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                        .TITLE CNDMAAO DMV11 MCTRL DIAG #1
                        .SBTTL PROGRAM DOCUMENT
                        .REM +


                                  I D E N T I F I C A T I O N
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                        PRODUCT CODE:     AC-T826A-MC

                        PRODUCT NAME:     CNDMAAO DMV-11 MICRO-CONTROLLER STATIC DIAGNOSTIC PART 1

                        PRODUCT DATE:     APRIL 1984

                        MAINTAINER:       ISS DIAGNOSTICS

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                        MODIFIED BY:      JAKI BERG        9-APR-1984

                        PURPOSE:          THIS DIAGNOSTIC IS DESIGNED TO PERFORM STATIC LOGIC TESTS FOR
                                          THE M8053 OR M8064 (HEREAFTER REFERRED TO AS THE DMV OR DMV-11)


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                                ***** MODIFICATION HISTORY *****

REV A: ORIGINAL RELEASE                    CHRIS BRIENEN, RAY MARSHALL    14-JAN-81

REV B: INSTALLED OUTSTANDING PATCHES                                      11-JUL-83

CVDMAB => CNDMAA                                    JAKI BERG              9-APR-84
CHANGES WERE MADE TO  CVDMAB  TO PRODUCE  CNDMAA  FOR THE  FALCON-PLUS PROJECT
(SBC 11/21+).   CHANGES, MARKED BY ";JB REV A.0", ARE:
  - SET THE  ODT BREAK  VECTOR (LOCATION 140) TO THE STARTING ADDRESS OF
    FALCON'S ODT ROM (170000-OCTAL).
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CONTENTS

1.0 INTRODUCTION

THE M8053 AND M8064 ARE SINGLE-LINE SYNCHRONOUS, MICRO-PROCESSOR BASED COMMUNICATIONS INTERFACES WHICH CAN SUPPORT BOTH CHARACTER-ORIENTED (DDCMP, BSC, ETC.) AND BIT-ORIENTED (SDLC, HDLC, ETC.) PROTOCOLS. THE PURPOSE OF THIS PROGRAM IS TO PERFORM DIAGNOSTIC TESTING OF THE CSRS, RAM, AND BASIC MICRO-PROCESSOR LOGIC ON THESE BOARDS. THE FOLLOWING FUNCTIONS WILL BE PERFORMED: DMV RESIDENT U-DIAG EXECUTION CSR ADDRESSING, VIA REGISTER STATIC BIT INTERACTION AND READ/WRITE TESTING, AND ON-BOARD RAM TESTING.

THE STATIC LOGIC TESTS WILL PROVIDE EXTENSIVE TROUBLESHOOTING CAPABILITIES, SUCH AS TIGHT SCOPE LOOPS, SWITCH OPTIONS, AND ABILITY TO "LOCK" ONTO INTERMITTENT ERRORS. IN ADDITION TESTS ARE DESIGNED AND STRUCTURED TO ACHIEVE MAXIMUM FAULT RESOLUTION AND FACILITATE REPLACEMENT OF THE SMALLEST FIELD REPLACEABLE UNIT.

THIS PROGRAM IS IMPLEMENTED USING THE DIAGNOSTIC SUPERVISOR AND A STRUCTURED PROGRAMMING APPROACH. BECAUSE THE DESIGN CONFORMS TO THE SUPERVISOR (STANDALONE VERSION) THE PROGRAM IS COMPATIBLE WITH ACT, APT, XXDP+, AND SLIDE.

THROUGH DIALOGUE WITH THE OPERATOR, THE PROGRAM ALLOWS MODIFICATION OF DEVICE PARAMETERS, SUCH AS LSI-BUS ADDRESS, VECTOR ADDRESSES AND DEVICE PRIORITY. IN ADDITION, THE OPERATOR CAN SPECIFY PARTICULAR TESTS TO BE RUN AND A VARIETY OF LOOPING, RUNNING, AND REPORTING MODES.

DEVICE ERRORS WILL BE REPORTED AS THEY OCCUR. THE REPORT WILL INCLUDE A TEST NUMBER AND DESCRIPTION OF THE ERROR, GOOD AND BAD TEST DATA, AND APPLICABLE DEVICE REGISTER CONTENTS.

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE M8053/8064 STATIC LOGIC TESTS:

SBC-11/21+
16K WORDS OF MEMORY
CONSOLE TERMINAL
M8053 OR M8064 COMMUNICATIONS INTERFACE

3.0 PRELIMINARY PROGRAM REQUIREMENTS

THIS PROGRAM (CNDMA) SHOULD BE THE FIRST OF THE FIVE DMV 11 STATIC DIAGNOSTICS TO BE RUN. ERRORS FOUND IN THIS PROGRAM SHOULD BE CORRECTED BEFORE RUNNING THE OTHERS.

PROGRAM DOCUMENT

4.0 GENERAL PROGRAM CONSIDERATIONS

4.1 DIAGNOSTIC SUPERVISOR

THIS PROGRAM IS COMPATIBLE WITH THE STANDALONE DIAGNOSTIC SUPERVISOR, AND MUST BE LOADED TO BE CO-RESIDENT WITH THE SUPERVISOR, OR BE PREVIOUSLY COMBINED WITH THE SUPERVISOR AND LOADED AS A SINGLE FILE. IN EITHER CASE, THE COMBINED PROGRAM WILL NOT EXCEED 16K OF MEMORY.

4.2 EXECUTION TIME

THE MAXIMUM TIME REQUIRED TO RUN THIS PROGRAM PER PASS FOR EACH UNIT IS 160 SECS.

4.3 XXDP+

THIS PROGRAM MAY BE LOADED UNDER XXDP+, AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

4.4 ACT/SLIDE

THIS PROGRAM MAY BE LOADED UNDER ACT OR SLIDE AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

4.5 APT

THIS PROGRAM MAY BE LOADED BY THE APT SYSTEM (INCLUDING APT-RD) AND RUN IN PROGRAM MODE OR SCRIPT MODE.

4.6 MEMORY MANAGEMENT

MEMORY MANAGEMENT IS NOT UTILIZED IN THIS PROGRAM.

4.7 ERROR LOGGING

AT THE END OF EACH PASS ON ALL UNITS, THE PROGRAM PRINTS OUT THE CUMULATIVE TOTAL NUMBER OF ERRORS SINCE THE LAST START OR RESTART COMMAND.

5.0 PROGRAM LOAD MEDIA

THIS PROGRAM CAN BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER OR FROM ACT, SLIDE, OR APT SYSTEMS, OR FROM ANY MEDIA SUPPORTED BY XXDP+. WHEN USING THE PAPER TAPE ABSOLUTE LOADER, THE PROGRAM SHOULD BE LOADED FIRST, FOLLOWED BY THE DIAGNOSTIC SUPERVISOR. WHEN USING XXDP+, THE DIAGNOSTIC SUPERVISOR SHOULD BE LOADED FIRST, FOLLOWED BY

225 THE DIAGNOSTIC PROGRAM.

6.0 OPERATING INSTRUCTIONS

6.1 LOADING AND STARTING PROCEDURES

6.1.1 LOADING PROCEDURES

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER. IT MAY ALSO BE LOADED FROM ANY XXDP+ LOAD MEDIA. WHEN LOADED UNDER XXDP+, THE DIAGNOSTIC SUPERVISOR WILL BE LOADED AUTOMATICALLY.

6.1.2 STARTING PROCEDURES

THE PROGRAM STARTS AT LOCATION 200. USE STANDARD DEC PROCEDURES TO START THE PROGRAM.

6.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE UNDER XXDP+, WITHOUT READING THE REMAINDER OF THIS DOCUMENT, AS FOLLOWS:

A) LOAD AND START DIAGNOSTIC USING RUN COMMAND
B) RECEIVE DIAGNOSTIC SUPERVISOR IDENTIFICATION AND PROMPT (DRS-C>)
C) ENTER STA<CR>
D) ANSWER HARDWARE AND SOFTWARE QUESTIONS
E) GET END OF PASS MESSAGES OR ERROR MESSAGES
F) TO END EXECUTION, ENTER CONTROL/C

6.2 INITIAL DIALOGUE

AFTER THE PROGRAM AND THE SUPERVISOR ARE LOADED AND THE PROGRAM IS STARTED, THE FOLLOWING IDENTIFICATION IS TYPED :

```
DRS LOADED
DIAG. RUN-TIME SERVICES
CNDMA-A-0
DMV 11 U CONTRL LOGIC DIAG   PART 1 OF 2
UNIT IS M8054 OR M8064
DR>
```

THE OPERATOR THEN PROCEEDS BY TYPING ONE OR MORE OF THE COMMANDS DESCRIBED IN THE FOLLOWING SECTION 6.3. (FOR MORE DETAILED INFORMATION, REFER TO THE DIAGNOSTIC SUPERVISOR FUNCTIONAL SPECIFICATION).

6.3 PROGRAM OPTIONS

6.3.1 START COMMAND

```
                        **********************************************************************
                        STA(R1)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
                           <FLAG-LIST>/EOP:<INCR>
                        **********************************************************************


                        6.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)

                        <TEST LIST>  IS  A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR
                        RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT  SPECIFY  THE
                        TESTS  TO BE EXECUTED.  THE NUMBERS ARE SEPARATED BY COLONS.
                        THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER  IN  THE
                        DIAGNOSTIC.  THEY MAY BE SPECIFIED IN ANY ORDER.  TESTS WILL
                        BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF  THE  ORDER  OF
                        SPECIFICATION.   THE  DEFAULT  IS  TO EXECUTE ALL TESTS  ON
                        THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION
                        USED  IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE
                        OPERATOR.  SEE EXAMPLE AT END OF 6.3.1.5.


                        6.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)

                        <PASS-CNT> IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER
                        OF  PASSES.   A PASS IS DEFINED AS THE EXECUTION OF THE FULL
                        DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUBMITTED.
                        THE DEFAULT IS NON-ENDING EXECUTION.  IN THIS CASE EXIT FROM
                        THE PROGRAM IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C  OR
                        BY  OCCURANCE  OF AN ERROR WITH THE HALT ON ERROR FLAG BEING
                        SET.  THE EXIT IS A RETURN TO COMMAND MODE.  SEE EXAMPLE  AT
                        END OF 6.3.1.5.


                        6.3.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

                        <FLAG-LIST>  IS  A  SEQUENCE OF ELEMENTS OF THE FORM <FLAG>,
                        <FLAG-1>, OR <FLAG-0>, SEPARATED BY COLONS, WHERE <FLAG> HAS
                        ONE OF THE FOLLOWING VALUES:

                           HOE    HALT ON ERROR, CAUSING COMMAND MODE TO BE
                                  ENTERED WHEN AN ERROR IS ENCOUNTERED
                           LOE    LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP
                                  CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK
                                  OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAIN-
                                  ING THE ERROR
                           IER    INHIBIT ERROR REPORTING
                           IBE    INHIBIT BASIC ERROR REPORTS
                           IXE    INHIBIT EXTENDED ERROR REPORTS
                           PRI    DIRECT ALL MESSAGES TO A LINE PRINTER
                           PNT    PRINT NUMBER OF TEST BEING EXECUTED
                           BOE    BELL ON ERROR
                           UAM    RUN IN UNATTENDED MODE, BYPASSING MANUAL
                                  INTERVENTION TESTS
                           ISR    INHIBIT STATISTICAL REPORTS
                           IDU    INHIBIT DROPPING OF UNITS BY DIAGNOSTIC
                           LOT    LOOP ON TEST
```

THE FLAGS NAMED OR EQUATED TO 1 ARE SET, THOSE EQUATED TO 0 ARE CLEARED. A FLAG NOT SPECIFIED IS CLEARED. IF THE FLAGS SWITCH IS NOT GIVEN ALL FLAGS ARE CLEARED. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.4 END OF PASS SWITCH (/EOP:<INCR>)

<INCR> IS A DECIMAL NUMBER INDICATING HOW OFTEN (IN TERMS OF PASSES) IT IS DESIRED THAT THE END OF PASS MESSAGE BE PRINTED. THE DEFAULT IS AT THE END OF EVERY PASS. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.5 EFFECT OF START COMMAND

THE EFFECT OF THE START COMMAND IS TO INITIATE THE HARDWARE PARAMETER DIALOGUE, THE SOFTWARE PARAMETER DIALOGUE, AND THEN THE DIAGNOSTIC TESTS THEMSELVES.

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "0 UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 16. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION. HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

FOLLOWING THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS TO BUILD THE SOFTWARE TABLES, WHICH DEFINE THE MODE (QUICK VERIFY ETC.) THAT THE DIAGNOSTIC WILL EXECUTE IN.

WHEN THE QUESTION "0 UNITS?" IS ANSWERED, MEMORY STORAGE IS ALLOCATED FOR THE P-TABLES, AND IF THERE IS NOT ENOUGH TO ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED. IN THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE TO TEST ALL UNITS.

EXAMPLE:

```
STA/TESTS:1:2:4:6:8:10/PASS:3/FLAGS:IER:HOE=1:UAM:LOE
```

THIS COMMAND WILL CAUSE THREE PASSES TO BE MADE, EACH PASS CONSISTING OF TESTS 1,2,3,4,6,8,9, AND 10 EXECUTED AGAINST ALL UNITS. THERE IS NO DIFFERENCE BETWEEN SAYING <FLAG> AND SAYING <FLAG=1>. THE NOTATION <FLAG=0> IS MEANINGFUL ONLY ON A COMMAND OTHER THAN START TO CLEAR A FLAG THAT WAS PREVIOUSLY SET. NOTE THAT ON ALL COMMANDS ONLY THE FIRST THREE LETTERS ARE SCANNED.

```
398
399
400                     6.3.2 RESTART COMMAND
401
402                     ****************************************************************
403                     RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
404                        <FLAG-LIST>/UNITS:<UNIT-LIST>
405                     ****************************************************************
406
407
408                     6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES
409
410                     <TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START
411                     COMMAND.
412
413
414                     6.3.2.2 UNITS SWITCH (/UNITS:<UNIT-LIST>)
415
416                     <UNIT-LIST>  IS  A SEQUENCE OF DECIMAL NUMBERS (0,1 ETC.) OR
417                     RANGES OF DECIMAL NUMBERS (0-5, 8-10 ETC.) THAT SPECIFY  THE
418                     UNITS  TO  BE  TESTED.  THE NUMBERS ARE SEPARATED BY COLONS.
419                     THE NUMBERS MAY RANGE FROM 0 THRU N-1  (N  IS  THE  NUMBER  OF
420                     UNITS  SPECIFIED IN THE PREVIOUS START COMMAND).  THE NUMBER
421                     INDICATES THE POSITION  OF  THE  P-TABLE  AS  THE  DATA  WAS
422                     ENTERED  DURING THE HARDWARE DIAGLOGUE.  THE UNITS WHICH ARE
423                     SELECTED MUST NOT HAVE BEEN DROPPED  BY  THE  DROP  COMMAND.
424                     SEE  THE DISCUSSION OF ADD AND DROP COMMANDS BELOW.  DEFAULT
425                     IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY  A  DROP
426                     COMMAND.
427
428
429                     6.3.2.3 EFFECT OF RESTART COMMAND
430
431                     THE  RESTART  COMMAND DIFFERS FROM THE START COMMAND IN THAT
432                     THE P-TABLES FROM THE PREVIOUS  START  COMMAND  (THERE  MUST
433                     HAVE  BEEN  ONE)  ARE USED, INSTEAD OF NEW ONES BEING BUILT.
434                     THE UNITS SWITCH GIVES THE ABILITY TO  SELECT  A  SUBSET  OF
435                     THESE.    THE  SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED
436                     (OPERATOR WILL BE ASKED). THE  COMMAND  CAN  BE  USED  AFTER
437                     COMMAND  MODE  HAS BEEN REENTERED IN ANY OF THE THREE NORMAL
438                     WAYS:  A) THE REQUESTED NUMBER OF PASSES HAVE BEEN  MADE  B)
439                     AN  ERROR WAS ENCOUNTERED WITH THE HALT ON ERROR FLAG SET C)
440                     A CONTROL/C WAS ENTERED BY THE OPERATOR.
441
442
443                     6.3.3 CONTINUE COMMAND
444
445                     ****************************************************************
446                     CON(TINUE)/PASS:<PASS CNT/FLAGS:<FLAG LIST>
447                     ****************************************************************
448
449
450                     6.3.3.1 PASS SWITCH (/PASS:<PASS CNT>)
451
452                     <PASS CNT> IS SAME AS IN START COMMAND, BUT THE  DEFAULT  IS
453                     THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART.
454                     IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.
```

```
455
456
457                     6.3.3.2 FLAG SWITCH (/FLAGS:<FLAG-LIST>)
458
459                     <FLAG-LIST> IS SAME AS IN  START  COMMAND,  BUT  UNSPECIFIED
460                     FLAGS RETAIN THEIR CURRENT VALUE
461
462
463                     6.3.3.3 EFFECT OF CONTINUE COMMAND
464
465                     CONTINUE  MUST  FOLLOW  A START OR RESTART, AND COMMAND MODE
466                     MUST HAVE  BEEN  ENTERED  DUE  TO  A  HALT  ON  ERROR  OR  A
467                     CONTROL/C.  THE  EFFECT  OF  THE  COMMAND  IS  TO  GO TO THE
468                     BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE  HALT
469                     OR  CONTROL/C  TOOK PLACE.  SOFTWARE DIALOGUE MAY OPTIONALLY
470                     BE REEXECUTED.  HARDWARE PARAMETERS MAY NOT BE CHANGED.
471
472
473                     6.3.4 PROCEED COMMAND
474
475                     ********************************************************************
476                     PRO(CEED)/FLAGS:<FLAG-LIST>
477                     ********************************************************************
478
479
480                     6.3.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)
481
482                     <FLAG-LIST> IS AS IN  THE  START  COMMAND,  BUT  UNSPECIFIED
483                     FLAGS RETAIN THEIR CURRENT VALUE.
484
485
486                     6.3.4.2 EFFECT OF PROCEED COMMAND
487
488                     PROCEED  MUST FOLLOW A START, RESTART, OR CONTINUE.  COMMAND
489                     MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR.  THE EFFECT
490                     OF  THE  COMMAND  IS  TO  BEGIN  EXECUTION  AT  THE LOCATION
491                     FOLLOWING THE ERROR CALL.  NEITHER  HARDWARE  NOR  SOFTWARE
492                     PARAMETERS MAY BE ALTERED.
493
494
495
496                     6.3.5 ADD COMMAND
497
498                     ********************* ****************************************
499                     ADD/UNITS:<UNIT LIST>
500                     ********************************************************************
501
502
503                     6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>
504
505                     <UNIT-LIST> IS AS IN THE RESTART COMMAND.
506
507
508                     6.3.5.2 EFFECT OF ADD COMMAND
509
510                     THE UNITS SPECIFIED ARE ADDED TO THE  TEST  SEQUENCE.  EACH
511                     UNIT  MUST  HAVE  A  P-TABLE  IN  MEMORY  DUE  TO AN EARLIER
```

HARDWARE DIALOGUE. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR CONTINUE. THE UNITS SWITCH MUST BE SPECIFIED. THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS THAT WERE PREVIOUSLY DROPPED.

6.3.6 DROP COMMAND

****
DRO(P)/UNITS:<UNIT-LIST>
****

6.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.6.2 EFFECT OF DROP COMMAND

THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING. THE UNITS WILL BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR START COMMAND. THE UNITS SWITCH MUST BE ENTERED. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR A CONTINUE COMMAND.

6.3.7 PRINT COMMAND

****
PRI(NT)
****

6.3.7.1 EFFECT OF PRINT COMMAND

THE TOTAL NUMBER OF ERRORS FOR EACH UNIT SINCE THE LAST START OR RESTART COMMAND ARE PRINTED. THE ISR (INHIBIT STATISTICAL REPORTING) FLAG IS CLEARED.

6.3.8 DISPLAY COMMAND

****
DIS(PLAY)/UNITS:<UNIT-LIST>
****

6.3.8.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.8.2 EFFECT OF DISPLAY COMMAND

THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED OUT IN THE FORMAT IN WHICH THEY WERE ENTERED. ANY UNITS THAT WERE DROPPED BY THE OPERATOR "DROP" COMMAND ARE SO

DESIGNATED.

6.3.9 FLAGS COMMAND

****
FLA(GS)
****

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

****
ZFL(AGS)
****

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

A CONTROL C (C) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES A RETURN TO COMMAND MODE.

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR DIALOGUES- HARD CORE QUESTIONS (SEE 6.2),HARDWARE DIALOGUE (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

A CONTROL O (O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES ALL TELETYPE OUTPUT TO BE SURPRESSED FOR THE REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER O IS TYPED, WHICH RESTORES NORMAL TELETYPE OUTPUT.

6.3.12 HARDWARE PARAMETERS

THE FOLLOWING 3 QUESTIONS WILL BE ASKED ON A START COMMAND. THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONSE.

1. DEVICE CSR ADDRESS : (O) 160020?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SEL0) RESIDE ON THE LSI-BUS. THE ALLOWABLE RANGE IS 160020-177760 (OCTAL), AND THE DEFAULT VALUE IS 160020.

2. DEVICE VECTOR ADDRESS : (O) 300 ?

THIS IS THE ADDRESS OF THE INPUT INTERRUPT VECTOR FOR THIS DEVICE. THE ALLOWABLE RANGE IS 000-674 (OCTAL), AND THE DEFAULT VALUE IS 300.

3. DEVICE PRIORITY LEVEL : (0) 4 ?

THIS IS THE CPU PRIORITY AT WHICH THE INTERRUPT HANDLERS OF THIS DEVICE WILL BE EXECUTED. THE ALLOWABLE RANGE IS 0-7, AND THE DEFAULT VALUE IS 4.

6.3.13 SOFTWARE PARAMETERS

NO SOFTWARE PARAMETER QUESTIONS ARE ASKED BY PART 1 OF THE STATIC LOGIC TESTS.

6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE

THE FULL CAPABILITY OF THE HARDWARE DIALOGUE IS REVEALED BY THE FOLLOWING DISCUSSION OF WHAT HAPPENS INTERNALLY.

AS SOON AS THE QUESTION "0 UNITS?" IS ANSWERED (WITH THE NUMBER N, SAY) SPACE IN CORE IS ALLOCATED FOR N P-TABLES. ALL OF THE P-TABLES ARE OF THE SAME FORMAT, AND THERE IS A ONE-TO ONE CORRESPONDENCE BETWEEN THE HARDWARE PARAMETER QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

ON THE FIRST TRIP THRU THE QUESTIONS, ALL OF THE SLOTS IN ALL OF THE P-TABLES ARE FILLED. IF THE OPERATOR TYPES IN LESS THAN N EXPLICIT VALUES IN RESPONSE TO A PARTICULAR QUESTION, THESE VALUES ARE PLACED IN THE P-TABLES (ONE VALUE GOING INTO THE PROPER SLOT OF EACH P-TABLE BEGINNING WITH THE FIRST P-TABLE) UNTIL THE STRING OF VALUES IS EXHAUSTED. THE LAST VALUE IN THE STRING BECOMES THE NEW DEFAULT AND IS USED TO FILL THAT SLOT IN THE REMAINING P-TABLES.

ON SUBSEQUENT TRIPS THRU THE QUESTIONS, THE SAME PROCESS IS CARRIED OUT, EXCEPT THAT THE EARLIEST P-TABLE NOT TO HAVE RECEIVED AN EXPLICIT VALUE IN ANY OF ITS SLOTS NOW ASSUMES THE ROLE THAT TABLE NUMBER ONE PLAYED IN THE FIRST TRIP.

THE SERIES OF QUESTIONS IS REISSUED UNTIL AT LEAST ONE QUESTION HAS RECEIVED N EXPLICIT VALUES FROM THE OPERATOR.

IN GIVING A STRING OF VALUES, COMMAS WITHOUT INTERVENING VALUES MAY BE USED TO INDICATE A REPETITION OF THE LAST NAMED VALUE.

A STRING OF VALUES MAY BE GIVEN AS A RANGE (6 10 FOR EXAMPLE). IF THE VALUES REPRESENT PURE NUMERICAL DATA, THIS SAMPLE RANGE TRANSLATES TO THE STRING 6,7,8,9,10 (AN INCREMENT OF 1). IF THE VALUES ARE ADDRESSES, THE SAMPLE RANGE TRANSLATES TO THE STRING 6,8,10 (AN INCREMENT OF 2).

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO

PROGRAM DOCUMENT

```
683                     CONSTRUCT A SET OF P-TABLES.  ASSUME THAT WE HAVE 16  UNITS,
684                     AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE
685                     SLOTS IN  THE  P-TABLE,  THREE  HARDWARE  QUESTIONS  IN  THE
686                     DIALOGUE).  LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE
687                     THE NUMBER 75 FOR ALL 16 TABLES.  LET THE DESIRED VALUE  FOR
688                     THE   SECOND   PARAMETER   BE   EQUAL   TO   THE   UNIT   NUMBER
689                     (0,1,2,...,15) EXCEPT FOR UNIT 12, WHICH SHOULD RECEIVE  THE
690                     VALUE  11.  LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE
691                     THE NUMBER 76 FOR THE FIRST 7 UNITS AND THE NUMBER  77  FOR
692                     THE LAST 9 UNITS.
693
694                     THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:
695
696                     @ UNITS (D) ? 16
697                     UNIT 0
698                     <QUESTION 1> ? 75
699                     <QUESTION 2> ? 0-6
700                     <QUESTION 3> ? 76
701
702                     UNIT 7
703                     <QUESTION 1> ?
704                     <QUESTION 2> ? 7-11,,13-15
705                     <QUESTION 3> ? 77
706
707                     THE  FIRST  TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75
708                     IN ALL 16 TABLES.  SLOT TWO RECEIVES THE VALUES 0,1,2,...,6
709                     IN  TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15.
710                     SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.
711
712                     THE SECOND TIME THRU THE SERIES, TABLES 7 THRU THE END  ARE
713                     GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS
714                     PRINTED OUT FOR THE THE OPERATOR IN THE FORM  "UNIT  XX"  AT
715                     THE  BEGINNING  OF EACH SERIES).  QUESTION 1 IS RESPONDED TO
716                     BY A <CR>, SO SLOT ONE STAYS AT CONSTANT  75  IN  TABLES  7
717                     THRU 15, SINCE NO NEW EXPLICIT VALUES ARE TYPED IN.  SLOT TWO
718                     GETS THE VALUES 7,8,9,10,11 IN TABLES 7  THRU  11.  AND
719                     GETS AN 11 IN SLOT 12, AND GETS THE VALUES 13,14,15 IN
720                     TABLES 13 THRU 15. SLOT THREE GETS THE VALUE 77 IN TABLES 7
721                     THRU 15.
722
723                     THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT
724                     16 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ONE QUESTION
725                     (NAMELY QUESTION 2).
726
727
```

```
                    7.0 TEST DESCRIPTIONS


                    ;*****************************************************************************
                    ;*      TEST 1  <DMV-11 AVAILABILITY>
                    ;*
                    ;* EACH NORMALLY USED CSR IS ACCESSED WITH A "TST" OR "TSTB" INSTRUCTION AND IF
                    ;* A BUS TIMEOUT OCCURS (INTERRUPT @ VECTOR ADDR 4) A FLAG WILL BE SET SHOWING
                    ;* WHICH CSR ADDR AND INSTRUCTION FAILED. "T1.HSW" REFLECTS "TST" INSTRUCTIONS
                    ;* AND "T1.HSB" REFLECTS "TSTB" INSTRUCTIONS.
                    ;*
                    ;*      EXAMPLES:
                    ;*
                    ;*      IF "TSTB  @BSEL1"  FAILS,  BIT # 1 OF "T1.HSB" WILL BE SET.
                    ;*      IF "TST  @SEL4" FAILS, BIT # 4 OF "T1.HSW" WILL BE SET
                    ;*      (NOTE: ONLY EVEN BITS IN "T1.HSW" CAN BE SET).
                    ;*
                    ;*  THE FLAG WORDS ARE OUTPUT IN BINARY AS "EXTENDED ERROR INFORMATION".
                    ;*****************************************************************************


                    ;*****************************************************************************
                    ;*      TEST 2  <MASTER CLEAR, RUN MICRODIAGNOSTICS>
                    ;*
                    ;* A MASTER CLEAR IS ISSUED TO THE DMV-11, AND THE PROGRAM ALLOWS SUFFICIENT
                    ;* TIME FOR THE MICRODIAGNOSTICS TO BE PERFORMED. THESE MICRODIAGNOSTICS RESIDE
                    ;* IN 6502 PROGRAM  MEMORY,  AND  THOROUGHLY VERIFY THE OPERATION OF THE 6502
                    ;* MICROPROCESSOR CHIP. THEN, THEY CHECK OUT THE DATA RAM, THE 6502'S ACCESS TO
                    ;* THE CSR'S,  AND  PERFORM  A  SIMPLE MESSAGE TEST USING THE 6522 CHIP AND THE
                    ;* USYRT, WITH INTERNAL LOOPBACK.
                    ;*
                    ;* NEXT, THE LSI-11 PROGRAM READS THE THE CSR'S (SEL0-SEL6) AND CHECKS THEM FOR
                    ;* THEIR EXPECTED INITIALIZED  STATES.  IF AN ERROR HAS OCCURRED IN THE MICRO-
                    ;* DIAGNOSTICS THE NUMBER OF THE FAILING TEST WILL BE FOUND IN SEL4, AND RUN
                    ;* (BIT 7) WILL NOT BE SET IN BSEL1.
                    ;*****************************************************************************


                    ;*****************************************************************************
                    ;*      TEST 3  <CSR ADDRESSING>
                    ;*
                    ;* FIRST, HALT THE 6502 UP BY CLEARING ALL CSRS. THEN, WRITE A DIFFERENT WORD
                    ;* OF DATA  PATTERN  A INTO EACH OF BSEL0-17, AND AFTER EACH WRITE, READ AND
                    ;* COMPARE ALL REGS TO EXPECTED VALUES.
                    ;*
                    ;* DATA PATTERN A = 001, 002, 004, 010, 020, 040, 100, 200, 052, 300, 140,
                    ;*                  060, 030, 014, 006, 003
                    ;*****************************************************************************


                    ;*****************************************************************************
                    ;*      TEST 4  <CSR REGISTERS DATA READ/WRITE>
                    ;*
                    ;* WRITE, READ, AND COMPARE EACH BYTE OF DATA PATTERN B INTO REGISTER BSEL0,
                    ;* THEN, REPEAT THIS USING EACH OF THE REMAINING CSR'S, BSEL1 BSEL1', WHEN BSEL1
```

```
786                     ;* IS BEING TESTED, THE PROGRAM ALWAYS SETS BIT 7 IN THE DATA PATTERN SO THAT
787                     ;* RUN WILL NOT BE CLEARED, AND IT ALWAYS CLEARS BIT6 SO THAT MCLR WILL NOT BE
788                     ;* SET.
789                     ;*
790                     ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
791                     ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
792                     ;*****************************************************************************
793
794
795                     ;*************************** *************************************************
796                     ;*      TEST 5  <BASIC MASTER CLEAR>
797                     ;*
798                     ;* PERFORM AN INITIAL MASTER CLEAR, WRITE 356 INTO BSEL0 AND READ AND CHECK IT.
799                     ;* THEN, ISSUE A MASTER CLEAR AND READ AND CHECK BSEL0 FOR 000.
800                     ;*****************************************************************************
801
802
803                     ;*****************************************************************************
804                     ;*      TEST 6  <BUS RESET>
805                     ;*
806                     ;* PERFORM AN INITIAL MASTER CLEAR.  WRITE 377 INTO BSEL0 AND READ AND CHECK
807                     ;* IT. THEN, ISSUE A RESET INSTRUCTION, STALL FOR COMPLETION, AND READ AND
808                     ;* CHECK BSEL0 FOR 000.
809                     ;*****************************************************************************
810
811
812                     ;*****************************************************************************
813                     ;*      TEST 7  <CSR, MAINTENANCE MICROCODE INTERACTION>
814                     ;*
815                     ;* THIS TEST INVOKES THE MAINTENANCE REQUEST MECHANISM THROUGH WHICH THE LSI-11
816                     ;* AND 6502 CAN COMMUNICATE.    FIRST, A MASTER CLEAR IS DONE WITH ONLY BIT 0
817                     ;* (MREQ) SET IN BSEL1. THE PROGRAM THEN CHECKS FOR THE SETTING OF BSEL2 BIT 7
818                     ;* (MRDY) BY THE MAINTENANCE MICROCODE WITHIN ABOUT 50 MICRO-SEC., AND IF MRDY
819                     ;* DOES NOT GET SET, AN ERROR IS REPORTED.
820                     ;*
821                     ;* NEXT, THE PROGRAM LOADS SEL4 WITH 000010 AND BSEL6 WITH 125. THEN, ALL CSR'S
822                     ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
823                     ;*
824                     ;* BSEL2 IS THEN LOADED WITH A WRITE COMMAND, WHICH SHOULD CAUSE THE MICROCODE
825                     ;* TO  TRANSFER  THE  125  INTO  BSEL0. ALL CSR'S ARE THEN READ AND CHECKED FOR
826                     ;* EXPECTED CONTENTS.
827                     ;*
828                     ;* THEN, THE PROGRAM LOADS 252 INTO BSEL0 AND READS AND CHECKS ALL CSR'S. BSEL2
829                     ;* IS THEN LOADED  WITH  A  READ  COMMAND, WHICH SHOULD CAUSE THE MICROCODE TO
830                     ;* TRANSFER THE 252 INTO BSEL6.  ALL CSR'S ARE READ AND CHECKED.
831                     ;*****************************************************************************
832
833
834                     ;*****************************************************************************
835                     ;*      TEST 8  <RUN FLIP-FLOP>
836                     ;*
837                     ;* THE PROGRAM PUTS THE MICROCODE INTO THE MAINTENANCE LOOP, A 125 CHARACTER
838                     ;* IS LOADED INTO BSEL6 AND A REQUEST IS MADE TO WRITE THE CONTENTS OF BSEL6
839                     ;* INTO BSEL0. THE PROGRAM THEN READS AND CHECKS BSEL0 TO CONTAIN 125.
840                     ;* NEXT, THE RUN FLIP-FLOP IS CLEARED BY LOADING A 0 INTO RUN (BSEL1 BIT 7).
841                     ;* BSEL0 IS THEN CLEARED AND THE REQUEST IS MADE AGAIN TO WRITE THE CONTENTS
842                     ;* OF BSEL6 INTO BSEL0. THE PROGRAM STALLS FOR 50 MICRO-SEC. AND CHECKS FOR
```

```
                        ;* MRDY (BSEL2 BIT 7) NOT SET, AND BSEL0 STILL CLEARED.
                        ;* THEN, THE PROGRAM SETS THE RUN FLIP-FLOP AGAIN BY LOADING A 1 INTO RUN,
                        ;* AND CHECKS FOR MRDY SET WITHIN 50 MICRO-SEC. AND BSEL0 = 125.
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*      TEST 9  <LOW RAM (00-0F) SCRATCHPAD>
                        ;*
                        ;* THIS TEST FIRST PERFORMS AN ADDRESSING TEST OF RAM LOCATIONS (00-0F), BY
                        ;* WRITING THE ADRS INTO EACH LOCATION AND AFTER EACH WRITE, ALL THE LOCATIONS
                        ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
                        ;*
                        ;* THEN, THE TEST PERFORMS READ/WRITE DATA TESTING OF RAM LOCATIONS 00-0F,
                        ;* BY WRITING, READING, AND COMPARING ALL BYTES OF DATA PATTERN 8 IN EACH
                        ;* LOCATION.
                        ;*   DATA PATTERN 8 = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*      TEST 10 <DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)>
                        ;*
                        ;* GENERAL DESCRIPTION:
                        ;*  FIRST, THE 2K BYTE LOCATIONS IN RAM ARE LOADED WITH 0'S (SEE NOTE BELOW).
                        ;* THEN, THE FIRST LOCATION IS READ AND CHECKED, A SINGLE 1 IS WRITTEN INTO
                        ;* THE LOW BIT POSITION, AND THIS IS READ AND CHECKED. THIS IS DONE FOR ALL
                        ;* BYTES IN THE RAM, BY INCREMENTING THE ADDRESS TO POINT TO THE NEXT RAM
                        ;* LOCATION.
                        ;*  THEN, THE NEXT BIT POSITION IS CHOSEN TO INSERT A 1, AND ALL LOCATIONS
                        ;* ARE READ, WRITTEN, AND READ AS BEFORE. THIS IS CONTINUED FOR ALL BIT
                        ;* POSITIONS UNTIL THE ENTIRE RAM IS WRITTEN TO ALL 1'S. THE ABOVE OPERATIONS
                        ;* ARE PERFORMED A SECOND TIME, WITH 0'S INSERTED INTO THE RAM INSTEAD OF 1'S,
                        ;* THIS RESULTS IN THE ENTIRE RAM BEING WRITTEN TO ALL 0'S.
                        ;*  THIS TEST CONSTITUTES A THOROUGH TEST OF THE RAM. IT IS CAPABLE OF
                        ;* DETECTING THE FOLLOWING FAULTS :  STUCK ADDRESS BITS, UNI- AND BI-DIRECT-
                        ;* IONAL COUPLING BETWEEN ADDRESS BITS, STUCK MEMORY BITS, AND UNI- AND
                        ;* BI-DIRECTIONAL COUPLING BETWEEN MEMORY BITS IN BOTH ROWS AND COLUMNS OF THE
                        ;* MEMORY MATRIX.
                        ;*
                        ;* NOTE:
                        ;*  THIS TEST DOES NOT CHECK LOCATIONS 0010-001F, SO THAT THE PRIMARY CSR'S
                        ;* ARE NOT WRITTEN. IT DOES TEST LOCATIONS 0000-000F (SCRATCHPAD RAM) AND
                        ;* LOCATIONS 0020-002F (SECONDARY CSR'S), AS WELL AS 0030-0800 (BASIC RAM).
                        ;*
                        ;* THE "TMP@" REGISTERS ARE USED HERE TO CONTAIN THE VARIOUS CONSTANTS &
                        ;* VARIABLES USED THROUGHOUT THIS TEST.  A LIST OF THEIR ASSIGNMENTS SEEMS
                        ;* USEFUL SO HERE IT IS:
                        ;*
                        ;*      TMP0    POINTS TO THE FIRST LOCATION AFTER THE SELECT REGISTERS.
                        ;*
                        ;*      TMP1    - - - -
                        ;*
                        ;*      TMP2    TEST PATTERN ID CODE -- UNUSED BY THIS TEST.
                        ;*
                        ;*      TMP3    TEST DATA PATTERN INDEX -- UNUSED BY THIS TEST.
```

```
900                     ;*
901                     ;*      TMP4    TEST DATA PATTERN.  THE HIGH BYTE IS THE PATTERN BEING WRITTEN
902                     ;*              ON ANY GIVEN PASS AND THE LOW BYTE IS THE PATTERN THAT WAS
903                     ;*              WRITTEN BY THE PREVIOUS PASS THROUGH THE RAM.
904                     ;*
905                     ;*      TMP5    DATA READ FROM THE RAM.  ONLY THE LOW BYTE IS USED.
906                     ;*
907                     ;*      TMP6    ----
908                     ;*      TMP7    ----
909                     ;*      TMP8    ----
910                     ;*      TMP9    ----
911                     ;*
912                     ;*      TMPA    RAM ADDRESS BEING TESTED.
913                     ;*
914                     ;*      TMPB    BIT POINTER.  NUMBER OF THE BIT WITHIN THE DATA FIELD WHICH IS
915                     ;*              BEING SWITCHED ON EACH WRITE WITHIN THE CURRENT PASS.
916                     ;*
917                     ;*      TMPC    DATA FLAG.  BIT 0 OF THIS WORD IS THE VALUE TO WHICH THE BIT
918                     ;*              IDENTIFIED IN TMPB IS BEING SET ON EACH WRITE IN THE CURRENT
919                     ;*              PASS.
920                     ;*
921                     ;*      TMPD    DIRECTION SWITCH.  0 = FORWARD    NON-ZERO = BACKWARD
922                     ;*
923                     ;*      TMPE    LAST VALID ADDRESS TO BE TESTED.  (I.E. THE END OF RAM)
924                     ;*
925                     ;*      TMPF    ERROR FLAGS.  BIT 1 SET = THE LAST DETECTED ERROR WAS THE READ
926                     ;*              OF THE PREVIOUS DATA BEFORE WRITING THE NEW DATA.  IF BIT2 IS
927                     ;*              SET, THE READ AFTER WRITE FAILED.  IF EITHER IS SET WHEN AN
928                     ;*              ERROR IS DETECTED, THE SUPERVISOR IS NOT CALL'D AND THEREFOR
929                     ;*              IT'S ERROR COUNTER WILL NOT REFLECT THE ERROR -- INSTEAD, THE
930                     ;*              DATA LINE IS PRINTED.  (UNLESS THE ERROR HANDLER'S DATA LINE
931                     ;*              PRINT COUNT HAS EXCEDED ITS LIMIT -- IN WHICH CASE ITS
932                     ;*              INVOCATION IS IGNORED.)
933                     ;*********************************************************************************
934
935
936                     ;*********************************************************************************
937                     ;*      TEST 11 <VIA REGISTER ADRESSING>
938                     ;*
939                     ;*      VIA -- "6522 VERSATILE INTERFACE ADAPTER"
940                     ;*
941                     ;* A MASTER CLEAR IS PERFORMED, NEXT, TIMER 1 LATCHES
942                     ;* ARE CLEARED BY WRITING 000 INTO VIA REGS 6 & 7
943                     ;* THEN, 377 IS LOADED INTO DATA DIRECTION REGISTERS A, B (DDRA,DDRB) TO
944                     ;* SET THE PORT PINS FOR OUTPUT MODE.
945                     ;* THEN, A DIFFERENT BYTE OF DATA PATTERN C IS WRITTEN INTO EACH VIA
946                     ;* LOCATION, (EXCEPT THE TIMER REGS 4,5,10,11 OCT) AND AFTER EACH IS WRITTEN,
947                     ;* ALL VIA REGS (EXCEPT 4,5,10,11) ARE READ AND COMPARED TO EXPECTED
948                     ;* CONTENTS. NOTE THAT SOME VIA REGS ARE ALTERED BY THE LOADING OF OTHERS,
949                     ;* AND THE PROGRAM TAKES THIS INTO ACCOUNT, IN THE SETTING OF EXPECTED REG
950                     ;* VALUES. THE DATA PATTERN IS CHOSEN TO AVOID ACTIVATING THE VIA CHIP (SUCH
951                     ;* AS GENERATING OUTPUTS ON CA1, CA2, CB1, CB2, OR CAUSING 6502
952                     ;* INTERRUPT REQUESTS).
953                     ;*  DATA PATTERN C (WITH VIA REGS AND THEIR DATA SHOWN IN OCTAL) :
954                     ;*   REGISTER = 00   01   02   03   06   07   12   13   14   15   16   17
955                     ;*        DATA = 100, 101, 377, 377, 106, 107, 112, 040, 042, 000, 200, 113
956                     ;* NEXT, 000 IS LOADED INTO DDRA, AND DDR3 IS READ AND COMPARED TO 377, THEN,
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                        ;* THE 377 IS LOADED BACK INTO DDRA, AND DDRB IS LOADED WITH 000 AND DDRA IS
                        ;* READ AND COMPARED TO 377.
                        ;*************************************************************************


                        ;*************************************************************************
                        ;*      TEST 12 <VIA'S DDRB DATA READ/WRITE>
                        ;*
                        ;*      DDRB == "DATA DIRECTION REGISTER B"
                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                        ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER B ARE TESTED BY WRITING,
                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                        ;*************************************************************************


                        ;*************************************************************************
                        ;*      TEST 13 <VIA'S DDRA DATA READ/WRITE>
                        ;*
                        ;*      DDRA == "DATA DIRECTION REGISTER A"
                        ;*
                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                        ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER A ARE TESTED BY WRITING,
                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                        ;*************************************************************************


                        ;*************************************************************************
                        ;*      TEST 14 <VIA'S ORB DATA READ/WRITE>
                        ;*
                        ;*      ORB == "OUTPUT REGISTER PORT B"
                        ;*
                        ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DATA
                        ;* DIR. REG. B (DDRB) TO SET ALL B PORT PINS FOR OUTPUT MODE. THEN ,
                        ;* READ/WRITE BITS 0-7 OF VIA OUTPUT REG. PORT B ARE TESTED BY WRITING,
                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                        ;*************************************************************************


                        ;*************************************************************************
                        ;*      TEST 15 <VIA'S T1 DATA READ/WRITE>
                        ;*
                        ;*      T1 == "TIMER #1"
                        ;*
                        ;* THIS TEST WRITES, READS, AND CHECKS THE T1 LATCHES AND COUNTER REGISTERS
                        ;* WITH DATA PATTERNS IN EACH OF 3 SUBTESTS.
                        ;*
                        ;*
                        ;* FIRST SUBTEST:  CHECKS FOR PROPER LOADING OF LATCHES
                        ;*      IT ALSO CHECKS TO BE SURE THAT THE COUNTER APPEARS TO BE DOING
                        ;*      SOMETHING TO THE COUNTERS.  AS LONG AS THEY HAVE CHANGED FROM THE
                        ;*      VALUE LOADED INTO THEM, WE WILL BE SATISFIED.
```

```
1014                    ;*
1015                    ;* A. A MASTER CLEAR IS PERFORMED.
1016                    ;* B. ALL LATCHES ARE LOADED TO ZEROES (JUST IN CASE), ACR6 & ACR7 ARE SET
1017                    ;*    TO ZERO (MODE 00), AND "T1" INTERRUPT ENABLE FLAG IS CLEARED.
1018                    ;*
1019                    ;* C. T1L-L(ADR 04) IS LOADED WITH THE CURRENT BYTE OF DATA PATTERN B.
1020                    ;* D. T1L-L(ADR 06) IS READ AND COMPARED TO THE BYTE JUST WRITTEN.
1021                    ;* E. T1C-L(ADR 04) IS READ AND CHECKED TO BE DIFFERENT THAN THE TEST BYTE.
1022                    ;*
1023                    ;* F. T1L-L(ADR 06) IS LOADED WITH THE COMPLEMENT OF THE CURRENT DATA BYTE.
1024                    ;* G. T1L-L(ADR 06) IS READ AND COMPARED TO THE BYTE JUST WRITTEN.
1025                    ;*
1026                    ;* H. T1L-L(ADR 06) IS RE-LOADED WITH 0 TO MAKE T1C-H DECREMENT FAST.
1027                    ;*    T1L-H(ADR 05) IS LOADED WITH THE ORIGINAL TEST DATA PATTERN BYTE.
1028                    ;* I. T1L-H(ADR 07) IS READ AND COMPARED TO THE BYTE LOADED INTO T1L-H.
1029                    ;*
1030                    ;* J. T1C-H(ADR 05) IS READ AND CHECKED TO BE DIFFERENT THAN THE TEST BYTE.
1031                    ;*
1032                    ;* K. T1L-H(ADR 07) IS LOADED WITH THE COMPLEMENT OF THE CURRENT DATA BYTE.
1033                    ;* L. T1L-H(ADR 07) IS READ AND COMPARED TO THE BYTE JUST LOADED.
1034                    ;*
1035                    ;* M. STEPS C-L ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
1036                    ;*
1037                    ;*
1038                    ;* SECOND SUBTEST:  CHECKS FOR CROSS-TALK AND ADDRESSING ERRORS
1039                    ;*                  FROM T1L-L TO T1L-H
1040                    ;*
1041                    ;* A. T1L-H(ADR 07) IS LOADED WITH 000 TO CLEAR IT.
1042                    ;* B. T1L-L(ADR 06) IS LOADED WITH A BYTE OF DATA PATTERN B.
1043                    ;* C. T1L-L(ADR 06) IS READ AND COMPARED TO THE DATA JUST WRITTEN.
1044                    ;* D. T1L-H(ADR 07) IS READ AND COMPARED TO 000.
1045                    ;* E. STEPS B-D ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
1046                    ;*
1047                    ;*
1048                    ;* THIRD SUBTEST:  CHECKS FOR CROSS-TALK AND ADDRESSING ERRORS
1049                    ;*                  FROM T1L-H TO T1L-L
1050                    ;*
1051                    ;* A. T1L-L(ADR 04) IS LOADED WITH 000 TO CLEAR IT
1052                    ;* B. T1L-H(ADR 07) IS LOADED WITH A BYTE OF DATA PATTERN B.
1053                    ;* C. T1L-H(ADR 07) IS READ AND COMPARED TO THE DATA JUST WRITTEN.
1054                    ;* D. T1L-L(ADR 06) IS READ AND COMPARED TO 000.
1055                    ;* E. STEPS B-D ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
1056                    ;*
1057                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
1058                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
1059                    ;*****************************************************************************
1060
1061
1062                    ;*************************/***************************************************
1063                    ;*      TEST 16 <VIA'S SR DATA READ/WRITE>
1064                    ;*
1065                    ;*      SR == "SHIFT REGISTER"
1066                    ;*
1067                    ;* FIRST, A MASTER CLEAR IS PERFORMED AND THE ACR IS SET TO 000. THEN :
1068                    ;* READ/WRITE BITS 0-7 OF VIA SHIFT REGISTER ARE TESTED BY WRITING, READING,
1069                    ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
1070                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
```

```
1071                    ;*                      200, 376, 375, 373, 367, 357, 337, 277, 177, 000
1072                    ;*****************************************************************************
1073
1074
1075                    ;*****************************************************************************
1076                    ;*      TEST 17 <VIA'S ACR DATA READ/WRITE>
1077                    ;*
1078                    ;*      ACR -- "AUXILIARY CONTROL REGISTER"
1079                    ;*
1080                    ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
1081                    ;* READ/WRITE BITS 0-7 OF THE ACR ARE TESTED BY WRITING, READING,
1082                    ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
1083                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
1084                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
1085                    ;*****************************************************************************
1086
1087
1088                    ;*****************************************************************************
1089                    ;*      TEST 18 <VIA'S PCR DATA READ/WRITE>
1090                    ;*
1091                    ;*      PCR -- "PERIPHERAL CONTROL REGISTER"
1092                    ;*
1093                    ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
1094                    ;* READ/WRITE BITS 0-7 OF THE PCR REGISTER ARE TESTED BY WRITING, READING,
1095                    ;* AND COMPARING EACH BYTE OF A SUBSET OF DATA PATTERN B.
1096                    ;*   DATA PATTERN B (SUBSET) =  125, 252, 000, 377, 001, 002, 004, 010, 020,
1097                    ;*                              040, 100, 200.
1098                    ;*****************************************************************************
1099
1100
1101                    ;*****************************************************************************
1102                    ;*      TEST 19 <VIA'S IER DATA READ/WRITE>
1103                    ;*
1104                    ;*      IER -- "INTERRUPT ENABLE REGISTER"
1105                    ;*
1106                    ;* BITS 0-6 OF THE IER CAN BE SET OR CLEARED ON A WRITE, UNDER CONTROL OF THE
1107                    ;* SET/CLEAR CONTROL BIT 7. TO TEST THIS , EACH BYTE OF DATA PATTERN D IS
1108                    ;* WRITTEN INTO IER, AND THE REGISTER IS READ AND COMPARED TO THE CORRESPOND-
1109                    ;* ING BYTE OF DATA PATTERN E.
1110                    ;*
1111                    ;*   DATA PATTERN D = 200, 201, 202, 204, 210, 220, 240, 300, 200, 000, 001,
1112                    ;*                    002, 004, 010, 020, 040, 100, 000, 325, 125, 252, 052
1113                    ;*
1114                    ;*   DATA PATTERN E = 000, 001, 003, 007, 017, 037, 077, 177, 177, 177, 176,
1115                    ;*                    174, 170, 160, 140, 100, 000, 000, 125, 000, 052, 000
1116                    ;*
1117                    ;*****************************************************************************
1118
1119
1120                    ;*****************************************************************************
1121                    ;*      TEST 20 <VIA'S ORB/DDRB MASTER CLEAR TEST>
1122                    ;*
1123                    ;*      ORB -- "OUTPUT REGISTER PORT B"
1124                    ;*      DDRB -- "DATA DIRECTION REGISTER B"
1125                    ;*
1126                    ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DDRB TO SET
1127                    ;* ALL B PORT PINS FOR OUTPUT MODE. THEN, A 000 BYTE IS WRITTEN INTO ORB AND
```

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1128                    ;* THE REGISTER IS READ BACK AND CHECKED FOR 000. THEN, A MASTER CLEAR IS
1129                    ;* PERFORMED AND ORB IS READ AND CHECKED FOR 377.
1130                    ;*****************************************************************************
1131
1132
1133                    ;*****************************************************************************
1134                    ;*      TEST 21 <VIA'S DDRB MASTER CLEAR TEST>
1135                    ;*
1136                    ;*      DDRB -- "DATA DIRECTION REGISTER B"
1137                    ;*
1138                    ;* A 377 BYTE IS WRITTEN INTO DDRB AND THE REGISTER IS READ BACK AND CHECKED
1139                    ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRB IS READ AND CHECKED FOR
1140                    ;* 000.
1141                    ;*
1142                    ;* NOTE:  THIS TESTING IS ALSO DONE IN TEST 23.  IT IS INCLUDED HERE ONLY TO
1143                    ;*        PROVIDE TIGHTER LOOPING ON JUST THE DDRB MASTER CLEAR CHECKING.
1144                    ;*****************************************************************************
1145
1146
1147                    ;*****************************************************************************
1148                    ;*      TEST 22 <VIA'S DDRA MASTER CLEAR TEST>
1149                    ;*
1150                    ;*      DDRA -- "DATA DIRECTION REGISTER A"
1151                    ;*
1152                    ;* A 377 BYTE IS WRITTEN INTO DDRA AND THE REGISTER IS READ BACK AND CHECKED
1153                    ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRA IS READ AND CHECKED FOR
1154                    ;* 000.
1155                    ;*****************************************************************************
1156
1157
1158                    ;*****************************************************************************
1159                    ;*      TEST 23 <VIA'S SR MASTER CLEAR TEST>
1160                    ;*
1161                    ;*      SR -- "SHIFT REGISTER"
1162                    ;*
1163                    ;* A 123 BYTE IS WRITTEN INTO SR AND THE REGISTER IS READ BACK AND CHECKED
1164                    ;* FOR 123. THEN, A MASTER CLEAR IS PERFORMED AND SR IS READ AND CHECKED FOR
1165                    ;* NO CHANGE.
1166                    ;*****************************************************************************
1167
1168
1169                    ;*****************************************************************************
1170                    ;*      TEST 24 <VIA'S ACR MASTER CLEAR TEST>
1171                    ;*
1172                    ;*      ACR -- "AUXILIARY CONTROL REGISTER"
1173                    ;*
1174                    ;* A 252 BYTE IS WRITTEN INTO ACR AND THE REGISTER IS READ BACK AND CHECKED
1175                    ;* FOR 252. THEN, A MASTER CLEAR IS PERFORMED AND ACR IS READ AND CHECKED FOR
1176                    ;* 000, TO VERIFY THAT IT IS CLEARED BY MASTER CLEAR.
1177                    ;*****************************************************************************
1178
1179
1180                    ;*****************************************************************************
1181                    ;*      TEST 25 <VIA'S PCR MASTER CLEAR TEST>
1182                    ;*
1183                    ;*      PCR -- "PERIPHERAL CONTROL REGISTER"
1184                    ;*
```

```
1185                    ;* A 377 BYTE IS WRITTEN INTO PCR AND THE REGISTER IS READ BACK AND CHECKED
1186                    ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND PCR IS READ AND CHECKED FOR
1187                    ;* 000.
1188                    ;*****************************************************************************
1189
1190
1191                    ;*****************************************************************************
1192                    ;*      TEST 26 <VIA'S IER MASTER CLEAR TEST>
1193                    ;*
1194                    ;*      IER = "INTERRUPT ENABLE REGISTER"
1195                    ;*
1196                    ;* A 377 BYTE IS WRITTEN INTO IER AND THE REGISTER IS READ BACK AND CHECKED
1197                    ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND IER IS READ AND CHECKED FOR
1198                    ;* 200.
1199                    ;*****************************************************************************
1200
```

```
1202
1203
1204                    8.0 ERROR INFORMATION
1205
1206
1207                    8.1 ERROR REPORTING
1208
1209                    ERRORS  ARE  REPORTED  BY  THE PROGRAM AS THEY OCCUR (IF NOT
1210                    INHIBITED). THE REPORT CONFORMS TO THE DIAGNOSTIC SUPERVISOR
1211                    ERROR  REPORT  FORMAT,  AND CONSISTS OF A DESCRIPTION OF THE
1212                    ERROR, THE TEST NUMBER, SUBTEST  NUMBER,  PC  OF  THE  ERROR
1213                    CALL,   DEVICE   ADDRESS,   AND  BASIC  AND  EXTENDED  ERROR
1214                    INFORMATION.
1215
1216                    THE FOLLOWING EXAMPLE PROVIDES A TYPICAL ERROR REPORT, WHICH
1217                    DESCRIBES A "MASTER CLEAR FAILURE" ERROR, AND PROVIDES THE PC
1218                    OF THE ERROR CALL AND THE DEVICE REGISTER CONTENTS :
1219
1220                      CNDMA DVC FTL ERR 00001 ON UNIT 00 TST 002 SUB 000 PC: 021122
1221                      MASTER CLEAR FAILURE
1222
1223                        THE CONTENTS OF ALL BYTE SELECT REG'S ARE:
1224                      BSEL0   BSEL1   BSEL2   BSEL3
1225                       000     000     000     000
1226                          BSEL4   BSEL5   BSEL6   BSEL7
1227                           000     000     121     000
1228                    BSEL10  BSEL11  BSEL12  BSEL13
1229                     000     000     000     000
1230                        BSEL14  BSEL15  BSEL16  BSEL17
1231                         000     000     000     000
1232
1233                    FOR OTHER ERRORS, THE REPORT  MAY  BE  MORE  EXTENSIVE,  AND
1234                    REQUIRE ADDITIONAL DATA TO BE REPORTED.
1235
1236                    IF  EXTENDED  ERROR INFORMATION HAD BEEN INHIBITED USING THE
1237                    IXE FLAG PRIOR TO RUNNING THE TEST, THE  ABOVE  ERROR  WOULD
1238                    HAVE BEEN REPORTED IN THE FOLLOWING SHORTENED FORM :
1239
1240                      CNDMA DVC FTL ERR 00001 ON UNIT 00 TST 002 SUB 000 PC: 021122
1241                      MASTER CLEAR FAILURE
1242
1243                    .
```

LISTING & ASSEMBLY CONTROL

```
                                .SBTTL  LISTING & ASSEMBLY CONTROL

000000                          HELP=0          ; CONTROL LISTING OF HELP INFORMATION
                                                ; HELP=0   NO LIST
                                                ; HELP=1   LIST

002000                                  .=2000

                                        .MCALL  SVC
002000                                  SVC                             ; INITIALIZE SUPERVISOR MACROS

002000                                  BGNMOD  LU1MOD

000001                          $LSTIN= 1
000001                          $LSTTAG= 1
000001                          SVCINS= 1       ; LIST INSTRUCTIONS, SHIFTED RIGHT
000001                          SVCTST= 1       ; LIST TEST TAGS, SHIFTED RIGHT
000001                          SVCSUB= 1       ; LIST SUBTEST TAGS, SHIFTED RIGHT
000001                          SVCGBL= 1       ; LIST GLOBAL TAGS, SHIFTED RIGHT
000001                          SVCTAG= 1       ; LIST OTHER TAGS, SHIFTED RIGHT

                                ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
                                ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
                                ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
                                ;       CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.

