT,R0      ;ELSE CHANGE TO PRESENT BIT
6397
6398  030504  005710                  12$:    TST     (R0)            ;CHECK IF NEXT BIT 0
6399  030506  001410                          BEQ     3$              ;YES - SKIP
6400  030510  032737  000001  002340          BIT     #1,ECCHI        ;NO, CHECK IF BIT 31 = 1
6401  030516  001410                          BEQ     5$              ;NO, SET ECC XORED BIT
6402  030520  005037  002336          1$:     CLR     ECCXOR          ;CLEAR ECC XORED BIT
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6403  030524  000241                          CLC                     ;CLEAR CARRY FLOP
6404  030526  000410                          BR      7$              ;SHIFT IN ECC BIT
6405
6406  030530  032737  000001  002340  3$:     BIT     #1,ECCHI        ;CHECK IF BIT 31 = 1
6407  030536  001770                          BEQ     1$              ;NO, CLEAR ECC XORED BIT
6408  030540  012737  000001  002336  5$:     MOV     #1,ECCXOR       ;SET ECC XOR
6409  030546  000261                          SEC                     ;SET CARRY FLOP
6410  030550  006037  002342          7$:     ROR     ECCLO
6411  030554  006037  002340                  ROR     ECCHI
6412  030560  005737  002336                  TST     ECCXOR          ;CHECK IF XOR NEEDED
6413  030564  001422                          BEQ     10$             ;NO, RETURN
6414  030566  012746  020020                  MOV     #BIT13!BIT4,-(SP) ;DO XOR OF ECC BITS
6415  030572  043716  002342                  BIC     ECCLO,(SP)      ;  0, 2, 11, 21, 23
6416  030576  042737  020020  002342          BIC     #BIT13!BIT4,ECCLO
6417  030604  052637  002342                  BIS     (SP)+,ECCLO
6418  030610  012746  002400                  MOV     #BIT10!BIT8,-(SP)
6419  030614  043716  002340                  BIC     ECCHI,(SP)
6420  030620  042737  002400  002340          BIC     #BIT10!BIT8,ECCHI
6421  030626  052637  002340                  BIS     (SP)+,ECCHI
6422  030632  013737  002340  002254  10$:     MOV     ECCHI,E.ECPT    ;STORE ECC PATTERN
6423  030640  042737  174000  002254          BIC     #174000,E.ECPT  ;MASK UNSEEN BITS
6424  030646  012600                          MOV     (SP)+,R0        ;RESTORE R0
6425  030650  000207                          RTS     PC              ;RETURN
6426
6427                                  .SBTTL  SIMULATE ONE BIT OF WRITE DATA IN MAINTANENCE MODE
6428                                  ;*      ONE BIT OF DATA IS WRITE SIMULATED. THE CONTENTS OF
6429                                  ;*      RKMR1 IS COMPUTED (PRECOMP ADVANCE AND DELAY, MAINTENANCE
6430                                  ;*      ENCODED WRITE DATA) FOR THE PROPER TRANSITION OF THE
6431                                  ;*      MAINTENANCE CLOCK AND CHECKED AT EACH TRANSITION. IF MR1
6432                                  ;*      IS INCORRECT AT ANY TRANSITION, AN ERROR IS SET UP TO
6433                                  ;*      CONTAIN A MESSAGE THAT IDENTIFIES THE TRANSITION WHEN THE
6434                                  ;*      ERROR OCCURRED.
6435                                  ;*
6436                                  ;*      CALL:   JSR     PC,WRTBIT
6437                                  ;*      RETURN: RTS     PC+2            FOR NO ERROR RETURN
6438                                  ;*              RTS     PC              FOR ERROR IN MR1
6439  030652  052737  002400  002244  WRTBIT: BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT. REG. 1
6440  030660  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIED 1ST UPWARD TRANSITION
6441  030666  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MAINT. REG. 1
6442  030674  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
6443  030702  001416                          BEQ     3$              ;YES, PROVIDE DOWNWARD TRANSISTION
6444  030704  012737  030724  001236          MOV     #1$,$ESCAPE     ;LOAD ESCAPE FOR LOOP ON ERROR
6445  030712  012737  043644  001512          MOV     #EMW1,EMW+2     ;LOAD ERROR MESSAGE
6446  030720  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6447  030722  000207                          RTS     PC              ;MR1 INCORRECT ON UPWARD TRANSITION
6448
6449  030724  032777  001000  150206  1$:     BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6450  030732  001402                          BEQ     3$              ;NO, CONTINUE
6451  030734  000137  031606                  JMP     63$             ;YES, LOOP ON ERROR
6452
6453  030740  042737  014400  002244  3$:     BIC     #MCLK!PCA!PCD,E.MR1 ;INITIALIZE MAINTENANCE REG. 1
6454  030746  052737  042000  002244          BIS     #MEWD!WRTGAT,E.MR1
6455  030754  005737  002320                  TST     PR.BIT          ;CHECK IF ONE
6456  030760  001152                          BNE     20$             ;YES, SIMULATE ONE
6457  030762  005737  002322                  TST     M1.BIT          ;CHECK IF PREVIOUS ONE
6458  030766  001023                          BNE     10$             ;YES, NO TRANSISTION
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6459  030770  042737  002000  002244          BIC     #MEWD,E.MR1     ;INDICATE TRANSISTION
6460  030776  005737  002316                  TST     P1.BIT          ;CHECK IF NEXT BIT = 1
6461  031002  001007                          BNE     5$              ;YES, CHECK FOR PRECOMP ADVANCE
6462  031004  005737  002324                  TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
6463  031010  001412                          BEQ     10$             ;NO, CLOCK IN ZERO
6464  031012  052737  010000  002244          BIS     #PCD,E.MR1      ;SET PRECOMP. DELATY
6465  031020  000406                          BR      10$             ;CLOCK IN ZERO
6466
6467  031022  005737  002324          5$:     TST     M2.BIT          ;CHECK FOR PRECOMP. ADVANCE
6468  031026  001003                          BNE     10$             ;CLOCK IN ZERO
6469  031030  052737  004000  002244          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVANCE
6470  031036  012762  000040  000026  10$:    MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
6471  031044  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6472  031052  023737  002204  002244          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6473  031060  001416                          BEQ     12$             ;YES, CONTINUE
6474  031062  012737  031102  001236          MOV     #11$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6475  031070  012737  043732  001512          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6476  031076  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6477  031100  000207                          RTS     PC              ;MR1 INCORRECT
6478
6479  031102  032777  001000  150030  11$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6480  031110  001402                          BEQ     12$             ;NO, CONTINUE
6481  031112  000137  031606                  JMP     63$             ;YES, LOOP ON ERROR
6482
6483  031116  052737  002400  002244  12$:    BIS     #MCLK!MEWD,E.MR1 ;CREATE EXPECTED MAINT REG 1
6484  031124  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSISITION
6485  031132  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG. 1
6486  031140  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG. 1 CORRECT
6487  031146  001416                          BEQ     15$             ;YES, CONTINUE
6488  031150  012737  031170  001236          MOV     #13$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6489  031156  012737  044022  001512          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
6490  031164  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6491  031166  000207                          RTS     PC              ;MR1 INCORRECT
6492
6493  031170  032777  001000  147742  13$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6494  031176  001402                          BEQ     15$             ;NO, CONTINUE
6495  031200  000137  031606                  JMP     63$             ;YES, LOOP ON ERROR
6496
6497  031204  052737  002000  002244  15$:    BIS     #MEWD,E.MR1     ;RESET TRANSITION INDICATION
6498  031212  042737  000400  002244          BIC     #MCLK,E.MR1
6499  031220  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;SUPPLY LAST PART OF DATA
6500  031226  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6501  031234  023737  002204  002244          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6502  031242  001414                          BEQ     18$             ;YES, RETURN
6503  031244  012737  031264  001236          MOV     #17$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6504  031252  012737  044110  001512          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
6505  031260  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6506  031262  000207                          RTS     PC              ;MR1 INCORRECT
6507
6508  031264  032777  001000  147646  17$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6509  031272  001145                          BNE     63$             ;YES, LOOP ON ERROR
6510  031274  005037  001236          18$:    CLR     $ESCAPE         ;CLEAR ESCAPE
6511  031300  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
6512  031304  000207                          RTS     PC              ;RETURN
6513
6514  031306  005737  002316          20$:    TST     P1.BIT          ;CHECK IN NEXT BIT A ONE
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6515  031312  001007                          BNE     30$             ;YES, CHECK IF PRECOMP DELAY
6516  031314  005737  002322                  TST     M1.BIT          ;CHECK FOR PRECOMP ADVANCE
6517  031320  001415                          BEQ     40$             ;NO, CHECK FO MR1
6518  031322  052737  004000  002244          BIS     #PCA,E.MR1      ;SET PRECOMP. ADVZNCE
6519  031330  000411                          BR      40$             ;CHECK MR1
6520
6521  031332  042737  000400  002244  30$:    BIC     #MCLK,E.MR1     ;RESET MAINT CLOCK IN EXPECTED MF1
6522  031340  005737  002322                  TST     M1.BIT          ;CHECK FOR PRECOMP DELAY
6523  031344  001003                          BNE     40$             ;NO, CHECK MR1
6524  031346  052737  010000  002244          BIS     #PCD,E MR1      ;SET SET PRECOMF DELAY
6525  031354  012762  000040  000026  40$:    MOV     #DMD,RKMR1(R2)  ;CLOCK IN DATA BIT
6526  031362  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6527  031370  023737  002204  002244          CMP     T.MR1,E.MR1     ;CHECK MR1 CORRECT
6528  031376  001414                          BEQ     42$             ;YES, CLOCK IN REST OF BIT
6529  031400  012737  031420  001236          MOV     #41$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6530  031406  012737  043732  001512          MOV     #EMW2,EMW+2     ;LOAD ERROR MESSAGE
6531  031414  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6532  031416  000207                          RTS     PC              ;MR1 INCORRECT
6533
6534  031420  032777  001000  147512  41$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6535  031426  001067                          BNE     63$             ;YES, LOOP ON ERROR
6536  031430  052737  000400  002244  42$:    BIS     #MCLK,E.MR1     ;CHREATE EXPECTED MAINT. REG. 1
6537  031436  012762  000440  000026          MOV     #DMD!MCLK,RKMR1(R2) ;PROVIDE 2ND UPWARD TRANSITION
6538  031444  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MAINT REG 1
6539  031452  023737  002244  002204          CMP     E.MR1,T.MR1     ;CHECK IF MAINT REG 1 CORRECT
6540  031460  001414                          BEQ     45$             ;YES, CONTINUE
6541  031462  012737  031502  001236          MOV     #43$,$ESCAPE    ;LOAD ESCAPE
6542  031470  012737  044022  001512          MOV     #EMW3,EMW+2     ;LOAD ERROR MESSAGE
6543  031476  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6544  031500  000207                          RTS     PC              ;MR1 INCORRECT
6545
6546  031502  032777  001000  147430  43$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6547  031510  001036                          BNE     63$             ;YES, LOOP ON ERROR
6548  031512  042737  002400  002244  45$:    BIC     #MEWD!MCLK,E.MR1 ;SET TRANSISTION
6549  031520  012762  000040  000026          MOV     #DMD,RKMR1(R2)  ;CLOCK TRANSISTION
6550  031526  016237  000026  002204          MOV     RKMR1(R2),T.MR1 ;STORE MR1
6551  031534  023737  002204  002244          CMP     T.MR1,E.MR1     ;CHECK IF MR1 CORRECT
6552  031542  001414                          BEQ     50$             ;YES, RETURN
6553  031544  012737  031564  001236          MOV     #47$,$ESCAPE    ;LOAD ESCAPE FOR LOOP ON ERROR
6554  031552  012737  044110  001512          MOV     #EMW4,EMW+2     ;LOAD ERROR MESSAGE
6555  031560  011646                          MOV     (SP),-(SP)      ;SAVE RETURN
6556  031562  000207                          RTS     PC              ;MR1 INCORRECT
6557
6558  031564  032777  001000  147346  47$:    BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6559  031572  001005                          BNE     63$             ;YES, LOOP ON ERROR
6560  031574  005037  001236          50$:    CLR     $ESCAPE         ;CLEAR ESCAPE
6561  031600  062716  000002                  ADD     #2,(SP)         ;ADJUST RETURN
6562  031604  000207                          RTS     PC              ;RETURN
6563
6564  031606  012706  001100          63$:    MOV     #STACK,SP       ;FORCE STACK
6565  031612  000177  147272                  JMP     @$LPERR         ;LOOP ON ERROR
6566
6567                                  .SBTTL  SIMULATE ONE BIT OR READ DATA IN MAINTENANCE MODE
6568                                  ;*      ONE BIT OF DATA IS READ SIMULATED. NO CHECKING IS
6569                                  ;*      DONE BY THIS ROUTINE.
6570                                  ;*
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6571                                        ;*      CALL:   JSR     PC,RDBIT
6572                                        ;*      RETURN: RTS     PC
6573  031616  005737  002320                RDBIT:  TST     PR.BIT          ;CHECK IF ONE
6574  031622  001024                                BNE     10$             ;YES, SIMULATE ONE
6575  031624  005737  002322                        TST     M1.BIT          ;CHECK IF PREVIOUS ONE
6576  031630  001404                                BEQ     4$              ;NO, INSERT TRANSITION
6577  031632  012762  000440  000026                MOV     #DMD!MCLK,RKMR1(R2)  ;YES, DO NOT INSERT TRANSITION
6578  031640  000403                                BR      5$              ;CLOCK IN ZERO
6579
6580  031642  012762  001440  000026          4$:   MOV     #DMD!MCLK!MERD,RKMR1(R2)  ;INSERT TRANSITION
6581  031650  012762  000040  000026          5$:   MOV     #DMD,RKMR1(R2)  ;CLOCK IN ZERO
6582  031656  012762  000440  000026                MOV     #DMD!MCLK,RKMR1(R2)
6583  031664  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6584  031672  000207                                RTS     PC              ;RETURN
6585
6586  031674  012762  000440  000026          10$:  MOV     #DMD!MCLK,RKMR1(R2)  ;CLOCK IN ONE
6587  031702  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6588  031710  012762  001440  000026                MOV     #DMD!MCLK!MERD,RKMR1(R2)
6589  031716  012762  000040  000026                MOV     #DMD,RKMR1(R2)
6590  031724  000207                                RTS     PC              ;RETURN
6591
6592                                        .SBTTL  MEMORY CHECK ENABLE TRAP
6593                                        ;*      IF THE PROCESSOR IN USE HAS MEMORY PARITY OPTION,
6594                                        ;*      IT WILL BE ENABLED. THIS ROUTINE WILL PROCESS TRAPS CAUSED
6595                                        ;*      BY MEMORY PARITY ERRORS.
6596  031726  012737  031742  001236      MEMERR: MOV     #10$,$ESCAPE    ;LOAD ESCAPE
6597  031734  011637  002310                        MOV     (SP),TRAPPC     ;STORE PC
6598  031740  104001                                ERROR   1               ;REPORT MEM PARITY ERROR
6599  031742  005037  001236                10$:   CLR     $ESCAPE         ;CLEAR ESCAPE
6600  031746  032777  001000  147164                BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
6601  031754  001001                                BNE     15$             ;YES, FORCE STACK AND TRY AGAIN
6602  031756  000002                                RTI                     ;NO, RETURN
6603
6604  031760  012706  001100              15$:    MOV     #STACK,SP       ;INITIALIZE STACK
6605  031764  000177  147120                        JMP     @$LPERR         ;LOOP ON ERROR
6606
6607                                        .SBTTL  CLEAR INPUT BUFFER
6608  031770  012700  046632              CLRIBF: MOV     #IBUFF,R0       ;GET BUFFER POINTER
6609  031774  010146                                MOV     R1,-(SP)        ;STORE R1
6610  031776  012701  000400                        MOV     #400,R1 ;SET COUNT FOR CLEAR
6611  032002  005020                        1$:     CLR     (R0)+           ;CLEAR BUFFER WORD
6612  032004  005301                                DEC     R1              ;DEC COUNT
6613  032006  001375                                BNE     1$              ;LOOP UNTIL COUNT IS ZERO
6614  032010  012601                                MOV     (SP)+,R1        ;RESTORE R1
6615  032012  000204                                RTS     R4              ;RETURN
6616                                        .SBTTL  BUILD DATA BUFFER
6617                                        ;*      THE PATTERN SPECIFIED IN THE CALL IS LOADED INTO THE DATA
6618                                        ;*      BUFFER. THE ENTIRE BUFFER IS ALWAYS LOADED (400(8) WORDS).
6619  032014                                BLDDAT:
6620  032014  010046                                MOV     R0,-(SP)        ;;PUSH R0 ON STACK
6621  032016  010146                                MOV     R1,-(SP)        ;;PUSH R1 ON STACK
6622  032020  010346                                MOV     R3,-(SP)        ;;PUSH R3 ON STACK
6623  032022  010546                                MOV     R5,-(SP)        ;;PUSH R5 ON STACK
6624  032024  012700  047636                        MOV     #OBUFF,R0       ;LOAD R0 TO POINT TO BUFFER
6625  032030  012701  000400                        MOV     #400,R1         ;SET DATA LENGTH
6626  032034  021427  000001                        CMP     (R4),#1         ;TEST IF PATTERN 1(ALL ZERO)
```

```
6627  032040  001004                  BNE     2$                ;NO - SKIP
6628  032042  005020          1$:     CLR     (R0)+             ;ELSE CLEAR OBUFF
6629  032044  005301                  DEC     R1
6630  032046  001375                  BNE     1$
6631  032050  000461                  BR      13$
6632  032052  021427  000007  2$:     CMP     (R4),#7           ;TEST IF PAT 7 (ALL ONES)
6633  032056  001006                  BNE     4$                ;NO SKIP
6634  032060  012703  177777          MOV     #177777,R3        ;ELSE SET BUFFER TO ALL ONES
6635  032064  010320          3$:     MOV     R3,(R0)+
6636  032066  005301                  DEC     R1
6637  032070  001375                  BNE     3$
6638  032072  000450                  BR      13$
6639  032074  021427  000006  4$:     CMP     (R4),#6           ;TEST IF PAT 6 (COMPOSIT ROTATING)
6640  032100  001003                  BNE     5$                ;NO - SKIP
6641  032102  012705  046572          MOV     #PAT6,R5          ;ELSE GET ADDRESS OF PATTERN 6
6642  032106  000427                  BR      10$               ;GO LOAD BUFFER
6643  032110  021427  000005  5$:     CMP     (R4),#5           ;TEST IF PATTERN 5 (ALT 1 & 0)
6644  032114  001006                  BNE     7$                ;NO SKIP
6645  032116  012703  125252          MOV     #125252,R3        ;ELSE LOAD OBUFF WITH PAT 5
6646  032122  010320          6$:     MOV     R3,(R0)+
6647  032124  005301                  DEC     R1
6648  032126  001375                  BNE     6$
6649  032130  000431                  BR      13$
6650  032132  021427  000004  7$:     CMP     (R4),#4           ;TEST IF PATTERN 4 (HI-LO FREQ MIX)
6651  032136  001003                  BNE     8$                ;NO - SKIP
6652  032140  012705  046532          MOV     #PAT4,R5          ;LOAD POINTER WITH ADD OF PAT 4
6653  032144  000410                  BR      10$
6654  032146  021427  000003  8$:     CMP     (R4),#3           ;TEST IF PAT 3 (MAX PRECOMP PHASE MIX)
6655  032152  001003                  BNE     9$                ;NO - SKIP
6656  032154  012705  046472          MOV     #PAT3,R5          ;LOAD POINTER WITH ADD OF PAT 3
6657  032160  000402                  BR      10$               ;GO LOAD BUFFER
6658  032162  012705  046432  9$:     MOV     #PAT2,R5          ;GET ADDRESS OF PAT 2
6659  032166  012703  000020  10$:    MOV     #16.,R3           ;SET PATTERN LENGTH COUNT
6660  032172  012520  11$:    MOV     (R5)+,(R0)+       ;MOV PATTERN INTO OBUFF
6661  032174  005301                  DEC     R1                ;DEC COUNTERS
6662  032176  005303                  DEC     R3
6663  032200  001374                  BNE     11$               ;LOOP UNTIL PATTERN IS MOVED
6664  032202  012705  047636          MOV     #OBUFF,R5         ;SET R5 TO START OF BUFFER
6665  032206  012520  12$:    MOV     (R5)+,(R0)+       ;REPEAT PATTERN THROUGH BUFFER
6666  032210  005301                  DEC     R1
6667  032212  001375                  BNE     12$
6668  032214  005724  13$:    TST     (R4)+             ;BUMP PAST PARAMETER
6669  032216  012605                  MOV     (SP)+,R5          ;;POP STACK INTO R5
6670  032220  012603                  MOV     (SP)+,R3          ;;POP STACK INTO R3
6671  032222  012601                  MOV     (SP)+,R1          ;;POP STACK INTO R1
6672  032224  012600                  MOV     (SP)+,R0          ;;POP STACK INTO R0
6673  032226  000204                  RTS     R4
6674
6675                          .SBTTL  LOAD "L" REGISTERS
6676                          ;*      THE "L" REGISTERS ARE LOADED FORM THE PARAMETERS FOLLOWING
6677                          ;*      THE SUBROUTINE CALL. DIAGNOSTIC MODE IS SET IN L.MR1
6678                          ;*      AND L.CS1 IS LOADED WITH THE COMMAND.
6679                          ;*
6680                          ;*      CALL:
6681                          ;*      JSR     R4,LOADRK
6682                          ;*      .WORD           CYLINDER
```

```
                                        ;*      .BYTE           ;SECTOR
                                        ;*      .BYTE           ;TRACK
                                        ;*      .WORD           ;BUFFER ADDRESS
                                        ;*      .WORD           ;WORD COUNT
                                        ;*      .WORD           ;COMMAND,FORMAT,DRIVE TYPE,&UPPER BUS ADDRESS BITS
                                        ;*
                                        ;*      RETURN:
                                        ;*      RTS     R4

032230  012437  002274          LOADRK: MOV     (R4)+,L.DCYL            ;LOAD CYLINDER
032234  012437  002266                  MOV     (R4)+,L.DA              ;       TRACK AND SECTOR
032240  012437  002264                  MOV     (R4)+,L.BA              ;       BUS ADDRESS
032244  012437  002262                  MOV     (R4)+,L.WC              ;       WORD COUNT
032250  012737  000040  002276          MOV     #DMD,L.MR1              ;SET DIAGNOSTIC MODE
032256  005037  002272                  CLR     L.ASOF                  ;CLEAR OFFSET
032262  005037  002270                  CLR     L.CS2                   ;CLEAR CS2
032266  012437  002260                  MOV     (R4)+,L.CS1             ;LOAD CS1
032272  000204                          RTS     R4                      ;RETURN

                                        .SBTTL  START THE OPERATION
                                        ;*      THE INFORMATION IN THE "L" REGISTERS ARE LOADED INTO THE
                                        ;*      RK611 REGISTERS IN A STARAIGHT TRANSFER.