002000                            POINTER BGNAU,BGNDU,ERRTBL
```

PROGRAM HEADER

```
                                .SBTTL PROGRAM HEADER
                                ;**
                                ;THE PROGRAM HEADER MACRO CHARACTERIZES THIS DIAGNOSTIC. THE
                                ;HEADER MACRO'S ARGUMENTS ARE FILE NAME, RELEASE LEVEL, PATCH
                                ;DISPOSITION OF THE MOST RECENT PATCH, MAXIMUM TEST TIME IN SEC.,
                                ;AND THE TYPE OF DIAGNOSTIC (0-SEQUENTIAL, 1-EXERCISER).  THESE
                                ;ARGUMENTS ARE IN RESPECTIVE ORDER.
                                ;-

                                HEADER CNDMA,A,0,110.,,0
002000                                                          L$NAME::
002000  103                                                             .ASCII /C/
002001  116                                                             .ASCII /N/
002002  104                                                             .ASCII /D/
002003  115                                                             .ASCII /M/
002004  101                                                             .ASCII /A/
002005  000                                                             .BYTE   0
002006  000                                                             .BYTE   0
002007  000                                                             .BYTE   0
002010                                                          L$REV::
002010  101                                                             .ASCII  /A/
002011                                                          L$DEPO::
002011  060                                                             .ASCII  /0/
002012                                                          L$UNIT::
002012  000000                                                          .WORD   0
002014                                                          L$TIML::
002014  000156                                                          .WORD   110.
002016                                                          L$HPCP::
002016  040122                                                          .WORD   L$HARD
002020                                                          L$SPCP::
002020  000000                                                          .WORD   0
002022                                                          L$HPTP::
002022  002216                                                          .WORD   L$HW
002024                                                          L$SPTP::
002024  000000                                                          .WORD   0
002026                                                          L$LADP::
002026  040400                                                          .WORD   L$LAST
002030                                                          L$STA::
002030  000000                                                          .WORD   0
002032                                                          L$CO::
002032  000000                                                          .WORD   0
002034                                                          L$DTYP::
002034  000000                                                          .WORD   0
002036                                                          L$APT::
002036  000000                                                          .WORD   0
002040                                                          L$DTP::
002040  002124                                                          .WORD   L$DISPATCH
002042                                                          L$PRIO::
002042  000000                                                          .WORD   0
002044                                                          L$ENVI::
002044  000000                                                          .WORD   0
002046                                                          L$EXPL::
002046  000000                                                          .WORD   0
002050                                                          L$MREV::
002050     003                                                          .BYTE   C$REVISION
002051     003                                                          .BYTE   C$EDLI
002052                                                          L$EF::
```

PROGRAM HEADER

```
002052  000000                          .WORD   0
002054  000000                          .WORD   0
002056                          L$SPC::
002056  000000                          .WORD   0
002060                          L$DEVP::
002060  003522                          .WORD   L$DVTYP
002062                          L$REPP::
002062  000000                          .WORD   0
002064                          L$EXP4::
002064  000000                          .WORD   0
002066                          L$EXP5::
002066  000000                          .WORD   0
002070                          L$AUT::
002070  020400                          .WORD   L$AU
002072                          L$DUT::
002072  020374                          .WORD   L$DU
002074                          L$LUN::
002074  000000                          .WORD   0
002076                          L$DESP::
002076  003542                          .WORD   L$DESC
002100                          L$LOAD::
002100  104035                          EMT     E$LOAD
002102  002236                  L$ETP::
                                        .WORD   L$ERRTBL
002104                          L$ICP::
002104  017622                          .WORD   L$INIT
002106                          L$CCP::
002106  020356                          .WORD   L$CLEAN
002110                          L$ACP::
002110  020232                          .WORD   L$AUTO
002112                          L$PRT::
002112  017614                          .WORD   L$PROT
002114                          L$TEST::
002114  000000                          .WORD   0
002116                          L$DLY::
002116  000000                          .WORD   0
002120                          L$HIME::
002120  000000                          .WORD   0
1297
1303                            .EVEN
```

DISPATCH TABLE

```
1305                            .SBTTL DISPATCH TABLE
1306
1307                            ;//////////////////////////////////////////////////////////////////////////////
1308                            ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
1309                            ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
1310                            ;//////////////////////////////////////////////////////////////////////////////
1311
1312 002122                             DISPATCH        28.
      002122  000034                                                    .WORD   28
      002124                                                  L$DISPATCH::
      002124  020402                                                    .WORD   T1
      002126  021146                                                    .WORD   T2
      002130  021256                                                    .WORD   T3
      002132  021450                                                    .WORD   T4
      002134  021612                                                    .WORD   T5
      002136  021734                                                    .WORD   T6
      002140  022136                                                    .WORD   T7
      002142  022646                                                    .WORD   T8
      002144  023214                                                    .WORD   T9
      002146  024162                                                    .WORD   T10
      002150  025142                                                    .WORD   T11
      002152  025764                                                    .WORD   T12
      002154  026046                                                    .WORD   T13
      002156  026130                                                    .WORD   T14
      002160  026232                                                    .WORD   T15
      002162  027276                                                    .WORD   T16
      002164  027360                                                    .WORD   T17
      002166  027442                                                    .WORD   T18
      002170  027526                                                    .WORD   T19
      002172  027614                                                    .WORD   T20
      002174  030102                                                    .WORD   T21
      002176  030232                                                    .WORD   T22
      002200  030362                                                    .WORD   T23
      002202  030516                                                    .WORD   T24
      002204  030646                                                    .WORD   T25
      002206  030776                                                    .WORD   T26
      002210  031134                                                    .WORD   T27
      002212  036366                                                    .WORD   T28
1313
```

```
                                .SBTTL DEFAULT HARDWARE P-TABLE

                                ;////////////////////////////////////////////////////////////////////////////
                                ;/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                ;/ THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                ;/ IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
                                ;////////////////////////////////////////////////////////////////////////////

002214                                  BGNHW   DFPTBL
002214  000007                                                                  .WORD   L10000-L$HW/2
002216                                                                  L$HW::
002216                                                                  DFPTBL::

002216  160020                          .WORD   160020          ;DMV11 CSR UNIBUS ADDRESS
002220  000300                          .WORD      300          ;DMV11 INTERRUPT VECTOR
002222  004000                          .WORD     4000          ;DMV11 INTERRUPT PRIORITY LEVEL = 4
002224  000000                          .WORD      000          ;SWITCH REG. #1 (BOOT ADDRESS)
002226  000000                          .WORD      000          ;SWITCH REG. #2 (DDCMP ADDRESS)
002230  000000                          .WORD        0          ;H3254&H3255 USED
002232  000111                          .WORD   000111          ;MISC. CONTROLS:

                                ; POWER-UP MODE 0 MASK = 100
                                ;   0 = NOT JUMPERED FOR MODE 0 POWER-UP
                                ;   1 = JUMPERED FOR MODE 0 POWER-UP    <*** DEFAULT SETTING
                                ;       BOTH W5 & W6 REMOVED

                                ; BAUD RATE MASK = 77
                                ;       7 = 19.2 K
                                ;       11 = 56 K       <*** DEFAULT SETTING

002234                                  ENDHW
002234                                                                  L10000:
```

F3

SOFTWARE P-TABLE

```
1350                            .SBTTL SOFTWARE P-TABLE
1351
1352                            ;////////////////////////////////////////////////////////////////////////
1353                            ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
1354                            ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
1355                            ;////////////////////////////////////////////////////////////////////////
1356
1357 002234                            BGNSW   SFPTBL
     002234  000000                                                        .WORD   L10001-L$SW/2
     002236                                                         L$SW::
     002236                                                         SFPTBL::
1358 002236                            ENDSW
     002236                                                         L10001:
```

GLOBAL EQUATES SECTION

```
1360                            .SBTTL GLOBAL EQUATES SECTION
1361
1362
1363                            ;//////////////////////////////////////////////////////////////////////////
1364                            ;/      THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
1365                            ;/      ARE USED IN MORE THAN ONE TEST.
1366                            ;//////////////////////////////////////////////////////////////////////////
1367
1368 002236                            EQUALS
                                ;
                                ; BIT DIFINITIONS
                                ;
            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
                                ;
            001000              BIT9==  BIT09
            000400              BIT8==  BIT08
            000200              BIT7==  BIT07
            000100              BIT6==  BIT06
            000040              BIT5==  BIT05
            000020              BIT4==  BIT04
            000010              BIT3==  BIT03
            000004              BIT2==  BIT02
            000002              BIT1==  BIT01
            000001              BIT0==  BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;
                                ;                                   ; BIT POSITION IN SECOND STATUS WORD
            000040              EF.START==      32.                 ; (100000) START COMMAND WAS ISSUED
            000037              EF.RESTART==    31.                 ; (040000) RESTART COMMAND WAS ISSUED
            000036              EF.CONTINUE==   30.                 ; (020000) CONTINUE COMMAND WAS ISSUED
            000035              EF.NEW==        29.                 ; (010000) A NEW PASS HAS BEEN STARTED
            000034              EF.PWR==        28.                 ; (004000) A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
            000340              PRI07== 340
            000300              PRI06== 300
            000240              PRI05== 240
            000200              PRI04== 200
```

GLOBAL EQUATES SECTION

```
                000140          PRIO3== 140
                000100          PRIO2== 100
                000040          PRIO1== 40
                000000          PRIO0== 0
                                ;
                                ;OPERATOR FLAG BITS
                                ;
                000004          EVL==     4
                000010          LOT==    10
                000020          ADR==    20
                000040          IDU==    40
                000100          ISR==   100
                000200          UAM==   200
                000400          BOE==   400
                001000          PNT==  1000
                002000          PRI==  2000
                004000          IXE==  4000
                010000          IBE== 10000
                020000          IER== 20000
                040000          LOE== 40000
                100000          HOE== 100000
1369
1370                            .SBTTL  DEFINE THE NUMBER OF CSR'S
1371            000020          CSREGS  = 16.
1372
1373                            ;-----------------------------------------------------------------------------
1374
1375                            .SBTTL  NPR ADDRESS REGISTER EQUATES
1376            000070          NPRAOL  = 70                    ;OUT NPR ADRS LO REG
1377            000071          NPRAOH  = NPRAOL+1              ;OUT NPR ADRS HI REG
1378            000072          NPRAOX  = NPRAOL+2              ;OUT NPR EXTENDED ADRS REG
1379            000074          NPRAIL  = NPRAOL+4              ;IN NPR ADRS LO REG
1380            000075          NPRAIH  = NPRAOL+5              ;IN NPR ADRS HI REG
1381            000076          NPRAIX  = NPRAOL+6              ;IN NPR EXTENDED ADRS REG
1382            000010          NPRBS7  = BIT3                  ;"BANK SELECT 7" BIT -- W/IN EXTENDED ADRS. REG.
1383
1384
1385
1386                            .SBTTL  NPR DATA REG EQUATES
1387            123000          NPRDRL  = 123000                ;NPR DATA REGISTER -- LOW BYTE
1388            123001          NPRDRH  = NPRDRL+1              ;NPR DATA REGISTER -- HIGH BYTE
1389
1390
1391
1392                            .SBTTL  NPR CONTROL REG EQUATES
1393            123004          NPRCTL  = NPRDRL+4              ;NPR CONTROL REGISTER
1394            000200          NPRABT  = BIT7                  ;=1 IF BUS TIME OUT ON NPR
1395            000100          NPRGO   = BIT6                  ;SET FOR NOP, CLEAR TO "GO" / 0=DONE, 1=BUSY
1396            000040          NPRIO   = BIT5                  ;0 = (LSI ==> DMV);  1 = (DMV ==> LSI)
1397            000020          LSIHLT  = BIT4                  ;SETTING THIS WILL "HALT" THE LSI-11 !!
1398            000010          NPRBYT  = BIT3                  ;SET TO 1 TO WRITE BYTE ONLY TO LSI 11
1399            000004          DMVPU   = BIT2                  ;SET BY MICRO-DIAG.  MUST REMAIN SET!!!
1400            000002          LSIDCL  = BIT1                  ;IF SET, WILL CAUSE POWER DOWN CONDITION IN LSI!
1401            000001          DMVDAI  = BIT0                  ;"DISABLE INIT" FROM EFFECTING DMV-11
1402
1403
1404                            .SBTTL  NPR REQUEST FUNCTIONS
```

NPR REQUEST FUNCTIONS

```
1405          000004                NPRLD   = DMVPU                 ;WORD XFER:  LSI ==> DMV
1406          000044                NPRDL   = DMVPU!NPRIO           ;WORD XFER:  DMV ==> LSI
1407          000054                NPRDLB  = DMVPU!NPRIO!NPRBYT    ;BYTE XFER:  DMV ==> LSI
1408
1409                                ;-------------------------------------------------------------------------------
1410
1411                                .SBTTL  INTERRUPT REG EQUATES
1412          123005                IRQREG  = 123005                ;INTERRUPT REQUEST REG
1413          000004                IRQA    = BIT2                  ;REQUEST BIT FOR XXO INTERRUPT -- "A"
1414          000002                IRQB    = BIT1                  ;REQUEST BIT FOR XX4 INTERRUPT -- "B"
1415
1416                                ;-------------------------------------------------------------------------------
1417
1418                                .SBTTL  CONTROL FLAGS FROM P-TABLE ENTRIES
1419          000001                PU24    = BIT0                  ;POWER-FAIL VECTORING MODE.  1 = MODE 0
1420                                                                ;  (I.E. JUMPERS W5 & W6 BOTH REMOVED)
```

SWITCH PACKS

```
1422                            .SBTTL  SWITCH PACKS
1423
1424                            ;;*****************************************************************************
1425                            ;* SWITCH PACKS
1426                            ;;*****************************************************************************
1427
1428            121000          SWPBOT  = 121000                ;"BOOT ADDRESS" SWITCH PACK [A200]
1429            121400          SWPDDCMP = 121400               ;"DDCMP ADDRESS" SWITCH PACK [A300]
1430
```

```
                        .SBTTL  CSR REG. DEFINITION FOR MAINT. LOOP

                        ;++*************************************************************************
                        .SBTTL          MAINTENANCE REGISTER - BSEL0
                        ;--*************************************************************************
                        ;       INTERRUPT ENABLE BITS

000001                  IENBA   = BIT0                  ;INTERRUPT ENABLE "A"
000020                  IENBB   = BIT4                  ;INTERRUPT ENABLE "B"


                        ;++*************************************************************************
                        .SBTTL          MAINTENANCE REGISTER - BSEL1
                        ;--*************************************************************************
                        ; MAINT. LOOP CONTROL BITS:

000200                  RUN     = BIT7
000100                  MCLR    = BIT6
000001                  MREQ    = BIT0


                        ;++*************************************************************************
                        .SBTTL          MAINTENANCE REGISTER - BSEL2
                        ;--*************************************************************************
                        ; MAINTENANCE FUNCTION CODES

000001                  REDLOC  = 1                     ;FUNCTION CODE FOR READ A 6502 LOCATION
000002                  WRILOC  = 2                     ;FUNCTION CODE FOR WRITE A 6502 LOCATION
000003                  REDPAG  = 3                     ;FUNCTION CODE FOR READ A 6502 MEMORY PAGE
000004                  WRIPAG  = 4                     ;FUNCTION CODE FOR WRITE A 6502 RAM PAGE
000005                  EXECUT  = 5                     ;FUNCTION CODE FOR EXECUTE AT GIVEN PC

000200                  MRDY    = BIT7                  ;M-LOOP REDY FOR A COMMAND WHEN SET
```

```
1466                            .SBTTL  DMV INTERNAL ADDRESSES
1467
1468                            ;**************************************************************************
1469                            ;                       DMV INTERNAL ADDRESSES
1470                            ;--**********************************************************************
1471
1472
1473                            ;#########  <<  MICROPROCESSOR REGISTER ADDRESS EQUATES  >>  ##########
1474
1475                            .SBTTL          BYTE & WORD SELECT REGISTERS
1476
1477    000020                  SLTO    =020
1478    000020                  BSLTO   =SLTO
1479    000021                  BSLT1   =SLTO+1
1480    000022                  SLT2    =SLTO+2
1481    000022                  BSLT2   =SLTO+2
1482    000023                  BSLT3   =SLTO+3
1483    000024                  SLT4    =SLTO+4
1484    000024                  BSLT4   =SLTO+4
1485    000025                  BSLT5   =SLTO+5
1486    000026                  SLT6    =SLTO+6
1487    000026                  BSLT6   =SLTO+6
1488    000027                  BSLT7   =SLTO+7
1489
1490                            .SBTTL          VIA'S REGISTERS
1491
1492    120000                  ORB     =120000
1493    120001                  ORA     =ORB+1
1494    120002                  DDRB    =ORB+2
1495    120003                  DDRA    =ORB+3
1496    120004                  T1CL    =ORB+4
1497    120005                  T1CH    =ORB+5
1498    120005                  T1LHGO  =ORB+5
1499    120006                  T1LL    =ORB+6
1500    120007                  T1LH    =ORB+7
1501    120010                  T2LL    =ORB+10
1502    120010                  T2CL    =T2LL
1503    120011                  T2CH    =ORB+11
1504    120012                  SR      =ORB+12
1505    120013                  ACR     =ORB+13
1506    120014                  PCR     =ORB+14
1507    120015                  IFR     =ORB+15
1508    120016                  IENR    =ORB+16
1509    120017                  ORAM    =ORB+17
1510
1511                            .SBTTL          VIA'S "IFR" REGISTER'S BIT ASSIGNMENTS
1512
1513    000200                  IFRIRQ  =BIT7   ;"IRQ" HAS BEEN ISSUED -- LOGICAL "OR" OF BITS 0 --> 6
1514    000100                  IFRT1   =BIT6   ;"T1" -- TIMER # 1 TIMED-OUT
1515    000040                  IFRT2   =BIT5   ;"T2" -- TIMER # 1 TIMED-OUT
1516    000020                  IFRCB1  =BIT4   ;"CB1" EDGE DETECTED ("K2 LINE UNIT STEP" O/P SIGNAL FROM SR)
1517    000010                  IFRCB2  =BIT3   ;"CB2" EDGE DETECTED (UNUSED!)
1518    000004                  IFRSR   =BIT2   ;"SR" REGISTER COMPLETED SHIFT OPERATION
1519    000002                  IFRCA1  =BIT1   ;"CA1" EDGE DETECTED ("K6 MOD RDY H")
1520    000001                  IFRCA2  =BIT0   ;"CA2" EDGE DETECTED ("K2 CTS H")
1521
1522
```

```
                        .SBTTL GLOBAL DATA SECTION

                        ;////////////////////////////////////////////////////////////////////////////
                        ;/      THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
                        ;/      IN MORE THAN ONE TEST.
                        ;////////////////////////////////////////////////////////////////////////////

                        ;+*************************************************************************
                        .SBTTL  CONTROL BLOCK FOR STACKED ERROR MESSAGES
                        ;--*************************************************************************

                                ERRTBL                                          L$ERRTBL::
002236  000000          ERRTYP::        .WORD   0
002240  000000          ERRNBR::        .WORD   0
002242  000000          ERRMSG::        .WORD   0
002244  000000          ERRBLK::        .WORD   0

                        ;+*************************************************************************
                        .SBTTL  STORAGE FOR DEVICE REGISTERS
                        ;--*************************************************************************
002246                  WSR0:
002246  000000          BSR0:   .WORD   0
002250                  WSR2:
002250  000000          BSR1:   .WORD   0
002252                  WSR4:
002252  000000          BSR2:   .WORD   0
002254                  WSR6:
002254  000000          BSR3:   .WORD   0
002256                  WSR10:
002256  000000          BSR4:   .WORD   0
002260                  WSR12:
002260  000000          BSR5:   .WORD   0
002262                  WSR14:
002262  000000          BSR6:   .WORD   0
002264                  WSR16:
002264  000000          BSR7:   .WORD   0
002266  000000          BSR10:  .WORD   0
002270  000000          BSR11:  .WORD   0
002272  000000          BSR12:  .WORD   0
002274  000000          BSR13:  .WORD   0
002276  000000          BSR14:  .WORD   0
002300  000000          BSR15:  .WORD   0
002302  000000          BSR16:  .WORD   0
002304  000000          BSR17:  .WORD   0

                        ;+*************************************************************************
                        .SBTTL  MISCELLANEOUS STORAGE
                        ;--*************************************************************************
002306  000000          TDATA:  .WORD   0               ;TEST DATA
002310  000000          GDATA:  .WORD   0               ;EXPECTED DATA
002312  000000          BDATA:  .WORD   0               ;ACTUAL DATA
002314  000000          XDATA:  .WORD   0               ;EXCLUSIVE OR BETWEEN "GDATA" & "BDATA"
002316  110400          DELAY1: .WORD   110400          ;DELAY TIME, 3 INST., 500 MILLISEC.
002320  000007          DELAY2: .WORD   7               ;DELAY TIME FOR M-LOOP FUNCTION, 100 USEC.APPROX.
002322  000000          LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
002324  000000          PSTACK: .WORD   0               ;CONTAINS BASE LEVEL PROGRAM STACK POINTER
```

MISCELLANEOUS STORAGE

```
1825 002326  000000          INTFLG: .WORD   0               ;INTERRUPT RECEIVED FLAG BYTES.  ALLOCATION:
1826                                                         ;  LOW BYTE FOR "A" & HIGH BYTE FOR "B"
1827 002330  000000          INTWCH: .WORD   0               ;BYTE IS SET NON-ZERO WHEN HANDLER SHOULD BE
1828                                                         ;  WATCHING FOR INT'S.  ALLOCATION: SEE INTFLG
1829 002332  000000          ERRFLG: .WORD   0               ;ERROR FLAG
1830 002334  000000          REGNUM: .WORD   0               ;REGISTER NUMBER -- FOR PASSING ARG. TO "ERR#"
1831 002336  000000          FRSTIM: .WORD   0               ;FLAG=0 IF PROGRAM JUST LOADED
1832 002340  000000          FRSPAS: .WORD   0               ;FLAG=0 IF FIRST PASS AFTER LOAD
1833 002342  000000          DEVMAP: .WORD   0               ;BIT MAP OF ACTIVE DEVICES
1834 002344  000000          DEVPTR: .WORD   0               ;DEVICE MAP BIT POINTER
1835 002346  000000          CONSOL: .WORD   0               ;CONSOLE DEVICE FLAG -- NON-ZERO = NONE PRESENT
1836 002350  000000          PFLAG:  .WORD   0               ;MISC. PROGRAM FLAGS
1837                                ;
1838                                ; THE ABOVE WORD CONTAINS MISC. FLAGS WHICH CAN ONLY BE ACCESSED BY PATCHING.
1839                                ; IT IS NOT INTENDED THAT THEY BE SET OR CLEARED EXCEPT UNDER VERY UNUSUAL
1840                                ; CIRCUMSTANCES.  THEREFORE, THEY WILL NOT BE DOCUMENTED ANY OTHER PLACE
1841                                ; EXCEPT RIGHT HERE.
1842                                ;
1843                                ; BIT 0 -- WHEN SET, THOSE TESTS WHICH DO A BUS RESET WILL NOT BE EXECUTED.
1844                                ;            THIS WAS IMPLEMENTED TO SAVE WEAR & TEAR ON THE RX01 IN THE
1845                                ;            DEVELOPMENT SYSTEM WHILE DOING LONG TERM TESTING OF ALL OTHER
1846                                ;            TESTS.
1847                                ;
1848                                ; BIT 1 -- CPU TYPE. (NOT USED)
1849                                ;
1850                                ; BIT 2 -- CONTROLS PRINTING OF EXTENDED ERROR INFORMATION DURING "MOVING
1851                                ;            INVERSIONS TEST" OF RAM.  NORMALLY ONLY ADDRESS, GOOD & BAD
1852                                ;            DATA, AND XOR WILL BE PRINTED.  IF THIS BIT IS SET HOWEVER,
1853                                ;            INFORMATION IDENTIFYING WHERE WITHIN THE ALGORITHM THE ERROR
1854                                ;            WAS DETECTED IS REPORTED.  THE FOLLOWING ABBREVIATIONS ARE USED
1855                                ;            IN THE HEADING:
1856                                ;                    BIT --- IDENTIFIES THE INNERMOST LOOP.  WHICH BIT IS
1857                                ;                            BEING INVERTED AT EACH LOCATION.  BITS
1858                                ;                            IDENTIFIED AS 0 THROUGH 7.
1859                                ;                    DATA -- IDENTIFIES THE VALUE TO WHICH THE ABOVE BIT IS
1860                                ;                            BEING SET (I.E. 0 OR 1).  IT IS FIRST READ AND
1861                                ;                            CHECKED FOR EXPECTED CONTENTS; THEN THE BIT IS
1862                                ;                            INVERTED TO THIS STATE (DATA) AND RE-WRITTEN;
1863                                ;                            THEN IT IS AGAIN READ & CHECKED FOR THE NEW
1864                                ;                            VALUE.
1865                                ;                    SEQ --- INDICATES THE DIRECTION (FWD OR BKWD) THE TEST
1866                                ;                            WAS SCANING THROUGH RAM WHEN THE ERROR OCCURED.
1867                                ;                    LSB --- THIS IS THE LOGICAL LEAST SIGNIFICANT BIT OF THE
1868                                ;                            RAM ADDRESS AS WE SCAN THROUGH MEMORY.  BY
1869                                ;                            VARYING THIS, THE ALGORITHM GENERATS NON-SEQUEN-
1870                                ;                            TIAL ADDRESSING OF RAM AND EFFECTS A MUCH MORE
1871                                ;                            THOROUGH TEST OF MEMORY.
1872                                ;
1873
1874
```

CURRENT DEVICE PARAMETERS

```
1876                                    .SBTTL  CURRENT DEVICE PARAMETERS
1877
1878            160000                  $MPCSR  ==      160000          ;INITIAL ASSEMBLED IN CSR ADDRESS
1879
1880 002352                            MPCSR:                          ;POINTER TO THE DMV11 CSR'S
1881 002352                            BSEL0:                          ;POINTER TO BSEL0
1882 002352                            BSEL:                           ;ALTERNATE NAME FOR BSEL0
1883 002352  160000                    SEL0:   .WORD   $MPCSR          ;POINTER TO SEL0
1884 002354  160001                    BSEL1:  .WORD   $MPCSR+1        ;POINTER TO BSEL1
1885 002356                            BSEL2:                          ;POINTER TO BSEL2
1886 002356  160002                    SEL2:   .WORD   $MPCSR+2        ;POINTER TO SEL2
1887 002360  160003                    BSEL3:  .WORD   $MPCSR+3        ;POINTER TO BSEL3
1888 002362                            BSEL4:                          ;POINTER TO BSEL4
1889 002362  160004                    SEL4:   .WORD   $MPCSR+4        ;POINTER TO SEL4
1890 002364  160005                    BSEL5:  .WORD   $MPCSR+5        ;POINTER TO BSEL5
1891 002366                            BSEL6:                          ;POINTER TO BSEL6
1892 002366  160006                    SEL6:   .WORD   $MPCSR+6        ;POINTER TO SEL6
1893 002370  160007                    BSEL7:  .WORD   $MPCSR+7        ;POINTER TO BSEL7
1894 002372                            BSEL10:                         ;POINTER TO BSEL10
1895 002372  160010                    SEL10:  .WORD   $MPCSR+10       ;POINTER TO SEL10
1896 002374  160011                    BSEL11: .WORD   $MPCSR+11       ;POINTER TO BSEL11
1897 002376                            BSEL12:                         ;POINTER TO BSEL12
1898 002376  160012                    SEL12:  .WORD   $MPCSR+12       ;POINTER TO SEL12
1899 002400  160013                    BSEL13: .WORD   $MPCSR+13       ;POINTER TO BSEL13
1900 002402                            BSEL14:                         ;POINTER TO BSEL14
1901 002402  160014                    SEL14:  .WORD   $MPCSR+14       ;POINTER TO SEL14
1902 002404  160015                    BSEL15: .WORD   $MPCSR+15       ;POINTER TO BSEL15
1903 002406                            BSEL16:                         ;POINTER TO BSEL16
1904 002406  160016                    SEL16:  .WORD   $MPCSR+16       ;POINTER TO SEL16
1905 002410  160017                    BSEL17: .WORD   $MPCSR+17       ;POINTER TO BSEL17
1906
1907 002412  000300                    MPIVEC: .WORD       300         ;DMV11 INPUT INTERRUPT VECTOR
1908 002414  000304                    MPOVEC: .WORD       304         ;DMV11 OUTPUT INTERRUPT VECTOR
1909 002416  000340                    MPRIOR: .WORD       340         ;DMV11 DEVICE PRIORITY
1910
1911                                    .SBTTL  GEN'L PURPOSE SCRATCH STORAGE
1912
1913 002420  000000                    REG0:   .WORD   0
1914 002422  000000                    REG1:   .WORD   0
1915 002424  000000                    REG2:   .WORD   0
1916 002426  000000                    REG3:   .WORD   0
1917 002430  000000                    REG4:   .WORD   0
1918 002432  000000                    REG5:   .WORD   0
1919 002434  000000                    REG6:   .WORD   0
1920 002436  000000                    REG7:   .WORD   0
1921
```

SCRATCH STORAGE FOR MESSAGE REPORTING

```
1923                                    .SBTTL  SCRATCH STORAGE FOR MESSAGE REPORTING
1924
1925 002440  000000                      TMP0:   .WORD   0
1926 002442  000000                      TMP1:   .WORD   0
1927 002444  000000                      TMP2:   .WORD   0
1928 002446  000000                      TMP3:   .WORD   0
1929 002450  000000                      TMP4:   .WORD   0
1930 002452  000000                      TMP5:   .WORD   0
1931 002454  000000                      TMP6:   .WORD   0
1932 002456  000000                      TMP7:   .WORD   0
1933 002460  000000                      TMP8:   .WORD   0
1934 002462  000000                      TMP9:   .WORD   0
1935 002464  000000                      TMPA:   .WORD   0
1936 002466  000000                      TMPB:   .WORD   0
1937 002470  000000                      TMPC:   .WORD   0
1938 002472  000000                      TMPD:   .WORD   0
1939 002474  000000                      TMPE:   .WORD   0
1940 002476  000000                      TMPF:   .WORD   0
1941 002500  000000                      NEWPC:  .WORD   0       ;SAVE LOCATION FOR A "PC" VALUE RESET
1942 002502  000000                      OLDSP:  .WORD   0       ;SAVE LOCATION FOR A STACK POINTER RESET VALUE
1943
1944
```

***** DATA PATTERN A *****

```
1946                                    .SBTTL  ***** DATA PATTERN A *****
1947
1948                                    .EVEN                           ;USAGE:
1949 002504  000020                     PATA:   .WORD   PATB-PATA-2     ;# OF BYTES IN PATTERN
1950 002506     001                             .BYTE   001             ;BSEL0
1951 002507     002                             .BYTE   002             ;BSEL1
1952 002510     004                             .BYTE   004             ;BSEL2
1953 002511     010                             .BYTE   010             ;BSEL3
1954 002512     020                             .BYTE   020             ;BSEL4
1955 002513     040                             .BYTE   040             ;BSEL5
1956 002514     100                             .BYTE   100             ;BSEL6
1957 002515     200                             .BYTE   200             ;BSEL7
1958 002516     052                             .BYTE   052             ;BSEL10
1959 002517     300                             .BYTE   300             ;BSEL11
1960 002520     140                             .BYTE   140             ;BSEL12
1961 002521     060                             .BYTE   060             ;BSEL13
1962 002522     030                             .BYTE   030             ;BSEL14
1963 002523     014                             .BYTE   014             ;BSEL15
1964 002524     006                             .BYTE   006             ;BSEL16
1965 002525     003                             .BYTE   003             ;BSEL17
1966
1967                                    .SBTTL  ***** DATA PATTERN B *****
1968
1969                                    .EVEN                           ;USAGE:
1970 002526  000026                     PATB:   .WORD   PATC-PATB-2     ;# OF BYTES IN PATTERN
1971 002530     125                             .BYTE   125
1972 002531     252                             .BYTE   252
1973 002532     000                             .BYTE   000
1974 002533     377                             .BYTE   377
1975 002534     001                             .BYTE   001
1976 002535     002                             .BYTE   002
1977 002536     004                             .BYTE   004
1978 002537     010                             .BYTE   010
1979 002540     020                             .BYTE   020
1980 002541     040                             .BYTE   040
1981 002542     100                             .BYTE   100
1982 002543     200                             .BYTE   200
1983 002544     376                             .BYTE   376
1984 002545     375                             .BYTE   375
1985 002546     373                             .BYTE   373
1986 002547     367                             .BYTE   367
1987 002550     357                             .BYTE   357
1988 002551     337                             .BYTE   337
1989 002552     277                             .BYTE   277
1990 002553     177                             .BYTE   177
1991 002554     000                             .BYTE   000
1992
```

***** DATA PATTERN C *****

```
                                        .SBTTL  ***** DATA PATTERN C *****
                                        ;       USED BY TEST # 11 TO LOAD UP THE VIA'S REGISTERS.  THE REGISTER NUMBER
                                        ;       LOADED IS THE FIRST BYTE AND THE VALUE LOADED INTO IT IS THE SECOND BYTE

                                        .EVEN
002556  000012                  PATC:   .WORD   <PATCR-PATC-2>/2
002560     002     377                  .BYTE   2,377           ;SETUP ORB AS AN I/O (READ/WRITE) REGISTER
002562     003     366                  .BYTE   3,366           ;SETUP ORA AS AN O/P REGISTER -- IT CAN'T BE TESTED!
002564     000     100                  .BYTE   0,100           ;LOAD UP ORB
002566     013     040                  .BYTE   13,040          ;       ACR
002570     006     106                  .BYTE   6,106           ;       T1LL
002572     007     107                  .BYTE   7,107           ;       T1LH
002574     012     112                  .BYTE   12,112          ;       SR
002576     014     042                  .BYTE   14,042          ;       PCR
002600     015     000                  .BYTE   15,000          ;       IFR
002602     016     200                  .BYTE   16,200          ;       IER

                                        ;       THIS TABLE IS THE LIST OF EXPECTED CONTENTS OF THE VIA'S REGISTERS

002604     100                  PATCR:  .BYTE   100             ; ORB
002605     000                          .BYTE   000             ; ORA
002606     377                          .BYTE   377             ; DDRB
002607     366                          .BYTE   366             ; DDRA
002610     000                          .BYTE   000             ; T1CL
002611     000                          .BYTE   000             ; T1CH
002612     106                          .BYTE   106             ; T1LL
002613     107                          .BYTE   107             ; T1LH
002614     000                          .BYTE   000             ; T2CL
002615     000                          .BYTE   000             ; T2CH
002616     112                          .BYTE   112             ; SR
002617     040                          .BYTE   040             ; ACR
002620     042                          .BYTE   042             ; PCR
002621     000                          .BYTE   000             ; IFR
002622     200                          .BYTE   200             ; IER
002623     000                          .BYTE   000             ; ORA

                                        ;       THIS IS THE TABLE OF TEST PATTERN "A" MASKS. BEFORE A REGISTER'S
                                        ;       CONTENTS IS TESTED, A BICB IS DONE USING ITS RESPECTIVE BYTE FROM
                                        ;       THE TABLE BELOW (INSURING THAT "DON'T CARE" BITS ARE IGNORED).

002624     000                  PATCM:  .BYTE   000             ; ORB
002625     377                          .BYTE   377             ; ORA -- THIS REGISTER CAN'T BE TESTED!!!
002626     000                          .BYTE   000             ; DDRB
002627     000                          .BYTE   000             ; DDRA
002630     377                          .BYTE   377             ; T1CL -- THIS IS A FREE RUNNING COUNTER
002631     377                          .BYTE   377             ; T1CH -- THIS IS A FREE RUNNING COUNTER
002632     000                          .BYTE   000             ; T1LL
002633     000                          .BYTE   000             ; T1LH
002634     377                          .BYTE   377             ; T2CL -- THIS IS A FREE RUNNING COUNTER
002635     377                          .BYTE   377             ; T2CH -- THIS IS A FREE RUNNING COUNTER
002636     000                          .BYTE   000             ; SR
002637     000                          .BYTE   000             ; ACR
002640     000                          .BYTE   000             ; PCR
002641     377                          .BYTE   377             ; IFR
002642     200                          .BYTE   200             ; IER -- BIT 7 IS ALWAYS READ AS ZERO
002643     377                          .BYTE   377             ; ORA -- THIS REGISTER CAN'T BE TESTED!!!
```

***** DATA PATTERN D *****

```
2051                                    .SBTTL  ***** DATA PATTERN D *****
2052
2053                                    .EVEN
2054 002644  000026                     PATD:   .WORD   PATE-PATD-2
2055 002646     200                             .BYTE   200
2056 002647     201                             .BYTE   201
2057 002650     202                             .BYTE   202
2058 002651     204                             .BYTE   204
2059 002652     210                             .BYTE   210
2060 002653     220                             .BYTE   220
2061 002654     240                             .BYTE   240
2062 002655     300                             .BYTE   300
2063 002656     200                             .BYTE   200
2064 002657     000                             .BYTE   000
2065 002660     001                             .BYTE   001
2066 002661     002                             .BYTE   002
2067 002662     004                             .BYTE   004
2068 002663     010                             .BYTE   010
2069 002664     020                             .BYTE   020
2070 002665     040                             .BYTE   040
2071 002666     100                             .BYTE   100
2072 002667     000                             .BYTE   000
2073 002670     325                             .BYTE   325
2074 002671     125                             .BYTE   125
2075 002672     252                             .BYTE   252
2076 002673     052                             .BYTE   052
2077
2078
2079                                    .SBTTL  ***** DATA PATTERN E *****
2080
2081                                    .EVEN
2082 002674  000C26                     PATE:   .WORD   PATF-PATE-2
2083 002676     200                             .BYTE   200
2084 002677     201                             .BYTE   201
2085 002700     203                             .BYTE   203
2086 002701     207                             .BYTE   207
2087 002702     217                             .BYTE   217
2088 002703     237                             .BYTE   237
2089 002704     277                             .BYTE   277
2090 002705     377                             .BYTE   377
2091 002706     377                             .BYTE   377
2092 002707     377                             .BYTE   377
2093 002710     376                             .BYTE   376
2094 002711     374                             .BYTE   374
2095 002712     370                             .BYTE   370
2096 002713     360                             .BYTE   360
2097 002714     340                             .BYTE   340
2098 002715     300                             .BYTE   300
2099 002716     200                             .BYTE   200
2100 002717     200                             .BYTE   200
2101 002720     325                             .BYTE   325
2102 002721     200                             .BYTE   200
2103 002722     252                             .BYTE   252
2104 002723     200                             .BYTE   200
```

***** DATA PATTERN F *****

```
2106
2107
2108
2109 002724  000045          .SBTTL  ***** DATA PATTERN F *****
2110 002726  125252
2111 002730  052525          .EVEN
2112 002732  000000  PATF:    .WORD   <PATG-PATF-2>/2
2113 002734  177777          .WORD   125252
2114 002736  000001          .WORD   052525
2115 002740  000002          .WORD   000000
2116 002742  000004          .WORD   177777
2117 002744  000010          .WORD   000001
2118 002746  000020          .WORD   000002
2119 002750  000040          .WORD   000004
2120 002752  000100          .WORD   000010
2121 002754  000200          .WORD   000020
2122 002756  000400          .WORD   000040
2123 002760  001000          .WORD   000100
2124 002762  002000          .WORD   000200
2125 002764  004000          .WORD   000400
2126 002766  010000          .WORD   001000
2127 002770  020000          .WORD   002000
2128 002772  040000          .WORD   004000
2129 002774  100000          .WORD   010000
2130 002776  177776          .WORD   020000
2131 003000  177775          .WORD   040000
2132 003002  177773          .WORD   100000
2133 003004  177767          .WORD   177776
2134 003006  177757          .WORD   177775
2135 003010  177737          .WORD   177773
2136 003012  177677          .WORD   177767
2137 003014  177577          .WORD   177757
2138 003016  177377          .WORD   177737
2139 003020  176777          .WORD   177677
2140 003022  175777          .WORD   177577
2141 003024  173777          .WORD   177377
2142 003026  167777          .WORD   176777
2143 003030  157777          .WORD   175777
2144 003032  137777          .WORD   173777
2145 003034  077777          .WORD   167777
2146 003036  000000          .WORD   157777
                             .WORD   137777
                             .WORD   077777
                             .WORD   000000
```

***** DATA PATTERN F *****

```
                        PATG:

                        .SBTTL  ***** DATA PATTERN RESULTS TABLE FOR MASTER CLEAR (RESFMC) *****

                        .EVEN
003040  000020  RESFMC: .WORD   RESFT3-RESFMC-2
003042     000  BSELRS: .BYTE   000             ;BSEL0
003043     200          .BYTE   200             ;BSEL1 -- "RUN" BIT SET
003044     000          .BYTE   000             ;BSEL2
003045     000          .BYTE   000             ;BSEL3
003046     033          .BYTE   033             ;BSEL4 -- CODE FOR THE DMV-11
003047     000          .BYTE   000             ;BSEL5
003050     305          .BYTE   305             ;BSEL6 -- INDICATING VALID COMPLETION OF U-DIAG.
003051     000          .BYTE   000             ;BSEL7
003052     000          .BYTE   000             ;BSEL10
003053     000          .BYTE   000             ;BSEL11
003054     000          .BYTE   000             ;BSEL12
003055     000          .BYTE   000             ;BSEL13
003056     000          .BYTE   000             ;BSEL14
003057     000          .BYTE   000             ;BSEL15
003060     000          .BYTE   000             ;BSEL16
003061     000          .BYTE   000             ;BSEL17

                        .SBTTL  ***** DATA PATTERN RESULTS FOR TEST 3 (RESFT3) *****

003062  RESFT3: .BLKW   16.
                .EVEN
```

DATA BUFFER AREAS

```
2176                                    .SBTTL  DATA BUFFER AREAS
2177
2178 003122                             BUFAREA:        .BLKB   256.
2179
2180
2181                                    ;  THIS BUFFER HAS SOME ALTERNATE USES TOO.  THE FOLLOWING LABELS ARE PROVIDED
2182                                    ;  FOR THOSE USAGES.
2183
2184            003322                  W0 = BUFAREA+128.       ;THIS WORD TABLE STARTS IN THE MIDDLE OF "BUFAREA"
2185            003324                  W1 = W0+2               ;AND IS USED BY "ERR6" FOR PRINTING BYTES
2186            003326                  W2 = W1+2
2187            003330                  W3 = W2+2
2188            003332                  W4 = W3+2
2189            003334                  W5 = W4+2
2190            003336                  W6 = W5+2
2191            003340                  W7 = W6+2
2192            003342                  W8 = W7+2
2193            003344                  W9 = W8+2
2194            003346                  WA = W9+2
2195            003350                  WB = WA+2
2196            003352                  WC = WB+2
2197            003354                  WD = WC+2
2198            003356                  WE = WD+2
2199            003360                  WF = WE+2
2200
2201            003122                  BT1 = BUFAREA           ;BYTE TABLE # 1
2202            003206                  BT2 = BUFAREA+64        ;BYTE TABLE # 2
```

```
                                .SBTTL GLOBAL TEXT SECTION

                                ;*****************************************************************************
                                ;*      THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
                                ;*      MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
                                ;*      MORE THAN ONE TEST.
                                ;*****************************************************************************

                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ;* NAMES OF DEVICES SUPPORTED BY PROGRAM
                                ;---------------------------------------------------------------------------
                                        DEVTYP  <M8053 OR M8064>
                                                                                L$DVTYP::
                                                                                        .ASCIZ  %M8053 OR M8064%
                                                                                        .EVEN

                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ;* TITLE OF PROGRAM
                                ;---------------------------------------------------------------------------
                        000012          .RADIX  10.
                                        DESCRIPT    <DMV-11 U-CONTRL LOGIC DIAG - PART 1 OF 2>
                                                                                L$DESC::
                                                                                        .ASCIZ  /DMV-11 U-CONTRL LOGIC DIAG - PART 1 OF 2/
                                                                                        .EVEN
                        000010          .RADIX  8.
```

2204					
2205					
2206					
2207					
2208					
2209					
2210					
2211					
2212					
2213					
2214					
2215	003522				
	003522				
	003522	115	070	060	
	003525	065	063	040	
	003530	117	122	040	
	003533	115	070	060	
	003536	066	064	000	
2216					
2217					
2218					
2219					
2220					
2221		000012			
2222	003542				
	003542				
	003542	104	115	126	
	003545	055	061	061	
	003550	040	125	055	
	003553	103	117	116	
	003556	124	122	114	
	003561	040	114	117	
	003564	107	111	103	
	003567	040	104	111	
	003572	101	107	040	
	003575	055	040	120	
	003600	101	122	124	
	003603	040	061	040	
	003606	117	106	040	
	003611	062	000		
2223		000010			
2224					

```
                        .SBTTL GLOBAL SUBROUTINES

                        ;////////////////////////////////////////////////////////////////////////////
                        ;/      THE GLOBAL SUBROUTINES ARE CALLED BY MORE THAN ONE TEST
                        ;////////////////////////////////////////////////////////////////////////////

                        ;+*************************************************************************
                        .SBTTL  MASCLR -  MASTER CLEAR SUBROUTINE
                        ;
                        ; FUNCTION:
                        ;
                        ;  THIS  SUBROUTINE  FORCES THE 6502 MICROPROCESSOR TO EXECUTE A MINI 17 PART
                        ;  DIAGNOSTIC OF THE MICRO-PROCESSOR INSTRUCTION SET, RAM DATA AND ADDRESSING
                        ;  VALIDITY,   AND   A  ROM  CRC  TEST.  THE  CLEAR  SUBROUTINE  EXECUTES  IN
                        ;  APPROXIMATELY  500  HUNDRED(S)  MILLISECOND. THIS SUBROUTINE WILL SEND THE
                        ;  MASTER  CLEAR  COMMAND  AND  DELAY FOR APPROX. 500 MSEC. AT WHICH POINT IN
                        ;  TIME,  THE  STATE  OF  THE  CSR  REGISTERS  IS  TESTED.  IF ANY ONE OF THE
                        ;  REGISTERS CONTAINS ANYTHING THAT IS NOT EXPECTED, AN ERROR IS QUEUE UP AND
                        ;  THE CARRY BIT IS SET, ELSE, THE CARRY BIT IS CLEARED.
                        ;
                        ; CALLING SEQUENCE:
                        ;
                        ;       JSP     PC,MASCLR
                        ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                        ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                        ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                        ;
                        ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                        ;
                        ;-*************************************************************************
                        ;
003614  010146          MASCLR: MOV     R1,-(SP)        ; SAVE REGISTER ONE
                        ;
003616  112777  000300  176530          MOVB    #RUN!MCLR,@BSEL1 ;SET BOTH THE RUN AND MASTER CLEAR BITS
                                                        ;TO INITIATE THE MICRODIAGNOSTIC
                        ;
                        ;NOW DELAY LONG ENOUGH FOR THE MICRODIAGNOSTIC TO COMPLETE
                        ;
003624  013701  002316          MOV     DELAY1,R1       ;INITIALIZE THE LOOP COUNTER FOR DELAY LOOP
003630  001402          2$:     BEQ     1$              ; EXIT DELAY LOOP IF THE TIME HAS EXPIRED
003632  005301                  DEC     R1              ;  ELSE, DECREMENT THE LOOP COUNTER AND
003634  000775                  BR      2$              ;  CONTINUE TO LOOP.
003636                  1$:                             ; TIME-UP!
003636  132777  000200  176510          BITB    #RUN,@BSEL1     ;CHECK THE RUN BIT
003644  001410                  BEQ     3$              ;IF NOT SET, GO REPORT THE ERROR
                        ;
                        ;IF THE RUN BIT IS SET, MICRODIAGNOSTICS ARE COMPLETE.
                        ;CHECK IF ALL MICRODIAGNOSTICS PASSED.
                        ;
003646  127737  176514  003050  4$:     CMPB    @#BSEL6,BSELRS+6 ;THIS CHECKS THE BYTE IN B-SELECT 6 FOR THE
                                                        ;VALID MICRODIAGNOSTIC COMPLETION CODE.
003654  001004                  BNE     3$              ;IF BAD, GO REPORT ERROR
                        ;
003656  127737  176500  003046          CMPB    @#BSEL4,BSELRS+4 ;ELSE, CHECK FOR THE VALID CODE FOR A DMV 11
003664  001420                  BEQ     6$              ;IF THIS TOO IS CORRECT THEN NO ERROR EXISTS
                                                        ;ELSE, FALL INTO THE ERROR REPORTING CODE
                        ;
```

MASCLR - MASTER CLEAR SUBROUTINE

```
2289 003666  004737  004434          3$:    JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
2290 003672                                 GTDF    20$,ERR3        ;MASTER CLEAR ERROR
                                            ;       QUEUE "DEVICE FATAL" ERROR # 1
     003672  012737  000001  002236                                                MOV     #T.EDF,ERRTYP
     003700  012737  000001  002240                                                MOV     #1,ERRNBR
     003706  012737  003734  002242                                                MOV     #20$,ERRMSG
     003714  012737  005414  002244                                                MOV     #ERR3,ERRBLK
2291 003722  000261                        SEC                     ;INDICATE TO THE CALLING ROUTINE THAT
2292 003724  000401                        BR      7$              ;   AN ERROR WAS DETECTED
2293
2294 003726  000241                  6$:   CLC                     ;CLEAR THE CARRY BIT TO INDICATE NO ERROR
2295 003730  012601                  7$:   MOV     (SP)+,R1        ;RESTORE REGISTER ONE
2296 003732  000207                        RTS     PC              ; RETURN TO THE CALLER
2297                                 .NLIST  BEX
2298 003734     115     ''1     123  20$:   .ASCIZ  /MASTER CLEAR FAILURE/
2299                                 .LIST   BEX
2300                                 .EVEN
```

M-LOOP -- MSTCLR -- MASTER CLEAR & ENTER M-LOOP

```
                                .SBTTL  M-LOOP -- MSTCLR -- MASTER CLEAR & ENTER M-LOOP
                                ;++*************************************************************************
                                ;  MSTCLR -- MASTER CLEAR & ENTER M-LOOP
                                ;
                                ;  CALLING SEQUENCE:
                                ;
                                ;       JSR     PC,MSTCLR
                                ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                                ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                                ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                                ;
                                ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                                ;
                                ;--*************************************************************************

003762  012777  140400  176362  MSTCLR: MOV     #<RUN!MCLR!MREQ>*256.,@SEL0  ;INITIATE M-LOOP

003770  010346                          MOV     R3,-(SP)
003772  012703  000014                  MOV     #12.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
003776  077301                  1$:     SOB     R3,1$
004000  012603                          MOV     (SP)+,R3

004002  132777  000200  176346          BITB    #MRDY,@SEL2     ;DID THE M-LOOP FINISH
004010  001023                          BNE     5$              ;YES,  GOOD.  RETURN
004012  004737  004576                  JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
004016  012737  000301  002310          MOV     #RUN!MCLR!MREQ,GDATA    ;IDENTIFY REQUESTED FUNCTION
004024                                  GTDF    EM3,ERR4        ;"MRDY" TIMEOUT
                                        ;       QUEUE "DEVICE FATAL" ERROR # 2
004024  012737  000001  002236                                          MOV     #T.EDF,ERRTYP
004032  012737  000002  002240                                          MOV     #2,ERRNBR
004040  012737  014454  002242                                          MOV     #EM3,ERRMSG
004046  012737  005426  002244                                          MOV     #ERR4,ERRBLK
004054  000261                          SEC                     ;SET CARRY TO INDICATE ERROR
004056  000401                          BR      9$              ;EXIT WITH THE "ERROR" FLAG (CARRY BIT) SET
004060  000241                  5$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
004062  000207                  9$:     RTS     PC              ;RETURN
```

```
                                        .SBTTL  M-LOOP -- READ
                                        ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        ; READ - READ THE SPECIFIED ADDRESS WITHIN THE DMV-11
                                        ;
                                        ;  CALLING SEQUENCE:
                                        ;
                                        ;       JSR     R5,READ
                                        ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
                                        ;       .WORD   <DESTINATION ADDRESS WITHIN LSI-11>
                                        ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                                        ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                                        ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                                        ;
                                        ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                                        ;
                                        ;---++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

004064  012577  176272          READ:  MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
004070  112777  000001  176260         MOVB    #REDLOC,@BSEL2  ;TELL M-LOOP TO GIVE US THE REQUESTED DATA

004076  010346                        MOV     R3,-(SP)
004100  012703  000032                MOV     #26.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
004104  077301                 1$:    SOB     R3,1$
004106  012603                        MOV     (SP)+,R3

004110  132777  000200  176240        BITB    #MRDY,@BSEL2    ;DID THE M-LOOP FINISH
004116  001023                        BNE     5$              ;YES.  GOOD.  RETURN

004120  004737  004576                JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
004124  012737  000001  002310        MOV     #REDLOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
004132                                GTDF    EM4,ERR4        ;"MRDY" TIMEOUT
                                                              ;       QUEUE "DEVICE FATAL" ERROR # 3
        004132  012737  000001  002236                                MOV     #1.EDF,ERRTYP
        004140  012737  000003  002240                                MOV     #3,ERRNBR
        004146  012737  014500  002242                                MOV     #EM4,ERRMSG
        004154  012737  005426  002244                                MOV     #ERR4,ERRBLK
004162  000261                        SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
004164  000401                        BR      6$              ;RETURN WITH THAT INDICATION

004166  000241                 5$:    CLC                     ;INDICATE "NO ERROR"
004170  117735  176172         6$:    MOVB    @BSEL6,@(R5)+   ;PUT DATA WHERE CALLER WANTS IT
004174  000205                        RTS     R5              ;RETURN
```

M-LOOP -- READ IMMEDIATE

```
2372                                    .SBTTL  M-LOOP -- READ IMMEDIATE
2373                                    ;**************************************************************************
2374                                    ; READI - READ IMMEDIATE THE SPECIFIED ADDRESS WITHIN THE DMV-11
2375                                    ;
2376                                    ; CALLING SEQUENCE:
2377                                    ;
2378                                    ;       JSR     R5,READI
2379                                    ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
2380                                    ;       .WORD   <DESTINATION -- CONTENTS OF REG. IS PUT HERE>
2381                                    ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
2382                                    ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
2383                                    ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
2384                                    ;
2385                                    ; N$:   <RESUMPTION OF NORMAL PROCESSING>
2386                                    ;
2387                                    ;**************************************************************************
2388
2389 004176                           READI:
2390 004176  012577  176160                    MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
2391 004202  112777  000001  176146            MOVB    #REDLOC,@BSEL2  ;TELL M-LOOP TO GIVE US THE REQUESTED DATA
2392
2393 004210  010346                            MOV     R3,-(SP)
2394 004212  012703  000015                    MOV     #13.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
2395 004216  077301                  1$:       SOB     R3,1$
2396 004220  012603                            MOV     (SP)+,R3
2397
2398 004222  132777  000200  176126            BITB    @MRDY,@BSEL2    ;DID THE M-LOOP FINISH
2399 004230  001023                            BNE     5$              ;YES,  GOOD.  RETURN
2400
2401 004232  004737  004576                    JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
2402 004236  012737  000001  002310            MOV     #REDLOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
2403 004244                                    GTDF    EM4,ERR4        ;"MRDY" TIMEOUT
                                               ;       QUEUE "DEVICE FATAL" ERROR # 4
     004244  012737  000001  002236                                            MOV     #T.EDF,ERRTYP
     004252  012737  000004  002240                                            MOV     #4,ERRNBR
     004260  012737  014500  002242                                            MOV     #EM4,ERRMSG
     004266  012737  005426  002244                                            MOV     #ERR4,ERRBLK
2404 004274  000261                            SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
2405 004276  000401                            BR      6$              ;RETURN WITH THAT INDICATION
2406
2407 004300  000241                  5$:       CLC                     ;INDICATE "NO ERROR"
2408 004302  017725  176060            6$:     MOV     @SEL6,(R5)+     ;PUT DATA WHERE CALLER WANTS IT
2409 004306  000205                            RTS     R5              ;RETURN
```

M-LOOP -- WRITE

```
                        .SBTTL  M-LOOP -- WRITE
                        ;+**********************************************************************
                        ; WRITE - WRITE THE SPECIFIED DATA INTO THE SPECIFIED DMV-11 ADDRESS
                        ;
                        ;  CALLING SEQUENCE:
                        ;
                        ;       JSR     R5,WRITE
                        ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
                        ;       .WORD   <ADDRESS OF DATA BYTE>
                        ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                        ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                        ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                        ;
                        ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                        ;
                        ;-**********************************************************************

004310  012577  176046  WRITE:  MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
004314  113577  176046          MOVB    @(R5)+,@SEL6    ;MAKE DATA AVAILABLE TO M-LOOP
004320  000404                  BR      MLWRI           ;THE REST OF THIS ROUTINE IS THE SAME AS "WRITEI"
```

```
                        .SBTTL  M-LOOP -- WRITE IMMEDIATE
                        ;++*************************************************************************
                        ; WRITEI - WRITE IMMEDIATE THE SPECIFIED DATA INTO THE SPECIFIED DMV-11 ADDRESS
                        ;
                        ; CALLING SEQUENCE:
                        ;
                        ;       JSR     R5,WRITEI
                        ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
                        ;       .WORD   <DATA FIELD -- DATA TO BE WRITTEN IN DMV-11>
                        ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                        ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                        ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                        ;
                        ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                        ;
                        ;--*************************************************************************

                        WRITEI:
004322  012577  176034          MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
004326  012577  176034          MOV     (R5)+,@SEL6     ;MAKE DATA AVAILABLE TO M-LOOP
004332  112777  000002  176016  MLWRI:  MOVB    #WRILOC,@BSEL2  ;TELL M-LOOP TO WRITE THE DATA
                        
004340  010346                  MOV     R3,-(SP)
004342  012703  000050          MOV     #40.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
004346  077301          1$:     SOB     R3,1$
004350  012603                  MOV     (SP)+,R3
                        
004352  132777  000200  175776  BITB    #MRDY,@BSEL2    ;DID THE M-LOOP FINISH
004360  001023                  BNE     5$              ;YES.  GOOD.  RETURN
004362  004737  004576          JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
004366  012737  000002  002310  MOV     #WRILOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
004374                          GTDF    EM4,ERR4        ;"MRDY" TIMEOUT
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 5
004374  012737  000001  002236                                          MOV     #T.EDF,ERRTYP
004402  012737  000005  002240                                          MOV     #5,ERRNBR
004410  012737  014500  002242                                          MOV     #EM4,ERRMSG
004416  012737  005426  002244                                          MOV     #ERR4,ERRBLK
004424  000261                  SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
004426  000401                  BR      6$              ;RETURN WITH THAT INDICATION
                        
004430  000241          5$:     CLC                     ;INDICATE "NO ERROR"
004432  000205          6$:     RTS     R5              ;RETURN
```

```
                                .SBTTL  GETBSR -- GET BYTE SELECT REGISTERS
                                ;+*****************************************************************************
                                ;
                                ;       GET THE CONTENTS OF ALL CONTROL AND STATUS REGISTERS
                                ;
                                ;       FUNCTION - THIS SUBROUTINE COLLECTS THE CONTENTS OF THE
                                ;               BYTE SELECT REGISTERS FOR THE PURPOSE OF DISPLAY.
                                ;
                                ;       ENTRY CONDITIONS - NONE
                                ;
                                ;        EXIT CONDITIONS   NONE
                                ;
                                ;    REGISTERS DESTROYED - NONE
                                ;
                                ;-*****************************************************************************

004434  117737  175712  002246  GETBSR: MOVB    @#BSEL0,BSR0    ;PUT THE CURRENT CSR VALUES INTO THE PRINT-OUT
004442  117737  175706  002250          MOVB    @#BSEL1,BSR1    ;TABLE
004450  117737  175702  002252          MOVB    @#BSEL2,BSR2
004456  117737  175676  002254          MOVB    @#BSEL3,BSR3
004464  117737  175672  002256          MOVB    @#BSEL4,BSR4
004472  117737  175666  002260          MOVB    @#BSEL5,BSR5
004500  117737  175662  002262          MOVB    @#BSEL6,BSR6
004506  117737  175656  002264          MOVB    @#BSEL7,BSR7
004514  117737  175652  002266          MOVB    @#BSEL10,BSR10
004522  117737  175646  002270          MOVB    @#BSEL11,BSR11
004530  117737  175642  002272          MOVB    @#BSEL12,BSR12
004536  117737  175636  002274          MOVB    @#BSEL13,BSR13
004544  117737  175632  002276          MOVB    @#BSEL14,BSR14
004552  117737  175626  002300          MOVB    @#BSEL15,BSR15
004560  117737  175622  002302          MOVB    @#BSEL16,BSR16
004566  117737  175616  002304          MOVB    @#BSEL17,BSR17
004574  000207                          RTS     PC              ;RETURN TO CALLER

                                .SBTTL  GETWSR -- GET WORD SELECT REGISTERS
                                ; "WORD" VERSION OF ABOVE SUBROUTINE

004576  017737  175550  002246  GETWSR: MOV     @#SEL0,WSR0     ;MOVE THE 8 WORD REGISTERS TO THE OTHERWISE
004604  017737  175546  002250          MOV     @#SEL2,WSR2     ;BYTE TABLE
004612  017737  175544  002252          MOV     @#SEL4,WSR4
004620  017737  175542  002254          MOV     @#SEL6,WSR6
004626  017737  175540  002256          MOV     @#SEL10,WSR10
004634  017737  175536  002260          MOV     @#SEL12,WSR12
004642  017737  175534  002262          MOV     @#SEL14,WSR14
004650  017737  175532  002264          MOV     @#SEL16,WSR16
004656  000207                          RTS     PC              ;RETURN TO CALLER
```

.INITT1 -- INITIALIZE TIMER # 1

```
                        .SBTTL  .INITT1 -- INITIALIZE TIMER # 1

                        ;*******************************************************************************
                        ;* INITT1 - INITIALIZE TIMER # 1
                        ;*
                        ;*       CALLING SEQUENCE:
                        ;*
                        ;*             JSR     R5,INITT1
                        ;*             .WORD   <VALUE LOADED INTO THE T1 LATCH @ T1LL & T1LH>
                        ;*             .WORD   <BITS 6 & 7 WILL BE LOADED INTO "ACR", BIT 5 WILL BE
                        ;*                      USED TO SET OR CLEAR BIT 6 ("T1") OF THE INTERRUPT
                        ;*                      ENABLE REGISTER ("IER")>
                        ;*
                        ;* SEQUENCE OF EVENTS HEREIN:
                        ;*
                        ;*      SET THE VIA'S INTERRUPT ENABLE REGISTER ("IER")
                        ;*
                        ;*      SET THE VIA'S "ACR"
                        ;*
                        ;*      SET T1L-L (ADDR 06)
                        ;*
                        ;*      SET T1L-H (ADDR 07)
                        ;*
                        ;*      RETURN WITHOUT ANY ERROR CHECKING
                        ;*
                        ;*******************************************************************************

004660  010146          INITT1: MOV     R1,-(SP)        ;SAVE THE REGISTER WE WILL BE USING
004662  112537  002455          MOVB    (R5)+,TMP6+1    ;SETUP VALUES TO BE LOADED INTO THE LATCHES
004666  112537  002457          MOVB    (R5)+,TMP7+1
004672  111537  002467          MOVB    (R5),TMPB+1     ;GET & PROCESS BITS FOR ACR 6 & 7
004676  142737  177477  002467  BICB    #^C<BIT6+BIT7>,TMPB+1 ;EXTRACT BITS 6 & 7 & SAVE THEM FOR LATER
004704  012501                  MOV     (R5)+,R1        ;NOW, GET THE BIT TO BE USED IN SETTING OR
                                                        ;CLEARING BIT 6 OF "IER"

                        ; THE PASSED BIT IS IN THE WRONG POSITION BUT, IT SHOULD CONTROL THE OPERATION.
                        ; WE KNOW WE ARE SETTING OR CLEARING BIT 6 -- THUS, THE PASSED BIT WILL BECOME
                        ; THE CONTROLLING BIT 7 AND WE WILL "OR" IN THE BIT WE WISH TO BE CONTROLLED
                        ; (BIT 6).

004706  106301                  ASLB    R1              ;THIS PUTS THE PASSED BIT INTO BIT 6.
004710  042701  177677          BIC     #^C<BIT6>,R1    ;WHILE HERE, CLEAR ALL OTHER BITS AND
004714  140177  175440          BICB    R1,@#SEL3       ;CLEAR THE INTERRUPT FLAG IN THE SELECT REG.
004720  106301                  ASLB    R1              ;NOW THE BIT IS IN THE CONTROLLING POSITION
004722  052701  000100          BIS     #BIT6,R1        ;SET BIT 6
004726  110137  002475          MOVB    R1,TMPE+1       ;THE CALL WILL NOW WRITE THE APPROPRIATE VALUE

004732  004537  004310          JSR     R5,WRITE        ;WRITE TO
004736  120016                  IENR                    ;THE VIA'S IER
004740  002475                  TMPE+1                  ;INTERRUPT ENABLE/DISABLE INFORMATION
004742  103431                  BCS     63$             ;EXIT ON ERROR

004744  004537  004064          JSR     R5,READ         ;READ THE CURRENT SETTING OF
004750  120013                  ACR                     ;THE VIA'S ACR
004752  002466                  TMPB
004754  103424                  BCS     63$             ;EXIT ON ERROR
```

.INITT1 -- INITIALIZE TIMER # 1

```
004756  013701  002466                 MOV     TMPB,R1             ;GET THAT VALUE
004762  042701  177477                 BIC     #^C<BIT6+BIT7>,R1   ;CLEAR BITS 6 & 7
004766  150137  002467                 BISB    R1,TMPB+1           ;ADD CURRENT BITS 0 --> 5 TO NEW BITS 6 & 7

004772  004537  004310                 JSR     R5,WRITE            ;WRITE THE NEW REGISTER SETTING TO VIA'S ACR
004776  120013                         ACR
005000  002467                         TMPB+1
005002  103411                         BCS     63$                 ;EXIT ON ERROR

005004  004537  004310                 JSR     R5,WRITE            ;WRITE TO
005010  120006                         T1LL                        ;LOW ORDER LATCH REGISTER (T1L-L)
005012  002455                         TMP6+1                      ;THE VALUE PASSED
005014  103404                         BCS     63$                 ;EXIT ON ERROR

005016  004537  004310                 JSR     R5,WRITE            ;WRITE TO
005022  120007                         T1LH                        ;HIGH ORDER LATCH REGESTER (T1L-H)
005024  002457                         TMP7+1                      ;THE VALUE PASSED


005026  012601                 63$:    MOV     (SP)+,R1            ;RESTORE R1
005030  000205                         RTS     R5                  ;RETURN


                               .SBTTL  STALL -- DELAY FOR 10.5 MICRO-SEC'S (ON LSI-11)
                               ;++*********************************************************************
                               ; STALL -- THIS SUBROUTINE STALLS FOR ABOUT 10.5 MICRO-SECONDS
                               ;--*********************************************************************

005032  000207                 STALL:  RTS     PC
```

```
                                .SBTTL  STREG -- STATIC TEST OF SPECIFIED DMV-11 LOCATION

                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ; STREG -- PERFORM A STATIC TEST OF THE SPECIFIED REGISTER
                                ;
                                ; CALLING SEQUENCE:
                                ;
                                ;       <R0 CONTAINS THE ADDRESS OF THE REGISTER TO BE TESTED>
                                ;       <"TDATA" CONTAINS THE TEST BYTE.
                                ;       <"GDATA" CONTAINS THE EXPECTED DATA>
                                ;
                                ;       JSR     PC,STREG
                                ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
                                ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
                                ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
                                ;
                                ; N$:   <RESUMPTION OF NORMAL PROCESSING>
                                ;
                                ;---++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

005034  010037  005050          STREG:  MOV     R0,2$           ;PUT SPECIFIED REGISTER'S ADDRESS IN I/O CALLS
005040  010037  005062                  MOV     R0,4$

005044  004537  004310                  JSR     R5,WRITE        ;WRITE IT
005050  000000                  2$:     0                       ;*** MODIFIED FROM ABOVE ***
005052  002306                          TDATA                   ;*** MODIFIED FROM ABOVE ***
005054  103435                          BCS     10$             ;ON ERROR, EXIT

005056  004537  004064                  JSR     R5,READ         ;READ IT BACK AGAIN
005062  000000                  4$:     0                       ;*** MODIFIED FROM ABOVE ***
005064  002312                          BDATA
005066  103430                          BCS     10$             ;ON ERROR, EXIT

005070  123737  002310  002312          CMPB    GDATA,BDATA     ;DID WE READ WHAT WE WROTE?
005076  000241                          CLC                     ; (THIS ISN'T NEEDED FOR THE ERROR TEST BUT
                                                                ; MUST BE CLEARED ON EXIT IF NO ERROR OCCURED)
005100  001423                          BEQ     10$             ;YES, EXIT FROM SUBTEST
005102  013737  005050  002334          MOV     2$,REGNUM       ;BUILD REGISTER #
005110  042737  177760  002334          BIC     #177760,REGNUM
005116                                  GTDF    EM25,ERR7       ;REPORT READ/WRITE ERROR
                                                                ;       QUEUE "DEVICE FATAL" ERROR # 6
005116  012737  000001  002236                                                  MOV     #T.EDF,ERRTYP
005124  012737  000006  002240                                                  MOV     #6,ERRNBR
005132  012737  015565  002242                                                  MOV     #EM25,ERRMSG
005140  012737  006612  002244                                                  MOV     #ERR7,ERRBLK
005146  000261                          SEC                     ;INDICATE THAT AN ERROR WAS DETECTED
005150  000207                  10$:    RTS     PC
```

```
                        .SBTTL  INTERRUPT HANDLER -- MPIHAN

                        ;''**************************************************************************
                        ; MPIHAN -- COUNT INTERRUPTS -- USUALLY INTERRUPT "A"
                        ;
                        ;       THIS ROUTINE WILL INCREMENT THE LOW BYTE OF "INTFLG" EACH TIME IT IS
                        ;       ENTERED.  IF "IHILNK" IS NON-ZERO, VECTOR TO THE ADDRESS THEREIN USING
                        ;       A "JSR  PC"
                        ;--**************************************************************************

005152                          BGNSRV  MPIHAN
005152                                                                  MPIHAN::
005152  010046                  MOV     R0,-(SP)        ;SAVE R0
005154  105737  002330          TSTB    INTWCH          ;HAVE WE BEEN TOLD TO WATCH FOR TYPE "A" INT'S?
005160  001007                  BNE     5$              ;YES, DO NORMAL INTERRUPT PROCESSING
005162  004737  004434          JSR     PC,GETBSR       ;NO,  DUMP REGISTERS AND
005166                          GEDF    EM34,ERR3       ;       REPORT "UNEXPECTED INTERRUPT"
                                                        ;       "DEVICE FATAL" ERROR # 7
005166  104455                                                          TRAP    C$ERDF
005170  000007                                                          .WORD   7
005172  015613                                                          .WORD   EM34
005174  005414                                                          .WORD   ERR3
005176  000407                  BR      10$             ;GO TO EXIT
                        ;
005200  105237  002326  5$:     INCB    INTFLG          ;INCREMENT LOW BYTE OF INTERRUPT COUNTER
005204  005737  005222          TST     IHILNK          ;ARE WE EXPECTED TO EXECUTE ANOTHER ROUTINE?
005210  001402                  BEQ     10$             ;NO, GET OUT
005212  004777  000004          JSR     PC,@IHILNK      ;YES, GO TO IT -- I HOPE IT'S VALID!
005216  012600          10$:    MOV     (SP)+,R0        ;RESTORE R0
005220                          ENDSRV                  ;RETURN TO INTERRUPTED PROCESS
005220                                                                  L10002:
005220  000002                                                                  RTI
                        ;
005222  000000          IHILNK: .WORD   0               ;POINTER TO AUXILIARY INT. HANDLING ROUTINE
```

```
                        .SBTTL  INTERRUPT HANDLER -- MPOHAN

                        ;++*************************************************************************
                        ; MPOHAN -- SIMPLY COUNT INTERRUPTS -- USUALLY INTERRUPT "B"
                        ;
                        ;       THIS ROUTINE WILL INCREMENT THE HIGH BYTE OF "INTFLG" EACH TIME IT IS
                        ;       ENTERED.  IF "IHOLNK" IS NON-ZERO, VECTOR TO THE ADDRESS THEREIN USING
                        ;       A "JSR  PC"
                        ;--*************************************************************************

005224                          BGNSRV  MPOHAN
005224                                                                  MPOHAN::
005224  010046                  MOV     R0,-(SP)        ;SAVE R0
005226  105737  002331          TSTB    INTWCH+1        ;HAVE WE BEEN TOLD TO WATCH FOR TYPE "B" INT'S?
005232  001007                  BNE     5$              ;YES, DO NORMAL INTERRUPT PROCESSING
005234  004737  004434          JSR     PC,GETBSR       ;NO,  DUMP REGISTERS AND
005240                          GEDF    EM34B,ERR3      ;       REPORT "UNEXPECTED INTERRUPT"
                                                        ;       "DEVICE FATAL" ERROR # 8
005240  104455                                                          TRAP    C$ERDF
005242  000010                                                          .WORD   8
005244  015644                                                          .WORD   EM34B
005246  005414                                                          .WORD   ERR3
005250  000407                  BR      10$             ;GO TO EXIT

005252  105237  002327  5$:     INCB    INTFLG+1        ;INCREMENT HIGH BYTE OF INTERRUPT COUNTER
005256  005737  005274          TST     IHOLNK          ;ARE WE EXPECTED TO EXECUTE ANOTHER ROUTINE?
005262  001402                  BEQ     10$             ;NO, GET OUT
005264  004777  000004          JSR     PC,@IHOLNK      ;YES, GO TO IT -- I HOPE IT'S VALID!
005270  012600          10$:    MOV     (SP)+,R0        ;RESTORE R0
005272                          ENDSRV                  ;RETURN TO INTERRUPTED PROCESS
005272                                                                  L10003:
005272  000002                                                                  RTI

005274  000000  IHOLNK:        .WORD   0               ;POINTER TO AUXILIARY INT. HANDLING ROUTINE
```

```
                                .SBTTL  GLOBAL ERROR REPORT REPORT SECTION

                                ;////////////////////////////////////////////////////////////////////////////
                                ;/    THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
                                ;/    THAT ARE USED IN MORE THAN ONE TEST.
                                ;////////////////////////////////////////////////////////////////////////////
                                        .EVEN
                                ;-----------------------------------------------------------------------------
                                .SBTTL  ERROR HANDLER -- ERR1 -- "NO NOTHING" HANDLER
                                ;-----------------------------------------------------------------------------
005276                                  BGNMSG  ERR1
005276                                                                          ERR1::
005276  004737  012072                  JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
005302                                  ENDMSG
005302                                                                          L10004:
005302  104423                                                                          TRAP    C$MSG
                                ;-----------------------------------------------------------------------------
                                .SBTTL  ERROR HANDLER -- ERR2 -- CSR REGISTER ERROR REPORTING
                                ;-----------------------------------------------------------------------------
005304                                  BGNMSG  ERR2
005304                                                                          ERR2::
005304                                  PRINTB  #FMT02,#TXT5,REGNUM
005304  013746  002334                                                                  MOV     REGNUM,-(SP)
005310  012746  013605                                                                  MOV     #TXT5,-(SP)
005314  012746  012124                                                                  MOV     #FMT02,-(SP)
005320  012746  000003                                                                  MOV     #3,-(SP)
005324  010600                                                                          MOV     SP,R0
005326  104414                                                                          TRAP    C$PNTB
005330  062706  000010                                                                  ADD     #10,SP
005334  004737  011276                  JSR     PC,XORGB
005340                                  PRINTB  #FMT02A,<B,GDATA>,<B,BDATA>,<B,XDATA>
005340  005046                                                                          CLR     -(SP)
005342  153716  002314                                                                  BISB    XDATA,(SP)
005346  005046                                                                          CLR     -(SP)
005350  153716  002312                                                                  BISB    BDATA,(SP)
005354  005046                                                                          CLR     -(SP)
005356  153716  002310                                                                  BISB    GDATA,(SP)
005362  012746  012161                                                                  MOV     #FMT02A,-(SP)
005366  012746  000004                                                                  MOV     #4,-(SP)
005372  010600                                                                          MOV     SP,R0
005374  104414                                                                          TRAP    C$PNTB
005376  062706  000012                                                                  ADD     #12,SP
005402  004737  011322                  JSR     PC,ERR4$                ;DUMP THE BYTE SELECT REGISTERS
005406  004737  012072                  JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
005412                                  ENDMSG
005412                                                                          L10005:
005412  104423                                                                          TRAP    C$MSG
                                ;-----------------------------------------------------------------------------
                                .SBTTL  ERROR HANDLER - ERR3 -- DUMP THE BYTE SELECT REGISTERS
                                ;-----------------------------------------------------------------------------
005414                                  BGNMSG  ERR3
005414                                                                          ERR3::
005414  004737  011322                  JSR     PC,ERR4$
005420  004737  012072                  JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
005424                                  ENDMSG
005424                                                                          L10006:
005424  104423                                                                          TRAP    C$MSG
```

```
                        ;-------------------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR4 -- M-LOOP TIMEOUT ERROR HANDLING
                        ;-------------------------------------------------------------------------------
                                BGNMSG  ERR4
                                                                                        ERR4::
                                MOV     R1,-(SP)                ;SAVE THE WORKING REGISTER
                                MOVB    GDATA,R1                ;SAVE THIS FOR LATER
                                CMPB    #17,R1                  ;WAS THIS AN M-LOOP REQUEST?
                                BHIS    5$                      ;YES, THEN REPORT THE FUNCTION CODE
                                PRINTX  #FMT5,<B,R1>            ;NO,  THEN IT MUST BE A BSEL1 SETTING
                                                                                        CLR     -(SP)
                                                                                        BISB    R1,(SP)
                                                                                        MOV     #FMT5,-(SP)
                                                                                        MOV     #2,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTX
                                                                                        ADD     #6,SP
                                BR      20$
                        5$:     BNE     6$                      ;IF IT WAS A 17, THIS IS A "NOP" AND
                                CLR     R1                      ;  THE TEXT POINTER MUST SO REFLECT.
                        6$:     CMP     #7,R1                   ;IS FUNCTION CODE > 7?
                                BGT     7$                      ;NO,  THEN WE CAN HANDLE IT
                                MOV     #6,R1                   ;YES, THEN IT'S UNDEFINED -- SAY SO
                        7$:     ASL     R1                      ;CONVERT TO A WORD OFFSET
                                PRINTX  #FMT5A,<B,GDATA>,TXTMLT(R1)     ;REPORT THE FAILING FUNCTION
                                                                                        MOV     TXTMLT(R1),-(SP)
                                                                                        CLR     -(SP)
                                                                                        BISB    GDATA,(SP)
                                                                                        MOV     #FMT5A,-(SP)
                                                                                        MOV     #3,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTX
                                                                                        ADD     #10,SP
                        20$:    MOV     (SP)+,R1                ;RESTORE THE WORKING REGISTER
                                JSR     PC,ERR5$                ;DUMP THE SELECT REGISTERS
                                ENDMSG
                                                                                L10007:
                                                                                        TRAP    C$MSG
                        ;-------------------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR5 -- WORD SELECT REG. ERRORS
                        ;-------------------------------------------------------------------------------
                                BGNMSG  ERR5
                                                                                ERR5::
                                PRINTB  #FMT02,#TXT5,REGNUM
                                                                                        MOV     REGNUM,-(SP)
                                                                                        MOV     #TXT5,-(SP)
                                                                                        MOV     #FMT02,-(SP)
                                                                                        MOV     #3,(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTB
                                                                                        ADD     #10,SP
                                JSR     PC,XORGB
                                PRINTB  #FMT10,GDATA,BDATA,XDATA
                                                                                        MOV     XDATA,-(SP)
                                                                                        MOV     BDATA,-(SP)
```