032274  013762  002262  000002  OPSTRT: MOV     L.WC,RKWC(R2)   ;MOVE THE "L"REGISTERS INTO
032302  013762  002264  000004          MOV     L.BA,RKBA(R2)   ;CORRESPONDING RK611 REGISTERS.
032310  013762  002274  000020          MOV     L.DCYL,RKDCYL(R2)
032316  013762  002266  000006          MOV     L.DA,RKDA(R2)
032324  013762  002270  000010          MOV     L.CS2,RKCS2(R2)
032332  013762  002276  000026          MOV     L.MR1,RKMR1(R2)
032340  013762  002272  000016          MOV     L.ASOF,RKASOF(R2)
032346  013762  002260  000000          MOV     L.CS1,RKCS1(R2)
032354  000204                          RTS     R4

                                        .SBTTL  GET THE RK611 REGISTERS
                                        ;*      ALL THE RK611 REGISTERS EXCEPT THE DATA BUFFER ARE
                                        ;*      STORED IN THE "T" REGISTERS.

032356                          GETREG:
032356  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
032360  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
032362  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
032364  010200                          MOV     R2,R0           ;GET RK BASE
032366  012701  002160                  MOV     #T.CS1,R1       ;GET START OF REGS
032372  012703  000011                  MOV     #11,R3          ;SET COUNT
032376  012021                  1$:     MOV     (R0)+,(R1)+     ;GET CS1 THRU DCYL
032400  005303                          DEC     R3
032402  001375                          BNE     1$              ;LOOP UNTIL DONE

032404  062700  000004                  ADD     #4,R0           ;SKIP OVER DB AND SPARE
032410  005021                          CLR     (R1)+           ;CLEAR T.DB
032412  012021                          MOV     (R0)+,(R1)+     ;STORE MR1
032414  012037  002212                  MOV     (R0)+,T.ECPS    ;       ECC POSITION
032420  012037  002214                  MOV     (R0)+,T.ECPT    ;       ECC PATTERN
032424  012037  002206                  MOV     (R0)+,T.MR2     ;       MR2
032430  012037  002210                  MOV     (R0)+,T.MR3     ;       MR3
032434  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
```

```
                                ;GET THE RK611 REGISTERS

032436  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
032440  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
032442  000204                  RTS     R4

                        .SBTTL  "FIRST SHALL BE LAST, LAST SHALL BE FIRST" SUBROUTINE
                        ;*      THE CONTENTS OF R3 IS SWAPPED END FOR END, I.E. BIT 15
                        ;*      BECOMES BIT 0 AND VICE VERSA,BIT 14 BECOMES BIT
                        ;*      1 AND VICE VERSA, ETC.
                        ;*
                        ;*      CALL:
                        ;*      JSR     R4,FSBLVV
                        ;*      WITH R3 LOADED WITH THE WORD TO BE SWAPPED
                        ;*
                        ;*      RETURN:
                        ;*      RTS     R4
                        ;*      WITH R3 SWAPPED.

032444                  FSBLVV:
032444  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
032446  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
032450  010446                  MOV     R4,-(SP)        ;;PUSH R4 ON STACK
032452  005004                  CLR     R4              ;CLEAR R4 FOR SWAPPED WORD
032454  012700  000001          MOV     #BIT0,R0        ;SET FOR BIT TEST
032460  012701  100000          MOV     #BIT15,R1       ;SET FOR BIT SET
032464  030003          1$:     BIT     R0,R3           ;TEST IF BIT SET
032466  001401                  BEQ     2$              ;NO - SKIP
032470  050104                  BIS     R1,R4           ;SET CORRESPONDING BIT
032472  006300          2$:     ASL     R0              ;SHIFT FOR NEXT BIT TEST
032474  001403                  BEQ     3$              ;LAST BIT TESTED - YES - EXIT
032476  000241                  CLC                     ;CLEAR CARRY
032500  006001                  ROR     R1              ;SHIFT FOR NEXT BIT SET
032502  000770                  BR      1$              ;LOOP
032504  010403          3$:     MOV     R4,R3           ;STORED SWAPPED WORD
032506  012604                  MOV     (SP)+,R4        ;;POP STACK INTO R4
032510  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
032512  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
032514  000204                  RTS     R4


                        .SBTTL  CHECK FOR MEMORY CHECK ENABLE

032516  012737  032602  000004  PARCHK: MOV     #20$,ERRVEC     ;SET VECTOR FOR MEMORY PARITY CHECK
032524  012737  000340  000006          MOV     #PR7,ERRVEC+2
032532  012737  000000  002334          MOV     #  BADPAR       ;LOAD GOOD PARITY
032540  005037  002332                  CLR     MEMPAR          ;CLEAR FLAG
032544  012703  172100                  MOV     #MEMBAS,R3      ;LOAD REGISTER TO DETERMINE IF
                                                                ;  MEMORY CHECK ENABLE AVAILIBLE
032550  012704  000001                  MOV     #1,R4           ;INITIALIZE MASK
032554  012713  000001          16$:    MOV     #PAR.EN,(R3)    ;ENABLE MEMORY CHECK
032560  005713                  TST     (R3)
032562  050437  002332                  BIS     R4,MEMPAR       ;SET FLAG
032566  062703  000002                  ADD     #2,R3
032572  000241                  CLC
032574  006104                  ROL     R4              ;CHECK IF FINISHED
032576  001366                  BNE     16$             ;NO, SET UP NEXT MEMORY PARITY MODULE
032600  000406                  BR      22$             ;RESTORE TRAP VECTOR
```

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6795
6796  032602  022626                  20$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
6797  032604  062703  000002                  ADD     #2,R3
6798  032610  000241                          CLC
6799  032612  006104                          ROL     R4              ;CHECK IF FINISHED
6800  032614  001357                          BNE     16$             ;NO, GET NEXT LOCATION
6801  032616  012737  000006  000004  22$:    MOV     #ERRVEC+2,ERRVEC ;RESTORE TRAP CATCHER
6802  032624  005037  000006                  CLR     ERRVEC+2
6803  032630  005737  002332                  TST     MEMPAR          ;CHECK IF MEMORY CHECK ENABLE AVAILIABLE
6804  032634  001005                          BNE     25$             ;YES, RETURN
6805  032636  012737  000116  000114          MOV     #MEMVEC+2,MEMVEC ;RESTORE TRAP CATCHER
6806  032644  005037  000116                  CLR     MEMVEC+2
6807  032650  000207                  25$:    RTS     PC              ;RETURN
6808                                  .SBTTL  ROUTINE TO SIZE MEMORY
6809
6810                                  ;;*****************************************************************
6811                                  ;*CALL:
6812                                  ;*      JSR     PC,$SIZE
6813                                  ;*      RETURN
6814                                  ;*$LSTAD WILL CONTAIN:
6815                                  ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
6816                                  ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
6817                                  ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
6818                                  ;*$KT11 IS THE MEMORY MANAGEMENT KEY
6819                                  ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
6820                                  ;*      MUST BE SETUP BEFORE THE CALL
6821                                  ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
6822                                  ;*      DETERMINED BY ROUTINE
6823
6824  032652  010046                  $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
6825  032654  010146                          MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
6826  032656  010246                          MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
6827  032660  010346                          MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
6828  032662  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
6829  032666  013746  000006                  MOV     @#ERRVEC+2,-(SP)
6830  032672  010600                          MOV     SP,R0           ;;SAVE THE STACK POINTER
6831                          ;;SET THE ERRVEC PS TO THE PRESENT PS
6832  032674  104400                          TRAP                    ;;PUSH OLD PSW AND PC ON STACK
6833  032676  012637  000006                  MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
6834  032702  012701  003776                  MOV     #3776,R1        ;;SETUP ADDRESS
6835  032706  105727                          TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
6836  032710  000200                  $KT11:  .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
6837  032712  100062                          BPL     $CORE           ;;BR IF NO
6838  032714  012737  033052  000004          MOV     #$KTNEX,@#ERRVEC ;;SET FOR TIMEOUT
6839  032722  005737  177572                  TST     @#SR0           ;;KT11 ARE YOU THERE?
6840  032726  052737  100000  032710          BIS     #100000,$KT11   ;;YES--SET KT11 KEY
6841  032734  005046                          CLR     -(SP)           ;;INITIALIZE FOR "PAR" LOADING
6842  032736  012702  172340                  MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
6843  032742  012703  000010                  MOV     #10,R3          ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
6844  032746  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
6845  032754  011622                          MOV     (SP),(R2)+      ;;LOAD "PAR"
6846  032756  062716  000200                  ADD     #200,(SP)       ;;UPDATE FOR NEXT "PAR"
6847  032762  077307                          SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
6848  032764  012742  177600                  MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
6849  032770  005042                          CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
6850  032772  012737  033010  000004          MOV     #2$,@#ERRVEC    ;;CATCH TIMEOUT IF NO SR3
```

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6851  033000  012737  000020  172516          MOV     #20,@#SR3       ;;ENABLE 22 BIT MODE
6852  033006  000401                          BR      3$              ;;THIS PDP-11 HAS A SR3 REGISTER
6853  033010  022626                  2$:     CMP     (SP)+,(SP)+     ;;CLEAN OFF THE STACK--NO SR3
6854  033012  005237  177572          3$:     INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
6855  033016  012737  033042  000004          MOV     #$KTOUT,@#ERRVEC ;;SET FOR TIME OUT
6856  033024  005737  143776          4$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
6857  033030  062712  000040                  ADD     #40,(R2)        ;;MAKE A 1K STEP
6858  033034  023712  172356                  CMP     @#KIPAR7,(R2)   ;;LAST ONE?
6859  033040  101371                          BHI     4$              ;;NO--TRY IT
6860  033042  011202          $KTOUT: MOV     (R2),R2         ;;GET LAST BANK+1
6861  033044  005037  177572                  CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
6862  033050  000421                          BR      $SIZEX
6863  033052  042737  100000  032710  $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
6864  033060  012737  033110  000004  $CORE:  MOV     #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
6865  033066  005002                          CLR     R2              ;;SET UP BANK
6866  033070  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
6867  033074  062702  000040                  ADD     #40,R2          ;;1K STEP
6868  033100  005711                          TST     (R1)            ;;TRAP ON TIME OUT
6869  033102  022701  177776                  CMP     #177776,R1      ;;LAST ONE
6870  033106  001370                          BNE     1$              ;;NO--TRY AGAIN
6871  033110  162701  004000          $CROUT: SUB     #4000,R1
6872  033114  162702  000040          $SIZEX: SUB     #40,R2          ;;DROP BACK
6873  033120  010006                          MOV     R0,SP           ;;RESTORE THE STACK
6874  033122  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
6875  033126  012637  000004                  MOV     (SP)+,@#ERRVEC
6876  033132  010137  033154                  MOV     R1,$LSTAD       ;;LAST ADDRESS
6877  033136  010237  033156                  MOV     R2,$LSTBK       ;;LAST BANK
6878  033142  012603                          MOV     (SP)+,R3        ;;RESTORE R3
6879  033144  012602                          MOV     (SP)+,R2        ;;RESTORE R2
6880  033146  012601                          MOV     (SP)+,R1        ;;RESTORE R1
6881  033150  012600                          MOV     (SP)+,R0        ;;RESTORE R0
6882  033152  000207                          RTS     PC
6883  033154  000000          $LSTAD: .WORD   0               ;;CONTAINS THE LAST ADDRESS
6884  033156  000000          $LSTBK: .WORD   0               ;;CONTAINS THE LAST BANK
6885                          .SBTTL  SCOPE HANDLER ROUTINE
6886
6887                          ;;**************************************************************
6888                          ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
6889                          ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
6890                          ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
6891                          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
6892                          ;*SW14=1         LOOP ON TEST
6893                          ;*SW11=1         INHIBIT ITERATIONS
6894                          ;*SW09=1         LOOP ON ERROR
6895                          ;*SW08=1         LOOP ON TEST IN SWR<7:0>
6896                          ;*CALL
6897                          ;*      SCOPE           ;;SCOPE=IOT
6898
6899  033160          $SCOPE:
6900  033160  104407                  CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
6901  033162  032777  040000  145750  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
6902  033170  001131                          BNE     $OVER           ;;YES IF SW14=1
6903                          ;*****START OF CODE FOR THE XOR TESTER*****
6904  033172  000416          $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
6905                                                          ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
6906  033174  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
```

```
6907  033200  012737  033220  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
6908  033206  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
6909  033212  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6910  033216  000500                          BR      $SVLAD          ;;GO TO THE NEXT TEST
6911  033220  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
6912  033222  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
6913  033226  000440                          BR      7$              ;;LOOP ON THE PRESENT TEST
6914  033230                          6$:;*****END OF CODE FOR THE XOR TESTER*****
6915  033230  032777  000400  145702          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
6916  033236  001421                          BEQ     2$              ;;BR IF NO
6917  033240  005046                          CLR     -(SP)           ;;CLEAR A TEMP. LOCATION
6918  033242  117716  145672                  MOVB    @SWR,(SP)       ;;PICKUP THE DESIRED TEST NUMBER
6919  033246  001414                          BEQ     8$              ;;BRANCH IF BAD TEST NUMBER IN SWR
6920  033250  022716  000036                  CMP     #36,(SP)        ;;CHECK THE NUMBER IN THE SWR
6921  033254  002411                          BLT     8$              ;;BRANCH IF TEST NUMBER IS OUT OF RANGE
6922  033256  011637  001102                  MOV     (SP),$TSTNM     ;;UPDATE THE TEST NUMBER
6923  033262  005316                          DEC     (SP)            ;;BACKUP BY ONE
6924  033264  006316                          ASL     (SP)            ;;SCALE THE TEST NUMBER AS AN INDEX
6925  033266  062716  033472                  ADD     #$SW08TBL,(SP)  ;;FORM THE ADDRESS OF TEST POINTER
6926  033272  013637  001106                  MOV     @(SP)+,$LPADR   ;;SET LOOP ADDRESS TO DESIRED TEST
6927  033276  000466                          BR      $OVER           ;;GO LOOP ON THE TEST
6928  033300  005726                  8$:     TST     (SP)+           ;;CLEAN THE BAD TEST NUMBER OFF OF THE STACK
6929  033302  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
6930  033306  001421                          BEQ     3$              ;;BR IF NO
6931  033310  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
6932  033316  101015                          BHI     3$              ;;BR IF NO
6933  033320  032777  001000  145612          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
6934  033326  001404                          BEQ     4$              ;;BR IF NO
6935  033330  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
6936  033336  000446                          BR      $OVER
6937  033340  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
6938  033344  005037  001234                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
6939  033350  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
6940  033352  032777  004000  145560  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
6941  033360  001011                          BNE     1$              ;;BR IF YES
6942  033362  005737  001256                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
6943  033366  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
6944  033370  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
6945  033374  023737  001234  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
6946  033402  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
6947  033404  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
6948  033412  013737  033470  001234          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
6949  033420  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
6950  033424  113737  001102  001254          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
6951  033432  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
6952  033436  011637  001110                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
6953  033442  005037  001236                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
6954  033446  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
6955  033454  013777  001102  145460  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
6956  033462  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
6957  033466  000002                          RTI                     ;;FIXES PS
6958  033470  003720                  $MXCNT: 2000.                   ;;MAX. NUMBER OF ITERATIONS
6959  033472                          $SW08TBL:
6960  033472  003414                          .WORD   TST1+2          ;;STARTING ADDRESS OF TEST 1
6961  033474  004032                          .WORD   TST2+2          ;;STARTING ADDRESS OF TEST 2
6962  033476  004444                          .WORD   TST3+2          ;;STARTING ADDRESS OF TEST 3
```

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 6963  033500  005056                        .WORD   TST4+2          ;;STARTING ADDRESS OF TEST 4
 6964  033502  005470                        .WORD   TST5+2          ;;STARTING ADDRESS OF TEST 5
 6965  033504  006112                        .WORD   TST6+2          ;;STARTING ADDRESS OF TEST 6
 6966  033506  006362                        .WORD   TST7+2          ;;STARTING ADDRESS OF TEST 7
 6967  033510  006624                        .WORD   TST10+2         ;;STARTING ADDRESS OF TEST 10
 6968  033512  007140                        .WORD   TST11+2         ;;STARTING ADDRESS OF TEST 11
 6969  033514  007432                        .WORD   TST12+2         ;;STARTING ADDRESS OF TEST 12
 6970  033516  010160                        .WORD   TST13+2         ;;STARTING ADDRESS OF TEST 13
 6971  033520  010706                        .WORD   TST14+2         ;;STARTING ADDRESS OF TEST 14
 6972  033522  011434                        .WORD   TST15+2         ;;STARTING ADDRESS OF TEST 15
 6973  033524  012162                        .WORD   TST16+2         ;;STARTING ADDRESS OF TEST 16
 6974  033526  012716                        .WORD   TST17+2         ;;STARTING ADDRESS OF TEST 17
 6975  033530  013452                        .WORD   TST20+2         ;;STARTING ADDRESS OF TEST 20
 6976  033532  014200                        .WORD   TST21+2         ;;STARTING ADDRESS OF TEST 21
 6977  033534  014514                        .WORD   TST22+2         ;;STARTING ADDRESS OF TEST 22
 6978  033536  015006                        .WORD   TST23+2         ;;STARTING ADDRESS OF TEST 23
 6979  033540  015534                        .WORD   TST24+2         ;;STARTING ADDRESS OF TEST 24
 6980  033542  016270                        .WORD   TST25+2         ;;STARTING ADDRESS OF TEST 25
 6981  033544  016604                        .WORD   TST26+2         ;;STARTING ADDRESS OF TEST 26
 6982  033546  017266                        .WORD   TST27+2         ;;STARTING ADDRESS OF TEST 27
 6983  033550  017602                        .WORD   TST30+2         ;;STARTING ADDRESS OF TEST 30
 6984  033552  020352                        .WORD   TST31+2         ;;STARTING ADDRESS OF TEST 31
 6985  033554  020662                        .WORD   TST32+2         ;;STARTING ADDRESS OF TEST 32
 6986  033556  021220                        .WORD   TST33+2         ;;STARTING ADDRESS OF TEST 33
 6987  033560  021550                        .WORD   TST34+2         ;;STARTING ADDRESS OF TEST 34
 6988  033562  022104                        .WORD   TST35+2         ;;STARTING ADDRESS OF TEST 35
 6989  033564  022460                        .WORD   TST36+2         ;;STARTING ADDRESS OF TEST 36
 6990                          ;;*************************************************************
 6991                          .SBTTL  LOOP ON INTERNAL ERROR
 6992
 6993  033566  032777  001000  145344  SCOP1$: BIT     #SW9,@SWR       ;CHECK IF LOOP ON ERROR
 6994  033574  001405                        BEQ     5$              ;NO RETURN
 6995  033576  105737  001103                TSTB    $ERFLG          ;CHECK IF ERROR OCCURED
 6996  033602  001402                        BEQ     5$              ;NO, RETURN
 6997  033604  013716  001110                MOV     $LPERR,(SP)     ;GO BACK TO BEGINNING OF LOOP
 6998  033610  000002                5$:     RTI                     ;RETURN
 6999                          .SBTTL  APT COMMUNICATIONS ROUTINE
 7000
 7001                          ;;*************************************************************
 7002  033612  112737  000001  034056  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
 7003  033620  112737  000001  034054  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
 7004  033626  000403                        BR      $ATYC
 7005  033630  112737  000001  034056  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
 7006  033636                        $ATYC:
 7007  033636  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 7008  033640  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 7009  033642  105737  034054                TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
 7010  033646  001450                        BEQ     5$              ;;IF NOT:  BR
 7011  033650  122737  000001  001270        CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
 7012  033656  001031                        BNE     3$              ;;IF NOT:  BR
 7013  033660  132737  000100  001271        BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
 7014  033666  001425                        BEQ     3$              ;;IF NOT:  BR
 7015  033670  017600  000004                MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
 7016  033674  062766  000002  000004        ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 7017  033702  005737  001250          1$:   TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
 7018  033706  001375                        BNE     1$              ;;IF NOT:  WAIT
```

```
7019  033710  010037  001264            MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
7020  033714  105720            2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
7021  033716  001376                    BNE     2$
7022  033720  163700  001264            SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
7023  033724  006200                    ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
7024  033726  010037  001266            MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
7025  033732  012737  000004  001250    MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
7026  033740  000413                    BR      5$
7027  033742  017637  000004  033766  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
7028  033750  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
7029  033756  013746  177776            MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
7030  033762  004737  034636            JSR     PC,$TYPE        ;;CALL TYPE MACRO
7031  033766  000000            4$:     .WORD   0
7032  033770                    5$:
7033  033770  105737  034056    10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
7034  033774  001416                    BEQ     12$             ;;IF NOT:  BR
7035  033776  005737  001270            TST     $ENV            ;;RUNNING UNDER APT?
7036  034002  001413                    BEQ     12$             ;;IF NOT:  BR
7037  034004  005737  001250    11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
7038  034010  001375                    BNE     11$             ;;IF NOT:  WAIT
7039  034012  017637  000004  001252    MOV     @4(SP),$FATAL   ;;GET ERROR #
7040  034020  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
7041  034026  005237  001250            INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
7042  034032  105037  034056    12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
7043  034036  105037  034055            CLRB    $LFLG           ;;CLEAR LOG FLAG
7044  034042  105037  034054            CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
7045  034046  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
7046  034050  012600                    MOV     (SP)+,R0        ;;POP STACK INTO R0
7047  034052  000207                    RTS     PC              ;;RETURN
7048  034054     000    $MFLG:  .BYTE   0       ;;MESSG. FLAG
7049  034055     000    $LFLG:  .BYTE   0       ;;LOG FLAG
7050  034056     000    $FFLG:  .BYTE   0       ;;FATAL FLAG
7051        034060            .EVEN
7052        000200    APTSIZE=200
7053        000001    APTENV=001
7054        000100    APTSPOOL=100
7055        000040    APTCSUP=040
7056                  .SBTTL  ERROR HANDLER ROUTINE
7057
7058                  ;;**************************************************************
7059                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
7060                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
7061                  ;*AND GO TO TYPERR ON ERROR
7062                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
7063                  ;*SW15=1         HALT ON ERROR
7064                  ;*SW13=1         INHIBIT ERROR TYPEOUTS
7065                  ;*SW10=1         BELL ON ERROR
7066                  ;*SW09=1         LOOP ON ERROR
7067                  ;*CALL
7068                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
7069
7070  034060          $ERROR:
7071  034060  104407            CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
7072  034062  105237  001103    7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
7073  034066  001775            BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
7074  034070  013777  001102  145044    MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
```

```
7075  034076  032777  002000  145034          BIT     #BIT10,@SWR     ;;BELL ON ERROR?
7076  034104  001402                          BEQ     1$              ;;NO - SKIP
7077  034106  104401  001240                  TYPE    ,$BELL          ;;RING BELL
7078  034112  005237  001112          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
7079  034116  011637  001116                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
7080  034122  162737  000002  001116          SUB     #2,$ERRPC
7081  034130  117737  144762  001114          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
7082  034136  032777  020000  144774          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
7083  034144  001004                          BNE     20$             ;;SKIP TYPEOUTS
7084  034146  004737  034260                  JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
7085  034152  104401  001245                  TYPE    ,$CRLF
7086  034156                          20$:
7087  034156  122737  000001  001270          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7088  034164  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
7089  034166  113737  001114  034200          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
7090  034174  004737  033630                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
7091  034200     000          21$:    .BYTE   0
7092  034201     000                  .BYTE   0
7093  034202  000777          22$:    BR      22$             ;;APT ERROR LOOP
7094  034204  005777  144730          2$:     TST     @SWR            ;;HALT ON ERROR
7095  034210  100002                          BPL     3$              ;;SKIP IF CONTINUE
7096  034212  000000                          HALT                    ;;HALT ON ERROR!
7097  034214  104407                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
7098  034216  032777  001000  144714  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
7099  034224  001402                          BEQ     4$              ;;BR IF NO
7100  034226  013716  001110                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
7101  034232  005737  001236          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
7102  034236  001402                          BEQ     5$              ;;BR IF NONE
7103  034240  013716  001236                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
7104  034244                          5$:
7105  034244  022737  023276  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
7106  034252  001001                          BNE     6$              ;;BRANCH IF NO
7107  034254  000000                          HALT                    ;;YES
7108  034256                          6$:
7109  034256  000002                          RTI                     ;;RETURN
7110
7111                                  ;;*****************************************************************
7112                                  .SBTTL  TYPE ERROR ROUTINE
7113                                  ;*ENTRY JSR PC,TYPERR
7114                                  ;*RETURN RTS PC
7115                                  ;*
7116                                  ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
7117                                  ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
7118                                  ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
7119                                  ;*THE ERROR.
7120                                  ;;*****************************************************************
7121  034260  104413          TYPERR: SAVREG
7122  034262  113737  001102  001254          MOVB    $TSTNM,$TESTN   ;SAVE TEST NUMBER FOR REPORT
7123  034270  042737  177400  001254          BIC     #177400,$TESTN  ;CLEAR UNUSED BITS
7124  034276  113700  001114                  MOVB    $ITEMB,R0       ;ENTER ERROR NUMBER
7125  034302  042700  177400                  BIC     #177400,R0      ;CLEAR UNUSED BITS
7126  034306  005300                          DEC     R0              ;FORM INDEX FOR ERROR TABLE
7127  034310  006300                          ASL     R0
7128  034312  006300                          ASL     R0
7129  034314  006300                          ASL     R0
7130  034316  062700  001330          1$:     ADD     #$ERRTB,R0      ;FORM ADDRESS OF ERROR ENTRY
```