```
ERROR HANDLER -- ERR5 -- WORD SELECT REG. ERRORS

        005616  013746  002310                                                  MOV     GDATA,-(SP)
        005622  012746  012654                                                  MOV     #FMT10,-(SP)
        005626  012746  000004                                                  MOV     #4,-(SP)
        005632  010600                                                          MOV     SP,R0
        005634  104414                                                          TRAP    C$PNTB
        005636  062706  000012                                                  ADD     #12,SP
   2763 005642  004737  011710          JSR     PC,ERR5$                ;DUMP THE SELECT REGISTERS
   2764 005646                          ENDMSG
        005646                                                          L10010:
        005646  104423                                                          TRAP    C$MSG
   2765                         ;-------------------------------------------------------------------------
   2766                         .SBTTL  ERROR HANDLER -- ERR6 -- VIA REGISTER ERRORS W/FULL REG. DUMP
   2767                         ;-------------------------------------------------------------------------
   2768 005650                          BGNMSG  ERR6
        005650                                                          ERR6::
   2769
   2770 005650  010146                  MOV     R1,-(SP)        ;PRESERVE R1'S CONTENTS
   2771 005652  012701  002604          MOV     #PATCR,R1       ;POINT TO EXPECTED VALUES
   2772 005656                          PRINTX  #FMT06,#TXT7
        005656  012746  013632                                                  MOV     #TXT7,-(SP)
        005662  012746  012562                                                  MOV     #FMT06,-(SP)
        005666  012746  000002                                                  MOV     #2,-(SP)
        005672  010600                                                          MOV     SP,R0
        005674  104415                                                          TRAP    C$PNTX
        005676  062706  000006                                                  ADD     #6,SP
   2773 005702                  PRINTX  #FMT06A,#TXT8A,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>
        005702  005046                                                          CLR     -(SP)
        005704  152116                                                          BISB    (R1)+,(SP)
        005706  005046                                                          CLR     -(SP)
        005710  152116                                                          BISB    (R1)+,(SP)
        005712  005046                                                          CLR     -(SP)
        005714  152116                                                          BISB    (R1)+,(SP)
        005716  005046                                                          CLR     -(SP)
        005720  152116                                                          BISB    (R1)+,(SP)
        005722  005046                                                          CLR     -(SP)
        005724  152116                                                          BISB    (R1)+,(SP)
        005726  005046                                                          CLR     -(SP)
        005730  152116                                                          BISB    (R1)+,(SP)
        005732  012746  014004                                                  MOV     #TXT8A,-(SP)
        005736  012746  012571                                                  MOV     #FMT06A,-(SP)
        005742  012746  000010                                                  MOV     #10,-(SP)
        005746  010600                                                          MOV     SP,R0
        005750  104415                                                          TRAP    C$PNTX
        005752  062706  000022                                                  ADD     #22,SP
   2774 005756                  PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
        005756  005046                                                          CLR     -(SP)
        005760  152116                                                          BISB    (R1)+,(SP)
        005762  005046                                                          CLR     -(SP)
        005764  152116                                                          BISB    (R1)+,(SP)
        005766  012746  012637                                                  MOV     #FMT06B,-(SP)
        005772  012746  000003                                                  MOV     #3,(SP)
        005776  010600                                                          MOV     SP,R0
        006000  104415                                                          TRAP    C$PNTX
        006002  062706  000010                                                  ADD     #10,SP
   2775 006006  012701  003122  MOV     #BT1,R1         ;POINT TO ACTUAL VALUES
   2776 006012                  PRINTX  #FMT06A,#TXT8B,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>
        006012  005046                                                          CLR     -(SP)
```

```
        006014  152116                                                          BISB    (R1)+,(SP)
        006016  005046                                                          CLR     -(SP)
        006020  152116                                                          BISB    (R1)+,(SP)
        006022  005046                                                          CLR     -(SP)
        006024  152116                                                          BISB    (R1)+,(SP)
        006026  005046                                                          CLR     -(SP)
        006030  152116                                                          BISB    (R1)+,(SP)
        006032  005046                                                          CLR     -(SP)
        006034  152116                                                          BISB    (R1)+,(SP)
        006036  005046                                                          CLR     -(SP)
        006040  152116                                                          BISB    (R1)+,(SP)
        006042  012746  014021                                                  MOV     #TXT8B,-(SP)
        006046  012746  012571                                                  MOV     #FMT06A,-(SP)
        006052  012746  000010                                                  MOV     #10,-(SP)
        006056  010600                                                          MOV     SP,R0
        006060  104415                                                          TRAP    C$PNTX
        006062  062706  000022                                                  ADD     #22,SP
2777    006066                          PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
        006066  005046                                                          CLR     -(SP)
        006070  152116                                                          BISB    (R1)+,(SP)
        006072  005046                                                          CLR     -(SP)
        006074  152116                                                          BISB    (R1)+,(SP)
        006076  012746  012637                                                  MOV     #FMT06B,-(SP)
        006102  012746  000003                                                  MOV     #3,-(SP)
        006106  010600                                                          MOV     SP,R0
        006110  104415                                                          TRAP    C$PNTX
        006112  062706  000010                                                  ADD     #10,SP
2778    006116  012701  003206 MOV     #BT2,R1         ;POINT TO XOR VALUES
2779    006122                  PRINTX  #FMT06A,#TXT8C,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+> <B,(R1)+>,<B,(R1)+>
        006122  005046                                                          CLR     -(SP)
        006124  152116                                                          BISB    (R1)+,(SP)
        006126  005046                                                          CLR     -(SP)
        006130  152116                                                          BISB    (R1)+,(SP)
        006132  005046                                                          CLR     -(SP)
        006134  152116                                                          BISB    (R1)+,(SP)
        006136  005046                                                          CLR     -(SP)
        006140  152116                                                          BISB    (R1)+,(SP)
        006142  005046                                                          CLR     -(SP)
        006144  152116                                                          BISB    (R1)+,(SP)
        006146  005046                                                          CLR     -(SP)
        006150  152116                                                          BISB    (R1)+,(SP)
        006152  012746  014036                                                  MOV     #TXT8C,-(SP)
        006156  012746  012571                                                  MOV     #FMT06A,-(SP)
        006162  012746  000010                                                  MOV     #10,-(SP)
        006166  010600                                                          MOV     SP,R0
        006170  104415                                                          TRAP    C$PNTX
        006172  062706  000022                                                  ADD     #22,SP
2780    006176                  PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
        006176  005046                                                          CLR     -(SP)
        006200  152116                                                          BISB    (R1)+,(SP)
        006202  005046                                                          CLR     -(SP)
        006204  152116                                                          BISB    (R1)+,(SP)
        006206  012746  012637                                                  MOV     #FMT06B,-(SP)
        006212  012746  000003                                                  MOV     #3,-(SP)
        006216  010600                                                          MOV     SP,R0
        006220  104415                                                          TRAP    C$PNTX
        006222  062706  000010                                                  ADD     #10,SP
```

```
2781                                    ;*** PRINT SECOND HALF OF THE REGISTERS ***
2782 006226  012701  002614              MOV     #PATCR+8.,R1    ;POINT TO 2ND HALF OF REGISTERS EXPECTED VALUES
2783 006232                             PRINTX  #FMT06,#TXT7A
     006232  012746  013717                                                        MOV     #TXT7A,-(SP)
     006236  012746  012562                                                        MOV     #FMT06,-(SP)
     006242  012746  000002                                                        MOV     #2,-(SP)
     006246  010600                                                                MOV     SP,R0
     006250  104415                                                                TRAP    C$PNTX
     006252  062706  000006                                                        ADD     #6,SP
2784 006256                             PRINTX  #FMT06A,#TXT8A,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>
     006256  005046                                                                CLR     -(SP)
     006260  152116                                                                BISB    (R1)+,(SP)
     006262  005046                                                                CLR     -(SP)
     006264  152116                                                                BISB    (R1)+,(SP)
     006266  005046                                                                CLR     -(SP)
     006270  152116                                                                BISB    (R1)+,(SP)
     006272  005046                                                                CLR     -(SP)
     006274  152116                                                                BISB    (R1)+,(SP)
     006276  005046                                                                CLR     -(SP)
     006300  152116                                                                BISB    (R1)+,(SP)
     006302  005046                                                                CLR     -(SP)
     006304  152116                                                                BISB    (R1)+,(SP)
     006306  012746  014004                                                        MOV     #TXT8A,-(SP)
     006312  012746  012571                                                        MOV     #FMT06A,-(SP)
     006316  012746  000010                                                        MOV     #10,-(SP)
     006322  010600                                                                MOV     SP,R0
     006324  104415                                                                TRAP    C$PNTX
     006326  062706  000022                                                        ADD     #22,SP
2785 006332                             PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
     006332  005046                                                                CLR     -(SP)
     006334  152116                                                                BISB    (R1)+,(SP)
     006336  005046                                                                CLR     -(SP)
     006340  152116                                                                BISB    (R1)+,(SP)
     006342  012746  012637                                                        MOV     #FMT06B,-(SP)
     006346  012746  000003                                                        MOV     #3,-(SP)
     006352  010600                                                                MOV     SP,R0
     006354  104415                                                                TRAP    C$PNTX
     006356  062706  000010                                                        ADD     #10,SP
2786 006362  012701  003132              MOV     #BT1+8.,R1      ;POINT TO 2ND HALF OF ACTUAL VALUES
2787 006366                             PRINTX  #FMT06A,#TXT8B,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>
     006366  005046                                                                CLR     -(SP)
     006370  152116                                                                BISB    (R1)+,(SP)
     006372  005046                                                                CLR     -(SP)
     006374  152116                                                                BISB    (R1)+,(SP)
     006376  005046                                                                CLR     -(SP)
     006400  152116                                                                BISB    (R1)+,(SP)
     006402  005046                                                                CLR     -(SP)
     006404  152116                                                                BISB    (R1)+,(SP)
     006406  005046                                                                CLR     -(SP)
     006410  152116                                                                BISB    (R1)+,(SP)
     006412  005046                                                                CLR     -(SP)
     006414  152116                                                                BISB    (R1)+,(SP)
     006416  012746  014021                                                        MOV     #TXT8B,-(SP)
     006422  012746  012571                                                        MOV     #FMT06A,-(SP)
     006426  012746  000010                                                        MOV     #10,-(SP)
     006432  010600                                                                MOV     SP,R0
     006434  104415                                                                TRAP    C$PNTX
```

```
     006436  062706  000022                                                         ADD     #22,SP
2788 006442                       PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
     006442  005046                                                                 CLR     -(SP)
     006444  152116                                                                 BISB    (R1)+,(SP)
     006446  005046                                                                 CLR     -(SP)
     006450  152116                                                                 BISB    (R1)+,(SP)
     006452  012746  012637                                                         MOV     #FMT06B,-(SP)
     006456  012746  000003                                                         MOV     #3,-(SP)
     006462  010600                                                                 MOV     SP,R0
     006464  104415                                                                 TRAP    C$PNTX
     006466  062706  000010                                                         ADD     #10,SP
2789 006472  012701  003216       MOV     #BT2+8.,R1        ;POINT TO 2ND HALF OF XOR VALUES
2790 006476                       PRINTX  #FMT06A,#TXT8C,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>
     006476  005046                                                                 CLR     -(SP)
     006500  152116                                                                 BISB    (R1)+,(SP)
     006502  005046                                                                 CLR     -(SP)
     006504  152116                                                                 BISB    (R1)+,(SP)
     006506  005046                                                                 CLR     -(SP)
     006510  152116                                                                 BISB    (R1)+,(SP)
     006512  005046                                                                 CLR     -(SP)
     006514  152116                                                                 BISB    (R1)+,(SP)
     006516  005046                                                                 CLR     -(SP)
     006520  152116                                                                 BISB    (R1)+,(SP)
     006522  005046                                                                 CLR     -(SP)
     006524  152116                                                                 BISB    (R1)+,(SP)
     006526  012746  014036                                                         MOV     #TXT8C,-(SP)
     006532  012746  012571                                                         MOV     #FMT06A,-(SP)
     006536  012746  000010                                                         MOV     #10,-(SP)
     006542  010600                                                                 MOV     SP,R0
     006544  104415                                                                 TRAP    C$PNTX
     006546  062706  000022                                                         ADD     #22,SP
2791 006552                       PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
     006552  005046                                                                 CLR     -(SP)
     006554  152116                                                                 BISB    (R1)+,(SP)
     006556  005046                                                                 CLR     -(SP)
     006560  152116                                                                 BISB    (R1)+,(SP)
     006562  012746  012637                                                         MOV     #FMT06B,-(SP)
     006566  012746  000003                                                         MOV     #3,-(SP)
     006572  010600                                                                 MOV     SP,R0
     006574  104415                                                                 TRAP    C$PNTX
     006576  062706  000010                                                         ADD     #10,SP
2792 006602  012601               MOV     (SP)+,R1          ;RESTORE R1
2793 006604  004737  012072       JSR     PC,NULERR         ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
2794 006610                       ENDMSG
     006610                                                             L10011:
     006610  104423                                                                 TRAP    C$MSG
2795                        ;-------------------------------------------------------------------------------
2796                        .SBTTL  ERROR HANDLER -- ERR7 -- VIA REGISTER ERRORS
2797                        ;-------------------------------------------------------------------------------
2798 006612                       BGNMSG  ERR7
     006612                                                             ERR7::
2799 006612  113701  002334       MOVB    REGNUM,R1
2800 006616  006301               ASL     R1                ;AS PASSED, THIS WAS A BYTE OFFSET
2801 006620                       PRINTB  #FMT07,#TXTVR,TXTVRT(R1)
     006620  016146  017554                                                         MOV     TXTVRT(R1),-(SP)
     006624  012746  014327                                                         MOV     #TXTVR,-(SP)
     006630  012746  012530                                                         MOV     #FMT07,-(SP)
```

ERROR HANDLER -- ERR7 -- VIA REGISTER ERRORS

```
        006634  012746  000003                                                  MOV     #3,-(SP)
        006640  010600                                                          MOV     SP,R0
        006642  104414                                                          TRAP    C$PNTB
        006644  062706  000010                                                  ADD     #10,SP
  2802  006650  004737  011276          JSR     PC,XORGB
  2803  006654                        PRINTB  #FMT02A,<B,GDATA>,<B,BDATA>,<B,XDATA>
        006654  005046                                                          CLR     -(SP)
        006656  153716  002314                                                  BISB    XDATA,(SP)
        006662  005046                                                          CLR     -(SP)
        006664  153716  002312                                                  BISB    BDATA,(SP)
        006670  005046                                                          CLR     -(SP)
        006672  153716  002310                                                  BISB    GDATA,(SP)
        006676  012746  012161                                                  MOV     #FMT02A,-(SP)
        006702  012746  000004                                                  MOV     #4,-(SP)
        006706  010600                                                          MOV     SP,R0
        006710  104414                                                          TRAP    C$PNTB
        006712  062706  000012                                                  ADD     #12,SP
  2804  006716  004737  012072          JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
  2805  006722                        ENDMSG
        006722                                                          L10012:
        006722  104423                                                          TRAP    C$MSG
  2806                          ;-------------------------------------------------------------------------------
  2807                          .SBTTL  ERROR HANDLER -- ERR47 -- FOR RAM DATA ERRORS IN STATIC TEST(S)
  2808                          ;-------------------------------------------------------------------------------
  2809  006724                        RGNMSG  ERR47
        006724                                                          ERR47::
  2810                          ;       PRINT HEADING LINE # 1
  2811
  2812  006724  013700  002444          MOV     TMP2,R0         ;GET TEST PATTERN CODE
  2813  006730  001404                  BEQ     2$              ;ZERO IS UNDEFINED BUT THERE IS TEXT TO SAY THAT
  2814  006732  020027  000006          CMP     R0,#6           ;THIS IT ALL WE UNDERSTAND FOR NOW
  2815  006736  003401                  BLE     2$              ;IF WITHIN LIMITS, LET IT GO
  2816  006740  005000                  CLR     R0              ;ELSE, MAKE IT 0 FOR "UNDEFINED"
  2817  006742  006300          2$:     ASL     R0              ;CONVERT TO A WORD INDEX
  2818  006744  016000  007614          MOV     TXT47P(R0),R0   ;GET ADDRESS OF REQUIRED TEXT
  2819  006750                        PRINTX  #FMT47A,R0      ;IDENTIFY TEST PATTERN BEING USED
        006750  010046                                                          MOV     R0,-(SP)
        006752  012746  007232                                                  MOV     #FMT47A,-(SP)
        006756  012746  000002                                                  MOV     #2,-(SP)
        006762  010600                                                          MOV     SP,R0
        006764  104415                                                          TRAP    C$PNTX
        006766  062706  000006                                                  ADD     #6,SP
  2820                          ;       PRINT HEADING LINE # 2
  2821
  2822  006772                        PRINTX  #FMT47B         ;STANDARD PORTION OF LINE 2
        006772  012746  007263                                                  MOV     #FMT47B,-(SP)
        006776  012746  000001                                                  MOV     #1,-(SP)
        007002  010600                                                          MOV     SP,R0
        007004  104415                                                          TRAP    C$PNTX
        007006  062706  000004                                                  ADD     #4,SP
  2823                          ;       PRINT HEADING LINE # 3
  2824
  2825  007012                        PRINTX  #FMT47C         ;STANDARD PORTION OF LINE 3
        007012  012746  007322                                                  MOV     #FMT47C,-(SP)
        007016  012746  000001                                                  MOV     #1,-(SP)
        007022  010600                                                          MOV     SP,R0
        007024  104415                                                          TRAP    C$PNTX
```

ERROR HANDLER -- ERR47 -- FOR RAM DATA ERRORS IN STATIC TEST(S

```
     007026  062706  000004                                                  ADD     #4,SP
2826                         ;       PRINT HEADING LINE # 4
2827
2828 007032                  PRINTX  #FMT47E          ;STANDARD PORTION OF LINE 4
     007032  012746  007350                                                  MOV     #FMT47E,-(SP)
     007036  012746  000001                                                  MOV     #1,-(SP)
     007042  010600                                                          MOV     SP,R0
     007044  104415                                                          TRAP    C$PNTX
     007046  062706  000004                                                  ADD     #4,SP
2829                         ;       GO PRINT DATA PORTION OF ERROR MESSAGE
2830
2831 007052                  PRINTX  #NEWLIN          ;TERMINATE HEADER & CAUSE 1 BLANK LINE
     007052  012746  012121                                                  MOV     #NEWLIN,-(SP)
     007056  012746  000001                                                  MOV     #1,-(SP)
     007062  010600                                                          MOV     SP,R0
     007064  104415                                                          TRAP    C$PNTX
     007066  062706  000004                                                  ADD     #4,SP
2832 007072  005037  007104  CLR     ER47CT          ;RE-INITIALIZE THE DATA LINE COUNTER
2833 007076  004737  007110  JSR     PC,ERR47.       ;USE COMMON SUBROUTINE TO REPORT DATA
2834 007102                  ENDMSG
     007102                                                          L10013:
     007102  104423                                                          TRAP    C$MSG
2835
2836 007104  000000  ER47CT: .WORD   0              ;THIS VARIABLE WILL COUNT THE DATA LINES
2837 007106  000020  ER47MX: .WORD   16.             ;THIS CONSTANT LIMITS THE DATA LINES PRINTED
2838
2839 007110                  ERR47.:
2840
2841 007110  023737  007104  007106  CMP     ER47CT,ER47MX   ;HAVE WE REPORTED ENOUGH OF THESE DATA LINES?
2842 007116  103044          BHIS    60$             ;YES,  BYPASS THIS WHOLE ROUTINE AND EXIT
2843 007120  005237  007104  INC     ER47CT          ;NO,   COUNT THIS LINE
2844
2845 007124  113701  002450  MOVB    TMP4,R1         ;GET EXPECTED DATA
2846 007130  113703  002452  MOVB    TMP5,R3         ;SETUP TO CALCULATE XOR
2847 007134  074103          XOR     R1,R3           ;CALCULATE XOR OF EXPECTED & ACTUAL DATA
2848 007136                  PRINTX  #FMT47G,TMPA,<B,R1>,<B,TMP5>,<B,R3> ;PRINT DATA LINE
     007136  005046                                                          CLR     -(SP)
     007140  150316                                                          BISB    R3,(SP)
     007142  005046                                                          CLR     -(SP)
     007144  153716  002452                                                  BISB    TMP5,(SP)
     007150  005046                                                          CLR     -(SP)
     007152  150116                                                          BISB    R1,(SP)
     007154  013746  002464                                                  MOV     TMPA,-(SP)
     007160  012746  007407                                                  MOV     #FMT47G,-(SP)
     007164  012746  000005                                                  MOV     #5,-(SP)
     007170  010600                                                          MOV     SP,R0
     007172  104415                                                          TRAP    C$PNTX
     007174  062706  000014                                                  ADD     #14,SP
2849 007200  023737  007104  007106  CMP     ER47CT,ER47MX   ;IF THESE TWO ARE EQUAL, WE WON'T BE PRINTING
2850 007206  001010          BNE     60$             ;ANY MORE LINES FOR A WHILE.  SO,
2851 007210                  PRINTX  #FMT48I          ;  PUT OUT A MESSAGE TO THAT EFFECT.
     007210  012746  010644                                                  MOV     #FMT48I,-(SP)
     007214  012746  000001                                                  MOV     #1,-(SP)
     007220  010600                                                          MOV     SP,R0
     007222  104415                                                          TRAP    C$PNTX
     007224  062706  000004                                                  ADD     #4,SP
2852 007230  000207          60$:    RTS     PC
```

F6

ERROR HANDLER -- ERR47 -- FOR RAM DATA ERRORS IN STATIC TEST(S

```
                                                .NLIST  BEX
007232  045  116  045  FMT47A: .ASCIZ  \¤N¤S2¤ATEST PATTERN:  ¤T\
007263  045  116  045  FMT47B: .ASCIZ  \¤N¤S2¤A  (ALL VALUES IN OCTAL)\
007322  045  116  045  FMT47C: .ASCIZ  \¤N¤S3¤A  RAM   SHOULD\
007350  045  116  045  FMT47E: .ASCIZ  \¤N¤S3¤AADDRESS   BE    IS  XOR\
007407  045  116  045  FMT47G: .ASCIZ  \¤N¤S4¤04¤S4¤03¤S3¤03¤S2¤03\
007442  101  114  114  TXT47C: .ASCIZ  \ALL ONES\
007453  101  114  114  TXT47D: .ASCIZ  \ALL ZEROES\
007466  061  040  102  TXT47E: .ASCIZ  \1 BIT ALTERNATING\
007510  062  040  102  TXT47F: .ASCIZ  \2 BITS ALTERNATING\
007533  101  104  104  TXT47G: .ASCIZ  \ADDRESS IN ADDRESS\
007556  111  116  103  TXT47H: .ASCIZ  \INCREMENTAL VALUE IN ADDRESS\
                                                .LIST   BEX
                                                .EVEN
007614  014235  007442  007453  TXT47P: .WORD   TXTML6,TXT47C,TXT47D,TXT47E,TXT47F,TXT47G,TXT47H
007622  007466  007510  007533
007630  007556

                                        ;       "TXTML6" ABOVE IS DEFINED AS "UNDEFINED" IN THE M-LOOP FUNCTION DEF'S.

                                        ;-------------------------------------------------------------------------------
                                        .SBTTL  ERROR HANDLER -- ERR48 -- FOR DATA ERRORS IN "MOVING INVERSIONS TEST"
                                        ;-------------------------------------------------------------------------------
007632                                  BGNMSG  ERR48
007632                                                                          ERR48::
                                        ;       PRINT HEADING LINE # 1

007632                                  PRINTX  #FMT48A         ;STANDARD PORTION OF LINE 1
007632  012746  010300                                                        MOV     #FMT48A,-(SP)
007636  012746  000001                                                        MOV     #1,-(SP)
007642  010600                                                                MOV     SP,R0
007644  104415                                                                TRAP    C$PNTX
007646  062706  000004                                                        ADD     #4,SP
007652  032737  000004  002350          BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
007660  001410                          BEQ     2$
007662                                  PRINTX  #FMT48B         ;PRINT EXTENDED PORTION OF LINE 1
007662  012746  010347                                                        MOV     #FMT48B,-(SP)
007666  012746  000001                                                        MOV     #1,-(SP)
007672  010600                                                                MOV     SP,R0
007674  104415                                                                TRAP    C$PNTX
007676  062706  000004                                                        ADD     #4,SP
                                        ;       PRINT HEADING LINE # 2

007702                                  2$:     PRINTX  #FMT48C         ;STANDARD PORTION OF LINE 2
007702  012746  010402                                                        MOV     #FMT48C,-(SP)
007706  012746  000001                                                        MOV     #1,-(SP)
007712  010600                                                                MOV     SP,R0
007714  104415                                                                TRAP    C$PNTX
007716  062706  000004                                                        ADD     #4,SP

                                        ;       PRINT HEADING LINE # 3

007722                                  PRINTX  #FMT48E         ;STANDARD PORTION OF LINE 3
007722  012746  010437                                                        MOV     #FMT48E,-(SP)
007726  012746  000001                                                        MOV     #1,-(SP)
007732  010600                                                                MOV     SP,R0
```

ERROR HANDLER -- ERR48 -- FOR DATA ERRORS IN "MOVING INVERSION

```
        007734  104415                                                          TRAP    C$PNTX
        007736  062706  000004                                                  ADD     #4,SP
2889    007742  032737  000004  002350          BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
2890    007750  001410                          BEQ     6$
2891    007752                                  PRINTX  #FMT48F         ;PRINT EXTENDED PORTION OF LINE 3
        007752  012746  010506                                                  MOV     #FMT48F,-(SP)
        007756  012746  000001                                                  MOV     #1,-(SP)
        007762  010600                                                          MOV     SP,R0
        007764  104415                                                          TRAP    C$PNTX
        007766  062706  000004                                                  ADD     #4,SP
2892                                    ;       GO PRINT DATA PORTION OF ERROR MESSAGE
2893
2894    007772                          6$:     PRINTX  #NEWLIN         ;TERMINATE HEADER & CAUSE 1 BLANK LINE
        007772  012746  012121                                                  MOV     #NEWLIN,-(SP)
        007776  012746  000001                                                  MOV     #1,-(SP)
        010002  010600                                                          MOV     SP,R0
        010004  104415                                                          TRAP    C$PNTX
        010006  062706  000004                                                  ADD     #4,SP
2895    010012  005037  010024                  CLR     ER48CT          ;RE-INITIALIZE THE DATA LINE COUNTER
2896    010016  004737  010030                  JSR     PC,ERR48.       ;USE COMMON SUBROUTINE TO REPORT DATA
2897    010022                                  ENDMSG
        010022                                                                  L10014:
        010022  104423                                                          TRAP    C$MSG
2898
2899    010024  000000                  ER48CT: .WORD   0               ;THIS VARIABLE WILL COUNT THE DATA LINES
2900    010026  000020                  ER48MX: .WORD   16.             ;THIS CONSTANT LIMITS THE DATA LINES PRINTED
2901
2902    010030                          ERR48.:
2903
2904    010030  023737  010024  010026          CMP     ER48CT,ER48MX   ;HAVE WE REPORTED ENOUGH OF THESE DATA LINES?
2905    010036  103117                          BHIS    60$             ;YES,  BYPASS THIS WHOLE ROUTINE AND EXIT
2906    010040  005237  010024                  INC     ER48CT          ;NO,   COUNT THIS LINE
2907
2908                                    ; DETERMINT WHICH ERROR CALL GOT US HERE -- PRE-WRITE OR POST-WRITE:
2909
2910    010044  032737  000002  002476          BIT     #BIT1,TMPF      ;DID PRE-WRITE ERROR CALL GET US HERE?
2911    010052  001405                          BEQ     2$              ;NO, THEN SETUP FOR "POST" IN ERROR MESSAGE
2912    010054  012700  010736                  MOV     #TXT48A,R0      ;YES, SETUP FOR "PRE" IN ERROR MESSAGE
2913    010060  113701  002450                  MOVB    TMP4,R1         ;GET EXPECTED DATA (BEFORE WRITING NEW VALUE)
2914    010064  000404                          BR      4$
2915
2916    010066  012700  010743          2$:     MOV     #TXT48B,R0      ;POINT TO "POST" TEXT
2917    010072  113701  002451                  MOVB    TMP4+1,R1       ;GET EXPECTED DATA (AFTER WRITING NEW VALUE)
2918    010076  013703  002452          4$:     MOV     TMP5,R3         ;SETUP TO CALCULATE XOR
2919    010102  074103                          XOR     R1,R3           ;CALCULATE XOR OF EXPECTED & ACTUAL DATA
2920    010104                                  PRINTX  #FMT48G,R0,TMPA,<B,R1>,<B,TMP5>,<B,R3> ;PRINT STANDARD DATA LINE
        010104  005046                                                                  CLR     (SP)
        010106  150316                                                                  BISB    R3,(SP)
        010110  005046                                                                  CLR     -(SP)
        010112  153716  002452                                                          BISB    TMP5,(SP)
        010116  005046                                                                  CLR     (SP)
        010120  150116                                                                  BISB    R1,(SP)
        010122  013746  002464                                                          MOV     TMPA,(SP)
        010126  010046                                                                  MOV     R0,(SP)
        010130  012746  010551                                                          MOV     #FMT48G,-(SP)
        010134  012746  000006                                                          MOV     #6,(SP)
        010140  010600                                                                  MOV     SP,R0
```

ERROR HANDLER -- ERR48 -- FOR DATA ERRORS IN "MOVING INVERSION

```
        010142  104415                                                                  TRAP    C$PNTX
        010144  062706  000016                                                         ADD     #16,SP
2921    010150  032737  000004  002350          BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
2922    010156  001433                          BEQ     10$
2923                                                             ;SETUP FOR PRINTING OF EXTENDED INFORMATION
2924    010160  013701  002470                  MOV     TMPC,R1         ;DATA BIT VALUE (0 OR 1)
2925    010164  042701  177776                  BIC     #^CBIT0,R1      ;  MAKE SURE WE ONLY HAVE ONE BIT
2926    010170  005737  002472                  TST     TMPD            ;DIRECTION?
2927    010174  001003                          BNE     6$              ;BACKWARD --
2928    010176  012700  010750                  MOV     #TXT48C,R0      ;FORWARD ---
2929    010202  000402                          BR      8$
2930    010204  012700  010755          6$:     MOV     #TXT48D,R0      ;BACKWARD --
2931    010210                          8$:     PRINTX  #FMT48H,TMPB,R1,R0,<B,TMP9>  ;PRINT EXTENDED INFORMATION
        010210  005046                                                                  CLR     -(SP)
        010212  153716  002462                                                         BISB    TMPB,(SP)
        010216  010046                                                                  MOV     R0,-(SP)
        010220  010146                                                                  MOV     R1,-(SP)
        010222  013746  002466                                                         MOV     TMPB,-(SP)
        010226  012746  010611                                                         MOV     #FMT48H,-(SP)
        010232  012746  000005                                                         MOV     #5,-(SP)
        010236  010600                                                                  MOV     SP,R0
        010240  104415                                                                  TRAP    C$PNTX
        010242  062706  000014                                                         ADD     #14,SP
2932    010246  023737  010024  010026  10$:     CMP     ER48CT,ER48MX   ;IF THESE TWO ARE EQUAL, WE WON'T BE PRINTING
2933    010254  001010                          BNE     60$             ;ANY MORE LINES FOR A WHILE,  SO,
2934    010256                                  PRINTX  #FMT48I         ;  PUT OUT A MESSAGE TO THAT EFFECT.
        010256  012746  010644                                                         MOV     #FMT48I,-(SP)
        010262  012746  000001                                                         MOV     #1,-(SP)
        010266  010600                                                                  MOV     SP,R0
        010270  104415                                                                  TRAP    C$PNTX
        010272  062706  000004                                                         ADD     #4,SP
2935    010276                          60$:
2936    010276  000207                          RTS     PC
2937                                    .NLIST  BEX
2938    010300      045     116     045 FMT48A: .ASCIZ  \%N%S2%APRE OR    (ALL VALUES IN OCTAL)\
2939    010347      045     123     065 FMT48B: .ASCIZ  \%S5%AEXTENDED INFORMATION:\
2940    010402      045     116     045 FMT48C: .ASCIZ  \%N%S3%APOST     RAM    SHOULD\
2941    010437      045     116     045 FMT48E: .ASCIZ  \%N%S2%AWRITE   ADDRESS   BE    IS  XOR\
2942    010506      045     123     065 FMT48F: .ASCIZ  \%S5%ABIT  DATA   SEQ  LSB(DECIMAL)\
2943    010551      045     116     045 FMT48G: .ASCIZ  \%N%S3%T%S4%04%S4%03%S3%03%S2%03\
2944    010611      045     123     066 FMT48H: .ASCIZ  \%S6%01%S5%01%S3%T%S2%D2%A.\
2945    010644      045     116     045 FMT48I: .ASCIZ  \%N%N%S5%AFURTHER DATA LINES SUPRESSED UNTIL NEW TEST DATA\
2946    010736      120     122     105 TXT48A: .ASCIZ  \PRE \
2947    010743      120     117     123 TXT48B: .ASCIZ  \POST\
2948    010750      040     106     127 TXT48C: .ASCIZ  \ FWD\
2949    010755      102     113     127 TXT48D: .ASCIZ  \BKWD\
2950                                    .LIST   BEX
2951                                    .EVEN
2952
2953
2954                                    ;-------------------------------------------------------------------------------
2955                                    .SBTTL  ERROR HANDLER -- ERR50 -- FOR REPORTING TIMER # 1 ERRORS
2956                                    ;-------------------------------------------------------------------------------
2957    010762                                  BGNMSG  ERR50
        010762                                                                                  ERR50::
2958    010762  010146                          MOV     R1,(SP)         ;SAVE R1 FOR CALLER
2959    010764  113701  002467                  MOVB    TMPB+1,R1       ;GET THE MODE LAST SETUP
```

ERROR HANDLER -- ERR50 -- FOR REPORTING TIMER # 1 ERRORS

```
2960 010770  000241                    CLC                     ;SEEING AS THE CARRY BIT WILL BE ROTATED INTO
2961                                                           ;THE DATA, WE HAD BETTER CLEAR IT JUST IN CASE.
2962 010772  042701  177477            BIC     #^C<BIT6+BIT7>,R1 ;LOOK @ JUST THE TIMER 1 MODE DEFINITION
2963 010776  106101                    ROLB    R1              ;POSITION IT FOR PRINTOUT
2964 011000  106101                    ROLB    R1
2965 011002  106101                    ROLB    R1
2966
2967                                   ;IDENTIFY THE MODE BEING USED AT THE TIME:
2968
2969 011004                            PRINTX  #FMT50A,R1
     011004  010146                                                    MOV     R1,-(SP)
     011006  012746  012747                                            MOV     #FMT50A,-(SP)
     011012  012746  000002                                            MOV     #2,-(SP)
     011016  010600                                                    MOV     SP,R0
     011020  104415                                                    TRAP    C$PNTX
     011022  062706  000006                                            ADD     #6,SP
2970                                   ;PRINT THE HEADING TO IDENTIFY THE REGISTERS:
2971
2972 011026                            PRINTX  #FMT50B
     011026  012746  013021                                            MOV     #FMT50B,-(SP)
     011032  012746  000001                                            MOV     #1,-(SP)
     011036  010600                                                    MOV     SP,R0
     011040  104415                                                    TRAP    C$PNTX
     011042  062706  000004                                            ADD     #4,SP
2973
2974                                   ;AND THE VALUES THAT WERE LOADED INTO THE REGISTERS:
2975 011046                            PRINTX  #FMT50C,#TXT8D,<B,TMP5+1>,<B,TMP4+1>,<B,TMP7+1>,<B,TMP6+1>
     011046  005046                                                    CLR     -(SP)
     011050  153716  002455                                          BISB    TMP6+1,(SP)
     011054  005046                                                    CLR     -(SP)
     011056  153716  002457                                          BISB    TMP7+1,(SP)
     011062  005046                                                    CLR     -(SP)
     011064  153716  002451                                          BISB    TMP4+1,(SP)
     011070  005046                                                    CLR     -(SP)
     011072  153716  002453                                          BISB    TMP5+1,(SP)
     011076  012746  014053                                          MOV     #TXT8D,-(SP)
     011102  012746  013102                                          MOV     #FMT50C,-(SP)
     011106  012746  000006                                          MOV     #6,-(SP)
     011112  010600                                                    MOV     SP,R0
     011114  104415                                                    TRAP    C$PNTX
     011116  062706  000016                                            ADD     #16,SP
2976 011122                            PRINTX  #FMT50D,<B,TMPB+1>,<B,TMPE+1>
     011122  005046                                                    CLR     -(SP)
     011124  153716  002475                                          BISB    TMPE+1,(SP)
     011130  005046                                                    CLR     -(SP)
     011132  153716  002467                                          BISB    TMPB+1,(SP)
     011136  012746  013142                                          MOV     #FMT50D,-(SP)
     011142  012746  000003                                          MOV     #3,-(SP)
     011146  010600                                                    MOV     SP,R0
     011150  104415                                                    TRAP    C$PNTX
     011152  062706  000010                                            ADD     #10,SP
2977                                   ;AND THE VALUES READ FROM THOSE REGISTERS:
2978
2979 011156                            PRINTX  #FMT50C,#TXT8E,<B,TMP5>,<B,TMP4>,<B,TMP7>,<B,TMP6>
     011156  005046                                                    CLR     -(SP)
     011160  153716  002454                                          BISB    TMP6,(SP)
     011164  005046                                                    CLR     -(SP)
```

ERROR HANDLER -- ERR50 -- FOR REPORTING TIMER # 1 ERRORS

```
        011166  153716  002456                                                  BISB    TMP7,(SP)
        011172  005046                                                          CLR     -(SP)
        011174  153716  002450                                                  BISB    TMP4,(SP)
        011200  005046                                                          CLR     -(SP)
        011202  153716  002452                                                  BISB    TMP5,(SP)
        011206  012746  014070                                                  MOV     #TXT8E,-(SP)
        011212  012746  013102                                                  MOV     #FMT50C,-(SP)
        011216  012746  000006                                                  MOV     #6,-(SP)
        011222  010600                                                          MOV     SP,R0
        011224  104415                                                          TRAP    C$PNTX
        011226  062706  000016                                                  ADD     #16,SP
  2980  011232                          PRINTX  #FMT50E,<B,TMPB>,<B,TMPD>
        011232  005046                                                          CLR     -(SP)
        011234  153716  002472                                                  BISB    TMPD,(SP)
        011240  005046                                                          CLR     -(SP)
        011242  153716  002466                                                  BISB    TMPB,(SP)
        011246  012746  013157                                                  MOV     #FMT50E,-(SP)
        011252  012746  000003                                                  MOV     #3,-(SP)
        011256  010600                                                          MOV     SP,R0
        011260  104415                                                          TRAP    C$PNTX
        011262  062706  000010                                                  ADD     #10,SP
  2981
  2982  011266  004737  012072                JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
  2983  011272  012601                        MOV     (SP)+,R1        ;RESTORE R1 FOR CALLER
  2984  011274                                ENDMSG
        011274                                                          L10015:
        011274  104423                                                          TRAP    C$MSG
  2985
  2986
```

ERROR HANDLER SUBROUTINES

```
                                        .SBTTL  ERROR HANDLER SUBROUTINES
                                        ;-------------------------------------------------------------------------------
                                        ;---------      SUBROUTINES USED ONLY BY ERROR HANDLERS ------------------------
                                        ;-------------------------------------------------------------------------------


                                        ;-------------------------------------------------------------------------------
                                        .SBTTL          ERROR HANDLER SUBROUTINE -- XORGB
                                        ;-------------------------------------------------------------------------------
                                        ;       PERFORM EXCLUSIVE OR BETWEEN "GDATA" & "BDATA" PUTTING
                                        ;       THE RESULT IN "XDATA"

011276  010146                  XORGB:  MOV     R1,-(SP)        ;PRESERVE WORKING REGISTER
011300  013701  002310                  MOV     GDATA,R1        ;GET "GOOD" DATA
011304  013737  002312  002314          MOV     BDATA,XDATA     ;AND "BAD" DATA
011312  074137  002314                  XOR     R1,XDATA        ;PERFORM EXCLUSIVE OR
011316  012601                          MOV     (SP)+,R1        ;RESTORE R1
011320  000207                          RTS     PC              ;RETURN


                                        ;-------------------------------------------------------------------------------
                                        .SBTTL          ERROR HANDLER SUBROUTINE -- ERR4$
                                        ;-------------------------------------------------------------------------------
                                        ;       IDENTIFY & DUMP THE BYTE SELECT REGISTERS

011322                          ERR4$:  PRINTX  #FMT4,#TXT3,#TXT1
011322  012746  013253                          MOV     #TXT1,-(SP)
011326  012746  013454                          MOV     #TXT3,-(SP)
011332  012746  012245                          MOV     #FMT4,-(SP)
011336  012746  000003                          MOV     #3,-(SP)
011342  010600                                  MOV     SP,R0
011344  104415                                  TRAP    C$PNTX
011346  062706  000010                          ADD     #10,SP
011352                                  PRINTX  #FMT4A,<B,BSR0>,<B,BSR1>,<B,BSR2>,<B,BSR3>
011352  005046                                  CLR     -(SP)
011354  153716  002254                          BISB    BSR3,(SP)
011360  005046                                  CLR     -(SP)
011362  153716  002252                          BISB    BSR2,(SP)
011366  005046                                  CLR     -(SP)
011370  153716  002250                          BISB    BSR1,(SP)
011374  005046                                  CLR     -(SP)
011376  153716  002246                          BISB    BSR0,(SP)
011402  012746  012305                          MOV     #FMT4A,-(SP)
011406  012746  000005                          MOV     #5,-(SP)
011412  010600                                  MOV     SP,R0
011414  104415                                  TRAP    C$PNTX
011416  062706  000014                          ADD     #14,SP
011422                                  PRINTX  #FMT4B,#TXT2
011422  012746  013311                          MOV     #TXT2,-(SP)
011426  012746  012340                          MOV     #FMT4B,(SP)
011432  012746  000002                          MOV     #2,(SP)
011436  010600                                  MOV     SP,R0
011440  104415                                  TRAP    C$PNTX
011442  062706  000006                          ADD     #6,SP
011446                                  PRINTX  #FMT4C,<B,BSR4>,<B,BSR5>,<B,BSR6>,<B,BSR7>
011446  005046                                  CLR     -(SP)
011450  153716  002264                          BISB    BSR7,(SP)
011454  005046                                  CLR     -(SP)
```

ERROR HANDLER SUBROUTINE -- ERR4$

```
        011456  153716  002262                                          BISB    BSR6,(SP)
        011462  005046                                                  CLR     -(SP)
        011464  153716  002260                                          BISB    BSR5,(SP)
        011470  005046                                                  CLR     -(SP)
        011472  153716  002256                                          BISB    BSR4,(SP)
        011476  012746  012345                                          MOV     #FMT4C,-(SP)
        011502  012746  000005                                          MOV     #5,-(SP)
        011506  010600                                                  MOV     SP,R0
        011510  104415                                                  TRAP    C$PNTX
        011512  062706  000014                                          ADD     #14,SP
3016    011516                  PRINTX  #FMT4B,#TXT2A
        011516  012746  013353                                          MOV     #TXT2A,-(SP)
        011522  012746  012340                                          MOV     #FMT4B,-(SP)
        011526  012746  000002                                          MOV     #2,-(SP)
        011532  010600                                                  MOV     SP,R0
        011534  104415                                                  TRAP    C$PNTX
        011536  062706  000006                                          ADD     #6,SP
3017    011542                  PRINTX  #FMT4A,<B,BSR10>,<B,BSR11>,<B,BSR12>,<B,BSR13>
        011542  005046                                                  CLR     -(SP)
        011544  153716  002274                                          BISB    BSR13,(SP)
        011550  005046                                                  CLR     -(SP)
        011552  153716  002272                                          BISB    BSR12,(SP)
        011556  005046                                                  CLR     -(SP)
        011560  153716  002270                                          BISB    BSR11,(SP)
        011564  005046                                                  CLR     -(SP)
        011566  153716  002266                                          BISB    BSR10,(SP)
        011572  012746  012305                                          MOV     #FMT4A,-(SP)
        011576  012746  000005                                          MOV     #5,-(SP)
        011602  010600                                                  MOV     SP,R0
        011604  104415                                                  TRAP    C$PNTX
        011606  062706  000014                                          ADD     #14,SP
3018    011612                  PRINTX  #FMT4B,#TXT2B
        011612  012746  013412                                          MOV     #TXT2B,-(SP)
        011616  012746  012340                                          MOV     #FMT4B,-(SP)
        011622  012746  000002                                          MOV     #2,-(SP)
        011626  010600                                                  MOV     SP,R0
        011630  104415                                                  TRAP    C$PNTX
        011632  062706  000006                                          ADD     #6,SP
3019    011636                  PRINTX  #FMT4C,<B,BSR14>,<B,BSR15>,<B,BSR16>,<B,BSR17>
        011636  005046                                                  CLR     -(SP)
        011640  153716  002304                                          BISB    BSR17,(SP)
        011644  005046                                                  CLR     -(SP)
        011646  153716  002302                                          BISB    BSR16,(SP)
        011652  005046                                                  CLR     -(SP)
        011654  153716  002300                                          BISB    BSR15,(SP)
        011660  005046                                                  CLR     -(SP)
        011662  153716  002276                                          BISB    BSR14,(SP)
        011666  012746  012345                                          MOV     #FMT4C,-(SP)
        011672  012746  000005                                          MOV     #5,-(SP)
        011676  010600                                                  MOV     SP,R0
        011700  104415                                                  TRAP    C$PNTX
        011702  062706  000014                                          ADD     #14,SP
3020    011706  000207          RTS     PC
3021
3022            ;-------------------------------------------------------------------------
3023            ;SBTTL ........ERROR HANDLER SUBROUTINE -- ERR5$
3024            ;-------------------------------------------------------------------------
```

```
                                        ;       COMMON ERROR SUBROUTINE TO PRINT SELECT REGISTERS
011710                                  ERR5$:
011710                                          PRINTX  #FMT4,#TXT6,#TXT4
011710  012746  013504                                                                                  MOV     #TXT4,-(SP)
011714  012746  013607                                                                                  MOV     #TXT6,-(SP)
011720  012746  012245                                                                                  MOV     #FMT4,-(SP)
011724  012746  000003                                                                                  MOV     #3,-(SP)
011730  010600                                                                                          MOV     SP,R0
011732  104415                                                                                          TRAP    C$PNTX
011734  062706  000010                                                                                  ADD     #10,SP
011740                                          PRINTX  #FMT11,WSR0,WSR2,WSR4,WSR6 ;DUMP THE SELECT REGISTERS
011740  013746  002254                                                                                  MOV     WSR6,-(SP)
011744  013746  002252                                                                                  MOV     WSR4,-(SP)
011750  013746  002250                                                                                  MOV     WSR2,-(SP)
011754  013746  002246                                                                                  MOV     WSR0,-(SP)
011760  012746  012730                                                                                  MOV     #FMT11,-(SP)
011764  012746  000005                                                                                  MOV     #5,-(SP)
011770  010600                                                                                          MOV     SP,R0
011772  104415                                                                                          TRAP    C$PNTX
011774  062706  000014                                                                                  ADD     #14,SP
012000                                          PRINTX  #FMT4B,#TXT4A
012000  012746  013544                                                                                  MOV     #TXT4A,-(SP)
012004  012746  012340                                                                                  MOV     #FMT4B,-(SP)
012010  012746  000002                                                                                  MOV     #2,-(SP)
012014  010600                                                                                          MOV     SP,R0
012016  104415                                                                                          TRAP    C$PNTX
012020  062706  000006                                                                                  ADD     #6,SP
012024                                          PRINTX  #FMT11,WSR10,WSR12,WSR14,WSR16
012024  013746  002264                                                                                  MOV     WSR16,-(SP)
012030  013746  002262                                                                                  MOV     WSR14,-(SP)
012034  013746  002260                                                                                  MOV     WSR12,-(SP)
012040  013746  002256                                                                                  MOV     WSR10,-(SP)
012044  012746  012730                                                                                  MOV     #FMT11,-(SP)
012050  012746  000005                                                                                  MOV     #5,-(SP)
012054  010600                                                                                          MOV     SP,R0
012056  104415                                                                                          TRAP    C$PNTX
012060  062706  000014                                                                                  ADD     #14,SP
012064  004737  012072                          JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
012070  000207                                  RTS     PC

                                        ;-----------------------------------------------------------------------------
                                        .SBTTL          SUBROUTINE TO PERFORM "PRINTB   #ENDEMB"

012072                                  NULERR: PRINTB  #ENDEMB         ;TERMINATE ERROR MESSAGE
012072  012746  012114                                                                                  MOV     #ENDEMB,-(SP)
012076  012746  000001                                                                                  MOV     #1,-(SP)
012102  010600                                                                                          MOV     SP,R0
012104  104414                                                                                          TRAP    C$PNTB
012106  062706  000004                                                                                  ADD     #4,SP
012112  000207                                  RTS     PC
                                        ;-----------------------------------------------------------------------------
```

```
                                        .SBTTL  FORMAT SPEC'S FOR ERROR HANDLERS -- "FMT___"
                                        ;-------------------------------------------------------------------------
                                        ;-------------- FORMAT SPEC'S USED BY ERROR HANDLERS ----------------------
                                        ;-------------------------------------------------------------------------
                                        .NLIST  BEX
012114      045     116     045 ENDEMB: .ASCIZ  /%N%N/
012121      045     116     000 NEWLIN: .ASCIZ  /%N/

012124      045     116     045 FMT02:  .ASCIZ  /%N%AFAILING REG = %T%ASEL%02/
012161      045     116     045 FMT02A: .ASCIZ  /%N%A  EXPECTED:  %03%A   ACTUAL:  %03%A   XOR:  %03/
012245      045     116     045 FMT4:   .ASCIZ  /%N%A  THE CONTENTS OF ALL%T%N%T/
012305      045     116     045 FMT4A:  .ASCIZ  /%N%S1%03%S5%03%S5%03%S5%03/
012340      045     116     045 FMT4B:  .ASCIZ  /%N%1/
012345      045     116     045 FMT4C:  .ASCIZ  /%N%S5%03%S5%03%S5%03%S5%03/
012400      045     116     045 FMT5:   .ASCIZ  /%N%A  WHEN %03%A LOADED INTO BSEL1/
012443      045     116     045 FMT5A:  .ASCIZ  /%N%A  ATTEMPTING "M-LOOP" FUNCTION CODE %02%A (%T%A)/
012530      045     101     040 FMT07:  .ASCIZ  /%A  DETECTED IN %T%T%A --/
012562      045     116     045 FMT06:  .ASCIZ  /%N%N%T/
012571      045     116     045 FMT06A: .ASCIZ  /%N%T%03%S2%03%S2%03%S2%03%S2%03%S2%03/
012637      045     123     062 FMT06B: .ASCIZ  /%S2%03%S2%03/
012654      045     116     045 FMT10:  .ASCIZ  /%N%A  EXPECTED:%08%A  ACTUAL:%08%A  XOR:%08/
012730      045     116     045 FMT11:  .ASCIZ  /%N%08%08%08%08/
012747      045     116     045 FMT50A: .ASCIZ  /%N%A  TIMER # 1 MODE:  %01%A   REGISTERS:/
013021      045     116     045 FMT50B: .ASCIZ  /%N%S15%AT1CH  T1CL  T1LH  T1LL   ACR   IFR   IER/
013102      045     116     045 FMT50C: .ASCIZ  /%N%S3%T%S1%03%S3%03%S3%03%S3%03/
013142      045     123     063 FMT50D: .ASCIZ  /%S3%03%S9%03/
013157      045     123     063 FMT50E: .ASCIZ  /%S3%03%S3%03/
013174      045     116     062 FMT50M: .ASCIZ  /%N2%S10%AC(T1CH & T1CL HAVEN'T YET BEEN LOADED)/

                                        .SBTTL  TEXT STRINGS FOR ERROR HANDLERS -- "TXT___"
                                        ;-------------------------------------------------------------------------
                                        ;--- ---  ---- TEXT USED BY ERROR HANDLERS ----------------------------
                                        ;-------------------------------------------------------------------------

013253      102     123     105 TXT1:   .ASCIZ  /BSEL0   BSEL1   BSEL2   BSEL3/
013311      040     040     040 TXT2:   .ASCIZ  /    BSEL4   BSEL5   BSEL6   BSEL7/
013353      102     123     105 TXT2A:  .ASCIZ  /BSEL10  BSEL11  BSEL12  BSEL13/
013412      040     040     040 TXT2B:  .ASCIZ  /   BSEL14  BSEL15  BSEL16  BSEL17/
013454      040     102     131 TXT3:   .ASCIZ  / BYTE SELECT REG'S ARE:/
013504      040     040     040 TXT4:   .ASCIZ  /   SEL0    SEL2    SEL4    SEL6/
013544      040     040     040 TXT4A:  .ASCIZ  /   SEL10   SEL12   SEL14   SEL16/
013605      102     000         TXT5:   .ASCIZ  /B/
013607      040     123     105 TXT6:   .ASCIZ  / SELECT REG'S ARE:/
013632      040     122     105 TXT7:   .ASCIZ  / REGISTERS  ORB  ORA  DDRB DDRA T1CL T1CH T1LL T1LH /
013717      040     040     040 TXT7A:  .ASCIZ  /            T2CL T2CH SR   ACR  PCR  IFR  IER  ORA  /
014004      040     105     130 TXT8A:  .ASCIZ  / EXPECTED:  /
014021      040     101     103 TXT8B:  .ASCIZ  / ACTUAL:    /
014036      040     130     117 TXT8C:  .ASCIZ  / XOR:       /
014053      040     114     117 TXT8D:  .ASCIZ  / LOADED:    /
014070      040     122     105 TXT8E:  .ASCIZ  / READ:      /

014105      116     117     120 TXTNL0: .ASCIZ  /NOP/
014111      122     105     101 TXTML1: .ASCIZ  /READ 1 BYTE/
014125      127     122     111 TXTML2: .ASCIZ  /WRITE 1 BYTE/
014142      116     120     122 TXTML3: .ASCIZ  /NPR-OUT 256 BYTES/
014164      116     120     122 TXTML4: .ASCIZ  /NPR-IN 256 BYTES/
014205      123     105     124 TXTML5: .ASCIZ  /SET MICROPROCESSOR'S PC/
```

TEXT STRINGS FOR ERROR HANDLERS -- "TXT___"

```
3098 014235  125  116  104  TXTML6: .ASCIZ  /UNDEFINED/
3099 014247  123  105  124  TXTML7: .ASCIZ  /SET MAINT INTR & CLR INTR DISABLE IN CPU STATUS/
3100
3101 014327  126  111  101  TXTVR:  .ASCIZ  /VIA REGISTER /
3102 014345  117  122  102  TXTVR0: .ASCIZ  /ORB/
3103 014351  117  122  101  TXTVR1: .ASCIZ  /ORA/
3104 014355  104  104  122  TXTVR2: .ASCIZ  /DDRB/
3105 014362  104  104  122  TXTVR3: .ASCIZ  /DDRA/
3106 014367  124  061  103  TXTVR4: .ASCIZ  /T1CL/
3107 014374  124  061  103  TXTVR5: .ASCIZ  /T1CH/
3108 014401  124  061  114  TXTVR6: .ASCIZ  /T1LL/
3109 014406  124  061  114  TXTVR7: .ASCIZ  /T1LH/
3110 014413  124  062  103  TXTVR8: .ASCIZ  /T2CL/
3111 014420  124  062  103  TXTVR9: .ASCIZ  /T2CH/
3112 014425  123  122  000  TXTVRA: .ASCIZ  /SR/
3113 014430  101  103  122  TXTVRB: .ASCIZ  /ACR/
3114 014434  120  103  122  TXTVRC: .ASCIZ  /PCR/
3115 014440  111  106  122  TXTVRD: .ASCIZ  /IFR/
3116 014444  111  105  122  TXTVRE: .ASCIZ  /IER/
3117 014450  117  122  101  TXTVRF: .ASCIZ  /ORA/
3118
```

ERROR MESSAGES -- "EM___"

```
3120                                    .SBTTL  ERROR MESSAGES -- "EM___"
3121                                    ;-------------------------------------------------------------------------
3122                                    ;------------- ERPOR MESSAGES USED BY ERROR CALL'S ------------------------
3123                                    ;-------------------------------------------------------------------------
3124
3125 014454     115     111     103    EM3:     .ASCIZ  /MICRO-DIAG. FAILURE/
3126 014500     115     122     104    EM4:     .ASCIZ  /MRDY TIMEOUT/
3127 014515     115     101     123    EM5:     .ASCIZ  /MASTER CLR FAILURE/
3128 014540     103     123     122    EM6:     .ASCIZ  /CSR ADDRESS FAILURE/
3129 014564     103     123     122    EM7:     .ASCIZ  /CSR DATA PAT FAILURE/
3130 014611     102     123     105    EM8:     .ASCIZ  /BSELO SET=ALL ONES/
3131 014634     105     130     124    EM9:     .ASCIZ  /EXTERNAL BUS RESET FAILURE/
3132 014667     102     101     104    EM14:    .ASCIZ  /BAD CSR VALUE(S) AFTER MASTER CLEAR/
3133 014733     042     115     122    EM15:    .ASCIZ  /"MRDY" DIDN'T GO LOW WHILE PROCESSING A COMMAND/
3134 015013     104     115     126    EM16:    .ASCIZ  /DMV'S RAM LOC. (CORRESPONDING TO BSELO) NOT PROPERLY WRITTEN/
3135 015110     066     065     060    EM17:    .ASCIZ  /6502 WRITE FUNC. FAILURE AFTER "RUN" BIT IS SET/
3136 015170     066     065     060    EM17A:   .ASCIZ  /6502 STILL RUNNING AFTER "RUN" BIT CLEARED/
3137 015243     126     111     101    EM20:    .ASCIZ  /VIA STATIC REGISTER ERROR/
3138 015275     126     111     101    EM20A:   .ASCIZ  /VIA STATIC REGISTER ERROR -- TIMMER NOT RUNNING/
3139 015355     126     111     101    EM20C:   .ASCIZ  /VIA STATIC REGISTER ERROR -- TIMMER CROSS TALK ERROR/
3140 015442     122     105     107    EM21:    .ASCIZ  /REGISTER NOT PROPERLY ZEROED/
3141 015477     132     105     122    EM22:    .ASCIZ  /ZEROING DDRB EFFECTED DDRA/
3142 015532     132     105     122    EM22A:   .ASCIZ  /ZEROING DDRA EFFECTED DDRB/
3143 015565     122     105     101    EM25:    .ASCIZ  'READ/WRITE DATA ERROR'
3144 015613     125     116     105    EM34:    .ASCIZ  /UNEXPECTED "A" INTERRUPT/
3145 015644     125     116     105    EM34B:   .ASCIZ  /UNEXPECTED "B" INTERRUPT/
3146 015675     122     101     115    EM47A:   .ASCIZ  /RAM DATA ERROR ON INITIAL WRITE/
3147 015735     122     101     115    EM47B:   .ASCIZ  /RAM DATA ERROR ON RE-READ AFTER TEST AREA FILLED/
3148 016016     122     101     115    EM48A:   .ASCIZ  /RAM DATA ERROR -- MOVING INVERSIONS TEST/
3149 016067     042     124     061    EM50A:   .ASCIZ  \"T1" FLAG NOT CLEARED BY LOADING T1LH\
3150 016135     042     124     061    EM50B:   .ASCIZ  \"T1" FLAG NOT CLEARED BY LOADING T1CH\
3151 016203     042     124     061    EM50C:   .ASCIZ  \"T1" FLAG NOT CLEARED BY READING T1CL\
3152 016251     126     111     101    EM50D:   .ASCIZ  \VIA'S T1CL NOT DECREMENTING\
3153 016305     126     111     101    EM50E:   .ASCIZ  \VIA'S T1CH NOT DECREMENTING\
3154 016341     042     124     061    EM50F:   .ASCIZ  \"T1" FLAG NOT SET ON TIMER 1 TIMEOUT\
3155 016406     042     124     061    EM50G:   .ASCIZ  \"T1" FLAG CLEARED BY READING T1CH\
3156 016450     126     111     101    EM50H:   .ASCIZ  \VIA'S T1LL IMPROPERLY LOADED BY WRITING T1CL @ ADDR 4\
3157 016536     042     124     061    EM50I:   .ASCIZ  \"T1" FLAG CLEARED BY READING T1LL\
3158 016600     126     111     101    EM50J:   .ASCIZ  \VIA'S T1LH IMPROPERLY LOADED BY WRITING T1CH @ ADDR 5\
3159 016666     042     124     061    EM50K:   .ASCIZ  \"T1" FLAG CLEARED BY READING T1LH\
3160 016730     042     124     061    EM50L:   .ASCIZ  \"T1" FLAG NOT SET AFTER RE-LOADING T1CH & TIMEOUT\
3161 017012     042     124     061    EM50M:   .ASCIZ  \"T1" FLAG CLEARED BY LOADING T1LL\
3162 017054     042     124     061    EM50N:   .ASCIZ  \"T1" FLAG NOT CLEARED BY LOADING T1CH\
3163 017122     042     120     102    EM50S:   .ASCIZ  \"PB7" W/IN VIA NOT SET ON TIMER 1 TIMEOUT\
3164 017174     042     120     102    EM50U:   .ASCIZ  \"PB7" NOT SET AFTER TIMER 1 TIMEOUT\
3165 017240     042     120     102    EM50V:   .ASCIZ  \"PB7" NOT DRIVEN LOW BY LOADING T1CH\
3166 017305     042     120     102    EM50W:   .ASCIZ  \"PB7" UNEXPECTEDLY MODIFIED BY TIMER 1\
3167 017354     042     124     061    EM50X:   .ASCIZ  \"T1" NOT RESET AFTER BEING CLEARED\
3168 017417     042     120     102    EM50Y:   .ASCIZ  \'PB7" PREMATURELY SET DURING T1 COUNTDOWN\
3169 017471     042     120     102    EM50Z:   .ASCIZ  \"PB7" NOT SET AFTER SECOND CYCLE\
3170
3171                                            .EVEN
```

```
                                        .SBTTL  TEXT ADDRESS TABLES FOR ERROR HANDLERS -- "TXT__T"
                                        ;-----------------------------------------------------------------------
                                        ;------------ TEXT ADDRESS TABLES USED BY ERROR HANDLERS ----------------
                                        ;-----------------------------------------------------------------------

017532  014105  014111  014125  TXTMLT: .WORD   TXTML0,TXTML1,TXTML2,TXTML3,TXTML4,TXTML5,TXTML6,TXTML7

017552  014327                          .WORD   TXTVR
017554  014345  014351  014355  TXTVRT: .WORD   TXTVR0,TXTVR1,TXTVR2,TXTVR3,TXTVR4,TXTVR5,TXTVR6,TXTVR7
017574  014413  014420  014425          .WORD   TXTVR8,TXTVR9,TXTVRA,TXTVRB,TXTVRC,TXTVRD,TXTVRE,TXTVRF

                                        .LIST   BEX
```

LOAD DEVICE PROTECTION TABLE

```
3186                                    .SBTTL LOAD DEVICE PROTECTION TABLE
3187
3188                                    ;////////////////////////////////////////////////////////////////////////////
3189                                    ;/ THIS TABLE IDENTIFIES THE LOAD DEVICE TO THE SUPERVISOR, SO THAT IT CAN BE
3190                                    ;/ PROTECTED FROM TESTING, IF DESIRED.
3191                                    ;////////////////////////////////////////////////////////////////////////////
3192
3193 017614                                    BGNPROT
     017614                                                                          L$PROT::
3194 017614  177777                            .WORD   -1      ;DON'T CHK CSR ADRS
3195 017616  177777                            .WORD   -1      ;DON'T CHK MASSBUS UNIT NO.
3196 017620  177777                            .WORD   -1      ;DON'T CHK DRIVE NO.
3197 017622                                    ENDPROT
```

```
                        .SBTTL INITIALIZE SECTION

                        ;//////////////////////////////////////////////////////////////////////
                        ;/ THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                        ;/ AT THE BEGINNING OF THE TEST SEQUENCE ON THE NEXT UNIT.
                        ;//////////////////////////////////////////////////////////////////////

017622                          BGNINIT
017622                                                          L$INIT::

017622                          SETVEC  #140,#170000,#340       ;ODT ROM ADDRESS
017622  012746  000340                                                  MOV     #340,-(SP)      ;JB REV A-0
017626  012746  170000                                                  MOV     #170000,-(SP)
017632  012746  000140                                                  MOV     #140,-(SP)
017636  012746  000003                                                  MOV     #3,-(SP)
017642  104437                                                          TRAP    C$SVEC
017644  062706  000010                                                  ADD     #10,SP

017650  010637  002324                  MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
                        ;SEE IF PROGRAM JUST STARTED, BR IF YES
017654                          READEF  #EF.START
017654  012700  000040                                                  MOV     #EF.START,R0
017660  104447                                                          TRAP    C$REFG
017662                          BCOMPLETE       STARST
017662  103417                                                          BCS     STARST
                        ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
017664                          READEF  #EF.RESTART
017664  012700  000037                                                  MOV     #EF.RESTART,R0
017670  104447                                                          TRAP    C$REFG
017672                          BCOMPLETE       RESTRT
017672  103435                                                          BCS     RESTRT
                        ;SEE IF THIS IS A NEW PASS, BR IF YES
017674                          READEF  #EF.NEW
017674  012700  000035                                                  MOV     #EF.NEW,R0
017700  104447                                                          TRAP    C$REFG
017702                          BCOMPLETE       NEWST
017702  103433                                                          BCS     NEWST
                        ;SEE IF PROGRAM WAS JUST CONTINUED
017704                          READEF  #EF.CONTINUE
017704  012700  000036                                                  MOV     #EF.CONTINUE,R0
017710  104447                                                          TRAP    C$REFG
017712                          BCOMPLETE       10$
017712  103401                                                          BCS     10$
017714  000436                  BR      GETPRM

017716  000137  020122          10$:    JMP     CONTIN          ;(THIS IS TO FAR AWAY FOR A "BR" INSTRUCTION)

017722                  STARST:         ;ENTER HERE IF "START" COMMAND ISSUED


                        ; TEST FOR THE PRESENCE OR ABSENCE OF A CONSOLE TERMINAL.

017722  005037  002346                  CLR     CONSOL          ;RESET THE CONSOLE TERMINAL FLAG
017726                          SETVEC  #4,#CONTST,#0   ;SETUP BUS TIMEOUT VECTER TO TEST FOR A CONSOLE
017726  012746  000000                                                  MOV     #0,-(SP)
017732  012746  020222                                                  MOV     #CONTST,-(SP)
017736  012746  000004                                                  MOV     #4,-(SP)
017742  012746  000003                                                  MOV     #3,-(SP)
```

INITIALIZE SECTION

```
                017746  104437                                                          TRAP    C$SVEC
                017750  062706  000010                                                  ADD     #10,SP
     3233       017754  005737  177564          TST     @#177564        ;TRY TO ACCESS THE CONSOLE TERMINAL'S "XCSR"
     3234       017760                          CLRVEC  #4              ;WE SHOULD BE THROUGH WITH THIS BY NOW
                017760  012700  000004                                                  MOV     #4,R0
                017764  104436                                                          TRAP    C$CVEC
     3235
     3236       017766                  RESTRT:         ;ENTER HERE IF "RESTART" COMMAND ISSUED
     3237
     3238                               ;CLEAR DEVICE MAP
     3239       017766  005037  002342          CLR     DEVMAP
     3240
     3241       017772                  NEWST:          ;ENTER HERE BEFORE EACH TEST
     3242
     3243       017772  012737  177777  002322          MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
     3244       020000  005237  002340                  INC     FRSPAS          ;INCREMENT NO. OF PASSES AFTER LOAD
     3245       020004  012737  000001  002344          MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
     3246                               ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
     3247                               ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
     3248       020012                  GETPRM:
     3249       020012  005237  002322          INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
     3250       020016                          GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
                020016  013700  002322                                                  MOV     LOGDEV,R0
                020022  104442                                                          TRAP    C$GPHRD
                020024  010001                                                          MOV     R0,R1
     3251       020026                          BCOMPLETE  10$          ;BR IF DEVICE AVAILABLE
                020026  103403                                                          BCS     10$
     3252       020030  006337  002344          ASL     DEVPTR          ;IF UN-AVAILABLE, SHIFT DEVICE MAP BIT POINTER
     3253       020034  000766                  BR      GETPRM          ;       AND SKIP THIS DEVICE
     3254
     3255       020036  053737  002344  002342  10$:    BIS     DEVPTR,DEVMAP   ;ELSE, SET BIT FOR THIS DEVICE IN DEVICE MAP
     3256       020044  006337  002344          ASL     DEVPTR          ;SHIFT DEVICE MAP BIT POINTER
     3257
     3258                               ;  "R1" WAS RETURNED WITH A POINTER TO THE CURRENT "P-TABLE"
     3259
     3260       020050  012100                  MOV     (R1)+,R0        ;GET THE DEVICE CSR ADDRESS
     3261       020052  012703  000020          MOV     #16.,R3         ;WE HAVE TO SETUP THIS MANY ADDRESS POINTERS
     3262       020056  012702  002352          MOV     #MPCSR,R2       ;THIS IS THE ADDRESS OF THE FIRST POINTER
     3263       020062  010022          12$:    MOV     R0,(R2)+        ;SETUP ONE CSR POINTER
     3264       020064  005200                  INC     R0              ;POINT TO THE NEXT CSR ADDRESS
     3265       020066  077303                  SOB     R3,12$          ;LOOP AS LONG AS THERE ARE MORE TABLE ENTRIES
     3266                                                               ;ELSE,  FALL THROUGH TO CONTINUE GETTING MORE
     3267                                                               ;       P-TABLE DATA
     3268
     3269       020070  012100                  MOV     (R1)+,R0        ;GET INTERRUPT VECTOR
     3270       020072  010037  002412          MOV     R0,MPIVEC       ;SETUP "A" VECTOR POINTER
     3271       020076  022020                  CMP     (R0)+,(R0)+     ;ADD 4 TO VECTOR TO GET ADDRESS OF "B" VECTOR
     3272       020100  010037  002414          MOV     R0,MPOVEC       ;SETUP "B" VECTOR POINTER
     3273
     3274       020104  012100                  MOV     (R1)+,R0        ;GET DMV11 DEVICE PRIORITY
     3275       020106  006200                  ASR     R0              ;       RE-POSITION IT
     3276       020110  006200                  ASR     R0
     3277       020112  006200                  ASR     R0
     3278       020114  006200                  ASR     R0
     3279       020116  010037  002416          MOV     R0,MPRIOR       ;SETUP OUR VARIABLE FOR INT. VECTOR INIT'S
     3280
     3281       020122                  CONTIN:         ;ENTER HERE WHEN A "CONTINUE" COMMAND IS ISSUED
```

INITIALIZE SECTION

```
3282
3283 020122                          SETVEC  @#MPIVEC,#MPIHAN,@#MPRIOR  ;SETUP "A" INT. VECTOR
     020122  013746  002416                                                  MOV     @#MPRIOR,-(SP)
     020126  012746  005152                                                  MOV     #MPIHAN,-(SP)
     020132  013746  002412                                                  MOV     @#MPIVEC,-(SP)
     020136  012746  000003                                                  MOV     #3,-(SP)
     020142  104437                                                         TRAP    C$SVEC
     020144  062706  000010                                                  ADD     #10,SP
3284 020150  005037  005222          CLR     IHILNK          ;WE DON'T WANT THE HANDLER TO LINK ELSEWHERE
3285 020154                          SETVEC  @#MPOVEC,#MPOHAN,@#MPRIOR  ;SETUP "B" INT. VECTOR
     020154  013746  002416                                                  MOV     @#MPRIOR,-(SP)
     020160  012746  005224                                                  MOV     #MPOHAN,-(SP)
     020164  013746  002414                                                  MOV     @#MPOVEC,-(SP)
     020170  012746  000003                                                  MOV     #3,-(SP)
     020174  104437                                                         TRAP    C$SVEC
     020176  062706  000010                                                  ADD     #10,SP
3286 020202  005037  005274          CLR     IHOLNK          ;WE DON'T WANT THE HANDLER TO LINK ELSEWHERE
3287 020206  005037  002330          CLR     INTWCH          ;RESET "INTERRUPT WATCH" FLAGS (BOTH "A" & "B")
3288
3289 020212  012737  000001  002336  MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH
3290 020220                          ENDINIT         ;END OF "INIT" CODE
     020220                                                              L10017:
     020220  104411                                                         TRAP    C$INIT
3291
3292                                 ; ***** SUBROUTINES USED BY "INIT" CODE *****
3293
3294                                 ;       INTERRUPT HANDLER FOR CONSOLE TERMINAL PRESENCE TESTING
3295
3296 020222  012737  177777  002346  CONTST: MOV     #-1,CONSOL      ;INDICATE THAT NO CONSOLE TERMINAL EXISTS!
3297 020230  000002                          RTI                     ;RETURN
3298
```

AUTO DROP UNIT SECTION

```
                        .SBTTL AUTO DROP UNIT SECTION

                        ;////////////////////////////////////////////////////////////////////////
                        ;/ THE AUTO DROP CODING DETERMINES WHETHER OR NOT THE DEVICE WHOSE P-TABLE
                        ;/ WAS JUST OBTAINED IS READY FOR TESTING, AND IT IS DROPPED IF NOT READY.
                        ;////////////////////////////////////////////////////////////////////////

                        ;+*************************************************************************
                        ;
                        ;       THIS ALGORITHM IS THE SAME AS TEST # 1 EXCEPT THAT TEST 1
                        ;       WILL JUST REPORT THE FAILURE AND GO ON -- THIS ROUTINE WILL CAUSE THE
                        ;       DEVICE TO BE DROPPED IF A BUS-TIMEOUT OCCURS WHEN ANY OF THE CSR'S
                        ;       ARE ACCESSED WITH EITHER A "TST" OR "TSTB" INSTRUCTION.
                        ;
                        ;-*************************************************************************

                                BGNAUTO
                                                                        L$AUTO::
                                SETVEC  #4,#AD.HIT,#0   ;SETUP INVALID-ADDRESS TRAP VECTOR
020232  012746  000000                                                  MOV     #0,-(SP)
020236  012746  020350                                                  MOV     #AD.HIT,-(SP)
020242  012746  000004                                                  MOV     #4,-(SP)
020246  012746  000003                                                  MOV     #3,-(SP)
020252  104437                                                          TRAP    C$SVEC
020254  062706  000010                                                  ADD     #10,SP
020260  005037  002440          CLR     TMP0            ;INITIALIZE TRAP FLAG REGISTER
020264  012702  000001          MOV     #1,R2           ;FLAG BIT
020270  013703  002352          MOV     BSEL0,R3        ;INIT ADDRESS POINTER

020274  105723          1$:     TSTB    (R3)+           ;ACCESS THE CSR'S BY BYTES.
020276  006302                  ASL     R2
020300  103375                  BCC     1$

020302  013703  002352          MOV     BSEL0,R3        ;RE-INIT ADDRESS POINTER
020306  012702  000001          MOV     #1,R2           ;RE INIT FLAG BIT
020312  005723          2$:     TST     (R3)+           ;ACCESS THE CSR'S BY WORDS.
020314  006302                  ASL     R2
020316  006302                  ASL     R2
020320  103374                  BCC     2$

020322                          CLRVEC  #4              ;RESTORE THE VECTOR TO DS
020322  012700  000004                                                  MOV     #4,R0
020326  104436                                                          TRAP    C$CVEC
020330  005737  002440          TST     TMP0            ;DID WE GET HIT WITH AN INVALID ADDRESS TRAP?
020334  001403                  BEQ     AD.OK           ;NO.  EXIT TEST
020336                          DODU    LOGDEV          ;YES, DROP THIS LOGICAL DEV.
020336  013700  002322                                                  MOV     LOGDEV,R0
020342  104451                                                          TRAP    C$DODU
020344  000240          AD.OK:  NOP                     ;(FOR PATCHING IN A HALT IF NECESSARY)
020346                          ENDAUTO
                                                                        L10020:
020346  104461                                                          TRAP    C$AUTO
020350  050237  002440  AD.HIT: BIS     R2,TMP0         ;FLAG THE HIT IF WE GET IT!
020354  000002                  RTI                     ;RETURN
```

CLEANUP CODING SECTION

```
                        .SBTTL CLEANUP CODING SECTION

                        ;//////////////////////////////////////////////////////////////////////
                        ;/ THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                        ;/ AT THE END OF THE TEST SEQUENCE ON A PARTICULAR UNIT.
                        ;//////////////////////////////////////////////////////////////////////

020356                          BGNCLN
020356                                                                  L$CLEAN::
020356                          CLRVEC  @#MPIVEC        ;RETURN VECTORS TO SUPERVISOR
020356  013700  002412                                                  MOV     @#MPIVEC,R0
020362  104436                                                          TRAP    C$CVEC
020364                          CLRVEC  @#MPOVEC
020364  013700  002414                                                  MOV     @#MPOVEC,R0
020370  104436                                                          TRAP    C$CVEC
020372                          ENDCLN
020372                                                                  L10021:
020372  104412                                                          TRAP    C$CLEAN
```

DROP UNIT SECTION

```
3354                            .SBTTL DROP UNIT SECTION
3355
3356                            ;////////////////////////////////////////////////////////////////////////////
3357                            ;/ THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3358                            ;/ TO NO LONGER BE TESTED.
3359                            ;////////////////////////////////////////////////////////////////////////////
3360
3361 020374                             BGNDU
      020374                                                                L$DU::
3362
3363 020374                     ;ISSUE UNIBUS RESET TO CLEAN UP
      020374  104433                    BRESET                                      TRAP    C$RESET
3364 020376                             ENDDU
      020376                                                                L10022:
      020376  104453                                                               TRAP    C$DU
```

```
                        .SBTTL ADD UNIT SECTION

                        ;//////////////////////////////////////////////////////////////////////
                        ;/ THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                        ;/  TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
                        ;/  "EF.AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
                        ;//////////////////////////////////////////////////////////////////////

                                BGNAU
020400                                                          L$AU::
                                ENDAU
020400                                                          L10023:
020400  104452                                                          TRAP    C$AU
```

```
                                        .SBTTL TEST 1 -- DMV-11 AVAILABILITY

                                        ;************************************************************************
                                        ;*
                                        ;*      TEST 1 -- DMV-11 AVAILABILITY
                                        ;*
                                        ;* EACH NORMALLY USED CSR IS ACCESSED WITH A "TST" OR "TSTB" INSTRUCTION AND IF
                                        ;* A BUS TIMEOUT OCCURS (INTERRUPT @ VECTOR ADDR 4) A FLAG WILL BE SET SHOWING
                                        ;* WHICH CSR ADDR AND INSTRUCTION FAILED. "T1.HSW" REFLECTS "TST" INSTRUCTIONS
                                        ;* AND "T1.HSB" REFLECTS "TSTB" INSTRUCTIONS.
                                        ;*
                                        ;*      EXAMPLES:
                                        ;*
                                        ;*      IF "TSTB  @BSEL1"  FAILS,  BIT # 1 OF "T1.HSB" WILL BE SET.
                                        ;*      IF "TST  @SEL4" FAILS, BIT # 4 OF "T1.HSW" WILL BE SET
                                        ;*      (NOTE: ONLY EVEN BITS IN "T1.HSW" CAN BE SET).
                                        ;*
                                        ;*  THE FLAG WORDS ARE OUTPUT IN BINARY AS "EXTENDED ERROR INFORMATION".
                                        ;*
                                        ;--**********************************************************************
                                        ;
                                        ;       BGNTST
  020402                                                                        T1::
  020402 005037  020546                         CLR     T1.HSW          ;INITIALIZE TRAP FLAG REGISTER
  020406 012702  000001                         MOV     #1,R2           ;FLAG BIT FOR BYTE ACCESSED CSR 0.
  020412 013703  002352                         MOV     BSEL0,R3        ;INIT ADDRESS POINTER
  020416                                        SETVEC  #4,#T1.HIT,#0   ;SETUP INVALID-ADDRESS TRAP VECTOR
  020416 012746  000000                                                         MOV     #0,-(SP)
  020422 012746  020540                                                         MOV     #T1.HIT,-(SP)
  020426 012746  000004                                                         MOV     #4,-(SP)
  020432 012746  000003                                                         MOV     #3,-(SP)
  020436 104437                                                                 TRAP    C$SVEC
  020440 062706  000010                                                         ADD     #10,SP

  020444 105723                         1$:     TSTB    (R3)+           ;ACCESS THE CSR'S BY BYTES.
  020446 006302                                 ASL     R2
  020450 103375                                 BCC     1$

  020452 013737  020546  020550                 MOV     T1.HSW,T1.HSB   ;MOVE BYTE INTERRUPT FLAG TO PROPER LOCATION.
  020460 005037  020546                         CLR     T1.HSW          ;INITIALIZE TRAP FLAG REGISTER
  020464 012702  000001                         MOV     #1,R2           ;FLAG BIT FOR WORD ACCESSED CSR 0.
  020470 013703  002352                         MOV     BSEL0,R3        ;RE-INIT ADDRESS POINTER

  020474 005723                         2$:     TST     (R3)+           ;ACCESS THE CSR'S BY WORDS.
  020476 006302                                 ASL     R2
  020500 006302                                 ASL     R2
  020502 103374                                 BCC     2$

  020504                                        CLRVEC  #4              ;RESTORE THE VECTOR TO DS
  020504 012700  000004                                                         MOV     #4,R0
  020510 104436                                                                 TRAP    C$CVEC
  020512 005737  020546                         TST     T1.HSW          ;DID WE GET AN INVALID ADDRESS TRAP?
  020516 001003                                 BNE     3$              ;YES, REPORT FAILURE
  020520 005737  020550                         TST     T1.HSB
  020524 001404                                 BEQ     T1.OK
  020526                                3$:     GEDF    T1.EHD,T1.EM1   ;YES, REPORT THE ERROR
                                                                        ;       "DEVICE FATAL" ERROR # 9
```

TEST 1 -- DMV-11 AVAILABILITY

```
                020526  104455                                                          TRAP    C$ERDF
                020530  000011                                                          .WORD   9
                020532  020670                                                          .WORD   T1.EHD
                020534  020552                                                          .WORD   T1.EM1
   3419 020536                          T1.OK:  ENDTST
                020536                                                          L10024:
                020536  104401                                                          TRAP    C$ETST
   3420
   3421 020540  050237  020546          T1.HIT: BIS     R2,T1.HSW       ;FLAG THE HIT IF WE GET IT!
   3422 020544  000002                          RTI                     ;RETURN
   3423
   3424 020546  000000                  T1.HSW: .WORD   0               ;INVALID ADDRESS TRAP FLAG WORD:
   3425                                                                 ;BITS SET INDICATE TRAPS ON WORD ACCESSES
   3426                                                                 ;(BIT # SET = CSR # THAT FAILED)
   3427 020550  000000                  T1.HSB: .WORD   0               ;INVALID ADDRESS TRAP FLAG WORD:
   3428                                                                 ;BITS SET INDICATE TRAPS ON BYTE ACCESSES
   3429                                                                 ;(BIT # SET = CSR # THAT FAILED)
   3430 020552                                  BGNMSG  T1.EM1
                020552                                                                  T1.EM1::
   3431 020552                                  PRINTB  #T1.1,MPCSR     ;IDENTIFY ERROR AND ON WHAT DEVICE
                020552  013746  002352                                                  MOV     MPCSR,-(SP)
                020556  012746  020717                                                  MOV     #T1.1,-(SP)
                020562  012746  000002                                                  MOV     #2,-(SP)
                020566  010600                                                          MOV     SP,R0
                020570  104414                                                          TRAP    C$PNTB
                020572  062706  000006                                                  ADD     #6,SP
   3432 020576                                  PRINTX  #T1.2           ;IF REQUESTED, ALSO INDICATE MISSES (TRAPS)
                020576  012746  021001                                                  MOV     #T1.2,-(SP)
                020602  012746  000001                                                  MOV     #1,-(SP)
                020606  010600                                                          MOV     SP,R0
                020610  104415                                                          TRAP    C$PNTX
                020612  062706  000004                                                  ADD     #4,SP
   3433 020616                                  PRINTX  #T1.3
                020616  012746  021034                                                  MOV     #T1.3,-(SP)
                020622  012746  000001                                                  MOV     #1,-(SP)
                020626  010600                                                          MOV     SP,R0
                020630  104415                                                          TRAP    C$PNTX
                020632  062706  000004                                                  ADD     #4,SP
   3434 020636                                  PRINTX  #T1.4,T1.HSW,T1.HSB
                020636  013746  020550                                                  MOV     T1.HSB,-(SP)
                020642  013746  020546                                                  MOV     T1.HSW,-(SP)
                020646  012746  021106                                                  MOV     #T1.4,-(SP)
                020652  012746  000003                                                  MOV     #3,-(SP)
                020656  010600                                                          MOV     SP,R0
                020660  104415                                                          TRAP    C$PNTX
                020662  062706  000010                                                  ADD     #10,SP
   3435 020666                                  ENDMSG
                020666                                                          L10025:
                020666  104423                                                          TRAP    C$MSG
   3436
   3437                                 .NLIST  BEX
   3438 020670      101      126      101 T1.EHD: .ASCIZ  'AVAILABILITY TEST (#1)'
   3439 020717      045      116      045 T1.1:   .ASCIZ  '%N%ADMV-11 @ %O%A NOT RESPONDING TO CSR ACCESSING'
   3440 021001      045      116      062 T1.2:   .ASCIZ  '%N2%S21%ASEL #%S11%ABSEL #'
   3441 021034      045      116      045 T1.3:   .ASCIZ  '%N%S15%AE C A 8 6 4 2 0  FEDCBA9876543210'
   3442 021106      045      116      062 T1.4:   .ASCIZ  '%N2%A   TRAP FLAGS:%B16%S2%B16'
   3443                                 .LIST   BEX
```

TEST 1 - DMV-11 AVAILABILITY

```
   3444                                 .EVEN
```

```
3461                                    .SBTTL TEST 2 -- MASTER CLEAR, RUN MICRODIAGNOSTICS

                                        ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        ;*
                                        ;*      TEST 2 -- MASTER CLEAR, RUN MICRODIAGNOSTICS
                                        ;*
                                        ;* A MASTER CLEAR IS ISSUED TO THE DMV-11, AND THE PROGRAM ALLOWS SUFFICIENT
                                        ;* TIME FOR THE MICRODIAGNOSTICS TO BE PERFORMED. THESE MICRODIAGNOSTICS RESIDE
                                        ;* IN 6502 PROGRAM  MEMORY,  AND  THOROUGHLY VERIFY THE OPERATION OF THE 6502
                                        ;* MICROPROCESSOR CHIP. THEN, THEY CHECK OUT THE DATA RAM, THE 6502'S ACCESS TO
                                        ;* THE CSR'S,  AND  PERFORM  A  SIMPLE MESSAGE TEST USING THE 6522 CHIP AND THE
                                        ;* USYRT, WITH INTERNAL LOOPBACK.
                                        ;*
                                        ;* NEXT, THE LSI-11 PROGRAM READS THE THE CSR'S (SEL0-SEL6) AND CHECKS THEM FOR
                                        ;* THEIR EXPECTED INITIALIZED  STATES.  IF AN ERROR HAS OCCURRED IN THE MICRO-
                                        ;* DIAGNOSTICS THE NUMBER OF THE FAILING TEST WILL BE FOUND IN SEL4, AND RUN
                                        ;* (BIT 7) WILL NOT BE SET IN BSEL1.
                                        ;*
                                        ;-----------------------------------------------------------------------------
                                        ;
                                        ;       BGNTST                                                  T2::
     021146
3462                                    ; ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY CALLING
3463                                    ; SUBROUTINE MASCLR.
3464
3465 021146  004737  003614             JSR     PC,MASCLR       ; -ATTEMPT- TO RUN THE MICRO-DIAGNOSTIC
3466 021152  103002                     BCC     8$              ;IF NO ERROR, PROCEED
3467 021154                             ERROR                   ;ELSE, REPORT IT AND
     021154  104460                                                     TRAP    C$ERROR
3468 021156  000436                     BR      24$             ;       EXIT THIS TEST
3469
3470                                    ; FIRST, INITIALIZE INDEX REGISTERS
3471 021160  005001             8$:     CLR     R1              ;R1 IS THE INDEX OF THE BYTE SELECT TABLE
3472 021162  005002                     CLR     R2              ;R2 IS THE INDEX OF THE RESULTS TABLE
3473 021164  016203  003040             MOV     RESFMC(R2),R3   ;GET THE NUMBER OF PATTERNS IN RESULTS TABLE
3474 021170  062702  000002             ADD     #2,R2           ;MOVE POINTER TO NEXT BYTE
3475 021174  126271  003040  002352  2$:     CMPB    RESFMC(R2),@BSEL(R1) ;COMPARE EXPECTED RESULTS WITH CSR'S.
3476 021202  001005                     BNE     1$              ;A MISMATCH IS A DEVICE FATAL ERROR
3477 021204  005202                     INC     R2              ;INCREMENT TABLE POINTER
3478 021206  005201                     INC     R1              ;INCREMENT POINTER
3479 021210  005201                     INC     R1              ;  BY 2  (WORD INCREMENT)
3480
3481 021212  077310                     SOB     R3,2$           ;CONTINUE TO LOOP THROUGH TABLE
3482
3483 021214  000417                     BR      24$             ;TEST COMPLETE WITH NO ERRORS, GO END TEST.
3484
3485 021216  117137  002352  002312  1$:     MOVB    @BSEL(R1),BDATA ;# GET DATA BYTE THAT FAILED
3486 021224  004737  004434             JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3487 021230  116237  003040  002310     MOVB    RESFMC(R2),GDATA ;# GET EXPECTED RESULT FROM TABLE
3488 021236  006201                     ASR     R1              ;CONVERT WORD OFFSET TO BYTE CSR #
3489 021240  010137  002334             MOV     R1,REGNUM
3490 021244                             GEDF    EM14,ERR2       ;DEVICE FATAL ERROR, REPORT IT AND END TEST
                                                                ;       "DEVICE FATAL" ERROR # 10
     021244  104455                                                     TRAP    C$ERDF
     021246  000012                                                     .WORD   10
     021250  014667                                                     .WORD   EM14
     021252  005304                                                     .WORD   ERR2
```

TEST 2 -- MASTER CLEAR, RUN MICRODIAGNOSTICS

```
3491 021254                          24$:    ENDTST
     021254                                                L10026:
     021254  104401                                              TRAP    C$ETST
```

```
3503                            .SBTTL TEST 3 -- CSR ADDRESSING

                                ;+*********************************************************************************
                                ;*
                                ;*      TEST 3 -- CSR ADDRESSING
                                ;*
                                ;* FIRST, HALT THE 6502 UP BY CLEARING ALL CSRS, THEN, WRITE A DIFFERENT WORD
                                ;* OF DATA  PATTERN  A INTO EACH OF BSEL0-17, AND AFTER EACH WRITE, READ AND
                                ;* COMPARE ALL REGS TO EXPECTED VALUES.
                                ;*
                                ;* DATA PATTERN A = 001, 002, 004, 010, 020, 040, 100, 200, 052, 300, 140,
                                ;*                  060, 030, 014, 006, 003
                                ;*
                                ;--*********************************************************************************
                                ;
                                ;       BGNTST
    021256                                                              T3::
3504                            ;-------------------------------------------------------------------------
3505                            ;       ******** DETAILED TEST DESCRIPTION ********
3506                            ; THIS TEST PROCEEDS AS FOLLOWS:
3507                            ;
3508                            ; (1) CLEAR ALL CSRS AND VERIFY SAME (CLEARING BSEL01 HALTS 6502)
3509                            ; (2) WRITE 01 INTO BSEL0; VERIFY BSEL0=01,ALL OTHERS=0
3510                            ; (3) WRITE 02 INTO BSEL1; VERIFY BSEL0=01,BSEL1=02,ALL OTHERS=0.
3511                            ; (4) WRITE 04 INTO BSEL2; VERIFY BSEL0=01,BSEL1=02,BSEL2=04,ALL OTHERS=0
3512                            ;
3513                            ; (5) => (17) CONTINUE TO INCREMENTALLY WRITE DATA-PATTERN-A INTO THE BSR'S,
3514                            ;               CHECKING ALL BSR'S AFTER EACH WRITE, UNTIL BSR'S COMPLETELY
3515                            ;               FILLED WITH DATA-PATTERN-A.
3516                            ; NOTE: IF AN ERROR OCCURS, THE FIRST BAD BSR NUMBER AND GOOD/BAD VALUES ARE
3517                            ;       GIVEN, FOLLOWED BY A COMPLETE BSR DUMP.
3518                            ;-------------------------------------------------------------------------
3519
3520                            ; CLEAR DMV CSRS AND RESULTS TABLE
3521
3522 021256  012703  000010             MOV     #10,R3          ;GET # OF CSRS
3523 021262  013701  002352             MOV     @#BSEL,R1       ;GET 1ST CSR ADDRESS
3524 021266  012702  003062             MOV     #RESFT3,R2      ;GET 1ST RESULTS TABLE ADDRESS
3525 021272  005021             1$:     CLR     (R1)+           ;CLEAR CSR, BUMP POINTER
3526 021274  005022                     CLR     (R2)+           ;CLEAR RESULTS TABLE LOC., BUMP POINTER
3527 021276  005022                     CLR     (R2)+           ; AND DO AGAIN
3528 021300  077304                     SOB     R3,1$           ;LOOP UNTIL ALL DONE
3529
3530                            ; NOW VERIFY CSRS ARE ALL ZEROED
3531
3532 021302  005002                     CLR     R2              ;CLEAR BSR ADDRESS INDEX
3533 021304  012703  000020             MOV     #CSREGS,R3      ;GET # OF CSRS
3534 021310  105772  002352     2$:     TSTB    @#BSEL(R2)      ;IS THIS CSR=0 ?
3535 021314  001035                     BNE     5$              ;IF NO: GO REPORT ERROR
3536 021316  005722                     TST     (R2)+           ;  YES: BUMP INDEX
3537 021320  077305                     SOB     R3,2$           ;DO UNTIL ALL BSRS CHECKED
3538
3539                            ;*************************************************************************
3540
3541                                    ; INITIALIZE INDEX REGISTERS
3542 021322  005001                     CLR     R1              ;INITIALIZE PATTERN INDEX REGISTER
3543 021324  012703  000020             MOV     #CSREGS,R3      ;GET NUMBER OF CSR'S
```

```
3544
3545                                        ; THE FIRST WORD OF THE DATA TABLE CONTAINS THE NUMBER OF PATTERNS IN
3546                                        ; THE TABLE:
3547 021330  016104  002504                 MOV     PATA(R1),R4     ;INITIALIZE NUMBER OF PATTERNS COUNT
3548 021334  005721                         TST     (R1)+           ;MOVE TABLE POINTER
3549
3550                                    ; PUT NEXT PATTERN OF DATA INTO NEXT REGISTER AND TEST AREA:
3551                                    ;
3552                                    ;  CALCULATE INDEX INTO DATA AREA AND TO REGISTER
3553
3554 021336  010102                     3$:     MOV     R1,R2           ;GET INDEX INTO TEST DATA AREA
3555 021340  005742                             TST     -(R2)           ;IT'S ONE WORD TOO LARGE
3556 021342  006302                             ASL     R2              ;CONVERT FROM BYTE TO WORD INDEX
3557
3558                                    ;  NOW, SETUP THE EXPECTED RESULTS AREA AND LOAD THE SELECT REGISTER
3559
3560 021344  116162  002504  003062             MOVB    PATA(R1),RESFT3(R2) ;UPDATE THE EXPECTED RESULTS TABLE
3561 021352  116172  002504  002352             MOVB    PATA(R1),@BSEL(R2) ;PUT PATTERN INTO THE CSR
3562
3563 021360  005201                             INC     R1              ;BUMP DATA POINTER FOR NEXT TIME AROUND
3564 021362  005002                             CLR     R2              ;INITIALIZE TABLE INDEX
3565 021364  012703  000020                     MOV     #CSREGS,R3      ;INITIALIZE NUMBER OF REGISTERS
3566
3567 021370  126272  003062  002352  4$:       CMPB    RESFT3(R2),@BSEL(R2) ;COMPARE CSR WITH RESULTS TABLE
3568 021376  001004                             BNE     5$              ;A MISMATCH IS A DEVICE FATAL ERROR
3569 021400  005722                             TST     (R2)+           ;BUMP TABLE POINTER BY 2  (WORD INCREMENT)
3570 021402  077306                             SOB     R3,4$           ;CONTINUE TO READ & MATCH ALL REGISTERS BEFORE
3571                                                                     ;LOADING THE NEXT PATTERN INTO NEXT REGISTER
3572
3573 021404  077424                             SOB     R4,3$           ;LOOP UNTIL ALL PATTERNS ARE TESTED
3574 021406  000417                             BR      24$             ;TEST COMPLETE **<< NO ERRORS >>**
3575
3576                                        ;--PREPARE THE FAILURE MESSAGE --
3577
3578 021410  116237  003062  002310  5$:       MOVB    RESFT3(R2),GDATA ;@ GET THE EXPECTED RESULT FROM TABLE
3579 021416  117237  002352  002312             MOVB    @BSEL(R2),BDATA ;@ GET THE FAILED BYTE
3580 021424  004737  004434                     JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3581 021430  006202                             ASR     R2              ;CONVERT WORD OFFSET TO BYTE CSR ADDRESS
3582 021432  010237  002334                     MOV     R2,REGNUM       ;GET THE REGISTER THAT FAILED
3583 021436                                     GEDF    EM6,ERR2        ;ERROR **** DEVICE FATAL ****
                                                                        ;       "DEVICE FATAL" ERROR @ 11
     021436  104455                                                                     TRAP    C$ERDF
     021440  000013                                                                     .WORD   11
     021442  014540                                                                     .WORD   EM6
     021444  005304                                                                     .WORD   ERR2
3584 021446                             24$:    ENDTST
     021446                                                                 L10027:
     021446  104401                                                                     TRAP    C$ETST
```

```
3598                                    .SBTTL TEST 4 -- CSR REGISTERS DATA READ/WRITE

                                        ;+*********************************************************************
                                        ;*
                                        ;*      TEST 4 -- CSR REGISTERS DATA READ/WRITE
                                        ;*
                                        ;* WRITE,  READ,  AND  COMPARE  EACH BYTE OF DATA PATTERN B INTO REGISTER BSEL0.
                                        ;* THEN, REPEAT THIS USING EACH OF THE REMAINING CSR'S, BSEL1-BSEL17.  WHEN BSEL1
                                        ;* IS  BEING  TESTED,  THE PROGRAM ALWAYS SETS BIT 7 IN THE DATA PATTERN SO THAT
                                        ;* RUN  WILL  NOT BE CLEARED, AND IT ALWAYS CLEARS BIT6 SO THAT MCLR WILL NOT BE
                                        ;* SET.
                                        ;*
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;-*********************************************************************
                                        ;
                                        ;       BGNTS1
                                                                                        T4::
    021450
3599 021450  004737  003762                     JSR     PC,MSTCLR       ;CALL MAINTENANCE READY INITIALIZATION. IF
3600                                                                    ;MSTCLR SHOULD FAIL BECAUSE THE MRDY FLAG DOES
3601                                                                    ;NOT BECOME SET, A DEVICE FATAL ERROR WILL BE
3602                                                                    ;REPORTED, AND MSTCLR WILL SET THE "C" BIT
3603 021454  103002                             BCC     8$              ;IF NO ERROR, PROCEED
3604 021456                                     ERROR                   ;ELSE, REPORT IT AND
     021456  104460                                                                     TRAP    C$ERROR
3605 021460  000453                             BR      24$             ;       EXIT THIS TEST
3606                                    ;
3607                                    ;  NOTE - THE FIRST BYTE LOCATION OF THE PATTERN B TABLE, USED IN THIS TEST,
3608                                    ;          CONTAINS THE NUMBER OF TEST PATTERNS OF PATTERN B TABLE, NOT A
3609                                    ;          TEST PATTERN.
3610                                    ;
3611                                    ; FIRST, INITIALIZE INDEX AND COUNT REGISTERS
3612
3613 021462  005001                     8$:     CLR     R1              ;R1 IS THE 'PATB' INDEX REGISTER
3614 021464  005002                             CLR     R2              ;R2 IS THE CSR INDEX REGISTER
3615 021466  016103  002526                     MOV     PATB(R1),R3     ;R3 CONTAINS THE NUMBER OF BYTES IN PATB
3616 021472  062702  000002                     ADD     #2,R2           ;MOVE POINTER TO FIRST BYTE OF DATA
3617
3618 021476  113777  000101  160650             MOVB    101,@BSEL1      ;STOP THE MICRO-PROCESSOR!!!
3619
3620 021504  116137  002526  002310  1$:       MOVB    PATB(R1),GDATA  ;GET THE PATB DATA BYTE, WE ARE TO USE
3621
3622                                    ; DON'T GET CAUGHT BY THE NEXT INSTRUCTION!  "R2" IS AN OFFSET INTO A
3623                                    ; WORD TABLE WHICH CONTAINS THE ADDRESSES OF THE CSR'S.  THEREFORE, WHEN
3624                                    ; R2 = 0 -- IT POINTS TO BSEL0'S ADDRESS, AND WHEN R2 = 2 -- IT POINTS TO
3625                                    ; BSEL1'S ADDRESS.
3626
3627 021512  022702  000002                     CMP     #2,R2           ;IS "BSEL1" BEING TESTED?
3628 021516  001003                             BNE     2$              ;IF YES, ALTER PATB DATA SO THAT BIT 7 IS
3629                                                                    ;ALWAYS SET, AND BIT6 IS ALWAYS RESET.
3630                                                                    ;ELSE, USE PATB DATA AS IS.
3631
3632 021520  142737  000300  002310             BICB    #RUN!MCLR,GDATA ;FORCE PATTERN TO RESET BITS 7 & 6
3633
3634 021526  113772  002310  002352  2$:       MOVB    GDATA,@BSEL0(R2)  ;PUT PATB DATA INTO REGISTER BEING TESTED
3635 021534  123772  002310  002352             CMPB    GDATA,@BSEL0(R2)  ; COMPARE PATTERN JUST WRITTEN
```

85

SEQ 0098

TEST 4 -- CSR REGISTERS DATA READ/WRITE

```
3636 021542  001414                        BEQ     5$              ;TEST PASSES IF A MATCH. ELSE, DEVICE FATAL ERROR
3637
3638                                        ;--PREPARE FOR THE FAILURE PRINTOUT--
3639
3640 021544  010237  002334                MOV     R2,REGNUM       ;GET THE REGISTER THAT FAILED
3641 021550  117237  002352  002312        MOVB    @BSEL0(R2),BDATA ;SCORE THE BAD DATA
3642 021556  004737  004434                JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3643 021562                                GEDF    EM7,ERR2        ;REPORT ERROR AND EXIT THE TEST
                                                                    ;       "DEVICE FATAL" ERROR # 12
     021562  104455                                                                     TRAP    C$ERDF
     021564  000014                                                                     .WORD   12
     021566  014564                                                                     .WORD   EM7
     021570  005304                                                                     .WORD   ERR2
3644 021572  000406                        BR      24$
3645
3646 021574  005201                5$:     INC     R1              ;MOVE TABLE POINTER
3647 021576  077336                        SOB     R3,1$           ;DECREMENT NUMBER OF PATTERNS LEFT. IF ZERO,EXIT.
3648                                                                ;ELSE, CONTINUE TO PATTERN TEST REGISTER
3649 021600  005722                        TST     (R2)+           ;INCREMENT THE REGISTER INDEX BY 2
3650 021602  020227  000040                CMP     R2,#<CSREGS*2>  ;COMPARE REGISTER INDEX TO NUMBER OF CSR'S
3651 021606  101336                        BHI     1$              ;IF R2 > 17, END THE TEST
3652
3653 021610                        24$:
3654 021610                                ENDTST
021610
021610  104401                    L10030:
                                                                            TRAP    C$ETST
```

```
                                .SBTTL TEST 5 -- BASIC MASTER CLEAR

                                ;+*********************************************************************
                                ;*
                                ;*      TEST 5 -- BASIC MASTER CLEAR
                                ;*
                                ;* PERFORM INITIAL MASTER CLEAR.  WRITE 356 INTO BSEL0 AND READ AND CHECK IT.
                                ;* THEN, ISSUE A MASTER CLEAR AND READ AND CHECK BSEL0 FOR 000.
                                ;*
                                ;--*********************************************************************
                                ;
                                ;       BGNTST
021612                                                                          T5::
                                ; ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY CALLING
                                ; SUBROUTINE MASCLR.
                                
021612  004737  003614                 JSR     PC,MASCLR       ; -ATTEMPT- TO RUN THE MICRO-DIAGNOSTIC
                                                                ;FAILURES WILL BE REPORTED BY THE SUBROUTINE
                                                                ;AS DEVICE FATAL AND THE "C" BIT WILL BE SET
021616  103002                        BCC     8$              ;IF NO ERROR, PROCEED
021620                              ERROR                       ;ELSE, REPORT IT AND
021620  104460                                                                    TRAP    C$ERROR
021622  000441                      BR      24$             ;       EXIT THIS TEST
                                
021624  112777  000356  160520  8$: MOVB    #356,@BSEL0     ;# SET BSEL TO ALMOST ALL ONES
021632  122777  000356  160512      CMPB    #356,@BSEL0     ;# COMPARE
021640  001011                      BNE     2$              ;A MISMATCH INDICATES A DEVICE FATAL ERROR


                                ; ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY CALLING
                                ; SUBROUTINE MASCLR.

021642  004737  003614                 JSR     PC,MASCLR       ; -ATTEMPT- TO RUN THE MICRO-DIAGNOSTIC
                                                                ;FAILURES WILL BE REPORTED BY THE SUBROUTINE
                                                                ;AS DEVICE FATAL AND THE "C" BIT WILL BE SET
021646  103002                        BCC     9$              ;IF NO ERROR, PROCEED
021650                              ERROR                       ;ELSE, REPORT IT AND
021650  104460                                                                    TRAP    C$ERROR
021652  000425                      BR      24$             ;       EXIT THIS TEST

021654  122777  000000  160470  9$: CMPB    #000,@BSEL0     ; THIS REGISTER SHOULD BE ZEROED DURING
                                                                ;INITIALIZATION
021662  001421                      BEQ     24$             ;IF ZERO, *** TEST PASSES ***, ELSE REPORT ERROR
                                ;--PREPARE FOR THE FAILURE PRINTOUT--
021664  112737  000356  002310  2$: MOVB    #356,GDATA      ;# ALMOST ALL ONES IS EXPECTED DATA
021672  117737  160454  002312      MOVB    @BSEL0,BDATA    ;SOMETHING OTHER THAN ALL ONES WAS FOUND. SCORE IT.
021700  004737  004434              JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
021704  105077  160442              CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
021710  012737  000000  002334      MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
021716                              GEDF    EM5,ERR2        ;REPORT DEVICE FATAL ERROR
                                                                ;       "DEVICE FATAL" ERROR # 15
021716  104455                                                                    TRAP    C$ERDF
021720  000015                                                                    .WORD   15
021722  014515                                                                    .WORD   EM5
021724  005304                                                                    .WORD   ERR.*
021726  105077  160420          24$:    CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
021732                              ENDTST
```

TEST 5 -- BASIC MASTER CLEAR

```
021732
021732  104401                          L10031:  TRAP    C$ETST
```

```
3708                                    .SBTTL TEST 6 -- BUS RESET

                                        ;++*************************************************************************
                                        ;*
                                        ;*      TEST 6 -- BUS RESET
                                        ;*
                                        ;* PERFORM AN INITIAL MASTER CLEAR.  WRITE 377 INTO BSEL0 AND READ AND CHECK IT.
                                        ;* THEN,  ISSUE  A  RESET  INSTRUCTION, STALL FOR COMPLETION, AND READ AND CHECK
                                        ;* BSEL0 FOR 000.
                                        ;*
                                        ;--*************************************************************************
                                        ;
                                        ;       BGNTST
     021734                                                                                          T6::
3709 021734  032737  000001  002350            BIT     @#BIT0,PFLAG    ;IF BUS RESETS ARE NOT ALLOWED,
3710 021742  001072                             BNE     24$             ;  BYPASS THIS TEST
3711
3712                                    ; ELSE, ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY
3713                                    ; CALLING SUBROUTINE MASCLR.
3714
3715 021744  004737  003614                     JSR     PC,MASCLR       ; -ATTEMPT- TO RUN THE MICRO-DIAGNOSTIC
3716                                                                     ;FAILURES WILL BE REPORTED BY THE SUBROUTINE
3717                                                                     ;AS DEVICE FATAL AND THE "C" BIT WILL BE SET
3718 021750  103002                             BCC     8$              ;IF NO ERROR, PROCEED
3719 021752                                     ERROR                   ;ELSE, REPORT IT AND
     021752  104460                                                                    TRAP    C$ERROR
3720 021754  000465                             BR      24$             ;       EXIT THIS TEST
3721
3722 021756  112777  000377  160366  8$:       MOVB    #377,@#BSEL0    ;SET ALL BITS IN BSEL0
3723 021764  122777  000377  160360            CMPB    #377,@#BSEL0    ;COMPARE TO ALL BITS SET
3724 021772  001035                             BNE     1$              ;A MISMATCH IS A DEVICE FATAL ERROR
3725
3726 021774                                     BRESET                  ;FORCE AN EXTERNAL BUS RESET.  THIS SHOULD
     021774  104433                                                                    TRAP    C$RESET
3727                                                                    ;CAUSE BSEL0=0 IN ABOUT 100 MICROSECONDS
3728
3729
3730                                    ; DELAY ABOUT 500 MILLISECONDS FOR THE MICRODIAGNOSTIC TO COMPLETE
3731 021776  013701  002316                     MOV     DELAY1,R1       ;INITIALIZE COUNTER
3732 022002  105737  002317            2$:      TSTB    DELAY1+1        ;THIS IS A DUMMY INSTRUCTION TO LENGTHEN THE DELAY
3733 022006  005301                             DEC     R1              ;TIME TO GET OUT OF THE DELAY?
3734 022010  001374                             BNE     2$              ;NO,
3735
3736 022012  122777  000000  160332            CMPB    #000,@#BSEL0    ;YES, CHECK FOR REGISTER TO BE ZERO
3737 022020  001443                             BEQ     24$             ;A MISMATCH IS A DEVICE FATAL ERROR
3738                                                                    ;ELSE, END TEST.
3739
3740                                    ; -PREPARE FOR THE FAILURE PRINTOUT--
3741
3742 022022  117737  160324  002312            MOVB    @#BSEL0,BDATA   ;GET THE ACTUAL DATA
3743 022030  004737  004434                     JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3744 022034  105077  160312                     CLRB    @#BSEL0         ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
3745 022040  012737  000000  002310            MOV     #000,GDATA      ;GET THE EXPECTED DATA
3746 022046  012737  000000  002334            MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
3747 022054                                     GEDF    EM9,ERR2        ;EXTERNAL BUS RESET FAILURE
                                                                        ;       "DEVICE FATAL" ERROR # 14
     022054  104455                                                                    TRAP    C$ERDF
```

TEST 6 -- BUS RESET

```
                022056  000016                                                          .WORD   14
                022060  014634                                                          .WORD   EM9
                022062  005304                                                          .WORD   ERR2
  3748          022064  000421                  BR      24$
  3749
  3750          022066  117737  160260  002312  1$:     MOVB    @#BSELO,BDATA   ;GET THE ACTUAL DATA
  3751          022074  004737  004434          JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
  3752          022100  105077  160246          CLRB    @#BSELO         ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
  3753          022104  112737  000377  002310  MOVB    #377,GDATA      ;ALL ONES WAS EXPECTED DATA
  3754          022112  012737  000000  002334  MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
  3755          022120                  GEDF    EM8,ERR2        ;BSELO COULD NOT BE SET TO ALL ONES
                                                                  ;       "DEVICE FATAL" ERROR # 15
                022120  104455                                                          TRAP    C$ERDF
                022122  000017                                                          .WORD   15
                022124  014611                                                          .WORD   EM8
                022126  005304                                                          .WORD   ERR2
  3756          022130  105077  160216          24$:    CLRB    @#BSELO         ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
  3757          022134                  ENDTST
                022134                                                          L10032:
                022134  104401                                                          TRAP    C$ETST
```

```
                        .SBTTL TEST 7 -- CSR, MAINTENANCE MICROCODE INTERACTION

                        ;++*********************************************************************
                        ;*
                        ;*      TEST 7 -- CSR, MAINTENANCE MICROCODE INTERACTION
                        ;*
                        ;* THIS  TEST INVOKES THE MAINTENANCE REQUEST MECHANISM THROUGH WHICH THE LSI-11
                        ;* AND  6502  CAN  COMMUNICATE.    FIRST, A MASTER CLEAR IS DONE WITH ONLY BIT 0
                        ;* (MREQ) SET IN BSEL1.   THE PROGRAM THEN CHECKS FOR THE SETTING OF BSEL2 BIT 7
                        ;* (MRDY)  BY  THE MAINTENANCE MICROCODE WITHIN ABOUT 50 MICRO-SEC., AND IF MRDY
                        ;* DOES NOT GET SET, AN ERROR IS REPORTED.
                        ;*
                        ;* NEXT, THE PROGRAM LOADS SEL4 WITH 000010 AND BSEL6 WITH 125.  THEN, ALL CSR'S
                        ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
                        ;*
                        ;* BSEL2  IS  THEN LOADED WITH A WRITE COMMAND, WHICH SHOULD CAUSE THE MICROCODE
                        ;* TO  TRANSFER  THE  125  INTO  BSEL0.  ALL CSR'S ARE THEN READ AND CHECKED FOR
                        ;* EXPECTED CONTENTS.
                        ;*
                        ;* THEN, THE PROGRAM LOADS 252 INTO BSEL0 AND READS AND CHECKS ALL CSR'S.  BSEL2
                        ;* IS  THEN  LOADED  WITH  A  READ  COMMAND, WHICH SHOULD CAUSE THE MICROCODE TO
                        ;* TRANSFER THE 252 INTO BSEL6.  ALL CSR'S ARE READ AND CHECKED.
                        ;*
                        ;--*********************************************************************
                        ;
                        ;       BGNTST
     022136                                                                     T7::
3780 022136             BGNSUB
     022136                                                                     T7.1:
     022136  104402                                                                     TRAP    C$BSUB
3781 022140  004737  003762                    JSR     PC,MSTCLR       ;PUT THE MICROPROCESSOR IN THE MAINTENANCE LOOP
3782 022144  103003                            BCC     10$             ;IF NO ERROR, PROCEED
3783 022146                                    ERROR                   ;ELSE, REPORT IT AND
     022146  104460                                                             TRAP    C$ERROR
3784 022150  000137  022642                    JMP     ENDT7           ;       EXIT THIS TEST
3785
3786 022154  012777  000020  160200  10$:     MOV     #SLT0,@SEL4     ;PUT ADDRESS OF SELECT REGISTER 0 IN 'ADDRESS' REG
3787 022162  012777  000125  160176          MOV     #125,@SEL6      ;PUT THE DATA TO BE WRITTEN IN 'DATA' REGISTER
3788
3789 022170  027727  160156  000400          CMP     @SEL0,#400      ;ONLY "MREQ" SHOULD BE SET
3790 022176  001411                            BEQ     1$              ;IF IT IS, PROCEED WITH TESTING
3791                                                                    ;ELSE, SETUP FOR (& REPORT) THE ERROR
3792 022200  017737  160146  002312          MOV     @SEL0,BDATA     ;  BAD DATA
3793 022206  012737  000400  002310          MOV     #400,GDATA      ;  GOOD DATA
3794 022214  005037  002334                    CLR     REGNUM          ;  REG. NUMBER
3795 022220  000451                            BR      4$
3796
3797 022222  027727  160130  000200  1$:     CMP     @SEL2,#200      ;"MRDY" SET?  (ALSO CHECKED BY "MSTCLR")
3798 022230  001412                            BEQ     2$              ;YES, PROCEED WITH TESTING
3799 022232  017737  160120  002312          MOV     @SEL2,BDATA     ;  BAD DATA
3800 022240  012737  000200  002310          MOV     #200,GDATA      ;  GOOD DATA
3801 022246  012737  000002  002334          MOV     #2,REGNUM       ;  THE REG. THAT FAILED
3802 022254  000433                            BR      4$              ;EXIT TEST
3803
3804 022256  027727  160100  000020  2$:     CMP     @SEL4,#SLT0     ;COMPARE SELECT REGISTER 4 WITH THE ADDRESS SENT
3805 022264  001412                            BEQ     3$              ;A MISMATCH IS A DEVICE FATAL ERROR
3806 022266  017737  160070  002312          MOV     @SEL4,BDATA     ;GET THE BAD DATA
```

TEST 7 -- CSR, MAINTENANCE MICROCODE INTERACTION

```
3807 022274  012737  000020  002310          MOV     #SLTO,GDATA     ;GET THE GOOD DATA
3808 022302  012737  000004  002334          MOV     #4,REGNUM       ;GET THE REGISTER NUMBER WHICH FAILED
3809 022310  000415                          BR      4$
3810
3811 022312  027727  160050  000125  3$:     CMP     @SEL6,#000125   ;COMPARE SELECT REGISTER 6 WITH THE DATA SENT
3812 022320  001415                          BEQ     60$             ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
3813 022322  017737  160040  002312          MOV     @SEL6,BDATA     ;GET THE BAD DATA
3814 022330  012737  000125  002310          MOV     #000125,GDATA   ;GET THE GOOD DATA
3815 022336  012737  000006  002334          MOV     #6,REGNUM       ;GET THE REGISTER NUMBER
3816
3817
3818                                         ;--PREPARE FOR THE FAILURE PRINTOUT--
3819
3820 022344                          4$:     GEDF    EM7,ERR5        ;ELSE, AN ERROR HAS BEEN FOUND
                                             ;       "DEVICE FATAL" ERROR # 16
     022344  104455                                                          TRAP    C$ERDF
     022346  000020                                                          .WORD   16
     022350  014564                                                          .WORD   EM7
     022352  005552                                                          .WORD   ERR5
3821 022354                          60$:    ENDSUB
     022354                                                          L10034:
     022354  104403                                                          TRAP    C$ESUB
3822                                 ;#################### > P A R T  2 < ##############################################
3823 022356                                  BGNSUB
     022356                                                                  T7.2:
     022356  104402                                                          TRAP    C$BSUB
3824
3825 022360  112777  000002  157770          MOVB    #WRILOC,@BSEL2  ;SEND THE WRITE LOCATION COMMAND
3826
3827 022366  032777  000200  157762          BIT     #200,@BSEL2     ;WE SHOULD HAVE IMEDIATLY LOST "MRDY".
3828 022374  001421                          BEQ     5$              ;GOT WHAT WE EXPECTED,  WAIT FOR READY AGAIN
3829 022376  017737  157754  002312          MOV     @BSEL2,BDATA    ;SOMETHING WRONG,  SETUP FOR AND REPORT ERROR
3830 022404  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3831 022410  012737  000002  002310          MOV     #002,GDATA      ;EXPECTED DATA
3832 022416  012737  000002  002334          MOV     #2,REGNUM       ;WE WERE TESTING BSEL2
3833 022424                                  GEDF    EM15,ERR2
                                             ;       "DEVICE FATAL" ERROR # 17
     022424  104455                                                          TRAP    C$ERDF
     022426  000021                                                          .WORD   17
     022430  014733                                                          .WORD   EM15
     022432  005304                                                          .WORD   ERR2
3834 022434                                  ESCAPE  TST
     022434  104410                                                          TRAP    C$ESCAPE
     022436  000206                                                          .WORD   L10033-.
3835
3836 022440  132777  000200  157710  5$:     BITB    #200,@BSEL2     ;WAIT FOR "MRDY" TO GO HIGH AGAIN
3837 022446  001774                          BEQ     5$
3838
3839 022450  004737  004576                  JSR     PC,GETWSR       ;WHEN IT DOES, GET CURRENT REGISTER CONTENTS
3840
3841 022454  023727  002246  000525          CMP     WSR0,#000525    ;COMPARE BYTE SELECT REGISTERS 0 AND 1
3842                                         ;REG 0 = 125, REG 1 = 001
3843 022462  001412                          BEQ     6$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
3844 022464  012737  000525  002310          MOV     #000525,GDATA   ;GET THE GOOD DATA
3845 022472  013737  002246  002312          MOV     WSR0,BDATA      ;GET THE BAD DATA
3846 022500  012737  000000  002334          MOV     #0,REGNUM       ;GET THE REGISTER NUMBER
3847 022506  000451                          BR      9$              ;EXIT TEST
```

TEST 7 - CSR, MAINTENANCE MICROCODE INTERACTION

```
3848
3849 022510  023727  002250  000200  6$:   CMP     WSR2,#000200    ;COMPARE BYTE SELECT REGISTERS 2 AND 3
3850                                                                ;REG 2 = 200 -- "MRDY" IS SET & COMMAND IS CLEARED
3851                                                                ;REG 3 = 000 SHOULD BE ZEROES.
3852 022516  001412                          BEQ     7$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
3853 022520  012737  000200  002310          MOV     #000200,GDATA   ;GET THE GOOD DATA
3854 022526  013737  002250  002312          MOV     WSR2,BDATA      ;GET THE BAD DATA
3855 022534  012737  0000    2334            MOV     #2,REGNUM       ;GET THE REGISTER NUMBER
3856 022542  000433                          BR      9$              ;EXIT TEST
3857
3858                                                                ;SUBROUTINE ATTEMPTED TO ZERO THIS LOCATION.
3859 022544  023727  002252  000020  7$:   CMP     WSR4,#SLTO      ;REG 4 = 020, THE 6502 ADDRESS TO PUT DATA
3860                                                                ; REG 5 = 000, ZEROED BY MSTCLR
3861 022552  001412                          BEQ     8$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
3862 022554  012737  000020  002310          MOV     #SLTO,GDATA     ;GET THE GOOD DATA
3863 022562  013737  002252  002312          MOV     WSR4,BDATA      ;GET THE BAD DATA
3864 022570  012737  000004  002334          MOV     #4,REGNUM       ;GET THE REGISTER NUMBER
3865 022576  000415                          BR      9$              ;EXIT TEST
3866
3867 022600  023727  002254  000125  8$:   CMP     WSR6,#000125    ;REG 6 = 125, THE WRITE DATA
3868 022606  001415                          BEQ     ENDT7           ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
3869 022610  012737  000125  002310          MOV     #000125,GDATA   ;GET THE GOOD DATA
3870 022616  013737  002254  002312          MOV     WSR6,BDATA      ;GET THE BAD DATA
3871 022624  012737  000006  002334          MOV     #6,REGNUM       ;GET THE REGISTER NUMBER
3872                                                                ; REG 7 = 000, ZEROED BY MSTCLR.
3873
3874                                                                ;--PREPARE FOR THE FAILURE PRINTOUT--
3875
3876 022632                           9$:     GEDF    EM7,ERR5        ;REPORT ERROR.
                                                                    ;       "DEVICE FATAL" ERROR # 18
     022632  104455                                                                 TRAP    C$ERDF
     022634  000022                                                                 .WORD   18
     022636  014564                                                                 .WORD   EM7
     022640  005552                                                                 .WORD   ERR5
3877 022642                           ENDT7:  ENDSUB
     022642                                                                 L10035:
     022642  104403                                                                 TRAP    C$ESUB
3878 022644                                   ENDTST
     022644                                                                 L10033:
     022644  104401                                                                 TRAP    C$ETST
```

```
                                                .SBTTL  TEST 8 -- RUN FLIP-FLOP

                                                ;**********************************************************************
                                                ;*
                                                ;*      TEST 8 -- RUN FLIP-FLOP
                                                ;*
                                                ;* THE PROGRAM PUTS THE MICROCODE INTO THE MAINTENANCE LOOP. A 125 CHARACTER
                                                ;* IS LOADED INTO BSEL6 AND A REQUEST IS MADE TO WRITE THE CONTENTS OF BSEL6
                                                ;* INTO BSEL0. THE PROGRAM THEN READS AND CHECKS BSEL0 TO CONTAIN 125.
                                                ;* NEXT, THE RUN FLIP-FLOP IS CLEARED BY LOADING A 0 INTO RUN (BSEL1 BIT 7).
                                                ;* BSEL0 IS THEN CLEARED AND THE REQUEST IS MADE AGAIN TO WRITE THE CONTENTS
                                                ;* OF BSEL6 INTO BSEL0. THE PROGRAM STALLS FOR 50 MICRO-SEC. AND CHECKS FOR
                                                ;* MRDY (BSEL2 BIT 7) NOT SET, AND BSEL0 STILL CLEARED.
                                                ;* THEN, THE PROGRAM SETS THE RUN FLIP-FLOP AGAIN BY LOADING A 1 INTO RUN,
                                                ;* AND CHECKS FOR MRDY SET WITHIN 50 MICRO-SEC. AND BSEL0 = 125.
                                                ;*
                                                ;--*********************************************************************
                                                ;
                                                ;       BGNTST
 022646                                                                                         T8::
 022646  004737  003762                                 JSR     PC,MSTCLR       ;CALL SUBROUTINE TO INITIALIZE THE CSR'S AND
                                                                                ;PUT THE 6502 INTO THE MAINTENANCE LOOP
 022652  103003                                         BCC     2$              ;IF NO ERROR, PROCEED
 022654                                                 ERROR                   ;ELSE, REPORT IT AND
 022654  104460                                                                                         TRAP    C$ERROR
 022656  000137  023212                                 JMP     24$             ;       EXIT THIS TEST

                                                ; DO NORMAL WRITE INTO LOCATION USED BY BSEL0

 022662  004537  004322                 2$:             JSR     R5,WRITEI       ;WRITE INTO BSEL0 THROUGH THE BACK DOOR!
 022666  000020                                         SLTO                    ;  ADDRESS OF BSEL0 WITHIN RAM
 022670  000125                         10$:            125                     ;  TEST DATA
 022672  103002                                         BCC     5$              ;IF AN ERROR OCCURED,
 022674                                                 ERROR                   ;REPORT IT &
 022674  104460                                                                                         TRAP    C$ERROR
 022676  000545                                         BR      24$             ;  EXIT
 022700  123777  022670  157444         5$:             CMPB    10$,@BSEL0      ;DID THE DATA GO INTO BSEL0?
 022706  001416                                         BEQ     11$             ;YES, NOW TRY IT WITH THE "RUN" BIT OFF
 022710  017737  157436  002312                         MOV     @SEL0,BDATA     ;NO.  SETUP & PRINT ERROR MESSAGE
 022716  013737  022670  002310                         MOV     10$,GDATA
 022724  005037  002334                                 CLR     REGNUM          ;WE'RE SINGLING OUT SEL0 FOR THE MESSAGE
 022730                                                 GEDF    EM16,ERR5
                                                                                ;       "DEVICE FATAL" ERROR # 19
 022730  104455                                                                                         TRAP    C$ERDF
 022732  000023                                                                                         .WORD   19
 022734  015013                                                                                         .WORD   EM16
 022736  005552                                                                                         .WORD   ERR5
 022740                                                 ESCAPE  TST             ;IF THIS WRITE DIDN'T WORK, THERE IS NO SENSE
 022740  104410                                                                                         TRAP    C$ESCAPE
 022742  000250                                                                                         .WORD   L10036-.
                                                                                ;IN TRYING IT WITH "RUN" OFF!