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7131  034322  012037  034336            MOV     (R0)+,2$        ;GET EM POINTER
7132  034326  001404                    BEQ     3$              ;BRANCH IF THERE ISN'T ONE
7133  034330  104401  001245            TYPE    ,$CRLF          ;TYPE CARRIAGE RETURN LINE FEED
7134  034334  104401                    TYPE                    ;TYPE ERROR MESSAGE (EM)
7135  034336  000000          2$:       .WORD   0               ;EM POINTER GOES HERE
7136  034340  012037  034354    3$:     MOV     (P0)+,4$        ;GET DH POINTER
7137  034344  001404                    BEQ     5$              ;BRANCH IF THERE ISN'T ONE
7138  034346  104401  001245            TYPE    ,$CRLF          ;TYPE CR-LF
7139  034352  104401                    TYPE                    ;TYPE DATA HEADER
7140  034354  000000          4$:       .WORD   0               ;DH POINTER GOES HERE
7141  034356  012001          5$:       MOV     (R0)+,R1        ;GET DT POINTER
7142  034360  001445                    BEQ     20$             ;BRANCH IF THERE ARE NONE
7143  034362  005004                    CLR     R4              ;RESET INDENT SWITCH
7144  034364  012000                    MOV     (R0)+,R0        ;GET DF POINTER
7145  034366  012002                    MOV     (R0)+,R2        ;STORE NUMBER OF DH'S
7146  034370  104401  001245            TYPE    ,$CRLF
7147  034374  112003          10$:      MOVB    (R0)+,R3        ;GET & STORE NUMBER OF DATA WORDS
7148  034376  105720                    TSTB    (R0)+           ;BUMP PAST FORMAT WORD
7149  034400  005703                    TST     R3              ;TEST IF ANY DATA FOR THIS HEADER
7150  034402  001416                    BEQ     14$             ;NO - SKIP DATA PRINT
7151  034404  005704                    TST     R4              ;CHECK IF INDENT WORDS
7152  034406  001004                    BNE     12$             ;YES, GO INDENT
7153  034410  013146          11$:      MOV     @(R1)+,-(SP)    ;PUT FIRST DATA WORD ON STACK
7154  034412  104402                    TYPOC                   ;TYPE IT
7155  034414  005303                    DEC     R3              ;MORE DATA WORDS
7156  034416  001403                    BEQ     13$             ;NO-BRANCH
7157  034420  104401  041116    12$:    TYPE    ,SPACE2         ;TYPE SEPARATORS
7158  034424  000771                    BR      11$             ;LOOP
7159  034426  104401  001245    13$:    TYPE    ,$CRLF          ;TYPE <CR><LF>
7160  034432  005710                    TST     (P0)            ;CHECK IF NEXT HEADER AVAILIBLE
7161  034434  001401                    BEQ     14$             ;NO, DO NOT CHANGE INDENT
7162  034436  005104                    COM     R4              ;CHANGE INDENT
7163  034440  005302          14$:      DEC     R2              ;MORE DH'S?
7164  034442  003414                    BLE     20$             ;NO-BRANCH
7165  034444  012037  034464    15$:    MOV     (R0)+,18$       ;GET NEXT DH POINTER
7166  034450  001751                    BEQ     10$             ;IF NO HEADER GET DATA
7167  034452  005704                    TST     R4              ;INDENT?
7168  034454  001402                    BEQ     17$             ;NO-BRANCH
7169  034456  104401  041116            TYPE    ,SPACE2         ;INDENT
7170  034462  104401          17$:      TYPE                    ;TYPE DH
7171  034464  000000          18$:      .WORD   0               ;DH POINTER GOES HERE
7172  034466  104401  001245            TYPE    ,$CRLF
7173  034472  000740                    BR      10$             ;LOOP
7174  034474  104414          20$:      RESREG
7175  034476  005237  002314            INC     ERRCNT          ;INCREMENT ERROR COUNT
7176  034502  032777  010000  144430    BIT     #SW12,@SWR      ;CHECK IF ABORT AFTER 20 ERRORS
7177  034510  001421                    BEQ     25$             ;NO, RETURN
7178  034512  022737  000024  002314    CMP     #20.,ERRCNT     ;CHECK IF EROR THRESHOLD EXCEEDED
7179  034520  103015                    BHIS    25$             ;NO, RETURN
7180  034522  104401  041121            TYPE    ,ABORT          ;TYPE "PROGRAM HAS BEEN ABORTED BECAUSE
7181                                                            ;  ERROR THRESHOLD EXCEEDED"
7182  034526  005737  000042            TST     42              ;CHECK IF IN CHAIN MODE
7183  034532  001407                    BEQ     30$             ;NO, HALT
7184  034534  012737  000001  023134    MOV     #1,$EOPCT       ;FORCE END OF PASS COUNT TO ONE FOR ABORT
7185  034542  012706  001100            MOV     #STACK,SP       ;INITIALIZE STACK
7186  034546  000137  023106            JMP     $EOP            ;BRING IN NEXT PROGRAM IN CHAIN
```

```
7187  034552  000000                  30$:    HALT
7188  034554  000207                  25$:    RTS     PC
7189
7190                                  .SBTTL  CONTROLLED PROGRAM HALT
7191
7192  034556  013702  001324          CTRHLT: MOV     $BASE,R2        ;SET '611 BASE
7193  034562  012762  005000  000010          MOV     #CLR,RKCS2(R2)  ;CLEAR SUBSYSTEM
7194  034570  005037  001236                  CLR     $ESCAPE         ;CLEAR ESCAPE
7195  034574  105037  001103                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
7196  034600  012706  001100                  MOV     #STACK,SP       ;CLEAR STACK
7197  034604  104401  041053                  TYPE    ,OPROO7         ;TYPE HALT MESSAGE
7198  034610  005737  000042                  TST     42              ;TEST IF MONITOR PRESENT
7199  034614  001405                          BEQ     5$              ;NO SKIP
7200  034616  012737  000001  023134          MOV     #1,$EOPCT       ;FORCE END OF PROGRAM
7201  034624  000137  023106                  JMP     $EOP            ;JUMP TO END OF PASS
7202
7203  034630  000000                  5$:     HALT                    ;HALT PROGRAM
7204  034632  000137  002404                  JMP     START1          ;RESTART IF CONTINUE
7205
7206                                  .SBTTL  TYPE ROUTINE
7207
7208                                  ;;*****************************************************************
7209                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
7210                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
7211                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
7212                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
7213                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
7214                                  ;*
7215                                  ;*CALL:
7216                                  ;*1) USING A TRAP INSTRUCTION
7217                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
7218                                  ;*OR
7219                                  ;*      TYPE
7220                                  ;*      MESADR
7221                                  ;*
7222
7223  034636  105737  001157          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
7224  034642  100002                          BPL     1$              ;;BR IF YES
7225  034644  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
7226  034646  000430                          BR      3$              ;;LEAVE
7227  034650  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
7228  034652  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
7229  034656  122737  000001  001270          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
7230  034664  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
7231  034666  132737  000100  001271          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
7232  034674  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
7233  034676  010037  034706                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
7234  034702  004737  033620                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
7235  034706  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
7236  034710  132737  000040  001271  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
7237  034716  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
7238  034720  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
7239  034722  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
7240  034724  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
7241  034726  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
7242  034730  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
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7243  034734  000002                      RTI                     ;;RETURN
7244  034736  122716  000011      4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
7245  034742  001430                      BEQ     8$
7246  034744  122716  000200              CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
7247  034750  001006                      BNE     5$
7248  034752  005726                      TST     (SP)+           ;;POP  <CR><LF> EQUIV
7249  034754  104401                      TYPE                    ;;TYPE A CR AND LF
7250  034756  001245                      $CRLF
7251  034760  105037  035114              CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
7252  034764  000755                      BR      2$              ;;GET NEXT CHARACTER
7253  034766  004737  035050      5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
7254  034772  123726  001156      6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
7255  034776  001350                      BNE     2$              ;;IF NO GO GET NEXT CHAR.
7256  035000  013746  001154              MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
7257                                                              ;;AND THE NULL CHAR.
7258  035004  105366  000001      7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
7259  035010  002770                      BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
7260  035012  004737  035050              JSR     PC,$TYPEC       ;;GO TYPE A NULL
7261  035016  105337  035114              DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
7262  035022  000770                      BR      7$              ;;LOOP
7263
7264                              ;HORIZONTAL TAB PROCESSOR
7265
7266  035024  112716  000040      8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
7267  035030  004737  035050      9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
7268  035034  132737  000007  035114      BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
7269  035042  001372                      BNE     9$              ;;TAB STOP
7270  035044  005726                      TST     (SP)+           ;;POP SPACE OFF STACK
7271  035046  000724                      BR      2$              ;;GET NEXT CHARACTER
7272  035050  105777  144074      $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
7273  035054  100375                      BPL     $TYPEC
7274  035056  116677  000002  144066      MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
7275  035064  122766  000015  000002      CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
7276  035072  001003                      BNE     1$              ;;BRANCH IF NO
7277  035074  105037  035114              CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
7278  035100  000406                      BR      $TYPEX          ;;EXIT
7279  035102  122766  000012  000002  1$: CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
7280  035110  001402                      BEQ     $TYPEX          ;;BRANCH IF YES
7281  035112  105227                      INCB    (PC)+           ;;COUNT THE CHARACTER
7282  035114  000000      $CHARCNT:.WORD  0                       ;;CHARACTER COUNT STORAGE
7283  035116  000207      $TYPEX: RTS     PC
7284
7285                              .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
7286
7287                              ;;**************************************************************
7288                              ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
7289                              ;*OCTAL (ASCII) NUMBER AND TYPE IT.
7290                              ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
7291                              ;*CALL:
7292                              ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7293                              ;*      TYPOS                   ;;CALL FOR TYPEOUT
7294                              ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
7295                              ;*      .BYTE   M               ;;M=1 OR 0
7296                              ;*                                      ;;1=TYPE LEADING ZEROS
7297                              ;*                                      ;;0=SUPPRESS LEADING ZEROS
7298                              ;*
```

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7299                                    ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
7300                                    ;*$TYPOS OR $TYPOC
7301                                    ;*CALL:
7302                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7303                                    ;*      TYPON                   ;;CALL FOR TYPEOUT
7304                                    ;*
7305                                    ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
7306                                    ;*CALL:
7307                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
7308                                    ;*      TYPOC                   ;;CALL FOR TYPEOUT
7309
7310  035120  017646  000000            $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
7311  035124  116637  000001  035343            MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
7312  035132  112637  035345                    MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
7313  035136  062716  000002                    ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
7314  035142  000406                            BR      $TYPON
7315  035144  112737  000001  035343  $TYPOC:  MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
7316  035152  112737  000006  035345            MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
7317  035160  112737  000005  035342  $TYPON:  MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
7318  035166  010346                            MOV     R3,-(SP)        ;;SAVE R3
7319  035170  010446                            MOV     R4,-(SP)        ;;SAVE R4
7320  035172  010546                            MOV     R5,-(SP)        ;;SAVE R5
7321  035174  113704  035345                    MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
7322  035200  005404                            NEG     R4
7323  035202  062704  000006                    ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
7324  035206  110437  035344                    MOVB    R4,$OMODE       ;;SAVE IT FOR USE
7325  035212  113704  035343                    MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
7326  035216  016605  000012                    MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
7327  035222  005003                            CLR     R3              ;;CLEAR THE OUTPUT WORD
7328  035224  006105                    1$:     ROL     R5              ;;ROTATE MSB INTO "C"
7329  035226  000404                            BR      3$              ;;GO DO MSB
7330  035230  006105                    2$:     ROL     R5              ;;FORM THIS DIGIT
7331  035232  006105                            ROL     R5
7332  035234  006105                            ROL     R5
7333  035236  010503                            MOV     R5,R3
7334  035240  006103                    3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
7335  035242  105337  035344                    DECB    $OMODE          ;;TYPE THIS DIGIT?
7336  035246  100016                            BPL     7$              ;;BR IF NO
7337  035250  042703  177770                    BIC     #177770,R3      ;;GET RID OF JUNK
7338  035254  001002                            BNE     4$              ;;TEST FOR 0
7339  035256  005704                            TST     R4              ;;SUPPRESS THIS 0?
7340  035260  001403                            BEQ     5$              ;;BR IF YES
7341  035262  005204                    4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
7342  035264  052703  000060                    BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
7343  035270  052703  000040            5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
7344  035274  110337  035340                    MOVB    R3,8$           ;;SAVE FOR TYPING
7345  035300  104401  035340                    TYPE    ,8$             ;;GO TYPE THIS DIGIT
7346  035304  105337  035342            7$:     DECB    $OCNT           ;;COUNT BY 1
7347  035310  003347                            BGT     2$              ;;BR IF MORE TO DO
7348  035312  002402                            BLT     6$              ;;BR IF DONE
7349  035314  005204                            INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
7350  035316  000744                            BR      2$              ;;GO DO THE LAST DIGIT
7351  035320  012605                    6$:     MOV     (SP)+,R5        ;;RESTORE R5
7352  035322  012604                            MOV     (SP)+,R4        ;;RESTORE R4
7353  035324  012603                            MOV     (SP)+,R3        ;;RESTORE R3
7354  035326  016666  000002  000004            MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
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7355  035334  012616                          MOV     (SP)+,(SP)
7356  035336  000002                          RTI                     ;;RETURN
7357  035340     000          8$:             .BYTE   0               ;;STORAGE FOR ASCII DIGIT
7358  035341     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
7359  035342     000          $OCNT:          .BYTE   0               ;;OCTAL DIGIT COUNTER
7360  035343     000          $OFILL:         .BYTE   0               ;;ZERO FILL SWITCH
7361  035344  000000          $OMODE:         .WORD   0               ;;NUMBER OF DIGITS TO TYPE
7362                                          .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
7363
7364                                          ;;**************************************************************
7365                                          ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
7366                                          ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
7367                                          ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
7368                                          ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
7369                                          ;*REPLACED WITH SPACES.
7370                                          ;*CALL:
7371                                          ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
7372                                          ;*      TYPDS                   ;;GO TO THE ROUTINE
7373
7374  035346                                  $TYPDS:
7375  035346  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
7376  035350  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
7377  035352  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
7378  035354  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
7379  035356  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
7380  035360  012746  020200                  MOV     #200,-(SP)      ;;SET BLANK SWITCH AND SIGN
7381  035364  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
7382  035370  100004                          BPL     1$              ;;BR IF INPUT IS POS.
7383  035372  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
7384  035374  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
7385  035402  005000          1$:             CLR     R0              ;;ZERO THE CONSTANTS INDEX
7386  035404  012703  035562                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
7387  035410  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
7388  035414  005002          2$:             CLR     R2              ;;CLEAR THE BCD NUMBER
7389  035416  016001  035552                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
7390  035422  160105          3$:             SUB     R1,R5           ;;FORM THIS BCD DIGIT
7391  035424  002402                          BLT     4$              ;;BR IF DONE
7392  035426  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
7393  035430  000774                          BR      3$
7394  035432  060105          4$:             ADD     R1,R5           ;;ADD BACK THE CONSTANT
7395  035434  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
7396  035436  001002                          BNE     5$              ;;FALL THROUGH IF 0
7397  035440  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
7398  035442  100407                          BMI     7$              ;;BR IF YES
7399  035444  106316          5$:             ASLB    (SP)            ;;MSD?
7400  035446  103003                          BCC     6$              ;;BR IF NO
7401  035450  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
7402  035456  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
7403  035462  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
7404  035466  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
7405  035470  005720                          TST     (R0)+           ;;JUST INCREMENTING
7406  035472  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
7407  035476  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
7408  035500  003002                          BGT     8$              ;;GO TO EXIT
7409  035502  010502                          MOV     R5,R2           ;;GET THE LSD
7410  035504  000764                          BR      6$              ;;GO CHANGE TO ASCII
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7411  035506  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
7412  035510  100003                          BPL     9$              ;;BR IF NO
7413  035512  116663  177777  177776        MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
7414  035520  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
7415  035522  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
7416  035524  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
7417  035526  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
7418  035530  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
7419  035532  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
7420  035534  104401  035562                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
7421  035540  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
7422  035546  012616                          MOV     (SP)+,(SP)
7423  035550  000002                          RTI                     ;;RETURN TO USER
7424  035552  023420                  $DTBL:  10000.
7425  035554  001750                          1000.
7426  035556  000144                          100.
7427  035560  000012                          10.
7428  035562  000004                  $DBLK:  .BLKW   4
7429                                  .SBTTL  TTY INPUT ROUTINE
7430
7431                                  ;;*****************************************************************
7432                                  .ENABL  LSB
7433  035572  000000                  $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
7434  035574  000000                  $TKQIN: .WORD   0               ;;INPUT POINTER
7435  035576  000000                  $TKQOUT: .WORD  0               ;;OUTPUT POINTER
7436  035600  000001                  $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
7437          035601                  $TKQEND=.
7438          035602                  .EVEN
7439
7440                                  ;*TK INITIALIZE ROUTINE
7441                                  ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
7442                                  ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
7443                                  ;
7444                                  ;*CALL:
7445                                  ;*      JSR     PC,$TKINT
7446                                  ;*      RETURN
7447                                  ;
7448  035602  005037  035572          $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
7449  035606  012737  035600  035574          MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
7450  035614  013737  035574  035576          MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
7451  035622  012737  035652  000060          MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
7452  035630  012737  000200  000062          MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
7453  035636  005777  143304                  TST     @$TKB           ;;CLEAR DONE FLAG
7454  035642  012777  000100  143274          MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
7455  035650  000207                          RTS     PC              ;;RETURN TO CALLER
7456
7457                                  ;*TK SERVICE ROUTINE
7458                                  ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
7459                                  ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
7460                                  ;*IT IN THE QUEUE.
7461                                  ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
7462                                  ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (CTRHLT)
7463                                  ;
7464  035652  117746  143270          $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
7465  035656  042716  177600                  BIC     #↑C177,(SP)     ;;STRIP THE JUNK
7466  035662  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL C?
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7467  035666  001007                        BNE     1$              ;;BRANCH IF NO
7468  035670  104401  036766                TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (↑C)
7469  035674  004737  035602                JSR     PC,$TKINT       ;;INIT THE KEYBOARD
7470  035700  005726                        TST     (SP)+           ;;CLEAN UP STACK
7471  035702  000137  034556                JMP     CTRHLT          ;;CONTROL C RESTART
7472  035706  021627  000007        1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
7473  035712  001004                        BNE     2$              ;;BRANCH IF NO
7474  035714  022737  000176  001140        CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
7475  035722  001500                        BEQ     6$              ;;GO TO SWR CHANGE
7476
7477  035724                        2$:
7478  035724  022737  000001  035572        CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
7479  035732  001004                        BNE     3$              ;;BRANCH IF NO
7480  035734  104401  001240                TYPE    ,$BELL          ;;RING THE TTY BELL
7481  035740  005726                        TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
7482  035742  000451                        BR      5$              ;;EXIT
7483  035744  021627  000023        3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
7484  035750  001021                        BNE     32$             ;;BRANCH IF NO
7485  035752  005077  143166                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7486  035756  005726                        TST     (SP)+           ;;CLEAN CHAR OFF STACK
7487  035760  105777  143160        31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
7488  035764  100375                        BPL     31$             ;;LOOP UNTIL ITS THERE
7489  035766  117746  143154                MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
7490  035772  042716  177600                BIC     #↑C177,(SP)     ;;MAKE IT 7-BIT ASCII
7491  035776  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
7492  036002  001366                        BNE     31$             ;;BRANCH IF NO
7493  036004  012777  000100  143132        MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
7494  036012  000002                        RTI                     ;;RETURN
7495  036014  005237  035572        32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
7496  036020  021627  000140                CMP     (SP),#140       ;;IS IT UPPER CASE?
7497  036024  002405                        BLT     4$              ;;BRANCH IF YES
7498  036026  021627  000175                CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
7499  036032  003002                        BGT     4$              ;;BRANCH IF YES
7500  036034  042716  000040                BIC     #40,(SP)        ;;MAKE IT UPPER CASE
7501  036040  112677  177530        4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
7502  036044  005237  035574                INC     $TKQIN          ;;UPDATE THE POINTER
7503  036050  023727  035574  035601        CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
7504  036056  001003                        BNE     5$              ;;BRANCH IF NO
7505  036060  012737  035600  035574        MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
7506  036066  000002                5$:     RTI                     ;;RETURN
7507
7508                                        ;;**************************************************************
7509                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
7510                                        ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
7511                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
7512                                        ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
7513  036070  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
7514  036076  001124                        BNE     15$             ;;EXIT IF NOT
7515  036100  105777  143040                TSTB    @$TKS           ;;IS A CHAR WAITING?
7516  036104  100121                        BPL     15$             ;;IF NOT, EXIT
7517  036106  117746  143034                MOVB    @$TKB,-(SP)     ;;YES
7518  036112  042716  177600                BIC     #↑C177,(SP)     ;;MAKE IT  7-BIT ASCII
7519  036116  021627  000007                CMP     (SP),#7         ;;IS IT A CONTROL-G?
7520  036122  001300                        BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
7521                                                                ;;AND EXIT
7522
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7523                                    ;;**********************************************************************
7524                                    ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
7525                                    ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
7526                                    ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
7527  036124  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
7528  036132  001674                          BEQ     2$              ;;BRANCH IF YES
7529  036134  005726                          TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
7530  036136  004737  035602                  JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
7531  036142  005077  142776                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
7532  036146  112737  000001  001135          MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
7533
7534  036154  104401  037000          $GTSWR: TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (↑G)
7535  036160  104401  037005                  TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
7536  036164  013746  000176                  MOV     $WREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
7537  036170  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
7538  036172  104401  037016                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
7539  036176  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
7540  036200  005046                          CLR     -(SP)           ;;THE NEW SWR
7541  036202  105777  142736          7$:     TSTB    @$TKS           ;;CHAR THERE?
7542  036206  100375                          BPL     7$              ;;IF NOT TRY AGAIN
7543
7544  036210  117746  142732                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
7545  036214  042716  177600                  BIC     #↑C177,(SP)     ;;MAKE IT 7-BIT ASCII
7546
7547  036220  021627  000003                  CMP     (SP),#3         ;;IS IT A CONTROL-C?
7548  036224  001015                          BNE     9$              ;;BRANCH IF NOT
7549  036226  104401  036766                  TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (↑C)
7550  036232  062706  000006                  ADD     #6,SP           ;;CLEAN UP STACK
7551  036236  123727  001135  000001          CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
7552  036244  001003                          BNE     8$              ;;BRANCH IF NO
7553  036246  012777  000100  142670          MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
7554  036254  000137  034556          8$:     JMP     CTRHLT          ;;CONTROL-C RESTART
7555
7556
7557  036260  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
7558  036264  001005                          BNE     10$             ;;BRANCH IF NOT
7559  036266  104401  036773                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (↑U)
7560  036272  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
7561  036276  000737                          BR      19$             ;;LET'S TRY IT AGAIN
7562
7563
7564  036300  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
7565  036304  001022                          BNE     16$             ;;BRANCH IF NO
7566  036306  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
7567  036312  001403                          BEQ     11$             ;;BRANCH IF YES
7568  036314  016677  000002  142616          MOV     2(SP),@SWR      ;;SAVE NEW SWR
7569  036322  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
7570  036326  104401  001245          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
7571  036332  123727  001135  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
7572  036340  001003                          BNE     15$             ;;BRANCH IF NOT
7573  036342  012777  000100  142574          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
7574  036350  000002                  15$:    RTI                     ;;RETURN
7575  036352  004737  035050          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
7576  036356  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
7577  036362  002420                          BLT     19$             ;;BRANCH IF YES
7578  036364  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
```