 022744  105077  157402                 11$:            CLRB    @BSEL0          ;CLEAR BSEL0 AGAIN
                                                                                ;REG'S ARE ALREADY SETUP FROM PREVIOUS WRITE
 022750  142777  000200  157376                         BICB    #RUN,@BSEL1     ;TURN OFF THE RUN BIT   & HOPEFULLY THE 6502 ALSO
 022756  112777  000002  157372                         MOVB    #WRILOC,@BSEL2  ;TELL MLOOP TO WRITE AGAIN
```

TEST 8 -- RUN FLIP-FLOP

```
3922                                    ;AT THIS POINT, THE DMV-11 SHOULD BE QUIESCENT.  IT SHOULDN'T EVEN KNOW THAT
3923                                    ;WE HAVE CLEARED "MRDY".  THEREFOR, THERE SHOULD BE NO CHANGE IN ANY OF THE
3924                                    ;REGISTERS FOR AS LONG AS WE CARE TO WAIT AND WATCH.  THE ONLY CHANGE THAT WE
3925                                    ;COULD POSSIBLY SEE WOULD BE "MRDY" BEING SET AGAIN AND/OR BSEL0 GETTING
3926                                    ;LOADED WITH THE TEST DATA -- WHICH IS WHAT THE REQUESTED COMMAND SHOULD
3927                                    ;ACCOMPLISH WHEN THE FUNCTION IS ALLOWED TO RUN AGAIN.
3928
3929 022764  013701  002320                      MOV     DELAY2,R1       ;SETUP AND WAIT FOR A WHILE.
3930 022770  132777  000200  157360  12$:        BITB    #MRDY,@BSEL2    ;WHILE WE'RE WAITING, WE MAY AS WELL CHECK "MRDY"
3931 022776  001042                            BNE     14$             ;IF IT GETS SET, WE HAVE AN ERROR BECAUSE
3932                                                                    ;NOTHING WAS SUPPOSED TO HAPPEN WITHIN
3933                                                                    ;THE 6502 MICRO-PROCESSOR
3934 023000  105777  157346                    TSTB    @BSEL0          ;WHILE WE'RE AT IT, WE MAY AS WELL LOOK AT
3935 023004  001063                            BNE     15$             ;BSEL0.  THAT ALSO ISN'T SUPPOSED TO CHANGE.
3936 023006  077110                            SOB     R1,12$          ;DECREMENT AND CHECK COUNTER -- LOOP TILL DONE
3937
3938                                    ;IF EVERYTHING GOES OK, WE SHOULD FALL OUT OF THE LOOP TO HERE.  OTHERWISE,
3939                                    ;"MRDY" OR BSEL0 COULD CHANGE SENDING US TO "14$" OR "15$" RESPECTIVELY TO
3940                                    ;PRINT AN APPROPRIATE (WE HOPE) ERROR MESSAGE.
3941
3942                                    ;IF WE DO GET TO HERE, WE CAN NOW SET "RUN" AND THE MLOOP SHOULD PERFORM THE
3943                                    ;REQUESTED FUNCTION.
3944
3945 023010  152777  000200  157336              BISB    #RUN,@BSEL1     ;SET "RUN" AND ALLOW THE 6502 TO RUN AGAIN
3946
3947                                    ;NOW ALL WE HAVE TO DO IS WAIT AGAIN AS BEFORE.  EXCEPT THAT THIS TIME "MRDY"
3948                                    ;OR BSEL0 GETTING SET IS THE VALID CONDITION -- NOT THE ERROR.  FAILURE TO
3949                                    ;PERFORM IS NOW THE ERROR WE'RE LOOKING FOR.
3950
3951 023016  013701  002320                      MOV     DELAY2,R1       ;SETUP AND WAIT FOR A WHILE.
3952 023022  132777  000200  157326  13$:        BITB    #MRDY,@BSEL2    ;WHILE WE'RE WAITING, "MRDY" SHOULD GO NON-ZERO
3953 023030  001070                            BNE     24$             ;IF IT GETS SET, WE CAN ASSUME THAT SOMETHING
3954                                                                    ;COMPLETED.  AT LEASE WE WERE ABLE TO GET THE
3955                                                                    ;6502 MICRO-PROCESSOR RUNNING AGAIN
3956 023032  077105                            SOB     R1,13$          ;DECREMENT AND CHECK COUNTER -- LOOP TILL DONE
3957
3958                                    ;IF WE GET HERE, WE WEREN'T ABLE TO RESTORE THE 6502 TO A RUNNING STATE!
3959
3960 023034  117737  157316  002312              MOVB    @BSEL2,BDATA    ;SETUP FOR THE ERROR MESSAGE -- GET BAD DATA
3961 023042  004737  004434                      JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3962 023046  113737  002312  002310              MOVB    BDATA,GDATA     ;PICK THE REGISTER'S DATA.  THE ONLY DIFFERANCE
3963 023054  152737  000200  002310              BISB    #MRDY,GDATA     ;BETWEEN GOOD & BAD IS THE "MRDY" BIT
3964 023062  012737  000002  002334              MOV     #2,REGNUM       ;INDICATE THAT WE'RE LOOKING AT BSEL2
3965 023070                                     GEDF    EM17,ERR2       ;NOW REPORT THE ERROR
                                                                        ;       "DEVICE FATAL" ERROR # 20
     023070  104455                                                                     TRAP    C$ERDF
     023072  000024                                                                     .WORD   20
     023074  015110                                                                     .WORD   EM17
     023076  005304                                                                     .WORD   ERR2
3966 023100                                     ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
     023100  104410                                                                     TRAP    C$ESCAPE
     023102  000110                                                                     .WORD   L10036-.
3967
3968                                    ;IF WE GET HERE, BSEL2 CHANGED WHEN THE 6502 WASN'T SUPPOSED TO BE RUNNING!
3969
3970 023104  117737  157246  002312  14$:        MOVB    @BSEL2,BDATA    ;GET THE UNEXPECTEDLY ALTERED CONTENTS OF BSEL2
3971 023112  004737  004434                      JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
```

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TEST 8 -- RUN FLIP-FLOP

```
3972 023116  113737  002312  002310          MOVB    BDATA,GDATA     ;PICK THE REGISTER'S DATA.  THE ONLY DIFFERANCE
3973 023124  142737  000200  002310          BICB    #MRDY,GDATA     ;BETWEEN GOOD & BAD IS THE "MRDY" BIT
3974 023132  012737  000002  002334          MOV     #2,REGNUM       ;INDICATE THAT WE'RE LOOKING AT BSEL2
3975 023140                                  GEDF    EM17A,ERR2      ;NOW REPORT THE ERROR
                                                                     ;       "DEVICE FATAL" ERROR # 21
     023140  104455                                                                  TRAP    C$ERDF
     023142  000025                                                                  .WORD   21
     023144  015170                                                                  .WORD   EM17A
     023146  005304                                                                  .WORD   ERR2
3976 023150                                  ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
     023150  104410                                                                  TRAP    C$ESCAPE
     023152  000040                                                                  .WORD   L10036-.
3977
3978                                 ;IF WE GET HERE, BSELO CHANGED WHEN THE 6502 WASN'T SUPPOSED TO BE RUNNING!
3979
3980 023154  117737  157172  002312  15$:    MOVB    @#BSELO,BDATA   ;GET THE UNEXPECTEDLY ALTERED CONTENTS OF BSELO
3981 023162  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
3982 023166  105037  002310                  CLRB    GDATA           ;IT WAS SUPPOSED TO STAY AT ZERO
3983 023172  105037  002334                  CLRB    REGNUM          ;INDICATE THAT WE'RE LOOKING AT BSELO
3984 023176                                  GEDF    EM17A,ERR2      ;NOW REPORT THE ERROR
                                                                     ;       "DEVICE FATAL" ERROR # 22
     023176  104455                                                                  TRAP    C$ERDF
     023200  000026                                                                  .WORD   22
     023202  015170                                                                  .WORD   EM17A
     023204  005304                                                                  .WORD   ERR2
3985 023206                                  ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
     023206  104410                                                                  TRAP    C$ESCAPE
     023210  000002                                                                  .WORD   L10036-.
3986
3987                                 ;IF WE GET HERE, THE TEST APPEARS TO HAVE PASSED WITH FLYING COLOURS
3988
3989 023212                          24$:    ENDTST
     023212                                                              L10036:
     023212  104401                                                                  TRAP    C$ETST
```

```
   4004                                 .SBTTL TEST 9 -- LOW RAM (00-0F) SCRATCHPAD

                                        ;*****************************************************************************
                                        ;*
                                        ;*      TEST 9 -- LOW RAM (00-0F) SCRATCHPAD
                                        ;*
                                        ;* THIS TEST FIRST PERFORMS AN ADDRESSING TEST OF RAM LOCATIONS (00-0F), BY
                                        ;* WRITING THE ADRS INTO EACH LOCATION AND AFTER EACH WRITE, ALL THE LOCATIONS
                                        ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
                                        ;*
                                        ;* THEN, THE TEST PERFORMS READ/WRITE DATA TESTING OF RAM LOCATIONS 00-0F,
                                        ;* BY WRITING, READING, AND COMPARING ALL BYTES OF DATA PATTERN B IN EACH
                                        ;* LOCATION.
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;*****************************************************************************
                                        ;
                                        ;       BGNTST
     023214                                                                                     T9::
4005 023214  004737  003762             1$:     JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
4006 023220  103003                             BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
4007 023222                                     ERROR                   ;ELSE, REPORT ERROR
     023222  104460                                                                             TRAP    C$ERROR
4008 023224                                     ESCAPE  TST             ;   & EXIT TEST
     023224  104410                                                                             TRAP    C$ESCAPE
     023226  000152                                                                             .WORD   L10037-.
4009 023230  012737  000001  002444  1$:      MOV     #1,TMP2         ;DATA GENERATION ALGORITHM CODE
4010 023236  012737  003777  002474            MOV     #2047.,TMPE     ;LAST VALID ADDRESS
4011 023244  004737  023402          2$:      JSR     PC,T9.RST       ;RESET TMP3, TMPA, & TMPF
4012 023250  005037  002450                     CLR     TMP4            ;TEST DATA
4013 023254  005037  002452                     CLR     TMP5            ;ACTUAL DATA
4014
4015                                    ; IN THIS PHASE OF TESTING WE WRITE, READ & CHECK EACH LOCATION INDIVIDUALLY.
4016
4017 023260  004737  023420          4$:      JSR     PC,WRCRAM       ;WRITE, READ, & CHECK 1 BYTE OF RAM
4018 023264  103003                             BCC     5$              ;IF NO ERROR, PROCEED
4019 023266                                     ERROR                   ;ELSE, REPORT IT
     023266  104460                                                                             TRAP    C$ERROR
4020 023270                                     ESCAPE  TST             ;   & LOOP IF ERROR
     023270  104410                                                                             TRAP    C$ESCAPE
     023272  000106                                                                             .WORD   L10037-.
4021 023274  005237  002464          5$:      INC     TMPA            ;POINT TO NEXT LOCATION
4022 023300  023737  002464  002474            CMP     TMPA,TMPE       ;HAVE WE TESTED ALL OF RAM?
4023 023306  101764                             BLOS    4$              ;NO, TEST ANOTHER BYTE
4024 023310                                     BREAK                   ;ELSE, SEE IF A ^C HAS BEEN STRUCK
     023310  104422                                                                             TRAP    C$BRK
4025                                                                    ;THEN PROCEED TO THE NEXT PHASE OF TESTING
4026
4027                                    ; IN THIS PHASE OF TESTING WE READ & CHECK DATA WHICH SHOULD ALREADY BE IN
4028                                    ; EACH LOCATION OF RAM BEING CHECKED.
4029
4030 023312  004737  023402                     JSR     PC,T9.RST       ;RESET TMP3, TMPA, & TMPF
4031 023316  004737  023616          8$:      JSR     PC,RCRAM        ;READ & CHECK 1 BYTE OF RAM
4032 023322  103001                             BCC     9$              ;IF NO ERROR, PROCEED
4033 023324                                     ERROR                   ;ELSE, REPORT IT
     023324  104460                                                                             TRAP    C$ERROR
```

TEST 9 -- LOW RAM (00-0F) SCRATCHPAD

```
4034 023326  005237  002464          9$:     INC     TMPA            ;POINT TO NEXT LOCATION
4035 023332  023737  002464  002474         CMP     TMPA,TMPE       ;HAVE WE TESTED ALL OF RAM?
4036 023340  101766                         BLOS    8$              ;NO, TEST ANOTHER BYTE
4037 023342                                  BREAK                   ;ELSE, SEE IF A ^C HAS BEEN STRUCK
     023342  104422                                                                  TRAP    C$BRK
4038                                                                 ;THEN PROCEED TO THE NEXT PHASE OF TESTING
4039
4040 023344  005037  007104                 CLR     ER47CT          ;RESET ERROR PRINT COUNT
4041 023350  005237  002444                 INC     TMP2            ;  ADVANCE TO NEXT DATA GEN. ALGORITHM CODE
4042 023354  023727  002444  000007         CMP     TMP2,#7         ;HAVE WE DONE ALL THE CODES WE'RE GOING TO DO?
4043 023362  002730                         BLT     2$              ;NO, THEN GO DO THIS PATTERN IN RAM
4044 023364  004537  004322                 JSR     R5,WRITEI       ;ELSE, CLEAR RAM LOCATION 0083 (HEX) & EXIT
4045 023370  000173                         173                     ;       (THIS CONVERTS TO 0083 HEX.)
4046 023372  000000                         0                       ;       (THIS WE HOPE, WILL CLEAR IT)
4047 023374  103001                         BCC     .+4             ;IF NO ERROR, PROCEED
4048 023376                                  ERROR                   ;ELSE, REPORT IT
     023376  104460                                                                  TRAP    C$ERROR
4049 023400                                  ENDTST
     023400                                                                 L10037:
     023400  104401                                                                  TRAP    C$ETST
4050
4051                            ; RESET THE FOLLOWING THREE REGISTERS
4052
4053 023402  005037  002446          T9.RST: CLR     TMP3            ;TEST DATA PATTERN INDEX
4054 023406  005037  002464                  CLR     TMPA            ;RAM LOCATION ADDRESS
4055 023412  005037  002476                  CLR     TMPF            ;RESET ALL ERROR FLAGS
4056 023416  000207                          RTS     PC
4057
4058                            ; WRITE, READ, & CHECK ONE LOCATION
4059
4060 023420  010046                  WRCRAM: MOV     R0,-(SP)        ;SAVE WORKING REGISTERS
4061
4062 023422  004737  023776                  JSR     PC,PATGEN       ;GENERATE ONE DATA PATTERN BYTE
4063
4064 023426  013700  002464                  MOV     TMPA,R0         ;GET ADDRESS WHERE WE CAN CHECK IT MORE EASILY
4065 023432  020027  000020                  CMP     R0,#SLT0        ;IS ADDRESS BELOW THE SELECT REGESTER AREA?
4066 023436  103412                          BLO     2$              ;YES, GOOD.  IT CAN BE TESTED.
4067 023440  020027  000030                  CMP     R0,#SLT0+8.     ;IS IT ABOVE THE SELECT REGISTER AREA?
4068 023444  103007                          BHIS    2$              ;YES, GOOD.  IT CAN BE TESTED.
4069 023446  023727  002444  000006          CMP     TMP2,#6         ;NO, IF "INCREMENTAL", BACK UP INDEX
4070 023454  001055                          BNE     12$             ;ELSE JUST BYPASS TEST
4071 023456  005337  002446                  DEC     TMP3            ;DECREMENT INDEX TO WHAT IT WAS BEFORE "PATGEN"
4072 023462  000452                          BR      12$             ;  AND THEN BYPASS THE TESTING
4073
4074 023464  010037  023500          2$:     MOV     R0,4$           ;SETUP ALL POINTERS FOR THE CURRENT RAM LOCATION
4075 023470  010037  023512                  MOV     R0,8$
4076
4077 023474  004537  004310                  JSR     R5,WRITE        ;WRITE ONE BYTE OF THE TEST DATA
4078 023500  000000          4$:     .WORD   0                       ;**** MODIFIED FROM ABOVE ****
4079 023502  002450                  TMP4                            ;TEST DATA IS IN TMP4
4080 023504  103442                  BCS     14$                     ;IF ERROR WRITING, FORGET THE REST
4081
4082 023506  004537  004064                  JSR     R5,READ         ;READ THAT BYTE BACK AGAIN
4083 023512  000000          8$:     .WORD   0                       ;**** MODIFIED FROM ABOVE ****
4084 023514  002452                  TMP5
4085 023516  103435                  BCS     14$                     ;IF ERROR READING, FORGET THE REST
4086
```

TEST 9 -- LOW RAM (00-0F) SCRATCHPAD

```
4087 023520  123737  002450  002452          CMPB    TMP4,TMP5       ;DID WE READ WHAT WE WROTE?
4088 023526  001430                           BEQ     12$             ;YES, EXIT
4089 023530  132737  000002  002476          BITB    #BIT1,TMPF      ;NO, HAVE WE ALREADY DONE THIS ERROR'S HEADER?
4090 023536  001020                           BNE     9$              ;YES, ONLY REPORT DATA
4091 023540  112737  000002  002476          MOVB    #BIT1,TMPF      ;ELSE, CALL MONITOR & PRINT HEADING
4092 023546                                   GTDF    EM47A,ERR47     ;QUEUE UP THE ERROR MESSAGE
                                                                      ;       QUEUE "DEVICE FATAL" ERROR # 23
     023546  012737  000001  002236                                                      MOV     #T.EDF,ERRTYP
     023554  012737  000027  002240                                                      MOV     #23,ERRNBR
     023562  012737  015675  002242                                                      MOV     #EM47A,ERRMSG
     023570  012737  006724  002244                                                      MOV     #ERR47,ERRBLK
4093 023576  000402                           BR      10$
4094
4095 023600  004737  007110          9$:     JSR     PC,ERR47.       ;JUST PRINT DATA
4096 023604  000261                  10$:    SEC                     ;       & SET THE ERROR FLAG
4097 023606  000401                          BR      14$             ;       & GO DIRECTLY TO THE EXIT "RTS"
4098
4099 023610  000241                  12$:    CLC                     ;NORMAL EXIT - MAKE SURE THE ERROR FLAG IS CLEAR
4100 023612  012600                  14$:    MOV     (SP)+,R0        ;RESTORE WORK REGISTERS
4101 023614  000207                          RTS     PC
4102
4103 023616  010046                  RCRAM:  MOV     R0,-(SP)        ;SAVE WORKING REGISTERS
4104
4105 023620  004737  023776                  JSR     PC,PATGEN       ;GENERATE ONE DATA PATTERN BYTE
4106
4107 023624  013700  002464                  MOV     TMPA,R0         ;GET ADDRESS WHERE WE CAN CHECK IT MORE EASILY
4108 023630  020027  000020                  CMP     R0,#SLT0        ;IS ADDRESS BELOW THE SELECT REGESTER AREA?
4109 023634  103412                          BLO     2$              ;YES, GOOD.  IT CAN BE TESTED.
4110 023636  020027  000030                  CMP     R0,#SLT0+8.     ;IS IT ABOVE THE SELECT REGISTER AREA?
4111 023642  103007                          BHIS    2$              ;YES, GOOD.  IT CAN BE TESTED.
4112 023644  023727  002444  000006          CMP     TMP2,#6         ;NO, IF "INCREMENTAL", BACK UP INDEX
4113 023652  001046                          BNE     12$             ;ELSE JUST BYPASS TEST
4114 023654  005337  002446                  DEC     TMP3            ;DECREMENT INDEX TO WHAT IT WAS BEFORE "PATGEN"
4115 023660  000443                          BR      12$             ;  AND THEN BYPASS THE TESTING
4116
4117 023662  010037  023672          2$:     MOV     R0,8$           ;SETUP POINTER FOR THE CURRENT RAM LOCATION
4118
4119 023666  004537  004064                  JSR     R5,READ         ;READ THAT BYTE BACK AGAIN
4120 023672  000000                  8$:     .WORD   0               ;**** MODIFIED FROM ABOVE ****
4121 023674  002452                          TMP5
4122 023676  103435                          BCS     14$             ;IF ERROR READING, FORGET THE REST
4123
4124 023700  123737  002450  002452          CMPB    TMP4,TMP5       ;WAS THIS LOC. STILL OK?
4125 023706  001430                          BEQ     12$             ;YES, EXIT
4126 023710  132737  000004  002476          BITB    #BIT2,TMPF      ;NO, HAVE WE ALREADY DONE THIS ERROR'S HEADER?
4127 023716  001020                          BNE     9$              ;YES, ONLY REPORT DATA
4128 023720  112737  000004  002476          MOVB    #BIT2,TMPF      ;ELSE, CALL MONITOR & PRINT HEADING
4129 023726                                   GTDF    EM47B,ERR47     ;QUEUE UP THE ERROR MESSAGE
                                                                      ;       QUEUE "DEVICE FATAL" ERROR # 24
     023726  012737  000001  002236                                                      MOV     #T.EDF,ERRTYP
     023734  012737  000030  002240                                                      MOV     #24,ERRNBR
     023742  012737  015735  002242                                                      MOV     #EM47B,ERRMSG
     023750  012737  006724  002244                                                      MOV     #ERR47,ERRBLK
4130 023756  000402                          BR      10$
4131
4132 023760  004737  007110          9$:     JSR     PC,ERR47.       ;JUST PRINT DATA
4133 023764  000261                  10$:    SEC                     ;       & SET THE ERROR FLAG
```

```
4134 023766  000401                        BR      14$             ;       & GO DIRECTLY TO THE EXIT "RTS"
4135
4136 023770  000241                12$:    CLC                     ;NORMAL EXIT - MAKE SURE THE ERROR FLAG IS CLEAR
4137 023772  012600                14$:    MOV     (SP)+,R0        ;RESTORE WORK REGISTERS
4138 023774  000207                        RTS     PC
4139
4140                               ;+*************************************************************************
4141                               ; PATGEN -- SUBROUTINE TO GENERATE A TEST DATA BYTE FOR A SPECIFIC ELEMENT
4142                               ;
4143                               ;       CALLING SEQUENCE:
4144                               ;
4145                               ;       <SET TEST PATTERN CODE # IN "TMP2">
4146                               ;       <SET TEST PATTERN INDEX IN "TMP3">
4147                               ;       JSR     PC,PATGEN
4148                               ;       <NEXT SEQUENCIAL INSTRUCTION>
4149                               ;
4150                               ;  TEST PATTERN CODES:
4151                               ;
4152                               ;       1 -- ALL ONES
4153                               ;       2 -- ALL ZEROES
4154                               ;       3 -- 1 BIT ALTERNATING
4155                               ;       4 -- 2 BITS ALTERNATING
4156                               ;       5 -- ADDRESS IN ADDRESS
4157                               ;       6 -- INCREMENTAL  (INDEX IN ADDRESS)
4158                               ;
4159                               ;  THE TEST PATTERN INDEX INDICATES HOW FAR INTO THE TEST PATTERN STRING OF
4160                               ;  BYTES WE ARE.  I.E. IT SPECIFIES THE NUMBER OF THE BYTE OF THE WHOLE STRING
4161                               ;  OF BYTES COMPOSING THE COMPLETE TEST PATTERN.
4162                               ;
4163                               ;--*************************************************************************
4164
4165
4166 023776                        PATGEN:
4167 023776  023727  002444  000002        CMP     TMP2,#2         ;DECODE THE TEST PATTERN IDENTIFIER
4168 024004  002414                        BLT     1$              ;0, 1, OR NEGITIVE WILL GIVE "ALL ONES"
4169 024006  001417                        BEQ     2$              ;2 = "ALL ZEROES"
4170 024010  023727  002444  000004        CMP     TMP2,#4
4171 024016  002416                        BLT     3$              ;3 = "1 BIT ALTERNATING"
4172 024020  001431                        BEQ     4$              ;4 = "2 BIT ALTERNATING PATTERN"
4173 024022  023727  002446  000006        CMP     TMP3,#6
4174 024030  002441                        BLT     5$              ;5 = "ADDRESS IN ADDRESS"
4175 024032  001444                        BEQ     6$              ;6 = "INCREMENTAL"  (INDEX IN ADDRESS)
4176 024034  000404                        BR      2$              ;UNDEFINED = "ALL ZEROES"
4177
4178 024036  112737  000377  002450  1$:   MOVB    #377,TMP4       ;"ALL ONES" DATA PATTERN
4179 024044  000443                        BR      60$
4180
4181 024046  105037  002450          2$:   CLRB    TMP4            ;"ALL ZEROES" DATA PATTERN
4182 024052  000440                        BR      60$
4183
4184 024054  132737  000001  002446  3$:   BITB    #1,TMP3         ;"1 BIT ALTERNATING" PATTERN
4185 024062  001404                        BEQ     20$             ;IF EVEN, USE "252"
4186 024064  112737  000125  002450        MOVB    #125,TMP4       ;IF ODD, USE "125"
4187 024072  000430                        BR      60$             ; PATTERN:  10101010
4188 024074  112737  000252  002450  20$:   MOVB    #252,TMP4
4189 024102  000424                        BR      60$             ; PATTERN:  01010101
4190
```

TEST 9 -- LOW RAM (00-0F) SCRATCHPAD

```
4191 024104  132737  000001  002446  4$:     BITB    #1,TMP3         ;"2 BIT ALTERNATING" PATTERN
4192 024112  001404                          BEQ     22$             ;IF EVEN, USE "214"
4193 024114  112737  000063  002450          MOVB    #063,TMP4       ;IF ODD, USE "063"
4194 024122  000414                          BR      60$             ; PATTERN:  11001100
4195 024124  112737  000214  002450  22$:    MOVB    #214,TMP4
4196 024132  000410                          BR      60$             ; PATTERN:  00110011
4197
4198 024134  113737  002464  002450  5$:     MOVB    TMPA,TMP4       ;"ADDRESS IN ADDRESS"
4199 024142  000404                          BR      60$
4200
4201 024144  113737  002446  002450  6$:     MOVB    TMP3,TMP4       ;"INCREMENTAL"  (INDEX IN ADDRESS)
4202 024152  000400                          BR      60$
4203
4204 024154  005237  002446          60$:    INC     TMP3            ;INCREMENT PATTERN INDEX FOR NEXT CALL
4205 024160  000207                  62$:    RTS     PC
4206
4207
```

```
   4279                         .SBTTL TEST 10 -- DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)

                         ;+*********************************************************************************
                         ;*
                         ;*      TEST 10 -- DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)
                         ;*
                         ;* GENERAL DESCRIPTION:
                         ;*  FIRST, THE 2K BYTE LOCATIONS IN RAM ARE LOADED WITH 0'S (SEE NOTE BELOW).
                         ;* THEN, THE FIRST LOCATION IS READ AND CHECKED, A SINGLE 1 IS WRITTEN INTO
                         ;* THE LOW BIT POSITION, AND THIS IS READ AND CHECKED. THIS IS DONE FOR ALL
                         ;* BYTES IN THE RAM, BY INCREMENTING THE ADDRESS TO POINT TO THE NEXT RAM
                         ;* LOCATION.
                         ;*  THEN, THE NEXT BIT POSITION IS CHOSEN TO INSERT A 1, AND ALL LOCATIONS
                         ;* ARE READ, WRITTEN, AND READ AS BEFORE. THIS IS CONTINUED FOR ALL BIT
                         ;* POSITIONS UNTIL THE ENTIRE RAM IS WRITTEN TO ALL 1'S. THE ABOVE OPERATIONS
                         ;* ARE PERFORMED A SECOND TIME, WITH 0'S INSERTED INTO THE RAM INSTEAD OF 1'S,
                         ;* THIS RESULTS IN THE ENTIRE RAM BEING WRITTEN TO ALL 0'S.
                         ;*  THIS TEST CONSTITUTES A THOROUGH TEST OF THE RAM. IT IS CAPABLE OF
                         ;* DETECTING THE FOLLOWING FAULTS :  STUCK ADDRESS BITS, UNI- AND BI-DIRECT-
                         ;* IONAL COUPLING BETWEEN ADDRESS BITS, STUCK MEMORY BITS, AND UNI- AND
                         ;* BI-DIRECTIONAL COUPLING BETWEEN MEMORY BITS IN BOTH ROWS AND COLUMNS OF THE
                         ;* MEMORY MATRIX.
                         ;*
                         ;* NOTE:
                         ;*  THIS TEST DOES NOT CHECK LOCATIONS 0010-001F, SO THAT THE PRIMARY CSR'S
                         ;* ARE NOT WRITTEN. IT DOES TEST LOCATIONS 0000-000F (SCRATCHPAD RAM) AND
                         ;* LOCATIONS 0020-002F (SECONDARY CSR'S), AS WELL AS 0030-0800 (BASIC RAM).
                         ;*
                         ;* THE "TMP0" REGISTERS ARE USED HERE TO CONTAIN THE VARIOUS CONSTANTS &
                         ;* VARIABLES USED THROUGHOUT THIS TEST.  A LIST OF THEIR ASSIGNMENTS SEEMS
                         ;* USEFUL SO HERE IT IS:
                         ;*
                         ;*      TMP0    POINTS TO THE FIRST LOCATION AFTER THE SELECT REGISTERS.
                         ;*
                         ;*      TMP1    ----
                         ;*
                         ;*      TMP2    TEST PATTERN ID CODE -- UNUSED BY THIS TEST.
                         ;*
                         ;*      TMP3    TEST DATA PATTERN INDEX -- UNUSED BY THIS TEST.
                         ;*
                         ;*      TMP4    TEST DATA PATTERN.  THE HIGH BYTE IS THE PATTERN BEING WRITTEN
                         ;*              ON ANY GIVEN PASS AND THE LOW BYTE IS THE PATTERN THAT WAS
                         ;*              WRITTEN BY THE PREVIOUS PASS THROUGH THE RAM.
                         ;*
                         ;*      TMP5    DATA READ FROM THE RAM.  ONLY THE LOW BYTE IS USED.
                         ;*
                         ;*      TMP6    ----
                         ;*      TMP7    ----
                         ;*      TMP8    ----
                         ;*      TMP9    ----
                         ;*
                         ;*      TMPA    RAM ADDRESS BEING TESTED.
                         ;*
                         ;*      TMPB    BIT POINTER.  NUMBER OF THE BIT WITHIN THE DATA FIELD WHICH IS
                         ;*              BEING SWITCHED ON EACH WRITE WITHIN THE CURRENT PASS.
                         ;*
                         ;*      TMPC    DATA FLAG.  BIT 0 OF THIS WORD IS THE VALUE TO WHICH THE BIT
```

```
                        ;*          IDENTIFIED IN TMPB IS BEING SET ON EACH WRITE IN THE CURRENT
                        ;*          PASS.
                        ;*
                        ;*      TMPD    DIRECTION SWITCH.  0 = FORWARD    NON-ZERO = BACKWARD
                        ;*
                        ;*      TMPE    LAST VALID ADDRESS TO BE TESTED.  (I.E. THE END OF RAM)
                        ;*
                        ;*      TMPF    ERROR FLAGS.  BIT 1 SET = THE LAST DETECTED ERROR WAS THE READ
                        ;*              OF THE PREVIOUS DATA BEFORE WRITING THE NEW DATA.  IF BIT2 IS
                        ;*              SET, THE READ AFTER WRITE FAILED.  IF EITHER IS SET WHEN AN
                        ;*              ERROR IS DETECTED, THE SUPERVISOR IS NOT CALL'D AND THEREFOR
                        ;*              IT'S ERROR COUNTER WILL NOT REFLECT THE ERROR -- INSTEAD, THE
                        ;*              DATA LINE IS PRINTED.  (UNLESS THE ERROR HANDLER'S DATA LINE
                        ;*              PRINT COUNT HAS EXCEDED ITS LIMIT -- IN WHICH CASE ITS
                        ;*              INVOCATION IS IGNORED.)
                        ;*
                        ;--**************************************************************************
                        ;
                        ;       BGNTST
     024162                                                                     T10::
4280 024162  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
4281 024166  103003                  BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
4282 024170                          ERROR                   ;ELSE, REPORT ERROR
     024170  104460                                                             TRAP    C$ERROR
4283 024172                          ESCAPE  TST             ;   & EXIT TEST
     024172  104410                                                             TRAP    C$ESCAPE
     024174  000744                                                             .WORD   L10040-.
4284 024176                  1$:
4285                         ;********** ACTUAL MOVING INVERSIONS ALGORITHM **********************************
4286
4287                         ;----------  INITIALIZE OUTER LOOP  ---------- ----------------------------
4288
4289 024176  012737  000030  002440          MOV     #24.,TMP0       ;INIT. POINTER TO 1'ST RAM LOC. AFTER SEL REG'S
4290 024204  012737  003777  002474          MOV     #2047.,TMPE     ;IDENTIFY LAST ADDRESS TO BE TESTED
4291 024212  005037  002462                  CLR     TMP9
4292 024216  005037  002476                  CLR     TMPF            ;ERROR FLAG -- INDICATE NO ERRORS YET
4293 024222  012737  177777  002470          MOV     #-1,TMPC        ;DATA = 1'S FIRST
4294
4295                         ;----------  INITIALIZE THE AREA BEING TESTED BY CLEARING IT TO ZEROES  --------
4296
4297                         ;   ZERO OUT LOCATIONS 0 THROUGH 10 (HEX) -- THOSE BELOW THE SELECT REGISTERS
4298
4299 024230  005037  024244          CLR     3$              ;INITTIALIZE ADDRESS
4300 024234  012703  000020          MOV     #SLT0,R3        ;RAM ADDRESS OF BSELO WILL DO AS BYTE COUNT
4301
4302 024240  004537  004322  2$:     JSR     R5,WRITEI       ;ZERO OUT LOC'S 0 --> 10 (HEX)
4303 024244  000000  3$:     .WORD   0               ;  ADDRESS
4304 024246  000000          0                       ;  DATA
4305 024250  103003          BCC     .+10            ;IF NO ERROR, PROCEED
4306 024252                  ERROR                   ;ELSE, REPORT IT
     024252  104460                                                             TRAP    C$ERROR
4307 024254                  ESCAPE  TST             ;       AND EXIT THIS TEST
     024254  104410                                                             TRAP    C$ESCAPE
     024256  000662                                                             .WORD   L10040-.
4308 024260  005237  024244          INC     3$              ;POINT TO NEXT LOCATION
4309 024264  077313          SOB     R3,2$           ;IF MORE TO BE DONE, DO IT
4310
```

```
4311                                    ;   ZERO OUT THE REST OF RAM -- ALL LOC'S ABOVE THE SELECT REGISTERS
4312
4313 024266  013737  002440  024312          MOV     TMP0,6$         ;FIRST LOCATION OF TEST AREA (18 HEX)
4314 024274  013703  002474                  MOV     TMPE,R3         ;START WITH "LAST ADDR. TO BE TESTED" AND CALC.
4315 024300  163703  002440                  SUB     TMP0,R3         ;THE # OF LOCATIONS TO BE TESTED (800-18 (HEX))
4316 024304  005203                          INC     R3              ; (THIS MAKES SURE WE GET EVERY SINGLE BYTE)
4317
4318 024306  004537  004322          4$:     JSR     R5,WRITEI       ;ZERO OUT THE ALL OF THE TEST AREA
4319 024312  000000          6$:     .WORD   0
4320 024314  000000                  0
4321 024316  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
4322 024320                          ERROR                   ;ELSE, REPORT IT
     024320  104460                                                      TRAP    C$ERROR
4323 024322                          ESCAPE  TST             ;       AND EXIT THIS TEST
     024322  104410                                                      TRAP    C$ESCAPE
     024324  000614                                                      .WORD   L10040-.
4324 024326  005237  024312                  INC     6$              ;POINT TO NEXT LOCATION
4325 024332  077313                          SOB     R3,4$           ;IF MORE TO BE DONE, DO IT
4326 024334  105037  002450                  CLRB    TMP4            ;THIS IS WHAT WE JUST SET ALL RAM LOCATIONS TO
4327
4328                                    ;----------  BEGINNING OF OUTER LOOP  ----------------------------------------
4329
4330 024340  005037  002472          8$:     CLR     TMPD            ;"SET FWD SEQUENCE"  (DIRECTION FLAG)
4331 024344  005037  002466                  CLR     TMPB            ;"SET BIT POSITION = 0"  (BIT POINTER)
4332                                                                  ;"SET ADDRESS = 0"  BUT OUR MEMORY STARTS @
4333                                                                  ;    18 HEX.  SO:
4334 024350  005037  002464                  CLR     TMPA            ;       INITIALIZE ADDRESS POINTER
4335 024354  112737  000001  002451          MOVB    #BIT0,TMP4+1    ;INITIALIZE CURRENT & NEXT DATA BYTES
4336
4337                                    ;----------  "READ CURRENT ADDRESS"  -----------------------------------------
4338
4339 024362  000240                  10$:    NOP
4340 024364  000240                          NOP
4341 024366                          BREAK                   ;FIRST SEE IF A ^C HAS BEEN STRUCK BY OPERATOR
     024366  104422                                                      TRAP    C$BRK
4342 024370  013737  002464  024402          MOV     TMPA,40$        ;NO,  PUT ADDRESS INTO READ CALL
4343 024376  004537  004064                  JSR     R5,READ         ;GO READ ONE LOCATION
4344 024402  000000          40$:    0                               ;**** MODIFIED ABOVE **** (ADDRESS)
4345 024404  002452                  TMP5                            ;ADDRESS OF DATA READ
4346 024406  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
4347 024410                          ERROR                   ;ELSE, REPORT IT
     024410  104460                                                      TRAP    C$ERROR
4348 024412                          ESCAPE  TST             ;       AND EXIT THIS TEST
     024412  104410                                                      TRAP    C$ESCAPE
     024414  000524                                                      .WORD   L10040-.
4349
4350                                    ;----------  CHECK DATA (FIRST TIME)  -----------------------------------------
4351
4352 024416  000240                          NOP
4353 024420  000240                          NOP
4354 024422  123737  002452  002450          CMPB    TMP5,TMP4       ;CHECK AGAINST EXPECTED DATA
4355 024430  001402                          BEQ     12$             ;IF OK, PROCEED
4356 024432  032737  000006  002476          BIT     #BIT1+BIT2,TMPF ;NO,  HAS AN ERROR ALREADY BEEN REPORTED?
4357 024440  001010                          BNE     42$             ;YES, JUST PRINT DATA IF WANTED
4358 024442  012737  000002  002476          MOV     #BIT1,TMPF      ;NO,  SET FLAG FOR NEXT TIME
4359 024450                                  GEDF    EM48A,ERR48     ;  AND PRINT COMPLETE ERROR MESSAGE
                                                                     ;       "DEVICE FATAL" ERROR # 25
```

TEST 10 -- DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)

```
                024450  104455                                                          TRAP    C$ERDF
                024452  000031                                                          .WORD   25
                024454  016016                                                          .WORD   EM48A
                024456  007632                                                          .WORD   ERR48
 4360 024460    000405                  BR      12$             ;PROCEED WITH TESTING
 4361 024462    012737  000002  002476  42$:    MOV     #BIT1,TMPF      ;INDICATE A "PRE" WRITE ERROR
 4362 024470    004737  010030          JSR     PC,ERR48.       ;USE ERROR HANDLER ONLY -- NO HEADER
 4363
 4364                            ;----------  WRITE NEW DATA  ----------------------------------------------------
 4365
 4366 024474    013737  002464  024506  12$:    MOV     TMPA,44$        ;GET THIS ADDRESS FOR THIS WRITE CALL
 4367 024502    004537  004310          JSR     R5,WRITE        ;WRITE THE UPDATED DATA IN THIS LOCATION
 4368 024506    000000                  44$:    .WORD   0
 4369 024510    002451                  TMP4+1                  ;NEW DATA ELEMENT RESIDES IN TMPD+1
 4370 024512    103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 4371 024514                            ERROR                   ;ELSE, REPORT IT
                024514  104460                                                          TRAP    C$ERROR
 4372 024516                            ESCAPE  TST             ;       AND EXIT THIS TEST
                024516  104410                                                          TRAP    C$ESCAPE
                024520  000420                                                          .WORD   L10040-.
 4373
 4374                            ;----------  RE-"READ CURRENT ADDRESS"  ------------------------------------------
 4375
 4376 024522    013737  002464  024534          MOV     TMPA,46$        ;GET ADDRESS FOR THIS READ
 4377 024530    004537  004064          JSR     R5,READ         ;READ DATA JUST WRITTEN
 4378 024534    000000                  46$:    .WORD   0
 4379 024536    002452                  TMP5
 4380 024540    103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 4381 024542                            ERROR                   ;ELSE, REPORT IT
                024542  104460                                                          TRAP    C$ERROR
 4382 024544                            ESCAPE  TST             ;       AND EXIT THIS TEST
                024544  104410                                                          TRAP    C$ESCAPE
                024546  000372                                                          .WORD   L10040-.
 4383
 4384                            ;----------  CHECK NEW DATA VALUE  ----------------------------------------------
 4385
 4386 024550    000240                  NOP
 4387 024552    000240                  NOP
 4388 024554    123737  002451  002452          CMPB    TMPA+1,TMP5     ;DID THE WRITE WORK CORRECTLY?
 4389 024562    001421                  BEQ     14$             ;YES,  PROCEED WITH TESTING
 4390 024564    032737  000006  002476          BIT     #BIT1+BIT2,TMPF ;NO,  HAS AN ERROR ALREADY BEEN REPORTED?
 4391 024572    001010                  BNE     48$             ;YES, ONLY USE ERROR HANDLER -- NO HEADER PLEASE
 4392 024574    012737  000004  002476          MOV     #BIT2,TMPF      ;NO,  INDICATE THAT WE'RE PRINTING A HEADER HERE
 4393 024602                            GEDF    EM48A,ERR48     ;REPORT RE-WRITE ERROR
                                                                ;       "DEVICE FATAL" ERROR # 26
                024602  104455                                                          TRAP    C$ERDF
                024604  000032                                                          .WORD   26
                024606  016016                                                          .WORD   EM48A
                024610  007632                                                          .WORD   ERR48
 4394 024612    000405                  BR      14$             ;PROCEED WITH TESTING
 4395
 4396 024614    012737  000004  002476  48$:    MOV     #BIT2,TMPF      ;INDICATE A "POST" WRITE ERROR
 4397 024622    004737  010030          JSR     PC,ERR48.       ;JUST REPORT DATA -- NO HEADER
 4398
 4399                            ;----------  "FORWARD SEQUENCE ?"  ----------------------------------------------
 4400
 4401 024626    000240          14$:    NOP
```

TEST 10 - DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)

```
4402 024630  005737  002472                    TST     TMPD            ;CHECK DIRECTION -- 0 = FORWARD
4403 024634  001056                            BNE     26$             ;REVERSE ===> PROCESS REVERSE ADDRESSING
4404                                                                   ;FORWARD
4405
4406                                ;----------  PROCESS FORWARD SEQUENCE -- "LAST ADDRESS"  ----------
4407
4408 024636  000240                16$:    NOP
4409 024640  023737  002464  002474          CMP     TMPA,TMPE       ;WAS THIS ADDR. THE LAST ONE?
4410 024646  001413                          BEQ     18$             ;YES, THEN CHECK THE BIT POSITION
4411 024650  005237  002464        50$:    INC     TMPA            ;NO,  THEN INCREMENT THE ADDR.
4412
4413                                ;  HERE WE MAKE SURE THE ADDRESS IS NOT WITHIN THE SELECT REGISTER AREA.  IF IT
4414                                ;  IS, WE WON'T USE IT -- BUT GO BACK AND DECREMENT TO THE NEXT ADDRESS AGAIN.
4415
4416 024654  022737  000020  002464  51$:    CMP     @SLTO,TMPA      ;IS IT BELOW THE AREA WE CAN'T CHECK?
4417 024662  101237                          BHI     10$             ;YES, THEN WE CAN CHECK THIS LOCATION -- DO IT
4418 024664  023737  002440  002464          CMP     TMPO,TMPA       ;IS IT BELOW THE BOTTOM ADDRESS?
4419 024672  101633                          BLOS    10$             ;NO,  TEST THIS LOCATION
4420 024674  000765                          BR      50$             ;YES, PERFORM THE INCREMENT AGAIN
4421
4422                                ;----------  "FWD" SEQUENCE -- "LAST BIT POSITION?"  ----------
4423
4424 024676  000240                18$:    NOP
4425 024700  005037  010024                CLR     ER48CT          ;RESET ERROR PRINT COUNT
4426 024704  023727  002466  000007        CMP     TMPB,#7         ;DID WE JUST PROCESS THE LAST BIT POSITION?
4427 024712  002016                          BGE     20$             ;YES, THEN WERE WE DOING 1'S OR 0'S
4428 024714  005237  002466                INC     TMPB            ;NO,  THEN INCREMENT THE BIT COUNTER
4429 024720  005037  002464        24$:    CLR     TMPA            ;RE-INITIALIZE ADDRESS POINTER
4430 024724  113737  002451  002450  57$:    MOVB    TMP4+1,TMP4     ;USE "NEXT" DATA AS "CURRENT" DATA
4431 024732  013700  002470                MOV     TMPC,R0         ;USE ONE BIT OF THE "DATA" SWITCH TO
4432 024736  006000                        ROR     R0
4433 024740  106137  002451                ROLB    TMP4+1          ;BUILD A NEW "NEXT" DATA VALUE
4434 024744  000137  024362        55$:    JMP     10$             ;       & TEST IT
4435
4436                                ;----------  "FWD" SEQUENCE -- "DATA = 1?"  ----------
4437
4438 024750  000240                20$:    NOP
4439 024752  005037  002466                CLR     TMPB            ;POINT TO BIT 0.
4440 024756  005137  002470                COM     TMPC            ;SWITCH DATA.  IF 1'S, DO 0'S;  IF 0'S DO 1'S
4441 024762  001756                        BEQ     24$             ;IF WENT TO FORWARD, .....
4442 024764  005137  002472                COM     TMPD            ;SWITCH DIRECTION
4443 024770  000755                        BR      57$             ;ELSE, BACKWARD.....
4444
4445                                ;----------  "BKWD" SEQUENCE -- "ADDRESS = 0?"  ----------
4446
4447 024772  000240                26$:    NOP
4448 024774  005737  002464                TST     TMPA            ;HAVE WE JUST PROCESSED THE FIRST ADDRESS?
4449 025000  001413                        BEQ     28$             ;YES,  CHECK BIT POSITION
4450 025002  005337  002464        52$:    DEC     TMPA            ;NO,   DECREMENT THE ADDRESS
4451
4452                                ;  HERE WE MAKE SURE THE ADDRESS IS NOT WITHIN THE SELECT REGISTER AREA.  IF IT
4453                                ;  IS, WE WON'T USE IT    BUT GO BACK AND DECREMENT TO THE NEXT ADDRESS AGAIN.
4454
4455 025006  022737  000020  002464  56$:    CMP     @SLTO,TMPA      ;IS IT BELOW THE AREA WE CAN'T CHECK.
4456 025014  101031                          BHI     58$             ;YES, THEN WE CAN CHECK THIS LOCATION -- DO IT
4457 025016  023737  002440  002464          CMP     TMPO,TMPA       ;IS IT BELOW THE BOTTOM ADDRESS?
4458 025024  101425                          BLOS    58$             ;NO,  TEST THIS LOCATION
```

```
4459 025026  000765                          BR      52$             ;YES, PERFORM THE DECREMENT AGAIN
4460
4461                              ;---------- "BKWD" SEQUENCE -- "LAST BIT POSITION" ----------
4462
4463 025030  000240                  28$:    NOP
4464 025032  005037  010024                  CLR     ER48CT          ;RESET ERROR PRINT COUNT
4465 025036  022737  000007    .6            CMP     #7,TMPB         ;LAST BIT POSITION?
4466 025044  003417                          BLE     30$             ;YES, CHECK DATA
4467 025046  005237  002466                  INC     TMPB            ;NO,  INCREMENT BIT POINTER,
4468 025052  113737  002451  002450  29$:    MOVB    TMP4+1,TMP4     ;USE "NEXT" DATA AS "CURRENT" DATA
4469 025060  013700  002470                  MOV     TMPC,R0         ;USE ONE BIT OF THE "DATA" SWITCH TO
4470 025064  006000                          ROR     R0
4471 025066  106137  002451                  ROLB    TMP4+1          ;BUILD A NEW "NEXT" DATA VALUE
4472 025072  013737  002474  002464          MOV     TMPE,TMPA       ;       POINT TO LAST ADDRESS AGAIN,
4473 025100  000137  024362          58$:    JMP     10$             ;       & TEST IT
4474
4475                              ;---------- "BKWD" SEQUENCE -- "DATA = 1?" ----------
4476
4477 025104  000240                  30$:    NOP
4478 025106  005137  002470                  COM     TMPC            ;SWITCH DATA TYPE
4479 025112  001003                          BNE     32$             ;NOW 1'S -- CHECK ADDRESS'S "LSB"
4480 025114  005037  002466                  CLR     TMPB            ;NOW 0'S -- POINT TO BIT POSITION 0 AGAIN
4481 025120  000754                          BR      29$             ;       RESET ADDRESS & TEST IT
4482
4483
4484                              ;---------- "STOP" ----------
4485
4486 025122  000240                  32$:    NOP
4487 025124  004537  004322          38$:    JSR     R5,WRITEI       ;CLEAR RAM LOCATION 0083 (HEX) & EXIT
4488 025130  000173                          173                     ;       (THIS CONVERTS TO 0083 HEX.)
4489 025132  000000                          0                       ;       (THIS WE HOPE, WILL CLEAR IT)
4490 025134  103001                          BCC     .+4             ;IF NO ERROR, PROCEED
4491 025136                                  ERROR                   ;ELSE, REPORT IT
     025136  104460                                                                  TRAP    C$ERROR
4492 025140                                  ENDTST                  ;THATS ALL FOLKS!
     025140                                                                  L10040:
     025140  104401                                                          TRAP    C$ETST
4493                              ;*****************************************************************************
4494                              .EVEN
```

```
                                        .SBTTL TEST 11 -- VIA REGISTER ADRESSING

                                        ;**************************************************************************
                                        ;*
                                        ;*      TEST 11 -- VIA REGISTER ADRESSING
                                        ;*
                                        ;*      VIA == "6522 VERSATILE INTERFACE ADAPTER"
                                        ;*
                                        ;* A MASTER CLEAR IS PERFORMED, NEXT, TIMER 1 LATCHES
                                        ;* ARE CLEARED BY WRITING 000 INTO VIA REGS 6 & 7
                                        ;* THEN, 377 IS LOADED INTO DATA DIRECTION REGISTERS A, B (DDRA,DDRB) TO
                                        ;* SET THE PORT PINS FOR OUTPUT MODE.
                                        ;* THEN, A DIFFERENT BYTE OF DATA PATTERN C IS WRITTEN INTO EACH VIA
                                        ;* LOCATION, (EXCEPT THE TIMER REGS 4,5,10,11 OCT) AND AFTER EACH IS WRITTEN,
                                        ;* ALL VIA REGS (EXCEPT 4,5,10,11) ARE READ AND COMPARED TO EXPECTED
                                        ;* CONTENTS. NOTE THAT SOME VIA REGS ARE ALTERED BY THE LOADING OF OTHERS,
                                        ;* AND THE PROGRAM TAKES THIS INTO ACCOUNT, IN THE SETTING OF EXPECTED REG
                                        ;* VALUES. THE DATA PATTERN IS CHOSEN TO AVOID ACTIVATING THE VIA CHIP (SUCH
                                        ;* AS GENERATING OUTPUTS ON CA1, CA2, CB1, CB2, OR CAUSING 6502
                                        ;* INTERRUPT REQUESTS).
                                        ;*  DATA PATTERN C (WITH VIA REGS AND THEIR DATA SHOWN IN OCTAL) :
                                        ;*   REGISTER =  00   01   02   03   06   07   12   13   14   15   16   17
                                        ;*       DATA = 100, 101, 377, 377, 106, 107, 112, 040, 042, 000, 200, 117
                                        ;* NEXT, 000 IS LOADED INTO DDRA, AND DDRB IS READ AND COMPARED TO 377, THEN
                                        ;* THE 377 IS LOADED BACK INTO DDRA, AND DDRB IS LOADED WITH 000 AND DDRA IS
                                        ;* READ AND COMPARED TO 377.
                                        ;*
                                        ;--************************************************************************
                                        ;
                                        ;       BGNTST
     025142                                                                                 T11::
     025142  004737  003762                     JSR     PC,MSTCLR       ;INIT DMV AND START UP THE MAINT. LOOP
     025146  103002                             BCC     1$              ;IF NO ERROR, PROCEED
     025150                                     ERROR                   ;ELSE,  REPORT IT AND
     025150  104460                                                                         TRAP    C$ERROR
     025152  000546                             BR      25$             ;       EXIT THIS CLEAR

     025154  004537  004322             1$:     JSR     R5,WRITEI       ;CLEAR THE TIMER 1 LATCHES
     025160  120006                             T1LL
     025162  000000                             0
     025164  103002                             BCC     30$             ;IF AN ERROR OCCURED,
     025166                                     ERROR                   ;REPORT IT &
     025166  104460                                                                         TRAP    C$ERROR
     025170  000537                             BR      25$             ;  EXIT
     025172  004537  004322             30$:    JSR     R5,WRITEI
     025176  120007                             T1LH
     025200  000000                             0
     025202  103002                             BCC     31$             ;IF AN ERROR OCCURED,
     025204                                     ERROR                   ;REPORT IT &
     025204  104460                                                                         TRAP    C$ERROR
     025206  000530                             BR      25$             ;  EXIT

                                        ; LOAD UP THE VIA'S REGISTERS WITH THE FIXED DATA STREAM OF PATTERN "C"

     025210  013703  002556             31$:    MOV     PATC,R3         ;GET COUNT OF # OF WRITES TO BE PERFORMED
     025214  012702  002560                     MOV     #PATC+2,R2      ;SETUP POINTER TO REGISTER ADDRESSES & DATA
```

TEST 11 -- VIA REGISTER ADRESSING

```
4544 025220  012737  120000  025242  2$:     MOV     #ORB,4$         ;ADDRESS OF FIRST REGISTER
4545 025226  152237  025242                  BISB    (R2)+,4$        ;OR IN REGISTER # TO BUILD REGISTER ADDRESS
4546 025232  112237  025244                  MOVB    (R2)+,5$        ;THIS IS THE DATA WE WANT TO WRITE
4547
4548 025236  004537  004322                  JSR     R5,WRITEI       ;WRITE ONE REGISTER WITH THE DESIRED DATA
4549 025242  000000                  4$:     0                       ;*** MODIFIED FROM ABOVE ***  DESTINATION ADDR.
4550 025244  000000                  5$:     0                       ;*** MODIFIED FROM ABOVE ***  DATA
4551
4552 025246  103002                          BCC     32$             ;IF AN ERROR OCCURED,
4553 025250                                  ERROR                   ;REPORT IT &
     025250  104460                                                                  TRAP    C$ERROR
4554 025252  000506                          BR      25$             ;  EXIT
4555 025254  077317                  32$:    SOB     R3,2$           ;LOOP UNTIL THE WHOLE TABLE HAS BEEN WRITTEN
4556
4557                                 ; READ BACK THE VIA'S REGISTERS
4558
4559 025256  012703  000020                  MOV     #PATCM-PATCR,R3 ;GET COUNT OF # OF REG'S TO BE READ
4560 025262  012737  120000  025302          MOV     #ORB,7$         ;ADDRESS OF FIRST REGISTER
4561 025270  012737  003122  025304          MOV     #BT1,8$         ;DESTINATION BUFFER AREA
4562
4563 025276  004537  004064          6$:     JSR     R5,READ         ;READ ONE REGISTER
4564 025302  000000                  7$:     0                       ;*** MODIFIED FROM ABOVE ***  SOURCE ADDRESS
4565 025304  000000                  8$:     0                       ;*** MODIFIED IN LINE *** DESTINATION ADDRESS
4566 025306  103002                          BCC     33$             ;IF AN ERROR OCCURED,
4567 025310                                  ERROR                   ;REPORT IT &
     025310  104460                                                                  TRAP    C$ERROR
4568 025312  000466                          BR      25$             ;  EXIT
4569
4570 025314  005237  025302          33$:    INC     7$              ;POINT TO NEXT REGISTER
4571 025320  005237  025304                  INC     8$              ;POINT TO NEXT BUFFER LOCATION
4572 025324  077314                          SOB     R3,6$           ;LOOP UNTIL ALL REGISTERS HAVE BEEN READ
4573
4574                                 ; CHECK THE VALUES READ AGAINST THE EXPECTED VALUES
4575
4576 025326  012701  002604                  MOV     #PATCR,R1       ;POINTER TO EXPECTED DATA VALUES
4577 025332  012702  003122                  MOV     #BT1,R2         ;POINTER TO DATA READ
4578 025336  012704  003206                  MOV     #BT2,R4         ;POINTER TO "XOR" VALUES
4579 025342  012705  002624                  MOV     #PATCM,R5       ;POINTER TO "MASK" VALUES
4580 025346  012703  000010                  MOV     #8.,R3          ;NUMBER OF WORDS TO BE PROCESSED
4581 025352  005037  002332                  CLR     ERRFLG          ;RESET THE ERROR FLAG
4582
4583 025356  012114                  9$:     MOV     (R1)+,(R4)      ;GET EXPECTED VALUE (2 BYTES AT A TIME)
4584 025360  012200                          MOV     (R2)+,R0        ;GET ACTUAL VALUE AND SETUP FOR "XOR"
4585 025362  074014                          XOR     R0,(R4)         ;DEVELOPE "XOR"
4586 025364  042524                          BIC     (R5)+,(R4)+     ;CLEAR THOSE BITS WE DON'T CARE ABOUT
4587 025366  001402                          BEQ     10$             ;IF NO ERROR, SKIP NEXT INSTRUCTION
4588 025370  005237  002332                  INC     ERRFLG          ;IF ERROR,  SET FLAG TO SAY SO!
4589 025374  077310                  10$:    SOB     R3,9$           ;LOOP UNTIL ALL VALUES CHECKED
4590
4591 025376  005737  002332                  TST     ERRFLG          ;WAS THERE AN ERROR DETECTED?
4592 025402  001406                          BEQ     12$             ;NO,  PROCEED WITH TESTING
4593 025404                                  GEDF    EM20,ERR6       ;YES, REPORT A VIA REGISTER ERROR
                                                                     ;       "DEVICE FATAL" ERROR # 27
     025404  104455                                                                  TRAP    C$ERDF
     025406  000033                                                                  .WORD   27
     025410  015243                                                                  .WORD   EM20
     025412  005650                                                                  .WORD   ERR6
```

TEST 11 -- VIA REGISTER ADRESSING

```
4594 025414                                ESCAPE  TST             ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
     025414  104410                                                                TRAP    C$ESCAPE
     025416  000344                                                                .WORD   L10041-.
4595
4596
4597
4598 025420  004537  004176        12$:    JSR     R5,READI        ;GET THE CURRENT VALUE OF THE VIA'S
4599 025424  120003                        DDRA                    ;    "DDRA" REGISTER FOR LATER ERROR CHECKING
4600 025426  000000                15$:    0
4601 025430  103002                        BCC     34$             ;IF AN ERROR OCCURED,
4602 025432                                ERROR                   ;REPORT IT &
     025432  104460                                                                TRAP    C$ERROR
4603 025434  000415                        BR      25$             ;  EXIT
4604 025436  004537  004322        34$:    JSR     R5,WRITEI       ;LOAD DDRB WITH 000
4605 025442  120002                        DDRB
4606 025444  000000                        0
4607 025446  103002                        BCC     35$             ;IF AN ERROR OCCURED,
4608 025450                                ERROR                   ;REPORT IT &
     025450  104460                                                                TRAP    C$ERROR
4609 025452  000406                        BR      25$             ;  EXIT
4610 025454  004537  004064        35$:    JSR     R5,READ         ;READ IT BACK AND CHECK IT
4611 025460  120002                        DDRB
4612 025462  002312                        BDATA
4613 025464  103002                        BCC     36$             ;IF AN ERROR OCCURED,
4614 025466                                ERROR                   ;REPORT IT &
     025466  104460                                                                TRAP    C$ERROR
4615 025470  000534                25$:    BR      24$             ;  EXIT
4616 025472  105737  002312        36$:    TSTB    BDATA           ;THIS SHOULD NOW BE ZERO
4617 025476  001413                        BEQ     14$             ;IT IS, PRECEDE TESTING
4618 025500  105037  002310                CLRB    GDATA           ;IT ISN'T!  SETUP FOR & REPORT ERROR
4619 025504  012737  000002  002334        MOV     #2,REGNUM       ;IDENTIFY THE DDRB REG.
4620 025512                                GEDF    EM21,ERR7       ;       REPORT ERROR
                                                                   ;       "DEVICE FATAL" ERROR # 28
     025512  104455                                                                TRAP    C$ERDF
     025514  000034                                                                .WORD   28
     025516  015442                                                                .WORD   EM21
     025520  006612                                                                .WORD   ERR7
4621 025522                                ESCAPE TST              ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
     025522  104410                                                                TRAP    C$ESCAPE
     025524  000236                                                                .WORD   L10041-.
4622
4623 025526  113737  025426  002310  14$:    MOVB    15$,GDATA       ;THIS IS WHAT WE EXPECT TO READ NOW
4624 025534  004537  004064                JSR     R5,READ         ;READ BACK DDRA -- IT SHOULD BE = 366
4625 025540  120003                        DDRA
4626 025542  002312                        BDATA
4627 025544  103002                        BCC     37$             ;IF AN ERROR OCCURED,
4628 025546                                ERROR                   ;REPORT IT &
     025546  104460                                                                TRAP    C$ERROR
4629 025550  000504                        BR      24$             ;  EXIT
4630 025552  123737  002310  002312  37$:    CMPB    GDATA,BDATA     ;IS IT REALLY A 377?
4631 025560  001411                        BEQ     16$             ;YES, PROCEED WITH TESTING
4632 025562  012737  000003  002334        MOV     #3,REGNUM       ;IDENTIFY THE DDRA REG.
4633 025570                                GEDF    EM22,ERR7       ;NO,    REPORT ERROR
                                                                   ;       "DEVICE FATAL" ERROR # 29
     025570  104455                                                                TRAP    C$ERDF
     025572  000035                                                                .WORD   29
     025574  015477                                                                .WORD   EM22
```

0110

TEST 11 -- VIA REGISTER ADRESSING

```
                025576  006612                                                          .WORD   ERR7
4634            025600                          ESCAPE TST              ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
                025600  104410                                                          TRAP    C$ESCAPE
                025602  000160                                                          .WORD   L10041-.
4635
4636            025604  004537  004322  16$:    JSR     R5,WRITEI       ;RE-LOAD DDRB WITH 377
4637            025610  120002                  DDRB
4638            025612  177777          17$:    -1
4639            025614  103002                  BCC     38$             ;IF AN ERROR OCCURED,
4640            025616                          ERROR                   ;REPORT IT &
                025616  104460                                                          TRAP    C$ERROR
4641            025620  000460                  BR      24$             ;  EXIT
4642            025622  004537  004322  38$:    JSR     R5,WRITEI       ;AND NOW CLEAR DDRA TO ZEROS
4643            025626  120003                  DDRA
4644            025630  000000                  0
4645            025632  103002                  BCC     39$             ;IF AN ERROR OCCURED,
4646            025634                          ERROR                   ;REPORT IT &
                025634  104460                                                          TRAP    C$ERROR
4647            025636  000451                  BR      24$             ;  EXIT
4648
4649            025640  004537  004064  39$:    JSR     R5,READ         ;NOW, DID DDRA GO TO ZEROES
4650            025644  120003                  DDRA
4651            025646  002312                  BDATA
4652            025650  105737  002312          TSTB    BDATA
4653            025654  001413                  BEQ     18$             ;YES, BUT WHAT ABOUT DDRB?
4654            025656  105037  002310          CLRB    GDATA           ;NO.  SETUP FOR AND
4655            025662  012737  000003  002334  MOV     #3,REGNUM       ;IDENTIFY THE DDRA REG.
4656            025670                          GEDF    EM21,ERR7       ;       REPORT THE ERROR
                                                                        ;       "DEVICE FATAL" ERROR # 30
                025670  104455                                                          TRAP    C$ERDF
                025672  000036                                                          .WORD   30
                025674  015442                                                          .WORD   EM21
                025676  006612                                                          .WORD   ERR7
4657            025700                          ESCAPE  TST             ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
                025700  104410                                                          TRAP    C$ESCAPE
                025702  000060                                                          .WORD   L10041-.
4658
4659            025704  004537  004064  18$:    JSR     R5,READ         ;WHAT ABOUT DDRB -- IT SHOULD BE 377 NOW
4660            025710  120002                  DDRB
4661            025712  002312                  BDATA
4662            025714  103002                  BCC     40$             ;IF AN ERROR OCCURED,
4663            025716                          ERROR                   ;REPORT IT &
                025716  104460                                                          TRAP    C$ERROR
4664            025720  000420                  BR      24$             ;  EXIT
4665            025722  123737  002312  025612  40$:    CMPB    BDATA,17$       ;IS IT?
4666            025730  001414                  BEQ     24$             ;YES, EXIT TEST
4667            025732  113737  025612  002310  MOVB    17$,GDATA       ;NO.  SETUP FOR AND
4668            025740  012737  000002  002334  MOV     #2,REGNUM       ;IDENTIFY THE DDRB REG.
4669            025746                          GEDF    EM22A,ERR7      ;       REPORT ERROR
                                                                        ;       "DEVICE FATAL" ERROR # 31
                025746  104455                                                          TRAP    C$ERDF
                025750  000037                                                          .WORD   31
                025752  015532                                                          .WORD   EM22A
                025754  006612                                                          .WORD   ERR7
4670            025756                          ESCAPE  TST             ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
                025756  104410                                                          TRAP    C$ESCAPE
                025760  000002                                                          .WORD   L10041-.
```

TEST 11 -- VIA REGISTER ADRESSING

```
   4671
   4672 025762                          24$:    ENDTST
        025762                                                  L10041:
        025762  104401                                                  TRAP    C$ETST
```

```
4684                                    .SBTTL TEST 12 -- VIA'S DDRB DATA READ/WRITE
                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 12 -- VIA'S DDRB DATA READ/WRITE
                                        ;*
                                        ;*      DDRB == "DATA DIRECTION REGISTER B"
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                                        ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER B ARE TESTED BY WRITING,
                                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
     025764                                                                                     T12::
4685 025764  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
4686 025770  103003                            BCC     30$             ;IF AN ERROR OCCURED,
4687 025772                                    ERROR                   ;REPORT IT &
     025772  104460                                                                         TRAP    C$ERROR
4688 025774                                    ESCAPE  TST             ;  EXIT
     025774  104410                                                                         TRAP    C$ESCAPE
     025776  000046                                                                         .WORD   L10042-.
4689
4690 026000  012701  002526        30$:        MOV     #PATB,R1        ;POINT TO PATTERN TABLE
4691 026004  012103                            MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
4692
4693 026006                        T12.LP:
4694 026006                                    BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     026006                                                                             T12.1:
     026006  104402                                                                         TRAP    C$BSUB
4695
4696 026010  111137  002306                    MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
4697 026014  112137  002310                    MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
4698 026020  012700  120002                    MOV     #DDRB,R0        ;SPECIFY THE REGISTER BEING TESTED
4699 026024  004737  005034                    JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
4700 026030  103003                            BCC     10$             ;WAS AN ERROR FOUND?
4701 026032                                    ERROR                   ;YES, REPORT IT AND
     026032  104460                                                                         TRAP    C$ERROR
4702 026034                                    ESCAPE  TST             ;       EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     026034  104410                                                                         TRAP    C$ESCAPE
     026036  000006                                                                         .WORD   L10042-.
4703
4704 026040                        10$:        ENDSUB
     026040                                                                         L10043:
     026040  104403                                                                         TRAP    C$ESUB
4705
4706 026042  077317                            SOB     R3,T12.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
4707                                                                   ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
4708
4709 026044                                    ENDTST
     026044                                                                         L10042:
     026044  104401                                                                         TRAP    C$ETST
```

```
 4722                                   .SBTTL TEST 13 -- VIA'S DDRA DATA READ/WRITE

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 13 -- VIA'S DDRA DATA READ/WRITE
                                        ;*
                                        ;*      DDRA == "DATA DIRECTION REGISTER A"
                                        ;*
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                                        ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER A ARE TESTED BY WRITING,
                                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;-*****************************************************************************
                                        ;
                                        ;       BGNTST
     026046                                                                     T13::
 4723 026046  004737  003762            JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
 4724 026052  103003                    BCC     30$             ;IF AN ERROR OCCURED,
 4725 026054                            ERROR                   ;REPORT IT &
     026054  104460                                                             TRAP    C$ERROR
 4726 026056                            ESCAPE  TST             ;  EXIT
     026056  104410                                                             TRAP    C$ESCAPE
     026060  000046                                                             .WORD   L10044-.
 4727
 4728 026062  012701  002526    30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
 4729 026066  012103                    MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
 4730
 4731 026070                    T13.LP:
 4732 026070                            BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     026070                                                                     T13.1:
     026070  104402                                                             TRAP    C$BSUB
 4733
 4734 026072  111137  002306            MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
 4735 026076  112137  002310            MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
 4736 026102  012700  120003            MOV     #DDRA,R0        ;SPECIFY THE REGISTER BEING TESTED
 4737 026106  004737  005034            JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
 4738 026112  103003                    BCC     10$             ;WAS AN ERROR FOUND?
 4739 026114                            ERROR                   ;YES, REPORT IT AND
     026114  104460                                                             TRAP    C$ERROR
 4740 026116                            ESCAPE  TST             ;       EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     026116  104410                                                             TRAP    C$ESCAPE
     026120  000006                                                             .WORD   L10044-.
 4741
 4742 026122                    10$:    ENDSUB
     026122                                                                     L10045:
     026122  104403                                                             TRAP    C$ESUB
 4743
 4744 026124  077317                    SOB     R3,T13.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
 4745                                                           ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
 4746
 4747 026126                            ENDTST
     026126                                                                     L10044:
     026126  104401                                                             TRAP    C$ETST
```

```
                                        .SBTTL TEST 14 -- VIA'S ORB DATA READ/WRITE

                                        ;*************************************************************************
                                        ;*
                                        ;*      TEST 14 -- VIA'S ORB DATA READ/WRITE
                                        ;*
                                        ;*      ORB == "OUTPUT REGISTER PORT B"
                                        ;*
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DATA
                                        ;* DIR. REG. B (DDRB) TO SET ALL B PORT PINS FOR OUTPUT MODE. THEN ,
                                        ;* READ/WRITE BITS 0-7 OF VIA OUTPUT REG. PORT B ARE TESTED BY WRITING,
                                        ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;-*************************************************************************
                                        ;
                                        ;       BGNTST
     026130                                                                        T14::
     026130  004737  003762                     JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
     026134  103003                             BCC     30$             ;IF AN ERROR OCCURED,
     026136                                     ERROR                   ;REPORT IT &
     026136  104460                                                                         TRAP     C$ERROR
     026140                                     ESCAPE  TST             ;  EXIT
     026140  104410                                                                         TRAP     C$ESCAPE
     026142  000066                                                                         .WORD    L10046-.

     026144  004537  004322             30$:    JSR     R5,WRITEI       ;INITIALIZE PORT B FOR I/O
     026150  120002                             DDRB
     026152  177777                             -1
     026154  103003                             BCC     31$             ;IF AN ERROR OCCURED,
     026156                                     ERROR                   ;REPORT IT &
     026156  104460                                                                         TRAP     C$ERROR
     026160                                     ESCAPE  TST             ;  EXIT
     026160  104410                                                                         TRAP     C$ESCAPE
     026162  000046                                                                         .WORD    L10046-.

     026164  012701  002526             31$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
     026170  012103                             MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE

     026172                             T14.LP:
     026172                                     BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     026172                                                                        T14.1:
     026172  104402                                                                         TRAP     C$BSUB

     026174  111137  002306                     MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
     026200  112137  002310                     MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
     026204  012700  120000                     MOV     #ORB,R0         ;SPECIFY THE REGISTER BEING TESTED
     026210  004737  005034                     JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
     026214  103003                             BCC     10$             ;WAS AN ERROR FOUND?
     026216                                     ERROR                   ;YES, REPORT IT AND
     026216  104460                                                                         TRAP     C$ERROR
     026220                                     ESCAPE  TST             ;     EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     026220  104410                                                                         TRAP     C$ESCAPE
     026222  000006                                                                         .WORD    L10046-.