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 7579  036370  003015                        BGT     18$             ;;BRANCH IF YES
 7580  036372  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
 7581  036376  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
 7582  036402  001403                        BEQ     17$             ;;BRANCH IF YES
 7583  036404  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
 7584  036406  006316                        ASL     (SP)            ;;   CHAR OVER TO MAKE
 7585  036410  006316                        ASL     (SP)            ;;   ROOM FOR NEW ONE.
 7586  036412  005266  000002        17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
 7587  036416  056616  177776                BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
 7588  036422  000667                        BR      7$              ;;GET THE NEXT ONE
 7589  036424  104401  001244        18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
 7590  036430  000720                        BR      20$             ;;SIMULATE CONTROL-U
 7591                                .DSABL  LSB
 7592
 7593
 7594                                ;;**************************************************************
 7595                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 7596                                ;*CALL:
 7597                                ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
 7598                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
 7599                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
 7600                                ;
 7601
 7602  036432  011646                $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
 7603  036434  016666  000004  000002        MOV     4(SP),2(SP)     ;;THE PS
 7604  036442  005066  000004                CLR     4(SP)           ;;GET READY FOR A CHARACTER
 7605  036446  005046                        CLR     -(SP)           ;;PUT NEW PS ON STACK
 7606  036450  012746  036456                MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
 7607  036454  000002                        RTI                     ;;POP NEW PC AND PS
 7608  036456                        64$:
 7609  036456  005737  035572        1$:     TST     $TKCNT          ;;WAIT ON A CHARACTER
 7610  036462  001775                        BEQ     1$
 7611  036464  005337  035572                DEC     $TKCNT          ;;DECREMENT THE COUNTER
 7612  036470  117766  177102  000004        MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
 7613  036476  005237  035576                INC     $TKQOUT         ;;UPDATE THE POINTER
 7614  036502  023727  035576  035601        CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
 7615  036510  001003                        BNE     2$              ;;BRANCH IF NO
 7616  036512  012737  035600  035576        MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
 7617  036520  000002                2$:     RTI                     ;;RETURN
 7618                                ;;**************************************************************
 7619                                ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 7620                                ;*CALL:
 7621                                ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 7622                                ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 7623                                ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 7624
 7625  036522  010346                $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 7626  036524  005046                        CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
 7627  036526  012703  036756        1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 7628  036532  022703  036766        2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
 7629  036536  101456                        BLOS    4$              ;;BR IF YES
 7630  036540  104410                        RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 7631  036542  112613                        MOVB    (SP)+,(R3)      ;;GET CHARACTER
 7632  036544  122713  000177        10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
 7633  036550  001022                        BNE     5$              ;;BR IF NO
 7634  036552  005716                        TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
```

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 7635  036554  001007                        BNE     6$              ;;BR IF NO
 7636  036556  112737  000134  036754        MOVB    #'\,9$          ;;TYPE A BACK SLASH
 7637  036564  104401  036754                TYPE    ,9$
 7638  036570  012716  177777                MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
 7639  036574  005303                6$:     DEC     R3              ;;BACKUP BY ONE
 7640  036576  020327  036756                CMP     R3,#$TTYIN      ;;STACK EMPTY?
 7641  036602  103434                        BLO     4$              ;;BR IF YES
 7642  036604  111337  036754                MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
 7643  036610  104401  036754                TYPE    ,9$             ;;GO TYPE
 7644  036614  000746                        BR      2$              ;;GO READ ANOTHER CHAR.
 7645  036616  005716                5$:     TST     (SP)            ;;RUBOUT KEY SET?
 7646  036620  001406                        BEQ     7$              ;;BR IF NO
 7647  036622  112737  000134  036754        MOVB    #'\,9$          ;;TYPE A BACK SLASH
 7648  036630  104401  036754                TYPE    ,9$
 7649  036634  005016                        CLR     (SP)            ;;CLEAR THE RUBOUT KEY
 7650  036636  122713  000025        7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
 7651  036642  001003                        BNE     8$              ;;BR IF NO
 7652  036644  104401  036773                TYPE    ,$CNTLU         ;;TYPE A CONTROL "U"
 7653  036650  000726                        BR      1$              ;;GO START OVER
 7654  036652  122713  000022        8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
 7655  036656  001011                        BNE     3$              ;;BRANCH IF NO
 7656  036660  105013                        CLRB    (R3)            ;;CLEAR THE CHARACTER
 7657  036662  104401  001245                TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
 7658  036666  104401  036756                TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
 7659  036672  000717                        BR      2$              ;;GO PICKUP ANOTHER CHACTER
 7660  036674  104401  001244        4$:     TYPE    ,$QUES          ;;TYPE A '?'
 7661  036700  000712                        BR      1$              ;;CLEAR THE BUFFER AND LOOP
 7662  036702  111337  036754        3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
 7663  036706  104401  036754                TYPE    ,9$
 7664  036712  122723  000015                CMPB    #15,(R3)+       ;;CHECK FOR RETURN
 7665  036716  001305                        BNE     2$              ;;LOOP IF NOT RETURN
 7666  036720  105063  177777                CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
 7667  036724  104401  001246                TYPE    ,$LF            ;;TYPE A LINE FEED
 7668  036730  005726                        TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
 7669  036732  012603                        MOV     (SP)+,R3        ;;RESTORE R3
 7670  036734  011646                        MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
 7671  036736  016666  000004  000002        MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
 7672  036744  012766  036756  000004        MOV     #$TTYIN,4(SP)
 7673  036752  000002                        RTI                     ;;RETURN
 7674  036754     000                9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
 7675  036755     000                        .BYTE   0               ;;TERMINATOR
 7676  036756  000010                $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
 7677  036766  041536  005015     000 $CNTLC: .ASCIZ  /↑C/<15><12>    ;;CONTROL "C"
 7678  036773     136  006525  000012 $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
 7679  037000  043536  005015     000 $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
 7680  037005     015  051412  051127 $MSWR:  .ASCIZ  <15><12>/SWR = /
 7681  037012  036440  000040
 7682  037016  020040  042516  020127 $MNEW:  .ASCIZ  /  NEW = /
 7683  037024  020075     000
 7684          037030                .EVEN
 7685                                .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
 7686
 7687                                ;;**************************************************************
 7688                                ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
 7689                                ;*CHANGE IT TO BINARY.
 7690                                ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
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                                        ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
                                        ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
                                        ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
                                        ;*CALL:
                                        ;*      RDOCT                   ;;READ AN OCTAL NUMBER
                                        ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
                                        ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT

037030  011646                  $RDOCT: MOV     (SP),-(SP)              ;;PROVIDE SPACE FOR THE
037032  016666  000004  000002          MOV     4(SP),2(SP)             ;;INPUT NUMBER
037040  010046                          MOV     R0,-(SP)                ;;PUSH R0 ON STACK
037042  010146                          MOV     R1,-(SP)                ;;PUSH R1 ON STACK
037044  010246                          MOV     R2,-(SP)                ;;PUSH R2 ON STACK
037046  104411                  1$:     RDLIN                           ;;READ AN ASCIZ LINE
037050  012600                          MOV     (SP)+,R0                ;;GET ADDRESS OF 1ST CHARACTER
037052  010037  037156                  MOV     R0,5$                   ;;AND SAVE IT
037056  005001                          CLR     R1                      ;;CLEAR DATA WORD
037060  005002                          CLR     R2
037062  112046                  2$:     MOVB    (R0)+,-(SP)             ;;PICKUP THIS CHARACTER
037064  001420                          BEQ     3$                      ;;IF ZERO GET OUT
037066  122716  000060                  CMPB    #'0,(SP)                ;;MAKE SURE THIS CHARACTER
037072  003026                          BGT     4$                      ;;IS AN OCTAL DIGIT
037074  122716  000067                  CMPB    #'7,(SP)
037100  002423                          BLT     4$
037102  006301                          ASL     R1                      ;;*2
037104  006102                          ROL     R2
037106  006301                          ASL     R1                      ;;*4
037110  006102                          ROL     R2
037112  006301                          ASL     R1                      ;;*8
037114  006102                          ROL     R2
037116  042716  177770                  BIC     #^C7,(SP)               ;;STRIP THE ASCII JUNK
037122  062601                          ADD     (SP)+,R1                ;;ADD IN THIS DIGIT
037124  000756                          BR      2$                      ;;LOOP
037126  005726                  3$:     TST     (SP)+                   ;;CLEAN TERMINATOR FROM STACK
037130  010166  000012                  MOV     R1,12(SP)               ;;SAVE THE RESULT
037134  010237  037166                  MOV     R2,$HIOCT
037140  012602                          MOV     (SP)+,R2                ;;POP STACK INTO R2
037142  012601                          MOV     (SP)+,R1                ;;POP STACK INTO R1
037144  012600                          MOV     (SP)+,R0                ;;POP STACK INTO R0
037146  000002                          RTI                             ;;RETURN
037150  005726                  4$:     TST     (SP)+                   ;;CLEAN PARTIAL FROM STACK
037152  105010                          CLRB    (R0)                    ;;SET A TERMINATOR
037154  104401                          TYPE                            ;;TYPE UP THRU THE BAD CHAR.
037156  000000                  5$:     .WORD   0
037160  104401  001244                  TYPE    $QUES                   ;;"?" "CR" & "LF"
037164  000730                          BR      1$                      ;;TRY AGAIN
037166  000000                  $HIOCT: .WORD   0                       ;;HIGH ORDER BITS GO HERE
                                .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES

                                ;;******************************************************************
                                ;*SAVE R0-R5
                                ;*CALL:
                                ;*      SAVREG
                                ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
                                ;*
                                ;*TOP---(+16)
```

```
                                        ;* +2---(+18)
                                        ;* +4---R5
                                        ;* +6---R4
                                        ;* +8---R3
                                        ;*+10---R2
                                        ;*+12---R1
                                        ;*+14---R0

037170                                  $SAVREG:
037170  010046                                 MOV     R0,-(SP)        ;;PUSH R0 ON STACK
037172  010146                                 MOV     R1,-(SP)        ;;PUSH R1 ON STACK
037174  010246                                 MOV     R2,-(SP)        ;;PUSH R2 ON STACK
037176  010346                                 MOV     R3,-(SP)        ;;PUSH R3 ON STACK
037200  010446                                 MOV     R4,-(SP)        ;;PUSH R4 ON STACK
037202  010546                                 MOV     R5,-(SP)        ;;PUSH R5 ON STACK
037204  016646  000022                         MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
037210  016646  000022                         MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
037214  016646  000022                         MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
037220  016646  000022                         MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
037224  000002                                 RTI

                                        ;*RESTORE R0-R5
                                        ;*CALL:
                                        ;*      RESREG
037226                                  $RESREG:
037226  012666  000022                         MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
037232  012666  000022                         MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
037236  012666  000022                         MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
037242  012666  000022                         MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
037246  012605                                 MOV     (SP)+,R5        ;;POP STACK INTO R5
037250  012604                                 MOV     (SP)+,R4        ;;POP STACK INTO R4
037252  012603                                 MOV     (SP)+,R3        ;;POP STACK INTO R3
037254  012602                                 MOV     (SP)+,R2        ;;POP STACK INTO R2
037256  012601                                 MOV     (SP)+,R1        ;;POP STACK INTO R1
037260  012600                                 MOV     (SP)+,R0        ;;POP STACK INTO R0
037262  000002                                 RTI

                                        .SBTTL  POWER DOWN AND UP ROUTINE

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

                                        ;POWER DOWN ROUTINE
037264  017737  141650  002256         $PWRDN: MOV     @SWR,SAVSWR     ;SAVE SWITCH REGISTER
037272  012737  037312  000024                 MOV     #$PWRUP,PWRVEC  ;SET UP VECTOR
037300  012737  000340  000026                 MOV     #PR7,PWRVEC+2
037306  000000                                 HALT
037310  000776                                 BR      .-2     ;HANG UP

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

                                        ;POWER UP ROUTINE
037312  005037  037406                 $PWRUP: CLR     $PWRCT          ;LOAD WAIT COUNT
037316  012737  000144  037410                 MOV     #100.,$PWRCT+2
037324  005237  037406                 1$:     INC     $PWRCT          ;WAIT FOR TELETYPE
037330  001375                                 BNE     1$
037332  005337  037410                         DEC     $PWRCT+2
```

```
7803  037336  001372                        BNE     1$
7804  037340  012737  037264  000024        MOV     #$PWRDN,PWRVEC  ;SET UP FOR POWER DOWN VECTOR
7805  037346  012737  000340  000026        MOV     #PR7,PWRVEC+2
7806  037354  012706  001100                MOV     #STACK,SP       ;FORCE STACK
7807  037360  104401  037412                TYPE    ,$POWER         ;TYPE POWER
7808  037364  004737  032516                JSR     PC,PARCHK       ;REINITIALIZE MEMORY CHECK ENABLE
7809  037370  013777  002356  141542        MOV     SAVSWR,@SWR     ;RESTORE SWITCH REGISTER
7810  037376  013702  001324                MOV     $BASE,R2        ;REINITIALISE R2 FOR '611 BASE
7811  037402  000177  141500                JMP     @$LPADR ;GO BACK TO LAST TEST
7812
7813  037406  000000  000000        $PWRCT: .WORD   0,0             ;TELETYPE TIME OUT
7814  037412  047520  042527  000122 $POWER: .ASCIZ  /POWER/
7815                                        .EVEN
7816                                .SBTTL  TRAP DECODER
7817
7818                                ;;**************************************************************
7819                                ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
7820                                ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
7821                                ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
7822                                ;*GO TO THAT ROUTINE.
7823
7824  037420  010046                $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
7825  037422  016600  000002                MOV     2(SP),R0        ;;GET TRAP ADDRESS
7826  037426  005740                        TST     -(R0)           ;;BACKUP BY 2
7827  037430  111000                        MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
7828  037432  006300                        ASL     R0              ;;POSITION FOR INDEXING
7829  037434  016000  037454                MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
7830  037440  000200                        RTS     R0              ;;GO TO ROUTINE
7831
7832
7833                                ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
7834
7835  037442  011646                $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
7836  037444  016666  000004  000002        MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
7837  037452  000002                        RTI                     ;;RESTORE THE PSW
7838
7839                                .SBTTL  TRAP TABLE
7840
7841                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
7842                                ;*BY THE "TRAP" INSTRUCTION.
7843
7844                                ;       ROUTINE
7845                                ;       -------
7846  037454  037442                $TRPAD: .WORD   $TRAP2
7847  037456  034636                        $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
7848  037460  035144                        $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
7849  037462  035120                        $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
7850  037464  035160                        $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
7851  037466  035346                        $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
7852
7853  037470  036160                        $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
7854
7855  037472  036070                        $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
7856  037474  036432                        $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
7857  037476  036522                        $RDLIN  ;;CALL=RDLIN    TRAP+11( 04411) TTY TYPEIN STRING ROUTINE
7858  037500  037030                        $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
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```
 7859  037502  037170                    $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
 7860  037504  037226                    $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
 7861  037506  033566                    SCOP1$  ;;CALL=SCOP1    TRAP+15(104415) INTERNAL LOOP ON ERROR
```

```
                                        .SBTTL  DATA TABLE FOR PRINT OUT
                                
037510  001254  002310          DT0000: .WORD   $TESTN,TRAPPC
037514  001254  001116  002220  DT0004: .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,T.CS2,T.ER,T.DS
037522  002160  002170  002174
037530  002172
037532  001254  001116  002244  DT0005: .WORD   $TESTN,$ERRPC,E.MR1,T.MR1
037540  002204
037542  001254  001116  002246  DT0006: .WORD   $TESTN,$ERRPC,E.MR2,T.MR2
037550  002206
037552  001254  001116  002250  DT0007: .WORD   $TESTN,$ERRPC,E.MR3,T.MR3
037560  002210
037562  001254  001116  002244  DT0010: .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,PR.BIT,M1.BIT,BITCNT
037570  002204  002320  002322
037576  002326
037600  001254  001116  002220  DT0011: .WORD   $TESTN,$ERRPC,E.CS1,T.CS1,PR.BIT,M1.BIT,BITCNT,T.CS2,T.ER,T.DS
037606  002160  002320  002322
037614  002326  002170  002174
037622  002172
037624  001254  001116  002240  DT0014: .WORD   $TESTN,$ERRPC,E.DCYL,T.DCYL,E.DA,T.DA
037632  002200  002226  002166
037640  001254  001116  002244  DT0017: .WORD   $TESTN,$ERRPC,E.MR1,T.MR1,P1.BIT,PR.BIT,M1.BIT,M2.BIT,BITCNT
037646  002204  002316  002320
037654  002322  002324  002326
037662  001254  001116  002254  DT0021: .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT,BITCNT
037670  002214  002326
037674  001254  001116  002160  DT0026: .WORD   $TESTN,$ERRPC,T.CS1,T.CS2,T.ER,T.DS,T.WC,T.DCYL,T.DA
037702  002170  002174  002172
037710  002162  002200  002166
037716  001254  001116          DT0037: .WORD   $TESTN,$ERRPC
037722  001162  001164  001166  DT0040: .WORD   $REG0,$REG1,$REG2
037730  001254  001116  002254  DT0041: .WORD   $TESTN,$ERRPC,E.ECPT,T.ECPT,E.ECPS,T.ECPS,BITCNT
037736  002214  002252  002212
037744  002326
037746  001254  001116  002252  DT0043: .WORD   $TESTN,$ERRPC,E.ECPS,T.ECPS,BITCNT
037754  002212  002326
037760  001254  001116  002234  DT0045: .WORD   $TESTN,$ERRPC,E.ER,T.ER
037766  002174
037770  001254  001116  002224  DT0046: .WORD   $TESTN,$ERRPC,E.BA,T.BA
037776  002164
040000  001254  001116  002222  DT0062: .WORD   $TESTN,$ERRPC,E.WC,T.WC
040006  002162
040010  001254  001116  001162  DT0063: .WORD   $TESTN,$ERRPC,$REG0,$REG3,$REG1,$REG4,$REG2
040016  001170  001164  001172
040024  001166
```

```
7907                                    .SBTTL  DATA FORMAT FOR PRINT OUT
7908
7909  040026  000001                    DF000:  .WORD   1
7910  040030      002       000                 .BYTE   2,0
7911  040032  000006                    DF0004: .WORD   6
7912  040034      000       000                 .BYTE   0,0
7913  040036  041232                            .WORD   DH0C0A
7914  040040      000       000                 .BYTE   0,0
7915  040042  041250                            .WORD   DH000B
7916  040044      002       000                 .BYTE   2,0
7917  040046  041314                            .WORD   DH004
7918  040050      000       000                 .BYTE   0,0
7919  040052  041333                            .WORD   DH004A
7920  040054      002       000                 .BYTE   2,0
7921  040056  041423                            .WORD   DH004E
7922  040060      003       000                 .BYTE   3,0
7923  040062  000005                    DF0005: .WORD   5
7924  040064      000       000                 .BYTE   0,0
7925  040066  041232                            .WORD   DH000A
7926  040070      000       000                 .BYTE   0,0
7927  040072  041250                            .WORD   DH000B
7928  040074      002       000                 .BYTE   2,0
7929  040076  041314                            .WORD   DH004
7930  040100      000       000                 .BYTE   0,0
7931  040102  041351                            .WORD   DH004B
7932  040104      002       000                 .BYTE   2,0
7933  040106  000005                    DF0006: .WORD   5
7934  040110      000       000                 .BYTE   0,0
7935  040112  041232                            .WORD   DH000A
7936  040114      000       000                 .BYTE   0,0
7937  040116  041250                            .WORD   DH000B
7938  040120      002       000                 .BYTE   2,0
7939  040122  041314                            .WORD   DH004
7940  040124      000       000                 .BYTE   0,0
7941  040126  041367                            .WORD   DH004C
7942  040130      002       000                 .BYTE   2,0
7943  040132  000005                    DF0007: .WORD   5
7944  040134      000       000                 .BYTE   0,0
7945  040136  041232                            .WORD   DH000A
7946  040140      000       000                 .BYTE   0,0
7947  040142  041250                            .WORD   DH000B
7948  040144      002       000                 .BYTE   2 0
7949  040146  041314                            .WORD   DH004
7950  040150      000       000                 .BYTE   0,0
7951  040152  041405                            .WORD   DH004D
7952  040154      002       000                 .BYTE   2,0
7953  040156  000005                    DF0010: .WORD   5
7954  040160      000       000                 .BYTE   0,0
7955  040162  041232                            .WORD   DH000A
7956  040164      000       000                 .BYTE   0,0
7957  040166  041250                            .WORD   DH000B
7958  040170      002       000                 .BYTE   2,0
7959  040172  041517                            .WORD   DH010
7960  040174      000       000                 .BYTE   0,0
7961  040176  041563                            .WORD   DH010A
7962  040200      005       000                 .BYTE   5,0
```

```
7963  040202  000006                DF0011: .WORD   6
7964  040204     000      000              .BYTE   0,0
7965  040206  041232                       .WORD   DH000A
7966  040210     000      000              .BYTE   0,0
7967  040212  041250                       .WORD   DH000B
7968  040214     002      000              .BYTE   2,0
7969  040216  041517                       .WORD   DH010
7970  040220     000      000              .BYTE   0,0
7971  040222  041631                       .WORD   DH010B
7972  040224     005      000              .BYTE   5,0
7973  040226  041423                       .WORD   DH004E
7974  040230     003      000              .BYTE   3,0
7975  040232  000005                DF0014: .WORD   5
7976  040234     000      000              .BYTE   0,0
7977  040236  041232                       .WORD   DH000A
7978  040240     000      000              .BYTE   0,0
7979  040242  041250                       .WORD   DH000B
7980  040244     002      000              .BYTE   2,0
7981  040246  041677                       .WORD   DH014
7982  040250     000      000              .BYTE   0,0
7983  040252  041736                       .WORD   DH014A
7984  040254     004      000              .BYTE   4,0
7985  040256  000005                DF0017: .WORD   5
7986  040260     000      000              .BYTE   0,0
7987  040262  041232                       .WORD   DH000A
7988  040264     000      000              .BYTE   0,0
7989  040266  041250                       .WORD   DH000B
7990  040270     002      000              .BYTE   2,0
7991  040272  041773                       .WORD   DH0017
7992  040274     000      000              .BYTE   0,0
7993  040276  042057                       .WORD   DH017A
7994  040300     007      000              .BYTE   7,0
7995  040302  000005                DF0021: .WORD   5
7996  040304     000      000              .BYTE   0,0
7997  040306  041232                       .WORD   DH000A
7998  040310     000      000              .BYTE   0,0
7999  040312  041250                       .WORD   DH000B
8000  040314     002      000              .BYTE   2,0
8001  040316  042145                       .WORD   DH0021
8002  040320     000      000              .BYTE   0,0
8003  040322  042171                       .WORD   DH021A
8004  040324     003      000              .BYTE   3,0
8005  040326  000004                DF0026: .WORD   4
8006  040330     000      000              .BYTE   0,0
8007  040332  041232                       .WORD   DH000A
8008  040334     000      000              .BYTE   0,0
8009  040336  041250                       .WORD   DH000B
8010  040340     002      000              .BYTE   2,0
8011  040342  042245                       .WORD   DH0026
8012  040344     007      000              .BYTE   7,0
8013  040346  000003                DF0027: .WORD   3
8014  040350     000      000              .BYTE   0,0
8015  040352  041250                       .WORD   DH000B
8016  040354     002      000              .BYTE   2,0
8017  040356  042245                       .WORD   DH0026
8018  040360     007      000              .BYTE   7,0
```

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8019  040362  000004                DF0037: .WORD   4
8020  040364     000  000                  .BYTE   0,0
8021  040366  041250                       .WORD   DH000B
8022  040370     002  000                  .BYTE   2,0
8023  040372  042332                       .WORD   DH037A
8024  040374     000  000                  .BYTE   0,0
8025  040376  042357                       .WORD   DH037B
8026  040400     003  000                  .BYTE   3,0
8027  040402  000000                DF0040: .WORD   0
8028  040404     003  000                  .BYTE   3,0
8029  040406  000004                DF0041: .WORD   4
8030  040410     000  000                  .BYTE   0,0
8031  040412  041250                       .WORD   DH000B
8032  040414     002  000                  .BYTE   2,0
8033  040416  042406                       .WORD   DH0041
8034  040420     000  000                  .BYTE   0,0
8035  040422  042452                       .WORD   DH041A
8036  040424     005  000                  .BYTE   5,0
8037  040426  000004                DF0042: .WORD   4
8038  040430     000  000                  .BYTE   0,0
8039  040432  041250                       .WORD   DH000B
8040  040434     002  000                  .BYTE   2,0
8041  040436  042145                       .WORD   DH0021
8042  040440     000  000                  .BYTE   0,0
8043  040442  042171                       .WORD   DH021A
8044  040444     003  000                  .BYTE   3,0
8045  040446  000004                DF0043: .WORD   4
8046  040450     000  000                  .BYTE   0,0
8047  040452  041250                       .WORD   DH000B
8048  040454     002  000                  .BYTE   2,0
8049  040456  042145                       .WORD   DH0021
8050  040460     000  000                  .BYTE   0,0
8051  040462  042217                       .WORD   DH021B
8052  040464     003  000                  .BYTE   3,0
8053  040466  000005                DF0045: .WORD   5
8054  040470     000  000                  .BYTE   0,0
8055  040472  041232                       .WORD   DH000A
8056  040474     000  000                  .BYTE   0,0
8057  040476  041250                       .WORD   DH000B
8058  040500     002  000                  .BYTE   2,0
8059  040502  041314                       .WORD   DH004
8060  040504     000  000                  .BYTE   0,0
8061  040506  041450                       .WORD   DH004F
8062  040510     002  000                  .BYTE   2,0
8063  040512  000004                DF0046: .WORD   4
8064  040514     000  000                  .BYTE   0,0
8065  040516  041250                       .WORD   DH000B
8066  040520     002  000                  .BYTE   2,0
8067  040522  041314                       .WORD   DH004
8068  040524     000  000                  .BYTE   0,0
8069  040526  041465                       .WORD   DH004G
8070  040530     002  000                  .BYTE   2,0
8071  040532  000005                DF0050: .WORD   5
8072  040534     000  000                  .BYTE   0,0
8073  040536  041232                       DH000A
8074  040540     000  000                  .BYTE   0,0
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8075  040542  041250                        .WORD   DH000B
8076  040544      002   000                 .BYTE   2,0
8077  040546  041314                        .WORD   DH004
8078  040550      000   000                 .BYTE   0,0
8079  040552  041333                        .WORD   DH004A
8080  040554      002   000                 .BYTE   2,0
8081  040556  000004              DF0060:   .WORD   4
8082  040560      000   000                 .BYTE   0,0
8083  040562  041250                        .WORD   DH000B
8084  040564      002   000                 .BYTE   2,0
8085  040566  042520                        .WORD   DH060A
8086  040570      000   000                 .BYTE   0,0
8087  040572  042545                        .WORD   DH060B
8088  040574      003   000                 .BYTE   3,0
8089  040576  000005              DF0061:   .WORD   5
8090  040600      000   000                 .BYTE   0,0
8091  040602  041232                        .WORD   DH000A
8092  040604      000   000                 .BYTE   0,0
8093  040606  041250                        .WORD   DH000B
8094  040610      002   000                 .BYTE   2,0
8095  040612  041314                        .WORD   DH004
8096  040614      000   000                 .BYTE   0,0
8097  040616  041465                        .WORD   DH004G
8098  040620      002   000                 .BYTE   2,0
8099  040622  000005              DF0062:   .WORD   5
8100  040624      000   000                 .BYTE   0,0
8101  040626  041232                        .WORD   DH000A
8102  040630      000   000                 .BYTE   0,0
8103  040632  041250                        .WORD   DH000B
8104  040634      002   000                 .BYTE   2,0
8105  040636  041314                        .WORD   DH004
8106  040640      000   000                 .BYTE   0,0
8107  040642  041502                        .WORD   DH004H
8108  040644      002   000                 .BYTE   2,0
8109  040646  000005              DF0063:   .WORD   5
8110  040650      000   000                 .BYTE   0,0
8111  040652  041232                        .WORD   DH000A
8112  040654      000   000                 .BYTE   0,0
8113  040656  041250                        .WORD   DH000B
8114  040660      002   000                 .BYTE   2,0
8115  040662  042572                        .WORD   DH063A
8116  040664      000   000                 .BYTE   0,0
8117  040666  042637                        .WORD   DH063B
8118  040670      005   000                 .BYTE   5,0
```

```
8119                                        .SBTTL  ASCII MESSAGES
8120
8121  040672  005015  045522  030466  OPR001: .ASCIZ  <15><12>/RK611 VECTOR ADDRESS ( /
8122  040700  020061  042526  052103
8123  040706  051117  040440  042104
8124  040714  042522  051523  024040
8125  040722  000040
8126  040724  024440  036440  000040  OPR002: .ASCIZ  / ) = /
8127  040732  045522  030466  020061  OPR003: .ASCIZ  /RK611 VECTOR ADDRESS ( /
8128  040740  042526  052103  051117
8129  040746  040440  042104  042522
8130  040754  051523  024040  000040
8131  040762  045522  030466  020061  OPR004: .ASCIZ  /RK611 PRIORITY ( /
8132  040770  051120  047511  044522
8133  040776  054524  024040  000040
8134  041004  005015  047062  020104  OPR006: .ASCIZ  <15><12>/2ND PASS RUN TIME APPROX 4 MINUTES/<15><12>
8135  041012  040520  051523  051040
8136  041020  047125  052040  046511
8137  041026  020105  050101  051120
8138  041034  054117  032040  046440
8139  041042  047111  052125  051505
8140  041050  005015    000
8141  041053      015  025012  025052  OPR007: .ASCIZ  <15><12>/*****   PROGRAM HALTED   *****/<15><12>
8142  041060  025052  020040  050040
8143  041066  047522  051107  046501
8144  041074  044040  046101  042524
8145  041102  020104  020040  025052
8146  041110  025052  006452  000012
8147  041116  020040    000           SPACE2: .ASCIZ  /  /
8148  041121      015  050012  047522  ABORT:  .ASCIZ  <15><12>/PROGRAM ABORTED BECAUSE ERROR THRESHOLD EXCEEDED/<15><12>
8149  041126  051107  046501  040440
8150  041134  047502  052122  042105
8151  041142  041040  041505  052501
8152  041150  042523  042440  051122
8153  041156  051117  052040  051110
8154  041164  051505  047510  042114
8155  041172  042440  041530  042505
8156  041200  042504  006504  000012
8157  041206  005015  042524  052123  TSTBY1: .ASCIZ  <15><12>/TEST /
8158  041214  000040
8159  041216  041040  050131  051501  TSTBY2: .ASCIZ  / BYPASSED/<15><12>
8160  041224  042523  006504  000012
```

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                                        .SBTTL  DATA HEADERS

041232  042524  052123  020040  DH000A: .ASCIZ  /TEST    ERROR/
041240  020040  051105  047522
041246  000122
041250  052516  020115  020040  DH000B: .ASCIZ  /NUM     PC/
041256  020040  041520     000
041263     124  051505  020124  DH000C: .ASCII  /TEST    TRAP/<15><12>
041270  020040  052040  040522
041276  006520     012
041301     116  046525  020040          .ASCIZ  /NUM     PC/
041306  020040  050040  000103
041314  054105  042520  052103  DH004:  .ASCIZ  /EXPECT  ACTUAL/
041322  020040  041501  052524
041330  046101     000
041333     122  041513  030523  DH004A: .ASCIZ  /RKCS1   RKCS1/
041340  020040  051040  041513
041346  030523     000
041351     122  046513  030522  DH004B: .ASCIZ  /RKMR1   RKMR1/
041356  020040  051040  046513
041364  030522     000
041367     122  046513  031122  DH004C: .ASCIZ  /RKMR2   RKMR2/
041374  020040  051040  046513
041402  031122     000
041405     122  046513  031522  DH004D: .ASCIZ  /RKMR3   RKMR3/
041412  020040  051040  046513
041420  031522     000
041423     122  041513  031123  DH004E: .ASCIZ  /RKCS2   RKER    RKDS/
041430  020040  051040  042513
041436  020122  020040  051040
041444  042113  000123
041450  045522  051105  020040  DH004F: .ASCIZ  /RKER    RKER/
041456  020040  045522  051105
041464     000
041465     122  041113  020101  DH004G: .ASCIZ  /RKBA    RKBA/
041472  020040  051040  041113
041500  000101
041502  045522  041527  020040  DH004H: .ASCIZ  /RKWC    RKWC/
041510  020040  045522  041527
041516     000
041517     105  050130  041505  DH010:  .ASCIZ  /EXPECT  ACTUAL  PRESENT PREVOUS BIT/
041524  020124  040440  052103
041532  040525  020114  050040
041540  042522  042523  052116
041546  050040  042522  047526
041554  051525  041040  052111
041562     000
041563     122  046513  030522  DH010A: .ASCIZ  /RKMR1   RKMR1   BIT     BIT     COUNT/
041570  020040  051040  046513
041576  030522  020040  041040
041604  052111  020040  020040
041612  041040  052111  020040
041620  020040  041440  052517
041626  052116     000
041631     122  041513  030523  DH010B: .ASCIZ  /RKCS1   RKCS1   BIT     BIT     COUNT/
041636  020040  051040  041513
```

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8217  041644  030523  020040  041040
8218  041652  052111  020040  020040
8219  041660  041040  052111  020040
8220  041666  020040  041440  052517
8221  041674  052116     000
8222  041677     105  050130  041505  DH014:  .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL/
8223  041704  020124  040440  052103
8224  041712  040525  020114  042440
8225  041720  050130  041505  020124
8226  041726  040440  052103  040525
8227  041734  000114
8228  041736  045522  041504  046131  DH014A: .ASCIZ  /RKDCYL  RKDCYL  RKDA  RKDA/
8229  041744  020040  045522  041504
8230  041752  046131  020040  045522
8231  041760  040504  020040  020040
8232  041766  045522  040504     000
8233  041773     105  050130  041505  DH0017: .ASCIZ  /EXPECT  ACTUAL  PRESENT PRESENT PRESENT PRESENT BIT/
8234  042000  020124  040440  052103
8235  042006  040525  020114  050040
8236  042014  042522  042523  052116
8237  042022  050040  042522  042523
8238  042030  052116  050040  042522
8239  042036  042523  052116  050040
8240  042044  042522  042523  052116
8241  042052  041040  052111     000
8242  042057     122  046513  030522  DH017A: .ASCIZ  /RKMR1  RKMR1  BIT+1  BIT  BIT-1  BIT-2  COUNT/
8243  042064  020040  051040  046513
8244  042072  030522  020040  041040
8245  042100  052111  030453  020040
8246  042106  041040  052111  020040
8247  042114  020040  041040  052111
8248  042122  030455  020040  041040
8249  042130  052111  031055  020040
8250  042136  041440  052517  052116
8251  042144     000
8252  042145     105  050130  041505  DH0021: .ASCIZ  /EXPECT  ACTUAL  BIT/
8253  042152  020124  040440  052103
8254  042160  040525  020114  041040
8255  042166  052111     000
8256  042171     122  042513  050103  DH021A: .ASCIZ  /RKECPT  RKECPT  COUNT/
8257  042176  020124  051040  042513
8258  042204  050103  020124  041440
8259  042212  052517  052116     000
8260  042217     122  042513  050103  DH021B: .ASCIZ  /RKECPS  RKECPS  COUNT/
8261  042224  020123  051040  042513
8262  042232  050103  020123  041440
8263  042240  052517  052116     000
8264  042245     122  041513  030523  DH0026: .ASCIZ  /RKCS1  RKCS2  RKER  RKDS  RKWC  RKDCYL  RKDA/
8265  042252  020040  051040  041513
8266  042260  031123  020040  051040
8267  042266  042513  020122  020040
8268  042274  051040  042113  020123
8269  042302  020040  051040  053513
8270  042310  020103  020040  051040
8271  042316  042113  054503  020114
8272  042324  051040  042113  000101
```

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8273  042332  047507  042117  020040  DH037A: .ASCIZ  /GOOD    BAD     WORD/
8274  042340  020040  040502  020104
8275  042346  020040  020040  047527
8276  042354  042122     000
8277  042357     127  051117  020104  DH037B: .ASCIZ  /WORD    WORD    NUMBER/
8278  042364  020040  053440  051117
8279  042372  020104  020040  047040
8280  042400  046525  042502  000122
8281  042406  054105  042520  052103  DH0041: .ASCIZ  /EXPECT  ACTUAL  EXPECT  ACTUAL  BIT/
8282  042414  020040  041501  052524
8283  042422  046101  020040  054105
8284  042430  042520  052103  020040
8285  042436  041501  052524  046101
8286  042444  020040  044502  000124
8287  042452  045522  041505  052120  DH041A: .ASCIZ  /RKECPT  RKECPT  RKECPS  RKECPS  COUNT/
8288  042460  020040  045522  041505
8289  042466  052120  020040  045522
8290  042474  041505  051520  020040
8291  042502  045522  041505  051520
8292  042510  020040  047503  047125
8293  042516  000124
8294  042520  045522  051503  020062  DH060A: .ASCIZ  /RKCS2   BUFFER .WORD/
8295  042526  020040  052502  043106
8296  042534  051105  020040  047527
8297  042542  042122     000
8298  042545     040  020040  020040  DH060B: .ASCIZ  /        WORD    READ/
8299  042552  020040  053440  051117
8300  042560  020104  020040  051040
8301  042566  040505  000104
8302  042572  045522  051503  020062  DH063A: .ASCIZ  /RKCS2   BA17-16 BUFFER  BA17-16 WORD/
8303  042600  020040  040502  033461
8304  042606  030455  020066  052502
8305  042614  043106  051105  020040
8306  042622  040502  033461  030455
8307  042630  020066  047527  042122
8308  042636     000
8309  042637     040  020040  020040  DH063B: .ASCIZ  /        BUF WD  WORD    WD READ READ/
8310  042644  020040  041040  043125
8311  042652  053440  020104  053440
8312  042660  051117  020104  020040
8313  042666  053440  020104  042522
8314  042674  042101  051040  040505
8315  042702  000104
```