     026224                             10$:    ENDSUB
```

TEST 14 -- VIA'S ORB DATA READ/WRITE

```
            026224                                                          L10047:
            026224  104403                                                          TRAP    C$ESUB
    4789
    4790 026226  077317                  SOB     R3,T14.LP      ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
    4791                                                        ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
    4792
    4793 026230                          ENDTST
            026230                                                          L10046:
            026230  104401                                                          TRAP    C$ETST
```

```
   4854                         .SBTTL TEST 15 -- VIA'S T1 DATA READ/WRITE

                         ;**********************************************************************************
                         ;*
                         ;*      TEST 15 -- VIA'S T1 DATA READ/WRITE
                         ;*
                         ;*      T1 == "TIMER #1"
                         ;*
                         ;* THIS TEST WRITES, READS, AND CHECKS THE T1 LATCHES AND COUNTER REGISTERS
                         ;* WITH DATA PATTERNS IN EACH OF 3 SUBTESTS.
                         ;*
                         ;*
                         ;* FIRST SUBTEST:  CHECKS FOR PROPER LOADING OF LATCHES
                         ;*      IT ALSO CHECKS TO BE SURE THAT THE COUNTER APPEARS TO BE DOING
                         ;*      SOMETHING TO THE COUNTERS.  AS LONG AS THEY HAVE CHANGED FROM THE
                         ;*      VALUE LOADED INTO THEM, WE WILL BE SATISFIED.
                         ;*
                         ;* A. A MASTER CLEAR IS PERFORMED.
                         ;* B. ALL LATCHES ARE LOADED TO ZEROES (JUST IN CASE), ACR6 & ACR7 ARE SET
                         ;*    TO ZERO (MODE 00), AND "T1" INTERRUPT ENABLE FLAG IS CLEARED.
                         ;*
                         ;* C. T1L-L(ADR 04) IS LOADED WITH THE CURRENT BYTE OF DATA PATTERN B.
                         ;* D. T1L-L(ADR 06) IS READ AND COMPARED TO THE BYTE JUST WRITTEN.
                         ;* E. T1C-L(ADR 04) IS READ AND CHECKED TO BE DIFFERENT THAN THE TEST BYTE.
                         ;*
                         ;* F. T1L-L(ADR 06) IS LOADED WITH THE COMPLEMENT OF THE CURRENT DATA BYTE.
                         ;* G. T1L-L(ADR 06) IS READ AND COMPARED TO THE BYTE JUST WRITTEN.
                         ;*
                         ;* H. T1L-L(ADR 06) IS RE-LOADED WITH 0 TO MAKE T1C-H DECREMENT FAST.
                         ;*    T1L-H(ADR 05) IS LOADED WITH THE ORIGINAL TEST DATA PATTERN BYTE.
                         ;* I. T1L-H(ADR 07) IS READ AND COMPARED TO THE BYTE LOADED INTO T1L-H.
                         ;*
                         ;* J. T1C-H(ADR 05) IS READ AND CHECKED TO BE DIFFERENT THAN THE TEST BYTE.
                         ;*
                         ;* K. T1L-H(ADR 07) IS LOADED WITH THE COMPLEMENT OF THE CURRENT DATA BYTE.
                         ;* L. T1L-H(ADR 07) IS READ AND COMPARED TO THE BYTE JUST LOADED.
                         ;*
                         ;* M. STEPS C-L ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
                         ;*
                         ;*
                         ;* SECOND SUBTEST:  CHECKS FOR CROSS-TALK AND ADDRESSING ERRORS
                         ;*                  FROM T1L-L TO T1L-H
                         ;*
                         ;* A. T1L-H(ADR 07) IS LOADED WITH 000 TO CLEAR IT.
                         ;* B. T1L-L(ADR 06) IS LOADED WITH A BYTE OF DATA PATTERN B.
                         ;* C. T1L-L(ADR 06) IS READ AND COMPARED TO THE DATA JUST WRITTEN.
                         ;* D. T1L-H(ADR 07) IS READ AND COMPARED TO 000.
                         ;* E. STEPS B-D ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
                         ;*
                         ;*
                         ;* THIRD SUBTEST:  CHECKS FOR CROSS-TALK AND ADDRESSING ERRORS
                         ;*                  FROM T1L-H TO T1L-L
                         ;*
                         ;* A. T1L-L(ADR 04) IS LOADED WITH 000 TO CLEAR IT
                         ;* B. T1L-H(ADR 07) IS LOADED WITH A BYTE OF DATA PATTERN B.
                         ;* C. T1L-H(ADR 07) IS READ AND COMPARED TO THE DATA JUST WRITTEN.
                         ;* D. T1L-L(ADR 06) IS READ AND COMPARED TO 000.
```

```
                                ;* E. STEPS B-D ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
                                ;*
                                ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                ;*                    200, 376, 375, 373  367, 357, 337, 277, 177, 000
                                ;*
                                ;--*************************************************************************
                                ;
                                ;       BGNTST
     026232                                                                          T15::
4855
4856
                                ; ***---*** STEP A ***---***
4857
4858 026232  004737  003762             JSR     PC,MSTCLR       ;INIT DMV & START UP M-LOOP
4859 026236  103003                     BCC     1$              ;IF NO ERRORS, PROCEED
4860 026240                             ERROR                   ;ELSE, REPORT ERROR &
     026240  104460                                                             TRAP    C$ERROR
4861 026242                             ESCAPE  TST             ;       GET OUT OF THE TEST
     026242  104410                                                             TRAP    C$ESCAPE
     026244  001030                                                             .WORD   L10050-.
4862 026246                     1$:
4863
4864                            ; ***---*** STEP B ***---***
4865
4866 026246  004537  004660             JSR     R5,INITT1       ;INITIALIZE THE TIMER'S REGISTERS
4867 026252  000000                     0                       ; WITH ZEROES
4868 026254  000000                     .WORD   0               ; 00 --> ACR6 & ACR7 AND DISABLE INTERRUPTS
4869 026256  103003                     BCC     .+10            ;IF NO ERROR, PROCEED
4870 026260                             ERROR                   ;ELSE, REPORT IT
     026260  104460                                                             TRAP    C$ERROR
4871 026262                             ESCAPE  TST             ;       AND EXIT THIS TEST
     026262  104410                                                             TRAP    C$ESCAPE
     026264  001010                                                             .WORD   L10050-.
4872
4873                            ;WE WANT THE LEAST ACTIVE OPERATING MODE FOR THIS TIMER WHILE WE ARE TESTING
4874                            ;IT.  THE MODE WE'RE USING HERE IS DOCUMENTED THUSLY:  "GENERATE A SINGLE
4875                            ;TIME-OUT INTERRUPT EACH TIME T1 IS LOADED.  PB7 DISABLED."
4876                            ;AS AN ADDED PRECAUTION, WE ARE DISABLING INTERRUPTS BY CLEARING THE "T1" FLAG
4877                            ;WITHIN "IER".
4878
4879 026266                             BGNSUB                  ;BEGIN THE FIRST SUBTEST
     026266                                                                     T15.1:
     026266  104402                                                             TRAP    C$BSUB
4880 026270  012701  002526             MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
4881 026274  012103                     MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
4882
4883 026276                     T16.LP:
4884 026276  112137  002306             MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
4885 026302  013737  002306  002310     MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
4886
4887 026310                             BGNSEG
     026310  104404                                                             TRAP    C$BSEG
4888
4889                            ; ***---***** STEP C ***---***
4890
4891 026312  004537  004310             JSR     R5,WRITE        ;LOAD T1L-L(ADDR 04)
4892 026316  120004                     T1CL
4893 026320  002306                     TDATA                   ;THE TEST DATA FROM "TDATA"
```

```
                                        ; ***---*** STEP D *** --***
026322  004537  004064          JSR     R5,READ         ;READ T1L-L(ADDR 06)
026326  120006                  T1LL
026330  002312                  BDATA
026332  123737  002310  002312  CMPB    GDATA,BDATA     ;AND CHECK IT
026340  001407                  BEQ     2$              ;IF OK, PROCEED
026342  012737  000006  002334  MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
026350                          GEDF    EM20,ERR7       ; REPORT FAILURE
                                                        ;       "DEVICE FATAL" ERROR # 32
026350  104455                                                    TRAP    C$ERDF
026352  000040                                                    .WORD   32
026354  015243                                                    .WORD   EM20
026356  006612                                                    .WORD   ERR7

                                        ; ***---*** STEP E ***---***
026360  004537  004064          2$:     JSR     R5,READ         ;READ T1C-L(ADDR 04)
026364  120004                  T1CL
026366  002312                  BDATA
026370  123737  002310  002312  CMPB    GDATA,BDATA     ;AND CHECK IT, SEEING AS THE TIMER IS RUNNING,
026376  001017                  BNE     4$              ;THIS MUST NOT EQUAL THE SET VALUE!
026400  004537  004064          JSR     R5,READ         ;IF IT IS, MAYBE WE JUST READ IT AT THE WRONG
026404  120004                  T1CL                    ;TIME!  RE-READ AND CHECK ONE MORE TIME.
026406  002312                  BDATA
026410  123737  002310  002312  CMPB    GDATA,BDATA     ;CHECK IT AGAIN, SAM.
026416  001007                  BNE     4$              ;THIS TIME IT SHOULD BE DIFFERENT.
                                                        ;OTHERWISE, WE HAVE A LEGITIMATE FAILURE
026420  012737  000004  002334  MOV     #4,REGNUM       ;  IDENTIFY THE FAILING REGISTER &
026426                          GEDF    EM20A,ERR7      ;  REPORT FAILURE
                                                        ;       "DEVICE FATAL" ERROR # 33
026426  104455                                                    TRAP    C$ERDF
026430  000041                                                    .WORD   33
026432  015275                                                    .WORD   EM20A
026434  006612                                                    .WORD   ERR7

                                        ; ***---*** STEP F ***---***
026436  105137  002306          4$:     COMB    TDATA           ;USE THE ONE'S COMPLEMENT THIS TIME
026442  105137  002310          COMB    GDATA           ;THE EXPECTED DATA IS ALSO THE COMPLEMENT
026446  004537  004310          JSR     R5,WRITE        ;LOAD T1L-L(ADDR 06)
026452  120006                  T1LL
026454  002306                  TDATA                   ;THE TEST DATA FROM "TDATA"

                                        ; ***---*** STEP G ***---***
026456  004537  004064          6$:     JSR     R5,READ         ;READ T1L-L(ADDR 06)
026462  120006                  T1LL
026464  002312                  BDATA
026466  123737  002310  002312  CMPB    GDATA,BDATA     ;AND CHECK IT
026474  001407                  BEQ     8$              ;IF OK, PROCEED
026476  012737  000006  002334  MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
026504                          GEDF    EM20,ERR7       ; REPORT FAILURE
                                                        ;       "DEVICE FATAL" ERROR # 34
026504  104455                                                    TRAP    C$ERDF
```

```
                026506  000042                                                          .WORD   34
                026510  015243                                                          .WORD   EM20
                026512  006612                                                          .WORD   ERR7
4939
4940                                    ; ***---*** STEP H ***---***
4941
4942 026514  105137  002306         8$:     COMB    TDATA           ;RESTORE THE DATA TO THE ORIGINAL VALUE
4943 026520  105137  002310                 COMB    GDATA
4944 026524  004537  004322                 JSR     R5,WRITEI       ;SET THE LOW LATCH TO MAKE SURE THE HIGH
4945 026530  120006                         T1LL                    ;COUNTER IS DOING MOST OF THE WORK
4946 026532  000001                         1
4947 026534  004537  004310                 JSR     R5,WRITE        ;LOAD T1L-H(ADDR 05)
4948 026540  120005                         T1CH
4949 026542  002306                         TDATA                   ;THE TEST DATA FROM "TDATA"
4950
4951                                    ; ***---*** STEP I ***---***
4952
4953 026544  004537  004064                 JSR     R5,READ         ;READ T1L-H(ADDR 07)
4954 026550  120007                         T1LH
4955 026552  002312                         BDATA
4956 026554  123737  002310  002312         CMPB    GDATA,BDATA     ;AND CHECK IT
4957 026562  001407                         BEQ     10$             ;IF OK, PROCEED
4958 026564  012737  000007  002334         MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
4959 026572                                 GEDF    EM20,ERR7       ; REPORT FAILURE
                                                                    ;       "DEVICE FATAL" ERROR # 35
                026572  104455                                                          TRAP    C$ERDF
                026574  000043                                                          .WORD   35
                026576  015243                                                          .WORD   EM20
                026600  006612                                                          .WORD   ERR7
4960
4961                                    ; ***---*** STEP J ***---***
4962
4963 026602  004537  004064         10$:    JSR     R5,READ         ;READ T1C-H(ADDR 05)
4964 026606  120005                         T1CH
4965 026610  002312                         BDATA
4966 026612  012737  000005  002334         MOV     #5,REGNUM       ;IDENTIFY THE REGISTER BEING CHECKED
4967 026620  105737  002306                 TSTB    TDATA           ;WAS THE TEST DATA "000"?
4968 026624  001410                         BEQ     14$             ;YES, THEN WE CAN'T BE SURE OF THE RESULTS!
4969 026626  123737  002310  002312         CMPB    GDATA,BDATA     ;NO, CHECK IT
4970 026634  001004                         BNE     14$             ;IT SHOULDN'T - THE LOADED VALUE
4971 026636                                 GEDF    EM20A,ERR7      ;IT DID!  REPORT FAILURE
                                                                    ;       "DEVICE FATAL" ERROR # 36
                026636  104455                                                          TRAP    C$ERDF
                026640  000044                                                          .WORD   36
                026642  015275                                                          .WORD   EM20A
                026644  006612                                                          .WORD   ERR7
4972                                                                ;AND CONTINUE TESTING
4973                                    ; ***---*** STEP K *** --***
4974
4975 026646  105137  002306         14$:    COMB    TDATA           ;USE THE ONE'S COMPLEMENT THIS TIME
4976 026652  105137  002310                 COMB    GDATA           ;THE EXPECTED DATA IS ALSO THE COMPLEMENT
4977 026656  004537  004310                 JSR     R5,WRITE        ;LOAD T1L-H(ADDR 07)
4978 026662  120007                         T1LH
4979 026664  002306                         TDATA                   ;THE TEST DATA FROM "TDATA"
4980
4981                                    ; ***---*** STEP L ***---***
4982
```

```
4983 026666  004537  004064          JSR     R5,READ         ;READ T1L-H(ADDR 07)
4984 026672  120007                  T1LH
4985 026674  002312                  BDATA
4986 026676  123737  C02310  002312  CMPB    GDATA,BDATA     ;AND CHECK IT
4987 026704  001407                  BEQ     16$             ;IF OK, PROCEED
4988 026706  012737  000007  002334  MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
4989 026714                          GEDF    EM20,ERR7       ; REPORT FAILURE
                                                             ;       "DEVICE FATAL" ERROR # 37
     026714  104455                                                          TRAP    C$ERDF
     026716  000045                                                          .WORD   37
     026720  015243                                                          .WORD   EM20
     026722  006612                                                          .WORD   ERR7
4990
4991                          ; ***---*** STEP M ***---***
4992
4993 026724                   16$:   ENDSEG
     026724                                                  10000$:
     026724  104405                                                          TRAP    C$ESEG
4994
4995 026726  000402                  BR      21$
4996 026730  000137  026276  20$:    JMP     T16.LP
4997 026734  077303          21$:    SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
4998                                                         ;ELSE, EXIT SUBTEST
4999 026736                          ENDSUB
     026736                                                  L10051:
     026736  104403                                                          TRAP    C$ESUB
5000
5001
5002 026740                          BGNSUB                  ;BEGIN THE SECOND SUBTEST
     026740                                                          T15.2:
     026740  104402                                                          TRAP    C$BSUB
5003 026742  012701  002526          MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
5004 026746  012103                  MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
5005
5006 026750                   T16.L1:
5007 026750  112137  002306          MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
5008 026754  013737  002306  002310  MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
5009
5010
5011                          ; ***---*** STEP A ***---***
5012
5013 026762  004537  004322          JSR     R5,WRITEI       ;CLEAR T1L-H(ADDR 07)
5014 026766  120007                  T1LH
5015 026770  000000                  0                       ;THE TEST DATA FROM "TDATA"
5016
5017 026772                          BGNSEG
     026772  104404                                                          TRAP    C$BSEG
5018
5019                          ; ***---*** STEP B ***---***
5020
5021 026774  004537  004310          JSR     R5,WRITE        ;LOAD T1L-L(ADDR 06)
5022 027000  120006                  T1LL
5023 027002  002306                  TDATA                   ;THE TEST DATA FROM "TDATA"
5024
5025                          ; ***---*** STEP C ***---***
5026
5027 027004  004537  004064          JSR     R5,READ         ;READ T1L-L(ADDR 06)
```

TEST 15 -- VIA'S T1 DATA READ/WRITE

```
5028 027010  120006                          T1LL
5029 027012  002312                          BDATA
5030 027014  123737  002310  002312          CMPB    GDATA,BDATA     ;AND CHECK IT
5031 027022  001407                          BEQ     2$              ;IF OK, PROCEED
5032 027024  012737  000006  002334          MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5033 027032                                  GEDF    EM20,ERR7       ; REPORT FAILURE
                                                                     ;       "DEVICE FATAL" ERROR # 38
     027032  104455                                                                  TRAP    C$ERDF
     027034  000046                                                                  .WORD   38
     027036  015243                                                                  .WORD   EM20
     027040  006612                                                                  .WORD   ERR7
5034
5035                                 ; ***---*** STEP D ***---***
5036
5037 027042  004537  004064          2$:     JSR     R5,READ         ;READ T1L-H(ADDR 07)
5038 027046  120007                          T1LH
5039 027050  002312                          BDATA
5040 027052  105737  002312                  TSTB    BDATA           ;AND CHECK IT -- THIS SHOULD STILL BE ZERO
5041 027056  001411                          BEQ     10$             ;IF OK, PROCEED
5042 027060  005037  002310                  CLR     GDATA
5043 027064  012737  000007  002334          MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5044 027072                                  GEDF    EM20B,ERR7      ; REPORT FAILURE
                                                                     ;       "DEVICE FATAL" ERROR # 39
     027072  104455                                                                  TRAP    C$ERDF
     027074  000047                                                                  .WORD   39
     027076  015355                                                                  .WORD   EM20B
     027100  006612                                                                  .WORD   ERR7
5045
5046                                 ; ***---*** STEP E ***---***
5047
5048 027102                          10$:    ENDSEG
     027102                                                          10000$:
     027102  104405                                                          TRAP    C$ESEG
5049
5050 027104  000402                          BR      21$
5051 027106  000137  026750          20$:    JMP     T16.L1
5052 027112  077303                  21$:    SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
5053                                                                 ;ELSE, EXIT SUBTEST
5054 027114                                  ENDSUB
     027114                                                          L10052:
     027114  104403                                                          TRAP    C$ESUB
5055
5056
5057 027116                                  BGNSUB                  ;BEGIN THE THIRD SUBTEST
     027116                                                                  T15.3:
     027116  104402                                                          TRAP    C$BSUB
5058 027120  012701  002526                  MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
5059 027124  012103                          MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
5060
5061 027126                          T16.L2:
5062 027126  112137  002306                  MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
5063 027132  013737  002306  002310          MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
5064
5065
5066                                 ; ***---*** STEP A ***---***
5067
5068 027140  004537  004322                  JSR     R5,WRITE1       ;CLEAR T1L-L(ADDR 04)
```

TEST 15 -- VIA'S T1 DATA READ/WRITE

```
5069 027144  120004                        T1CL
5070 027146  000000                        0
5071
5072 027150                                BGNSEG
     027150  104404                                                    TRAP    C$BSEG
5073
5074                              ; ***---*** STEP B ***---***
5075
5076 027152  004537  004310                JSR     R5,WRITE        ;LOAD T1L-H(ADDR 07)
5077 027156  120007                        T1LH
5078 027160  002306                        TDATA                   ;THE TEST DATA FROM "TDATA"
5079
5080                              ; ***---*** STEP C ***---***
5081
5082 027162  004537  004064                JSR     R5,READ         ;READ T1L-H(ADDR 07)
5083 027166  120007                        T1LH
5084 027170  002312                        BDATA
5085 027172  123737  002310  002312        CMPB    GDATA,BDATA     ;AND CHECK IT
5086 027200  001407                        BEQ     10$             ;IF OK, PROCEED
5087 027202  012737  000007  002334        MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5088 027210                                GEDF    EM20,ERR7       ; REPORT FAILURE
                                                                   ;       "DEVICE FATAL" ERROR # 40
     027210  104455                                                    TRAP    C$ERDF
     027212  000050                                                    .WORD   40
     027214  015243                                                    .WORD   EM20
     027216  006612                                                    .WORD   ERR7
5089
5090                              ; ***---*** STEP D ***---***
5091
5092 027220  004537  004064  10$:   JSR     R5,READ         ;READ T1L-L(ADDR 06)
5093 027224  120006                T1LL
5094 027226  002312                BDATA
5095 027230  105737  002312        TSTB    BDATA           ;AND CHECK IT
5096 027234  001411                BEQ     2$              ;IF OK, PROCEED
5097 027236  005037  002310        CLR     GDATA
5098 027242  012737  000006  002334 MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5099 027250                        GEDF    EM20B,ERR7      ; REPORT FAILURE
                                                           ;       "DEVICE FATAL" ERROR # 41
     027250  104455                                                    TRAP    C$ERDF
     027252  000051                                                    .WORD   41
     027254  015355                                                    .WORD   EM20B
     027256  006612                                                    .WORD   ERR7
5100
5101                              ; ***---*** STEP E ***---***
5102
5103 027260  2$:    ENDSEG
     027260                                                         10000$:
     027260  104405                                                    TRAP    C$ESEG
5104
5105 027262  000402                BR      21$
5106 027264  000137  027126  20$:   JMP     T16.L2
5107 027270  077303        21$:   SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
5108                                                       ;ELSE, EXIT SUBTEST
5109 027272                        ENDSUB
     027272                                                         L10053:
     027272  104403                                                    TRAP    C$ESUB
5110
```

TEST 15 -- VIA'S T1 DATA READ/WRITE

```
   5111 027274                              ENDTST
        027274                                          L10050:
        027274  104401                                          TRAP    C$ETST
```

```
                                  .SBTTL TEST 16 -- VIA'S SR DATA READ/WRITE

                                  ;++*******************************************************************
                                  ;*
                                  ;*       TEST 16 -- VIA'S SR DATA READ/WRITE
                                  ;*
                                  ;*       SR == "SHIFT REGISTER"
                                  ;*
                                  ;* FIRST, A MASTER CLEAR IS PERFORMED AND THE ACR IS SET TO 000. THEN :
                                  ;* READ/WRITE BITS 0-7 OF VIA SHIFT REGISTER ARE TESTED BY WRITING, READING,
                                  ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
                                  ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                  ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                  ;*
                                  ;--*******************************************************************
                                  ;
                                  ;       BGNTST
027276                                                                        T16::
027276  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
027302  103003                            BCC     30$             ;IF AN ERROR OCCURED,
027304                                    ERROR                   ;REPORT IT &
027304  104460                                                                          TRAP    C$ERROR
027306                                    ESCAPE  TST             ;  EXIT
027306  104410                                                                          TRAP    C$ESCAPE
027310  000046                                                                          .WORD   L10054-.

027312  012701  002526            30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
027316  012103                            MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE

027320                            T18.LP:
027320                                    BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
027320                                                                        T16.1:
027320  104402                                                                          TRAP    C$BSUB

027322  111137  002306                    MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
027326  112137  002310                    MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
027332  012700  120012                    MOV     #SR,R0          ;SPECIFY THE REGISTER BEING TESTED
027336  004737  005034                    JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
027342  103003                            BCC     10$             ;WAS AN ERROR FOUND?
027344                                    ERROR                   ;YES, REPORT IT AND
027344  104460                                                                          TRAP    C$ERROR
027346                                    ESCAPE  TST             ;     EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
027346  104410                                                                          TRAP    C$ESCAPE
027350  000006                                                                          .WORD   L10054-.

027352                            10$:    ENDSUB
027352                                                                        L10055:
027352  104403                                                                          TRAP    C$ESUB

027354  077317                            SOB     R3,T18.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
                                                                  ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST

027356                                    ENDTST
027356                                                                        L10054:
027356  104401                                                                          TRAP    C$ETST
```

```
5162                                    .SBTTL TEST 17 -- VIA'S ACR DATA READ/WRITE

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 17 -- VIA'S ACR DATA READ/WRITE
                                        ;*
                                        ;*      ACR == "AUXILIARY CONTROL REGISTER"
                                        ;*
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                                        ;* READ/WRITE BITS 0-7 OF THE ACR ARE TESTED BY WRITING, READING,
                                        ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
                                        ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
                                        ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
                                        ;*
                                        ;-*****************************************************************************
                                        ;
                                        ;       BGNTST
     027360                                                                                  T17::
5163 027360  004737  003762             JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5164 027364  103003                     BCC     30$             ;IF AN ERROR OCCURED,
5165 027366                             ERROR                   ;REPORT IT &
     027366  104460                                                                          TRAP    C$ERROR
5166 027370                             ESCAPE  TST             ;  EXIT
     027370  104410                                                                          TRAP    C$ESCAPE
     027372  000046                                                                         .WORD   L10056-.
5167
5168 027374  012701  002526     30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
5169 027400  012103                     MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
5170
5171 027402                     T19.LP:
5172 027402                             BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     027402                                                                                  T17.1:
     027402  104402                                                                          TRAP    C$BSUB
5173
5174 027404  111137  002306             MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
5175 027410  112137  002310             MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
5176 027414  012700  120013             MOV     #ACR,R0         ;SPECIFY THE REGISTER BEING TESTED
5177 027420  004737  005034             JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
5178 027424  103003                     BCC     10$             ;WAS AN ERROR FOUND?
5179 027426                             ERROR                   ;YES, REPORT IT AND
     027426  104460                                                                          TRAP    C$ERROR
5180 027430                             ESCAPE  TST             ;     EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     027430  104410                                                                          TRAP    C$ESCAPE
     027432  000006                                                                         .WORD   L10056-.
5181
5182 027434                     10$:    ENDSUB
     027434                                                                          L10057:
     027434  104403                                                                          TRAP    C$ESUB
5183
5184 027436  077317                     SOB     R3,T19.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
5185                                                             ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
5186
5187 027440                             ENDTST
     027440                                                                          L10056:
     027440  104401                                                                          TRAP    C$ETST
```

```
   5200                                 .SBTTL TEST 18 -- VIA'S PCR DATA READ/WRITE

                                        ;+*********************************************************************
                                        ;*
                                        ;*      TEST 18 -- VIA'S PCR DATA READ/WRITE
                                        ;*
                                        ;*      PCR == "PERIPHERAL CONTROL REGISTER"
                                        ;*
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
                                        ;* READ/WRITE BITS 0-7 OF THE PCR REGISTER ARE TESTED BY WRITING, READING,
                                        ;* AND COMPARING EACH BYTE OF A SUBSET OF DATA PATTERN B.
                                        ;*   DATA PATTERN B (SUBSET) =  125, 252, 000, 377, 001, 002, 004, 010, 020,
                                        ;*                              040, 100, 200.
                                        ;*
                                        ;--*********************************************************************
                                        ;
                                        ;       BGNTST
     027442                                                                     T18::
5201 027442  004737  003762             JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5202 027446  103003                     BCC     30$             ;IF AN ERROR OCCURED,
5203 027450                             ERROR                   ;REPORT IT &
     027450  104460                                                             TRAP    C$ERROR
5204 027452                             ESCAPE  TST             ;  EXIT
     027452  104410                                                             TRAP    C$ESCAPE
     027454  000050                                                             .WORD   L10060-.
5205
5206 027456  012701  002530     30$:    MOV     #PATB+2,R1      ;POINT TO PATTERN TABLE
5207 027462  012703  002543             MOV     #PATB+15,R3     ;GET # OF ENTRIES IN TABLE
5208
5209 027466                     T20.LP:
5210 027466                             BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     027466                                                                     T18.1:
     027466  104402                                                             TRAP    C$BSUB
5211
5212 027470  111137  002306             MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR "STREG"
5213 027474  112137  002310             MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
5214 027500  012700  120014             MOV     #PCR,R0         ;SPECIFY THE REGISTER BEING TESTED
5215 027504  004737  005034             JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
5216 027510  103003                     BCC     10$             ;WAS AN ERROR FOUND?
5217 027512                             ERROR                   ;YES, REPORT IT AND
     027512  104460                                                             TRAP    C$ERROR
5218 027514                             ESCAPE  TST             ;     EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     027514  104410                                                             TRAP    C$ESCAPE
     027516  000006                                                             .WORD   L10060-.
5219
5220 027520                     10$:    ENDSUB
     027520                                                                     L10061:
     027520  104403                                                             TRAP    C$ESUB
5221
5222 027522  077317                     SOB     R3,T20.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
5223                                                             ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
5224 027524                             ENDTST
     027524                                                                     L10060:
     027524  104401                                                             TRAP    C$ETST
```

```
5243                                    .SBTTL TEST 19 -- VIA'S IER DATA READ/WRITE

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 19 -- VIA'S IER DATA READ/WRITE
                                        ;*
                                        ;*      IER == "INTERRUPT ENABLE REGISTER"
                                        ;*
                                        ;* BITS 0-6 OF THE IER CAN BE SET OR CLEARED ON A WRITE, UNDER CONTROL OF THE
                                        ;* SET/CLEAR CONTROL BIT 7. TO TEST THIS , EACH BYTE OF DATA PATTERN D IS
                                        ;* WRITTEN INTO IER, AND THE REGISTER IS READ AND COMPARED TO THE CORRESPOND-
                                        ;* ING BYTE OF DATA PATTERN E.
                                        ;*
                                        ;*   DATA PATTERN D = 200, 201, 202, 204, 210, 220, 240, 300, 200, 000, 001,
                                        ;*                    002, 004, 010, 020, 040, 100, 000, 325, 125, 252, 052
                                        ;*
                                        ;*   DATA PATTERN E = 000, 001, 003, 007, 017, 037, 077, 177, 177, 177, 176,
                                        ;*                    174, 170, 160, 140, 100, 000, 000, 125, 000, 052, 000
                                        ;*
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
                027526                                                                          T19::
5244 027526  004737  003762             ;       JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5245 027532  103003                     ;       BCC     30$             ;IF AN ERROR OCCURED,
5246 027534                             ;       ERROR                   ;REPORT IT &
     027534  104460                                                                             TRAP    C$ERROR
5247 027536                             ;       ESCAPE  TST             ;  EXIT
     027536  104410                                                                             TRAP    C$ESCAPE
     027540  000052                                                                             .WORD   L10062-.
5248
5249 027542  012701  002644     30$:    ;       MOV     #PATD,R1        ;POINT TO PATTERN TABLE
5250 027546  012103                     ;       MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
5251 027550  012702  002676             ;       MOV     #PATE+2,R2      ;POINT TO "EXPECTED" DATA PATTERN TABLE
5252
5253 027554                     T21.LP:
5254 027554                             ;       BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
     027554                                                                                 T19.1:
     027554  104402                                                                             TRAP    C$BSUB
5255
5256 027556  112137  002306             ;       MOVB    (R1)+,TDATA     ;SETUP TEST DATA BYTE FOR "STREG"
5257 027562  112237  002310             ;       MOVB    (R2)+,CDATA     ;SETUP EXPECTED DATA BYTE FOR "STREG"
5258 027566  012700  120016             ;       MOV     #IENR,R0        ;SPECIFY THE REGISTER BEING TESTED
5259 027572  004737  005034             ;       JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
5260 027576  103003                     ;       BCC     10$             ;WAS AN ERROR FOUND?
5261 027600                             ;       ERROR                   ;YES, REPORT IT AND
     027600  104460                                                                             TRAP    C$ERROR
5262 027602                             ;       ESCAPE  TST             ;       EXIT FROM THE TEST.  "CKLOOP" IS IMPLIED
     027602  104410                                                                             TRAP    C$ESCAPE
     027604  000006                                                                             .WORD   L10062-.
5263
5264 027606                     10$:    ;       ENDSUB
     027606                                                                             L10063:
     027606  104403                                                                             TRAP    C$ESUB
5265
5266 027610  077317                     ;       SOB     R3,T21.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
```

Q 0128

SEQ 0141

TEST 19 -- VIA'S IER DATA READ/WRITE

```
5267                                                    ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
5268
5269 027612                            ENDTST
     027612                                                        L10062:
     027612  104401                                                       TRAP    C$ETST
```

```
5282                                    .SBTTL TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST
                                        ;*
                                        ;*      ORB == "OUTPUT REGISTER PORT B"
                                        ;*      DDRB == "DATA DIRECTION REGISTER B"
                                        ;*
                                        ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DDRB TO SET
                                        ;* ALL B PORT PINS FOR OUTPUT MODE. THEN, A 000 BYTE IS WRITTEN INTO ORB AND
                                        ;* THE REGISTER IS READ BACK AND CHECKED FOR 000. THEN, A MASTER CLEAR IS
                                        ;* PERFORMED AND ORB IS READ AND CHECKED FOR 377.
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
     027614                                                                                     T20::
5283
5284 027614  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5285 027620  103003                            BCC     1$              ;IF AN ERROR OCCURED,
5286 027622                                    ERROR                   ;REPORT IT &
     027622  104460                                                                             TRAP    C$ERROR
5287 027624                                    ESCAPE  TST             ;  EXIT
     027624  104410                                                                             TRAP    C$ESCAPE
     027626  000252                                                                             .WORD   L10064-.
5288
5289 027630  012737  000377  002310  1$:      MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
5290 027636  013737  002310  002306          MOV     GDATA,TDATA
5291
5292                                    ;  WE'LL USE "STREG" TO LOAD & CHECK "DDRB" WITH 377 THEREBY SETTING UP
5293                                    ;  "ORB" FOR BI-DIRECTIONAL TRANSFERS
5294
5295 027644  012700  120002                    MOV     #DDRB,R0                ;POINT TO ORB
5296 027650  004737  005034                    JSR     PC,STREG        ;LOAD & TEST IT
5297 027654  103003                            BCC     4$              ;IF OK, PROCEED WITH TESTING
5298 027656                                    ERROR                   ;ELSE, REPORT THE ERROR
     027656  104460                                                                             TRAP    C$ERROR
5299 027660                                    ESCAPE  TST             ;       & QUIT
     027660  104410                                                                             TRAP    C$ESCAPE
     027662  000216                                                                             .WORD   L10064-.
5300
5301                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "ORB"
5302
5303 027664  012700  120000  4$:      MOV     #ORB,R0         ;POINT TO DDRB
5304 027670  004737  005034                    JSR     PC,STREG        ;LOAD & TEST "ORB"
5305 027674  103003                            BCC     5$              ;IF NO ERROR HERE, PROCEED
5306 027676                                    ERROR                   ;ELSE, REPORT THE ERROR
     027676  104460                                                                             TRAP    C$ERROR
5307 027700                                    ESCAPE  TST             ;       & QUIT
     027700  104410                                                                             TRAP    C$ESCAPE
     027702  000176                                                                             .WORD   L10064-.
5308
5309 027704  004737  003762  5$:      JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
5310 027710  103003                            BCC     10$             ;IF NO ERROR HERE, PROCEED
5311 027712                                    ERROR                   ;ELSE, REPORT IT
     027712  104460                                                                             TRAP    C$ERROR
```

TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST

```
 5312 027714                                ESCAPE  TST             ;       & QUIT
      027714  104410                                                                    TRAP    C$ESCAPE
      027716  000162                                                                    .WORD   L10064-.
 5313
 5314 027720  005037  002310          10$:  CLR     GDATA           ;FOR TESTING PURPOSES LATER
 5315
 5316 027724  004537  004064                JSR     R5,READ         ;READ THE "RESET" VALUE OF THE "DDRB"
 5317 027730  120002                        DDRB
 5318 027732  002312                        BDATA
 5319 027734  103003                        BCC     12$             ;IF NO ERROR READING IT, PROCEED
 5320 027736                                ERROR                   ;ELSE, REPORT IT
      027736  104460                                                                    TRAP    C$ERROR
 5321 027740                                ESCAPE  TST             ;       & QUIT
      027740  104410                                                                    TRAP    C$ESCAPE
      027742  000136                                                                    .WORD   L10064-.
 5322
 5323 027744  123737  002312  002310  12$:  CMPB    BDATA,GDATA     ;DID IT GET CLEARE?
 5324 027752  001407                        BEQ     14$             ;YES, GOOD.  NOW CHECK "ORB"
 5325 027754  012737  000002  002334        MOV     #DDRB&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
 5326 027762                                GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                    ;       "DEVICE FATAL" ERROR # 42
      027762  104455                                                                    TRAP    C$ERDF
      027764  000052                                                                    .WORD   42
      027766  014515                                                                    .WORD   EM5
      027770  006612                                                                    .WORD   ERR7
 5327
 5328 027772  012737  000377  002310  14$:  MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
 5329 030000  013737  002310  002306        MOV     GDATA,TDATA
 5330
 5331                                       ;  WE'LL USE "STREG" TO LOAD & CHECK "DDRB" WITH 377 THEREBY SETTING UP
 5332                                       ;  "ORB" FOR BY-DIRECTIONAL TRANSFERS
 5333
 5334 030006  012700  120002                MOV     #DDRB,R0                ;POINT TO ORB
 5335 030012  004737  005034                JSR     PC,STREG        ;LOAD & TEST IT
 5336 030016  103003                        BCC     16$             ;IF OK, PROCEED WITH TESTING
 5337 030020                                ERROR                   ;ELSE, REPORT THE ERROR
      030020  104460                                                                    TRAP    C$ERROR
 5338 030022                                ESCAPE  TST             ;       & QUIT
      030022  104410                                                                    TRAP    C$ESCAPE
      030024  000054                                                                    .WORD   L10064-.
 5339
 5340 030026  005037  002310          16$:  CLR     GDATA           ;SETUP FOR TESTING ORB
 5341 030032  004537  004064                JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "ORB"
 5342 030036  120000                        ORB
 5343 030040  002312                        BDATA
 5344 030042  103003                        BCC     18$             ;IF NO ERROR READING IT, PROCEED
 5345 030044                                ERROR                   ;ELSE, REPORT IT
      030044  104460                                                                    TRAP    C$ERROR
 5346 030046                                ESCAPE  TST             ;       & QUIT
      030046  104410                                                                    TRAP    C$ESCAPE
      030050  000030                                                                    .WORD   L10064-.
 5347
 5348 030052  123737  002310  002312  18$:  CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
 5349 030060  001407                        BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
 5350 030062  012737  000000  002334        MOV     #ORB&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
 5351 030070                                GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                    ;       "DEVICE FATAL" ERROR # 43
```

TEST 20 - VIA'S ORB/DDRB MASTER CLEAR TEST

```
          030070  104455                                          TRAP    C1ERDF
          030072  000053                                          .WORD   43
          030074  014515                                          .WORD   EM1
          030076  006612                                          .WORD   ERR17
     5352
     5353 030100                          324:    ENDTST
          030100                                                  L10064:
          030100  104401                                          TRAP    C1ETST
```

```
                                                .SBTTL  TEST 21 -- VIA'S DDRB MASTER CLEAR TEST

                                                ;*********************************************************************
                                                ;*
                                                ;*      TEST 21 -- VIA'S DDRB MASTER CLEAR TEST
                                                ;*
                                                ;*      DDRB -- "DATA DIRECTION REGISTER B"
                                                ;*
                                                ;* A 377 BYTE IS WRITTEN INTO DDRB AND THE REGISTER IS READ BACK AND CHECKED
                                                ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRB IS READ AND CHECKED FOR
                                                ;* 000.
                                                ;*
                                                ;* NOTE:  THIS TESTING IS ALSO DONE IN TEST 23.  IT IS INCLUDED HERE ONLY TO
                                                ;*        PROVIDE TIGHTER LOOPING ON JUST THE DDRB MASTER CLEAR CHECKING.
                                                ;*
                                                ;--*******************************************************************
                                                ;
                                                ;       BGNTST
        030102                                                                                      T21::

        030102  004737  003762                          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
        030106  103003                                  BCC     1$              ;IF AN ERROR OCCURED,
        030110                                          ERROR                   ;REPORT IT &
        030110  104460                                                                          TRAP    C$ERROR
        030112                                          ESCAPE  TST             ;  EXIT
        030112  104410                                                                          TRAP    C$ESCAPE
        030114  000114                                                                          .WORD   L10065-.

        030116  012737  000377  002310  1$:             MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
        030124  013737  002310  002306                  MOV     GDATA,TDATA
        030132  012700  120002                          MOV     #DDRB,R0

                                                ;  NOW WE'LL USE "STREG" TO SET & CHECK "DDRB"

        030136  004737  005034                          JSR     PC,STREG        ;LOAD & TEST "DDRB"
        030142  103003                                  BCC     5$              ;IF NO ERROR HERE, PROCEED
        030144                                          ERROR                   ;ELSE, REPORT IT
        030144  104460                                                                          TRAP    C$ERROR
        030146                                          ESCAPE  TST             ;       & QUIT
        030146  104410                                                                          TRAP    C$ESCAPE
        030150  000060                                                                          .WORD   L10065-.

        030152  004737  003762          5$:             JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
        030156  103003                                  BCC     10$             ;IF NO ERROR HERE, PROCEED
        030160                                          ERROR                   ;ELSE, REPORT IT
        030160  104460                                                                          TRAP    C$ERROR
        030162                                          ESCAPE  TST             ;       & QUIT
        030162  104410                                                                          TRAP    C$ESCAPE
        030164  000044                                                                          .WORD   L10065-.

        030166  005037  002310          10$:            CLR     GDATA           ;FOR TESTING PURPOSES LATER
        030172  004537  004064                          JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "DDRB"
        030176  120002                                  DDRB
        030200  002312                                  BDATA

        030202  123737  002310  002312                  CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
        030210  001407                                  BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
```

0133

TEST 21 - VIA'S DDRB MASTER CLEAR TEST

```
 5397 030212  012737  000002  002334          MOV     #DDRB&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
 5398 030220                                  GEDF    EM5,ERR7                ;REPORT MASTER CLEAR FAILURE
                                                                              ;       "DEVICE FATAL" ERROR # 44
      030220  104455                                                                    TRAP    C$ERDF
      030222  000054                                                                    .WORD   44
      030224  014515                                                                    .WORD   EM5
      030226  006612                                                                    .WORD   ERR7
 5399
 5400 030230                          32$:    ENDTST
      030230                                                                  L10065:
      030230  104401                                                                    TRAP    C$ETST
```

```
5411                                    .SBTTL TEST 22 -- VIA'S DDRA MASTER CLEAR TEST

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 22 -- VIA'S DDRA MASTER CLEAR TEST
                                        ;*
                                        ;*      DDRA -- "DATA DIRECTION REGISTER A"
                                        ;*
                                        ;* A 377 BYTE IS WRITTEN INTO DDRA AND THE REGISTER IS READ BACK AND CHECKED
                                        ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRA IS READ AND CHECKED FOR
                                        ;* 000.
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
    030232                                                                                      T22::
5412
5413 030232  004737  003762                     JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5414 030236  103003                             BCC     1$              ;IF AN ERROR OCCURED,
5415 030240                                     ERROR                   ;REPORT IT &
     030240  104460                                                                         TRAP    C$ERROR
5416 030242                                     ESCAPE  TST             ;  EXIT
     030242  104410                                                                         TRAP    C$ESCAPE
     030244  000114                                                                         .WORD   L10066-.
5417
5418 030246  012737  000377  002310  1$:       MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
5419 030254  013737  002310  002306            MOV     GDATA,TDATA
5420 030262  012700  120003                     MOV     #DDRA,R0
5421
5422                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "DDRA"
5423
5424 030266  004737  005034                     JSR     PC,STREG        ;LOAD & TEST "DDRA"
5425 030272  103003                             BCC     5$              ;IF NO ERROR HERE, PROCEED
5426 030274                                     ERROR                   ;ELSE, REPORT IT
     030274  104460                                                                         TRAP    C$ERROR
5427 030276                                     ESCAPE  TST             ;       & QUIT
     030276  104410                                                                         TRAP    C$ESCAPE
     030300  000060                                                                         .WORD   L10066-.
5428
5429 030302  004737  003762            5$:      JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
5430 030306  103003                             BCC     10$             ;IF NO ERROR HERE, PROCEED
5431 030310                                     ERROR                   ;ELSE, REPORT IT
     030310  104460                                                                         TRAP    C$ERROR
5432 030312                                     ESCAPE  TST             ;       & QUIT
     030312  104410                                                                         TRAP    C$ESCAPE
     030314  000044                                                                         .WORD   L10066-.
5433
5434 030316  005037  002310            10$:     CLR     GDATA           ;FOR TESTING PURPOSES LATER
5435 030322  004537  004064                     JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "DDRA"
5436 030326  120003                             DDRA
5437 030330  002312                             BDATA
5438
5439 030332  123737  002310  002312            CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
5440 030340  001407                             BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
5441 030342  012737  000003  002334            MOV     #DDRA&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
5442 030350                                     GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                        ;       "DEVICE FATAL" ERROR # 45
```

F12

Q 0135

SEQ 0148

TEST 22 -- VIA'S DDRA MASTER CLEAR TEST

```
        030350  104455                                          TRAP    C$ERDF
        030352  000055                                          .WORD   45
        030354  014515                                          .WORD   EM5
        030356  006612                                          .WORD   ERR7
   5443
   5444 030360                          32$:    ENDTST
        030360                                              L10066:
        030360  104401                                          TRAP    C$ETST
```

```
5455                                    .SBTTL TEST 23 -- VIA'S SR MASTER CLEAR TEST

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 23 -- VIA'S SR MASTER CLEAR TEST
                                        ;*
                                        ;*      SR ** "SHIFT REGISTER"
                                        ;*
                                        ;* A 123 BYTE IS WRITTEN INTO SR AND THE REGISTER IS READ BACK AND CHECKED
                                        ;* FOR 123. THEN, A MASTER CLEAR IS PERFORMED AND SR IS READ AND CHECKED FOR
                                        ;* NO CHANGE.
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
    030362                                                                                      T23::
5456
5457 030362  004737  003762             JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5458 030366  103003                     BCC     1$              ;IF AN ERROR OCCURED,
5459 030370                             ERROR                   ;REPORT IT &
     030370  104460                                                                 TRAP    C$ERROR
5460 030372                             ESCAPE  TST             ;  EXIT
     030372  104410                                                                 TRAP    C$ESCAPE
     030374  000120                                                                 .WORD   L10067-.
5461
5462 030376  004537  004322     1$:     JSR     R5,WRITEI       ;FORCE SR TO MODE 0
5463 030402  120013                     ACR
5464 030404  000000                     0
5465 030406  012737  000123  002310     MOV     #123,GDATA      ;SETUP FOR CALL TO STREG
5466 030414  013737  002310  002306     MOV     GDATA,TDATA
5467 030422  012700  120012             MOV     #SR,R0
5468
5469                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "SR"
5470
5471 030426  004737  005034             JSR     PC,STREG        ;LOAD & TEST "SR"
5472 030432  103003                     BCC     5$              ;IF NO ERROR HERE, PROCEED
5473 030434                             ERROR                   ;ELSE, REPORT IT
     030434  104460                                                                 TRAP    C$ERROR
5474 030436                             ESCAPE  TST             ;       & QUIT
     030436  104410                                                                 TRAP    C$ESCAPE
     030440  000054                                                                 .WORD   L10067-.
5475
5476 030442  004737  003762     5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
5477 030446  103003                     BCC     10$             ;IF NO ERROR HERE, PROCEED
5478 030450                             ERROR                   ;ELSE, REPORT IT
     030450  104460                                                                 TRAP    C$ERROR
5479 030452                             ESCAPE  TST             ;       & QUIT
     030452  104410                                                                 TRAP    C$ESCAPE
     030454  000040                                                                 .WORD   L10067-.
5480
5481 030456  004537  004064     10$:    JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "SR"
5482 030462  120012                     SR                      ;       (IT SHOULDN'T HAVE CHANGED)
5483 030464  002312                     BDATA
5484
5485 030466  123737  002310  002312     CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
5486 030474  001407                     BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
5487 030476  012737  000012  002334     MOV     #SR&<17>,REGNUM ;NO!    BUILD REGISTER # POINTER
```

H12

Q 0137

SEQ 0150

TEST 23 -- VIA'S SR MASTER CLEAR TEST

```
 5488 030504                                GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                    ;       "DEVICE FATAL" ERROR # 46
      030504  104455                                                                   TRAP    C$ERDF
      030506  000056                                                                   .WORD   46
      030510  014515                                                                   .WORD   EM5
      030512  006612                                                                   .WORD   ERR7
 5489
 5490 030514                          32$:  ENDTST
      030514                                                                L10067:
      030514  104401                                                                   TRAP    C$ETST
```

```
5501                                    .SBTTL TEST 24 -- VIA'S ACR MASTER CLEAR TEST

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 24 -- VIA'S ACR MASTER CLEAR TEST
                                        ;*
                                        ;*      ACR == "AUXILIARY CONTROL REGISTER"
                                        ;*
                                        ;* A 252 BYTE IS WRITTEN INTO ACR AND THE REGISTER IS READ BACK AND CHECKED
                                        ;* FOR 252. THEN, A MASTER CLEAR IS PERFORMED AND ACR IS READ AND CHECKED FOR
                                        ;* 000, TO VERIFY THAT IT IS CLEARED BY MASTER CLEAR.
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
    030516                                                                              T24::
5502
5503 030516  004737  003762                     JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5504 030522  103003                             BCC     1$              ;IF AN ERROR OCCURED,
5505 030524                                     ERROR                   ;REPORT IT &
     030524  104460                                                                     TRAP    C$ERROR
5506 030526                                     ESCAPE  TST             ;  EXIT
     030526  104410                                                                     TRAP    C$ESCAPE
     030530  000114                                                                     .WORD   L10070-.
5507
5508 030532  012737  000252  002310  1$:       MOV     #252,GDATA      ;SETUP FOR CALL TO STREG
5509 030540  013737  002310  002306            MOV     GDATA,TDATA
5510 030546  012700  120013                     MOV     #ACR,R0
5511
5512                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "ACR"
5513
5514 030552  004737  005034                     JSR     PC,STREG        ;LOAD & TEST "ACR"
5515 030556  103003                             BCC     5$              ;IF NO ERROR HERE, PROCEED
5516 030560                                     ERROR                   ;ELSE, REPORT IT
     030560  104460                                                                     TRAP    C$ERROR
5517 030562                                     ESCAPE  TST             ;       & QUIT
     030562  104410                                                                     TRAP    C$ESCAPE
     030564  000060                                                                     .WORD   L10070-.
5518
5519 030566  004737  003762          5$:        JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
5520 030572  103003                             BCC     10$             ;IF NO ERROR HERE, PROCEED
5521 030574                                     ERROR                   ;ELSE, REPORT IT
     030574  104460                                                                     TRAP    C$ERROR
5522 030576                                     ESCAPE  TST             ;       & QUIT
     030576  104410                                                                     TRAP    C$ESCAPE
     030600  000044                                                                     .WORD   L10070-.
5523
5524 030602  005037  002310          10$:       CLR     GDATA           ;FOR TESTING PURPOSES LATER
5525 030606  004537  004064                     JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "ACR"
5526 030612  120013                             ACR
5527 030614  002312                             BDATA
5528
5529 030616  123737  002310  002312            CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
5530 030624  001407                             BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
5531 030626  012737  000013  002334            MOV     #ACR&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
5532 030634                                     GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                        ;       "DEVICE FATAL" ERROR # 47
```

J12

Q 0139

SEQ 0152

TEST 24 -- VIA'S ACR MASTER CLEAR TEST

```
        030634  104455                                          TRAP    C$ERDF
        030636  000057                                          .WORD   47
        030640  014515                                          .WORD   EM5
        030642  006612                                          .WORD   ERR7
   5533
   5534 030644                          32$:    ENDTST
        030644                                          L10070:
        030644  104401                                          TRAP    C$ETST
```

```
5545                                    .SBTTL TEST 25 -- VIA'S PCR MASTER CLEAR TEST

                                        ;+*****************************************************************************
                                        ;*
                                        ;*      TEST 25 -- VIA'S PCR MASTER CLEAR TEST
                                        ;*
                                        ;*      PCR == "PERIPHERAL CONTROL REGISTER"
                                        ;*
                                        ;* A 377 BYTE IS WRITTEN INTO PCR AND THE REGISTER IS READ BACK AND CHECKED
                                        ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND PCR IS READ AND CHECKED FOR
                                        ;* 000.
                                        ;*
                                        ;--*****************************************************************************
                                        ;
                                        ;       BGNTST
    030646                                                                              T25::
5546
5547 030646  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5548 030652  103003                            BCC     1$              ;IF AN ERROR OCCURED,
5549 030654                                    ERROR                   ;REPORT IT &
     030654  104460                                                                     TRAP    C$ERROR
5550 030656                                    ESCAPE  TST             ;  EXIT
     030656  104410                                                                     TRAP    C$ESCAPE
     030660  000114                                                                     .WORD   L10071-.
5551
5552 030662  012737  000377  002310  1$:      MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
5553 030670  013737  002310  002306          MOV     GDATA,TDATA
5554 030676  012700  120014                    MOV     #PCR,R0
5555
5556                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "PCR"
5557
5558 030702  004737  005034                    JSR     PC,STREG        ;LOAD & TEST "PCR"
5559 030706  103003                            BCC     5$              ;IF NO ERROR HERE, PROCEED
5560 030710                                    ERROR                   ;ELSE, REPORT IT
     030710  104460                                                                     TRAP    C$ERROR
5561 030712                                    ESCAPE  TST             ;       & QUIT
     030712  104410                                                                     TRAP    C$ESCAPE
     030714  000060                                                                     .WORD   L10071-.
5562
5563 030716  004737  003762          5$:       JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
5564 030722  103003                            BCC     10$             ;IF NO ERROR HERE, PROCEED
5565 030724                                    ERROR                   ;ELSE, REPORT IT
     030724  104460                                                                     TRAP    C$ERROR
5566 030726                                    ESCAPE  TST             ;       & QUIT
     030726  104410                                                                     TRAP    C$ESCAPE
     030730  000044                                                                     .WORD   L10071-.
5567
5568 030732  005037  002310          10$:      CLR     GDATA           ;FOR TESTING PURPOSES LATER
5569 030736  004537  004064                    JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "PCR"
5570 030742  120014                            PCR
5571 030744  002312                            BDATA
5572
5573 030746  123737  002310  002312          CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
5574 030754  001407                            BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
5575 030756  012737  000014  002334          MOV     #PCR&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
5576 030764                                    GEDF    EMS,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                        ;       "DEVICE FATAL" ERROR # 48
```

TEST 25 -- VIA'S PCR MASTER CLEAR TEST

```
        030764  104455                                          TRAP    C$ERDF
        030766  000060                                          .WORD   48
        030770  014515                                          .WORD   EM5
        030772  006612                                          .WORD   ERR7
   5577
   5578 030774                          32$:    ENDTST
        030774                                                  L10071:
        030774  104401                                          TRAP    C$ETST
```

```
5589                                    .SBTTL TEST 26 -- VIA'S IER MASTER CLEAR TEST

                                        ;+**********************************************************************
                                        ;*
                                        ;*      TEST 26 -- VIA'S IER MASTER CLEAR TEST
                                        ;*
                                        ;*      IER == "INTERRUPT ENABLE REGISTER"
                                        ;*
                                        ;* A 377 BYTE IS WRITTEN INTO IER AND THE REGISTER IS READ BACK AND CHECKED
                                        ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND IER IS READ AND CHECKED FOR
                                        ;* 200.
                                        ;*
                                        ;--**********************************************************************
                                        ;
                                        ;       BGNTST
     030776                                                                     T26::
5590
5591 030776  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5592 031002  103003                            BCC     1$              ;IF AN ERROR OCCURED,
5593 031004                                    ERROR                   ;REPORT IT &
     031004  104460                                                             TRAP    C$ERROR
5594 031006                                    ESCAPE  TST             ;  EXIT
     031006  104410                                                             TRAP    C$ESCAPE
     031010  000122                                                             .WORD   L10072-.
5595
5596 031012  105077  151334          1$:       CLRB    @#BSELO         ;MAKE SURE NO Q-BUS INTERRUPTS RESULT FROM
5597                                                                    ;       TESTING THE IER REGISTER
5598 031016  012737  000377  002310            MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
5599 031024  013737  002310  002306            MOV     GDATA,TDATA
5600 031032  012700  120016                    MOV     #IENR,R0
5601
5602                                    ;  NOW WE'LL USE "STREG" TO SET & CHECK "IER"
5603
5604 031036  004737  005034                    JSR     PC,STREG        ;LOAD & TEST "IER"
5605 031042  103003                            BCC     5$              ;IF NO ERROR HERE, PROCEED
5606 031044                                    ERROR                   ;ELSE, REPORT IT
     031044  104460                                                             TRAP    C$ERROR
5607 031046                                    ESCAPE  TST             ;       & QUIT
     031046  104410                                                             TRAP    C$ESCAPE
     031050  000062                                                             .WORD   L10072-.
5608
5609 031052  004737  003762          5$:       JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAT IN M-LOOP)
5610 031056  103003                            BCC     10$             ;IF NO ERROR HERE, PROCEED
5611 031060                                    ERROR                   ;ELSE, REPORT IT
     031060  104460                                                             TRAP    C$ERROR
5612 031062                                    ESCAPE  TST             ;       & QUIT
     031062  104410                                                             TRAP    C$ESCAPE
     031064  000046                                                             .WORD   L10072-.
5613
5614 031066  012737  000200  002310  10$:     MOV     #200,GDATA      ;FOR TESTING PURPOSES LATER
5615 031074  004537  004064                    JSR     R5,READ         ;NOW READ THE "RESET" VALUE OF "IER"
5616 031100  120016                            IENR
5617 031102  002312                            BDATA
5618
5619 031104  123737  002310  002312            CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
5620 031112  001407                            BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
5621 031114  012737  000016  002334            MOV     #IENR&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
```

TEST 26 -- VIA'S IER MASTER CLEAR TEST

```
   5622 031122                                  GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
                                                                        ;       "DEVICE FATAL" ERROR # 49
        031122  104455                                                                  TRAP    C$ERDF
        031124  000061                                                                  .WORD   49
        031126  014515                                                                  .WORD   EM5
        031130  006612                                                                  .WORD   ERR7
   5623
   5624 031132                          32$:    ENDTST
        031132                                                          L10072:
        031132  104401                                                                  TRAP    C$ETST
   5625
```

```
5672                                  .SBTTL TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

                                      ;**********************************************************************
                                      ;*
                                      ;*      TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE
                                      ;*
                                      ;* THIS TEST VERIFIES THAT THE TIMER 1 COUNTER IS OPERATIONAL IN ONE-SHOT
                                      ;* MODE, IN EACH OF TWO SUBTESTS.
                                      ;*
                                      ;* IN THE FIRST SUBTEST, THE FOLLOWING IS PERFORMED :
                                      ;*
                                      ;*    A  MASTER  CLEAR IS DONE AND THE TIMER IS PLACED IN ONE-SHOT MODE BY
                                      ;*    SETTING BOTH ACR7 & ACR6 TO 0.
                                      ;*
                                      ;*    THE  PROGRAM  CHECKS  FOR  THE  "T1"  FLAG  (BIT 6) IN THE IFR TO BE
                                      ;*    INITIALLY CLEARED.
                                      ;*
                                      ;*    T1L-L  (ADR  04)  & T1C-H (ADR 05) ARE BOTH LOADED WITH 252 (OCTAL).
                                      ;*    (THIS  IS  EQUIVALENT  TO  AAAA  (HEX) OR 43,690 (DECIMAL).) LOADING
                                      ;*    T1C-H STARTS THE COUNTER.
                                      ;*
                                      ;*    THE  PROGRAM  PERIODICALLY  CHECKS  THE COUNTER TO VERIFY THAT IT IS
                                      ;*    DECREMENTING  AND THAT IT EVENTUALLY UNDERFLOWS PAST 0 AND CONTINUES
                                      ;*    TO  DECREMENT.
                                      ;*
                                      ;*    T1L-L  (ADR  04)  IS LOADED WITH 001 & T1C-H (ADR 05) IS LOADED WITH
                                      ;*    000  IN  ORDER TO SET "T1" WITH A QUICK UNDERFLOW. THE "T1" FLAG BIT
                                      ;*    IN IFR IS READ AND CHECKED TO BE SET.
                                      ;*
                                      ;*    T1C-H, T1L-L, & T1L-H (ADDR'S 05, 06, & 07 RESP.) ARE READ AND AFTER
                                      ;*    EACH THE "T1" INTERRUPT FLAG IS CHECKED TO BE STILL SET.
                                      ;*
                                      ;*    T1C-L (ADDR 04) IS READ AND "T1" IS CHECKED TO BE CLEARED.
                                      ;*
                                      ;*    T1C-H  IS  LOADED  WITH  0 AGAIN TO INITIATE A NEW COUNT DOWN (WHICH
                                      ;*    SHOULD  UNDERFLOW  ALMOST  IMMEDIATELY)  AND  THE "T1" BIT IN IFR IS
                                      ;*    CHECKED TO BE SET AGAIN.
                                      ;*
                                      ;*    T1L-L IS LOADED WITH 125 (OCTAL) AND "T1" BIT IS CHECKED TO BE STILL
                                      ;*    SET.
                                      ;*
                                      ;*    T1C-H IS LOADED WITH 125, AND THE "T1" BIT IS READ AND CHECKED TO BE
                                      ;*    CLEARED BY THE LOADING OF T1C-H.
                                      ;*
                                      ;*
                                      ;*  IN THE SECOND SUBTEST,  ALL OF THE ABOVE OPERATIONS ARE REPEATED,
                                      ;*    WITH ACR BIT 7 SET TO 1, AND ACR BIT 6 SET TO 0. "PB7" (BIT 7 OF ORB)
                                      ;*    WILL BE MONITORED FOR ITS EXPECTED LEVELS DURING THIS SUBTEST.
                                      ;*
                                      ;**********************************************************************
                                      ;
                                      ;       BGNTST
        031134                                                               T27::
5673    031134                                  BGNSUB
        031134                                                               T27.1:
        031134  104402                                                              TRAP    C$BSUB
5674                                  ;----------------------------------------------------------------------
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
5675
5676 031136  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
5677 031142  103003                  BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
5678 031144                          ERROR                   ;ELSE, REPORT ERROR
     031144  104460                                                  TRAP    C$ERROR
5679 031146                          ESCAPE  TST             ;   & EXIT TEST
     031146  104410                                                  TRAP    C$ESCAPE
     031150  004742                                                  .WORD   L10073-.
5680 031152  004537  004660    1$:   JSR     R5,INITT1       ;INITIALIZE TIMER # 1
5681 031156  000000                  0                       ;       0 ==> LATCHES
5682 031160  000000                  0                       ;       MODE 0 & "T1" INT. ENABLE FLAG CLEARED
5683 031162  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5684 031164                          ERROR                   ;ELSE, REPORT IT
     031164  104460                                                  TRAP    C$ERROR
5685 031166                          ESCAPE  TST             ;       AND EXIT THIS TEST
     031166  104410                                                  TRAP    C$ESCAPE
     031170  004722                                                  .WORD   L10073-.
5686 031172  004737  036146          JSR     PC,GETT1        ;IS "T1" SET?
5687 031176  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
5688 031200                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     031200  104410                                                  TRAP    C$ESCAPE
     031202  002202                                                  .WORD   L10074-.
5689 031204  103143                  BCC     6$              ;NO, GOOD.
5690 031206  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
5691 031212  120004                  T1CL
5692 031214  002450                  TMP4
5693 031216  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5694 031220                          ERROR                   ;ELSE, REPORT IT
     031220  104460                                                  TRAP    C$ERROR
5695 031222                          ESCAPE  TST             ;       AND EXIT THIS TEST
     031222  104410                                                  TRAP    C$ESCAPE
     031224  004666                                                  .WORD   L10073-.
5696 031226  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
5697 031232  120005                  T1CH
5698 031234  002452                  TMP5
5699 031236  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5700 031240                          ERROR                   ;ELSE, REPORT IT
     031240  104460                                                  TRAP    C$ERROR
5701 031242                          ESCAPE  TST             ;       AND EXIT THIS TEST
     031242  104410                                                  TRAP    C$ESCAPE
     031244  004646                                                  .WORD   L10073-.
5702 031246  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
5703 031252  120006                  T1LL
5704 031254  002454                  TMP6
5705 031256  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5706 031260                          ERROR                   ;ELSE, REPORT IT
     031260  104460                                                  TRAP    C$ERROR
5707 031262                          ESCAPE  TST             ;       AND EXIT THIS TEST
     031262  104410                                                  TRAP    C$ESCAPE
     031264  004626                                                  .WORD   L10073-.
5708 031266  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
5709 031272  120007                  T1CH
5710 031274  002456                  TMP7
5711 031276  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5712 031300                          ERROR                   ;ELSE, REPORT IT
     031300  104460                                                  TRAP    C$ERROR
5713 031302                          ESCAPE  TST             ;       AND EXIT THIS TEST
```

TEST 27 - VIA TIMER # 1 ONE-SHOT MODE

```
                031302  104410                                                          TRAP    C$ESCAPE
                031304  004606                                                          .WORD   L10073-.
     5714       031306  004537  004064          JSR     R5,READ         ;GET ACR FOR ERROR MESSAGE
     5715       031312  120013                  ACR
     5716       031314  002466                  TMPB
     5717       031316  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
     5718       031320                          ERROR                   ;ELSE, REPORT IT
                031320  104460                                                          TRAP    C$ERROR
     5719       031322                          ESCAPE  TST             ;       AND EXIT THIS TEST
                031322  104410                                                          TRAP    C$ESCAPE
                031324  004566                                                          .WORD   L10073-.
     5720       031326                          GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED & INIT.
                                                                         ;       "DEVICE FATAL" ERROR # 50
                031326  104455                                                          TRAP    C$ERDF
                031330  000062                                                          .WORD   50
                031332  016067                                                          .WORD   EM50A
                031334  010762                                                          .WORD   ERR50
     5721       031336                          PRINTX  #FMT50M         ;  & SAY THE COUNTERS HAVEN'T BEEN LOADED YET!
                031336  012746  013174                                                  MOV     #FMT50M,-(SP)
                031342  012746  000001                                                  MOV     #1,-(SP)
                031346  010600                                                          MOV     SP,R0
                031350  104415                                                          TRAP    C$PNTX
                031352  062706  000004                                                  ADD     #4,SP
     5722
     5723                               ;-----------------------------------------------------------------------
     5724
     5725       031356  112737  000002  002453  MOVB    #2,TMP5+1
     5726       031364  004537  004310          JSR     R5,WRITE        ;INIT TIMER # 1 BY WRITING INTO
     5727       031370  120005                  T1CH                    ;T1C-H (ADDR 05)
     5728       031372  002453                  TMP5+1
     5729       031374  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
     5730       031376                          ERROR                   ;ELSE, REPORT IT
                031376  104460                                                          TRAP    C$ERROR
     5731       031400                          ESCAPE  TST             ;       AND EXIT THIS TEST
                031400  104410                                                          TRAP    C$ESCAPE
                031402  004510                                                          .WORD   L10073-.
     5732       031404  004737  036146          JSR     PC,GETT1        ;IS "T1" SET?
     5733       031410  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
     5734       031412                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED    EXIT
                031412  104410                                                          TRAP    C$ESCAPE
                031414  001770                                                          .WORD   L10074-.
     5735       031416  103036                  BCC     6$              ;NO, GOOD.
     5736       031420  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
     5737       031424  120004                  T1CL
     5738       031426  002450                  TMP4
     5739       031430  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
     5740       031432                          ERROR                   ;ELSE, REPORT IT
                031432  104460                                                          TRAP    C$ERROR
     5741       031434                          ESCAPE  TST             ;       AND EXIT THIS TEST
                031434  104410                                                          TRAP    C$ESCAPE
                031436  004454                                                          .WORD   L10073-.
     5742       031440  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
     5743       031444  120005                  T1CH
     5744       031446  002452                  TMP5
     5745       031450  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
     5746       031452                          ERROR                   ;ELSE, REPORT IT
                031452  104460                                                          TRAP    C$ERROR
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
5747 031454                              ESCAPE  TST             ;       AND EXIT THIS TEST
     031454  104410                                                                  TRAP    C$ESCAPE
     031456  004434                                                                  .WORD   L10073-.
5748 031460  004537  004064              JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
5749 031464  120007                      T1LH
5750 031466  002456                      TMP7
5751 031470  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
5752 031472                              ERROR                   ;ELSE, REPORT IT
     031472  104460                                                                  TRAP    C$ERROR
5753 031474                              ESCAPE  TST             ;       AND EXIT THIS TEST
     031474  104410                                                                  TRAP    C$ESCAPE
     031476  004414                                                                  .WORD   L10073-.
5754 031500                              GEDF    EM50B,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
                                                                 ;       "DEVICE FATAL" ERROR # 51
     031500  104455                                                                  TRAP    C$ERDF
     031502  000063                                                                  .WORD   51
     031504  016135                                                                  .WORD   EM50B
     031506  010762                                                                  .WORD   ERR50
5755 031510                              ESCAPE  SUB             ;AND EXIT SUBTEST
     031510  104410                                                                  TRAP    C$ESCAPE
     031512  001672                                                                  .WORD   L10074-.
5756
5757                             ;-------------------------------------------------------------------------
5758
5759 031514  004537  004064      6$:     JSR     R5,READ         ;GET ACR FOR LATER ERROR MESSAGES
5760 031520  120013                      ACR
5761 031522  002466                      TMPB
5762 031524  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
5763 031526                              ERROR                   ;ELSE, REPORT IT
     031526  104460                                                                  TRAP    C$ERROR
5764 031530                              ESCAPE  TST             ;       AND EXIT THIS TEST
     031530  104410                                                                  TRAP    C$ESCAPE
     031532  004360                                                                  .WORD   L10073-.
5765 031534  112737  000377  002445      MOVB    #377,TMP2+1     ;INITIALIZE ORB FOR INPUT/OUTPUT
5766 031542  004537  004310              JSR     R5,WRITE
5767 031546  120002                      DDRB
5768 031550  002445                      TMP2+1
5769 031552  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
5770 031554                              ERROR                   ;ELSE, REPORT IT
     031554  104460                                                                  TRAP    C$ERROR
5771 031556                              ESCAPE  TST             ;       AND EXIT THIS TEST
     031556  104410                                                                  TRAP    C$ESCAPE
     031560  004332                                                                  .WORD   L10073-.
5772 031562  112737  000377  002441      MOVB    #377,TMP0+1     ;SETUP VALUE FOR ORB
5773 031570  004537  004310              JSR     R5,WRITE        ;DO IT
5774 031574  120000                      ORB
5775 031576  002441                      TMP0+1
5776 031600  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
5777 031602                              ERROR                   ;ELSE, REPORT IT
     031602  104460                                                                  TRAP    C$ERROR
5778 031604                              ESCAPE  TST             ;       AND EXIT THIS TEST
     031604  104410                                                                  TRAP    C$ESCAPE
     031606  004304                                                                  .WORD   L10073-.
5779 031610  004537  036114              JSR     R5,LODT1C       ;LOAD TIMER # 1
5780 031614     252              7$:     .BYTE   252
5781 031615     252              8$:     .BYTE   252
5782
```