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8316                                    .SBTTL  ERROR MESSAGES
8317
8318  042704  047125  054105  042520  EM000:  .ASCIZ  /UNEXPECTED MEMORY PARITY ENABLE TRAP/
8319  042712  052103  042105  046440
8320  042720  046505  051117  020131
8321  042726  040520  044522  054524
8322  042734  042440  040516  046102
8323  042742  020105  051124  050101
8324  042750     000
8325  042751     105  051122  051117  EM5004: .ASCIZ  /ERROR AFTER ATTEMPTING IMPLIED SEEK/
8326  042756  040440  052106  051105
8327  042764  040440  052124  046505
8328  042772  052120  047111  020107
8329  043000  046511  046120  042511
8330  043006  020104  042523  045505
8331  043014     000
8332  043015     122  041513  030523  E5004A: .ASCIZ  /RKCS1 IN ERROR/
8333  043022  044440  020116  051105
8334  043030  047522  000122
8335  043034  045522  051115  020061  E5004B: .ASCIZ  /RKMR1 IN ERROR/
8336  043042  047111  042440  051122
8337  043050  051117     000
8338  043053     122  046513  031122  E5004C: .ASCIZ  /RKMR2 IN ERROR/
8339  043060  044440  020116  051105
8340  043066  047522  000122
8341  043072  045522  051115  020063  E5004D: .ASCIZ  /RKMR3 IN ERROR/
8342  043100  047111  042440  051122
8343  043106  051117     000
8344  043111     122  042513  020122  E5004E: .ASCIZ  /RKER IN ERROR/
8345  043116  047111  042440  051122
8346  043124  051117     000
8347  043127     122  041113  020101  E5004F: .ASCIZ  /RKBA IN ERROR/
8348  043134  047111  042440  051122
8349  043142  051117     000
8350  043145     122  053513  020103  E5004G: .ASCIZ  /RKWC IN ERROR/
8351  043152  047111  042440  051122
8352  043160  051117     000
8353  043163     105  051122  051117  EM5010: .ASCIZ  /ERROR ATTEMPTING TO READ HEADER SYNC (PREAMBLE)/
8354  043170  040440  052124  046505
8355  043176  052120  047111  020107
8356  043204  047524  051040  040505
8357  043212  020104  042510  042101
8358  043220  051105  051440  047131
8359  043226  020103  050050  042522
8360  043234  046501  046102  024505
8361  043242     000
8362  043243     105  051122  051117  EM5011: .ASCIZ  &ERROR ATTEMPTING TO DO HEADER READ/COMPARE&
8363  043250  040440  052124  046505
8364  043256  052120  047111  020107
8365  043264  047524  042040  020117
8366  043272  042510  042101  051105
8367  043300  051040  040505  027504
8368  043306  047503  050115  051101
8369  043314  000105
8370  043316  045522  041504  046131  E5011A: .ASCIZ  /RKDCYL OR RKDA IN ERROR/
8371  043324  047440  020122  045522
```

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8372  043332  040504  044440  020116
8373  043340  051105  047522  000122
8374  043346  051105  047522  020122  EM5015: .ASCIZ  /ERROR ATTEMPTING TO READ GAP/
8375  043354  052101  042524  050115
8376  043362  044524  043516  052040
8377  043370  020117  042522  042101
8378  043376  043440  050101     000
8379  043403     105  051122  051117  EM5020: .ASCIZ  /ERROR ATTEMPTING TO WRITE DATA SYNC (PREAMBLE)/
8380  043410  040440  052124  046505
8381  043416  052120  047111  020107
8382  043424  047524  053440  044522
8383  043432  042524  042040  052101
8384  043440  020101  054523  041516
8385  043446  024040  051120  040505
8386  043454  041115  042514  000051
8387  043462  051105  047522  020122  EM5021: .ASCIZ  /ERROR ATTEMPTING TO WRITE DATA OR ECC/
8388  043470  052101  042524  050115
8389  043476  044524  043516  052040
8390  043504  020117  051127  052111
8391  043512  020105  040504  040524
8392  043520  047440  020122  041505
8393  043526  000103
8394  043530  051105  047522  020122  E5021A: .ASCIZ  /ERROR IN ECC CENERATION/
8395  043536  047111  042440  041503
8396  043544  043440  047105  051105
8397  043552  052101  047511  000116
8398  043560  051105  047522  020122  EM5023: .ASCIZ  /ERROR BETWEEN SECTORS ATTEMPTING MULTI-SECTOR WRITE/
8399  043566  042502  053524  042505
8400  043574  020116  042523  052103
8401  043602  051117  020123  052101
8402  043610  042524  050115  044524
8403  043616  043516  046440  046125
8404  043624  044524  051455  041505
8405  043632  047524  020122  051127
8406  043640  052111  000105
8407  043644  051115  020061  047111  EMW1:   .ASCIZ  /MR1 INCORRECT ON 1ST UPWARD TRANSITION OF MAINT CLOCK/
8408  043652  047503  051122  041505
8409  043660  020124  047117  030440
8410  043666  052123  052440  053520
8411  043674  051101  020104  051124
8412  043702  047101  044523  044524
8413  043710  047117  047440  020106
8414  043716  040515  047111  020124
8415  043724  046103  041517  000113
8416  043732  051115  020061  047111  EMW2:   .ASCIZ  /MR1 INCORRECT ON 1ST DOWNWARD TRANSITION OF MAINT CLOCK/
8417  043740  047503  051122  041505
8418  043746  020124  047117  030440
8419  043754  052123  042040  053517
8420  043762  053516  051101  020104
8421  043770  051124  047101  044523
8422  043776  044524  047117  047440
8423  044004  020106  040515  047111
8424  044012  020124  046103  041517
8425  044020  000113
8426  044022  051115  020061  047111  EMW3:   .ASCIZ  /MR1 INCORRECT ON 2ND UPWARD TRANSITION OF MAINT CLOCK/
8427  044030  047503  051122  041505
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8428  044036  020124  047117  031040
8429  044044  042116  052440  053520
8430  044052  051101  020104  051124
8431  044060  047101  044523  044524
8432  044066  047117  047440  020106
8433  044074  040515  047111  020124
8434  044102  046103  041517  000113
8435  044110  051115  020061  047111  EMW4:    .ASCIZ  /MR1 INCORRECT ON 2ND DOWNWARD TRANSITION OF MAINT CLOCK/
8436  044116  047503  051122  041505
8437  044124  020124  047117  031040
8438  044132  042116  042040  053517
8439  044140  053516  051101  020104
8440  044146  051124  047101  044523
8441  044154  044524  047117  047440
8442  044162  020106  040515  047111
8443  044170  020124  046103  041517
8444  044176  000113
8445  044200  054105  042520  052103  EM5026: .ASCIZ  /EXPECTED CYLINDER OVERFLOW ERR DID NOT SET/
8446  044206  042105  041440  046131
8447  044214  047111  042504  020122
8448  044222  053117  051105  046106
8449  044230  053517  042440  051122
8450  044236  042040  042111  047040
8451  044244  052117  051440  052105
8452  044252     000
8453  044253     127  044522  042524  E5026A: .ASCIZ  /WRITE TO CYL 632, TRACK 2, SECTOR 25, WORD COUNT 401/
8454  044260  052040  020117  054503
8455  044266  020114  031466  026062
8456  044274  052040  040522  045503
8457  044302  031040  020054  042523
8458  044310  052103  051117  031040
8459  044316  026065  053440  051117
8460  044324  020104  047503  047125
8461  044332  020124  030064  000061
8462  044340  047125  054105  042520  EM5027: .ASCIZ  /UNEXPECTED ERROR WHILE TRYING TO FORCE CYL OVERFLOW/
8463  044346  052103  042105  042440
8464  044354  051122  051117  053440
8465  044362  044510  042514  052040
8466  044370  054522  047111  020107
8467  044376  047524  043040  051117
8468  044404  042503  041440  046131
8469  044412  047440  042526  043122
8470  044420  047514  000127
8471  044424  051127  052111  020105  E5026B: .ASCIZ  /WRITE TO CYL 1456, TRACK 2, SECTOR 25, WORD COUNT 401/
8472  044432  047524  041440  046131
8473  044440  030440  032464  026066
8474  044446  052040  040522  045503
8475  044454  031040  020054  042523
8476  044462  052103  051117  031040
8477  044470  026065  053440  051117
8478  044476  020104  047503  047125
8479  044504  020124  030064  000061
8480  044512  047125  054105  042520  EM5030: .ASCIZ  /UNEXPECTED CYLINDER OVERFLOW WRITING LAST PHYSICAL ADDRESS/
8481  044520  052103  042105  041440
8482  044526  046131  047111  042504
8483  044534  020122  053117  051105
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8484  044542  046106  053517  053440
8485  044550  044522  044524  043516
8486  044556  046040  051501  020124
8487  044564  044120  051531  041511
8488  044572  046101  040440  042104
8489  044600  042522  051523     000
8490  044605     125  042516  050130  EM5031: .ASCIZ  /UNEXPECTED ERROR WHILE WRITING LAST PHYSICAL ADDRESS/
8491  044612  041505  042524  020104
8492  044620  051105  047522  020122
8493  044626  044127  046111  020105
8494  044634  051127  052111  047111
8495  044642  020107  040514  052123
8496  044650  050040  054510  044523
8497  044656  040503  020114  042101
8498  044664  051104  051505  000123
8499  044672  051105  047522  020122  EM5032: .ASCIZ  /ERROR ATTEMPTING TO READ DATA SYNC (PREAMBLE)/
8500  044700  052101  042524  050115
8501  044706  044524  043516  052040
8502  044714  020117  042522  042101
8503  044722  042040  052101  020101
8504  044730  054523  041516  024040
8505  044736  051120  040505  041115
8506  044744  042514  000051
8507  044750  051105  047522  020122  EM5034: .ASCIZ  /ERROR ATTEMPTING TO READ DATA OR ECC/
8508  044756  052101  042524  050115
8509  044764  044524  043516  052040
8510  044772  020117  042522  042101
8511  045000  042040  052101  020101
8512  045006  051117  042440  041503
8513  045014     000
8514  045015     105  041503  042440  EM5035: .ASCIZ  /ECC ERROR IN READ DATA OPERATION/
8515  045022  051122  051117  044440
8516  045030  020116  042522  042101
8517  045036  042040  052101  020101
8518  045044  050117  051105  052101
8519  045052  047511  000116
8520  045056  040504  040524  041440  EM5037: .ASCIZ  /DATA COMPARE ERROR AFTER INPUT NPR TRANSFER/
8521  045064  046517  040520  042522
8522  045072  042440  051122  051117
8523  045100  040440  052106  051105
8524  045106  044440  050116  052125
8525  045114  047040  051120  052040
8526  045122  040522  051516  042506
8527  045130  000122
8528  045132  041505  020103  042522  EM5041: .ASCIZ  /ECC REGISTER NOT CORRECT AFTER ECC READ IN READ DATA/
8529  045140  044507  052123  051105
8530  045146  047040  052117  041440
8531  045154  051117  042522  052103
8532  045162  040440  052106  051105
8533  045170  042440  041503  051040
8534  045176  040505  020104  047111
8535  045204  051040  040505  020104
8536  045212  040504  040524     000
8537  045217     105  051122  051117  EM5042: .ASCIZ  /ERROR IN ECC PATTERN CALCULATION AFTER ECC ERROR/
8538  045224  044440  020116  041505
8539  045232  020103  040520  052124
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8540  045240  051105  020116  040503
8541  045246  041514  046125  052101
8542  045254  047511  020116  043101
8543  045262  042524  020122  041505
8544  045270  020103  051105  047522
8545  045276  000122
8546  045300  051105  047522  020122  EM5043: .ASCIZ  /ERROR IN ECC POSITION COUNTING AFTER ECC ERROR/
8547  045306  047111  042440  041503
8548  045314  050040  051517  052111
8549  045322  047511  020116  047503
8550  045330  047125  044524  043516
8551  045336  040440  052106  051105
8552  045344  042440  041503  042440
8553  045352  051122  051117     000
8554  045357     105  051122  051117  EM5044: .ASCIZ  /ERROR AFTER PROCESSING DATA CHECK ERROR/
8555  045364  040440  052106  051105
8556  045372  050040  047522  042503
8557  045400  051523  047111  020107
8558  045406  040504  040524  041440
8559  045414  042510  045503  042440
8560  045422  051122  051117     000
8561  045427     124  040522  051516  EM5046: .ASCIZ  /TRANSFER LENGTH ERROR ATTEMPTING PARTIAL SECTOR OPERATION/
8562  045434  042506  020122  042514
8563  045442  043516  044124  042440
8564  045450  051122  051117  040440
8565  045456  052124  046505  052120
8566  045464  047111  020107  040520
8567  045472  052122  040511  020114
8568  045500  042523  052103  051117
8569  045506  047440  042520  040522
8570  045514  044524  047117     000
8571  045521     102  042101  051440  EM5047: .ASCIZ  /BAD SECTOR ERROR DID NOT PREVENT DESIRED ADDRESS INCREMENT/
8572  045526  041505  047524  020122
8573  045534  051105  047522  020122
8574  045542  044504  020104  047516
8575  045550  020124  051120  053105
8576  045556  047105  020124  042504
8577  045564  044523  042522  020104
8578  045572  042101  051104  051505
8579  045600  020123  047111  051103
8580  045606  046505  047105  000124
8581  045614  040502  020104  042523  EM5050: .ASCIZ  /BAD SECTOR ERROR DID NOT CAUSE CERR TO SET/
8582  045622  052103  051117  042440
8583  045630  051122  051117  042040
8584  045636  042111  047040  052117
8585  045644  041440  052501  042523
8586  045652  041440  051105  020122
8587  045660  047524  051440  052105
8588  045666     000
8589  045667     102  042101  051440  EM5051: .ASCIZ  /BAD SECTOR ERROR FAILED TO SET WHEN EXPECTED/
8590  045674  041505  047524  020122
8591  045702  051105  047522  020122
8592  045710  040506  046111  042105
8593  045716  052040  020117  042523
8594  045724  020124  044127  047105
8595  045732  042440  050130  041505
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 8596  045740  042524  000104
 8597  045744  040504  040524  052040  EM5052: .ASCII  /DATA TRANSFER DID NOT CONTINUE TO END OF SECTOR/
 8598  045752  040522  051516  042506
 8599  045760  020122  044504  020104
 8600  045766  047516  020124  047503
 8601  045774  052116  047111  042525
 8602  046002  052040  020117  047105
 8603  046010  020104  043117  051440
 8604  046016  041505  047524     122
 8605  046023     015  053412  042510          .ASCIZ  <15><12>/WHEN BAD SECTOR ERROR OCCURRED/
 8606  046030  020116  040502  020104
 8607  046036  042523  052103  051117
 8608  046044  042440  051122  051117
 8609  046052  047440  041503  051125
 8610  046060  042522  000104
 8611  046064  051105  047522  020122  EM5053: .ASCIZ  /ERROR ATTEMPTING WRITE CHECK OR ECC READ AFTER WRT CHK/
 8612  046072  052101  042524  050115
 8613  046100  044524  043516  053440
 8614  046106  044522  042524  041440
 8615  046114  042510  045503  047440
 8616  046122  020122  041505  020103
 8617  046130  042522  042101  040440
 8618  046136  052106  051105  053440
 8619  046144  052122  041440  045510
 8620  046152     000
 8621  046153     105  041503  042440  EM5054: .ASCIZ  /ECC ERROR IN WRITE CHECK OPERATION/
 8622  046160  051122  051117  044440
 8623  046166  020116  051127  052111
 8624  046174  020105  044103  041505
 8625  046202  020113  050117  051105
 8626  046210  052101  047511  000116
 8627  046216  051127  052111  020105  EM5060: .ASCIZ  /WRITE CHECK ERROR FAILED TO SET IN 16 BIT MODE/
 8628  046224  044103  041505  020113
 8629  046232  051105  047522  020122
 8630  046240  040506  046111  042105
 8631  046246  052040  020117  042523
 8632  046254  020124  047111  030440
 8633  046262  020066  044502  020124
 8634  046270  047515  042504     000
 8635  046275     124  040522  051516  EM5061: .ASCIZ  /TRANSFER LENGTH ERROR WITH WRITE CHECK ERROR/
 8636  046302  042506  020122  042514
 8637  046310  043516  044124  042440
 8638  046316  051122  051117  053440
 8639  046324  052111  020110  051127
 8640  046332  052111  020105  044103
 8641  046340  041505  020113  051105
 8642  046346  047522  000122
 8643  046352  051127  052111  020105  EM5063: .ASCIZ  /WRITE CHECK ERROR FAILED TO SET IN 18 BIT MODE/
 8644  046360  044103  041505  020113
 8645  046366  051105  047522  020122
 8646  046374  040506  046111  042105
 8647  046402  052040  020117  042523
 8648  046410  020124  047111  030440
 8649  046416  020070  044502  020124
 8650  046424  047515  042504     000
 8651
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8652                046432
8653                                        .EVEN
8654                                .SBTTL  DATA PATTERNS AND BUFFERS
8655                                ;*      PATTERN 1 - ALL ZEROS
8656                                ;*      PATTERN 2 - ROTATING CELL PULSE PRECOMP
8657    046432
8658    046432  121105              PAT2:   121105
8659    046434  150442                      150442
8660    046436  064221                      064221
8661    046440  132110                      132110
8662    046442  055044                      055044
8663    046444  026422                      026422
8664    046446  013211                      013211
8665    046450  105504                      105504
8666    046452  042642                      042642
8667    046454  021321                      021321
8668    046456  110550                      110550
8669    046460  044264                      044264
8670    046462  022132                      022132
8671    046464  011055                      011055
8672    046466  104426                      104426
8673    046470  042213                      042213
8674
8675                                ;*      PATTERN 3 - MAX PRECOMP PHASE MIX
8676
8677    046472                      PAT3:
8678    046472  133333                      133333
8679    046474  066666                      066666
8680    046476  155555                      155555
8681    046500  155555                      155555
8682    046502  133333                      133333
8683    046504  066666                      066666
8684    046506  066666                      066666
8685    046510  155555                      155555
8686    046512  155555                      155555
8687    046514  133333                      133333
8688    046516  133333                      133333
8689    046520  133333                      133333
8690    046522  133333                      133333
8691    046524  133333                      133333
8692    046526  133333                      133333
8693    046530  133333                      133333
8694
8695                                ;*      PATTERN 4 - HI-LO FREQ. MIX
8696
8697    046532                      PAT4:
8698    046532  177777                      177777
8699    046534  177777                      177777
8700    046536  177777                      177777
8701    046540  052525                      052525
8702    046542  052525                      052525
8703    046544  052525                      052525
8704    046546  177777                      177777
8705    046550  177777                      177777
8706    046552  052525                      052525
8707    046554  052525                      052525
```

```
8708  046556  177777                        177777
8709  046560  052525                        052525
8710  046562  177252                        177252
8711  046564  177252                        177252
8712  046566  172765                        172765
8713  046570  172765                        172765
8714
8715                          ;*      PATTERN 5 - ALTERNATING 1'S AND 0'S
8716
8717                          ;*      PATTERN 6 - COMPOSIT ROTATING
8718
8719  046572                  PAT6:
8720  046572  072307                        072307
8721  046574  135143                        135143
8722  046576  156461                        156461
8723  046600  167230                        167230
8724  046602  073514                        073514
8725  046604  035646                        035646
8726  046606  016723                        016723
8727  046610  107351                        107351
8728  046612  143564                        143564
8729  046614  061672                        061672
8730  046616  030735                        030735
8731  046620  114356                        114356
8732  046622  046167                        046167
8733  046624  123073                        123073
8734  046626  151453                        151453
8735  046630  164616                        164616
8736
8737                          ;*      PATTERN 7 - ALL ONES
8738
8739  046632  000402          IBUFF:  .BLKW   402
8740  047636  000402          OBUFF:  .BLKW   402
8741          000001          .END
```

```
ABASE = 177440          1053#   1306    1347
ABORT   041121          7180    8148#
ACDW1 = 000000          1306
ACDW2 = 000000          1306
ACLO  = 000010          1148#
ACPUOP= 000000          1306    1321
ADDW0 = 000000          1306
ADDW1 = 000000          1306
ADDW10= 000000          1306
ADDWF1= 000000          1306
ADDW12= 000000          1306
ADDW13= 000000          1306
ADDW14= 000000          1306
ADDW15= 000000          1306
ADDW2 = 000000          1306
ADDW3 = 000000          1306
ADDW4 = 000000          1306
ADDW5 = 000000          1306
ADDW6 = 000000          1306
ADDW7 = 000000          1306
ADDW8 = 000000          1306
ADDW9 = 000000          1306
ADEVCT= 000000          1306    1312
ADEVM = 000000          1306    1348
AENV  = 000000          1306    1317
AENVM = 000000          1306    1318
AFATAL= 000000          1306    1309
AMADR1= 000000          1306    1334
AMADR2= 000000          1306    1338
AMADR3= 000000          1306    1341
AMADR4= 000000          1306    1344
AMAMS1= 000000          1306    1328
AMAMS2= 000000          1306    1336
AMAMS3= 000000          1306    1339
AMAMS4= 000000          1306    1342
AMSGAD= 000000          1306    1314
AMSGLG= 000000          1306    1315
AMSGTY= 000000          1306    1308
AMTYP1= 000000          1306    1329
AMTYP2= 000000          1306    1337
AMTYP3= 000000          1306    1340
AMTYP4= 000000          1306    1343
APASS = 000000          1306    1311
APRIOR= 000005          1052#   1306
APTCSU= 000040          7055#   7236
APTENV= 000001          7011    7053#   7087    7229
APTSIZ= 000200          1805    7052#
APTSP0= 000100          7013    7054#   7231
ASWREG= 000000          1306    1319
ATESTN= 000000          1306    1310
AUNIT = 000000          1306    1313
AUSWR = 000000          1306    1320
AVECT1= 120210          1051#   1306    1345
AVECT2= 000000          1306    1346
BADPAR  002334          1739#   6782*
BAI   = 000020          1111#
```

```
BA16   = 000400          1096#
BA17   = 001000          1097#
BITCNT  002326          1736#  2930*  2947*  3060*  3077*  3193*  3210*  3324*  3341*  3455*  3472*  3586*  3603*
                        3718*  3735*  4041*  4058*  4172*  4189*  4634*  4651*  5458*  5483*  5496*  5511*  5554*
                        5613*  5739*  5744*  5746*  5759*  5783*  5793*  5804*  5841*  5873*  5916*  5942*  6017*
                        6022*  6024*  6037*  6061*  6072*  6084*  6096*  6183*  6212   6220*  6239   6265   6273*
                        6274   6277   6290   6295   7874   7877   7883   7886   7893   7896
BIT0   = 000001          997*  1093   1126   1145   3286   3416   3547   4133   4909   5006   5585   5590   5855
                        5904   5930   6197   6253   6323   6761
BIT00  = 000001          987*   997
BIT01  = 000002          986*   996
BIT02  = 000004          985*   995
BIT03  = 000010          984*   994
BIT04  = 000020          983*   993
BIT05  = 000040          982*   992
BIT06  = 000100          981*   991
BIT07  = 000200          980*   990
BIT08  = 000400          979*   989   6915
BIT09  = 001000          978*   988   6933   7098
BIT1   = 000002          996*  1127   3417   4134   5360   6394
BIT10  = 002000          977*  1098   1117   1136   1169   1184   6418   6420   7075
BIT11  = 004000          976*  1099   1118   1137   1154   1170   1185   3283   3413   3544   4130   6940
BIT12  = 010000          975*  1101   1119   1138   1171   3284   3414   3545   3548   4131   5660
BIT13  = 020000          974*  1102   1120   1139   1155   1172   6414   6416   7082
BIT14  = 040000          973*  1103   1121   1140   1156   1173   3284   3414   3545   4131   5564   5894   6230
                        6901
BIT15  = 100000          972*  1104   1105   1122   1141   1157   1174   4395   5564   5634   6762
BIT2   = 000004          995*  1128   1147
BIT3   = 000010          994*  1110   1129   1148
BIT4   = 000020          993*  1111   1130   1149   1163   1178   6414   6416
BIT5   = 000040          992*  1112   1131   1150   1164   1179
BIT6   = 000100          991*  1094   1113   1132   1151   1165   1180   2887   2889   2891   3017   3019   3021
                        3150   3152   3154   3284   3414   3545   3675   3677   3679   3998   4000   4002   4131
                        4590   4592   4594   5210   5212   5214   5654
BIT7   = 000200          990*  1095   1114   1133   1152   1166   1181
BIT8   = 000400          989*  1096   1115   1134   1153   1167   1182   5658   6418   6420
BIT9   = 001000          988*  1097   1116   1135   1168   1183   1980   2098   2215   2332   2453   3283   3413
                        3544   4130   5388   5400   5409   5417   5425   5430   5473   5520   5568   5599   5651
                        5703   5765   5814   5968   5978   6043   6106   6355   6372
BLDDAT  032014          1926   2044   2161   2278   2399   2514   2597   2685   2792   2879   3009   3142   3275
                        3405   3536   3667   3798   3903   3990   4122   4254   4349   4483   4576   4712   4803
                        5196   6619#
BPTVEC= 000014          1004#
BSE    = 000200          1133#  4417   4419
BSEDES  002352          1746#  1914*  2034*  2151*  2268*  2386*  2503*  2586*  2670*  2777*  2865*  2995*  3128*
                        3260*  3391*  3522*  3653*  3783*  3888*  3976*  4108*  4239*  4336*  4395*  4411*  4469*
                        4564*  4699*  4790*  4895*  4992*  5085*  5185*  5574   5576   5577
CCLR   = 100000          1105#  1912   2032   2149   2266   2384   2504   2587   2671   2778   2866   2996   3129
                        3262   3392   3523   3654   3784   3889   3977   4109   4240   4334   4493   4597   4722
                        4813   4914   5011   5099   5217
CDT    = 002000          1098#
CERR   = 100000          1104#  2557   2643   2967   3097   3230   3361   3492   3623   3755   4078   4209   4439
                        4671
CFMT   = 010000          1101#  1978   2096   2213   2330   2397   2451   3794   3899   3986   4118   4708   5093
                        5366   5386   5566   5648   5677   5879   5890   6187   6226
CKSWR  = 104407          6900   7071   7097   7855#
```

```
CLEAR = 000005           1078#
CLRIBF  031770           2683    2790    2877    3007    3140    3273    3403    3534    3665    3796    3901    3988    4120
                         4252    4347    4481    4574    4710    4801    5194    6608#
COE   = 001000           1135#   2560    2640
CR    = 000015            912#   7275    7285
CRLF  = 000200            913#   1830    7246    7285
CTO   = 004000           1099#
CTRHLT  034556           7192#   7471    7554
DCK   = 100000           1141#   2975    3105    3238    3369    3500    3631    3763    4086    4217    4679
DDISP = 177570            919#   1264    1793
DDT   = 000400           1153#
DF000   040026           1370    7909#
DF0004  040032           1385    1487    1577    1637    1643    7911#
DF0005  040062           1391    7923#
DF0006  040106           1397    1475    7933#
DF0007  040132           1403    1481    7943#
DF0010  040156           1409    1421    1439    1517    1529    1619    7953#
DF0011  040202           1415    1427    1445    1457    1469    1523    1541    1631    7963#
DF0014  040232           1433    1595    7975#
DF0017  040256           1451    7985#
DF0021  040302           1463    1535    1625    7995#
DF0026  040326           1493    1499    1505    1511    8005#
DF0027  040346           8013#
DF0037  040362           1547    8019#
DF0040  040402           1553    8027#
DF0041  040406           1559    8029#
DF0042  040426           1565    8037#
DF0043  040446           1571    8045#
DF0045  040466           1583    1607    8053#
DF0046  040512           1589    1613    8063#
DF0050  040532           1601    8071#
DF0060  040556           1649    8081#
DF0061  040576           1655    8089#
DF0062  040622           1661    8099#
DF0063  040646           1667    8109#
DH0CMP  024276           1943    2009    2061    2127    2178    2244    2295    2361    2416    2482    2531    2614    2702
                         2809    2907    3037    3170    3301    3432    3563    3695    3815    3920    4018    4149    4271
                         4366    4403    4507    4611    4736    4827    4928    5025    5118    5231    5549#
DH000A  041232           1497    1545    1557    1563    1569    1587    1611    1647    7913    7925    7935    7945    7955
                         7965    7977    7987    7997    8007    8055    8073    8091    8101    8111    8163#
DH000B  041250           7915    7927    7937    7947    7957    7967    7979    7989    7999    8009    8015    8021    8031
                         8039    8047    8057    8065    8075    8083    8093    8103    8113    8166#
DH000C  041263           1368    8168#
DH0017  041773           7991    8233#
DH0021  042145           8001    8041    8049    8252#
DH0026  042245           8011    8017    8264#
DH004   041314           7917    7929    7939    7949    8059    8067    8077    8095    8105    8173#
DH004A  041333           7919    8079    8176#
DH0048  041351           7931    8179#
DH004C  041367           7941    8182#
DH004D  041405           7951    8185#
DH004E  041423           7921    7973    8188#
DH004F  041450           8061    8192#
DH004G  041465           8069    8097    8195#
DH004H  041502           8107    8198#
DH0041  042406           8033    8281#
```

```
DH010   041517          7959    7969    8201#
DH010A  041563          7961    8208#
DH010B  041631          7971    8215#
DH014   041677          7981    8222#
DH014A  041736          7983    8228#
DH017A  042057          7993    8242#
DH021A  042171          8003    8043    8256#
DH021B  042217          8051    8260#
DH037A  042332          8023    8273#
DH037B  042357          8025    8277#
DH041A  042452          8035    8287#
DH060A  042520          8085    8294#
DH060B  042545          8087    8298#
DH063A  042572          8115    8302#
DH063B  042637          8117    8309#
DI      = 040000        1103#
DISEEK  023334          1931    2049    2166    2283    2404    2519    2602    2690    2797    2895    3025    3158    3289
                        3420    3551    3683    3803    3908    4006    4137    4259    4354    4495    4599    4724    4815
                        4916    5013    5106    5219    5357#
DISPLA  001142          1264#   1793*   1801*   6955*   7074*
DISPRE  000174          1193#   1801
DLT     = 100000        1122#
DMD     = 000040        1164#   1962    1963    2080    2081    2197    2198    2314    2315    2435    2436    2551    2552
                        2634    2635    2834    2835    3945    3946    4302    4303    4390    4391    4532    4533    4761
                        4762    4858    4859    4951    4952    5048    5049    5141    5142    5255    5256    5335    5336
                        5371    5372    5393    5463    5488    5583    5750    5788    6028    6062    6440    6470    6484
                        6499    6525    6537    6549    6577    6580    6581    6582    6583    6586    6587    6588    6589
                        6696
DRA     = 000001        1145#
DRDY    = 000200        1152#
DREAD   027176          2715    2822    2920    3050    3183    3314    3445    3576    3708    3828    3933    4031    4162
                        4284    4379    6165#
DRGPSN  026500          2707    2814    2912    3042    3175    3306    3437    3568    3700    3820    3925    4023    4154
                        4276    4371    4512    4616    4741    4832    4933    5030    5123    5236    6009#
DROT    = 000040        1150#
DRPAR   = 000010        1129#
DRSYNC  023740          1939    2005    2057    2123    2174    2240    2291    2357    2412    2478    2527    2610    2698
                        2805    2903    3033    3166    3297    3428    3559    3691    3811    3916    4014    4145    4267
                        4362    4399    4503    4607    4732    4823    4924    5021    5114    5227    5436#
DRVMSK= 000007          1109#
DSC     = 040000        1156#
DSECTR  023316          1915    1937    2003    2055    2121    2172    2238    2289    2355    2410    2476    2525    2608
                        2696    2803    2901    3031    3164    3295    3426    3557    3689    3809    3914    4012    4143
                        4265    4360    4397    4501    4605    4730    4821    4922    5019    5112    5225    5335#
DSWR    = 177570         918#   1263    1792
DTE     = 010000        1138#
DTYE    = 000040        1131#
DT000   037510          1369    7864#
DT0004  037514          1384    1486    1576    1600    1636    1642    7865#
DT0005  037532          1390    7868#
DT0006  037542          1396    1474    7870#
DT0007  037552          1402    1480    7872#
DT0010  037562          1408    1420    1438    1516    1528    1618    7874#
DT0011  037600          1414    1426    1444    1456    1468    1522    1540    1630    7877#
DT0014  037624          1432    1594    7881#
DT0017  037640          1450    7883#
```

```
DT0021  037662  1462  1534  1564  1624  7886#
DT0026  037674  1492  1498  1504  1510  7888#
DT0037  037716  1546  1648  7891#
DT0040  037722  1552  7892#
DT0041  037730  1558  7893#
DT0043  037746  1570  7896#
DT0045  037760  1582  1606  7898#
DT0046  037770  1588  1612  1654  7900#
DT0062  040000  1660  7902#
DT0063  040010  1666  7904#
DWGPSN  025204  1949  2067  2184  2301  2422  2537  2620  5731#
DWRITE  025604  1956  2074  2191  2308  2429  2544  2627  5836#
DWRTCK  027176  4520  4624  4749  4840  4941  5038  5131  5244  6164#
ECCGEN  030462  2936  3066  3199  3330  3461  3592  3724  4047  4178  4640  5867  6214  6245
                6267  6392#
ECCHI   002340  1741#  5843#  5903  6184#  6249  6400  6406  6411#  6419  6420#  6421#  6422
ECCLO   002342  1742#  5842#  5931  6185#  6250  6410#  6415  6416#  6417#
ECCSRC  002344  1743#  2673#  2779#  2780#  2886#  3016#  3149#  3282#  3412#  3543#  3674#  3786#  3890#
                3891#  3997#  4129#  4242#  4337#  4471#  4472#  4589#  4701#  4792#  4897#  4994#  5086#
                5209#  6247
ECCW  = 020000  1172#  5393  5463  5488  5583  5750  5788  5886  5924  6028  6062  6276  6279
ECCXOR  002336  1740#  6402#  6408#  6412
ECH   = 000100  1132#  2973  3103  3236  3367  3498  3500  3629  3631  3761  4084  4215  4217
                4677
ECPATX  002346  1744#  2713#  2820#  2918#  3048#  3181#  3312#  3443#  3574#  3706#  3826#  3931#  4029#
                4160#  4282#  4377#  4518#  4622#  4747#  4838#  4939#  5036#  5129#  5242#  6292
ECPOSX  002350  1745#  2714#  2821#  2919#  2939#  2940  2952#  2960#  3049#  3069#  3070  3082#  3090#
                3182#  3202#  3203  3215#  3223#  3313#  3333#  3334  3346#  3354#  3444#  3464#  3465
                3477#  3485#  3575#  3595#  3596  3608#  3616#  3707#  3727#  3728  3740#  3748#  3827#
                3932#  4030#  4050#  4051  4063#  4071#  4161#  4181#  4182  4194#  4202#  4283#  4378#
                4519#  4623#  4643#  4644  4656#  4664#  4748#  4839#  4940#  5037#  5130#  5243#  6284
                6297#  6300
EH026   001602  1491#  2648#
EH030   001622  1503#  2562#
EH031   001632  1509#  2566#
EMTVEC= 000030  1007#  1776#  1777#
EMW     001510  1448#  1948#  1955#  2066#  2073#  2183#  2190#  2300#  2307#  2421#  2428#  2536#  2543#
                2619#  2626#  6445#  6475#  6489#  6504#  6530#  6542#  6554#
EMW1    043644  6445  8407#
EMW2    043732  6475  6530  8416#
EMW3    044022  6489  6542  8426#
EMW4    044110  6504  6554  8435#
EM000   042704  1367  8318#
EM5004  042751  1382  1388  1394  1400  1586  8325#
EM5010  043163  1406  1412  1442  8353#
EM5011  043243  1418  1424  1430  8362#
EM5015  043346  1436  8374#
EM5020  043403  1454  1948  2066  2183  2300  2421  2536  2619  8379#
EM5021  043462  1460  1466  1955  2073  2190  2307  2428  2543  2626  8387#
EM5023  043560  1472  1478  1484  8398#
EM5026  044200  1490  8445#
EM5027  044340  1496  8462#
EM5030  044512  1502  8480#
EM5031  044605  1508  8490#
EM5032  044672  1514  1520  8499#
EM5034  044750  1526  1538  1634  8507#
```

```
EM5035  045015  1532  8514#
EM5037  045056  1544  8520#
EM5041  045132  1556  8528#
EM5042  045217  1562  8537#
EM5043  045300  1568  8546#
EM5044  045357  1574  1580  8554#
EM5046  045427  8561#
EM5047  045521  1592  8571#
EM5050  045614  1598  8581#
EM5051  045667  1604  8589#
EM5052  045744  1610  8597#
EM5053  046064  1616  1628  1640  8611#
EM5054  046153  1622  8621#
EM5060  046216  1646  8627#
EM5061  046275  1652  1658  8635#
EM5063  046352  1664  8643#
ERRCNT  002314  1731#  1809*  7175*  7176
ERRVEC=  000004  1000#  1790  1791*  1802*  6780*  6781*  6801*  6802*  6828  6829  6833*  6838*  6850*
                 6855*  6864*  6874*  6875*  6906  6907*  6909*  6912*
E.ASOF  002236  1696#
E.BA  002224  1691#  4298*  4445*  4446  4854*  5269*  5270*  5271  7900
E.CS1  002220  1689#  1987*  1988  2105*  2106  2222*  2223  2339*  2340  2460*  2461  2841*  2842*
               2843  2966*  2967*  2968*  2969  3096*  3097*  3098*  3099  3229*  3230*  3231*  3232
               3360*  3361*  3362*  3363  3491*  3492*  3493*  3494  3622*  3623*  3624*  3625  3754*
               3755*  3756*  3757  3951*  3952*  3953*  3954  4077*  4078*  4079*  4080  4208*  4209*
               4210*  4211  4308*  4309*  4310*  4311  4424*  4425  4438*  4439*  4440  4538*  4539*
               4540*  4541  4670*  4671*  4672*  4673  4767*  4768*  4769*  4770  4864*  4865*  4866*
               4867  5392*  5396  5513*  5514  5668*  5669  5777*  577P  5808  5949*  5951  6055*
               6056  6100  6328*  6329  7865  7877
E.CS2  002230  1693#
E.DA  002226  1692#  4413*  5674*  5675*  5680  5682*  5683*  5685  5688*  5693  5698  7881
E.DB  002242  1698#
E.DCYL  002240  1697#  4412*  5673*  5689*  5691  5697  7881
E.DS  002232  1694#
E.ECPS  002252  1702#  2940*  2944  3070*  3074  3203*  3207  3334*  3338  3465*  3469  3596*  3600
                3738*  3732  4051*  4055  4182*  4186  4644*  4648  6284*  6287  6300*  6304  7893
                7846
E.ECPT  002254  1703#  2941  3071  3204  3335  3466  3597  3729  4052  4183  4645  5869  6216
                6269  6285  6301  6422*  6423*  7886  7893
E.ER  002234  1695#  2975*  3105*  3238*  3369*  3500*  3631*  3763*  4086*  4217*  4419*  4679*  7898
E.MR1  002244  1699#  5393*  5407  5463*  5467  5488*  5492  5504  5583*  5593  5662*  5750*  5755
               5788*  5886*  5924*  6028*  6033  6062*  6067  6076*  6079  6090*  6091  6208  6262
               6276*  6279*  6280*  6439*  6442  6453*  6454*  6459*  6464*  6469*  6472  6483*  6486
               6497*  6498*  6501  6518*  6521*  6524*  6527  6536*  6539  6548*  6551  7868  7874
               7883
E.MR2  002246  1700#  1969*  1993  2087*  2111  2204*  2228  2321*  2345  2442*  2466  5378*  5415
               7870
E.MR3  002250  1701#  1983*  1998  2101*  2116  2218*  2233  2335*  2350  2456*  2471  5390*  5423
               7872
E.SPAR  002256  1704#
E.WC  002222  1690#  5276*  5277  7902
E5004A  043015  1383  1413  1425  1443  1455  1467  1485  1521  1539  1575  1599  1629  1635
                1641  8332#
E5004B  043034  1389  1407  1419  1437  1515  1527  1617  8335#
E5004C  043053  1395  1473  8338#
E5004D  043072  1401  1479  8341#
```