```
5783                                    ;-----------------------------------------------------------------------
5784
5785 031616  004737  036332                    JSR     PC,GETPB7       ;GET "PB7".  IS IT SET?
5786 031622  102002                            BVC     .+6             ;IF NO ERROR, PROCEED
5787 031624                             ESCAPE  SUB                     ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     031624  104410                                                                    TRAP    C$ESCAPE
     031626  001556                                                                    .WORD   L10074-.
5788 031630  103404                            BCS     9$              ;IT IS.  (SET BY LOADING DDR8 & ORB ABOVE)
5789 031632                                    GEDF    EM50W,ERR1      ;IF NOT, TIMER 1 CLEARED IT!!!
                                                                       ;       "DEVICE FATAL" ERROR # 52
     031632  104455                                                                    TRAP    C$ERDF
     031634  000064                                                                    .WORD   52
     031636  017305                                                                    .WORD   EM50W
     031640  005276                                                                    .WORD   ERR1
5790 031642  004737  036204         9$:        JSR     PC,KICKT1       ;IT TAKES SO MUCH TIME TO CHECK FOR (& MAYBE
5791                                                                   ;  EVEN REPORT) THIS ERROR THAT WE SHOULD
5792                                                                   ;  KICK OFF THE TIMER AGAIN
5793 031646  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
5794 031650                                    ERROR                   ;ELSE, REPORT IT
     031650  104460                                                                    TRAP    C$ERROR
5795 031652                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     031652  104410                                                                    TRAP    C$ESCAPE
     031654  004236                                                                    .WORD   L10073-.
5796 031656  000240                            NOP                     ;
5797 031660  000240                            NOP                     ;NOW WAIT A LITTLE WHILE -- LET T1CL CHANGE
5798 031662  000240                            NOP                     ;
5799 031664  004537  004064                    JSR     R5,READ         ;READ THE LOW COUNTER
5800 031670  120004                            T1CL
5801 031672  002450                            TMP4
5802 031674  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
5803 031676                                    ERROR                   ;ELSE, REPORT IT
     031676  104460                                                                    TRAP    C$ERROR
5804 031700                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     031700  104410                                                                    TRAP    C$ESCAPE
     031702  004210                                                                    .WORD   L10073-.
5805 031704  123737  002450  031614          CMPB    TMP4,7$         ;MAKE SURE THE COUNTER IS DECREMENTING
5806 031712  001024                            BNE     12$             ;IT IS, NOW SEE IF THE HIGH COUNTER IS TOO
5807 031714  004537  004064                    JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
5808 031720  120005                            T1CH
5809 031722  002452                            TMP5
5810 031724  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
5811 031726                                    ERROR                   ;ELSE, REPORT IT
     031726  104460                                                                    TRAP    C$ERROR
5812 031730                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     031730  104410                                                                    TRAP    C$ESCAPE
     031732  004160                                                                    .WORD   L10073-.
5813 031734  004537  004064                    JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
5814 031740  120006                            T1LL
5815 031742  002454                            TMP6
5816 031744  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
5817 031746                                    ERROR                   ;ELSE, REPORT IT
     031746  104460                                                                    TRAP    C$ERROR
5818 031750                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     031750  104410                                                                    TRAP    C$ESCAPE
     031752  004140                                                                    .WORD   L10073-.
5819 031754                                    GEDF    EM50D,ERR50     ;IT WASN'T -- REPORT THE ERROR
                                                                       ;       "DEVICE FATAL" ERROR # 53
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
                031754  104455                                                          TRAP    C$ERDF
                031756  000065                                                          .WORD   53
                031760  016251                                                          .WORD   EM50D
                031762  010762                                                          .WORD   ERR50
 5820           031764  012703  000100          12$:    MOV     #100,R3         ;INIT. TIMEOUT VALUE
 5821           031770  004537  004064          13$:    JSR     R5,READ         ;READ THE HIGH COUNTER
 5822           031774  120005                  T1CH
 5823           031776  002452                  TMP5
 5824           032000  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 5825           032002                          ERROR                   ;ELSE, REPORT IT
                032002  104460                                                          TRAP    C$ERROR
 5826           032004                          ESCAPE  TST             ;       AND EXIT THIS TEST
                032004  104410                                                          TRAP    C$ESCAPE
                032006  004104                                                          .WORD   L10073-.
 5827           032010  123737  002452  031615          CMPB    TMP5,8$         ;DID IT CHANGE FROM THE LOADED VALUE?
 5828           032016  001037                  BNE     17$             ;YES, PROCEED WITH TESTING
 5829           032020  077315                  SOB     R3,13$          ;NO,  IF NO TIMEOUT, TRY AGAIN
 5830           032022  004537  004064          JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
 5831           032026  120015                  IFR
 5832           032030  002472                  TMPD
 5833           032032  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 5834           032034                          ERROR                   ;ELSE, REPORT IT
                032034  104460                                                          TRAP    C$ERROR
 5835           032036                          ESCAPE  TST             ;       AND EXIT THIS TEST
                032036  104410                                                          TRAP    C$ESCAPE
                032040  004052                                                          .WORD   L10073-.
 5836           032042  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
 5837           032046  120006                  T1LL
 5838           032050  002454                  TMP6
 5839           032052  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 5840           032054                          ERROR                   ;ELSE, REPORT IT
                032054  104460                                                          TRAP    C$ERROR
 5841           032056                          ESCAPE  TST             ;       AND EXIT THIS TEST
                032056  104410                                                          TRAP    C$ESCAPE
                032060  004032                                                          .WORD   L10073-.
 5842           032062  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
 5843           032066  120007                  T1LH
 5844           032070  002456                  TMP7
 5845           032072  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 5846           032074                          ERROR                   ;ELSE, REPORT IT
                032074  104460                                                          TRAP    C$ERROR
 5847           032076                          ESCAPE  TST             ;       AND EXIT THIS TEST
                032076  104410                                                          TRAP    C$ESCAPE
                032100  004012                                                          .WORD   L10073-.
 5848           032102                          GEDF    EM50E,ERR50     ;ELSE, REPORT THAT HIGH COUNTER ISN'T RUNNING
                                                                        ;       "DEVICE FATAL" ERROR # 54
                032102  104455                                                          TRAP    C$ERDF
                032104  000066                                                          .WORD   54
                032106  016305                                                          .WORD   EM50E
                032110  010762                                                          .WORD   ERR50
 5849           032112                          ESCAPE  SUB             ;IN THAT CASE, WE CAN'T PROCEED WITH TESTING EITHER
                032112  104410                                                          TRAP    C$ESCAPE
                032114  001270                                                          .WORD   L10074-.
 5850                                   ;-------------------------------------------------------------------------
 5851
 5852           032116  112737  000377  002445  17$:    MOVB    #377,IMP2+1     ;INITIALIZE ORB FOR INPUT/OUTPUT
 5853           032124  004537  004310                  JSR     R5,WRITF
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
5854 032130  120002                          DDRB
5855 032132  002445                          TMP2+1
5856 032134  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
5857 032136                                  ERROR                   ;ELSE, REPORT IT
     032136  104460                                                                  TRAP    C$ERROR
5858 032140                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     032140  104410                                                                  TRAP    C$ESCAPE
     032142  003750                                                                  .WORD   L10073-.
5859 032144  023737  002440  002441         CMP     TMP0,TMP0+1     ;CLEAR PB7 BY WRITING INTO ORB
5860 032152  004537  004322                 JSR     R5,WRITEI
5861 032156  120000                          ORB
5862 032160  000030                          30                      ;  (THIS CLEARS DTR & RTS! ALSO)
5863 032162  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
5864 032164                                  ERROR                   ;ELSE, REPORT IT
     032164  104460                                                                  TRAP    C$ERROR
5865 032166                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     032166  104410                                                                  TRAP    C$ESCAPE
     032170  003722                                                                  .WORD   L10073-.
5866 032172  004537  036114                 JSR     R5,LODT1C       ;RE-LOAD TIMER # 1 WITH A VALUE WHICH CAUSE AN
5867 032176     001          18$:    .BYTE   1                       ;ALMOST IMMEDIATE TIMEOUT
5868 032177     000          19$:    .BYTE   0                       ; (ADDRESS OF HIGH BYTE FOR T1C-H (ADDR 05))
5869                         ;-------------------------------------------------------------------------
5870
5871 032200  004737  036146                 JSR     PC,GETT1        ;WAS "T1" SET BY THE ABOVE OPERATION?
5872 032204  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
5873 032206                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     032206  104410                                                                  TRAP    C$ESCAPE
     032210  001174                                                                  .WORD   L10074-.
5874 032212  103426                  BCS     20$             ;YES, OK -- CONTINUE ERROR CHECKING
5875 032214  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
5876 032220  120006                  T1LL
5877 032222  002454                  TMP6
5878 032224  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5879 032226                          ERROR                   ;ELSE, REPORT IT
     032226  104460                                                          TRAP    C$ERROR
5880 032230                          ESCAPE  TST             ;       AND EXIT THIS TEST
     032230  104410                                                          TRAP    C$ESCAPE
     032232  003660                                                          .WORD   L10073-.
5881 032234  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
5882 032240  120007                  T1LH
5883 032242  002456                  TMP7
5884 032244  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
5885 032246                          ERROR                   ;ELSE, REPORT IT
     032246  104460                                                          TRAP    C$ERROR
5886 032250                          ESCAPE  TST             ;       AND EXIT THIS TEST
     032250  104410                                                          TRAP    C$ESCAPE
     032252  003640                                                          .WORD   L10073 .
5887 032254                          GERDF   EM50F,ERR50     ;NO,  BAD NEWS!  REPORT THE FAILURE
                                                             ;       "DEVICE FATAL" ERROR # 55
     032254  104455                                                          TRAP    C$ERDF
     032256  000067                                                          .WORD   55
     032260  016341                                                          .WORD   EM50F
     032262  010762                                                          .WORD   ERR50
5888 032264                          ESCAPE  SUB             ;  AND GET OUT OF SUBTEST
     032264  104410                                                          TRAP    C$ESCAPE
     032266  001116                                                          .WORD   L10074-.
5889 032270  004737  036332  20$:    JSR     PC,GETPB7       ;GET "PB7".  IS IT CLEARED?
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
5890 032274  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
5891 032276                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     032276  104410                                                    TRAP    C$ESCAPE
     032300  001104                                                    .WORD   L10074-.
5892 032302  103024                    BCC     40$             ;IF CLEARED, ODRB IS STILL IN CONTROL OF IT
5893 032304  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
5894 032310  120006                    T1LL
5895 032312  002454                    TMP6
5896 032314  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
5897 032316                            ERROR                   ;ELSE, REPORT IT
     032316  104460                                                    TRAP    C$ERROR
5898 032320                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032320  104410                                                    TRAP    C$ESCAPE
     032322  003570                                                    .WORD   L10073-.
5899 032324  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
5900 032330  120007                    T1LH
5901 032332  002456                    TMP7
5902 032334  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
5903 032336                            ERROR                   ;ELSE, REPORT IT
     032336  104460                                                    TRAP    C$ERROR
5904 032340                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032340  104410                                                    TRAP    C$ESCAPE
     032342  003550                                                    .WORD   L10073-.
5905 032344                            GEDF    EM50W,ERR50     ;ELSE, IT'S BEING SET BY TIMER 1 IN MODE 0!
                                                               ;       "DEVICE FATAL" ERROR # 56
     032344  104455                                                    TRAP    C$ERDF
     032346  000070                                                    .WORD   56
     032350  017305                                                    .WORD   EM50W
     032352  010762                                                    .WORD   ERR50
5906 032354  004537  004064    40$:    JSR     R5,READ         ;READ T1C-H (ADDR 05) TO SEE IF THIS CLEARS "T1"
5907 032360  120005                    T1CH                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
5908 032362  002452                    TMP5                    ; ALMOST ANYTHING)
5909 032364  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
5910 032366                            ERROR                   ;ELSE, REPORT IT
     032366  104460                                                    TRAP    C$ERROR
5911 032370                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032370  104410                                                    TRAP    C$ESCAPE
     032372  003520                                                    .WORD   L10073-.
5912 032374  004737  036146            JSR     PC,GETT1        ;PUT THE CURRENT "T1" VALUE INTO THE CARRY BIT
5913 032400  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
5914 032402                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     032402  104410                                                    TRAP    C$ESCAPE
     032404  001000                                                    .WORD   L10074-.
5915 032406  103425                    BCS     21$             ;IF SET, READING T1CH DIDN'T CLEAR IT -- OK!
5916 032410  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
5917 032414  120006                    T1LL
5918 032416  002454                    TMP6
5919 032420  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
5920 032422                            ERROR                   ;ELSE, REPORT IT
     032422  104460                                                    TRAP    C$ERROR
5921 032424                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032424  104410                                                    TRAP    C$ESCAP.
     032426  003464                                                    .WORD   L10073-.
5922 032430  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
5923 032434  120007                    T1LH
5924 032436  002456                    TMP7
5925 032440  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
```

```
5926 032442                               ERROR                       ;ELSE, REPORT IT
     032442  104460                                                                        TRAP    C$ERROR
5927 032444                               ESCAPE   TST                ;       AND EXIT THIS TEST
     032444  104410                                                                        TRAP    C$ESCAPE
     032446  003444                                                                        .WORD   L10073-.
5928 032450                               GEDF     EM50G,ERR50        ;IF CLEARED!  BAD VIA CHIP!
                                                                      ;       "DEVICE FATAL" ERROR # 57
     032450  104455                                                                        TRAP    C$ERDF
     032452  000071                                                                        .WORD   57
     032454  016406                                                                        .WORD   EM50G
     032456  010762                                                                        .WORD   ERR50
5929 032460  000507                       BR       28$                ;BYPASS THE REST OF THIS SECTION OF TESTING
5930
5931 032462  004537  004064       21$:    JSR      R5,READ            ;READ T1L-L (ADDR 06)
5932 032466  120006                       T1LL
5933 032470  002454                       TMP6                        ;THIS SHOULD RETURN A 001
5934 032472  103003                       BCC      .+10               ;IF NO ERROR, PROCEED
5935 032474                               ERROR                       ;ELSE, REPORT IT
     032474  104460                                                                        TRAP    C$ERROR
5936 032476                               ESCAPE   TST                ;       AND EXIT THIS TEST
     032476  104410                                                                        TRAP    C$ESCAPE
     032500  003412                                                                        .WORD   L10073-.
5937 032502  123737  002454  032176       CMPB     TMP6,18$           ;CHECK T1L-L (ADDR 06) AGAINST LOADED VALUE
5938 032510  001415                       BEQ      23$                ;IF SAME, PROCEED
5939 032512  004537  004064               JSR      R5,READ            ;GET T1LH FOR ERROR MESSAGE
5940 032516  120007                       T1LH
5941 032520  002456                       TMP7
5942 032522  103003                       BCC      .+10               ;IF NO ERROR, PROCEED
5943 032524                               ERROR                       ;ELSE, REPORT IT
     032524  104460                                                                        TRAP    C$ERROR
5944 032526                               ESCAPE   TST                ;       AND EXIT THIS TEST
     032526  104410                                                                        TRAP    C$ESCAPE
     032530  003362                                                                        .WORD   L10073-.
5945 032532                               GEDF     EM50H,ERR50        ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
                                                                      ;       "DEVICE FATAL" ERROR # 58
     032532  104455                                                                        TRAP    C$ERDF
     032534  000072                                                                        .WORD   58
     032536  016450                                                                        .WORD   EM50H
     032540  010762                                                                        .WORD   ERR50
5946 032542  000456                       BR       28$                ;BYPASS THE REST OF THIS SECTION OF TESTING
5947
5948 032544  004737  036146       23$:    JSR      PC,GETT1           ;IS "T1" STILL SET?
5949 032550  102002                       BVC      .+6                ;IF NO ERROR, PROCEED
5950 032552                               ESCAPE   SUB                ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     032552  104410                                                                        TRAP    C$ESCAPE
     032554  000630                                                                        .WORD   L10074-.
5951 032556  103415                       BCS      24$                ;YES, ALL'S OK
5952 032560  004537  004064               JSR      R5,READ            ;GET T1LH FOR ERROR MESSAGE
5953 032564  120007                       T1LH
5954 032566  002456                       TMP7
5955 032570  103003                       BCC      .+10               ;IF NO ERROR, PROCEED
5956 032572                               ERROR                       ;ELSE, REPORT IT
     032572  104460                                                                        TRAP    C$ERROR
5957 032574                               ESCAPE   TST                ;       AND EXIT THIS TEST
     032574  104410                                                                        TRAP    C$ESCAPE
     032576  003314                                                                        .WORD   L10073-.
5958 032600                               GEDF     EM50I,ERR50        ;NO:  BAD VIA CHIP!
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
                                                        ;       "DEVICE FATAL" ERROR # 59
      032600  104455                                                   TRAP    C$ERDF
      032602  000073                                                   .WORD   59
      032604  016536                                                   .WORD   EM50I
      032606  010762                                                   .WORD   ERR50
 5959 032610  000433                    BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
 5960
 5961 032612  004537  004064    24$:    JSR     R5,READ         ;READ T1L-H (ADDR 07)
 5962 032616  120007                    T1LH
 5963 032620  002456                    TMP7                    ;THIS SHOULD RETURN A 000
 5964 032622  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 5965 032624                            ERROR                   ;ELSE, REPORT IT
      032624  104460                                                   TRAP    C$ERROR
 5966 032626                            ESCAPE  TST             ;       AND EXIT THIS TEST
      032626  104410                                                   TRAP    C$ESCAPE
      032630  003262                                                   .WORD   L10073-.
 5967 032632  123737  002456  032177        CMPB    TMP7,19$        ;CHECK T1L-H (ADDR 07) AGAINST LOADED VALUE
 5968 032640  001405                    BEQ     26$             ;IF SAME, PROCEED
 5969 032642                            GEDF    EM50J,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-H (ADDR 07)
                                                        ;       "DEVICE FATAL" ERROR # 60
      032642  104455                                                   TRAP    C$ERDF
      032644  000074                                                   .WORD   60
      032646  016600                                                   .WORD   EM50J
      032650  010762                                                   .WORD   ERR50
 5970 032652  000412                    BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
 5971
 5972 032654  004737  036146    26$:    JSR     PC,GETT1        ;IS "T1" STILL SET?
 5973 032660  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
 5974 032662                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
      032662  104410                                                   TRAP    C$ESCAPE
      032664  000520                                                   .WORD   L10074 .
 5975 032666  103404                    BCS     28$             ;YES, ALL'S OK
 5976 032670                            GEDF    EM50K,ERR50     ;NO!  BAD VIA CHIP!
                                                        ;       "DEVICE FATAL" ERROR # 61
      032670  104455                                                   TRAP    C$ERDF
      032672  000075                                                   .WORD   61
      032674  016666                                                   .WORD   EM50K
      032676  010762                                                   .WORD   ERR50
 5977
 5978                                   ;-------------------------------------------------------------------------
 5979
 5980 032700  004537  004064    28$:    JSR     R5,READ         ;READ T1C L (ADDR 04)
 5981 032704  120004                    T1CL                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
 5982 032706  002450                    TMP4                    ; ALMOST ANYTHING)
 5983 032710  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 5984 032712                            ERROR                   ;ELSE, REPORT IT
      032712  104460                                                   TRAP    C$ERROR
 5985 032714                            ESCAPE  TST             ;       AND EXIT THIS TEST
      032714  104410                                                   TRAP    C$ESCAPE
      032716  003174                                                   .WORD   L10073-.
 5986 032720  004737  036146            JSR     PC,GETT1        ;IS "T1" CLEARED NOW
 5987 032724  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
 5988 032726                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
      032726  104410                                                   TRAP    C$ESCAPE
      032730  000454                                                   .WORD   L10074-.
 5989 032732  103024                    BCC     29$             ;YES, ALL'S OK
 5990 032734  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
```

EQ 0154

SEQ 0167

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
5991 032740  120006                    T1LL
5992 032742  002454                    TMP6
5993 032744  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
5994 032746                            ERROR                   ;ELSE, REPORT IT
     032746  104460                                                    TRAP    C$ERROR
5995 032750                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032750  104410                                                    TRAP    C$ESCAPE
     032752  003140                                                    .WORD   L10073-.
5996 032754  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
5997 032760  120007                    T1LH
5998 032762  002456                    TMP7
5999 032764  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6000 032766                            ERROR                   ;ELSE, REPORT IT
     032766  104460                                                    TRAP    C$ERROR
6001 032770                            ESCAPE  TST             ;       AND EXIT THIS TEST
     032770  104410                                                    TRAP    C$ESCAPE
     032772  003120                                                    .WORD   L10073-.
6002 032774                            GEDF    EM50C,ERR50     ;NO!  BAD VIA CHIP!
                                                               ;       "DEVICE FATAL" ERROR # 62
     032774  104455                                                    TRAP    C$ERDF
     032776  000076                                                    .WORD   62
     033000  016203                                                    .WORD   EM50C
     033002  010762                                                    .WORD   ERR50
6003
6004                                   ;-------------------------------------------------------------------------
6005
6006 033004  004537  004310    29$:    JSR     R5,WRITE        ;RE-WRITE INTO T1C-H (ADDR 05) TO SET T1 AGAIN
6007 033010  120005                    T1CH
6008 033012  002453                    TMP5+1
6009 033014  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6010 033016                            ERROR                   ;ELSE, REPORT IT
     033016  104460                                                    TRAP    C$ERROR
6011 033020                            ESCAPE  TST             ;       AND EXIT THIS TEST
     033020  104410                                                    TRAP    C$ESCAPE
     033022  003070                                                    .WORD   L10073-.
6012 033024  004737  036146            JSR     PC,GETT1        ;IS "T1" SET AGAIN
6013 033030  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
6014 033032                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
     033032  104410                                                    TRAP    C$ESCAPE
     033034  000350                                                    .WORD   L10074-.
6015 033036  103426                    BCS     32$             ;YES, ALL'S WELL (AGAIN?)
6016 033040  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6017 033044  120006                    T1LL
6018 033046  002454                    TMP6
6019 033050  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6020 033052                            ERROR                   ;ELSE, REPORT IT
     033052  104460                                                    TRAP    C$ERROR
6021 033054                            ESCAPE  TST             ;       AND EXIT THIS TEST
     033054  104410                                                    TRAP    C$ESCAPE
     033056  003034                                                    .WORD   L10073-.
6022 033060  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6023 033064  120007                    T1LH
6024 033066  002456                    TMP7
6025 033070  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6026 033072                            ERROR                   ;ELSE, REPORT IT
     033072  104460                                                    TRAP    C$ERROR
6027 033074                            ESCAPE  TST             ;       AND EXIT THIS TEST
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
        033074  104410                                                          TRAP    C$ESCAPE
        033076  003014                                                          .WORD   L10073-.
   6028 033100                          GEDF    EM50L,ERR50     ;NO!  SOMETHING WENT WRONG.  REPORT IT
                                                                ;       "DEVICE FATAL" ERROR # 63
        033100  104455                                                          TRAP    C$ERDF
        033102  000077                                                          .WORD   63
        033104  016730                                                          .WORD   EM50L
        033106  010762                                                          .WORD   ERR50
   6029 033110                          ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
        033110  104410                                                          TRAP    C$ESCAPE
        033112  000272                                                          .WORD   L10074-.
   6030
   6031                                 ;-------------------------------------------------------------------
   6032
   6033 033114  112737  000125  002455  32$:    MOVB    #125,TMP6+1     ;USING A DIFFERENT VALUE -- 55 HEX.,
   6034 033122  004537  004310                  JSR     R5,WRITE        ;RE-LOAD T1L-L (ADDR 06)
   6035 033126  120006                          T1LL
   6036 033130  002455                          TMP6+1
   6037 033132  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
   6038 033134                                  ERROR                   ;ELSE, REPORT IT
        033134  104460                                                          TRAP    C$ERROR
   6039 033136                          ESCAPE  TST             ;       AND EXIT THIS TEST
        033136  104410                                                          TRAP    C$ESCAPE
        033140  002752                                                          .WORD   L10073-.
   6040 033142  004737  036146                  JSR     PC,GETT1        ;IS "T1" STILL SET?
   6041 033146  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
   6042 033150                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
        033150  104410                                                          TRAP    C$ESCAPE
        033152  000232                                                          .WORD   L10074-.
   6043 033154  103426                          BCS     33$             ;YES, ALL'S STILL OK
   6044 033156  004537  004064                  JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
   6045 033162  120006                          T1LL
   6046 033164  002454                          TMP6
   6047 033166  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
   6048 033170                                  ERROR                   ;ELSE, REPORT IT
        033170  104460                                                          TRAP    C$ERROR
   6049 033172                          ESCAPE  TST             ;       AND EXIT THIS TEST
        033172  104410                                                          TRAP    C$ESCAPE
        033174  002716                                                          .WORD   L10073-.
   6050 033176  004537  004064                  JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
   6051 033202  120007                          T1LH
   6052 033204  002456                          TMP7
   6053 033206  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
   6054 033210                                  ERROR                   ;ELSE, REPORT IT
        033210  104460                                                          TRAP    C$ERROR
   6055 033212                          ESCAPE  TST             ;       AND EXIT THIS TEST
        033212  104410                                                          TRAP    C$ESCAPE
        033214  002676                                                          .WORD   L10073-.
   6056 033216                          GEDF    EM50M,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
                                                                ;       "DEVICE FATAL" ERROR # 64
        033216  104455                                                          TRAP    C$ERDF
        033220  000100                                                          .WORD   64
        033222  017012                                                          .WORD   EM50M
        033224  010762                                                          .WORD   ERR50
   6057 033226                          ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
        033226  104410                                                          TRAP    C$ESCAPE
        033230  000154                                                          .WORD   L10074-.
```

```
6058
6059                                    ;-------------------------------------------------------------------------------
6060
6061 033232  112737  000125  002453  33$:    MOVB    #125,TMP5+1     ;AND USING THE SAME VALUE AGAIN (55 HEX),
6062 033240  004537  004310                  JSR     R5,WRITE        ;NOW LOAD T1C-H (ADDR 05)
6063 033244  120005                          T1CH
6064 033246  002453                          TMP5+1
6065 033250  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6066 033252                                  ERROR                   ;ELSE, REPORT IT
     033252  104460                                                                  TRAP    C$ERROR
6067 033254                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033254  104410                                                                  TRAP    C$ESCAPE
     033256  002634                                                                  .WORD   L10073-.
6068 033260  004737  036146                  JSR     PC,GETT1        ;"T1" SHOULD NOW BE CLEARED
6069 033264  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
6070 033266                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     033266  104410                                                                  TRAP    C$ESCAPE
     033270  000114                                                                  .WORD   L10074-.
6071 033272  103044                          BCC     34$             ;IT WAS, ALL'S WELL THAT END'S WELL (I THINK!?)
6072 033274  004537  004064                  JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
6073 033300  120004                          T1CL
6074 033302  002450                          TMP4
6075 033304  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6076 033306                                  ERROR                   ;ELSE, REPORT IT
     033306  104460                                                                  TRAP    C$ERROR
6077 033310                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033310  104410                                                                  TRAP    C$ESCAPE
     033312  002600                                                                  .WORD   L10073-.
6078 033314  004537  004064                  JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6079 033320  120005                          T1CH
6080 033322  002452                          TMP5
6081 033324  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6082 033326                                  ERROR                   ;ELSE, REPORT IT
     033326  104460                                                                  TRAP    C$ERROR
6083 033330                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033330  104410                                                                  TRAP    C$ESCAPE
     033332  002560                                                                  .WORD   L10073-.
6084 033334  004537  004064                  JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6085 033340  120006                          T1LL
6086 033342  002454                          TMP6
6087 033344  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6088 033346                                  ERROR                   ;ELSE, REPORT IT
     033346  104460                                                                  TRAP    C$ERROR
6089 033350                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033350  104410                                                                  TRAP    C$ESCAPE
     033352  002540                                                                  .WORD   L10073-.
6090 033354  004537  004064                  JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6091 033360  120007                          T1LH
6092 033362  002456                          TMP7
6093 033364  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6094 033366                                  ERROR                   ;ELSE, REPORT IT
     033366  104460                                                                  TRAP    C$ERROR
6095 033370                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033370  104410                                                                  TRAP    C$ESCAPE
     033372  002520                                                                  .WORD   L10073-.
6096 033374                                  GEDF    EM5ON,ERR50     ;IT WASN'T!  SOMETHING WENT WRONG!  REPORT IT
                                                                     ;       "DEVICE FATAL" ERROR # 65
```

0157

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
        033374  104455                                                          TRAP    C$ERDF
        033376  000101                                                          .WORD   65
        033400  017054                                                          .WORD   EM50N
        033402  010762                                                          .WORD   ERR50
 6097
 6098 033404                        34$:    ENDSUB
        033404                                                          L10074:
        033404  104403                                                          TRAP    C$ESUB
 6099                               ;*****************************************************************
 6100
 6101                               ; TEST TIMER # 1 USING ONE-SHOT MODE WITH OUTPUT ON PB7 ENABLED.
 6102
 6103 033406                                BGNSUB
        033406                                                          T27.2:
        033406  104402                                                          TRAP    C$BSUB
 6104 033410  004737  003762                JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
 6105 033414  103003                        BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
 6106 033416                                ERROR                   ;ELSE, REPORT ERROR
        033416  104460                                                          TRAP    C$ERROR
 6107 033420                                ESCAPE  TST             ;   & EXIT TEST
        033420  104410                                                          TRAP    C$ESCAPE
        033422  002470                                                          .WORD   L10073-.
 6108 033424  004537  004660        1$:     JSR     R5,INITT1       ;INITIALIZE TIMER # 1
 6109 033430  000000                        0                       ;       0 ==> LATCHES
 6110 033432  000200                        BIT7                    ;       MODE 2 & "T1" INT. ENABLE FLAG CLEARED
 6111 033434  103005                        BCC     .+10            ;IF NO ERROR, PROCEED
 6112 033436                                ERROR                   ;ELSE, REPORT IT
        033436  104460                                                          TRAP    C$ERROR
 6113 033440                                ESCAPE  TST             ;       AND EXIT THIS TEST
        033440  104410                                                          TRAP    C$ESCAPE
        033442  002450                                                          .WORD   L10073-.
 6114
 6115                               ; MODE 2 IS ONE-SHOT MODE WITH OUTPUT ON PB7 CONTROLED BY TIMER 1
 6116
 6117 033444  004737  036146                JSR     PC,GETT1        ;IS "T1" SET?
 6118 033450  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
 6119 033452                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
        033452  104410                                                          TRAP    C$ESCAPE
        033454  002434                                                          .WORD   L10075-.
 6120 033456  103123                        BCC     6$              ;NO, GOOD.
 6121                                                               ;YES, REPORT IT'S NOT BEING CLEARED & INIT.
 6122 033460  004537  004064                JSR     R5,READ         ;GET ACR FOR ERROR MESSAGE
 6123 033464  120013                        ACR
 6124 033466  002466                        TMPB
 6125 033470  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
 6126 033472                                ERROR                   ;ELSE, REPORT IT
        033472  104460                                                          TRAP    C$ERROR
 6127 033474                                ESCAPE  TST             ;       AND EXIT THIS TEST
        033474  104410                                                          TRAP    C$ESCAPE
        033476  002414                                                          .WORD   L10073-.
 6128 033500  004537  004064                JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
 6129 033504  120004                        T1CL
 6130 033506  002450                        TMP4
 6131 033510  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
 6132 033512                                ERROR                   ;ELSE, REPORT IT
        033512  104460                                                          TRAP    C$ERROR
 6133 033514                                ESCAPE  TST             ;       AND EXIT THIS TEST
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
                033514  104410                                                          TRAP    C$ESCAPE
                033516  002374                                                          .WORD   L10073-.
6134            033520  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6135            033524  120005                  T1CH
6136            033526  002452                  TMP5
6137            033530  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6138            033532                          ERROR                   ;ELSE, REPORT IT
                033532  104460                                                          TRAP    C$ERROR
6139            033534                          ESCAPE  TST             ;       AND EXIT THIS TEST
                033534  104410                                                          TRAP    C$ESCAPE
                033536  002354                                                          .WORD   L10073-.
6140            033540  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6141            033544  120006                  T1LL
6142            033546  002454                  TMP6
6143            033550  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6144            033552                          ERROR                   ;ELSE, REPORT IT
                033552  104460                                                          TRAP    C$ERROR
6145            033554                          ESCAPE  TST             ;       AND EXIT THIS TEST
                033554  104410                                                          TRAP    C$ESCAPE
                033556  002334                                                          .WORD   L10073-.
6146            033560  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6147            033564  120007                  T1LH
6148            033566  002456                  TMP7
6149            033570  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6150            033572                          ERROR                   ;ELSE, REPORT IT
                033572  104460                                                          TRAP    C$ERROR
6151            033574                          ESCAPE  TST             ;       AND EXIT THIS TEST
                033574  104410                                                          TRAP    C$ESCAPE
                033576  002314                                                          .WORD   L10073-.
6152            033600                          GEDF    EM50A ERR50     ;REPORT "T1" NOT CLEARED @ INIT.
                                                                        ;       "DEVICE FATAL" ERROR # 66
                033600  104455                                                          TRAP    C$ERDF
                033602  000102                                                          .WORD   66
                033604  016067                                                          .WORD   EM50A
                033606  010762                                                          .WORD   ERR50
6153
6154                                    ;-------------------------------------------------------------------
6155
6156            033610  112737  000002  002453          MOVB    #2,TMP5+1
6157            033616  004537  004310                  JSR     R5,WRITE        ;INIT TIMER # 1 BY WRITING INTO
6158            033622  120005                          T1CH                    ;T1C-H (ADDR 05)
6159            033624  002453                          TMP5+1
6160            033626  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6161            033630                                  ERROR                   ;ELSE, REPORT IT
                033630  104460                                                          TRAP    C$ERROR
6162            033632                                  ESCAPE  TST             ;       AND EXIT THIS TEST
                033632  104410                                                          TRAP    C$ESCAPE
                033634  002256                                                          .WORD   L10073-.
6163            033636  004737  036146                  JSR     PC,GETT1        ;IS "T1" SET?
6164            033642  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
6165            033644                                  ESCAPE  SOB             ;ELSE, IT'S ALREADY BEEN REPORTED    EXIT
                033644  104410                                                          TRAP    C$ESCAPE
                033646  002242                                                          .WORD   L10073-.
6166            033650  103026                          BCC     6$              ;NO, GOOD.
6167                                                                            ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
6168            033652  004537  004064          6$:     JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6169            033656  120005                          T1CH
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
6170 033660  002452                    TMP5
6171 033662  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6172 033664                            ERROR                   ;ELSE, REPORT IT
     033664  104460                                                    TRAP    C$ERROR
6173 033666                            ESCAPE  TST             ;       AND EXIT THIS TEST
     033666  104410                                                    TRAP    C$ESCAPE
     033670  002222                                                    .WORD   L10073-.
6174 033672  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6175 033676  120007                    T1LH
6176 033700  002456                    TMP7
6177 033702  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6178 033704                            ERROR                   ;ELSE, REPORT IT
     033704  104460                                                    TRAP    C$ERROR
6179 033706                            ESCAPE  TST             ;       AND EXIT THIS TEST
     033706  104410                                                    TRAP    C$ESCAPE
     033710  002202                                                    .WORD   L10073-.
6180 033712                            GEDF    EM50B,ERR50     ;REPORT "T1" NOT CLEARED @ INIT.
                                                               ;       "DEVICE FATAL" ERROR # 67
     033712  104455                                                    TRAP    C$ERDF
     033714  000103                                                    .WORD   67
     033716  016135                                                    .WORD   EM50B
     033720  010762                                                    .WORD   ERR50
6181 033722                            ESCAPE  SUB             ;AND EXIT SUBTEST
     033722  104410                                                    TRAP    C$ESCAPE
     033724  002164                                                    .WORD   L10075-.
6182
6183                                   ;-----------------------------------------------------------------------
6184
6185 033726  004737  003762  002445  6$:     JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP AGAIN
6186 033732  112737  000377  002445          MOVB    #377,TMP2+1     ;INITIAL VALUE FOR DDRB
6187 033740  004537  004310                  JSR     R5,WRITE        ;LOAD IT
6188 033744  120002                          DDRB
6189 033746  002445                          TMP2+1
6190 033750  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6191 033752                                  ERROR                   ;ELSE, REPORT IT
     033752  104460                                                    TRAP    C$ERROR
6192 033754                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033754  104410                                                    TRAP    C$ESCAPE
     033756  002134                                                    .WORD   L10073-.
6193 033760  004537  004660                  JSR     R5,INITT1       ;RE-INITIALIZE THE TIMER
6194 033764  000000                          0                       ;       FOR MAXIMUM TIMEOUT
6195 033766  000200                          BIT7                    ;       MODE 2 & CLEARED "T1" INT. FLAG
6196 033770  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6197 033772                                  ERROR                   ;ELSE, REPORT IT
     033772  104460                                                    TRAP    C$ERROR
6198 033774                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     033774  104410                                                    TRAP    C$ESCAPE
     033776  002114                                                    .WORD   L10073-.
6199 034000  004537  004064                  JSR     R5,READ         ;GET ACR FOR FUTURE ERROR MESSAGES
6200 034004  120013                          ACR
6201 034006  002466                          TMP8
6202 034010  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
6203 034012                                  ERROR                   ;ELSE, REPORT IT
     034012  104460                                                    TRAP    C$ERROR
6204 034014                                  ESCAPE  TST             ;       AND EXIT THIS TEST
     034014  104410                                                    TRAP    C$ESCAPE
     034016  002074                                                    .WORD   L10073-.
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
6205 034020  004537  036114                JSR     R5,LODT1C       ;LOAD TIMER # 1
6206 034024     252                 7$:    .BYTE   252
6207 034025     252                 8$:    .BYTE   252
6208
6209                                ;-----------------------------------------------------------------------
6210
6211 034026  004737  036332                JSR     PC,GETPB7       ;GET "PB7".  IS IT CLEARED?
6212 034032  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
6213 034034                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
     034034  104410                                                        TRAP    C$ESCAPE
     034036  002052                                                        .WORD   L10075-.
6214 034040  103070                        BCC     9$              ;IT IS, GOOD
6215 034042  004537  004064                JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
6216 034046  120015                        IFR
6217 034050  002472                        TMPD
6218 034052  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6219 034054                                ERROR                   ;ELSE, REPORT IT
     034054  104460                                                        TRAP    C$ERROR
6220 034056                                ESCAPE  TST             ;       AND EXIT THIS TEST
     034056  104410                                                        TRAP    C$ESCAPE
     034060  002032                                                        .WORD   L10073-.
6221 034062  004537  004064                JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
6222 034066  120004                        T1CL
6223 034070  002450                        TMP4
6224 034072  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6225 034074                                ERROR                   ;ELSE, REPORT IT
     034074  104460                                                        TRAP    C$ERROR
6226 034076                                ESCAPE  TST             ;       AND EXIT THIS TEST
     034076  104410                                                        TRAP    C$ESCAPE
     034100  002012                                                        .WORD   L10073-.
6227 034102  004537  004064                JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6228 034106  120005                        T1CH
6229 034110  002452                        TMP5
6230 034112  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6231 034114                                ERROR                   ;ELSE, REPORT IT
     034114  104460                                                        TRAP    C$ERROR
6232 034116                                ESCAPE  TST             ;       AND EXIT THIS TEST
     034116  104410                                                        TRAP    C$ESCAPE
     034120  001772                                                        .WORD   L10073-.
6233 034122  004537  004064                JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6234 034126  120006                        T1LL
6235 034130  002454                        TMP6
6236 034132  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6237 034134                                ERROR                   ;ELSE, REPORT IT
     034134  104460                                                        TRAP    C$ERROR
6238 034136                                ESCAPE  TST             ;       AND EXIT THIS TEST
     034136  104410                                                        TRAP    C$ESCAPE
     034140  001752                                                        .WORD   L10073-.
6239 034142  004537  004064                JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6240 034146  120007                        T1LH
6241 034150  002456                        TMP7
6242 034152  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6243 034154                                ERROR                   ;ELSE, REPORT IT
     034154  104460                                                        TRAP    C$ERROR
6244 034156                                ESCAPE  TST             ;       AND EXIT THIS TEST
     034156  104410                                                        TRAP    C$ESCAPE
     034160  001732                                                        .WORD   L10073-.
```

SEQ 0161

SEQ 0174

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
6245 034162                                    GEDF    EM50V,ERR50     ;NO, STILL(?) SET!
                                                                       ;       "DEVICE FATAL" ERROR # 68
     034162  104455                                                                    TRAP    C$ERDF
     034164  000104                                                                    .WORD   68
     034166  017240                                                                    .WORD   EM50V
     034170  010762                                                                    .WORD   ERR50
6246 034172  004737  036204                    JSR     PC,KICKT1       ;BECAUSE THE ERROR MESSAGE TAKES SO LONG TO
6247 034176  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
6248 034200                                    ERROR                   ;ELSE, REPORT IT
     034200  104460                                                                    TRAP    C$ERROR
6249 034202                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     034202  104410                                                                    TRAP    C$ESCAPE
     034204  001706                                                                    .WORD   L10073-.
6250 034206  004737  005032                    JSR     PC,STALL        ;  PROCESS & PRINT, RE-START THE TIMER AND THEN
6251 034212  004737  005032                    JSR     PC,STALL        ;  DELAY FOR A LITTLE WHILE SO IT CAN DECREMENT
6252 034216  012703  000100          10$:      MOV     #100,R3         ;# INIT. "REPEAT" VALUE
6253 034222  004537  004064          9$:       JSR     R5,READ         ;READ THE LOW COUNTER
6254 034226  120004                            T1CL
6255 034230  002450                            TMP4
6256 034232  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
6257 034234                                    ERROR                   ;ELSE, REPORT IT
     034234  104460                                                                    TRAP    C$ERROR
6258 034236                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     034236  104410                                                                    TRAP    C$ESCAPE
     034240  001652                                                                    .WORD   L10073-.
6259 034242  123737  002450  034024            CMPB    TMP4,7$         ;MAKE SURE THE COUNTER IS DECREMENTING
6260 034250  001013                            BNE     12$             ;IT IS, NOW SEE IF THE HIGH COUNTER IS TOO
6261 034252  077315                            SOB     R3,9$           ;# NO: IF NOT 64, ATTEMPTS, TRY AGAIN
6262 034254                                    GEDF    EM50D,ERR50     ;IT WASN'T -- REPORT THE ERROR
                                                                       ;       "DEVICE FATAL" ERROR # 69
     034254  104455                                                                    TRAP    C$ERDF
     034256  000105                                                                    .WORD   69
     034260  016251                                                                    .WORD   EM50D
     034262  010762                                                                    .WORD   ERR50
6263 034264  004737  036204                    JSR     PC,KICKT1       ;RESTART TIMER AGAIN IF ERROR MESSAGE PRINTED
6264 034270  103003                            BCC     12$             ;IF NO ERROR, PROCEED
6265 034272                                    ERROR                   ;ELSE, REPORT IT
     034272  104460                                                                    TRAP    C$ERROR
6266 034274                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     034274  104410                                                                    TRAP    C$ESCAPE
     034276  001614                                                                    .WORD   L10073-.
6267 034300  012703  000100          12$:      MOV     #100,R3         ;INIT. TIMEOUT VALUE
6268 034304  004537  004064          13$:      JSR     R5,READ         ;READ THE HIGH COUNTER
6269 034310  120005                            T1CH
6270 034312  002452                            TMP5
6271 034314  103003                            BCC     .+10            ;IF NO ERROR, PROCEED
6272 034316                                    ERROR                   ;ELSE, REPORT IT
     034316  104460                                                                    TRAP    C$ERROR
6273 034320                                    ESCAPE  TST             ;       AND EXIT THIS TEST
     034320  104410                                                                    TRAP    C$ESCAPE
     034322  001570                                                                    .WORD   L10073-.
6274 034324  123737  002452  034025            CMPB    TMP5,8$         ;DID IT CHANGE FROM THE LOADED VALUE?
6275 034332  001027                            BNE     17$             ;YES, PROCEED WITH TESTING
6276 034334  077315                            SOB     R3,13$          ;NO,  IF NO TIMEOUT, TRY AGAIN
6277 034336  004537  004064                    JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6278 034342  120006                            T1LL
6279 034344  002454                            TMP6
```

SEQ 0162

SEQ 0175

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
6280 034346  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6281 034350                            ERROR                   ;ELSE, REPORT IT
     034350  104460                                                    TRAP    C$ERROR
6282 034352                            ESCAPE  TST             ;       AND EXIT THIS TEST
     034352  104410                                                    TRAP    C$ESCAPE
     034354  001536                                                    .WORD   L10073-.
6283 034356  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6284 034362  120007                    T1LH
6285 034364  002456                    TMP7
6286 034366  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6287 034370                            ERROR                   ;ELSE, REPORT IT
     034370  104460                                                    TRAP    C$ERROR
6288 034372                            ESCAPE  TST             ;       AND EXIT THIS TEST
     034372  104410                                                    TRAP    C$ESCAPE
     034374  001516                                                    .WORD   L10073-.
6289 034376                            GEDF    EM50E,ERR50     ;ELSE, REPORT THAT HIGH COUNTER ISN'T RUNNING
                                       ;       "DEVICE FATAL" ERROR # 70
     034376  104455                                                    TRAP    C$ERDF
     034400  000106                                                    .WORD   70
     034402  016305                                                    .WORD   EM50E
     034404  010762                                                    .WORD   ERR50
6290 034406                            ESCAPE  SUB             ;IN THAT CASE, WE CAN'T PROCEED WITH TESTING EITHER
     034406  104410                                                    TRAP    C$ESCAPE
     034410  001500                                                    .WORD   L10075-.
6291                                   ;-------------------------------------------------------------------------
6292
6293 034412  112737  000377  002445  17$:    MOVB    #377,TMP2+1     ;SETUP DDRB FOR DESIRED DIRECTION OF ORB
6294 034420  004537  004310            JSR     R5,WRITE
6295 034424  120002                    DDRB
6296 034426  002445                    TMP2+1
6297 034430  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6298 034432                            ERROR                   ;ELSE, REPORT IT
     034432  104460                                                    TRAP    C$ERROR
6299 034434                            ESCAPE  TST             ;       AND EXIT THIS TEST
     034434  104410                                                    TRAP    C$ESCAPE
     034436  001454                                                    .WORD   L10073-.
6300 034440  004537  036114            JSR     R5,LODT1C       ;RE-LOAD TIMER # 1 WITH A VALUE WHICH WILL
6301 034444     001            18$:    .BYTE   1               ;   CAUSE AN ALMOST IMMEDIATE TIMEOUT
6302 034445     000            19$:    .BYTE   0               ; (ADDRESS OF HIGH BYTE FOR T1C-H (ADDR 05))
6303                                   ;-------------------------------------------------------------------------
6304
6305 034446  004737  036146            JSR     PC,GETT1        ;WAS "T1" SET BY THE ABOVE OPERATION?
6306 034452  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
6307 034454                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     034454  104410                                                    TRAP    C$ESCAPE
     034456  001432                                                    .WORD   L10075-.
6308 034460  103446                    BCS     .+0$            ;YES, OK -- CONTINUE ERROR CHECKING
6309 034462  004537  004064            JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
6310 034466  120004                    T1CL
6311 034470  002450                    TMP4
6312 034472  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6313 034474                            ERROR                   ;ELSE, REPORT IT
     034474  104460                                                    TRAP    C$ERROR
6314 034476                            ESCAPE  TST             ;       AND EXIT THIS TEST
     034476  104410                                                    TRAP    C$ESCAPE
     034500  001412                                                    .WORD   L10073-.
6315 034502  004537  004064            JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
 6316 034506  120005                    T1CH
 6317 034510  002452                    TMP5
 6318 034512  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 6319 034514                            ERROR                   ;ELSE, REPORT IT
      034514  104460                                                            TRAP    C$ERROR
 6320 034516                            ESCAPE  TST             ;       AND EXIT THIS TEST
      034516  104410                                                            TRAP    C$ESCAPE
      034520  001372                                                            .WORD   L10073-.
 6321 034522  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
 6322 034526  120006                    T1LL
 6323 034530  002454                    TMP6
 6324 034532  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 6325 034534                            ERROR                   ;ELSE, REPORT IT
      034534  104460                                                            TRAP    C$ERROR
 6326 034536                            ESCAPE  TST             ;       AND EXIT THIS TEST
      034536  104410                                                            TRAP    C$ESCAPE
      034540  001352                                                            .WORD   L10073-.
 6327 034542  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
 6328 034546  120007                    T1LH
 6329 034550  002456                    TMP7
 6330 034552  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 6331 034554                            ERROR                   ;ELSE, REPORT IT
      034554  104460                                                            TRAP    C$ERROR
 6332 034556                            ESCAPE  TST             ;       AND EXIT THIS TEST
      034556  104410                                                            TRAP    C$ESCAPE
      034560  001332                                                            .WORD   L10073-.
 6333 034562                            GEDF    EM50F,ERR50     ;NO,  BAD NEWS!  REPORT THE FAILURE
                                                                ;       "DEVICE FATAL" ERROR # 71
      034562  104455                                                            TRAP    C$ERDF
      034564  000107                                                            .WORD   71
      034566  016341                                                            .WORD   EM50F
      034570   10762                                                            .WORD   ERR50
 6334 034572                            ESCAPE  SUB             ;  AND GET OUT OF SUBTEST
      034572  104410                                                            TRAP    C$ESCAPE
      034574  001314                                                            .WORD   L10075-.
 6335 034576  004737  036332    20$:    JSR     PC,GETPB7       ;GET "PB7".  IS IT SET?
 6336 034602  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
 6337 034604                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -  EXIT
      034604  104410                                                            TRAP    C$ESCAPE
      034606  001302                                                            .WORD   L10075-.
 6338 034610  103445                    BCS     41$             ;YES, CONTINUE CHECKING "T1"
 6339 034612  004537  004064            JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
 6340 034616  120004                    T1CL
 6341 034620  002450                    TMP4
 6342 034622  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 6343 034624                            ERROR                   ;ELSE, REPORT IT
      034624  104460                                                            TRAP    C$ERROR
 6344 034626                            ESCAPE  TST             ;       AND EXIT THIS TEST
      034626  104410                                                            TRAP    C$ESCAPE
      034630  001262                                                            .WORD   L10073-.
 6345 034632  004537  004064            JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
 6346 034636  120005                    T1CH
 6347 034640  002452                    TMP5
 6348 034642  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
 6349 034644                            ERROR                   ;ELSE, REPORT IT
      034644  104460                                                            TRAP    C$ERROR
 6350 034646                            ESCAPE  TST             ;       AND EXIT THIS TEST
```

EQ 0164

SEQ 0177

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
        034646  104410                                                          TRAP    C$ESCAPE
        034650  001242                                                          .WORD   L10073-.
  6351  034652  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
  6352  034656  120006                  T1LL
  6353  034660  002454                  TMP6
  6354  034662  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
  6355  034664                          ERROR                   ;ELSE, REPORT IT
        034664  104460                                                          TRAP    C$ERROR
  6356  034666                          ESCAPE  TST             ;       AND EXIT THIS TEST
        034666  104410                                                          TRAP    C$ESCAPE
        034670  001222                                                          .WORD   L10073-.
  6357  034672  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
  6358  034676  120007                  T1LH
  6359  034700  002456                  TMP7
  6360  034702  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
  6361  034704                          ERROR                   ;ELSE, REPORT IT
        034704  104460                                                          TRAP    C$ERROR
  6362  034706                          ESCAPE  TST             ;       AND EXIT THIS TEST
        034706  104410                                                          TRAP    C$ESCAPE
        034710  001202                                                          .WORD   L10073-.
  6363  034712                          GEDF    EM50S,ERR50     ;NO!  REPORT THAT PB7 DIDN'T GET SET!
                                                                  ;       "DEVICE FATAL" ERROR # 72
        034712  104455                                                          TRAP    C$ERDF
        034714  000110                                                          .WORD   72
        034716  017122                                                          .WORD   EM50S
        034720  010762                                                          .WORD   ERR50
  6364  034722  000562                  BR      28$             ;   & EXIT THIS SECTION OF SUBTEST
  6365  034724  004537  004064  41$:   JSR     R5,READ         ;READ T1C-H (ADDR 05) TO SEE IF IT CLEARS "T1"
  6366  034730  120005                  T1CH                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
  6367  034732  002452                  TMP5                    ; ALMOST ANYTHING)
  6368  034734  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
  6369  034736                          ERROR                   ;ELSE, REPORT IT
        034736  104460                                                          TRAP    C$ERROR
  6370  034740                          ESCAPE  TST             ;       AND EXIT THIS TEST
        034740  104410                                                          TRAP    C$ESCAPE
        034742  001150                                                          .WORD   L10073-.
  6371  034744  004737  036146          JSR     PC,GETT1        ;PUT THE CURRENT "T1" VALUE INTO THE CARRY BIT
  6372  034750  102002                  BVC     11$             ;IF NO ERROR, PROCEED
  6373  034752                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
        034752  104410                                                          TRAP    C$ESCAPE
        034754  001134                                                          .WORD   L10075-.
  6374  034756  103435          11$:    BCS     21$             ;IF SET, ALL'S OK
  6375                                                          ;IF CLEARED!  BAD VIA CHIP!
  6376  034760  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
  6377  034764  120004                  T1CL
  6378  034766  002450                  TMP4
  6379  034770  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
  6380  034772                          ERROR                   ;ELSE, REPORT IT
        034772  104460                                                          TRAP    C$ERROR
  6381  034774                          ESCAPE  TST             ;       AND EXIT THIS TEST
        034774  104410                                                          TRAP    C$ESCAPE
        034776  001114                                                          .WORD   L10073-.
  6382  035000  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
  6383  035004  120006                  T1LL
  6384  035006  002454                  TMP6
  6385  035010  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
  6386  035012                          ERROR                   ;ELSE, REPORT IT
```

J14

SEQ 0165

SEQ 0178

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
                035012  104460                                                          TRAP    C$ERROR
6387            035014                          ESCAPE  TST             ;       AND EXIT THIS TEST
                035014  104410                                                          TRAP    C$ESCAPE
                035016  001074                                                          .WORD   L10073-.
6388            035020  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6389            035024  120007                  T1LH
6390            035026  002456                  TMP7
6391            035030  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6392            035032                          ERROR                   ;ELSE, REPORT IT
                035032  104460                                                          TRAP    C$ERROR
6393            035034                          ESCAPE  TST             ;       AND EXIT THIS TEST
                035034  104410                                                          TRAP    C$ESCAPE
                035036  001054                                                          .WORD   L10073-.
6394            035040                          GEDF    EM50G,ERR50     ;REPORT BAD VIA CHIP!
                                                                        ;       "DEVICE FATAL" ERROR # 73
                035040  104455                                                          TRAP    C$ERDF
                035042  000111                                                          .WORD   73
                035044  016406                                                          .WORD   EM50G
                035046  010762                                                          .WORD   ERR50
6395            035050  000507                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
6396
6397            035052  004537  004064  21$:    JSR     R5,READ         ;READ T1L-L (ADDR 06)
6398            035056  120006                  T1LL
6399            035060  002454                  TMP6                    ;THIS SHOULD RETURN A 001
6400            035062  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6401            035064                          ERROR                   ;ELSE, REPORT IT
                035064  104460                                                          TRAP    C$ERROR
6402            035066                          ESCAPE  TST             ;       AND EXIT THIS TEST
                035066  104410                                                          TRAP    C$ESCAPE
                035070  001022                                                          .WORD   L10073-.
6403            035072  123737  002454  034444  CMPB    TMP6,18$        ;CHECK T1L-L (ADDR 06) AGAINST LOADED VALUE
6404            035100  001415                  BEQ     23$             ;IF SAME, PROCEED
6405                                                                    ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
6406            035102  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6407            035106  120007                  T1LH
6408            035110  002456                  TMP7
6409            035112  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6410            035114                          ERROR                   ;ELSE, REPORT IT
                035114  104460                                                          TRAP    C$ERROR
6411            035116                          ESCAPE  TST             ;       AND EXIT THIS TEST
                035116  104410                                                          TRAP    C$ESCAPE
                035120  000772                                                          .WORD   L10073-.
6412            035122                          GEDF    EM50H,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
                                                                        ;       "DEVICE FATAL" ERROR # 74
                035122  104455                                                          TRAP    C$ERDF
                035124  000112                                                          .WORD   74
                035126  016450                                                          .WORD   EM50H
                035130  010762                                                          .WORD   ERR50
6413            035132  000456                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
6414
6415            035134  004737  036146  23$:    JSR     PC,GETT1        ;IS "T1" STILL SET?
6416            035140  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
6417            035142                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
                035142  104410                                                          TRAP    C$ESCAPE
                035144  000744                                                          .WORD   L10075-.
6418            035146  103415                  BCS     24$             ;YES, ALL'S OK
6419                                                                    ;NO!  BAD VIA CHIP!
```

TEST 27 - VIA TIMER # 1 ONE-SHOT MODE

```
6420 035150  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6421 035154  120007                  T1LH
6422 035156  002456                  TMP7
6423 035160  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6424 035162                          ERROR                   ;ELSE, REPORT IT
     035162  104460                                                  TRAP    C$ERROR
6425 035164                          ESCAPE  TST             ;       AND EXIT THIS TEST
     035164  104410                                                  TRAP    C$ESCAPE
     035166  000724                                                  .WORD   L10073-.
6426 035170                          GEDF    EM50I,ERR50     ;REPORT BAD VIA CHIP!
                                                             ;       "DEVICE FATAL" ERROR # 75
     035170  104455                                                  TRAP    C$ERDF
     035172  000113                                                  .WORD   75
     035174  016536                                                  .WORD   EM50I
     035176  010762                                                  .WORD   ERR50
6427 035200  000433                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
6428
6429 035202  004537  004064  24$:    JSR     R5,READ         ;READ T1L-H (ADDR 07)
6430 035206  120007                  T1LH
6431 035210  002456                  TMP7                    ;THIS SHOULD RETURN A 000
6432 035212  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6433 035214                          ERROR                   ;ELSE, REPORT IT
     035214  104460                                                  TRAP    C$ERROR
6434 035216                          ESCAPE  TST             ;       AND EXIT THIS TEST
     035216  104410                                                  TRAP    C$ESCAPE
     035220  000672                                                  .WORD   L10073-.
6435 035222  123737  002456  034445  CMPB    TMP7,19$        ;CHECK T1L-H (ADDR 07) AGAINST LOADED VALUE
6436 035230  001405                  BEQ     26$             ;IF SAME, PROCEED
6437 035232                          GEDF    EM50J,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-H (ADDR 07)
                                                             ;       "DEVICE FATAL" ERROR # 76
     035232  104455                                                  TRAP    C$ERDF
     035234  000114                                                  .WORD   76
     035236  016600                                                  .WORD   EM50J
     035240  010762                                                  .WORD   ERR50
6438 035242  000412                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
6439
6440 035244  004737  036146  26$:    JSR     PC,GETT1        ;IS "T1" STILL SET?
6441 035250  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
6442 035252                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     035252  104410                                                  TRAP    C$ESCAPE
     035254  000634                                                  .WORD   L10075-.
6443 035256  103404                  BCS     28$             ;YES, ALL'S OK
6444 035260                          GEDF    EM50K,ERR50     ;NO!  BAD VIA CHIP!
                                                             ;       "DEVICE FATAL" ERROR # 77
     035260  104455                                                  TRAP    C$ERDF
     035262  000115                                                  .WORD   77
     035264  016666                                                  .WORD   EM50K
     035266  010762                                                  .WORD   ERR50
6445
6446                                 ;
6447
6448 035270  004537  004064  28$:    JSR     R5,READ         ;READ T1C-L (ADDR 04) TO CLEAR 'T1'
6449 035274  120004                  T1CL                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
6450 035276  002450                  TMP4                    ; ALMOST ANYTHING)
6451 035300  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6452 035302                          ERROR                   ;ELSE, REPORT IT
     035302  104460                                                  TRAP    C$ERROR
```

SEQ 0167

SEQ 0180

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
6453 035304                                ESCAPE  TST             ;       AND EXIT THIS TEST
     035304  104410                                                                TRAP    C$ESCAPE
     035306  000604                                                                .WORD   L10073-.
6454 035310  004737  036146                JSR     PC,GETT1        ;IS "T1" CLEARED NOW
6455 035314  102002                       BVC     16$             ;IF NO ERROR, PROCEED
6456 035316                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     035316  104410                                                                TRAP    C$ESCAPE
     035320  000570                                                                .WORD   L10075-.
6457 035322  103004                 16$:   BCC     29$             ;YES, ALL'S OK
6458 035324                                GEDF    EM50C,ERR50     ;NO!  BAD VIA CHIP!
                                                                   ;       "DEVICE FATAL" ERROR # 78
     035324  104455                                                                TRAP    C$ERDF
     035326  000116                                                                .WORD   78
     035330  016203                                                                .WORD   EM50C
     035332  010762                                                                .WORD   ERR50
6459
6460                               ;-------------------------------------------------------------------------
6461
6462 035334  105037  002445        29$:   CLRB    TMP2+1          ;CHANGE THE DIRECTION OF ORB -- IT SHOULDN'T
6463 035340  004537  004310               JSR     R5,WRITE        ;   HAVE ANY EFFECT ON "PB7"
6464 035344  120002                       DORB
6465 035346  002445                       TMP2+1
6466 035350  103003                       BCC     .+10            ;IF NO ERROR, PROCEED
6467 035352                                ERROR                   ;ELSE, REPORT IT
     035352  104460                                                                TRAP    C$ERROR
6468 035354                                ESCAPE  TST             ;       AND EXIT THIS TEST
     035354  104410                                                                TRAP    C$ESCAPE
     035356  000534                                                                .WORD   L10073-.
6469 035360  004537  004310               JSR     R5,WRITE        ;RE-WRITE INTO T1C-H (ADDR 05) TO SET T1 AGAIN
6470 035364  120005                       T1CH
6471 035366  002453                       TMP5+1
6472 035370  103003                       BCC     .+10            ;IF NO ERROR, PROCEED
6473 035372                                ERROR                   ;ELSE, REPORT IT
     035372  104460                                                                TRAP    C$ERROR
6474 035374                                ESCAPE  TST             ;       AND EXIT THIS TEST
     035374  104410                                                                TRAP    C$ESCAPE
     035376  000514                                                                .WORD   L10073-.
6475 035400  004737  036146               JSR     PC,GETT1        ;IS "T1" SET AGAIN
6476 035404  102002                       BVC     .+6             ;IF NO ERROR, PROCEED
6477 035406                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     035406  104410                                                                TRAP    C$ESCAPE
     035410  000500                                                                .WORD   L10075-.
6478 035412  103426                       BCS     32$             ;YES, ALL'S WELL (AGAIN?)
6479 035414  004537  004064               JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6480 035420  120005                       T1CH
6481 035422  002452                       TMP5
6482 035424  103003                       BCC     .+10            ;IF NO ERROR, PROCEED
6483 035426                                ERROR                   ;ELSE, REPORT IT
     035426  104460                                                                TRAP    C$ERROR
6484 035430                                ESCAPE  TST             ;       AND EXIT THIS TEST
     035430  104410                                                                TRAP    C$ESCAPE
     035432  000460                                                                .WORD   L10073-.
6485 035434  004537  004064               JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6486 035440  120007                       T1CH
6487 035442  002456                       TMP7
6488 035444  103003                       BCC     .+10            ;IF NO ERROR, PROCEED
6489 035446                                ERROR                   ;ELSE, REPORT IT
```

```
     035446  104460                                                            TRAP    C$ERROR
6490 035450                             ESCAPE  TST             ;       AND EXIT THIS TEST
     035450  104410                                                            TRAP    C$ESCAPE
     035452  000440                                                            .WORD   L10073-.
6491 035454                             GEDF    EM50L,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
                                                                ;       "DEVICE FATAL" ERROR # 79
     035454  104455                                                            TRAP    C$ERDF
     035456  000117                                                            .WORD   79
     035460  016730                                                            .WORD   EM50L
     035462  010762                                                            .WORD   ERR50
6492 035464                             ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
     035464  104410                                                            TRAP    C$ESCAPE
     035466  000422                                                            .WORD   L10075-.
6493
6494                            ;-------------------------------------------------------------------
6495
6496 035470  004737  036332     32$:    JSR     PC,GETPB7       ;GET "PB7".  IS IT SET?
6497 035474  102002                     BVC     .+6             ;IF NO ERROR, PROCEED
6498 035476                             ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     035476  104410                                                            TRAP    C$ESCAPE
     035500  000410                                                            .WORD   L10075-.
6499 035502  103404                     BCS     44$             ;YES,  GOOD.
6500 035504                             GEDF    EM50U,ERR50     ;NO,  BAD!  REPORT IT:  NOT SET AFTER TIMEOUT
                                                                ;       "DEVICE FATAL" ERROR # 80
     035504  104455                                                            TRAP    C$ERDF
     035506  000120                                                            .WORD   80
     035510  017174                                                            .WORD   EM50U
     035512  010762                                                            .WORD   ERR50
6501 035514  112737  000125  002455  44$:  MOVB  #125,TMP6+1    ;USING A DIFFERENT VALUE -- 55 HEX.,
6502 035522  004537  004310             JSR     R5,WRITE        ;RE-LOAD T1L-L (ADDR 06)
6503 035526  120006                     T1LL
6504 035530  002455                     TMP6+1
6505 035532  103003                     BCC     .+10            ;IF NO ERROR, PROCEED
6506 035534                             ERROR                   ;ELSE, REPORT IT
     035534  104460                                                            TRAP    C$ERROR
6507 035536                             ESCAPE  TST             ;       AND EXIT THIS TEST
     035536  104410                                                            TRAP    C$ESCAPE
     035540  000352                                                            .WORD   L10073-.
6508 035542  004737  036146             JSR     PC,GETT1        ;IS "T1" STILL SET?
6509 035546  102002                     BVC     .+6             ;IF NO ERROR, PROCEED
6510 035550                             ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     035550  104410                                                            TRAP    C$ESCAPE
     035552  000336                                                            .WORD   L10075-.
6511 035554  103416                     BCS     33$             ;YES, ALL'S STILL OK
6512 035556  004537  004064             JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6513 035562  120006                     T1LL
6514 035564  002454                     TMP6
6515 035566  103003                     BCC     .+10            ;IF NO ERROR, PROCEED
6516 035570                             ERROR                   ;ELSE, REPORT IT
     035570  104460                                                            TRAP    C$ERROR
6517 035572                             ESCAPE  TST             ;       AND EXIT THIS TEST
     035572  104410                                                            TRAP    C$ESCAPE
     035574  000316                                                            .WORD   L10073-.
6518 035576                             GEDF    EM50M,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
                                                                ;       "DEVICE FATAL" ERROR # 81
     035576  104455                                                            TRAP    C$ERDF
     035600  000121                                                            .WORD   81
```

TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

```
                035602  017012                                                          .WORD   EM5OM
                035604  010762                                                          .WORD   ERR5O
6519            035606                          ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
                035606  104410                                                          TRAP    C$ESCAPE
                035610  000300                                                          .WORD   L10075-.
6520
6521                                    ;-------------------------------------------------------------------------
6522
6523 035612  112737  000125  002453  33$:    MOVB    #125,TMP5+1     ;AND USING THE SAME VALUE AGAIN (55 HEX),
6524 035620  004537  004310              JSR     R5,WRITE        ;NOW LOAD T1C-H (ADDR 05)
6525 035624  120005                      T1CH
6526 035626  002453                      TMP5+1
6527 035630  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6528 035632                              ERROR                   ;ELSE, REPORT IT
                035632  104460                                                          TRAP    C$ERROR
6529 035634                              ESCAPE  TST             ;       AND EXIT THIS TEST
                035634  104410                                                          TRAP    C$ESCAPE
                035636  000254                                                          .WORD   L10073-.
6530 035640  004737  036146              JSR     PC,GETT1        ;"T1" SHOULD NOW BE CLEARED
6531 035644  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
6532 035646                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                035646  104410                                                          TRAP    C$ESCAPE
                035650  000240                                                          .WORD   L10075-.
6533 035652  103024                      BCC     34$             ;IT WAS, ALL'S WELL THAT END'S WELL (I THINK!?)
6534 035654  004537  004064              JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6535 035660  120006                      T1LL
6536 035662  002454                      TMP6
6537 035664  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6538 035666                              ERROR                   ;ELSE, REPORT IT
                035666  104460                                                          TRAP    C$ERROR
6539 035670                              ESCAPE  TST             ;       AND EXIT THIS TEST
                035670  104410                                                          TRAP    C$ESCAPE
                035672  000220                                                          .WORD   L10073-.
6540 035674  004537  004064              JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6541 035700  120007                      T1LH
6542 035702  002456                      TMP7
6543 035704  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6544 035706                              ERROR                   ;ELSE, REPORT IT
                035706  104460                                                          TRAP    C$ERROR
6545 035710                              ESCAPE  TST             ;       AND EXIT THIS TEST
                035710  104410                                                          TRAP    C$ESCAPE
                035712  000200                                                          .WORD   L10073-.
6546 035714                              GEDF    EM5ON,ERR50     ;IT WASN'T!  SOMETHING WENT WRONG!  REPORT IT
                                                                 ;       "DEVICE FATAL" ERROR # 82
                035714  104455                                                          TRAP    C$ERDF
                035716  000122                                                          .WORD   82
                035720  017054                                                          .WORD   EM5ON
                035722  010762                                                          .WORD   ERR50
6547
6548 035724  004537  004310      34$:    JSR     R5,WRITE        ;RE-LOAD T1C-H (ADDR 5) TO START IT AGAIN
6549 035730  120005                      T1CH
6550 035732  002453                      TMP5+1
6551 035734  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6552 035736                              ERROR                   ;ELSE, REPORT IT
                035736  104460                                                          TRAP    C$ERROR
6553 035740                              ESCAPE  TST             ;       AND EXIT THIS TEST
                035740  104410                                                          TRAP    C$ESCAPE
```