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E5004E  043111          1581    1605    8344#
E5004F  043127          1653    8347#
E5004G  043145          1659    1665    8350#
E5011A  043315          1431    1593    8370#
E5021A  043530          1461    1533    1623    8394#
E5026A  044253          2562    2566    2648    8453#
E5026B  044424          8471#
FMTE  =  000020         1130#
FSBLVV  032444          1968    1982    2086    2100    2203    2217    2320    2334    2441    2455    5377    5389    6756#
GETREG  032356          2556    2639    2840    2965    3095    3228    3359    3490    3621    3753    3950    4076    4207
                        4307    4423    4437    4537    4669    4766    4863    4956    5053    5146    5260    5394    5510
                        5666    5775    5806    5946    6053    6098    6327    6720#
GNS   =  ******  U      1192    1829    5306    5313    7847    7848    7849    7850    7851    7853    7855    7856    7857
                        7858    7859    7860    7861
GO    =  000001         1093#   2841    2968    3098    3231    3362    3493    3624    3756    3952    4079    4210    4309
                        4438    4539    4672    4768    4865
GTSWR =  104406         1824    7853#
HIBITS  002354          1747#   2674*   2781*   2869*   2998*   3131*   3264*   3394*   3525*   3656*   3787*   3892*   3979*
                        4111*   4243*   4338*   4468*   4565*   4700*   4791*   4896*   4993*   5095*   5153    5162    5164*
                        5184*   6231
HT    =  000011          910#   7244    7285
HVRC  =  000400         1134#
IBUFF   046632          2679    2726    2786    2873    3003    3136    3269    3399    3530    3661    3792    3839    3897
                        3984    4116    4248    4295    4298    4343    4445    4477    4487    4570    4580    4706    4716
                        4797    4807    4851    4854    4902    4908*   4909    4960    4966*   4999    5005*   5006    5057
                        5063*   5064*   5091    5096*   5150    5190    5200    5264    5269    6608    8739#
IDAE  =  002000         1136#
IE    =  000100         1094#
ILF   =  000001         1126#
INTR  =  000300         1089#
IOTVEC=  000020         1005#   1774*   1775*
IR    =  000100         1113#
KIPAR0=  172340         1038#   6814    6842
KIPAR1=  172342         1039#
KIPAR2=  172344         1040#
KIPAR3=  172346         1041#
KIPAR4=  172350         1042#
KIPAR5=  172352         1043#
KIPAR6=  172354         1044#
KIPAR7=  172356         1045#   6858
KIPDR0=  172300         1027#
KIPDR1=  172302         1028#
KIPDR2=  172304         1029#
KIPDR3=  172306         1030#
KIPDR4=  172310         1031#
KIPDR5=  172312         1032#
KIPDR6=  172314         1033#
KIPDR7=  172316         1034#
LF    =  000012          911#   7279    7285
LOADRK  032230          1918    2036    2153    2270    2391    2506    2589    2675    2782    2869    2999    3132    3265
                        3395    3526    3657    3788    3893    3980    4112    4244    4339    4473    4566    4702    4793
                        4898    4995    5087    5186    6692#
L.ASOF  002272          1714#   6697*   6712
L.BA    002264          1709#   6694*   6707
L.CS1   002260          1707#   1978    1987    2096    2105    2213    2222    2330    2339    2451    2460    2966    3096
                        3229    3360    3491    3622    3754    3951    4077    4208    4308    4424    4538    4670    4767
```

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                        4864    5360    5366    5386    5392    5513    5566    5648    5668    5677    5777    5879    5890
                        5949    6055    6187    6226    6328    6394    6699*   6713
L.CS2   002270          1713#   6698*   6710
L.DA    002266          1710#   4413    5674    5890    5736    6014    6693*   6709
L.DCYL  002274          1715#   1967    2085    2202    2319    2440    4412    5376    5565    5673    5697*   6692*   6708
L.DS    002266          1711#   1976    2094    2211    2328    2449    5385    5563    5652    5656    5741    6019
L.DT    002267          1712#   1970    2088    2205    2322    2443    5379    5556
L.MR1   002276          1716#   6696*   6711
L.MR2   002300          1717#
L.MR3   002302          1718#
L.WC    002262          1708#   6695*   6706
MCLK  = 000400          1167#   1962    2080    2197    2314    2435    2551    2634    2834    3945    4302    4390    4532
                        4761    4858    4951    5048    5141    5255    5371    6439    6440    6453    6483    6484    6498
                        6521    6536    6537    6548    6577    6580    6582    6586    6588
MDS   = 001000          1116#
MEMBAS= 172100          1048#   6784
MEMERR  031726          1211    6596#
MEMPAR  002332          1738#   6783*   6789*   6803
MEMVEC= 000114          1047#   1210    6805*   6806*
MERD  = 001000          1168#   6580    6588
MESMSK= 000017          1161#
MEWD  = 002000          1169#   5443    5463    5488    5583    5750    5788    6028    6062    6439    6454    6459    6483
                        6497    6548
MIND  = 000200          1166#
MMVEC = 000250          1016#
MSP   = 000100          1165#   5335
M1.BIT  002322          1734#   4432*   5462*   5500*   5586*   5752*   5784*   5858    5859*   5906    5907*   5936    5937*
                        6030*   6200*   6244*   6255*   6396    6457    6516    6522    6575    7874    7877    7883
M2.BIT  002324          1735#   5785*   5858*   5906*   5936*   6462    6467    7883
NED   = 010000          1119#
NEM   = 004000          1118#
NEWPAS  003364          1886#   5329
NXF   = 000004          1128#
OBUFF   047636          1922    2040    2157    2274    2395    2510    2593    2725    2884*   2885*   2887    2889*   2891*
                        3014*   3015*   3017    3019*   3021*   3147*   3148*   3150    3152*   3154*   3280*   3281*   3283*
                        3284*   3286*   3410*   3411*   3413*   3414*   3416*   3417*   3541*   3542*   3544*   3545*   3547*
                        3548*   3672*   3673*   3675    3677*   3679*   3838    3995*   3996*   3998    4000*   4002*   4127*
                        4128*   4130*   4131*   4133*   4134*   4488    4581    4587*   4588*   4590    4592*   4594*   4717
                        4808    4907*   4911*   4961    5004*   5008*   5058    5097*   5151    5201    5207*   5208*   5210
                        5212*   5214*   5265    5845    6182    6249*   6250*   6624    6664    8740#
OFFSET= 000015          1082#
OFST  = 000004          1147#
OPI   = 020000          1139#
OPR001  040672          1836    8121#
OPR002  040724          1839    1849    1866    8126#
OPR003  040732          1846    8127#
OPR004  040762          1857    8131#
OPR006  041004          1833    8134#
OPR007  041053          7197    8141#
OPSTRT  032274          1929    2047    2164    2281    2402    2517    2600    2689    2796    2894    3024    3157    3288
                        3419    3550    3682    3802    3907    4005    4136    4258    4353    4494    4598    4723    4814
                        4915    5012    5105    5218    6706#
OR    = 000200          1114#
PACK  = 000003          1077#
PARCHK  032516          1888    6780#   7808
PARM    002360          1199    1751#
```

```
PAR.EN= 000001           1050#  6787
PAT    = 000020           1163#
PAT2     046432           6658   8657#
PAT3     046472           6656   8677#
PAT4     046532           6652   8697#
PAT6     046572           6641   8719#
PCA    = 004000           1170#  6453   6469   6518
PCD    = 010000           1171#  6453   6464   6524
PGE    = 002000           1117#
PIP    = 020000           1155#
PIRQ   = 177772            917#
PIRQVE= 000240           1011#
PR.BIT   002320           1733#  4431#  5461#  5500   5501#  5586   5587#  5590#  5751#  5787#  5859   5860#  5907
                          5908#  5937   5938#  6029#  6088#  6200   6201#  6204#  6244   6255   6256#  6259#  6455
                          6573   7874   7877   7883
PR0    = 000000            934#  1889
PR1    = 000040            935#
PR2    = 000100            936#
PR3    = 000140            937#
PR4    = 000200            938#
PR5    = 000240            939#  1725
PR6    = 000300            940#
PR7    = 000340            941#  1212   1761   6781   7791   7805
PS     = 177776            914#   915
PSW    = 177776            915#
PWRVEC= 000024           1006#  1780#  1781#  7790#  7791#  7804#  7805#
P1.BIT   002316           1732#  5786#  5801#  5860   5861#  5864#  5908   5909#  5912#  5938   5939#  6393   6460
                          6514   7883
RDBIT    031616           2935   2964   3065   3094   3198   3227   3329   3358   3460   3489   3591   3620   3723
                          3752   4046   4075   4177   4206   4433   4639   4668   5465   5490   5502   5591   5753
                          6031   6065   6077   6089   6206   6260   6573#
RDCHR  = 104410           7630   7856#
RDDATA= 000021           1084#  2681   2788   2875   3005   3138   3271   3401   3532   3663   3794   3899   3986
                          4118   4250   4345
RDGATE= 100000           1174#  5488   5583   5662   6076   6280
RDHEAD= 000025           1086#
RDLIN  = 104411           7704   7857#
RDOCT  = 104412           1840   1850   1867   7858#
RDY    = 000200           1095#  2842   2967   3097   3230   3361   3492   3623   3755   3953   4078   4209   4310
                          4439   4540   4671   4769   4866
RECAL  = 000013           1081#
RESREG= 104414           7174   7860#
RESTRT   002370           1197   1754#
RESVEC= 000010           1001#
RKASOF= 000016           1064#  6712#
RKBA   = 000004           1059#  6707#
RKCS1  = 000000           1057#  1912#  1986   2032#  2104   2149#  2221   2266#  2338   2384#  2459   2504#  2587#
                          2671#  2778#  2839   2866#  2996#  3129#  3262#  3392#  3523#  3654#  3784#  3889#  3977#
                          4109#  4240#  4334#  4493#  4597#  4722#  4813#  4914#  5011#  5099#  5217#  6713#
RKCS2  = 000010           1061#  6710#  7193#
RKDA   = 000006           1060#  6709#
RKDB   = 000024           1066#
RKDCYL= 000020           1065#  6708#
RKDS   = 000012           1062#
RKECPS= 000030           1070#  2938   3068   3201   3332   3463   3594   3726   4049   4180   4642   6283   6299
RKECPT= 000032           1071#  2937   3067   3200   3331   3462   3593   3725   4048   4179   4641   5868   6[illegible]
```

```
                        6268    6282    6298
RKER    = 000014        1063#   4416
RKMR1   = 000026        1067#   1962*   1963*   2080*   2081*   2197*   2198*   2314*   2315*   2435*   2436*   2551*   2552*
                        2634*   2635*   2834*   2835*   3945*   3946*   4302*   4303*   4390*   4391*   4532*   4533*   4761*
                        4762*   4858*   4859*   4951*   4952*   5048*   5049*   5141*   5142*   5255*   5256*   5335*   5336*
                        5371*   5372*   5466    5491    5503    5592    5754    6032    6066    6078    6090    6207    6261
                        6440*   6441    6470*   6471    6464*   6485    6499*   6500    6525*   6526    6537*   6538    6549*
                        6550    6577*   6580*   6581*   6582*   6593*   6586*   6587*   6588*   6589*   6711*
RKMR2   = 000034        1068#   1984    2102    2219    2336    2457
RKMR3   = 000036        1069#   1985    2103    2220    2337    2458
RKPRI     002306        1725#   1883*
RKSPAR= 000022          1072#
RKVEC     002304        1724#   1881*   1882*
RKWC    = 000002        1058#   6706*
RLS     = 000010        1110#
SAVREG= 104413          7121    7859#
SAVSWR    002356        1748#   7789*   7809
SCLR    = 000040        1112#
SCOP1   = 104415        4964    5061    5160    7861#
SCOP1$    033566        6993#   7861
SEEK    = 000017        1083#
SELDRV= 000001          1076#
SKI     = 000002        1127#
SPACE2    041116        7157    7169    8147#
SPAR    = 020000        1102#
SPDLSS= 000020          1149#
SRTFLG    002312        1727#   1751*   1754*   1757*   1834
SRTSPL= 000011          1080#
SR0     = 177572        1020#   6839    6854*   6861*
SR1     = 177574        1021#
SR2     = 177576        1022#
SR3     = 172516        1023#   6851*
STACK   = 001100         905#   1760    1772    5439    6564    6604    7185    7196    7806
START     002400        1196    1757#
START1    002404        1752    1755    1758#   7204
STKLMT= 177774           916#
SVAL    = 100000        1157#
SWR       001140        1263#   1770    1792*   1794    1800*   1807*   1822    5400    5409    5417    5425    5430    5473
                        5520    5599    5703    5765    5814    5968    5978    6043    6106    6355    6372    6449    6479
                        6493    6508    6534    6546    6558    6600    6901    6915    6918    6933    6940    6993    7075
                        7082    7094    7098    7176    7474    7513    7568*   7789    7809*
SWREG     000176        1194#   1800    1822    7474    7513    7536
SW0     = 000001         969#
SW00    = 000001         959#    969
SW01    = 000002         958#    968
SW02    = 000004         957#    967
SW03    = 000010         956#    966
SW04    = 000020         955#    965
SW05    = 000040         954#    964
SW06    = 000100         953#    963
SW07    = 000200         952#    962
SW08    = 000400         951#    961
SW09    = 001000         950#    960
SW1     = 000002         968#
SW10    = 002000         949#
SW11    = 004000         948#
```

```
SW12   = 010000            947#   7176
SW13   = 020000            946#
SW14   = 040000            945#
SW15   = 100000            944#
SW2    = 000004            967#
SW3    = 000010            966#
SW4    = 000020            965#
SW5    = 000040            964#
SW6    = 000100            963#
SW7    = 000200            962#
SW8    = 000400            961#
SW9    = 001000            960#   6449    6479    6493    6508    6534    6546    6558    6600    6993
S.CLR  = 000400           1182#
S.FMT  = 001000           1183#
S.PACK= 004000            1185#
S.RECL= 000040            1179#
S.RTC  = 000200           1181#
S.SEEK= 000020            1178#
S.STSP= 000100            1180#
S.UNLD= 002000            1184#
TBITVE= 000014            1002#
TKVEC  = 000060           1009#   7451*   7452*
TPVEC  = 000064           1010#
TRAPPC  002310            1726#   6597*   7864
TRAPVE= 000034            1008#   1778*   1779*
TRTVEC= 000014            1003#
TSTBY1  041206            8157#
TSTBY2  041216            8159#
TST1    003412            1890    1909#   6960
TST10   006622            2667#   6967
TST11   007136            2774#   6968
TST12   007430            2862#   6969
TST13   010156            2993#   6970
TST14   010704            3125#   6971
TST15   011432            3257#   6972
TST16   012160            3388#   6973
TST17   012714            3519#   6974
TST2    004030            1991    1996    2001    2029#   6961
TST20   013450            3650#   6975
TST21   014176            3780#   6976
TST22   014512            3885#   6977
TST23   015004            3973#   6978
TST24   015532            4105#   6979
TST25   016266            4236#   6980
TST26   016602            4331#   6981
TST27   017264            4421    4428    4443    4466#   6982
TST3    004442            2109    2114    2119    2146#   6962
TST30   017600            4561#   6983
TST31   020350            4696#   6984
TST32   020660            4787#   6985
TST33   021216            4892#   6986
TST34   021546            4989#   6987
TST35   022102            5082#   6988
TST36   022456            5181#   6989
TST4    005054            2226    2231    2236    2263#   6963
TST5    005466            2343    2348    2353    2381#   6964
```

```
TST6     006110          2464    2469    2474    2500*   6965
TST7     006360          2583*   6966
TYPDS  = 104405          5310    5317    7851*
TYPE   = 104401          1816    1833    1836    1839    1846    1849    1857    1866    5304    5311    5318    7077    7085
                         7133    7134    7138    7139    7146    7157    7159    7169    7170    7172    7180    7197    7249
                         7345    7420    7468    7480    7534    7535    7538    7549    7559    7570    7589    7637    7643
                         7648    7652    7657    7658    7660    7663    7667    7733    7735    7807    7847*
TYPERR   034260          7084    7121*
TYPOC  = 104402          1838    1865    7154    7537    7848*
TYPON  = 104404          7850*
TYPOS  = 104403          7849*
T.ASOF   002176          1677*
T.BA     002164          1672*   4294    4446    4850    5271    7900
T.CS1    002160          1670*   1986*   1988    2104*   2106    2221*   2223    2338*   2340    2459*   2461    2557    2643
                         2839*   2843    2969    3099    3232    3363    3494    3625    3757    3954    4080    4211    4311
                         4425    4440    4541    4673    4770    4867    5396    5514    5669    5778    5808    5951    6056
                         6100    6329    6725    7865    7877    7888
T.CS2    002170          1674*   4957    4959    5054    5056    5147    5149    5261    5263    7865    7877    7888
T.DA     002166          1673*   5693    7881    7888
T.DB     002202          1679*
T.DCYL   002200          1678*   5691    7881    7888
T.DS     002172          1675*   7865    7877    7888
T.ECPS   002212          1683*   2938*   2944    3068*   3074    3201*   3207    3332*   3338    3463*   3469    3594*   3600
                         3726*   3732    4049*   4055    4180*   4186    4642*   4648    6283*   6287    6299*   6304    6734*
                         7893    7896
T.ECPT   002214          1684*   2937*   2941    3067*   3071    3200*   3204    3331*   3335    3462*   3466    3593*   3597
                         3725*   3729    4048*   4052    4179*   4183    4641*   4645    5868*   5869    6215*   6216    6268*
                         6269    6282*   6285    6298*   6301    6735*   7886    7893
T.ER     002174          1676*   2560    2640    2973    3103    3236    3367    3498    3629    3761    4084    4215    4416*
                         4417    4677    7865    7877    7888    7898
T.MR1    002204          1680*   5407    5466*   5467    5491*   5492    5503*   5504    5592*   5593    5754*   5755    6032*
                         6033    6066*   6067    6078*   6079    6091    6207*   6208    6261*   6262    6441*   6442    6471*
                         6472    6485*   6486    6500*   6501    6526*   6527    6538*   6539    6550*   6551    7868    7874
                         7883
T.MR2    002206          1681*   1984*   1993    2102*   2111    2219*   2228    2336*   2345    2457*   2466    5415    6736*
                         7870
T.MR3    002210          1682*   1985*   1998    2103*   2116    2220*   2233    2337*   2350    2458*   2471    5423    6737*
                         7872
T.SPAR   002216          1685*
T.WC     002162          1671*   5277    7888    7302
UFE    = 000400          1115*
UNLOAD = 000007          1079*
UNS    = 040000          1140*
UPE    = 020000          1120*
VV     = 000100          1151*
WCE    = 040000          1121*   4957    5054    5147    5261
WLE    = 004000          1137*
WRDATA = 000023          1085*   1924    2042    2159    2276    2397    2512    2595
WRDCNT   002330          1737*
WRHEAD = 000027          1087*
WRL    = 004000          1154*
WRTBIT   030652          5791    5802    5865    5913    5940    6439*
WRTCHK = 000031          1088*   4479    4572    4708    4799    4904    5001    5093    5192
WRTGAT = 040000          1173*   5788    6454
WR.PAR = 000004          1049*
$APTHD   001000          1223    1229*
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$ATY1   033612          7002#
$ATY3   033620          7003#   7234
$ATY4   033630          7005#   7090
$AUTOB  001134          1260#   1326*   7527    7684
$BASE   001324          1347#   1837    1845*   1886    7152    7810
$BDADR  001122          1255#
$BDDAT  001126          1257#
$BELL   001240          1298#   7077    7110    7480    7677
$CHARC  035114          7251*   7261*   7268    7277*   7282#
$CKSWR  036070          7513#   7855
$CMTAG  001100          1243#   1767    1768    1776    1782    1783    1784
$CM1  =  000010         1275#   1276#   1277#   1278#   1279#   1280#   1281#   1282#   1283#
$CM2  =  000020         1275#   1276#   1277#   1278#   1279#   1280#   1281#   1282#   1283#
$CM3  =  000010         1273#   1275
$CM4  =  000015         1283#   1284#   1285#   1286#   1287#   1288#   1289#   1290#   1291#   1292#   1293#   1294#   1295#
                        1296#
$CNTLC  036766          7468    7549    7677#
$CNTLG  037000          7534    7679#
$CNTLU  036773          7559    7652    7678#
$CORE   033060          6837    6864#
$CPUOP  001276          1321#
$CRLF   001245          1300#   5318    7085    7110    7133    7138    7146    7159    7172    7250    7285    7570    7657
                        7677    7738
$CROUT  033110          6864    6871#
$DBLK   035562          7386    7420    7428#
$DEVCT  001260          1312#
$DEVM   001326          1348#
$DOAGN  023306          5300    5321    5327#
$DTBL   035552          7389    7424#
$ENDAD  023276          1206    1814    5323#   7105
$ENDCT  023142          1782    5302#
$ENULL  023312          5330#
$ENV    001270          1317#   1820    7011    7035    7087    7229
$ENVM   001271          1318#   1805    7013    7231    7236
$EOP    023106          5292#   7186    7201
$EOPCT  023134          1782*   5299#   5303    7184*   7200*
$ERFLG  001103          1246#   1759*   6890    6929    6931    6937*   6959    6995    7072*   7110    7195*
$ERMAX  001115          1252#   1785*   6931    6954*   6959
$ERROR  034060          1776    7070#
$ERRPC  001116          1253#   7079*   7080*   7081    7110    7865    7868    7870    7872    7874    7877    7881    7883
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$ERRTB  001330          1365#   7130
$ERTTL  001112          1250#   5315    5319*   7078*   7110
$ESCAP  001236          1297#   1784*   1887*   2729*   3842*   5398*   5411*   5419*   5427*   5433*   5438*   5459*   5470*
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                        5769*   5770*   5816*   5957*   5971*   5977*   5982*   5983*   6035*   6042*   6047*   6048*   6070*
                        6081*   6093*   6108*   6335*   6339*   6343*   6347*   6351*   6359*   6371*   6377*   6379*   6444*
                        6474*   6488*   6503*   6510*   6529*   6541*   6553*   6560*   6596*   6599*   6953*   7101    7103
                        7110    7194*
$ETABL  001270          1316#
$ETEND  001330          1235    1349#
$FATAL  001252          1309#   7039*
$FFLG   034056          7002*   7005*   7033    7042*   7050#
$FILLC  001156          1271#   7254    7285
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$GDDAT  001124          1256#
$GET42  023266          5320#
$GTSWR  036160          7535#  7953
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$HIBTS  001000          1230#
$HIOCT  037166          7726*  7737#
$ICNT   001104          1247#  6944*  6945   6947*  6958
$INTAG  001135          1261#  7532*  7551   7571   7684
$ITEMB  001114          1251#  7081*  7089   7110   7124
$KTNEX  033052          6838   6863#
$KTOUT  033042          6855   6860#
$KTI1   032710          6836#  6840*  6863#
$LF     001246          1301#  7110   7285   7667   7677   7738
$LFLG   034055          7043*  7049#
$LPADR  001106          1248#  1786*  6926*  6935*  6951*  6956   6958   7811
$LPERR  001110          1249#  1787*  4912*  5009*  5098*  5440   6565   6605   6935   6952*  6958   6997   7100
$LSTAD  033154          6876*  6883#
$LSTBK  033156          6877*  6884#
$MADR1  001302          1334#
$MADR2  001306          1338#
$MADR3  001312          1341#
$MADR4  001316          1344#
$MAIL   001250          1231   1235   1307#  1804   1820   6950   7087   7229
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$MAMS2  001304          1336#
$MAMS3  001310          1339#
$MAMS4  001314          1342#
$MBADR  001002          1231#
$MFLG   034054          7003*  7009   7044*  7048#
$MNEW   037016          7538   7682#
$MSGAD  001264          1314#  7019*  7022
$MSGLG  001266          1315#  7024*
$MSGTY  001250          1308#  7017   7025*  7037   7041*
$MSWR   037005          7535   7680#
$MTYP1  001301          1329#
$MTYP2  001305          1337#
$MTYP3  001311          1340#
$MTYP4  001315          1343#
$MXCNT  033470          6948   6958#
$NULL   001154          1269#  7256   7285
$NWTST= 000001          1894#  1896   2014#  2016   2132#  2134   2249#  2251   2367#  2369   2487#  2489   2571#
                        2573   2655#  2657   2762#  2764   2847#  2849   2979#  2981   3110#  3112   3243#  3245
                        3374#  3376   3505#  3507   3636#  3638   3768#  3770   3873#  3875   3958#  3960   4091#
                        4093   4224#  4226   4317#  4319   4454#  4456   4546#  4548   4684#  4686   4774#  4776
                        4873#  4875   4970#  4972   5068#  5070   5168#  5170
$OCNT   035342          7317*  7346*  7359#
$OMODE  035344          7312*  7316*  7321   7324*  7335*  7361#
$OVER   033454          6902   6927   6936   6946   6955#
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$PASTM  001006          1233#
$POWER  037412          7807   7814#
$PWRCT  037406          7798*  7799*  7800*  7802*  7813#
$PWRDN  037264          1780   7789#  7804
$PWRUP  037312          7790   7798#
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$RDDEC= ****** U        7859
$RDLIN  036522          7625#   7857
$RDOCT  037030          7699#   7858
$RDSZ = 000010          7618#
$REGAD  001160          1273#
$REG0   001162          1275#   2745*   3858*   4959*   5056*   5149*   5263*   7892    7904
$REG1   001164          1276#   2746*   3859*   4960*   5057*   5150*   5264*   7892    7904
$REG2   001166          1277#   2747*   3860*   4961*   5058*   5151*   5265*   7892    7904
$REG3   001170          1278#   5152*   7904
$REG4   001172          1279#   5153*   5155*   7904
$REG5   001174          1280#
$REG6   001176          1281#
$REG7   001200          1282#
$RESRE  037226          7771#   7860
$RTNAD  023310          5329#
$R2A  = ****** U        7861
$SAVRE  037170          7755#   7859
$SCOPE  033160          1774    6899#
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                        6900    7071    7097    7105    7472    7477    7478    7508    7684
$SIZE   032652          1884    6824#
$SIZEX  033114          6862    6872#
$STUP = 177777          1751#
$SVLAD  033420          6910    6949#
$SVPC = 000220          1204#   1209
$SWR  = 167400           878#    890     894     895     896     897     898     899     900     301    1296    1297    1298
                        1783    1784    1786    1787    1910    2030    2147    2264    2382    2501    2584    2668    2775
                        2863    2994    3126    3258    3389    3520    3651    3781    3886    3974    4106    4237    4332
                        4467    4562    4697    4788    4893    4990    5083    5182    5289    5295    5322    5328    5330
                        6891    6892    6893    6894    6895    6901    6913    6915    6916    6929    6930    6931    6938
                        6939    6940    6952    6955    6958    7062    7063    7064    7065    7066    7075    7082    7094
                        7098    7110
$SWREG  001272          1319#   1807
$SWRMK= 000000           901     902    6895    6896    6919
$SWO8T  033472          5477    5603    5769    5982    6047    6377    6925    6959#
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                        7870    7872    7874    7877    7881    7883    7886    7888    7891    7893    7896    7898    7900
                        7902    7904
$TIMES  001234          1296#   1783*   1910*   2030*   2147*   2264*   2382*   2501*   2584*   2668*   2775*   2863*   2994*
                        3126*   3258*   3389*   3520*   3651*   3781*   3886*   3974*   4106*   4237*   4332*   4467*   4562*
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$TKB    001146          1266#   7432    7453    7464    7489    7517    7544
$TKCNT  035572          7433#   7448#   7478    7495*   7609    7611*
$TKINT  035602          1765    7448#   7469    7530
$TKQEN= 035601          7437#   7503    7614
$TKQIN  035574          7434#   7449*   7450    7501*   7502*   7503    7505*
$TKQOU  035576          7435#   7450*   7612    7613*   7614    7616*
$TKQSR  035600          7436#   7449    7505    7616
$TKS    001144          1265#   7432    7454*   7485*   7487    7493*   7515    7531*   7541    7553*   7573*
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$TMP0   001202          1283#   1841*   1843    1845    1851*   1853    1856    1868*   1870    1872    1874*   1875*   1876*
                        1877*   1878*   1880
$TMP1   001204          1284#   5582*   5619    5622*   5625    5628*   5631    5635*   5638    5661*
$TMP10  001222          1291#   6179*   6346
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CROSS REFERENCE TABLE -- USER SYMBOLS

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$TMP14  001232          1295#  6191*  6195*  6277   6290   6295
$TMP2   001206          1285#
$TMP3   001210          1286#  6175*  6370
$TMP4   001212          1287#  6177*  6368
$TMP5   001214          1288#  2933*  2956   2961*  3063*  3086   3091*  3196*  3219   3224*  3327*  3350   3355*
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$TMP6   001216          1289#  5846*  5960   5963   5966   6171*  6334   6342
$TMP7   001220          1290#  2730*  2749   2751*  3843*  3862   3864*  5848*  5947   5956   6173*  6338
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                        2147#  2226   2231   2236   2249   2264#  2343   2348   2353   2367   2382#  2464   2469
                        2474   2487   2501#  2571   2584#  2655   2668#  2762   2775#  2847   2863#  2979   2994#
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$TPB    001152          1268#  7274*  7285
$TPFLG  001157          1272#  7223   7285
$TPS    001150          1267#  7272   7285
$TRAP   037420          1778   7824#
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$TRPAD  037454          7829   7846#
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$TYPDS  035346          7374#  7851
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$TYPEX  035116          7278   7280   7283#
$TYPOC  035144          7315#  7848
$TYPON  035160          7314   7317#  7850
$TYPOS  035120          7310#  7849
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$UNITM  001010          1234#
$USWR   001274          1320#
$VECT1  001320          1345#  1847   1855*  1856*  1859   1879*  1880*  1881   1883
$VECT2  001322          1346#
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.$ASTA= ****** U        7003   7006
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.$X = 001000 1219# 1224

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ESCAPE   1012#
FSECWT   1719#  1918  2036  2153  2270  2391
GETPRI   1012#  6832
GETSWR   1012#  1817#
LDLPER   1214#
MSG      1894#  1896  2014#  2016  2132#  2134  2249#  2251  2367#  2369  2487#  2489  2571#  2573  2655#
               2657  2762#  2764  2847#  2849  2979#  2981  3110#  3112  3243#  3245  3374#  3376  3505#  3507
               3636#  3638  3768#  3770  3873#  3875  3958#  3960  4091#  4093  4224#  4226  4317#  4319  4454#
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	4456	4546#	4548	4684#	4686	4774#	4776	4873#	4875	4970#	4972	5068#	5070	5168#	5170
MULT	1012#														
NEWTST	1012#	1894	2014	2132	2249	2367	2487	2571	2655	2762	2847	2979	3110	3243	3374
	3505	3636	3768	3873	3958	4091	4224	4317	4454	4546	4684	4774	4873	4970	5068
	5168														
OSECRD	1720#	2673	2780	2868	2998	3131	3264	3394	3525	3656	3786	3891	3979	4111	4242
	4337														
OSECWC	1721#	4472	4566	470.	4792	4897	4994	5186							
POP	1012#	5434	5479	5606	5771	5984	6049	6361	6669	6738	6772	7045	7046	7415	772?
	7776														
PUSH	1012#	5357	5456	5549	5731	5836	6009	6165	6619	6720	6756	7006	7008	7029	7374
	7701	7756													
REPORT	1012#														
SCOPE	907#	1909	2029	2146	2263	2381	2500	2583	2667	2774	2862	2993	3125	3257	3388
	3519	3650	3780	3885	3973	4105	4236	4331	4466	4561	4696	4787	4892	4989	5082
	5181	5293													
SETPRI	1012#	7605													
SETTRA	7839#	7848	7849	7850	7851	7853	7855	7856	7857	7858	7859	7860	7861		
SETUP	1012#	1766													
SKIP	1012#	1991	1996	2001	2109	2114	2119	2226	2231	2236	2343	2348	2353	2464	2469
	2474	4421	4428	4443											
SLASH	1012#														
SPACE	1012#														
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STARS	1012#	1702	1216	1218	1225	1238	1302	1305	1894	1908	2014	2028	2132	2145	2249
	2262	2367	2380	2487	2499	2571	2582	2655	2666	2762	2773	2847	2861	2979	2992
	3110	3124	3243	3256	3374	3387	3505	3518	3636	3649	3768	3779	3873	3884	3958
	3972	4091	4104	4224	4235	4317	4330	4454	4465	4546	4560	4684	4695	4774	4786
	4873	4891	4970	4988	5068	5081	5168	5180	5285	6810	6887	6990	7001	7058	7111
	7120	7208	7287	7364	7431	7508	7523	7594	7618	7687	7740	7786	7795	7818	
SWRSU	1012#	1788#													
TRMTRP	7839#														
TYPBIN	1012#														
TYPDEC	1012#	5308	5315												
TYPNAM	1012#	1810													
TYPNUM	1012#														
TYPOCS	1012#														
TYPOCT	1012#	1837	7536												
TYPTXT	1012#	5304	5311												
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$$ESCA	1012#														
$$NEWT	1012#	1894	2014	2132	2249	2367	2487	2571	2655	2762	2847	2979	3110	3243	3374
	3505	3636	3768	3873	3958	4091	4224	4317	4454	4546	4684	4774	4873	4970	5068
	5168														
$$SET	7839#	7848	7849	7850	7851	7853	7855	7856	7857	7858	7859	7860	7861		
$$SETM	1804#														
$$SKIP	1012#	1991	1996	2001	2109	2114	2119	2226	2231	2236	2343	2348	2353	2464	2469
	2474	4421	4428	4443											
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.HEADE	878#	880													
.KT11	878#	1012													
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.SWRHI	878#	890													
.SWRLO	878#	902#													
.$ACT1	878#	1200													

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.$AF       878#    1214
 $WFIY     878#    6999
.$CATC     878#    1186
.$CMTA     878#    1236
.$EOP      878#    5283
.$ERRO     878#    7056
.$ERRT     878#
.$POWE     878#
.$RDOC     878#    7685
.$READ     878#    7429
.$SAVE     878#    7738
.$SCOP     878#    6885
.$SIZE     878#    6808
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.$TYPD     878#    7362
.$TYPE     878#    7206
.$TYPO     878#    7285


. ABS.   050642      000

 ERRORS DETECTED:  0

 RM03:CZR6EB,RM03:CZR6EB.SEQ/SOL/CRF/NL:TOC/DOC=RM03:CZR6EB.P11
 RUN-TIME:  29 24 2 SECONDS
 RUN-TIME RATIO:  1392/56=24.7
 CORE USED:  30K  (59 PAGES)

 DOCUMENT PAGES:  183
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