TEST 27 VIA TIMER # 1 ONE-SHOT MODE

```
                035742  000150                                                          .WORD   L10073-.
6554            035744  004737  036332          JSR     PC,GETPB7       ;GET "PB7".  IS IT CLEARED?
6555            035750  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
6556            035752                  ESCAPE  SUB                     ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                035752  104410                                                          TRAP    C$ESCAPE
                035754  000134                                                          .WORD   L10075-.
6557            035756  103054                  BCC     48$             ;YES, GOOD.
6558            035760  004537  004064          JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
6559            035764  120015                  IFR
6560            035766  002472                  TMPD
6561            035770  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6562            035772                  ERROR                           ;ELSE, REPORT IT
                035772  104460                                                          TRAP    C$ERROR
6563            035774                  ESCAPE  TST                     ;       AND EXIT THIS TEST
                035774  104410                                                          TRAP    C$ESCAPE
                035776  000114                                                          .WORD   L10073-.
6564            036000  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
6565            036004  120004                  T1CL
6566            036006  002450                  TMP4
6567            036010  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6568            036012                  ERROR                           ;ELSE, REPORT IT
                036012  104460                                                          TRAP    C$ERROR
6569            036014                  ESCAPE  TST                     ;       AND EXIT THIS TEST
                036014  104410                                                          TRAP    C$ESCAPE
                036016  000074                                                          .WORD   L10073-.
6570            036020  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
6571            036024  120005                  T1CH
6572            036026  002452                  TMP5
6573            036030  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6574            036032                  ERROR                           ;ELSE, REPORT IT
                036032  104460                                                          TRAP    C$ERROR
6575            036034                  ESCAPE  TST                     ;       AND EXIT THIS TEST
                036034  104410                                                          TRAP    C$ESCAPE
                036036  000054                                                          .WORD   L10073-.
6576            036040  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6577            036044  120006                  T1LL
6578            036046  002454                  TMP6
6579            036050  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6580            036052                  ERROR                           ;ELSE, REPORT IT
                036052  104460                                                          TRAP    C$ERROR
6581            036054                  ESCAPE  TST                     ;       AND EXIT THIS TEST
                036054  104410                                                          TRAP    C$ESCAPE
                036056  000034                                                          .WORD   L10073-.
6582            036060  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6583            036064  120007                  T1LH
6584            036066  002456                  TMP7
6585            036070  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6586            036072                  ERROR                           ;ELSE, REPORT IT
                036072  104460                                                          TRAP    C$ERROR
6587            036074                  ESCAPE  TST                     ;       AND EXIT THIS TEST
                036074  104410                                                          TRAP    C$ESCAPE
                036076  000014                                                          .WORD   L10073-.
6588            036100                  GEDF    EM50V,ERR50             ;NO,  BAD!  EPT, PB7 NOT DRIVEN LOW
                                                                        ;       "DEVICE FATAL" ERROR # 85
                036100  104455                                                          TRAP    C$ERDF
                036102  000125                                                          .WORD   85.
                036104  017240                                                          .WORD   EM50V
```

```
036106  010762                                                                   .WORD   ERR50
036110                    48$:    ENDSUB
036110                                                                  L10075:
036110  104403                                                                   TRAP    C$ESUB
036112                            ENDTST
036112                                                                  L10073:
036112  104401                                                                   TRAP    C$ETST

                          ;-----------------------------------------------------------------------
                          ; LODT1C -- LOAD TIMER ONE AT ADDRESSES 04 & 05
                          ;
                          ; CALLING SEQUENCE:
                          ;
                          ;       JSR     R5,LODT1C
                          ;       .BYTE   <VALUE FOR T1L-L (ADDRESS 04)>
                          ;       .BYTE   <VALUE FOR T1C-H (ADDRESS 05)>
                          ;       <NEXT SEQUENCIAL INSTRUCTION
                          ;
                          ;-----------------------------------------------------------------------

036114  112537  002451    LODT1C: MOVB    (R5)+,TMP4+1    ;SETUP TO LOAD T1CL
036120  112537  002453            MOVB    (R5)+,TMP5+1    ;  AND T1CH
036124  004537  004310            JSR     R5,WRITE        ;LOAD T1C-L (ADDR 04) WITH PASSED PARAMETER
036130  120004                    T1CL
036132  002451                    TMP4+1
036134  004537  004310            JSR     R5,WRITE        ;LOAD T1C-H (ADDR 05) WITH PASSED PARAMETER
036140  120005                    T1CH                    ;  (THIS WILL ALSO RESET "T1" & THE COUNTER)
036142  002453                    TMP5+1
036144  000205                    RTS     R5

                          ;-----------------------------------------------------------------------
                          ; GETT1 -- GET THE "T1" FLAG FROM THE VIA'S IFR REGISTER AND PUT IT
                          ;               INTO THE "CARRY" BIT
                          ;
                          ;-----------------------------------------------------------------------

036146  004537  004064    GETT1:  JSR     R5,READ         ;GET VIA'S IFR REG.
036152  120015                    IFR
036154  002472                    TMPD
036156  103003                    BCC     1$              ;IF NO ERROR, PROCEED
036160                            ERROR                   ;ELSE, REPORT IT
036160  104460                                                                   TRAP    C$ERROR
036162  000262                    SEV                     ;FLAG AN ERROR TO MAINLINE ROUTINE
036164  000207                    RTS     PC              ;  AND TAKE AN ABNORMAL RETURN

036166  010046            1$:     MOV     R0,-(SP)        ;PRESERVE R0
036170  113700  002472            MOVB    TMPD,R0         ;PUT VALUE HERE TO PRESERVE TMPD
036174  106100                    ROLB    R0              ;"IRQ" GOES INTO CARRY BIT
036176  106100                    ROLB    R0              ;"T1" GOES INTO CARRY BIT
036200  012600                    MOV     (SP)+,R0        ;RESTORE R0
036202  000207                    RTS     PC

                          ;-----------------------------------------------------------------------
                          ; KICKT1    INIT. TIMER # 1 BY THE FOLLOWING PROCEDURE:
                          ;
                          ;       READ T1L-H (ADDR 07) TO GET THE LAST VALUE LOADED INTO IT
                          ;
```

```
6640                                    ;       WRITE THAT VALUE INTO T1C-H (ADDR 05) TO RESET THE "T1" INTERRUPT FLAG
6641                                    ;          AND CAUSE THE RE-LOADING OF BOTH COUNTERS.
6642                                    ;-------------------------------------------------------------------------------
6643
6644 036204  010346                    KICKT1: MOV     R3, (SP)        ;SAVE CALLER'S REGISTER CONTENTS
6645 036206  004537  004064                    JSR     R5,READ         ;GET THE CURRENT SETTING OF THE HIGH LATCH
6646 036212  120007                            T1LH
6647 036214  002456                            TMP7
6648 036216  103443                            BCS     10$             ;IF ERROR, EXIT
6649
6650 036220  012777  120005  144134            MOV     #T1CH,@SEL4     ;SETUP ADDRESS FOR M-LOOP WRITE
6651 036226  113777  002456  144132            MOVB    TMP7,@SEL6      ;SETUP DATA FOR SAME
6652 036234  113737  002456  002453            MOVB    TMP7,TMP5+1     ;PUT HERE TOO, BECAUSE WE'RE GOING TO WRITE IT.
6653 036242  142777  000100  144110            BICB    #IFR1,@BSEL3    ;CLEAR THE INTERRUPT BIT -- JUST IN CASE
6654 036250  112777  000002  144100            MOVB    #WRILOC,@BSEL2  ;TELL THE M-LOOP TO WRITE THE BYTE FOR US
6655 036256  012703  000074                    MOV     #60.,R3         ;SETUP TIMEOUT COUNTER
6656 036262  132777  000200  144066  5$:       BITB    #MRDY,@BSEL2    ;WAIT FOR M-READY TO BE SET
6657 036270  001016                            BNE     10$             ;AS SOON AS "MRDY" IS SET, EXIT!
6658 036272  077305                            SOB     R3,5$           ;IF NO TIMEOUT, CHECK AGAIN FOR M-READY
6659 036274                                    GTDF    EM4,ERR4        ;ELSE, "MRDY" TIMEOUT
                                                                       ;       QUEUE "DEVICE FATAL" ERROR # 84
     036274  012737  000001  002236                                                                    MOV     #T.EDF,ERRTYP
     036302  012737  000124  002240                                                                    MOV     #84,ERRNBR
     036310  012737  014500  002242                                                                    MOV     #EM4,ERRMSG
     036316  012737  005426  002244                                                                    MOV     #ERR4,ERRBLK
6660 036324  000261                            SEC                     ;INDICATE THE FAILURE & EXIT
6661
6662 036326  012603                    10$:    MOV     (SP)+,R3        ;RESTORE REGISTER
6663 036330  000207                            RTS     PC              ;IMMEDIATE RETURN
6664
6665                                    ;-------------------------------------------------------------------------------
6666                                    ; GETPB7 -- PUT THE CURRENT SETTING OF "PB7" (BIT 7 OF ORB W'IN THE VIA CHIP)
6667                                    ;           INTO THE CARRY BIT SO IT CAN BE TESTED UPON RETURN.
6668                                    ;
6669                                    ;       CALLING SEQUENCE:
6670                                    ;
6671                                    ;       JSR     PC,GETPB7
6672                                    ;       <TEST FOR PB7 SET OR CLEARED WITH "BCS" OR "BCC" INSTR'S>
6673                                    ;-------------------------------------------------------------------------------
6674
6675 036332  004537  004064            GETPB7: JSR     R5,READ         ;GET THE REGISTER THAT CONTAINS "PB7"
6676 036336  120000                            ORB
6677 036340  002440                            TMP0
6678 036342  103003                            BCC     1$              ;IF NO ERROR, PROCEED
6679 036344                                    ERROR                   ;ELSE, REPORT IT
     036344  104460                                                                    TRAP    C$ERROR
6680 036346  000262                            SEV                     ;FLAG AN ERROR TO MAINLINE ROUTINE
6681 036350  000207                            RTS     PC              ;  AND TAKE AN ABNORMAL RETURN
6682
6683 036352  010046                    1$:     MOV     R0, (SP)        ;PRESERVE THIS REGISTER FOR THE CALLER
6684 036354  113700  002440                    MOVB    TMP0,R0         ;PUT ITS CONTENTS HERE SO WE CAN MANIPULATE IT
6685 036360  106100                            ROLB    R0              ;PUT "PB7" INTO THE CARRY BIT
6686 036362  012600                            MOV     (SP)+,R0        ;RESTORE R0 FOR THE CALLER
6687 036364  000207                            RTS     PC              ;RETURN WITH "PB7" IN THE CARRY BIT
6688
```

```
   6733                               .SBTTL TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST
                                      ;;*****************************************************************************
                                      ;*
                                      ;*      TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST
                                      ;*
                                      ;*     THIS TEST VERIFIES THAT THE TIMER 1 COUNTER IS OPERATIONAL IN
                                      ;*     FREE-RUNNING MODE, IN EACH OF TWO SUBTESTS.
                                      ;*
                                      ;*     THE PROGRAM PERIODICALLY CHECKS THE COUNTER TO VERIFY THAT:
                                      ;*
                                      ;*       IT IS DECREMENTING AND EVENTUALLY REACHES 0,
                                      ;*
                                      ;*       RELOADS FROM THE LATCHES, AND
                                      ;*
                                      ;*       CONTINUES TO DECREMENT.
                                      ;*
                                      ;*   IN THE FIRST SUBTEST, THE FOLLOWING IS PERFORMED :
                                      ;*
                                      ;*     A MASTER CLEAR IS DONE AND THE TIMER IS PLACED IN FREE RUNNING MODE
                                      ;*     BY SETTING ACR7 TO 0 & ACR6 TO 1 (MODE 1). AND THE PROGRAM CHECKS
                                      ;*     FOR THE "T1" (BIT 6 IN IFR) TO BE INITIALLY CLEARED.
                                      ;*
                                      ;*     THEN T1L-L (ADR 04) IS LOADED WITH 125 (OCTAL) AND T1C-H (ADR 05) IS
                                      ;*     LOADED WITH 125 (OCTAL) STARTING THE COUNTER.
                                      ;*
                                      ;*     THE COUNT IS ALLOWED TO REACH 0 AGAIN, AND THE "T1" IS READ AND
                                      ;*     CHECKED TO BE SET.
                                      ;*
                                      ;*     T1C-H (ADR 05) IS READ AND "T1" IS CHECKED TO BE STILL SET.
                                      ;*
                                      ;*     THE COUNTER LO BYTE IS READ AND THE "T1" IS READ AND CHECKED TO BE
                                      ;*     CLEARED BY THE READ OF T1C-L.
                                      ;*
                                      ;*     THE COUNT IS ALLOWED TO REACH 0 ONCE MORE AND "T1" IS CHECKED TO BE
                                      ;*     SET AGAIN.
                                      ;*
                                      ;*     T1L-L IS LOADED WITH 252 (OCTAL) AND "T1" IS CHECKED TO BE STILL
                                      ;*     SET.
                                      ;*
                                      ;*     T1C-H IS LOADED WITH 252 (OCTAL) AND "T1" IS READ AND CHECKED TO BE
                                      ;*     CLEARED BY THE LOADING OF T1C-H.
                                      ;*
                                      ;*   IN THE SECOND SUBTEST, ALL OF THE ABOVE OPERATIONS ARE REPEATED, WITH
                                      ;*     ACR7 = 1, AND ACR6 = 1 (MODE 3). ALSO, PB7 IS VERIFIED FOR PROPER
                                      ;*     STATE AT THE PROPER TIME.
                                      ;*
                                      ;;*****************************************************************************
                                      ;
                                      ;       BGNTST
        036366                                                                      T28::
   6734 036366                                BGNSUB
        036366                                                                      T28.1:
        036366  104402                                                                      TRAP    C$BSUB
   6735 036370  004737  003762                JSR     PC,MSTCLR       ;INIT DMV & ENTER M LOOP
   6736 036374  103003                        BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
   6737 036376                                ERROR                   ;ELSE, REPORT ERROR
```

SEQ 0174

SEQ 0187

TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

```
                036376  104460                                                          TRAP    C$ERROR
6738            036400                          ESCAPE  TST             ;   & EXIT TEST
                036400  104410                                                          TRAP    C$ESCAPE
                036402  001514                                                          .WORD   L10076-.
6739            036404  004537  004660  1$:     JSR     R5,INITT1       ;INITIALIZE TIMER # 1
6740            036410  000000                  0                       ;       0 ==> LATCHES
6741            036412  000100                  BIT6                    ;       MODE 1 & "T1" INT. ENABLE FLAG CLEARED
6742            036414  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6743            036416                          ERROR                   ;ELSE, REPORT IT
                036416  104460                                                          TRAP    C$ERROR
6744            036420                          ESCAPE  TST             ;       AND EXIT THIS TEST
                036420  104410                                                          TRAP    C$ESCAPE
                036422  001474                                                          .WORD   L10076-.
6745            036424  004737  036146          JSR     PC,GETT1        ;IS "T1" SET?
6746            036430  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
6747            036432                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
                036432  104410                                                          TRAP    C$ESCAPE
                036434  000414                                                          .WORD   L10077-.
6748            036436  103006                  BCC     2$              ;NO, GOOD.
6749            036440                          GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
                                                                        ;       "DEVICE FATAL" ERROR # 85
                036440  104455                                                          TRAP    C$ERDF
                036442  000125                                                          .WORD   85
                036444  016067                                                          .WORD   EM50A
                036446  010762                                                          .WORD   ERR50
6750            036450                          ESCAPE  SUB             ;   & EXIT TEST
                036450  104410                                                          TRAP    C$ESCAPE
                036452  000376                                                          .WORD   L10077-.
6751
6752                                    ;-------------------------------------------------------------------------------
6753
6754            036454  004537  036114  2$:     JSR     R5,LODT1C       ;RELOAD TIMER 1'S COUNTERS WITH NEW VALUES:
6755            036460     125     125          .BYTE   125,125
6756
6757                                    ;-------------------------------------------------------------------------------
6758
6759            036462  005003                  CLR     R3              ;INITIALIZE TIMEOUT COUNTER
6760            036464  004737  036146  3$:     JSR     PC,GETT1        ;"T1" SHOULD BE SET.  IS IT?
6761            036470  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
6762            036472                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED - EXIT
                036472  104410                                                          TRAP    C$ESCAPE
                036474  000354                                                          .WORD   L10077-.
6763            036476  103407                  BCS     4$              ;YES, GOOD.
6764            036500  077307                  SOB     R3,3$           ;NO,  IF NO TIMEOUT, LOOK AGAIN
6765            036502                          GEDF    EM50F,ERR50     ;ELSE, SAY IT WASN'T SET BY T1 TIMEOUT
                                                                        ;       "DEVICE FATAL" ERROR # 86
                036502  104455                                                          TRAP    C$ERDF
                036504  000126                                                          .WORD   86
                036506  016341                                                          .WORD   EM50F
                036510  010762                                                          .WORD   ERR50
6766            036512                          ESCAPE  SUB             ;IF ERROR, THE REST OF THIS TEST IS UN-DOABLE!
                036512  104410                                                          TRAP    C$ESCAPE
                036514  000334                                                          .WORD   L10077-.
6767
6768            036516  004537  004064  4$:     JSR     R5,READ         ;READING T1CH SHOULDN'T CLEAR "T1"
6769            036522  120005                  T1CH
6770            036524  002452                  TMPS                    ; (WE DON'T CARE WHAT THIS IS)
```

SEQ 0175

SEQ 0188

TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

```
6771 036526  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6772 036530                            ERROR                   ;ELSE, REPORT IT
     036530  104460                                                    TRAP    C$ERROR
6773 036532                            ESCAPE  TST             ;       AND EXIT THIS TEST
     036532  104410                                                    TRAP    C$ESCAPE
     036534  001362                                                    .WORD   L10076-.
6774 036536  004737  03614C            JSR     PC,GETT1        ;CHECK "T1" -- IT SHOULD STILL BE SET
6775 036542  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
6776 036544                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     036544  104410                                                    TRAP    C$ESCAPE
     036546  000302                                                    .WORD   L10077-.
6777 036550  103404                    BCS     6$              ;IT IS, GOOD.
6778 036552                            GEDF    EM50G,ERR50     ;CLEARED BY READING T1CH!!
                                                               ;       "DEVICE FATAL" ERROR # 87
     036552  104455                                                    TRAP    C$ERDF
     036554  000127                                                    .WORD   87
     036556  016406                                                    .WORD   EM50G
     036560  010762                                                    .WORD   ERR50
6779 036562  004737  036204    6$:     JSR     PC,KICKT1       ;KICK IT OFF AGAIN SO WE CAN PRESERVE TIMING
6780 036566  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6781 036570                            ERROR                   ;ELSE, REPORT IT
     036570  104460                                                    TRAP    C$ERROR
6782 036572                            ESCAPE  TST             ;       AND EXIT THIS TEST
     036572  104410                                                    TRAP    C$ESCAPE
     036574  001322                                                    .WORD   L10076-.
6783
6784                                                           ;WAIT FOR IT TO FINISH:
6785 036576  005003                    CLR     R3              ;INITIALIZE TIMEOUT COUNTER
6786 036600  004737  036146    7$:     JSR     PC,GETT1        ;"T1" SHOULD BE SET.  IS IT?
6787 036604  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
6788 036606                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     036606  104410                                                    TRAP    C$ESCAPE
     036610  000240                                                    .WORD   L10077-.
6789 036612  103402                    BCS     8$              ;YES, GOOD.
6790 036614  077307                    SOB     R3,7$           ;NO.  IF NO TIMEOUT, LOOK AGAIN
6791 036616  000422                    BR      10$             ;IF TIMEOUT, BYPASS NEXT CHECK (THIS DONE ABOVE)
6792 036620  004537  004064    8$:     JSR     R5,READ         ;READING T1CL SHOULD CLEAR "T1"
6793 036624  120004                    T1CL
6794 036626  002450                    IMP4                    ; (WE DON'T CARE WHAT THIS IS EITHER)
6795 036630  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
6796 036632                            ERROR                   ;ELSE, REPORT IT
     036632  104460                                                    TRAP    C$ERROR
6797 036634                            ESCAPE  TST             ;       AND EXIT THIS TEST
     036634  104410                                                    TRAP    C$ESCAPE
     036636  001260                                                    .WORD   L10076-.
6798 036640  004737  036146            JSR     PC,GETT1        ;CHECK "T1" -- IT SHOULD BE CLEARED NOW
6799 036644  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
6800 036646                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     036646  104410                                                    TRAP    C$ESCAPE
     036650  000200                                                    .WORD   L10077-.
6801 036652  103004                    BCC     10$             ;IT IS, GOOD.
6802 036654                            GEDF    EM50C,ERR50     ;NOT CLEARED!  REPORT IT.
                                                               ;       "DEVICE FATAL" ERROR # 88
     036654  104455                                                    TRAP    C$ERDF
     036656  000130                                                    .WORD   88
     036660  016403                                                    .WORD   EM50C
     036662  010762                                                    .WORD   ERR50
```

SEQ 0176

SEQ 0189

TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

```
6803 036664  005003                    10$:  CLR     R3              ;RE-INITIALIZE THE TIMEOUT COUNTER
6804 036666  004737  036146              12$:  JSR     PC,GETT1        ;WAIT FOR "T1" TO GET SET AGAIN
6805 036672  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
6806 036674                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     036674  104410                                                                  TRAP    C$ESCAPE
     036676  000152                                                                  .WORD   L10077-.
6807 036700  103407                          BCS     14$             ;GOT IT -- GOOD.
6808 036702  077307                          SOB     R3,12$          ;NOT YET.  IF NO TIMEOUT, TRY AGAIN.
6809 036704                                  GEDF    EM50X,ERR50     ;ELSE, REPORT "T1" NOT RESET
                                                                     ;       "DEVICE FATAL" ERROR # 89
     036704  104455                                                                  TRAP    C$ERDF
     036706  000131                                                                  .WORD   89
     036710  017554                                                                  .WORD   EM50X
     036712  010762                                                                  .WORD   ERR50
6810 036714                                  ESCAPE  SUB             ;IF ERROR, CAN'T CONTINUE THIS TEST
     036714  104410                                                                  TRAP    C$ESCAPE
     036716  000132                                                                  .WORD   L10077-.
6811 036720  112737  000252  002455  14$:   MOVB    #252,TMP6+1     ;SETUP FOR AND
6812 036726  004537  004310                JSR     R5,WRITE        ;  LOAD TILL (ADDR 6)
6813 036732  120006                        TILL
6814 036734  002455                        TMP6+1                  ;  WITH 252 OCTAL
6815 036736  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6816 036740                                ERROR                   ;ELSE, REPORT IT
     036740  104460                                                                  TRAP    C$ERROR
6817 036742                                ESCAPE  TST             ;       AND EXIT THIS TEST
     036742  104410                                                                  TRAP    C$ESCAPE
     036744  001152                                                                  .WORD   L10076-.
6818 036746  004737  036146                JSR     PC,GETT1        ;THIS SHOULDN'T CLEAR "T1"
6819 036752  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
6820 036754                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED    EXIT
     036754  104410                                                                  TRAP    C$ESCAPE
     036756  000072                                                                  .WORD   L10077-.
6821 036760  103406                        BCS     16$             ;IT DIDN'T    GOOD.
6822 036762                                GEDF    EM50M,ERR50     ;WOOPS, IT DID!!  REPORT FAILURE
                                                                     ;       "DEVICE FATAL" ERROR # 90
     036762  104455                                                                  TRAP    C$ERDF
     036764  000132                                                                  .WORD   90
     036766  017012                                                                  .WORD   EM50M
     036770  010762                                                                  .WORD   ERR50
6823 036772                                ESCAPE  SUB             ;       THE REST OF THIS TEST IS INVALID TOO!
     036772  104410                                                                  TRAP    C$ESCAPE
     036774  000054                                                                  .WORD   L10077-.
6824 036776  112737  000252  002457  16$:   MOVB    #252,TMP7+1     ;SETUP FOR AND
6825 037004  004537  004310                JSR     R5,WRITE        ;  LOAD TILH (ADDR 7)
6826 037010  120007                        TILH
6827 037012  002457                        TMP7+1                  ;  WITH 252 OCTAL
6828 037014  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
6829 037016                                ERROR                   ;ELSE, REPORT IT
     037016  104460                                                                  TRAP    C$ERROR
6830 037020                                ESCAPE  TST             ;       AND EXIT THIS TEST
     037020  104410                                                                  TRAP    C$ESCAPE
     037022  001074                                                                  .WORD   L10076-.
6831 037024  004737  036146                JSR     PC,GETT1        ;THIS SHOULD CLEAR "T1"
6832 037030  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
6833 037032                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED    EXIT
     037032  104410                                                                  TRAP    C$ESCAPE
     037034  000014                                                                  .WORD   L10077-.
```

SEQ 0177

SEQ 0190

```
TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

 6834 037036  103004                          BCC     18$             ;IT DID -- GOOD.
 6835 037040                                  GEDF    EM50A,ERR50     ;NOP!  REPORT:  "T1" NOT CLEARED BY LOADING T1LH
                                                                      ;       "DEVICE FATAL" ERROR # 91
      037040  104455                                                                          TRAP    C$ERDF
      037042  000133                                                                          .WORD   91
      037044  016067                                                                          .WORD   EM50A
      037046  010762                                                                          .WORD   ERR50
 6836 037050                          18$:     ;THAT'S ALL FOLKS!
 6837 037050                                  ENDSUB
      037050                                                                  L10077:
      037050  104403                                                                          TRAP    C$ESUB
 6838                                 ;*****************************************************************
 6839 037052                                  BGNSUB
      037052                                                                  T28.2:
      037052  104402                                                                          TRAP    C$BSUB
 6840 037054  004737  003762                  JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
 6841 037060  103003                          BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
 6842 037062                                  ERROR                   ;ELSE, REPORT ERROR
      037062  104460                                                                          TRAP    C$ERROR
 6843 037064                                  ESCAPE  TST             ;   & EXIT TEST
      037064  104410                                                                          TRAP    C$ESCAPE
      037066  001030                                                                          .WORD   L10076-.
 6844 037070  112737  000377  002445  1$:     MOVB    #377,TMP2+1     ;SETUP DDRB SUCH THAT ORB IS AN INPUT/OUTPUT REG
 6845 037076  004537  004310                  JSR     R5,WRITE
 6846 037102  120002                          DDRB
 6847 037104  002445                          TMP2+1
 6848 037106  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
 6849 037110                                  ERROR                   ;ELSE, REPORT IT
      037110  104460                                                                          TRAP    C$ERROR
 6850 037112                                  ESCAPE  TST             ;       AND EXIT THIS TEST
      037112  104410                                                                          TRAP    C$ESCAPE
      037114  001002                                                                          .WORD   L10076-.
 6851 037116  112737  000030  002441          MOVB    #30,TMP0+1      ;CLEAR ALL BITS IN ORB EXCEPT DTR L & RTS L
 6852 037124  004537  004310                  JSR     R5,WRITE        ;  BY DOING THIS, WE SHOULD EXPECT PB7 TO BE
 6853 037130  120000                          ORB                     ;  CLEARED IF MODE 3 DOESN'T WORK PROPERLY.
 6854 037132  002441                          TMP0+1
 6855 037134  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
 6856 037136                                  ERROR                   ;ELSE, REPORT IT
      037136  104460                                                                          TRAP    C$ERROR
 6857 037140                                  ESCAPE  TST             ;       AND EXIT THIS TEST
      037140  104410                                                                          TRAP    C$ESCAPE
      037142  000754                                                                          .WORD   L10076-.
 6858 037144  004537  004660                  JSR     R5,INITT1       ;INITIALIZE TIMER # 1
 6859 037150  000000                          0                       ;       0 ==> LATCHES
 6860 037152  000300                          BIT7+BIT6               ;       MODE 3 & "T1" INT. ENABLE FLAG CLEARED
 6861 037154  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
 6862 037156                                  ERROR                   ;ELSE, REPORT IT
      037156  104460                                                                          TRAP    C$ERROR
 6863 037160                                  ESCAPE  TST             ;       AND EXIT THIS TEST
      037160  104410                                                                          TRAP    C$ESCAPE
      037162  000731                                                                          .WORD   L10076-.
 6864 037164  004737  036146                  JSR     PC,GETT1        ;IS "T1" SET?
 6865 037170  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
 6866 037172                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED    EXIT
      037172  104410                                                                          TRAP    C$ESCAPE
      037174  000720                                                                          .WORD   L10100-.
 6867 037176  103006                          BCC     2$              ;NO, GOOD.
```

TEST 28 - VIA TIMER 1 FREE-RUNNING MODE TEST

```
6868 037200                              GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
                                                                 ;       "DEVICE FATAL" ERROR # 92
     037200  104455                                                                      TRAP    C$ERDF
     037202  000134                                                                      .WORD   92
     037204  016067                                                                      .WORD   EM50A
     037206  010762                                                                      .WORD   ERR50
6869 037210                              ESCAPE  SUB             ;   & EXIT TEST
     037210  104410                                                                      TRAP    C$ESCAPE
     037212  000702                                                                      .WORD   L10100-.
6870
6871                             ;-------------------------------------------------------------------------------
6872
6873 037214  004537  036114     2$:     JSR     R5,LODT1C       ;RELOAD TIMER 1'S COUNTERS WITH NEW VALUES:
6874 037220     125     125             .BYTE   125,125
6875
6876                             ;-------------------------------------------------------------------------------
6877
6878 037222  005003                      CLR     R3              ;INITIALIZE TIMEOUT COUNTER
6879 037224  004737  036146     4$:     JSR     PC,GETT1        ;"T1" SHOULD BE SET.  IS IT?
6880 037230  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
6881 037232                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037232  104410                                                                      TRAP    C$ESCAPE
     037234  000660                                                                      .WORD   L10100-.
6882 037236  103407                      BCS     5$              ;YES, GOOD.
6883 037240  077307                      SOB     R3,4$           ;NO,  IF NO TIMEOUT, LOOK AGAIN
6884 037242                              GEDF    EM50F,ERR50     ;ELSE, SAY IT WASN'T SET BY T1 TIMEOUT
                                                                 ;       "DEVICE FATAL" ERROR # 93
     037242  104455                                                                      TRAP    C$ERDF
     037244  000135                                                                      .WORD   93
     037246  016341                                                                      .WORD   EM50F
     037250  010762                                                                      .WORD   ERR50
6885 037252                              ESCAPE  SUB             ;IF ERROR, THE REST OF THIS TEST IS UN-DOABLE!
     037252  104410                                                                      TRAP    C$ESCAPE
     037254  000640                                                                      .WORD   L10100-.
6886
6887                             ;-------------------------------------------------------------------------------
6888
6889 037256                      5$:
6890 037256  004737  036332             JSR     PC,GETPB7       ;GET "PB7".  IS IT SET?
6891 037262  102002                     BVC     .+6             ;IF NO ERROR, PROCEED
6892 037264                             ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037264  104410                                                                      TRAP    C$ESCAPE
     037266  000626                                                                      .WORD   L10100-.
6893 037270  103406                     BCS     36$             ;YES, GOOD.
6894 037272                             GEDF    EM50U,ERR50     ;NO,  REPORT IT NOT SET.
                                                                 ;       "DEVICE FATAL" ERROR # 94
     037272  104455                                                                      TRAP    C$ERDF
     037274  000136                                                                      .WORD   94
     037276  017174                                                                      .WORD   EM50U
     037300  010762                                                                      .WORD   ERR50
6895 037302                             ESCAPE  SUB             ;       & ALLOW RESTART OF THIS SUBTEST
     037302  104410                                                                      TRAP    C$ESCAPE
     037304  000610                                                                      .WORD   L10100-.
6896
6897                             ;-------------------------------------------------------------------------------
6898
6899 037306  004537  004064     36$:    JSR     R5,READ         ;READING TICH SHOULDN'T CLEAR "T1"
```

SEQ 0179

SEQ 0192

TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

```
6900 037312  120005                        T1CH
6901 037314  002452                        TMP5                ; (WE DON'T CARE WHAT THIS IS)
6902 037316  103003                        BCC     .+10        ;IF NO ERROR, PROCEED
6903 037320                                ERROR               ;ELSE, REPORT IT
     037320  104460                                                        TRAP    C$ERROR
6904 037322                                ESCAPE  TST         ;       AND EXIT THIS TEST
     037322  104410                                                        TRAP    C$ESCAPE
     037324  000572                                                        .WORD   L10076-.
6905 037326  004737  036146                JSR     PC,GETT1    ;CHECK "T1" -- IT SHOULD STILL BE SET
6906 037332  102002                        BVC     .+6         ;IF NO ERROR, PROCEED
6907 037334                                ESCAPE  SUB         ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037334  104410                                                        TRAP    C$ESCAPE
     037336  000556                                                        .WORD   L10100-.
6908 037340  103406                        BCS     37$         ;IT IS, GOOD.
6909 037342                                GEDF    EM50G,ERR50 ;CLEARED BY READING T1CH!!
                                                               ;       "DEVICE FATAL" ERROR # 95
     037342  104455                                                        TRAP    C$ERDF
     037344  000137                                                        .WORD   95
     037346  016406                                                        .WORD   EM50G
     037350  010762                                                        .WORD   ERR50
6910 037352                                ESCAPE  SUB         ;       ALLOW RESTART OF THIS SUBTEST
     037352  104410                                                        TRAP    C$ESCAPE
     037354  000540                                                        .WORD   L10100-.
6911
6912                                       ;-------------------------------------------------------------------------
6913
6914 037356  005003                 37$:   CLR     R3          ;INITIALIZE TIMEOUT COUNTER AGAIN
6915 037360  004737  036146          38$:   JSR     PC,GETT1    ;WAIT FOR "T1" TO BE SET AGAIN
6916 037364  102002                        BVC     .+6         ;IF NO ERROR, PROCEED
6917 037366                                ESCAPE  SUB         ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037366  104410                                                        TRAP    C$ESCAPE
     037370  000524                                                        .WORD   L10100-.
6918 037372  103407                        BCS     39$         ;GOT IT -- NO CHECK PB7
6919 037374  077307                        SOB     R3,38$      ;NOT YET.  IF NO TIMEOUT, LOOK AGAIN.
6920 037376                                GEDF    EM50L,ERR50 ;ELSE, TIMER NOT REALLY WORKING RIGHT!
                                                               ;       "DEVICE FATAL" ERROR # 96
     037376  104455                                                        TRAP    C$ERDF
     037400  000140                                                        .WORD   96
     037402  016730                                                        .WORD   EM50L
     037404  010762                                                        .WORD   ERR50
6921 037406                                ESCAPE  SUB
     037406  104410                                                        TRAP    C$ESCAPE
     037410  000504                                                        .WORD   L10100-.
6922
6923                                       ;--- ... -------------------------------------------------------------------
6924
6925 037412                          39$:
6926 037412  004737  036332                JSR     PC,GETPB7   ;GET "PB7".  IS IT SET?
6927 037416  102002                        BVC     .+6         ;IF NO ERROR, PROCEED
6928 037420                                ESCAPE  SUB         ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037420  104410                                                        TRAP    C$ESCAPE
     037422  000472                                                        .WORD   L10100-.
6929 037424  103404                        BCS     6$          ;YES, GOOD.
6930 037426                                GEDF    EM50Z,ERR50 ;NO,  REPORT "PB7" NOT SET AFTER SECOND CYCLE
                                                               ;       "DEVICE FATAL" ERROR # 97
     037426  104455                                                        TRAP    C$ERDF
     037430  000141                                                        .WORD   97
```

```
     037432  017471                                                                      .WORD   EM50Z
     037434  010762                                                                      .WORD   ERR50
6931
6932                                      ;-------------------------------------------------------------
6933
6934 037436  004737  036204    6$:     JSR     PC,KICKT1          ;KICK IT OFF AGAIN SO WE CAN PRESERVE TIMING
6935 037442  103003                    BCC     .+10               ;IF NO ERROR, PROCEED
6936 037444                            ERROR                      ;ELSE, REPORT IT
     037444  104460                                                                      TRAP    C$ERROR
6937 037446                            ESCAPE  TST                ;       AND EXIT THIS TEST
     037446  104410                                                                      TRAP    C$ESCAPE
     037450  000446                                                                      .WORD   L10076-.
6938
6939                                                        ;WAIT FOR IT TO FINISH:
6940 037452  005003                    CLR     R3                 ;INITIALIZE TIMEOUT COUNTER
6941 037454  004737  036146    7$:     JSR     PC,GETT1           ;"T1" SHOULD BE SET.  IS IT?
6942 037460  102002                    BVC     .+6                ;IF NO ERROR, PROCEED
6943 037462                            ESCAPE  SUB                ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037462  104410                                                                      TRAP    C$ESCAPE
     037464  000430                                                                      .WORD   L10100-.
6944 037466  103402                    BCS     8$                 ;YES, GOOD.
6945 037470  077307                    SOB     R3,7$              ;NO,  IF NO TIMEOUT, LOOK AGAIN
6946 037472  000442                    BR      14$                ;IF TIMEOUT, BYPASS NEXT CHECK (THIS DONE ABOVE)
6947 037474  004537  004064    8$:     JSR     R5,READ            ;READING T1CL SHOULD CLEAR "T1"
6948 037500  120004                    T1CL
6949 037502  002450                    TMP4                       ; (WE DON'T CARE WHAT THIS IS EITHER)
6950 037504  103003                    BCC     .+10               ;IF NO ERROR, PROCEED
6951 037506                            ERROR                      ;ELSE, REPORT IT
     037506  104460                                                                      TRAP    C$ERROR
6952 037510                            ESCAPE  TST                ;       AND EXIT THIS TEST
     037510  104410                                                                      TRAP    C$ESCAPE
     037512  000404                                                                      .WORD   L10076-.
6953 037514  004737  036146            JSR     PC,GETT1           ;CHECK "T1" -- IT SHOULD BE CLEARED NOW
6954 037520  102002                    BVC     .+6                ;IF NO ERROR, PROCEED
6955 037522                            ESCAPE  SUB                ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037522  104410                                                                      TRAP    C$ESCAPE
     037524  000370                                                                      .WORD   L10100-.
6956 037526  103006                    BCC     9$                 ;IT IS, GOOD.
6957 037530                            GEDF    EM50C,ERR50        ;NOT CLEARED!  REPORT IT.
                                                                  ;       "DEVICE FATAL" ERROR # 98
     037530  104455                                                                      TRAP    C$ERDF
     037532  000142                                                                      .WORD   98
     037534  016203                                                                      .WORD   EM50C
     037536  010762                                                                      .WORD   ERR50
6958 037540                            ESCAPE  SUB                ;IF THIS ERROR OCCURED, EXIT SUBTEST
     037540  104410                                                                      TRAP    C$ESCAPE
     037542  000352                                                                      .WORD   L10100-.
6959 037544  005003            9$:     CLR     R3                 ;RE-INITIALIZE THE TIMEOUT COUNTER
6960 037546  004737  036146    12$:    JSR     PC,GETT1           ;WAIT FOR "T1" TO GET SET AGAIN
6961 037552  102002                    BVC     .+6                ;IF NO ERROR, PROCEED
6962 037554                            ESCAPE  SUB                ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     037554  104410                                                                      TRAP    C$ESCAPE
     037556  000336                                                                      .WORD   L10100-.
6963 037560  103407                    BCS     14$                ;GOT IT -- GOOD.
6964 037562  077307                    SOB     R3,12$             ;NOT YET.  IF NO TIMEOUT, TRY AGAIN.
6965 037564                            GEDF    EM50X,ERR50        ;ELSE, REPORT "T1" NOT RESET
                                                                  ;       "DEVICE FATAL" ERROR # 99
```

TEST 28 -- VIA TIMER 1 FREE-RUNNING MODE TEST

```
                037564  104455                                                          TRAP    C$ERDF
                037566  000143                                                          .WORD   99
                037570  017354                                                          .WORD   EM50X
                037572  010762                                                          .WORD   ERR50
        6966    037574                          ESCAPE  SUB             ;IF ERROR, CAN'T CONTINUE THIS TEST
                037574  104410                                                          TRAP    C$ESCAPE
                037576  000316                                                          .WORD   L10100-.
        6967    037600  112737  000252  002455  14$:    MOVB    #252,TMP6+1     ;SETUP FOR AND
        6968    037606  004537  004310                  JSR     R5,WRITE        ;  LOAD T1LL (ADDR 6)
        6969    037612  120006                          T1LL
        6970    037614  002455                          TMP6+1                  ;  WITH 252 OCTAL
        6971    037616  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
        6972    037620                                  ERROR                   ;ELSE, REPORT IT
                037620  104460                                                          TRAP    C$ERROR
        6973    037622                          ESCAPE  TST             ;       AND EXIT THIS TEST
                037622  104410                                                          TRAP    C$ESCAPE
                037624  000272                                                          .WORD   L10076-.
        6974    037626  004737  036146                  JSR     PC,GETT1        ;THIS SHOULDN'T CLEAR "T1"
        6975    037632  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
        6976    037634                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                037634  104410                                                          TRAP    C$ESCAPE
                037636  000256                                                          .WORD   L10100-.
        6977    037640  103406                          BCS     16$             ;IT DIDN'T -- GOOD.
        6978    037642                                  GEDF    EM50M,ERR50     ;WOOPS, IT DID!!  REPORT FAILURE
                                                                                ;       "DEVICE FATAL" ERROR # 100
                037642  104455                                                          TRAP    C$ERDF
                037644  000144                                                          .WORD   100
                037646  017012                                                          .WORD   EM50M
                037650  010762                                                          .WORD   ERR50
        6979    037652                          ESCAPE  SUB             ;       THE REST OF THIS TEST IS INVALID TOO!
                037652  104410                                                          TRAP    C$ESCAPE
                037654  000240                                                          .WORD   L10100-.
        6980    037656  004737  036332          16$:    JSR     PC,GETPB7       ;"PB7" SHOULD BE LOW HERE
        6981    037662  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
        6982    037664                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                037664  104410                                                          TRAP    C$ESCAPE
                037666  000226                                                          .WORD   L10100-.
        6983    037670  103054                          BCC     17$             ;IT WASN'T, GOOD.
        6984    037672  004537  004064                  JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
        6985    037676  120015                          IFR
        6986    037700  002472                          TMPD
        6987    037702  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
        6988    037704                                  ERROR                   ;ELSE, REPORT IT
                037704  104460                                                          TRAP    C$ERROR
        6989    037706                          ESCAPE  TST             ;       AND EXIT THIS TEST
                037706  104410                                                          TRAP    C$ESCAPE
                037710  000206                                                          .WORD   L10076-.
        6990    037712  004537  004064                  JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
        6991    037716  120004                          T1CL
        6992    037720  002450                          TMP4
        6993    037722  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
        6994    037724                                  ERROR                   ;ELSE, REPORT IT
                037724  104460                                                          TRAP    C$ERROR
        6995    037726                          ESCAPE  TST             ;       AND EXIT THIS TEST
                037726  104410                                                          TRAP    C$ESCAPE
                037730  000166                                                          .WORD   L10076-.
        6996    037732  004537  004064                  JSR     R5,READ         ;GET T1CM FOR ERROR MESSAGE
```

TEST 28 -- V1A TIMER 1 FREE-RUNNING MODE TEST

```
6997 037736  120005                    T1CH
6998 037740  002452                    TMP5
6999 037742  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7000 037744                            ERROR                   ;ELSE, REPORT IT
     037744  104460                                                    TRAP    C$ERROR
7001 037746                            ESCAPE  TST             ;       AND EXIT THIS TEST
     037746  104410                                                    TRAP    C$ESCAPE
     037750  000146                                                    .WORD   L10076-.
7002 037752  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7003 037756  120006                    T1LL
7004 037760  002454                    TMP6
7005 037762  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7006 037764                            ERROR                   ;ELSE, REPORT IT
     037764  104460                                                    TRAP    C$ERROR
7007 037766                            ESCAPE  TST             ;       AND EXIT THIS TEST
     037766  104410                                                    TRAP    C$ESCAPE
     037770  000126                                                    .WORD   L10076-.
7008 037772  004537  004064            JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7009 037776  120007                    T1LH
7010 040000  002456                    TMP7
7011 040002  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7012 040004                            ERROR                   ;ELSE, REPORT IT
     040004  104460                                                    TRAP    C$ERROR
7013 040006                            ESCAPE  TST             ;       AND EXIT THIS TEST
     040006  104410                                                    TRAP    C$ESCAPE
     040010  000106                                                    .WORD   L10076-.
7014 040012                            GEDF    EM50Y,ERR50     ;IT WAS!  REPORT IT BEING RESET BY WRITTING T1LL
                                                               ;       "DEVICE FATAL" ERROR # 101
     040012  104455                                                    TRAP    C$ERDF
     040014  000145                                                    .WORD   101
     040016  017417                                                    .WORD   EM50Y
     040020  010762                                                    .WORD   ERR50
7015
7016                           ; AT THE ABOVE "PB7" TEST, IT SHOULD BE LOW,  NOT BECAUSE OF ANY READ/WRITE
7017                           ; OPERATION, BUT BECAUSE OF WHERE WE ARE IN THE CYCLING OF TIMER # 1.  "PB7"
7018                           ; SHOULD BE LOW HERE UNTIL T1 TIMES OUT.
7019
7020 040022  112737  000252  002457  17$:   MOVB    #252,TMP7+1     ;SETUP FOR AND
7021 040030  004537  004310            JSR     R5,WRITE        ;  LOAD T1LH (ADDR 7)
7022 040034  120007                    T1LH
7023 040036  002457                    TMP7+1                  ;  WITH 252 OCTAL
7024 040040  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7025 040042                            ERROR                   ;ELSE, REPORT IT
     040042  104460                                                    TRAP    C$ERROR
7026 040044                            ESCAPE  TST             ;       AND EXIT THIS TEST
     040044  104410                                                    TRAP    C$ESCAPE
     040046  000050                                                    .WORD   L10076-.
7027 040050  004737  036146            JSR     PC,GETT1        ;THIS SHOULD CLEAR "T1"
7028 040054  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
7029 040056                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
     040056  104410                                                    TRAP    C$ESCAPE
     040060  000034                                                    .WORD   L10100-.
7030 040062  103006                    BCC     18$             ;IT DID -- GOOD.
7031 040064                            GEDF    EM50A,ERR50     ;NOP!  REPORT:  "T1" NOT CLEARED BY LOADING T1LH
                                                               ;       "DEVICE FATAL" ERROR # 102
     040064  104455                                                    TRAP    C$ERDF
     040066  000146                                                    .WORD   102
```

EQ 0183

SEQ 0196

TEST 28 VIA TIMER 1 FREE-RUNNING MODE TEST

```
                040070  016067                                                          .WORD   EM50A
                040072  010762                                                          .WORD   ERR50
7032            040074                          ESCAPE  SUB
                040074  104410                                                          TRAP    C$ESCAPE
                040076  000016                                                          .WORD   L10100-.
7033            040100  004537  004660          18$:    JSR     R5,INITT1       ;RE-INITIALIZE IT TO STOP ITS FUNCTIONING
7034            040104  000001                          1
7035            040106  000000                          0
7036            040110  103001                          BCC     .+4             ;IF NO ERROR, EXIT
7037            040112                                  ERROR                   ;ELSE, REPORT IT
                040112  104460                                                          TRAP    C$ERROR
7038                                                    ;THAT'S ALL FOLKS!
7039            040114                          ENDSUB
                040114                                                          L10100:
                040114  104403                                                          TRAP    C$ESUB
7040            040116                          ENDTST
                040116                                                          L10076:
                040116  104401                                                          TRAP    C$ETST
7041
7042
7043
```

```
                        .SBTTL  HARDWARE PARAMETER CODING SECTION


                        ;////////////////////////////////////////////////////////////////////////////
                        ;/ THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                        ;/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                        ;/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                        ;/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                        ;/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                        ;/ WITH THE OPERATOR.
                        ;////////////////////////////////////////////////////////////////////////////

040120                          BGNHRD
040120  000015                                                    .WORD L10101-L$HARD/2
040122                                                        L$HARD::

040122                          GPRMA   ADDRES,0,0,160020,177776,YES
040122  000031                                                  .WORD   T$CODE
040124  040154                                                  .WORD   ADDRES
040126  160020                                                  .WORD   T$LOLIM
040130  177776                                                  .WORD   T$HILIM
040132                          GPRMA   VECTOR,2,0,0,674,YES
040132  001031                                                  .WORD   T$CODE
040134  040202                                                  .WORD   VECTOR
040136  000000                                                  .WORD   T$LOLIM
040140  000674                                                  .WORD   T$HILIM
040142                          GPRMD   PRIRTY,4,0,7000,0,7,YES
040142  002032                                                  .WORD   T$CODE
040144  040233                                                  .WORD   PRIRTY
040146  007000                                                  .WORD   7000
040150  000000                                                  .WORD   T$LOLIM
040152  000007                                                  .WORD   T$HILIM

040154                          ENDHRD
                                                                .EVEN
040154                                                        L10101:

                                .NLIST  BEX
040154  104     105     126     ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
040202  104     105     126     VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
040233  104     105     126     PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
                                .LIST   BEX
                                .EVEN
```

SEQ 0185

SEQ 0198

SOFTWARE PARAMETER CODING SECTION

```
                                .SBTTL SOFTWARE PARAMETER CODING SECTION



                                ;////////////////////////////////////////////////////////////////////////
                                ;/  THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ;/  THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ;/  MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ;/  INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ;/  MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ;/  WITH THE OPERATOR.
                                ;////////////////////////////////////////////////////////////////////////

040264                                  BGNSFT
040264  000000                                                    .WORD L10102-L$SOFT/2
040266                                                  L$SOFT::
040266                                  ENDSFT
                                                                .EVEN
040266                                                  L10102:
```

RTYP
R
SG
BLK

FQ 0186

SEQ 0199

PATCH AREA FOR DEBUG

```
                                .SBTTL PATCH AREA FOR DEBUG
040266                          PATCH:
040366                                  .=.+100
040366  000240                         NOP
040370  000240                         NOP
040372  000240                         NOP

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

                                .SBTTL "ENDMOD" & "LASTAD"
040374                                  ENDMOD
040374                                  LASTAD
                                                                        .EVEN
040374  000000                                                          .WORD   0
040376  000000                                                          .WORD   0
040400                          L$LAST::
000001                          .END
```

SEQ 0187

SEQ 0200

SYMBOL TABLE

```
ACR     = 120013          BSLT5 = 000025          C$GPRI= 000040          EM50A   016067          FMT06A  012571
ADDRES  040154            BSLT6 = 000026          C$INIT= 000011          EM50B   016135          FMT06B  012637
ADR     = 000020 G        BSLT7 = 000027          C$INLP= 000020          EM50C   016203          FMT07   012530
AD.HIT  020350            BSR0    002246          C$MANI= 000050          EM50D   016251          FMT10   012654
AD.OK   020344            BSR1    002250          C$MEM = 000031          EM50E   016305          FMT11   012730
ASSEMB= 000010            BSR10   002266          C$MSG = 000023          EM50F   016341          FMT4    012245
BDATA   002312            BSR11   002270          C$OPEN= 000034          EM50G   016406          FMT4A   012305
BIT0    = 000001 G        BSR12   002272          C$PNTB= 000014          EM50H   016450          FMT4B   012340
BIT00   = 000001 G        BSR13   002274          C$PNTF= 000017          EM50I   016536          FMT4C   012345
BIT01   = 000002 G        BSR14   002276          C$PNTS= 000016          EM50J   016600          FMT47A  007232
BIT02   = 000004 G        BSR15   002300          C$PNTX= 000015          EM50K   016666          FMT47B  007263
BIT03   = 000010 G        BSR16   002302          C$QIO = 000077          EM50L   016730          FMT47C  007322
BIT04   = 000020 G        BSR17   002304          C$RDBU= 000007          EM50M   017012          FMT47E  007350
BIT05   = 000040 G        BSR2    002252          C$REFG= 000047          EM50N   017054          FMT47G  007407
BIT06   = 000100 G        BSR3    002254          C$RESE= 000033          EM50S   017122          FMT48A  010300
BIT07   = 000200 G        BSR4    002256          C$REVI= 000003          EM50U   017174          FMT48B  010347
BIT08   = 000400 G        BSR5    002260          C$RFLA= 000021          EM50V   017240          FMT48C  010402
BIT09   = 001000 G        BSR6    002262          C$RPT = 000025          EM50W   017305          FMT48E  010437
BIT1    = 000002 G        BSR7    002264          C$SEFG= 000046          EM50X   017354          FMT48F  010506
BIT10   = 002000 G        BT1     = 003122        C$SPRI= 000041          EM50Y   017417          FMT48G  010551
BIT11   = 004000 G        BT2     = 003206        C$SVEC= 000037          EM50Z   017471          FMT48H  010611
BIT12   = 010000 G        BUFARE  003122          C$TPRI= 000013          EM6     014540          FMT48I  010644
BIT13   = 020000 G        CONSOL  002346          DDRA  = 120003          EM7     014564          FMT5    012400
BIT14   = 040000 G        CONTIN  020122          DDRB  = 120002          EM8     014611          FMT5A   012443
BIT15   = 100000 G        CONTST  020222          DELAY1  002316          EM9     014634          FMT50A  012747
BIT2    = 000004 G        CSREGS= 000020          DELAY2  002320          ENDEMB  012114          FMT50B  013021
BIT3    = 000010 G        C$AU  = 000052          DEVMAP  002342          ENDT7   022642          FMT50C  013102
BIT4    = 000020 G        C$AUTO= 000061          DEVPTR  002344          ERRBLK  002244 G        FMT50D  013142
BIT5    = 000040 G        C$BRK = 000022          DFPTBL  002216 G        ERRFLG  002332          FMT50E  013157
BIT6    = 000100 G        C$BSEG= 000004          DIAGMC= 000000          ERRMSG  002242 G        FMT50M  013174
BIT7    = 000200 G        C$BSUB= 000002          DMVDAI= 000001          ERRNBR  002240 G        FRSPAS  002340
BIT8    = 000400 G        C$CEFG= 000045          DMVPU = 000004          ERRTYP  002236 G        FRSTIM  002336
BIT9    = 001000 G        C$CLCK= 000062          EF.CON= 000036 G        ERR1    005276 G        F$AU  = 000015
B0E     = 000400 G        C$CLEA= 000012          EF.NEW= 000035 G        ERR2    005304 G        F$AUTO= 000020
BSEL    002352            C$CLOS= 000035          EF.PWR= 000034 G        ERR3    005414 G        F$BGN = 000040
BSELRS  003042            C$CLP1= 000006          EF.RES= 000037 G        ERR4    005426 G        F$CLEA= 000007
BSEL0   002352            C$CVEC= 000036          EF.STA= 000040 G        ERR41   011522          F$DU  = 000016
BSEL1   002354            C$DCLN= 000044          EM14    014667          ERR47   006724 G        F$END = 000041
BSEL10  002372            C$DODU= 000051          EM15    014733          ERR47.  007110          F$HARD= 000004
BSEL11  002374            C$DRPT= 000024          EM16    015013          ERR48   007632 G        F$HW  = 000013
BSEL12  002376            C$DU  = 000053          EM17    015110          ERR48.  010030          F$INIT= 000006
BSEL13  002400            C$EDIT= 000003          EM17A   015170          ERR5    005552 G        F$JMP = 000050
BSEL14  002402            C$ERDF= 000035          EM20    015243          ERR51   011710          F$MOD = 000000
BSEL15  002404            C$ERHR= 000056          EM20A   015275          ERR50   010762 G        F$MSG = 000011
BSEL16  002406            C$ERRO= 000060          EM20B   015355          ERR6    005650 G        F$PROT= 000021
BSEL17  002410            C$ERSF= 000054          EM21    015442          ERR7    006612 G        F$PWR = 000017
BSEL2   002356            C$ERSO= 000057          EM22    015477          ER47CT  007104          F$RPT = 000012
BSEL3   002360            C$ESCA= 000010          EM22A   015532          ER47MX  007106          F$SEG = 000003
BSEL4   002362            C$ESEG= 000005          EM25    015565          ER48CT  010024          F$SOFT= 000005
BSEL5   002364            C$ESUB= 000003          EM3     014454          ER48MX  010026          F$SRV = 000010
BSEL6   002366            C$ETST= 000001          EM34    015613          EVL     = 000004 G      F$SUB = 000002
BSEL7   002370            C$EXIT= 000032          EM34B   015644          EXECUT= 000005          F$SW  = 000014
BSLT0 = 000020            C$GETB= 000026          EM4     014500          F$END = 002100          F$TEST= 000001
BSLT1 = 000021            C$GETW= 000027          EM47A   015675          F$LOAD= 000035          GDATA   002310
BSLT2 = 000022            C$GMAN= 000043          EM47B   015735          FMT02   012124          GETBSR  004434
BSLT3 = 000023            C$GPHR= 000042          EM48A   016016          FMT02A  012161          GETPB2  036332
BSLT4 = 000024            C$GPLU= 000030          EM5     014515          FMT06   012562          GETPRM  020012
```

SYMBOL TABLE

```
GETT1   036146          I$PTAB= 000031          L$PRIO  002042 G        L10054  027356          ORA    = 120001
GETWDR  004576          I$PWR = 000041          L$PROT  017614 G        L10055  027352          ORAM   = 120017
G$CNTO= 000200          I$RPT = 000042          L$PRT   002112 G        L10056  027440          ORB    = 120000
G$DELM= 000372          I$SEG = 000041          L$RFPP  002062 G        L10057  027434          O$APTS= 000000
G$DISP= 000003          I$SETU= 000041          L$REV   002010 G        L10060  027524          O$AU   = 000001
G$EXCP= 000400          I$SFT = 000041          L$SOFT  040266 G        L10061  027520          O$BGNR= 000000
G$HILI= 000002          I$SRV = 000041          L$SPC   002056 G        L10062  027612          O$BGNS= 000000
G$LOLI= 000001          I$SUB = 000041          L$SPCP  002020 G        L10063  027606          O$DU   = 000001
G$NO  = 000000          I$TST = 000041          L$SPTP  002024 G        L10064  030100          O$ERRT= 000001
G$OFFS= 000400          J$JMP = 000167          L$STA   002030 G        L10065  030230          O$GNSW= 000000
G$OFSI= 000376          KICKT1  036204          L$SW    002236 G        L10066  030360          O$POIN= 000001
G$PRMA= 000001          LOBTIC  036114          L$TEST  002114 G        L10067  030514          O$SETU= 000000
G$PRMD= 000002          LOE   = 040000 G        L$TIML  002014 G        L10070  030644          PATA   002504
G$PRML= 000000          LOGDEV  002322          L$UNIT  002012 G        L10071  030774          PATB   002526
G$RADA= 000140          LOT   = 000010 G        L10000  002234          L10072  031132          PATC   002556
G$RADB= 000000          LSIDCL= 000002          L10001  002236          L10073  036112          PATCH  040266
G$RADD= 000040          LSIHLT= 000020          L10002  005220          L10074  033404          PATCM  002624
G$RADL= 000120          LU1MOD  002000 G        L10003  005272          L10075  036110          PATCR  002604
G$RADO= 000020          L$ACP   002110 G        L10004  005302          L10076  040116          PATD   002644
G$XFER= 000004          L$APT   002036 G        L10005  005412          L10077  037050          PATE   002674
G$YES = 000010          L$AU    020400 G        L10006  005424          L10100  040114          PATF   002724
HELP  = 000000          L$AUT   002070 G        L10007  005550          L10101  040154          PATG   003040
HOE   = 100000 G        L$AUTO  020232 G        L10010  005646          L10102  040266          PATGEN 023776
IBF   = 010000 G        L$CCP   002106 G        L10011  006610          MASCLR  003614          PCR    = 120014
IDO   = 000040 G        L$CLEA  020356 G        L10012  006722          MCLR  = 000100          PFLAG  002350
IENBA = 000001          L$CO    002032 G        L10013  007102          MLWRI   004332          PNT    = 001000 G
IENBB = 000020          L$DEPO  002011 G        L10014  010022          MPCSR   002352          PRI    = 002000 G
IENR  = 120016          L$DESC  003542 G        L10015  011274          MPIHAN  005152 G        PRIRTY  040233
IER   = 020000 G        L$DESP  002076 G        L10017  020220          MPIVEC  002412          PRI00 = 000000 G
IFR   = 120015          L$DEVP  002060 G        L10020  020346          MPOHAN  005224 G        PRI01 = 000040 G
IFRCA1= 000002          L$DISP  002124 G        L10021  020372          MPOVEC  002414          PRI02 = 000100 G
IFRCA2= 000001          L$DLY   002116 G        L10022  020376          MPRIOR  002416          PRI03 = 000140 G
IFRCB1= 000020          L$DTP   002040 G        L10023  020400          MRDY  = 000200          PRI04 = 000200 G
IFRCB2= 000010          L$DTYP  002034 G        L10024  020536          MREQ  = 000001          PRI05 = 000240 G
IFRIRQ= 000200          L$DU    020374 G        L10025  020666          MSTCLR  003762          PRI06 = 000300 G
IFRSR = 000004          L$DUT   002072 G        L10026  021254          NEWLIN  012121          PRI07 = 000340 G
IFRT1 = 000100          L$DVTY  003522 G        L10027  021446          NEWPC   002500          PSTACK  002324
IFRT2 = 000040          L$EF    002052 G        L10030  021610          NEWST   017772          PU24   = 000001
IHILNK  005222          L$ENVI  002044 G        L10031  021732          NPRABT= 000200          RCRAM  023616
IHOLNK  005274          L$ERRT  002236 G        L10032  022134          NPRAIH= 000075          READ   004064
INITT1  004660          L$ETP   002102 G        L10033  022644          NPRAIL= 000074          READI  004176
INTFLG  002326          L$EXP1  002046 G        L10034  022554          NPRAIX= 000076          REDLOC= 000001
INTWCH  002330          L$EXP4  002064 G        L10035  022642          NPRAOH= 000071          REDPAG= 000003
IRQA  = 000004          L$EXP5  002066 G        L10036  023212          NPRAOL= 000070          REGNUM  002354
IRQB  = 000002          L$HARD  040122 G        L10037  023400          NPRAOX= 000072          REG0   002420
IRQREG= 123005          L$HIME  002120 G        L10040  025140          NPRBS7= 000010          REG1   002422
ISR   = 000100 G        L$HPCP  002026 G        L10041  025762          NPRBYT= 000010          REG2   002424
IXE   = 004000 G        L$HPTP  002022 G        L10042  026044          NPRCTL= 123004          REG3   002426
I$AU  = 000041          L$HW    002216 G        L10043  026040          NPRDL = 000044          REG4   002430
I$AUTO= 000041          L$ICP   002104 G        L10044  026126          NPRDLB= 000054          REG5   002432
I$CLN = 000041          L$INIT  017622 G        L10045  026122          NPRDRH= 123001          REG6   002434
I$DU  = 000041          L$LADP  002026 G        L10046  026230          NPRDRL= 123000          REG7   002436
I$HRD = 000041          L$LAST  040400 G        L10047  026224          NPRGO = 000100          RESEMC  005040
I$INIT= 000041          L$LOAD  002100 G        L10050  027274          NPRIO = 000040          RESETS  005062
I$MOD   000041          L$LUN   002074 G        L10051  026736          NPRLD = 000004          RESTRT  011266
I$MSG = 000041          L$MREV  002050 G        L10052  027114          NUCERR  012072          RUN    = 000000
I$PROT= 000040          L$NAME  002000 G        L10053  027272          OLDSP   002502          SELO   002352
```

SYMBOL TABLE

```
SEL10   002372          TXTVRB  014430          T$LOLI= 000000          T1.2    021001          T4      021450 G
SEL12   002376          TXTVRC  014434          T$LSYM= 010000          T1.3    021034          T5      021612 G
SEL14   002402          TXTVRD  014440          T$LTNO= 000034          T1.4    021106          T6      021754 G
SEL16   002406          TXTVRE  014444          T$NEST= 177777          T10     024162 G        T7      022136 G
SEL2    002356          TXTVRF  014450          T$NS0 = 000000          T11     025142 G        T7.1    022136
SEL4    002362          TXTVRT  017554          T$NS1 = 000005          T12     025764 G        T7.2    022356
SEL6    002366          TXTVR0  014345          T$NS2 = 000002          T12.LP  026006          T8      022646 G
SFPTBL  002236 G        TXTVR1  014351          T$NS3 = 000003          T12.1   026006          T9      023214 G
SLT0    = 000020        TXTVR2  014355          T$PTNU= 000000          T13     026046 G        T9.RST  023402
SLT2    = 000022        TXTVR3  014362          T$SAVL= 177777          T13.LP  026070          UAM     = 000200 G
SLT4    = 000024        TXTVR4  014367          T$SEGL= 177777          T13.1   026070          VECTOR  040202
SLT6    = 000026        TXTVR5  014374          T$SEKO= 010000          T14     026130 G        WA      = 003346
SR      = 120012        TXTVR6  014401          T$SUBN= 000002          T14.LP  026172          WB      = 003350
STALL   005032          TXTVR7  014406          T$TAGL= 177777          T14.1   026172          WC      = 003352
STARST  017722          TXTVR8  014413          T$TAGN= 010103          T15     026252 G        WD      = 003354
STREG   005034          TXTVR9  014420          T$TEMP= 000000          T15.1   026266          WE      = 003356
SVCGBL= 000000          TXT1    013253          T$TEST= 000030          T15.2   026740          WF      = 003360
SVCINS= 000001          TXT2    013311          T$TSTM= 177777          T15.3   027116          WRCRAM  023420
SVCSUB= 000001          TXT2A   013353          T$TSTS= 000001          T16     027276 G        WRILOC= 000002
SVCTAG= 000001          TXT2B   013412          T$$AU = 010023          T16.LP  026276          WRIPAG= 000004
SVCTST= 000001          TXT3    013454          T$$AUT= 010020          T16.L1  026750          WRITE   004510
SWPBOT= 121000          TXT4    013504          T$$CLE= 010021          T16.L2  027126          WRITEI  004322
SWPDDC= 121400          TXT4A   013544          T$$DU = 010022          T16.1   027320          WSR0    002246
S$LSYM= 010000          TXT47C  007442          T$$HAR= 010101          T17     027360 G        WSR10   002256
TDATA   002306          TXT47D  007453          T$$HW = 010000          T17.1   027402          WSR12   002260
TMPA    002464          TXT47E  007466          T$$INI= 010017          T18     027442 G        WSR14   002262
TMPB    002466          TXT47F  007510          T$$MSG= 010025          T18.LP  027320          WSR16   002264
TMPC    002470          TXT47G  007533          T$$PRO= 010016          T18.1   027466          WSR2    002250
TMPD    002472          TXT47H  007556          T$$SEG= 010000          T19     027526 G        WSR4    002252
TMPE    002474          TXT47P  007614          T$$SOF= 010102          T19.LP  027402          WSR6    002254
TMPF    002476          TXT48A  010736          T$$SRV= 010003          T19.1   027554          W0      = 003322
TMP0    002440          TXT48B  010743          T$$SUB= 010100          T2      021146 G        W1      = 003324
TMP1    002442          TXT48C  010750          T$$SW = 010001          T2CH    = 120011        W2      = 003326
TMP2    002444          TXT48D  010755          T$$TES= 010076          T2CL    = 120010        W3      = 003330
TMP3    002446          TXT5    013605          T.EDF = 000001          T2LL    = 120010        W4      = 003332
TMP4    002450          TXT6    013607          T.EHRD= 000002          T20     027614 G        W5      = 003334
TMP5    002452          TXT7    013632          T.ESF = 000000          T20.LP  027466          W6      = 003336
TMP6    002454          TXT7A   013717          T.ESFT= 000003          T21     030102 G        W7      = 003340
TMP7    002456          TXT8A   014004          T1      020402 G        T21.LP  027554          W8      = 003342
TMP8    002460          TXT8B   014021          T1CH    = 120005        T22     030232 G        W9      = 003344
TMP9    002462          TXT8C   014036          T1CL    = 120004        T23     030362 G        XDATA   002314
TXTMLT  017532          TXT8D   014053          T1LH    = 120007        T24     030516 G        XORGB   011276
TXTML0  014105          TXT8E   014070          T1LHGO= 120005          T25     030646 G        X$ALWA= 000000
TXTML1  014111          T$ARGC= 000001          T1LL    = 120006          T26     030776 G        X$FALS= 000040
TXTML2  014125          T$CODE= 002032          T1.EHD  020670          T27     031134 G        X$OFFS= 000400
TXTML3  014142          T$ERRN= 000146          T1.EM1  020552 G        T27.1   031134          X$TRUE= 000020
TXTML4  014164          T$EXCP= 000000          T1.HIT  020540          T27.2   033406          $E      = 000146
TXTML5  014205          T$FLAG= 000040          T1.HSB  020550          T28     036366 G        $LSTIN= 000001
TXTML6  014235          T$GMAN= 000000          T1.HSW  020546          T28.1   036366          $LSTTA= 000001
TXTML7  014247          T$HILI= 000007          T1.OK   020536          T28.2   037052          $MPCSR= 160000 G
TXTVR   014327          T$LAST= 000001          T1.1    020717          T3      021256 G        $T      = 000034
TXTVRA  014425
```

```
. ABS.  040400      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  31452 WORDS  ( 125 PAGES)
```

SEQ 0190

SEQ 0203

SYMBOL TABLE

DYNAMIC MEMORY: 19748 WORDS (75 PAGES)
ELAPSED TIME: 00:08:46
CNDMAA,BIC,CNDMAA,SEQ/CR/-SP=SVC34,MLB/ML,CNDMAA,P11

.

SEQ 0195

CNDMAAO DMV11 MCTRL

....B1 ....B5 ....B9 ....B13
....C1 ....C5 ....C9 ....C13
....D1 ....D5 ....D9 ....D13
....E1 ....E5 ....E9 ....E13
....F1 ....F5 ....F9 ....F13
....G1 ....G5 ....G9 ....G13
....H1 ....H5 ....H9 ....H13
....I1 ....I5 ....I9 ....I13
....J1 ....J5 ....J9 ....J13
....K1 ....K5 ....K9 ....K13
....L1 ....L5 ....L9 ....L13
....M1 ....M5 ....M9 ....M13
....N1 ....N5 ....N9 ....N13

....B2 ....B6 ....B10 ....B14
....C2 ....C6 ....C10 ....C14
....D2 ....D6 ....D10 ....D14
....E2 ....E6 ....E10 ....E14
....F2 ....F6 ....F10 ....F14
....G2 ....G6 ....G10 ....G14
....H2 ....H6 ....H10 ....H14
....I2 ....I6 ....I10 ....I14
....J2 ....J6 ....J10 ....J14
....K2 ....K6 ....K10 ....K14
....L2 ....L6 ....L10 ....L14
....M2 ....M6 ....M10 ....M14
....N2 ....N6 ....N10 ....N14

....B3 ....B7 ....B11 ....B15
....C3 ....C7 ....C11 ....C15
....D3 ....D7 ....D11 ....D15
....E3 ....E7 ....E11 ....E15
....F3 ....F7 ....F11 ....F15
....G3 ....G7 ....G11 ....G15
....H3 ....H7 ....H11 ....H15
....I3 ....I7 ....I11 ....I15
....J3 ....J7 ....J11 ....J15
....K3 ....K7 ....K11 ....K15
....L3 ....L7 ....L11 ....L15
....M3 ....M7 ....M11 ....M15
....N3 ....N7 ....N11 ....N15

....B4 ....B8 ....B12 ....B16
....C4 ....C8 ....C12 ....C16
....D4 ....D8 ....D12 ....D16
....E4 ....E8 ....E12 ....E16
....F4 ....F8 ....F12 ....F16
....G4 ....G8 ....G12 ....G16
....H4 ....H8 ....H12 ....H16
....I4 ....I8 ....I12 ....I16
....J4 ....J8 ....J12
....K4 ....K8 ....K12
....L4 ....L8 ....L12
....M4 ....M8 ....M12
....N4 ....N8 ....N12